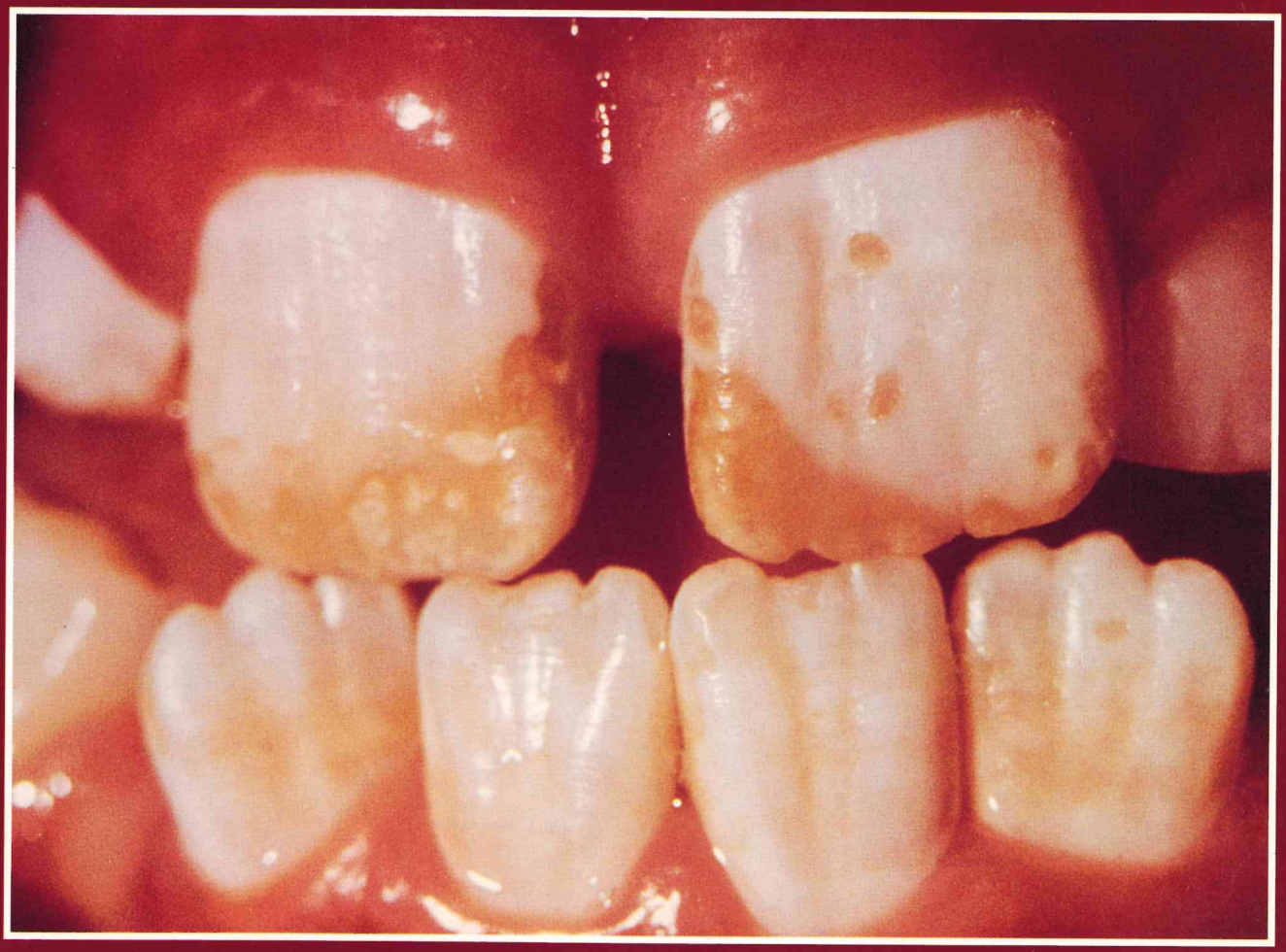
The Secret War

and

The Fluoride Conspiracy



Dr Geoffrey E. Smith

In *The Secret War* Dr Smith documents the chronology of the **Fluoride Conspiracy.** It reveals how the dental profession was ruthlessly manipulated by powerful industrial and commercial interests.

He explains why **fluoride air pollution** has increased so dramatically over the past four decades and shows how these air pollutants can be so dangerous and why we hear so little about them.

Dr Smith looks at how a safe and effective anti-tooth decay vaccine was developed in the early 1970's, and why development of the vaccine was discouraged by the dental establishment and multi-national toiletry companies marketing fluoride toothpaste.

The illustration on the front cover shows the discolored and pitted fluoride damaged teeth of a nine year old boy. The condition is known as **dental fluorosis.**

Mr Justice Crisp pointed out in 1968:

"It is established beyond doubt that the earliest warning and the most sensitive indication of any over-exposure to fluoride is dental fluorosis".

Report of the Royal Commissioner into the Fluoridation of Public Water Supplies. Government Printer, Hobart, Tasmania, 1968 page 82, Section 336.

Cover photograph by J.M. Caris

THE SECRET WAR

This is the true story of how a healing profession let itself be used by Multi-National companies and International Security Agencies - including the CIA, and the KGB, to promote the greatest and potentially, most harmful medical hoax of the 20th Century.

By Dr Geoffrey E. Smith

THE SECRET WAR

By Dr Geoffrey E. Smith

A number of Multi-National companies have been waging a SECRET WAR for many years - YOU may be a victim.

The companies indicted in this monograph include - those responsible for the production of aluminium (particularly ALCOA and COMALCO), copper, steel and beryllium; those manufacturing phosphate fertilizers, insecticides and pesticides; nuclear facilities producing enriched uranium and nuclear power stations; multi-national toiletry companies including Procter and Gamble and Colgate-Palmolive. And, companies like the Nestles Group who, amongst other things, make INFANT FORMULAS.

The common denominator in the above companies concerns the most reactive of all the chemical elements - FLUORINE, which has been rightly called "THE DEVIL'S ELEMENT."

"Chemical and biological weapons mean that war need never be declared. It could go on for years with only the hidden aggressors knowing what was happening. Then, gradually, successive crop failures, devastation of herds by disease, human epidemics - unexplained because "the organisms weren't in the books" - and a catastrophic fall in the birthrate, through sterilization of women by tampering with the water supply, would reveal the truth."

Frederic Joliet-Curie, Paris, 1946.

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FOREWORD

Dentist Announces Tooth-Decay Vaccine, Paining the ADA

THE WALL STREET JOURNAL, **Friday, November, 17, 1972**

The most common disease in the world today is not malaria, influenza, or even the common cold. It is tooth decay, also known as dental caries.

While tooth decay doesn't kill or cripple, it does cause a disproportionate amount of pain and suffering across all age and social groups.

Health authorities in developed countries often claim that the disease is now under control. Up to a point this is true, but in the developing and third world nations tooth decay has reached epidemic proportions as a result of the shift away from traditional eating habits to western-style, high sugar, decay-causing diets.

The cost of containing dental disease - using present-day technology - is enormous. For example, in the United States alone, over $35 BILLION is spent annually on dental care, and that represents about $140 per head of population per year.

This sort of expenditure is totally unrealistic in developing countries where annual incomes range between $200 and $1,000 per person.

The problem of escalating tooth decay rates in developing countries was predicted many years ago.

As a result, a safe and effective vaccine was developed in the early 1970's which had the potential to eradicate tooth decay on a global scale.

This monograph explains how and why the 'dental establishment' went to extraordinary lengths to discourage development of the vaccine.

They were aided and abetted by a cartel of multi-national toiletry companies (Procter & Gamble, Colgate-Palmolive, Unilever, etc.,) who controlled and dominated the multi-billion dollar fluoride toothpaste market.

Furthermore, because industrial fluoride AIR POLLUTION has increased massively over the past four decades, many major industries (nuclear, metal-smelting, petro-chemical refineries, coal-burning power stations, fertilizer works, etc.,) have encouraged the 'promotion' of fluoride as a beneficial element essential for healthy teeth, since this deflects attention away from the hazards of fluoride pollution.

Fluoride has two faces. One apparently benevolent, the other undoubtedly sinister.

Fluoride can help prevent tooth decay. But fluoride can also damage bone-cells and, even more important, bone marrow cells - which include the precursors of immune system cells.

As a result of a series of experiments carried out in 1967-1970 by one of the world's leading research based pharmaceutical companies - GLAXO -, and the British Ministry of Health, it was evident that long-term, low-level, exposure to fluoride could lead to an increase in leukaemia rates, and a marked increase in bone disorders in human populations.

Because of these findings the search for a safe and effective anti-decay vaccine was accelerated.

But, of course, such a product promised to revolutionise the practise of dentistry. Hence it was perceived as a major threat by the 'dental establishment ' which, incidentally, includes an elitist, all-male, pseudo-masonic, secret society of dentists named - DELTA SIGMA DELTA.

Aided, and at times funded by the cartel of fluoride toothpaste makers, dentists encouraged the proliferation and widespread use of a wide range of fluoridated products - toothpastes, tablets, mouthrinses, gels, paints, filling materials, and even fluoride-impregnated toothpicks and dental floss.

Not one of these products has ever been tested for safety and effectiveness in the manner now mandatory for *medicinal* products. Instead, the products were categorised as 'toiletries' or 'topicals' which require no such testing. YET MANY OF THESE PRODUCTS CAN, IN CERTAIN CIRCUMSTANCES, BE HARMFUL.

This monograph explains the many harmful effects of excessive fluoride intake on human health; it also considers in some detail, the effect of industrial fluoride air pollution on the total environment.

Essentially, however, it reveals how a healing profession - Dentistry - was used by extremely powerful industrial and commercial interests to perpetrate the biggest and potentially most dangerous medical 'hoax' of the 20th Century.

The monograph is timely since the latest phase in the "Fluoride Conspiracy" is now well underway. In 1987 manufacturers of the CFCs finally conceded that their products were harming the Ozone Layer. 15 of the world chemical industry's leading producers have invested *hundreds of millions of dollars* in new production facilities for the hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs). The former contain no chlorine and should not threaten the Ozone Layer; the latter release small amounts of chlorine but breakdown before reaching the stratosphere.

However, the breakdown products of the HFCs and HCFCs will rain back on earth and some of them are intensely harmful. As Eric Banks, professor of fluorine chemistry at Manchester University has pointed out:

> *"Industry is rushing headlong into production of these new chemicals in almost complete ignorance of their degradation by-products or their effects on the biosphere."* (*New Scientist*, 20 October 1990, p.34).

The two degradation products which should be causing most concern are HYDROGEN FLUORIDE (HF), and TRIFLUOROACETIC ACID (TFA).

HF figures prominently in this monograph and can damage sensitive vegetation at levels of 0.1 parts per BILLION in air; TFA, which itself is very toxic, can enter the food chain and be converted by some plants and microbes to the highly toxic MONOFLUOROACETIC ACID (MFA).

In the mammalian body, MFA is transformed by a process known as "Lethal Synthesis" to FLUOROCITRIC ACID - a chemical so toxic that 0.6 *MICROGRAMS* kills a rat instantly when injected into the subarachnoid space.

This monograph chronicles how scientists and manufacturers either fail to consider the possibility that 'new' chemicals could cause *future* harm to people or the biosphere, or, deliberately conspire to suppress evidence of the dangers of the chemicals.

THE SECRET WAR

"FOR YE SHALL KNOW THE TRUTH AND THE TRUTH WILL SET YOU FREE"

Motto of the US Central Intelligence Agency

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PREFACE

This monograph is dedicated to the many scientists who have publicly expressed their concerns about the dental profession's infatuation with fluoride, and they include:

Sir Edward Dunlop, Professor Sir Arthur Amies, Dr Philip Sutton, Dr Paul Pincus, Professor Sir A. Stanton-Hicks, Assoc. prof. J. Polya, Dr Doug Everingham, Justice Lionel Gross, Dr George Waldbott, Professor Albert Burgstahler, Dr J. Yiamoyiannis, Dr F. Exner, Dr P. Zanfagna, Dr J. Colquhoun, Professor H. Sinclair, Emeritus Professor Margaret Murray, Dr Dagmar Wilson, Dr J. R. Mariert, Professor Lennart Krook, Professor Mark Diesendorf, the four Nobel Laureates - Otto Warburg, Henry Muller, William Murphy, and Hugo Theorell, Professor Arvid Carlsson, Professor H.S. Scorer, Dr H.C. Moolenburgh, Dr G.W. Grimbergen, Dr John Lee, and also Phillipe Grandjean, Professor of Environmental Medicine at Odense University in Denmark, who wrote to the US Environmental Agency in June 1985 about a World Health Organization study on fluorine and fluoride and pointed out that -

"Information which could cast any doubt on the advantage of fluoride supplements was left out by the Task Group. Unless I had been present myself, I would have found it hard to believe."

"We are the Pilgrims, master; we shall go
Always a little further: it may be
Beyond that last blue mountain barred with snow,
Across that angry or that glimmering sea,
White on a throne or guarded in a cave
There lives a prophet who can understand
Why men were born; but surely we are brave,
Who make the Golden Journey to Samarkand."

James Elroy Flecker (1884-1915)

In the former Soviet Union, children living near aluminium smelters were seven times more likely to come down with rickets than youngsters in cleaner surroundings. Downwind from such a smelter at Turson-Zade on the border of Uzbekistan and Tajikistan - only a stones-throw from SAMARKAND - the children never smile because their teeth are blackened, pitted, and unsightly, in other words, they suffer from dental fluorosis.

Source: Tsifry i fakty, *MedGaz*, 3 June 1990, p.3.

INTRODUCTION

You will have heard of fluoride. It's the miracle ingredient in your toothpaste, and the chemical they put in public water supplies to prevent cavities in teeth. But did you know that fluoride is also a mind-dulling drug that both the Nazis and Soviets used to 'doctor' drinking water in concentration camps and slave-labour gulags?

You may have heard of hydrogen fluoride. It's a common, particularly dangerous but relatively unknown air pollutant produced by the most powerful industries including:- steel mills, iron foundries, copper, zinc and aluminium smelters, plastics manufacturers, fertilizer works, agro-chemical factories, petro-chemical refineries, brick works, glass factories, coal-burning power stations, and nuclear processing plants.

But, if health authorities were to set air pollution standards for hydrogen fluoride which were harmless, then certain key industries in our technologically-orientated society would almost grind to a halt.

This dilemma led to the most bizarre conspiracy of modern times in which captains of industry and national security agencies combined to ruthlessly suppress evidence of the dangers of hydrogen fluoride air pollution; and, cynically used a healing profession - dentistry - to promote an apparently beneficial image for fluoride.

The result is that we live in an increasingly 'fluoridated' world. The fluoride in water and toothpaste is potentially harmful; the hydrogen fluoride in contaminated air far more so. Each year, tens of thousands of tonnes of hydrogen fluoride create an environmental hazard more threatening than global warming or depletion of the ozone layer; and hydrogen fluoride, which can be 1,000 times more harmful than sulphur dioxide, is often a key, but rarely mentioned component of 'acid rain'.

Few people living in the developed countries of the world can escape exposure to hydrogen fluoride (HF). Workers in more than 60 occupations[1] are now breathing HF-contaminated air, and anyone living in the vicinity of the fluoride-polluting industries mentioned above is also at risk.

Dr Jag Cook[2] of Britain's National Chemical Emergency Group, which is responsible for dealing with disasters involving toxic chemicals, once said:

"Hydrogen fluoride is about the only chemical that really frightens me."

The World Health Organisation has estimated that many millions of people live in areas with air pollution problems severe enough to cause tens of thousands of premature deaths each year and leave many more chronically ill and disabled.

During this century three major air pollution disasters emphasised the link between contaminated air, disaster and death. These occurred in the Meuse Valley, Belgium, in 1930; Donora, Pennsylvania in 1948, and London in 1952. The worst began in London on Thursday, 4th December and lasted 3 days. During this period, 4,000 people in London died from heart and lung disease.

Hydrogen fluoride was the chief killer in all three disasters.[3]

However, outside certain workplace settings or rare climatic conditions, exposure to levels of HF which would cause acute distress or death are rare. We are chiefly concerned with the effect on human health of low-level long-term exposure to trace amounts of hydrogen fluoride.

The first symptoms are NOT physiological but psychological and include chronic fatigue, confusion, partial loss of memory and mental dullness. Behaviour is exquisitely sensitive to minute traces of hydrogen fluoride in the environment. This is because, like the 'nerve' gases designed for chemical warfare, HF is an *anti-cholinesterase agent* [4] and interferes with the activity of a vital enzyme.

At incredibly low concentrations HF can induce subtle changes in enzyme activities, nerve action potentials and host defence - the immune system.[5]

Hydrogen fluoride can also cause mutations that will be irrevocably engraved on the genetic code and passed on from generation to generation. Some of the mutagenic changes can be so subtle (a ten-point change in IQ, perhaps), that they might go completely undetected for several generations.

The first warning of any such event would be an increase in the number, incidence, or severity of genetic illnesses; marked changes in the birth ratio of men to women; or an almost imperceptible loss of vigour and vitality, progressing from generation to generation.

Hydrogen fluoride at a concentration of just *0.1 parts per billion* in air can damage sensitive vegetation; [6] at a concentration of 1 part per billion it can devastate vineyards and orchards. Of all air pollutants which affect farm animals, hydrogen fluoride has caused the most severe and widespread damage.[7] Yet health authorities insist that low-level long-term exposure to HF *cannot* harm human health! [8]

If there is scientifically acceptable evidence to support my claims about the hazards of HF, how on earth have authorities managed to deceive people for so long? Why do we hear so much about sulphur dioxide, nitrogen oxides and carbon monoxide, and so little about hydrogen fluoride?

Because most people have been 'brain-washed' into believing that 'fluoride' is good for them. After all, its put into water and toothpaste to prevent tooth decay. If you can drink water containing 1 part per million fluoride, and use toothpaste containing 1,000 parts per million fluoride, then how could fluoride in air at a level of parts per *billion* be harmful?

In other words, health authorities pretend that the fluoride in air is the same as the fluoride in drinking water and toothpaste. They even present their measurements of hydrogen fluoride in air as - *fluoride.*

BUT HYDROGEN FLUORIDE IS FAR MORE DANGEROUS THAN THE FLUORIDE IN WATER OR TOOTHPASTE. EVEN SO, AND AS I WILL SHOW, FLUORIDATED WATER AND TOOTHPASTE CAN THEMSELVES BE HARMFUL TO YOUR HEALTH.

In the 1930's scientists in Britain, Europe and the United States *knew* that low levels of HF were harmful. Furthermore, they had identified a visible symptom of chronic HF poisoning.[9]

Children who grew up near industries with fluoride-pollution problems could develop 'mottled' teeth; so too could cattle and sheep in the vicinity. The relationship between HF air pollution and 'mottled' teeth was an obvious threat to the Captains of Industry. They might argue whether it was sulphur dioxide, nitrogen oxides or hydrogen fluoride that was responsible for damage to crops and livestock, but no other air pollutants caused mottled teeth.

In 1930 there were plenty of 'mottled' teeth amongst children in Pittsburgh, Pennsylvania, headquarters of the Aluminum Company of America, ALCOA. The head chemist of ALCOA, H.V. Churchill, was given the job of 'explaining' the 'mottled' teeth in a way that would deflect attention away from ALCOA's fluoride air pollution problems.

Churchill reasoned that if trace amounts of HF in air could cause mottling, then much larger amounts of *fluoride* in *water* might also cause mottling. And he was right. In some parts of the world the water *naturally* contains relatively high levels of fluoride (not HF remember), and in those areas fluoride 'mottled' teeth were common.

But ALCOA was concerned about far more than 'mottled' teeth. Their very future was under threat.

Although the injurious effects on vegetation of hydrogen fluoride emissions from brickworks, metal smelters, chemical manufacturing plants, fertilizer factories and glass works had been known since the late 19th century, reports of injuries to

livestock began to escalate from 1918 onward. Then, in December 1930, during the first week of December, all of Belgium was blanketed by dense fog. In addition, there was a temperature inversion in the Meuse Valley which acted like a lid to prevent the upward escape of the gases.

In a 15 mile stretch of the valley, with hills of 250 to 350 feet on each side, some 6,000 people became violently ill and, on the third and fourth days, 60 died. Many cattle and household pets were also killed.

The cause of the tragedy was investigated by no less than six teams of 'experts'.

All agreed that the symptoms were those of acute hydrogen fluoride poisoning. One team also put the blame on sulphur dioxide and sulphuric acid. The others disagreed and pointed out that windows and light bulbs in the houses were 'etched' - a classic sign of exposure to hydrogen fluoride.

Eventually, all the evidence was carefully studied by Professor Kaj Roholm,[3] who, at the time, was generally acknowledged to be the world's leading authority on fluoride poisoning.

He concluded that the symptoms and details of the disaster pointed overwhelmingly to hydrogen fluoride poisoning. Of the 27 factories in the area, 15 either used raw materials containing fluoride (superphosphate works and zinc mills), or added fluoride compounds to the raw materials (steel mills, iron works, glass factories), involving the production of gases such as hydrogen fluoride and silicon tetrafluoride, which were released to the atmosphere via chimney stacks.

Thus, by 1930, it was clearly established, and beyond reasonable doubt, that hydrogen fluoride could not only damage vegetation and livestock, but also harm human health.

Aluminium smelters are one of the worst offenders so far as fluoride air pollution is concerned. Their employees, particularly those who work in the pot room are exposed to relatively high levels of hydrogen fluoride, and pot room asthma is an occupational hazard. Yet even today, ALCOA will not admit the link between the disease and hydrogen fluoride.

In 1930, it was essential to ALCOA that Churchill should deflect attention away from their fluoride air pollution problem.

On May 31, 1931, the following story appeared in the *Pittsburgh Press:*

> "SCIENTIST FINDS 'SECRET POISON' WHICH BLACKENS TEETH OF CHILDREN
>
> ***Long research pins blame on fluorine found in drinking water; Churchill's discovery offers way to save disfigurement.***

Churchill (chief chemist of ALCOA) lined up the elements present in Bauxite, Arkansas, drinking water, and examined each one for guilt or innocence, as a prosecutor might do with a score of murder suspects. Those with proven records of innocence were checked off. Those which might attack human tissues were held under suspicion.

As a matter of fact, Churchill had fluorine in mind. He had recalled that brewers once used to sterilise beer vats with a calcium fluoride solution, because it killed wild yeast, but that drinkers of the beer became affected with peculiar bone troubles, and the dismayed brewers ceased its use.

Chemical analyses of the water followed. These showed comparatively large amounts of fluorine in water from localities where 'mottled' enamel was most frequent. Such spots in Arkansas, Colorado, North and South Dakota and Idaho, showed 2 to 13.7 parts of fluorine per million parts of water. Other localities showed fluorine, but less than one part to 1,000,000. The water of 26 cities was analysed, and in 16 samples fluorine was found, but always less than one part to a million.

Eager interest has been manifested in Churchill's discovery among public health experts and dentists the world over, and it is believed that those cities whose children suffer from 'mottled' enamel may have to add, to avoid it, a method of eliminating fluorine to their present water-purification methods."

Churchill had successfully deflected attention away from ALCOA's air pollution problems and apparently established that it was fluoride in water *only*, that caused 'mottling'. Even today that myth still exists - even amongst many dentists.

So lets dispel it straight away. Two of the most highly respected medical scientists in Britain, Emeritus Professor Margaret Murray and Dr. Dagmar Wilson, began investigating the physiological effect of fluoride in the mid-1930's.

In 1942, Murray and Wilson published a paper in the *Lancet* [10] entitled:

"DENTAL FLUOROSIS (mottled teeth) AND CARIES IN LONDON CHILDREN".

The report showed that out of 589 London children, *28 per cent* had mottled teeth. 6 children had severe mottling, 7 had moderate mottling, 54 mild mottling, and 83 children very mild mottling. Incidentally, 258 children had 'questionable' mottling and only 167 had no mottling.

Now, according to Churchill and the US Public Health Service, London's drinking water should have contained well over 1 part per million fluoride to account for such an incidence of mottling. In fact, it contained just 0.19 ppm fluoride.

There was insufficient fluoride in London's drinking water to account for the mottling, so where did it come from?

Up until World War II, in an area the size of the state of Michigan, England burnt half as much coal as the entire United States, and coal contains, on average 120 ppm fluoride, which on burning is released as hydrogen fluoride and silicon tetrafluoride. Hence, London children were breathing HF-contaminated air.

In fact, Murray and Wilson were well aware of the problem. In another paper in the *Lancet*,[11] headed: "FLUORINE HAZARDS WITH SPECIAL REFERENCE TO SOME SOCIAL CONSEQUENCES OF INDUSTRIAL PROCESSES", they wrote:

> *"An outbreak of fluorosis in cattle has once more drawn attention to the large amount of fluorine and fluorine compounds being set free by some recently extended industrial processes and has shown the necessity for consideration of the dangers to public health and to agricultural economy existing in the neighbourhood of these undertakings."*

Murray and Wilson go on:

> *"Hazards associated with such fluorine evolution concern not only workers inside the factories but also their families living in the neighbourhood and others resident or employed in the area."*

In the paper Murray and Wilson describe a particular episode involving a farmer and his family who were exposed to HF air pollution for a number of years in south Lincolnshire. In all nine persons were involved in the study. The younger ones had mottled teeth; all were suffering other symptoms involving the respiratory tract and/or the skeletal system; and five had radiologicaly detectable changes in bones.

The authors of the paper concluded:

> *"An example has been studied of some important secondary consequences for dwellers in the neighbourhood of certain industrial undertakings.*
> *... methods for fluorine control are at present too rarely applied in this country, because fluorine hazards are not sufficiently appreciated."*

Meanwhile, in America, in 1939, the American Water Works Association decided there was now sufficient evidence available about fluoride to classify it as a hazard in the same category as lead and arsenic. They proposed a safety standard of 0.1 parts per million fluoride in drinking water.[12]

This proposal caused consternation in certain board-rooms. Besides fluoride air pollution, many industries produced vast quantities of solid fluoride wastes and a popular way of disposing of them was to dissolve the waste in water and either pour it down drains or pump it into nearby waterways - some of which were also used as drinking water.

An obscure biochemist working at the MELLON INSTITUTE - a seat of learning set up by the founders of ALCOA as a "Laboratory for applied science open to the US businessman", came up with the suggestion that:

> *"The present trend toward complete removal of fluorine from water and food may need some reversal."*[13]

The biochemist, Gerald Cox, claimed to have fed rats small doses of fluoride and found that this prevented dental decay in the animals.

There was nothing new in this. Margaret Murray and Dagmar Wilson were also aware that trace amounts of HF or tiny amounts of fluoride could reduce the incidence of tooth decay in children. But, they argued that the mechanism by which fluoride might prevent decay could damage important cells and tissues *inside the body.*

A dentist in the US Public Health Service, obviously concerned only with teeth, argued that as the degree of 'mottling' increased, the presence of tooth decay decreased. He developed a hypothesis which totally ignored fluoride intake from sources other than water, and involved artificially raising the fluoride content of low-fluoride water supplies to levels sufficient to achieve a reduction in tooth decay without causing an undesirable increase in mottled teeth.

The dentist, Trendley Dean, was encouraged by his superiors to test the hypothesis. And this he did and from the *dental* point of view the results seemed to support his hypothesis.[14] What Dean didn't do was to look beyond the affects on teeth. And yet in the test area with naturally high fluoride drinking water, there were fewer cavities, an increased amount of 'mottled' teeth, AND A STATISTICALLY SIGNIFICANT INCREASE IN BONE CANCER.[15]

But by now, an attorney formerly retained by ALCOA at a fee of $750,000 a year, had become head of the US Public Health Service, and the 'fluoride conspiracy' was underway.

INTRODUCTION - REFERENCES AND NOTES

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8. See reference 1, where on page 134, we find:

   "These standards were not established on the basis of protection of human health, but on the basis of damage to livestock and vegetation. The levels are well below those found to adversely affect human health."

   In other words, HF levels that can cripple cattle and destroy vineyards cannot possibly harm *you!* I find that hard to believe.

   In this book I will argue that regulatory bodies have *deliberately* UNDERESTIMATED the dangers of low-level long-term exposure to HF by a factor of 100.

9. McClure F. J., A Review of Fluorine and its Physiological Effects. *Physiological Reviews,* 13, 277-300, 1933.

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14. Dean H.T. et al., *US Public Health Report* 54, 862, 1939.
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15. Marinelli L.D., Radioactivity in the Human Skeleton. Janeway Lecture. *American J. Roent.,* 80, 729-740, 1958.

Note:
Dean, in his two studies examined children's teeth in the following towns and cities: GALESBURG, MONMOUTH, MACOMB, AURORA, JOLIET, QUINCEY, ELMHURST, MAYWOOD, ELGIN, EVANSTON, OAK PARK and WAUKEGAN.

Marinelli reported levels of RADIUM-226 present in the drinking water of the same 12 cities. The data from the two sets of studies show that HIGH levels of RADIUM-226 were found in the drinking waters with HIGH FLUORIDE content, and low levels of RADIUM-226 were found in the LOW FLUORIDE WATERS (see Table 1 overleaf).

FURTHER, THERE WERE STATISTICALLY SIGNIFICANT INCREASES IN BONE CANCER IN ELMHURST, MAYWOOD, AURORA, AND JOLIET (HIGH FLUORIDE), WHEN COMPARED TO EVANSTON, OAK PARK, AND WAUKEGAN (LOW FLUORIDE).

I have combined the relevant data in the following table:

Table 1

Location	Decayed Teeth per 100 children	Fluoride in water (ppm)	Conc. of Radium-226*
Galesburg	194	1.8	5.0
Monmouth	208	1.8	5.0
Elmhurst	252	1.8	5.0
Maywood	258	1.2	4.3
Aurora	281	1.2	5.0
Joliet	323	1.3	5.0
Macomb	368	0.2	0.1
Elgin	444	0.5	0.7
Quincey	628	0.2	0.1
Evanston	673	0.0	0.03
Oak Park	722	0.0	0.03
Waukegan	810	0.0	0.03

*Radium-226 expressed as picocuries/litre.

N.B. Increases in bone cancer rates were found in Elmhurst, Maywood, Aurora and Joliet; unfortunately, bone cancer rates were not recorded for Galesburg, Monmouth, Macomb, Elgin, and Quincey.

A strange omission in retrospect.

FLUORIDE AND THE INTELLIGENCE COMMUNITY

"The location of factories in the United Kingdom which manufacture hydrogen fluoride (HF) and elemental fluorine (F_2) is officially secret.

To disclose the locations of such factories would not be in the interest of National Security."

The Home Office, London, 1992.
(See also *New Statesman and Society*, 20 October, 1988).

"If you divulge, in public, the precise composition of the gaseous emissions from Capenhurst (Britain's uranium hexafluoride gaseous diffusion plant in Cheshire), you may well be charged under the Official Secrets Act; and if you were, the hearings could well be heard in camera."

Officer from the Security Service (MI 5) to the author, August 1976.

"A chemical devil has been tamed and trained to serve in war and peace."

(Waggman W.H., Fluorine: Devil Element, *Chem.* 18:1, 1945.)

I once began an article on 'Fluoridation' by recalling that I had lectured on the subject to a group of intelligence officers from various NATO countries.[1]

This brought forth howls of derision from certain members of the Australian Dental Association, one of whom wrote to Prime Minister Margaret Thatcher asking her to confirm or deny that I was a member of Her Majesty's Secret Service.

Of course Mrs Thatcher had better things to do with her time than get involved in the 'fluoridation controversy'. Anyway, it was only in 1991, that the British Government officially acknowledged the existence of MI 6.

There are, in fact, some very good reasons why the intelligence community has taken an interest in fluoride for more than 50 years.

For instance, on *March 29 1957,* in the County of Arapahoe, in the State of Colorado and before a public notary named Joe E. Atencio, one *Oliver Kenneth Goff* had made a sworn affidavit. In it he claimed to have been a member of the American Communist Party and the Young Communist League.

The FBI had forwarded a copy of the affidavit to the British Ministry of Defence asking for comment.[2]

In the statement Goff claimed he was trained in a number of espionage skills including: the printing and distribution of propaganda; how to sabotage planes and trains; and how to poison community water supplies.

Goff stated that his teacher, a Soviet agent, had told him that in Russia, fluoride was added to drinking water in prison camps where it acted as a mild tranquilizer. He was also told that in American cities using fluoridated water, "the stores of sodium fluoride near the reservoirs could be used to make a nerve gas to poison the population."

Now, one important task of 'security services' is protection of public utilities, such as power and water supplies. Without these necessities any modern community would be thrown into chaos.

Was the fluoride used to treat drinking water a security risk?

Well, early fluoridation projects employed sodium fluoride as the source of fluoride, and if London's water was to be fluoridated, for example, you would need to add about 2.4 tonnes of sodium fluoride to the water each day.

That's a lot of sodium fluoride.

During World War II the Ministry of Supply had requisitioned all available supplies of sodium fluoride, and I'll explain why.

Early in 1941, the Ministry of Supply established a research team to investigate the toxic fluorophosphate compounds as possible chemical warfare weapons. Dr. H. McCombie and Dr. B. C. Saunders of the Cambridge University Chemical Laboratories headed the team which kept in regular contact with other scientists at Porton Down - the British Chemical and Bacteriological Warfare Research Centre.[3]

The only previous reference McCombie and Saunders could find to the physiological activity of the compounds under test was a paper published in 1932.

In this, Lange and von Kreuger reported that vapours of diethyl phosphorofluoridate when breathed in small amounts, produced symptoms of breathlessness and constriction of the pupil of the eye. Lange and his colleague also described a very tedious and laborious method for preparing dimethyl and diethyl fluoro-phosphanates.

During 1941, the Cambridge team prepared several compounds and in a preliminary report concluded: [4]

- These substances have high toxicity as lethal inhalants. The rapid effect and quick knock-out action is shown by few other gases or vapours.

- At lower and non-fatal concentrations, a peculiar effect is produced on the eyes. The material causes the pupils to become acutely constricted and the effect lasts for several days. There is no tear formation and reading is rendered difficult. Vision at night is seriously affected.

The team developed a number of methods of making the compounds and eventually found a *simple one-stage process suitable for mass production.*

This involved the addition of phosphorus trichloride to isopropyl alcohol, dissolved in carbon tetrachloride, without external cooling. The crude product (still in carbon tetrachloride) was chlorinated and then heated with *sodium fluoride.*

After filtration, the carbon tetrachloride was distilled off, and the pure diisopropyl fluorophosphonate (DFP) distilled.

The British had manufactured their first 'nerve' gas.

DFP was far more toxic than phosgene and the quick knock-out action was comparable with hydrogen cyanide.

Secret reports were made available to American scientists at the Edgeware Arsenal almost from the inception of the investigations, and the simple manufacturing process developed at Cambridge formed the basis of future processes resulting in far more potent 'nerve' gases such as Isopropyl Methylphosphono*fluoridate,* or GB.

It's hardly surprising perhaps, that intelligence officers were concerned to find that the very chemical used to make a 'nerve' gas would be stored in large quantities adjacent to public water supplies.

FLUORIDE AND THE BOMB

In April 1939, the French physicist Frederic Joliet-Curie published the results of an experiment in *Nature.*[5]

The experiment confirmed without doubt that a nuclear bomb was a theoretical possibility.

In Britain, Professor Sir George Thomson read Joliet-Curie's report with increasing foreboding. Within hours he talked with Laurence Bragg, head of the Cavendish Institute, a brilliant physicist and the youngest ever Nobel Laureate. Bragg agreed that the French experiment confirmed the feasibility of a chain reaction which would unleash vast energy.

Thomson and Bragg prepared a short paper on the subject and discussed it with Major-General H.L. Ismay - secretary to the Committee of Imperial Defence. This paper became the first entry in the British Government's MOST SECRET dossier on uranium and the nuclear bomb.

Only 7 atoms in 1,000 of natural uranium are U-235, the rest are U-238. To make a uranium bomb, the monumental problem of separating out the U-235 atoms would have to be solved.

In Birmingham, England, Otto Frisch, then technically an enemy alien was working on the problem. There was no obvious chemical method since U-235 is chemically identical with U-238.

However, Frisch reasoned that if the uranium was turned into a gas then the atoms could be made to separate according to their weight or mass, and U-235 is lighter than U-238.

The only theoretically suitable gas was uranium hexafluoride (UF_6), but this was so reactive and corrosive that no pipe, or pump, or diffusion barrier had yet been designed that would contain it.

In addition, to produce the enormous amounts of uranium hexafluoride needed, elemental fluorine gas - the most reactive of all the elements - would have to be generated on a scale never before contemplated.

Nevertheless, Frisch and two other German exiles, Rudolph Peierls and Francis Simon, argued that U-235 should be isolated by the gaseous diffusion process and that the problems associated with the corrosive nature of uranium hexafluoride could be overcome.

They prepared a paper for the War Cabinet and reported: [6]

> *"A complex able to deal with enormous amounts of gasified uranium (UF_6) should be built. It would produce a substance of high purity. Purity higher than has been dreamed of, a staggering 99 per cent. It would mean a vast area of 70,000 square metres of porous metal Membranes. There would have to be 18,000 units, with each unit having 20 stages; and the whole plant would cover about 40 acres of ground and would need a supply of 60 megawatts of power to operate 70,000 tons of machinery. Such a complex could produce a kilogram of uranium-235 each day."*

A Cabinet sub-committee evaluated the report and pointed out that the plant would extremely vulnerable to air attack or saboteurs. The consequences of an incendiary attack on the gas filled plant would be devastating.

The fluorine would consume everything it touched including water, steel, concrete and people. The heat would be tremendous and the products of combustion all deadly poisons. 2,000 litres of fluorine would release enough toxic gases to kill a million people, and decontamination of the affected area would be a major problem.

Despite these objections, Churchill was loathe to forget about a uranium bomb and suggested that the uranium hexafluoride gaseous diffusion plant be built in either Australia or Canada.

However, in the United States, on December 6 1941, President Roosevelt, ordered American scientists to begin building an atomic bomb. Six days later, Pearl Harbor gave an urgency to American efforts that quickly outstripped British work on the bomb.

In June 1942, US Army General Leslie R. Groves, took charge of the "Manhattan Project." [7]

He had been ordered to build a new weapon for which no clear manufacturing procedures had yet been developed.

By 1943, Site X of the Manhattan Project was underway. It was a gargantuan development under Black Oak Ridge, Tenessee. 50,000 workers were constructing some of the largest factories ever built on 500,000 acres of land.

At the gaseous diffusion plant, chemists and engineers were designing tubing, pumps and valves which could withstand the corrosive properties of fluorine and uranium hexafluoride. Paradoxically, the only material that could contain the reactive gases was a *fluorocarbon*. And this was the first time many of the now common fluorocarbons were synthesised.

In May 1943, the Medical Section of the Manhattan Project [8] was set up at the University of Rochester, New York, to establish the toxicity of various uranium and fluorine compounds which workers in the Project might be exposed to.

By September 1943, the Medical Section concluded that the four most potentially hazardous chemicals were: uranyl fluoride (UO_2F_2), uranium hexafluoride (UF_6), fluorine (F_2) and hydrogen fluoride (HF). Soon afterwards they added oxygen difluoride (OF_2) to the list of particularly dangerous chemicals.

Naturally enough, the Medical Section was working under enormous pressure, worker safety was important but production of the bomb even more so. No-one had time to consider the impact of emissions from Oak Ridge on the environment or on the health of people living near the plant.

General Groves enforced the strict rules of military security on the 150,000 persons employed on the Manhattan Project. Communication amongst scientists in different sections was forbidden. Army intelligence and the FBI spied on the scientists, read their mail and recorded their phone conversations.

Well, the bomb was built, tested and used. World War II ended but the walls of secrecy and security that were built up during the Manhattan Project remained.

Descriptions of the Manhattan Project have usually covered the nuclear physics background together with the political and strategic considerations surrounding the decision to manufacture and use atomic bombs.

The key role played by fluorine chemistry in the realisation of nuclear weapons has received relatively scant attention. However, as a direct result of the Manhattan Project, fluorine chemistry became established as a branch of chemical science with immense potential industrial application. The combination of military, governmental, academic and industrial interests, driven by the need to produce nuclear weapons, led to the growth of fluorine chemistry into the vast subject it is today.

Fluorine and its compounds emerged from virtual obscurity in the first half of the 20th Century to an extremely valuable position in modern industry. Indeed, there are few chemicals with greater industrial potential than fluorides.

Unfortunately, as we have seen, fluorides also have military potential. Not only as nerve gases and the production of nuclear weapons, but also as rocket propellants of incredible power and as high energy chemical laser weapons. For instance, a 25 megawatt hydrogen/fluorine laser would use about a tonne of H_2/F_2 fuel every second and exhaust a similar amount of hydrogen fluoride.[9]

Because of the military applications of fluoride every major intelligence agency in the world discourages people from asking too many questions about certain facilities using or emitting fluoride gases.

A CRUEL DEATH

Joe Harding[10] worked for over 18 years in the nuclear plant at Paducah, Kentucky. While at work he regularly breathed traces of the mildly radioactive gas - uranium hexafluoride, which was known to generations of workers in the industry as HEX.

Sometimes, as Joe said:

> *"The gas was so thick you could see the haze in the air when you looked at the ceiling light, and you could taste it coated on your teeth and in your throat."*

By February 1980, Joe, now aged 59 years, had lost 95 per cent of his stomach, suffered chronic lung problems, and skin sores that refused to heal, had a tumour wrapped round his spine in the abdominal cavity; and finally, bony outgrowths protruding from his joints.

When Joe died, his widow was told her husband had rarely been monitored for radiation - "Because of the low potential for exposure among workers in his field". Apparently, the experts were baffled by Joe's symptoms; and his widow wasn't encouraged to ask too many questions. As Joe had told her, the company put a tight lid on discussion of plant safety. Before you worked there the FBI ran a security check, and after you were hired they would keep a close eye on you. But there is no mystery about Joe's symptoms, and his condition should have been diagnosed in the early stages of his suffering.

In the workplace Joe was regularly exposed to uranium hexafluoride - one mildly radioactive uranium atom surrounded by six atoms of the devil's element - fluorine. When swallowed, the fluoride, in the acid environment of the stomach, is converted to intensely corrosive hydrofluoric acid (HF), which inexorably and

painfully, gradually ate away most of Joe's stomach. Likewise, fluoride deposited on the skin, especially in the presence of sweat - because Joe was a hard worker, is converted to HF causing chronic ulceration.

Furthermore, we know from studies carried out by the Medical Section of the Manhattan Project in 1944 - some published, others still 'classified' - that uranium hexafluoride irritates the linings of the trachea and lungs when inhaled.

The bony outgrowths from Joe's joints were a *classic* symptom of skeletal fluorosis and were first described in the medical literature over 50 years ago. They result from prolonged over-exposure to fluoride.

Indeed, any third-year medical student in India, China or Kenya, would have recognised the significance of this particular symptom since skeletal fluorosis is endemic in parts of those countries due to naturally high levels of fluoride in the soils and drinking water.

Finally, *synergism* was responsible for the tumour wrapped round Joe's spine. Certainly, the uranium that Joe inhaled was only 'mildly' radioactive, but the fluoride in UF_6 stimulated the formation of *denser bone* and disturbed the normal processes of bone resorption and deposition which continually occur in the healthy skeleton. Thus, the uranium was trapped within Joe's bones for a dangerous length of time.

FERNALD, OHIO, A TOWN WITH A PROBLEM [11]

In Fernald there is a Feed Materials Production Center which turns uranium oxide into the metal form for use as a reactor fuel.

In manufacturing uranium metal, hydrogen fluoride is used in large amounts, and the waste gases (containing HF), are cleaned before discharge into the atmosphere. The solid wastes, recovered from the scrubbing system, are stored in pits on a site prepared to prevent ground water contamination.

Then, some of the wastes containing soluble fluorides are discharged into the Great Miami River which passes close to the plant. The rate of discharge is supposedly controlled so that a "permissible" level of fluorides in the river of 1.2 parts per million is not exceeded. An average of over *6,000 kg of fluorides per month* have been discharged this way.

On October 7 1988, after 37 years in operation, the 420 hectare plant at Fernald was closed down by workers striking for safer working conditions. Their leaders told of families stricken with 'curious' cancers, of employees becoming mysteriously sick, and of general illness rates far higher than normal. 14,000 local residents launched a law suit seeking $300 million in damages for the decline in

property values and for 'emotional trauma' caused by exposure to hazardous wastes.

In documents presented to a House of Representatives Energy and Commerce Sub-Committee, the US Government admitted it: "knew full well that the normal operation of the Fernald plant would result in emissions of uranium and other substances", into the Great Miami River and into the atmosphere.

In other words, Government officials knew for decades that the plant was releasing thousands of tonnes of mildly radioactive compounds and other toxic wastes into the environment, thus exposing thousands of workers and area residents.

Dr Richard Shank, director of Ohio's Environmental Protection Agency, told the hearing that since the plant opened in 1951, 12.7 million pounds of uranium and other toxic wastes had been disposed off in pits; 167,000 pounds discharged into the great Miami River; and at least 298,000 pounds released into the air.

Congressman T. A. Luken, a Democrat representing the Cincinnati area commented:

> *"The Department of Energy has been waging a kind of chemical warfare against the community of Fernald. It knew for over 20 years that its waste pits were leaking. It now admits that it knew that the plant's pollution control system was obsolete. And it now admits that for most of the past 35 years it sat on its hands and did nothing to fix these serious and potentially life-threatening problems."*

Perhaps most chilling of all, the Congressional hearings have now revealed how Washington has used 'secrecy' justified by *National Security Considerations* to cover up ruthless cost-cutting strategies and 'cover-ups' which have put tens of thousands of Americans at risk.

When World War II ended, the head of the Medical Section of the Manhattan Project Professor Harold Hodge, became the leading Government spokesman promoting two important issues - the safety of nuclear power and, the safety of water fluoridation. Both in the United States and overseas, and sponsored by either the Atomic Energy Commission or the Public Health Service, Hodge preached the merits of nuclear energy and fluoride in drinking water. He wrote innumerable articles 'proving' the safety of fluoridation, and regarding uranium processing plants he wrote:

> *"Finally, a tribute should be paid to the vigilant medical supervision of the Manhattan Project and the Atomic Energy Commission. This supervision has been so successful at all their installations that severe uranium poisoning has never occurred and mild uranium poisoning is so rare that it is practically unknown."*[12]

What about Joe Harding and the workers at Fernald, Professor Hodge?

STRONTIUM-90, FLUORIDE AND THE KGB

Since the end of World War II, the Americans, Soviets, British and French had increasingly tested nuclear devices in the atmosphere. By 1966, the total fission energy produced by such tests had reached *194 megatonnes.*

Since Strontium-90 is produced in nuclear explosions in the amount of approximately 3.7×10^{15} Becquerels per megatonne of fission energy, the total amount of Strontium-90 produced in weapons testing between 1951 and 1965 was a staggering 74×10^{16} Becquerels.

Not surprisingly, Strontium-90 levels in human teeth and bone were increasing all around the world, and the element is a particularly nasty by-product of nuclear fission because it can cause bone cancer and leukaemia.

Health authorities on both sides of the Iron Curtain were concerned. The British Ministry of Health were sponsoring a conference at Chapel Cross,[13] a nuclear facility in Scotland, and had invited experts from all the nuclear powers to discuss ways of reducing the build-up of Strontium-90 in the human skeleton.

Although I wasn't an authority on either Strontium-90 or bone, I was invited to attend the conference as an observer.

I listened to a number of lectures - all gloom and doom. Apparently no-one had the least idea about how to prevent the deadly strontium locking into bone.

That is, until two Russian scientists delivered their paper.[14] They were from the Biophysics Institute of Moscow, which wasn't a good sign since the Institute was run by the KGB. But, the contents of their paper caused a sensation. They claimed, and seemed to have evidence to support the claim, that the best way to prevent Strontium-90 building up in bone was to drink fluoridated water.

V.A. Knizhnikov and A.N. Marei concluded:

> *"Levels of strontium-90 in human bone were lower in towns having drinking water with a relatively high fluorine content than in control towns with normal fluorine* content."*

*Note: continental scientists use the term fluo*rine* in place of fluo*ride*. For further information see Appendix 4 - Terminology (page 166).

And the Russians made it clear that by relatively high levels they meant 0.8 to 1.2 ppm fluoride, which was the same as the population drank in artificially fluoridated populations in the West.

The implications of the Soviet findings were quite startling. They had raised the real possibility of bone cancer and leukaemia on an epidemic scale being prevented, or at least minimised, by simply introducing water fluoridation on a global scale.

But were the Russian studies correct, and could they be confirmed? Well, that was my job, and it took the best part of two years.

The first problem was this. If fluoride had this new 'miraculous' property, and Strontium-90 fall-out was a problem over the whole of the Soviet Union (and the rest of the world), were Soviet authorities rushing to fluoridate water throughout the country? It wasn't easy to find out. But, as the months passed it seemed that there was no rush to fluoridate, and only a very small proportion of the Soviet population, around 5 per cent, were drinking treated water.

In many western countries vociferous groups of 'anti-fluoridationists' were often blamed when authorities were thwarted in their plans to introduce the measure. But surely this wouldn't be a problem in the USSR? An edict from the Supreme Soviet would be all that was needed to implement the measure.

Health authorities in the West didn't know how to handle the Russian claim. At first supporters of fluoridation were ecstatic, not only was fluoride good for teeth but now it could nullify the ghastly potential of Strontium-90. The trouble was, that emphasising the problem of Strontium-90 might cause panic.

Obviously the top priority was to try and verify the Soviet claim.

The mineral content of tooth enamel and bone consists of micro-crystals of hydroxyapatite, the prototype of which is:

$$Ca_{10}(PO_4)_6\,(OH)_2$$

This basic composition may be altered by surface exchange and to a lesser degree by internal defects and substitutions. In other words, many other elements may become incorporated into hydroxyapatite.

For instance, fluoride is one of the most avid of the 'bone-seeking' elements and is thought to be incorporated by exchange with OH^- in the surface layers of existing crystals, and by incorporation in place of OH^- in the lattice of new crystals. On the other hand, lead, which may reach the circulation either by ingestion or inhalation is also retained in bone, but in this case most investigators believe that lead (Pb^{2+}) exchanges with calcium (Ca^{2+}) in the crystal lattice.

Likewise, popular wisdom suggests that strontium (and Strontium-90) would interchange with calcium.

This point worried all the experts who studied the Soviet paper.

If fluoride could indeed prevent Strontium-90 deposition in bone, one would expect it to be as the result of some sort of competitive mechanism. The fluoride and the strontium would be competing for the same position in the crystal lattice and for some reason fluoride won, and strontium having 'lost' would soon be excreted.

But all the available evidence suggested that the two elements were not direct competitors - fluoride could interchange with the hydroxyl radical, while Strontium-90 could 'swap' places with calcium.

One thing everyone with knowledge of the subject agreed on was that the complicated effect of fluoride on bone had been an enigma since the first adequate description of skeletal fluorosis in 1937.

One of Britain's leading authorities on fluoride and bone metabolism was Dr. J.M. Faccini,[15] of the Anatomy School at the University of Cambridge. He had recently completed a series of experiments involving the treatment of rabbits with fluoride. On the basis of these studies he suggested:

> *"Fluoride can replace the hydroxyl radical in the apatite lattice; and the resultant bond holding the fluoride ion is stronger; this explains the greater insolubility of fluorapatite in water, and may also explain the greater resistance of fluorapatite-containing dental enamel to the demineralising effect of caries. It is equally possible, therefore, that fluoride, in producing more stable (or denser) bone mineral, renders the fluoride-containing bone resistant to the normal processes of resorption."*

There is a crucial difference between developed tooth enamel and bone; in enamel all cellular activity has ceased. But, in order to fulfil its structural and physiological roles, bone must be in a dynamic state and there is constant bone remodelling in both the growing and fully mature skeleton. Hence, normal bone is in a constant state of dynamic equilibrium with both the matrix and mineral being constantly removed and replaced.

Yet Faccini and other investigators were suggesting that "fluoride-containing bone" was "resistant *to the normal* processes *of* resorption."

What was the evidence for this statement?

Well, Faccini referred to an experiment reported in the *Lancet* in 1962.[16]

This study concerned the treatment of patients with Paget's disease with fluoride. The patients also received *radioactive* calcium as a 'bone marker'.

The experiment showed that there was a reduction in the loss of the radioactive calcium from the skeleton of the patients receiving fluoride. It seemed that the fluoride 'locked' the radioactive calcium into the skeleton - presumably because the normal processes of resorption were disturbed.

The implications of this study were profound.

If fluoride could 'lock' radioactive calcium into the skeleton, and strontium could interchange with calcium in the crystal lattice, then it seemed logical to assume that fluoride could 'lock' Strontium-90 into the bones for an undue length of time.

We searched the medical literature and discovered there is nothing new under the sun. In February 1958, an American, Dr. James G. Kerwin, of the Department of Health, Passaic, New Jersey, published an article in the *Dental Digest,*[17] entitled:

> "POSSIBLE BIOLOGICAL HAZARDS OF STRONTIUM-90 AND FLUORIDATION."

In the paper, Kerwin argued quite convincingly, that "if more fluoride is taken in, Strontium-90 will be retained within the bones and soft tissues longer than usual, and the body will thus be exposed to that much more internal radiation."

Kerwin's four-page article obviously concerned the US Public Health Service because they sponsored three experiments designed to test his hypothesis. With hindsight, these studies were poorly designed.

Nevertheless, they were used by the US PHS to claim that Kerwin was wrong. Indeed, the US PHS said that fluoride didn't interfere with strontium metabolism, and strontium didn't interfere with fluoride metabolism.[18]

But, if this were true, not only Kerwin was wrong, so too were the Russians. The 'case' was getting curiouser and curiouser.

We had written to the Biophysics Institute in Moscow asking for further details about their study but received no reply. However we had a response from the Moscow Medical Stomatological Institute, Department of Health, USSR.[19] They stated:

> *"We do not apply artificial fluoridation to our drinking water in order to prevent tooth decay. We also do not use tablets containing fluorine preparations.*
>
> *Of all different methods of applying fluorine in order to decrease tooth decay, we used on a wide scale for more than ten years a local fluorization of children's teeth by rubbing into the surface of the crowns a paste containing 75 per cent of fluoric natrium on glycerine. The results were quite contradictory.*
>
> *We know from the world literature of other methods of inducing fluorine preparations in other media, particularly fluoridation of central water supplies. Right now we are disputing the question of how effective this method would be*

when widely applied in our conditions."

This letter was interesting because it came from an Institute specialising in dental health. The Biophysics Institute had nothing to do with teeth.

In 1966, the Biophysics Institute was headed by KGB Lieutenant-General A.I. Burnazian, and operated a State-wide 'closed' network of clinics, hospitals, and research centres all serving the *Nuclear Industry.*[20]

Why should the Moscow Stomatological Institute imply there was no fluoridation?

We ran a thorough scan of Soviet scientific literature looking for papers published by workers at the Biophysics Institute and dealing with either fluoride or Strontium-90 or both.

But, there is an obvious problem with this approach.

All scientists like to see their work published in reputable journals, but those working in 'Defence' associated establishments - both in Eastern Bloc and Western countries - are often studying 'classified' projects, hence their reports rarely see the light of day. Nevertheless, we did discover a number of interesting papers describing some of the work being done at the Biophysics Institute.

For instance, a series of papers described the effect of fluoride on the Central Nervous System (CNS) activity in rats.

One paper reported: "depression of brain wave activity in rats drinking water containing 15 parts per million fluoride."[21] Another that there was: "impaired reflex activity in rats drinking as little as one part per million fluoride."[22]

The significance of these studies was that conditioned reflex methods are considered by most Russian - and some Western scientists - to be more sensitive than any other toxicological tests.

Rats are trained to find their way through a 'maze' in order to reach their food. When they have solved the problem they are exposed to the chemical under test; and if the chemical affects the Central Nervous System, they become disorientated and can't find the food.

Commenting on these studies two Soviet scientists concluded:

> *"... it is evident that fluorine, affecting metabolism in nerve cells and disturbing receptor function and the transmission of nerve impulses, can influence the function of higher sections of the central nervous system, which should be reflected in the cortical regulation of vegetative processes and conditioned reflex activity."*[23]

Perhaps the most significant study concerned an experiment involving rats and hydrogen fluoride, a gaseous pollutant produced by many industries including steel foundries, aluminium smelters and nuclear processing plants.

Rats were exposed to hydrogen fluoride in the incredibly low concentrations of : 100 parts per *billion;* 30 parts per *billion;* and 10 parts per *billion.*[24]

The highest dose (100 ppb) produced an increase in the latency of the learned responses, i.e. slowed them down, and a disruption of some of the discriminations that the animals had been taught. These effects were greatest with the highest concentration but were detectable even with the 30 ppb dosage.

The behaviourally active doses also depressed cholinesterase activity. In addition, the rats exposed to the 100 ppb concentration showed, on histological examinations of the brains, changes ranging from hyperaemia of the membrane capillaries to structural changes in the nerves themselves.

So, scientists at the Biophysics Institute in Moscow were promoting fluoridation as an antidote to Strontium-90 poisoning, yet at the same time they had evidence that fluoride at very low concentrations had a 'mind-dulling' effect. What were they up to?

Together with the Ministry of Health and scientists from the GLAXO GROUP - Britain's leading pharmaceutical company - I'd been planning a series of experiments designed to test the Soviet theory that fluoride could prevent the build-up of Strontium-90 in bone.

They had just got underway when MI 5 - Britain's internal security agency - came up with something interesting.

Immediately World War II ended, Allied Security Officers conducted interviews with German scientists who had been associated with the development of a series of Hitler's 'secret weapons'.

In one particular record of interview[25] a high-ranking German scientist employed at an I.G. Farben subsidiary called LURANIL, claimed that his team had spent some time exploring the use of fluoride as a "mind-dulling" drug.

He explained that both bromine and fluorine were related in the sense they both belonged to the group of elements known as the halogens. However, fluorine is far more reactive than bromine.

Between the 1860's and the late 1940's, certain salts of bromine - chiefly sodium and potassium bromide - were widely prescribed as hypnotic drugs and, in much smaller doses, as daytime sedatives. Indeed, anyone who served in the British forces until quite recently will recall stories of NAAFI tea being 'spiked' with bromide to suppress the libido.

Anyway, the bromides had various unpleasant side-effects and are now rarely prescribed. More modern hypnotics such as the barbiturates replaced them.

The German scientist claimed that fluoridated water was used routinely in concentration camps, and part of his statement reads:

> *"We came to the conclusion that infinitely small amounts of fluorine would accumulate and interfere with nerve transmissions. We believed that any person drinking fluorinated water for any length of time would be affected psychologically. The reason for this is that a portion of brain tissue in the rear occiput of the left lobe will be slowly poisoned by the fluorine."*

While this was interesting, it had nothing to do with Strontium-90 or bone. Nevertheless, I discussed it with an old friend who was a specialist in 'dis-information' and worked with the US Central Intelligence Agency.

He didn't see any reason why a recently defeated German scientist should make up such a story and assumed it was probably true. But he did tell me a bizarre 'anecdote'.

Do you recall the film: Dr Strangelove, or How I Learned to Love the Bomb? It was released in the early 1960's and has since become a cult movie. One of the characters in the film, Jack Ripper, was depicted as a right-wing fanatic who had to be restrained from dropping the atomic bomb on the Soviets. Although it had nothing to do with the main plot, Ripper was characterised as a rabid 'anti-fluoridationist' who saw the measure as a communist plot and was constantly worrying about what fluoridated water was doing to his bodily tissues and life processes.

Anyone who saw "Dr Strangelove" couldn't be blamed if they assumed that all 'anti-fluoridationists' were as deranged as Jack Ripper. Interestingly, however, in the first edition of the original story - which was called: "Red Alert" - there was no mention of fluoride or water fluoridation. And, by a strange 'coincidence', Dr W.E.J. Ripper was the name of a German scientist who worked with I.G. Farben during World War II developing fluoride-based nerve gases (SARIN and SOMAN).

By another 'coincidence', the author of Dr Strangelove was supposed to be Peter George, an ex-RAF officer who committed suicide shortly after finishing the book. It's very difficult to find out anything at all about Peter George; but the two stars were Peter Sellars and George C. Scott.

One more strange twist. Immediately after the war, President Truman ordered the 'dismantling' of the giant I.G. Farben industrial complex. It was senior officers from the Office of Strategic Services (the OSS was the predecessor to the CIA) who were given the job. One of them was called Paul Mellon, his family founded ALCOA - the Aluminum Company of America. Finally, there were strong rumours that the movie Dr Strangelove was partly financed by the CIA through one of its many front organisations.

Back to the GLAXO laboratories!

We did a number of experiments exploring the Soviet claim that fluoride could prevent the build-up of Strontium-90 in bone. Only one needs to be described and I'll do that, simply.

There were four groups of male mice involved, 24 mice in each group.[26]

GROUP A mice were given a normal diet supplemented with fluoride;

GROUP B mice had a normal diet supplemented with strontium;

GROUP C mice had the normal diet supplemented with both fluoride and strontium;

GROUP D mice had the normal diet and acted as a control group.

The results of the study demonstrated convincingly that in GROUP C mice the fluoride 'locked' the strontium into the bones for an appreciable length of time.

In 1986, about 18 years later, a French team[27] of scientists conducted a very similar experiment which was reported in the journal, *Metabolism,* their findings were the same as ours.

But back to 1968, the Russians had been wrong about fluoride and Strontium-90. An innocent error in the interpretation of the data, or a deliberate one? And if the latter, what possible motive could they have?

Well, in 1968, a report was published in the prestigious journal *Science,*[28] which described work being carried out by the Czechoslovakian Institute of Hygiene and Epidemiology and concerned air pollution in parts of that country. The report noted:

> *"Air concentrations as high as 1.13 milligrams of fluorine per cubic metre were recorded; close to the factory the fluric distribution was 61 per cent solid and 39 per cent gaseous. Further away, the distribution was 15 per cent solid and 85 per cent gaseous. Within a five kilometre distance tree leaves were necrosed, had a decreased chlorophyll content, and the amount of fluorine was 7 to 72 times more than that normally found. Vegetables and fruit were disfigured in shape and colour and contained 5 to 21 times more fluorine than did control samples. All bee colonies had died, and 95 per cent of the cattle were afflicted with fluorosis; this condition was confirmed by fluoride analysis in several tissues.*
> *In comparison with a control group, local children had a decreased haemoglobin and increased erythrocyte level, with two to three times more fluorine in their teeth, fingernails, hair and urine."*

The report was describing the environmental impact of fluoride air pollution from an aluminium smelter.

In the same year, the Soviet Ministry of Health published a weighty volume titled: "Studies in the Standardisation of Maximum Allowable Hydrogen Fluoride Concentrations in the Air of Inhabited Areas."[24]

The craft of intelligence is concerned with discovering hidden facts and analysing all the available information.

Lets review the 'evidence' we had accumulated since the Soviet scientists had read their controversial paper at Chapel Cross.

- two Russians from an Institute run by the KGB and specialising in *nuclear* medicine claimed that water fluoridation was a partial 'antidote' to Strontium-90 poisoning.

- Their evidence didn't stand up to experimental testing; and over the following two years there was no rush to fluoridate drinking water in the Soviet Union.

- The Moscow Institute of Stomatology (Dentistry), claimed they were thinking about water fluoridation but the measure had yet to be adopted.

- There was solid evidence that some towns and cities in the Soviet Union *did* have artificially fluoridated water, and some of the industrial cities in the Ukraine had been drinking 'treated' water for possibly ten-years.

- In many industrial areas, both in Russia and other Eastern Bloc countries there was growing concern about the impact of fluoride air pollution on the environment and human health.

- This type of air pollution was generated by more than a score of major industries including steel mills, petro-chemical refineries, copper and aluminium smelters, zinc and beryllium factories, coal-burning power-stations, cement works and nuclear processing plants.

- In their paper the Russians had not named the towns using fluoridated water but claimed they were situated in the Ukraine and Kazakhstan.

- There had been a nuclear disaster of some magnitude in the southern Urals in the mid-1950's. This was well-known in the intelligence community but did not become public knowledge until 1976.[20]

Before explaining how British intelligence interpreted this 'evidence', you should understand why experienced analysts spent a great deal of time trying to solve the riddle of Strontium-90 and fluoridation.

At that time a powerful group in the Western intelligence community believed that *everything* the Soviets did was deceitful, with an ulterior motive. The leader of these 'hard-liners' was James Angleton, a counter-espionage specialist in the CIA. And one of Angleton's pet hates was a section of the KGB called 'Department D.'

THE DEPARTMENT OF DEZINFORMATSIYA

In September 1965, the CIA circulated a lengthy document to every member of the US Congress describing the activities of the KGB's 'Department of Disinformation.'

The CIA defined disinformation as : *"False, incomplete or misleading information that is passed, fed or confirmed to a targeted individual, group or country".*

The CIA claimed the disinformation department was established in 1959 and "is staffed by an estimated forty to fifty functional specialists in Moscow alone," and, "produces between 350 and 400 derogatory items annually."

According to the CIA, the head of Department D, was a notorious KGB figure - General Ivan Ivanovich Agayants, who in the early 1950's was Moscow chief of the western European section of the KGB's foreign intelligence directorate.

One could argue, of course, that the CIA had its own motives for circulating such a report on Capitol Hill; by doing so they were subtly suggesting that all criticism of the CIA could probably be linked to Department D of the KGB.

The Soviet paper read at Chapel Cross *could* be a classic example of 'disinformation'. The data were incomplete, the conclusion was false, and the hypothesis misleading. But, what possible motive was there for this particular piece of disinformation?

And matters were complicated because through the 1950's and 1960's, the CIA were running a very strange project indeed!

PROJECT MKUltra [29]

In April 1953, Richard Helms of the CIA proposed a program for:

> *"The covert use of biological and chemical materials to control human behaviour."*

The project was given the go-ahead and its objectives precisely defined:

> *"The program was to discover substances which will promote illogical thinking and impulsiveness to the point where the recipient would be discredited in public.*

Substances which increase the efficiency of mentation and perception.

Materials which will prevent or counteract the intoxicating effect of alcohol.

Materials which will promote the intoxicating effect of alcohol.

Materials which will produce the signs and symptoms of recognised diseases in a reversible way.

Materials which will render the induction of hypnosis easier.

Substances which will enable the individual to withstand privation, torture and coercion better.

Materials and physical methods which will produce amnesia for events preceding and during their use.

Substances which will produce physical disablement.

Substances which will alter personality structure.

Substances which will lower the ambition and general working efficiency of men.

Substances which promote weakness of eyesight or hearing faculties.

A knock out pill.

A material which can be surreptitiously administered (in food and drink and cigarettes) which in very small amounts will make it impossible for a man to perform any physical activity whatever."

In a memorandum to Allen Dulles, Director of the CIA, Richard Helms noted:[30]

"Aside from the offensive potential, the development of a comprehensive capability in this field of covert chemical and biological warfare gives us thorough knowledge of the enemy's theoretical potential, thus enabling us to defend ourselves against a foe who might not be as restrained in the use of these techniques as we are."

A vast amount of research was done in Project MKUltra, and not just by CIA personnel. In the LSD (the hallucinogen) research alone, medical researchers at Columbia Presbyterian Medical Center and Mount Sinai Hospital in New York, Boston Psychopathic Hospital, the Addiction Research Center in Lexington, The University of Rochester, the University of Oklahoma, and the University of Illinois Medical School, used CIA funds, channelled to them through the Josiah Macy Jr. Foundation and the Geschickter Fund for Medical Research, to conduct their experiments.

Of course, many of the researchers did not realise they were working for the CIA!

In view of the CIA's interest in chemicals which can influence the mind, its not surprising that the Agency was fascinated by the KGB's experiments with fluoride as a mind-dulling agent.

So, what did the combined analytical skills of the British Secret Intelligence Service and the CIA make of the Soviet caper at Chapel Cross?

Well, in the true bureaucratic manner, intelligence analysts don't like to commit themselves and usually present a number of possible conclusions - some less likely than others.

You can take your pick from our conclusions:

1. The Russians simply wanted an excuse to get into Chapel Cross. Part of the facility manufactures weapons-grade plutonium. The paper was a way of getting an invitation to the conference.

2. The two scientists used the paper to get to the West where they planned to defect. If this were the case, presumably they got cold feet at the last minute.

3. The Biophysics Institute was trying to convince *somebody* that fluoridation was an antidote to Strontium-90 poisoning.
   a. This was unlikely to be Western experts who were bound to try and repeat the Russian studies and find them flawed.
   b. Were the findings for 'home' consumption only? The credibility of the two scientists could be enhanced by their invitation to a conference attended by the world's leading 'experts' on the subject.

4. Many lakes and large areas of countryside, plus a number of towns and cities, had been contaminated by Strontium-90 following the nuclear disaster in the Urals in 1956. Were authorities 'pretending' that fluoride could act as an antidote to lull fears amongst people exposed to the radiation?

5. Were the Biophysics Institute scientists promoting fluoridation to deflect attention away from the damaging effects of fluoride air pollution on the environment and human health?

6. The Soviets believed that fluoridated water could have a 'mind-dulling' effect and wanted to persuade Western countries to adopt the measure.

Personally, and at the time, I favoured 3b and 4 as the 'best guess'. Today, I would add number 5.

In London we closed the file on the "Chapel Cross Affair", not because we were satisfied with our conclusions but because the Americans suddenly stopped cooperating.

This was interesting but not surprising since Angleton in particular, discouraged his colleagues from collaborating too closely with the 'Brits'.

Two years later I was in New York trying to persuade the American dental profession to take a serious look at the possibility of manufacturing a dental vaccine that would prevent tooth decay.

NEW YORK, NEW YORK

The morning after I held a press conference at the Chemists Club, the *Wall Street Journal* carried a story with the following headline:

> "DENTIST ANNOUNCES TOOTH-DECAY VACCINE,
> PAINING THE ADA.
>
> ***Association calls Britons claim of 90%***
> ***fewer cavities in test "extraordinarily premature".***

The article went on:

> *"Geoffrey E. Smith, a British dental surgeon, told newsmen he has developed a "vaccine" that reduced dental cavities in children up to 90% in a test.*
>
> *But even as Dr. Smith spoke at a news conference....the American Dental Association issued a denunciation in Chicago of what it called Dr. Smith's "extraordinarily premature" publicity.*
>
> *The ADA objected on the grounds that Dr. Smith "hasn't offered reports on the vaccine at any scientific meetings of which the association is aware," and that the vaccine hasn't been reported in the scientific literature. "It is extraordinarily premature to publicize a 'vaccine' which hasn't been vitally tested and which hasn't been submitted to the judgement of the scientific community,"* the ADA statement said.

The article then went on to explain that a number of teams around the world were trying to develop a dental vaccine, and described my vaccine in some detail.

Now, two days before my news conference I had visited ADA headquarters in Chicago and met with about 40 leading American dental scientists.

I explained to them that 'my' vaccine had in fact been developed with a great deal of assistance from the GLAXO GROUP - Britain's leading research-based pharmaceutical company. Further, I told my American colleagues that we had

started work on the vaccine because in 1966 - 1967, we had discovered that there was some doubt about the safety of fluoride when used in a dental context.

My reason for coming to America was, I said, to try and encourage a joint UK/US venture to develop a vaccine capable of eliminating tooth decay. We could pool our knowledge, seek financial support on Wall Street and perhaps in 5 years have a simple and safe product which would eliminate a costly and ubiquitous disease.

Well, I was very naive in those days.

Perhaps two members of my audience were interested in what I had to say about the vaccine, the rest were far more concerned that I was daring to raise doubts about fluoride. We didn't need a vaccine I was told - very bluntly. Fluoride was a dental 'miracle', and talk of a possible vaccine was giving ammunition to deranged antifluoridationists. I tried in vain to explain that scientists from the British Ministry of Health and GLAXO, in checking out Soviet claims that fluoride could prevent Strontium-90 build-up in bone, had discovered a possible synergistic effect between fluoride and ionizing radiation which could be very serious.

But, the ADA were adamant. Fluoride was the answer to tooth decay.

The most puzzling thing was that I had understood that the US Atomic Energy Commission had sponsored some American research to check out the Soviet claim. If this had been done, then presumably the results had been similar to ours in London. If they weren't and supported the Soviet claim, why were supporters of fluoridation not publicising this new and miraculous property of fluoride?

In fact, it wasn't only the ADA that were opposed to the vaccine. In January 1972, an article of mine which described the anti-decay vaccine in some detail appeared in the *Guardian*, in the same month, in the *British Dental Journal*, the following cryptic comment appeared and was attributed to, the editors correspondents:

> *"We are a small and highly vulnerable profession, faced in the next few years with greater problems for our survival than at any previous time. The implications of the Monopolies Commission, the re-organisation of the health services, the Common Market, the Todd Report, "a cure for caries", the professions perennial tendency to revert to cannibalism are all portentous: i.e. ominous, threatening.*
> *It must surely be obvious that to deal with them will require a united profession and strong leadership."*[32]
> (my emphasis)

I could understand the profession being concerned about possible political interference, but did the British Dental Association really fear "a cure for caries"?

Wasn't that akin to editors correspondents in the *British Medical Journal* writing that the profession was threatened by a "cure for cancer"?

Anyway, I was deeply interested in trying to understand the causes of tooth decay and helping develop ways to prevent the disease. But, the profession was obviously intent on promoting fluoride as the only answer; and this set me thinking again about the Chapel Cross Affair.

The experiments we had done at GLAXO had never been published. If they had supported the Russian study they would have been, and no doubt, used to promote fluoridation on a grand scale.

Everyone involved with them, however, assumed they sounded the death knell for dentistry's *'fluoride era'*. It wasn't only the synergistic effect between fluoride and ionizing radiation. Key cells in the immune system start life in bone marrow and we had found that fluoride at very low concentrations could interfere with antibody formation.[33]

To me, at least, the situation was quite clear. Fluoride was on the way out, and the sooner the better. On the other hand, by focusing upon the way the body *naturally* defends itself against tooth decay, i.e. the immune system, it was only a matter of time before new and safer ways of preventing cavities were developed.

But it wasn't working out that way. Health authorities were less than enthusiastic about the potentials of the immune system, and were ignoring the newly discovered hazards of fluoride therapy.

A cynic could argue that the dental profession saw a future vaccine as a threat and were quite happy with fluoride treatments costing $25 a time. But it wasn't just up to dentistry. Leading health authorities in Britain and the US had sponsored experiments which exposed the potential hazards of fluoride - yet they were doing nothing about it.

It wasn't necessary to cause a panic. A discreet retreat from fluoride and its replacement by new and safe techniques was all that was needed.

Perhaps more powerful forces than the dental profession were involved in the 'fluoride issue'?

I had signed the British Official Secrets Act in 1955, just before I went to Belfast to make discreet enquires about the recent death of Blair Mayne in a car crash. Mayne was an amazing character. The 1st Special Air Service Regiment had been given formal status in 1942, but soon afterwards its first commander - David Stirling - had been captured and command of the regiment passed to 'Paddy' Mayne, a former Irish rugby union international. Mayne's exploits in World War II became legendary; he had the D.S.O. and *three* bars, and was credited with destroying over 100 enemy aircraft *on the ground* - most by explosives, some with his bare hands.

Anyway, after the War Mayne returned to Northern Ireland where he practised as a barrister. Not surprisingly, he found it difficult to adjust to civilian life and got into one to two 'scrapes'. Then, one night Mayne was driving toward Newtownards when his car left the road and hit a stone wall. Paddy died instantly, and the Coroner called it an accident which it probably was. But, Mayne being the sort of character he was, and Ireland being the kind of country it is, some of his old colleagues wanted to be sure. I found nothing to suggest that Mayne's death had been anything but 'accidental'.

But the fact that I had signed the Official Secrets Act was to haunt me for the next 35 years.

I'm going to briefly describe a series of events which occurred between 1970 and 1976, and in which I was involved.

In 1970, experiments carried out in GLAXO laboratories had identified potentially serious side-effects from fluoride therapy, but the studies had been carried out on behalf of the Ministry of Health and the results were *'confidential'*- subject to the Official Secrets Act.

Because of these experiments GLAXO had initiated a major research project to clarify the function of the immune system in the mouth with the possible objective of developing a safe vaccine to prevent tooth decay. The early work progressed well. Then, I was asked by a GLAXO director whether, "I would mind if the Company 'shelved' plans for a dental vaccine for a few years?"

I replied that GLAXO could do what it liked, I personally would look for another partner to progress the project. So, and quite amicably, GLAXO and I parted company.

Six months later, GLAXO, through a subsidiary - ALLIED LABORATORIES - began marketing an imported high-strength topical fluoride gel to dentists.

By 1970, the Ministry of Health were aware of experiments which disproved the Soviet claim regarding Strontium-90 and fluoride. They also knew that these experiments cast grave doubts on the safety of water fluoridation and fluoridated dental health products. Yet the Ministry was still promoting fluoridation and even claiming that it was "possibly beneficial to bone."

I requested a meeting with the Chief Dental Officer at the Ministry, Mr. R. D. Gibbs. At the meeting with Gibbs and several of his medical colleagues, I was told, diplomatically but firmly, to forget my worries about fluoride - "after reviewing all the available evidence the Ministry would continue promoting fluoridation and encouraging the use of fluoridated dental products."

By 1974, and with the help of an old friend in the CIA, I had found out a little more about fluoridation in the Soviet Union and some of the Eastern Bloc countries. It seemed that in the USSR just 15 per cent of the population drank

artificially fluoridated water, in Czechoslovakia the figure was 20 per cent, in Poland 4 per cent, and in East Germany about 12 per cent. The really interesting point was that in Russia and her satellites, water fluoridation had only been introduced in major industrial centres - cities with known fluoride air pollution problems.

Why should totalitarian states, if they truly believed that fluoridation could dramatically reduce tooth decay, be so selective in their choice of water supplies to fluoridate?

That same year, and again with help from my CIA contact, I prepared a report on the GLAXO/Ministry of Health experiments on fluoride/Strontium-90 to be sent to President Nixon. I also suggested a joint British-American effort to look at alternative ways of preventing tooth decay - possibly the vaccine - so that health authorities could 'back away' from fluoride without losing face.

Unfortunately, Nixon gave my report to Dr James Carlos, who is still (1996) one of the leaders of the 'fluoride lobby' in the United States. In his reply Carlos totally ignored the first part of my report concerning fluoride and focused on the second half which concerned the vaccine approach.[34]

In 1976, the Ministry of Health began a major promotional campaign to encourage local authorities throughout Britain to fluoridate their water supplies; and the PR experts seemed to be focusing much attention on the north-west of England, a part of the country I knew well.

There are three very important nuclear installations in that part of the world. One, the notorious Windscale/Sellafield complex in West Cumbria had two nuclear reactors and a re-processing plant for spent fuel operating by 1952. The giant uranium hexafluoride gaseous diffusion plant at Capenhurst, which covers more than 30 acres and uses more electricity than Canberra, began spewing out a devil's brew of waste solids and gases in 1953; while the uranium enrichment factory at Springfields near Preston, had been doing the same since June 1948.

The latter was quite near my old 'home-town', Lytham-St. Annes, where the incidence of leukaemia had more than doubled between 1971 and 1975.*

In July 1976, I took a trip to Cheshire. The British Nuclear Fuels plant at Capenhurst discharges its effluent partly via a culvert into the Rivacre brook which runs into the river Mersey, and partly to the sea via the North West Water Authority sewage outfall off Meols. The gaseous emissions from Capenhurst into the atmosphere are quite widely dispersed but with some concentration of the emissions downwind of the installation following the path of the prevailing winds.

I went to Capenhurst to see if the fluoride emissions were having any effect on plant and animal life in the vicinity of the installation.

**The Lancet* Sept. 15, 1979 p.579

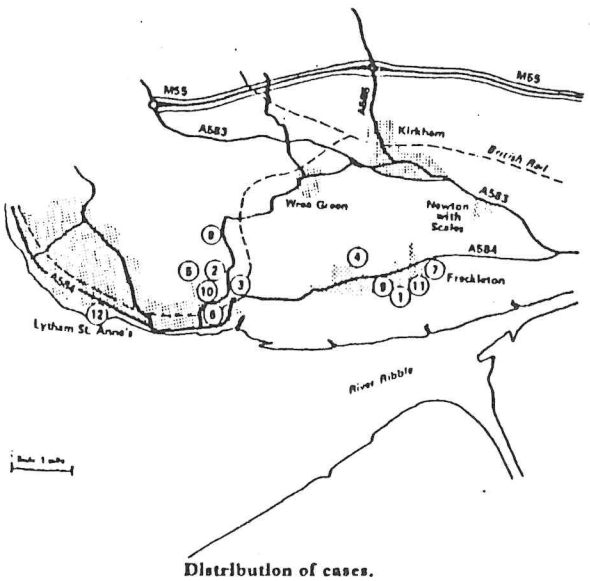
CLUSTER OF MYELOID LEUKÆMIA IN LYTHAM ST. ANNES

SIR,—We report here an unusually high incidence of myeloid leukæmia in the area served by a single general practice in Lytham St. Annes, Lancashire.

CASES OF ACUTE (AML) AND CHRONIC (CML) MYELOID LEUKÆMIA IDENTIFIED (CASE NUMBERS REFER TO THE IDENTIFICATION POINTS IN ACCOMPANYING MAP)

Case no	Date of presentation	Sex, age	Diagnosis
	1972		
1	May	M;48	CML
2	June	F;66	Sub-leukæmic AML
3	July	M;64	AML
	1973		
4	September	F;52	AML
	1974		
5	September	F;40	Idiopathic thrombocythæmia, terminating as AML
	1975		
6	September	F;70	AML
7	September	F;81	AML
	1976		
8	January	M;33	AML
9	May	F;73	"Smouldering" AML
	1977		
10	August	M;38	AML
	1978		
11	August	F;65	"Smouldering" AML
12	October	M;50	CML

The practice serves approximately 9000 patients and covers an area of some 3 square miles, adjacent to the Ribble Estuary. It maintains a diagnostic register of patients with all types of malignant disease; our interest was first aroused when 3 cases of myeloid leukæmia (2 acute, 1 chronic) were encountered in the first half of 1972. Using the diagnostic register, and the counterfoils of death certificates issued by members of the practice, a search for neoplasms of lymphoid and hæmopoietic tissues presenting in 1958-71 was carried out; cases occurring between then and the end of 1978 have been noted as they have arisen. In 1958–71, 1 case of acute myeloid leukæmia, 1 myeloma, 1 "lympho sarcoma", and 2 cases of Hodgkin's disease were noted. In 1972–78, 11 cases of acute and chronic myeloid leukæmia were diagnosed. Details of these cases, all of which were confirmed by appropriate investigations in hospital, are shown in the table, while their geographical distribution in the practice area is shown in the figure. Between 1972 and 1978 4 cases of non-Hodgkin's lymphoma, 2 Hodgkin's disease, 1 chronic lymphatic leukæmia, and one myeloma were also encountered.



Distribution of cases.

Although increasing diagnostic awareness may be responsible for part of the increased incidence we have observed, it is significant that, whereas there has been a sharp increase in myeloid leukæmia from 1972, the incidence of other types of hæmopoietic neoplastic disease, such as myeloma and lymphoma, showed only small increases.

The practice area is continuous with, and overlaps that of, several other physicians working in the area who have not noticed increased numbers of leukæmic patients in their own practices. Nevertheless, it appears that the increased incidence seen by us during the last 7 years reflects a similar increment over a much wider area of Lancashire.

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I collected samples of vegetation, water and air from around Capenhurst, and unearthed bones of birds and small mammals.

A month later I went on another 'field-trip' to Windscale/Sellafield in West Cumbria and made a similar collection of samples.

Analysis of the samples demonstrated that both installations were emitting fluoride gases (hydrogen fluoride, uranium hexafluoride - detected as uranyl fluoride and possibly, oxygen difluoride) and ionizing radiation (uranium, Cerium-144, and Strontium-90 - the two latter at Windscale/Sellafield).

Some pollutants act synergistically, which simply means that they create more problems together than they do separately. There have been many claims of increased cancer rates in the vicinity of certain nuclear installations. The 'experts' usually dismiss such claims by saying that ionizing radiation levels detected are insufficient to cause increased cancer rates. Yet even today no-one has studied the possibility of a synergistic effect between fluoride and ionizing radiation despite the fact that health authorities in Britain and America were aware of 'classified' experiments strongly suggesting that fluoride could 'lock' ionizing radiation into bones for an undue length of time.

I put all my evidence from Capenhurst, Windscale/Sellafield and the GLAXO/Ministry of Health experiments together and arranged meetings with two of the most respected senior members of my profession. However, after lengthy discussions, both advised me to forget the whole business!

Next, I approached a member of the House of Lords I had known for some time and whose family had been involved in politics since the time of the first Queen Elizabeth. He conceded that the evidence I had was 'hot', but, I had signed the Official Secrets Act; nevertheless he would make a few discreet enquires and see if he could come up with any practical suggestions.

He rang two days later and the news wasn't good! If I so much as mentioned my findings on the emissions from Capenhurst and Windscale/Sellafield or even the 'classified' Ministry of Health experiments, I would be charged under the Official Secrets Act and in all probability the proceedings would be held *in camera.*

I knew enough about the security services to realise this was no idle threat.

I was 44 years old, happily married with five children aged between 5 and 15 years of age, and I was planning to go to Australia to work as a consultant with Nicholas International, a well-known pharmaceutical company. I had no intention of tangling with the counter-espionage establishment.

Nevertheless, I was loathe to "forget the whole business."

I had a neighbour and close friend, Clark Todd, who worked in London for the American National Broadcasting Corporation (NBC), and one night over dinner I explained my predicament to him.

Clark agreed that there was nothing to be gained by trying to reveal 'classified' information but could a strong enough case against fluoridation be made without referring to Capenhurst, Windscale and the Strontium-90/fluoride experiments?

I thought this was a possibility and together we worked out a strategy.

Anyone who has studied the 'fluoridation' controversy will know that many very reputable scientists have opposed the measure, and for a variety of reasons; however, very few dentists have openly opposed fluoridation - although there are a handful of notable exceptions. This lack of opposition is *not* because all dentists agree with the measure - far from it, there is another reason.

A dentist in Britain, America and Australia cannot practise his profession without first *registering* with the relevant Dental Board. In return for registration the dentist agrees to abide by a set of 'regulations' governing his professional conduct. Since the Boards are Statutory Bodies these regulations are enforceable by law.

In most English-speaking countries, dentists are not permitted to advertise. And this just doesn't mean placing advertisements in newspapers 'touting for customers'. In fact, dentists are not permitted to write about, or talk about, any subject in dentistry to a lay audience without first getting official permission from either the Dental Board or their dental association.

Any dentist who fails to get permission may be charged with "drawing attention to his or her professional skills and knowledge", and Dental Boards equate this with, UNPROFESSIONAL CONDUCT. If found guilty of such a charge a dentist risks having their name struck from the register.

Now, I wasn't in general dental practice, my family and I were planning to go to Australia, at least for several years, but I was a registered dentist. Suppose I wrote an article for the local newspaper which, without mentioning any 'classified' information about fluoride, expressed my doubts and reservations about fluoridation. How would the General Dental Council react?

WINTER IN WIMPOLE STREET

What I had in mind was this. There was little doubt in my mind by this stage that the dental profession was being used by extremely powerful interests to promote a 'benevolent' image for fluoride. Equally, those interests were suppressing evidence that confirmed the sinister aspect of fluoride.

It also seemed clear that the vast majority of my colleagues were totally unaware of their role in the medical hoax of the century.

A number of highly qualified medical scientists such as Dr George Waldbott and Dr Frank Exner had made strong cases against fluoridation and supported their arguments with convincing scientific evidence. Yet the authorities just ignored their findings.

It was possible that I could engineer a confrontation with the GENERAL DENTAL COUNCIL, the profession's ruling body in the UK. But what would be gained by such a confrontation?

I reasoned that there was a possibility, that as the 'accused' in a court-room setting I might be able to persuade my judges that the profession had been deliberately misled about the safety of fluoridation and fluoridated dental health products.

The hearing, if it ever took place, would be open to the public so I wouldn't be able to mention any of the classified evidence, on the other hand, I could lodge it with the Council as a 'confidential submission' and some members of the Council might read it - at least it would be "on the record". One day, someone might be persuaded to take the matter further.

I rang Peter Richardson the editor of the local newspaper and asked if his readers were interested in the subject of fluoridation. Apparently they were and I sent him the draft of an article titled:

"FLUORIDATION: THE CASE FOR CAUTION."

It wasn't a very controversial sort of article, in retrospect it seemed unlikely that it would worry the GDC, but it did.

The article appeared the following week on a Thursday. The very next day I received a registered letter from the Registrar of the General Dental Council, which read:

> *"On behalf of the General Dental Council notice is hereby given to you that in consequence of information received by the Council an inquiry is to be held into the following charge against you:-*
> *That being a registered dentist:*
> *In or about August 1976 you instigated or acquiesced in, the publication of articles in the Welwyn Times and Hatfield Advertiser which drew attention to your professional skill knowledge and services and were calculated improperly to promote your own professional advantages."*

I was also informed that any response to the charge I might like to make would be considered by a sub-committee manning a preliminary inquiry into the complaint.

Clark Todd was amazed at the speedy response by the GDC to what he considered an innocuous article and suggested my profession had obviously "become paranoidal about fluoride" and asked what happened next?

Well, I was supposed to write a letter of apology to the sub-committee, and promise not to do it again, and the matter would probably be dropped. But I wasn't going to do that and the next move was up to the GDC.

A month later I received another registered letter from the General Dental Council. Since I had ignored the opportunity offered by the preliminary inquiry, I was given notice that:

> *"On Wednesday the 10th day of November 1976, a meeting of the Disciplinary Committee of the Council will be held at 37 Wimpole Street, London W I., at 2.00 pm to consider the charge against you, and to determine whether or not they should direct the registrar to erase your name from the Register, pursuant to Section 25 of the Dentists Act, 1957."*

My family and I were due to fly to Melbourne, Australia, on November 16 1976, and at least half-a-dozen members of the GDC were aware of our plans.

Some readers might consider that I had become 'paranoidal' about fluoride and was intent on destroying my professional career. But this wasn't the case. The GDC had three options left to them.

They could find me 'not guilty' - which was unlikely because I had "acquiesced in the publication of the article;" or, they could find me *'guilty'* but that the offence was not serious enough to warrant the removal of my name from the Register. If they did this the case would be closed, since according to the regulations governing the hearing - I could not appeal the verdict, only the sentence. So, if the GDC found me guilty and ordered removal of my name from the register I would appeal to a higher court, and my 'confidential submission' would come into the public domain.

Of course at that stage the GDC weren't aware of the existence of the submission, but they would be before they passed sentence, and even a glance through its contents would make it very clear that the *Council* was now in possession of 'sensitive' and apparently 'top secret' information.

I had absolutely no intention of mentioning my findings from Capenhurst and Windscale in public, but if my case went to a Court of Appeal, the GDC would be required to pass on *all the evidence* upon which they had deliberated. Clark Todd had arranged that my hearing in Wimpole Street would be covered by certain journalists, if the case progressed to higher courts it would inevitably attract considerable publicity. I calculated that neither the GDC nor other pillars of the 'Establishment' would let that happen.

Wednesday 10th November 1976 arrived and I took my two eldest children with me to the hearing in Wimpole Street.

Since becoming an independent and autonomous profession in 1956, the General Dental Council has taken its responsibilities very seriously. Its premises are far more grand than those of the General Medical Council. Cases of Unprofessional

Conduct are conducted in a modern, luxuriously equipped lecture theatre which is readily converted into a courtroom.

During the hearing, 16 'Judges' sit behind a semi-circular desk set on a raised dais overlooking the well of the 'court', where a barrister (always a QC) presents the case against the respondent. A witness box is provided, and several stenographers record the evidence as it unfolds.

After the preliminaries, the prosecuting counsel called Peter Richardson, editor of the *Welwyn Times and Hatfield Observer* to the witness box. Peter agreed that I had phoned him about publishing an article about fluoridation. He also explained that in his opinion fluoridation was a subject which interested many of his readers. Indeed, it was an issue of genuine concern. He pointed out that just a week previously (Nov. 4 1976), his newspaper had carried an article which read:

> "ABOUT TURN IN WATER CLASH",
>
> *"Councillors who hurriedly decided last month that fluoridation of water supplies would be a good idea have changed their minds. Welwyn and Hatfield's Environmental Health and Welfare Committee voted 10 to 5 on Tuesday that fluoride should not be added to Hertfordshire's water. This opinion will go before the full Council for approval and then be sent to the Hertfordshire Area Health Authority, which aims to make a decision on fluoride before the end of the year. When the Committee last considered the issue it voted 13 to 2 in favour of fluoride after a discussion lasting only ten minutes."*

I didn't cross-examine Peter Richardson, but pointed out that I wasn't working in dental practice and my family and I were emigrating to Australia. In the circumstances I could hardly be accused of 'touting for customers'. I accepted that there was a regulation which prevented a dentist writing an article in the 'local' newspaper without permission; but in certain circumstances might not this regulation act as an infringement upon freedom of speech?

As Mr. Richardson had pointed out many of his readers were interested in the issue of fluoridation; official spokespersons for the dental profession gave the impression that all dentists supported the measure. In my opinion this simply wasn't true. Many dentists had genuine doubts and reservations about fluoridation and the increasingly common use of fluoride-containing dental health products.

I then gave a detailed account of my objections to fluoride and finally said that since some of my evidence was 'confidential' I had prepared copies of a submission for each member of the Committee and I hoped they would at least glance through the 'exhibit' before coming to their verdict.

The clerk of the court distributed the copies of the 'confidential submission', and the President of the GDC asked the respondent and members of the press and public to leave the room while the Committee deliberated.

Forty minutes later we were called back to the courtroom. I stood while the President read the verdict. I was guilty as charged but there would be no order made to remove my name from the register.

That evening, back at home in Hatfield, I was discussing the day's events with Clark Todd, when a courier arrived with an envelope from the General Dental Council. For one moment I thought they might be prepared to talk with me about the evidence in the 'confidential submission'. But it wasn't that. In the excitement of the events I had left my flight tickets to Australia in the courtroom. The GDC were returning them. On the envelope someone had written, "Good Luck Down-under", the signature below the message was indecipherable.

A rather strange episode preceded my appearance in Wimpole Street. Earlier in this monograph I mentioned that Western Intelligence were aware of a nuclear disaster which occurred in the Soviet Union in the mid-1950's. Details of the disaster were never made public.

On November 4 1976, just 6 days before I appeared before the GDC, the *New Scientist* published an article by the exiled Soviet scientist, Zhores Medvedev, in which he described a 1957 nuclear disaster in the Urals involving stored radioactive wastes. The story was picked up by the media and the leading 'experts' in Britain, the United States, and Western Europe lost no time in vigorously denouncing Medvedev's claim, stating that such an accident was *technically* impossible.

In an article in the *Times*, Sir John Hill, Chairman of the UK Atomic Energy Authority, was reported as saying that Medvedev's story was "Rubbish"; "Pure science fiction"; and a "Figment of a fevered imagination."

Several years later, Medvedev published a book about the Urals disaster, in which he presented a vast amount of evidence to support his claim. But it wasn't until the end of the Cold War, and the release of certain files by the KGB, that western 'experts' had to admit that a nuclear disaster had indeed occurred in the Urals in 1957.

Interestingly, many of the towns near the disaster area, had artificially fluoridated water supplies from 1958 onwards, the same towns had also been exposed to high levels of Strontium-90 fall-out as a result of the explosion.

From 1976 to the present I've maintained my interest in fluoride but kept silent about the evidence in my 'confidential submission' to the GDC. I've written many articles about fluorides. Some have appeared in scientific journals, others in popular magazines, but I could never tell all I knew about this strange subject.

Recently, I contacted the registrar of the GDC and confirmed that the transcription of my trial and all the 'exhibits', are still kept in Wimpole Street. I've also received permission from GLAXO HOLDINGS to refer to certain in-house memos which concerned the experiments on fluoride/Strontium-90. There

is still the business of the Official Secrets Act, but today the Cold War has ended, I'm 60 plus years of age and my children have all grown up.

Perhaps it is now time to publish and be damned! And, one final intriguing point.

Did the Americans check out the Soviet claim that fluoridation prevented Strontium-90 build-up in bone?

THERE ARE NO PUBLISHED PAPERS IN THE SCIENTIFIC LITERATURE WHICH SHOW THAT THEY DID.

Yet, they became aware of the claim in 1966, and particularly at that time, the concern about Strontium-90 fall-out was considerable.

Further, I know that the British did check the Soviet claim - but in a "classified" Report.

Was "classified" and never published work carried out in America in 1967 - 1968?

The CIRCUMSTANTIAL evidence

Since the mid-1950's, the leading research team in the States studying methods to minimise Strontium-90 build-up in bone, worked at the Loyola University Strich School of Medicine and the Metabolic Section, Veterans Administration Hospital, Hines, Ill. In many of their published papers they acknowledge contract support from the US Atomic Energy Commission. The leader of the team, Dr. Herta Spencer, attended the Chapel Cross Symposium (see list of contributors in reference 13). (Part one refs.)

The team, between 1956 and 1967, regularly published 4 or so papers a year. In 1968, there is a gap. Then, in 1969, the regular publications begin again. In not one paper, up to 1969, do the team mention fluoride. Yet in 1969, one of their papers is entitled: "The Effect of Sodium fluoride on calcium absorption and balance on man." (my emphasis).

What were the team doing in 1968? My repeated enquires have failed to get a response. In the paper involving fluoride and calcium, the study was carried out on:

> NINE FULLY AMBULATORY MALE SUBJECTS WHO WERE IN A GOOD PHYSICAL AND NUTRITIONAL STATE.

The subjects in a paper (in 1972 by the same team) entitled: *"Effect of orally administered stable Strontium on ^{90}Sr metabolism in man,"* were described as:

NINE FULLY AMBULATORY MALE SUBJECTS WHO WERE IN A GOOD PHYSICAL AND NUTRITIONAL STATE.

Even more intriguing, the subjects in the 1969 paper were identified as living in a 'fluoridated' area and drinking fluoridated water. The word fluoride is not mentioned in the 1972 paper - NOR IS THE PAPER BY KNIZHNIKOV AND MAREI MENTIONED OR CITED. YET THE 'EXPERTS' AROUND THE WORLD WHO WERE INTERESTED IN THE SUBJECT WERE ALL AWARE OF IT. I am sure many scientists will agree that this - in the circumstances - was a very strange omission.

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And the paper by H. Spencer et al., describing the effect of NaF on calcium absorption, appeared in the *American Journal of Clinical Nutrition,* 22, 381-390, 1969.

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31. *Wall Street Journal,* November 17 1972, page 9.
see also:
Business Week, November 11, 1972, page 135.
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34. Personal communication to GES from James P. Carlos, Director National Caries Program, National Institute of Dental Research, Bethesda, Md., May 15 1973.

NOTE; regarding Reference 4. See also:

British Secret Patent, Min. of Supply. April 17, 1944.
British Secret Patent, Min. of Supply. September 15, 1943.
XL Report to Min. of Supply, Jan. 7, 1943.
McCombie H. and Saunders B.C. Report No 1 on Fluorophosphonates to Min. of Supply, December 18, 1941.
McCombie H. and Saunders B.C. Report No II on Fluorophosphonates to Min. of Supply, May 27, 1943.

On the subject of fluoridation Dr. B. C. Saunders stated:

> *"I, too, am very worried about fluoridation of public water supplies. I am particularly worried about the build-up of fluoride into organic compounds containing the C-F link when all said and done the plant 'gifblaar' is able to do precisely this. Are we sure that there are no other plants or bacteria which can bring about this lethal synthesis."?*

DEPARTMENT OF HEALTH AND SOCIAL SECURITY
ALEXANDER FLEMING HOUSE
ELEPHANT AND CASTLE
LONDON S.E.1 6BY

TELEPHONE: 01-407 5522

March 21 1973

PRIVATE AND CONFIDENTIAL.

Dear Geoffrey,

I felt our recent telephone conversation was rather inconclusive. Hence I am writing to you in an attempt to clarify this important issue.

May I begin by summarising the essential facts as I see them?

- In May 1966, our Soviet colleagues turned up at Chapel Cross and claimed that water fluoridation could help prevent the build up of strontium-90 in bones.
- You, Glaxo, and the Ministry undertook a series of experiments designed to clarify the Soviet 'theory'.
- We now know that the claim was not only wrong, but possibly mischievous.

You believe that as a consequence of our experiments we should gently 'back away' from fluoride and concentrate on the vaccine approach to the control of caries. Further, you suggest a joint UK/US project to perfect the vaccine.

But, the Ministry is far from convinced that water fluoridation - per se - presents a potential long-term hazard.

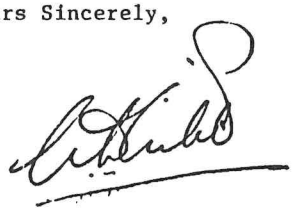
You are requesting permission to inform US Health Authorities about the results of the Glaxo/Ministry of Health experiments; but these experiments were and remain "classified". Consequently, the Minister must reject your request.

On the other hand, and on your own initiative, you might consider an approach to a very HIGH authority in the States - no doubt your Master could help here - and arrange to discuss the subject in general terms.

I am sorry that I cannot be more helpful but as you appreciate this concerns a particularly delicate subject with both political and professional ramifications.

My regards to your family.

Yours Sincerely,



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH
BETHESDA, MARYLAND 20014

May 15, 1973

NOTE: The dossier sent to Nixon was in two parts. Part I. Described the studies with Sr-90, fluoride and bone. Part II, described work on the vaccine in great detail, I was suggesting a joint US/UK venture to speed up work on the vaccine and get the profession 'off the hook' as regards fluoride. In his reply, Carlos completely ignored Part I of the dossier.

AIR MAIL

Dr. G. E. Smith
Northwold House
14 Fore Street
Old Hatfield, Herts
England

Dear Dr. Smith:

Your recent letter to President Nixon has been referred to me for reply.

As a part of the research activities of the National Caries Program of the National Institute of Dental Research we have, for several years, been supporting a modest amount of work on the possible feasibility of developing a vaccine against caries. These studies include characterization of antigenic properties of streptococcal cell walls and cell products, as well as several series of animal experiments with hamsters and rats, injected with various antigenic substances. We are, of course, also closely informed regarding the work being carried out with monkeys at the Royal Dental College in London.

Unfortunately, the aggregate results of this research to date cannot be regarded as very encouraging. Although a few experiments have produced data suggestive of a mild anti-caries effect, the majority have been equivocal or negative.

There appear to be many problems to be solved before such an approach could be considered as an anti-caries measure in humans. Indeed, at this point, we have not begun to even contemplate human clinical trials.

Nevertheless, the dental research community certainly welcomes all contributions to the field of "caries-vaccine" research. I therefore suggest, as I did when we met in Chicago last November, that you publish the results of your experiments in scientific journals where they can undergo the customary scrutiny and evaluation by other scientists interested in this problem. Verification or rebuttal of your ideas can, after all, only be carried out in the open arena of scientific exchange, and not by the opinion of any individual.

I appreciate the opportunity to see the summary of your research and return this material to you herewith.

Sincerely,

James P. Carlos, D.D.S.
Associate Director for
National Caries Program
National Institute of Dental Research

NOTE: The first published patent (Brevet D'Invention 794 307, Belgium) appeared in print 19 July 1973, it was 50 pages in length and described both methods of manufacture and results of clinical trials of the vaccine.

GENERAL DENTAL COUNCIL

Telephone: 01-486 2171

REGISTRAR:
David Hindley-Smith, C.B.E., M.A.

37 WIMPOLE STREET
LONDON W1M 8DQ

In reply please quote: D 22/2

10 November, 1976

Sir,

This letter will confirm that you, Geoffrey Ernest Smith, appeared before the Disciplinary Committee of the General Dental Council on the 10th of November 1976.

The purpose of this letter is to acknowledge that during the hearing you handed 12 copies of a sealed submission to the Registrar.

Your explanation for the action being that you could not discuss the contents of the submission in public since that might make you liable to prosecution under the provisions of the Official Secrets Act.

I hereby acknowledge delivery of the sealed submissions entitled:

a). "Is fluorine a partial antidote to Strontium-90 poisoning".

b). "Emissions from nuclear facilities at Windscale, Capenhurst, and Springfields".

I am, Sir,
Your obedient servant,

Registrar

G.E.Smith, Esq., L.D.S.,R.C.S.
14 Fore Street,
Hatfield,
Herts. AL9 5AH.

SUMMARY OF THE CONTROVERSIAL RUSSIAN PAPER, in Strontium metabolism, Academic Press, New York, 1967

Strontium Metabolism in Man

V. A. KNIZHNIKOV AND A. N. MAREI
Institute of Biophysics, Ministry of Public Health of the U.S.S.R., Moscow

SUMMARY

This is a survey of recent work on Sr metabolism in the Soviet Union leading to the following conclusions. 1. The daily intake of ^{90}Sr with diet during the years 1963–64 was considerably greater than in the United States. 2. The level of ^{90}Sr in human bone at various age groups in the Soviet Union during these years was about the same as in the United States. It is suggested that the fallout strontium deposited in insoluble form on growing grain crops is less effectively absorbed in the human subject than the soluble Sr compounds present in milk and other dairy products. Bread and grain represent the major source of dietary ^{90}Sr in the Soviet Union, whereas milk and dairy products are the main source in the United States. 3. Addition of Ca to the diet of experimental human subjects reduced the retention and accumulation of ^{90}Sr in bone. 4. Levels of ^{90}Sr in human bone were lower in towns having drinking water with a relatively high fluorine content than in control towns with normal fluorine content.

INTRODUCTION

Earlier reports (Knizhnikov *et al.*, 1965; Marei *et al.*, 1964, 1965) have discussed the passage of ^{90}Sr into the human body with food and water as well as the accumulation of this nuclide in bone in various regions of the Soviet Union.

The present paper reviews the earlier work, along with some additional results that are significant for the study of the passage of ^{90}Sr along food change and its metabolism in the human body.

Levels of stable and radioactive Sr and Ca in the skeleton were determined by the analysis of individual bones as well as of extracted teeth. Teeth from not less than twenty persons were combined into single samples. The relationship of average skeletal levels of ^{90}Sr to the quantities measured in teeth or individual bones was determined in a preliminary survey (Marei *et al.*, 1965). The accuracy attained in measurements on teeth was ±6–10% for ^{90}Sr, ±12% for stable Sr and ±2% for Ca.

From: Pro-tective Security, 17/1/97.
To: GES(Red Phoenix?).

Re: Victor KNIZHNIKOV, (KNIJNIKOV).

File opened on K. prior to visit to Chapel Cross -May 1966.
Re-opened in aftermath of CHERNOBYL disaster (April 26 1986).
K. born Moscow c. 1926, parents both Jewish and civil servants. K. graduated with top marks but was refused admission to prestigious Institute of International Relations. Enrolled in Moscow Medical School, graduated with honours.Spent next years in KAZAKHSTAN studying the effects of the many nuclear tests around SEMIPALATINSK and contaminated area around MAYAK, which in 1957 had been devastated by a nuclear accident.

K. became the Soviet's leading authority on the absorption of strontium and cesium radionuclides into the body. His epidemiological studies were of great interest to the Americans - hence his invitation to Chapel Cross at behest of Atomic Energy Commission, Herta Spencer's team and CIA

K and Leonid ILYN - director of the Biophysics Institute - were responsible for setting "SAFE" levels of exposure to radionuclides.
In late 1988 K. wrote an unpublished article in which he predicted 20,000 additional deaths from cancer due to CHERNOBYL.

In 1989 K. was summoned to MINSK to appear before the UKRAINIAN SUPREME SOVIET where several BELORUSSIAN deputies accused K and ILYN of GENOCIDE.

The charge was never followed up presumably because of disintegration of the SOVIET UNION.

In 1990, K. suffered a severe heart attack and retired.

Hope this is of help.

Regards to all the family.

20.18.25..19.20.1.20.5.17,,6.18.5.5.4.15.13..
9.14.6.15.18.13.1.20.9.15.14..

De-coded the above message reads - TRY STATES FREEDOM OF INFORMATION.

Perhaps an American reader would like to check if Herta Spencer and her team (or any other) checked the Soviet study.

N.B. Typewritten copy of hand-written fax.

Fluoride, immunity and tooth decay

SIR—Diesendorf[1] has raised fundamental questions about the supposed benefits of fluoridation in preventing tooth decay. May the debate continue.

As to why tooth decay in developed countries has declined, consider the following: the usual and first explanation for a marked fall in the incidence of any infectious disease is the acquisition of specific immunity to the causative organism by a significant proportion of the population at risk. Specific immunity may be acquired naturally or artificially (vaccination). Naturally acquired specific immunity may explain the decline in caries in developed countries. Tooth-brushing is now widespread in pre-school children and as many as 75 per cent of children may be brushing their teeth by the age of 18 months[2]. Current techniques teach children to brush the gums gently as well as the teeth. The bristles of a tooth-brush together with the mild abrasives found in toothpaste make an ideal instrument for transferring and implanting antigenic material from around the teeth, that is, decay-causing bacteria, into the oral mucus membranes.

The mouth possesses an immune system, and murine oral mucosa, at least, contains both the effector and regulatory cells required for the local production of immunoglobulin[3]. Brushing the gums with a contaminated brush may therefore produce a massive antigenic challenge resulting in the production of SIgA immunoglobulins[4]. The immunoglobulins may then cross cell barriers into the oral fluids, or they may form an SIgA-mucin complex on the surfaces of teeth. In either location they may interfere with the ability of decay-causing bacteria to attach to teeth.

GEOFFREY E. SMITH

56 Surrey Road,
Melbourne 3141,
Victoria, Australia

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2. Dowell, T.B. *Br. dent. J.* 150, 247–249 (1981).
3. Deslauriers, N., Neron, S. & Mourad, W. *Immunology* 55, 391–397 (1985).
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CENTRAL INTELLIGENCE AGENCY

WASHINGTON, D. C. 20505

PUBLIC AFFAIRS
Phone: (703) 351-7676

7/1/90

To whosoever it may concern

This document will introduce Dr Geoffrey Ernest SMITH, holder of British Passports Nos P 997792, and, C 182588. Endorsed with U.S. LND No. 625082 Non-immigrant Visa, Classification B-1B-2 23 - Valid Indefinitely for Multiple applications for admission to the United States.

Dr Smith has been known to Officers of the Agency since 1956, and any assistance you can give him will be greatly appreciated.

Signed:

Director.

Glaxo Holdings p.l.c.
Lansdowne House, Berkeley Square, London W1X 6BP

Jeremy Strachan
Group Director, Corporate Affairs

Dr. Geoffrey E. Smith, L.D.S., R.C.S. (Eng)
Yallamble,
RMB 1680,
Nagamble 3608,
Victoria,
Australia.

12 December 1991

Dear Dr. Smith,

Many thanks for your letter of 2 December.

You may certainly have Glaxo's permission to reproduce in a book the internal memorandum dated 10 August 1970 of which you sent me a copy.

Copy of confidential internal memo - original on BDH Pharmaceuticals stationery.

To: R.D. Smart. IO August I970

Subject: The Caries Vaccine.

As a result of our studies with Strontium-90, Fluoride and bone, all parties agreed that we should accelerate work on the vaccine approach.

On August 6 I met with Dr Furminger and Mrs Blackwell at Evans Medical Ltd., Speke. I handed them my collection of micro-organisms, a comprehensive selection of up-to-date literature, and outlined some of my own ideas. We had a very constructive meeting and rapidly agreed the Ist Year programme.

We suggest:

"A programme to deduce sufficient and precise information on four aspects of the problem for presentation to the Board of BDH Pharmaceuticals Ltd., in one years time. The four specific aspects are:

I. The identification and further characterisation of cariogenic Streptococci.
2. The preparation of a test vaccine from ORGANISM GB I, and its use on a colony of hamsters.
3. More precise information to be obtained on the nature of possible antigens.
4. The means of preparation and potentiation of the vaccine to be clarified."

Sufficient information exists about organism GB I to justify the immediate preparation of a test vaccine; thus investigation of points I and 2 will proceed concurrently.

Signed: Geoffrey E. Smith.

Lernschwäche auch in den Fächern führen, für die das Kind überdurchschnittlich begabt ist."

In der Schulpraxis werden derartige Fälle häufig nicht erkannt, und so werden bereits in der Grundschule viele Begabungen vertan. Steinwachs: „Diese schreibschwachen Kinder werden leicht aufgrund einer nicht durchgeführten Legasthenie-Symptom-Testung falsch diagnostiziert und der Sonderschule zugeführt, womit ihr soziales Schicksal häufig vorbestimmt ist."

Abhilfe verspricht sich der Aachener Schreibdruck-Experte von einem Griff in die pädagogische Mottenkiste. Nur die alte, geschmähte Schiefertafel — spezialbeschichtet mit Naturschiefer — und der holzumkleidete weiche Griffel senken den Schreibdruck der Kinderfinger bereits nach sechs Monaten und verbessern die Schreibbewegungen rapide. Das wies das Steinwachs-Team in zwei Jahre langen Versuchen mit 30 000 elektrischen Schreibdruck-Meßwerten von 150 Kindern des ersten und zweiten Schuljahres nach.

Der Reibungswiderstand der Tafel verlangsamt die Schreibgeschwindigkeit der Grundschüler; die harte Schieferplatte entkrampft die Schreibhand. Schnelle Tafel-Erfolge wiederum fördern Lerneifer und aktivieren Intelligenz.

Dem eingewurzelten Pädagogen-Vorurteil, Schiefertafeln seien unhygienischer als Hefte, begegnete der Psychologe schließlich mit einem Professoren-Gutachten. Erlangens mittlerweile emeritierter Hygieniker und Bakteriologe Knorr prüfte Hefte und Tafeln.

Knorrs mikroskopisch gesicherter Befund: Auf Papier haften Keime wesentlich besser und länger als auf Schiefertafeln.

ZAHNMEDIZIN

Schuß in die Höhle

Mit Löchern im Zahn, Horror der Patienten und Pfründe der Zahnärzte könnte es bald ein Ende haben. Medizinforscher entwickeln einen Impfstoff gegen Karies.

„Meine drei ältesten Kinder", berichtet Dr. Geoffrey Smith, „haben zusammen 21 kaputte Zähne." Derart ruinierte Gebisse schon bei Halbwüchsigen, so weiß der englische Zahnmediziner, „entsprechen der nationalen Norm".

Die jüngsten Smiths aber, fünf und sechs Jahre alt, mußten noch nie auf den Marterstuhl eines Dentisten. Dabei sind ihnen weder Bonbons verboten noch Diätspeisen, fluoridierte Milch oder medizinische Zahnpasten verordnet.

Beide Kinder, so erklärte Smith vorletzte Woche in der britischen Tageszeitung „Guardian", profitieren offenbar von einer Forschungsleistung ihres Vaters: Er hat sie versuchsweise gegen Karies geimpft.

Wenn solcher Schutz vor Zahnfäule allgemein möglich würde, könnte eine der geschäftigsten Sparten der Medizin, die der Zahnärzte, fast völlig von Therapie auf Vorsorge umgestellt werden.

Mit verfallendem Kauwerk beschäftigen sich allein in der Bundesrepublik rund 31 000 Zahnmediziner. Für Zahnbehandlung müssen die Bundesbürger derzeit jährlich weit mehr als zwei Milliarden, für Zahnersatz mehr als eine Milliarde Mark aufwenden. Und Karies ist in neun von zehn dieser Fälle Ursache der meist schmerzlichen Übel.

Zahnmediziner Smith bei Karies-Impfung
Bonbons erlaubt

Die Krankheit, die Schmelz und Knochengewebe des Zahns erweicht, setzt oft schon Kleinkindern zu. Und kaum haben sie ihr amalgamgefülltes Milchgebiß verloren, findet der Zahnarzt in den nachwachsenden zweiten Zähnen wieder Ansatzstellen für seinen Bohrer; selbst goldene Füllungen können die bräunlich verfärbten Höhlungen meist nur auf Zeit sanieren.

Karies wird von Bakterien — Streptokokken — verursacht, die sonst harmlos sind und auch in gesunden Mundhöhlen gedeihen. Daß diese Mikroben dennoch die harte Zahnoberfläche angreifen, wurde allen irgend denkbaren Umständen zugeschrieben: Erbeinflüssen ebenso wie faulem Kauen und lässigem Zähneputzen, vor allem aber der modernen Kost mit feingemahlenem Mehl und raffiniertem Zucker.

Am besten sind die Zähne gegen den Bakterien-Angriff vorerst noch durch Fluoride zu schützen. Allerdings muß, wer Karies verhüten will, lebenslang täglich etwa ein Milligramm dieser Verbindungen des Gases Fluor schlucken oder als Lack oder Lösung regelmäßig auf den Zahnschmelz pinseln lassen.

Massen-Vorsorge durch das Anreichern des Trinkwassers mit Fluoriden, darüber gibt es nach langem Forscher-Streit und Großversuchen nun keinen Zweifel mehr, hat sich bewährt. Doch nur wenige Länder — darunter etliche Bundesstaaten der USA, die Niederlande und die DDR — konnten bislang diese Maßnahme populär machen.

Seit Jahrzehnten suchen deshalb Wissenschaftler nach anderen Methoden, die Streptokokken unschädlich zu machen. Schon 1927 hatten sie erstmals einen Impfstoff präsentiert. Aber entweder erzielten solche Präparate nicht den angestrebten Immunschutz, oder sie hatten gefährliche Nebenwirkungen.

Inzwischen entwickelten jedoch der Brite Geoffrey Smith sowie schwedische und Schweizer Forscherkollegen in Malmö und Basel neuartige Impfstoffe: Ihre Wirkung geht nicht mehr von abgeschwächten oder abgetöteten Karies-Keimen aus, sondern von gereinigten Enzymen aus Streptokokken-Kulturen.

Erste klinische Versuche in den letzten zwei Jahren, berichtet Smith, hatten Erfolg. Fast alle der 24 geimpften Kinder, darunter seine eigenen, blieben — nach jeweils jährlicher Auffrisch-Impfung — von Karies verschont.

Jetzt soll der Schutz des Impfstoffs, den Smith (unterstützt vom britischen Medical Research Council, der Pharmafirma Aspro-Nicholas und dem Chemiekonzern Glaxo) entwickelte, an 120 Kindern erprobt werden. Das Medikament muß mit der Impfpistole in die Mundhöhle geschossen werden.

Dennoch meint Smith, das Verfahren würde sich für Reihenimpfungen eignen. Das Präparat dafür wäre nach seinen Erwartungen „in drei bis fünf Jahren verfügbar".

AUTOMOBILE

Stoß ins Wasser

Amerikanische Ingenieure testeten Stoßfänger des Automobil-Jahrgangs 1972. Das Resultat war niederschmetternd.

Rumms, tönte es von der Testbarriere — lauter und folgenschwerer, als die Ingenieure erwartet hatten. Der Wagen, ein 72er Cadillac Calais, war im gemächlichen Spaziergängertempo von vier Kilometern pro Stunde gegen das massive Hindernis gelenkt worden. Reparaturkosten: 222 Dollar.

„Das sollen verbesserte Stoßstangen sein?" spottete einer der Testingenieure. Die Stoßfänger des ladierten Luxusautos und anderer, gleichfalls getesteter Typen des Jahrgangs 1972 seien „für die Katz". Schauplatz der unlängst abgehaltenen Aufpralltests war das Ver-

SPECTRUM

Jabs against decay

THE ANGUISHED memory of the dentist's drill may fade soon, thanks to a newly developed vaccine that helps to prevent tooth decay. In small-scale tests on 120 children, the vaccine cut the rate at which tooth cavities form by 85 per cent. It stopped the formation of dental plaque, the tacky mix of processed sugar and natural mouth bacteria which liberates destructive acids and holds them against the surface of the tooth.

Although the theory and the development work has been an international race, the first man to the patents office with details of how to make an effective vaccine is Geoffrey Smith, a British dentist; on November 27 his British patent, number 3222 will be published, and if there is no objection, it will be sealed and effective in three months.

The theory behind the vaccine is simple. Natural bacteria in the mouth are usually harmless. But when one villain, NCTC 10449 or streptococcus mutans, mixes with processed sugar, it forms dextrans. This sticky substance releases enzymes that spill out acids, and the stickiness holds it to the smooth surface of teeth. In Western diet, the "plaque", that the dextrans form holds firm to the teeth, because we chew too little and therefore do not encourage saliva to act as a natural mouthwash. The end result is holes in the teeth.

The vaccine breaks the process. Developed from the enzymes that NCTC 10449 releases, it stops the mingling of sugar and bacteria by producing antibodies, which exist naturally to keep some lucky people free from caries. There is no plaque, no acid and no decay.

The key problem of which bacterium liberated the rotting enzymes was solved in 1960. But making a workable vaccine has been a long and difficult process.

Geoffrey Smith's work, partly in the laboratories of Glaxo, but largely on his own, fell foul of drug firms' lack of interest in dental products and the fact that dental research has a low priority in medical spending.

Hard on his heels as he worked at making a vaccine and getting the money to produce it have been both European and American groups working on the same principle. In Zurich, in Malmo in Sweden, the State University of New York and at a German firm, Behringwerke in Marburg, researchers had come close to producing a viable vaccine. The Royal College of Surgeons has done extensive work on vaccines with monkeys.

Behringwerke say their development should take between five and seven years to go through clinical trials on human beings. But Smith's associates expect his vaccine to be marketed in Japan within two years and Italy within 15 months (although no estimate can be given for Britain). It seems he has won the patent race.

Extensive clinical tests are starting in Britain now, with a sample of 500 children. To be most effective, the vaccine has to be given once a year, starting before the first teeth form. It is injected in the mucous membranes of the mouth so that the antibodies form in the saliva rather than the bloodstream. It should be a painless business, since the vaccine will not produce a reaction in most people, unlike, say, immunisation against tuberculosis.

But the problem may lie, not with the vaccine, but with the National Health Service. At present only one sort of major preventative dental technique is paid for by the NHS—scaling teeth. None of the newer developments have been added to the list of approved treatments, although section 30 of the regulations allows the Dental Estimates Board to approve other methods and techniques that are not in the list. Dentists outside the schools service can only do modern, preventative work for patients who pay.

The British Dental Association will take some convincing about the effectiveness of the vaccine before they drop their major campaign—to encourage fluoridating water so that the surface of teeth is strengthened against decay. "We've been tackling a disaster in dental health since 1948," says Ronald Allen, secretary of BDA, "and we're only starting to think about preventative work." Geoffrey Smith now has to ask if big drugs firms and his own profession will want to know about his tooth-saving invention.

Michael Pye

Graphics, John Grimwade; Photograph, Kelvin Brodie

Normal decay on left: Geoffrey Smith holds preventative vaccine, whose process is shown on right

1375866

PATENT SPECIFICATION (11) 1375866

(19)

(21) Application No. 27400/71 (22) Filed 11 June 1971
(23) Complete Specification filed 25 Nov. 1971
(44) Complete Specification published 27 Nov. 1974
(51) International Classification A61K 23/00
(52) Index at acceptance A5B 721 722 724 725 726 727 72Y

(54) VACCINES EFFECTIVE IN HINDERING DENTAL CARIES

(71) I, GEOFFREY ERNEST SMITH, of Northwold House, 14 Fore Street, Old Hatfield, Hertfordshire, of British nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a vaccine effective in reducing or preventing the incidence of dental caries on the smooth surfaces of the teeth and to a method of preparing the vaccine.

The demonstration of antibodies and bactericidal substances in saliva has stimulated interest in their possible relationship to caries resistance in man. Several attempts have been reported in which immunisation procedures have been used to lower the incidence and intensity of dental caries in experimental animals.

In 1927 V. Ross, F. Krasnow and J. Samet (J.D.R. 7.337). inoculated rabbits with dead B. Acidophilus. The sera showed agglutination to a greater or lesser degree. The saliva from the rabbits bore agglutinins in 7 of 14 cases, the titre being much weaker than that of the sera. They suggested: "Should the existing data for the belief that B.Acidophilus is an actiological factor in dental caries be substantiated, the present experiments would appear to add some degree of experimental evidence in favour of attempts at vaccine prophylaxis and treatment."

In 1932 P. Jay et al. (J.Am.D.A.20.2130). prepared filtrates from 40 oral strains of B.-Acidophilus isolated from cases of dental caries. A skin reactive substance was observed in the filtrate. In two cases negative skin reactions were associated with B.Acidophilus agglutinins in the blood serum after the use of polyvalent B.Acidophilus vaccine. In 1933, P. Jay et al. concluded from a series of experiments: "Bacillus acidophilus agglutinins can generally be demonstrated in the blood serums of caries-free persons. The B.Acidophilus agglutinin titre of the blood serums of certain susceptible patients was raised to the titre of caries-free persons by the administration of a vaccine containing the R phase of B.Acidolphilus. Such a procedure was generally accompanied by abscess formation at the site of the inoculation."

In 1942 C.P. Canby and J.L. Bernier. (J.Am.D.A.) 29.606). made studies of the antigenic behaviour of 24 strains of Lactofacillus Acidophilus from carious dentine, and of the quantitative results of vaccination with L.Acidophilus bacteria on this organism in the mouth. They suggested: "The antigenic behaviour of members of this group of organisms presents a bewildering complexity as determined by cross-agglutination tests." They showed that vaccination of human beings with vaccines prepared from strains of L.-Acidophilus seemed to "stimulate the production of a substance having growth inhibitory properties toward L.Acidophilus in the mouth." They concluded that the small number of cases under study would not allow them to draw any conclusions on the basis of results obtained. In 1943, V.Dietz, N.B. Williams and W. Lawton (J.Am.D.A. 30.839) compared the strength of the agglutinins for lactobacilli in the blood of 15 highly caries susceptible and 15 caries insusceptible patients. No significant differences could be demonstrated. The highest titres were accompanied by a negative salivary lactobacillus count irrespective of the caries experience. The low agglutinin titres in the two groups were not consistently accompanied by high salivary counts. They concluded: "The high blood titres in our results appear to serve more directly as indicators of a low incidence of lactobacilli in the mouth rather than as an index of caries experience."

In 1944 N. Williams, (J.D.R. 23.403) inoculated human beings with both heat-killed and living organisms, various strains of lactobacilli. Vaccination increased the blood agglutinin titres for the strains used in the vaccines, the maximum being attained around two weeks after vaccination. The titres

[Price 25p]

ROYAUME DE BELGIQUE

MINISTÈRE DES AFFAIRES ÉCONOMIQUES

BREVET D'INVENTION

N° 794.307

Classif. Internat.: C 12 k / A 61 k

Mis en lecture le: 19-7-1973

Le Ministre des Affaires Economiques,

Vu la loi du 24 mai 1854 sur les brevets d'invention;

Vu le procès-verbal dressé le 19 janvier *197* 3 *à* 15 *h.* 30

au Service de la Propriété industrielle;

ARRÊTE :

Article 1. — *Il est délivré à* la Sté dite : PATENTS INTERNATIONAL AFFILIATES LIMITED,
1370 Avenue of the Americas, New York, New York, (Etats-Unis d'Amérique),

repr. par MM. J. Gevers & Cie à Bruxelles,

un brevet d'invention pour: Vaccin anti-caries, sa préparation et son utilisation,

qu'elle déclare avoir fait l'objet d'une demande de brevet non encore accordée à ce jour, déposée en Grande-Bretagne le 11 juin 1971 n° 27400.

Article 2. — *Ce brevet lui est délivré sans examen préalable, à ses risques et périls, sans garantie soit de la réalité, de la nouveauté ou du mérite de l'invention, soit de l'exactitude de la description, et sans préjudice du droit des tiers.*

Au présent arrêté demeurera joint un des doubles de la spécification de l'invention (mémoire descriptif et éventuellement dessins) signés par l'intéressé et déposés à l'appui de sa demande de brevet.

Bruxelles, le 19 juillet *197* 3

PAR DÉLÉGATION SPÉCIALE:
Le Directeur Général,

R. RAUX.

T. 38

1972 - Imp. E. Heyvaert & Fils

FORM 7 COMMONWEALTH OF AUSTRALIA PATENTS ACT 1952-69

DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT OR PATENT OF ADDITION.

Full name of Applicant.

In support of the application made by
PATENTS INTERNATIONAL AFFILIATES LIMITED

for a patent ~~patent of addition~~ for an invention entitled

"VACCINE"

Full name and address of Declarant.

I, Roger Shashoua of 1135 Park Ave New York, N.Y. United States of America

do solemnly and sincerely declare as follows:–

~~1. I am the applicant for the patent of addition.~~

(or, in the case of an application by a body corporate)

1. I am authorised by PATENTS INTERNATIONAL AFFILIATES LIMITED the applicant for the patent ~~patent of addition~~ to make this declaration on its behalf.

~~2. I am the actual inventor of the invention.~~

(or, where a person other than the inventor is the applicant)

Full name and address of Inventor(s).

2. GEOFFREY ERNEST SMITH, of 42 Hallmores, St. Catharines Road, Broxbourne, Hertfordshire, England,

COMMONWEALTH 2 APR 1973 PATENT OFFICE

is the actual inventor of the invention and the facts upon which the applicant is/are entitled to make the application are as follows:

The said Applicant is the assignee of the actual inventor.

Declared at New York this 19 day of March 1973

Signature of Declarant.

To:
The Commissioner of Patents.

SPRUSON & FERGUSON

Αὐξ. Ἀριθ. ..49084.....

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

ΔΙΑΔΗΜΑ ΤΗΣ ΕΛΛΑΔΟΣ

ΝΟΜΑΡΧΙΑ ΑΤΤΙΚΗΣ

ΔΙΑΜΕΡΙΣΜΑ ΑΘΗΝΩΝ

ΔΙΕΥΘΥΝΣΙΣ ΕΜΠΟΡΙΟΥ

ΔΙΠΛΩΜΑ ΕΥΡΕΣΙΤΕΧΝΙΑΣ

Ἔχοντες ὑπ' ὄψιν :

α. Τὸν Ν. 2527/1920 «περὶ διπλωμάτων εὑρεσιτεχνίας».

β. Τὸν Ν. 4325/1963 «περὶ ἐφευρέσεων ἀφορωσῶν τὴν Ἐθνικὴν Ἄμυναν τῆς χώρας».

γ. Τὸν Ν.Δ. 1147/1972 «περὶ διοικήσεως τῆς Μείζονος Πρωτευούσης».

δ. Τὴν ὑπ' ἀριθ. Α7/7-2/2/11-12-72 κοινὴν ἀπόφασιν τοῦ Ὑπουργοῦ παρὰ τῷ Πρωθυπουργῷ Ἐσωτερικῶν καὶ Ἐθνικῆς Οἰκονομίας «περὶ Ὀργανώσεως τῶν παρὰ τῇ Νομαρχίᾳ Ἀττικῆς καὶ τοῖς Διαμερίσμασιν αὐτῆς Ὑπηρεσιῶν» ἁρμοδιότητος Ὑπουργείου Ἐθνικῆς Οἰκονομίας (τ, Ἐμπορίου).

ε. Τὴν ὑπ' ἀριθ. 390/8-I-73 κοινὴν ἀπόφασιν τοῦ Νομάρχου Ἀττικῆς καὶ τοῦ Ἀναπληρωτοῦ Νομάρχου Προϊσταμένου τοῦ Διαμερίσματος ...Ἀθηνῶν..... «περὶ ἐξουσιοδοτήσεως ἀσκήσεως ἁρμοδιότητος».

στ. Τὴν ἐνώπιον τοῦ Προϊσταμένου τῆς Δ/σεως Ἐμπορίου τοῦ Διαμερίσματος ...Ἀθηνῶν... ..... τῆς Νομαρχίας Ἀττικῆς, κανονικῶς κατατεθεῖσαν δήλωσιν καθ' ὥραν .13.45... τῆς ....22..... τοῦ μηνὸς Δεκεμβρίου ἔτους 1972.... ὡς καὶ τὸ ὑπ' ἀριθ...35939..... ἔγγραφον τῆς Διευθύνσεως Ἐμπορ. & Βιομ. Ἰδιοκτησίας.

.....

Ἀπονέμομεν,

τὸ παρὸν δίπλωμα εὑρεσιτεχνίας, εἰς ὃ συνάπτονται τεθεωρημένα τὰ ἀνήκοντα ἔγγραφα στοιχεῖα, Ισχῦον μέχρι τῆς 22 Δεκεμβρίου 1987 .....

εἰς τὴν ἐν NEW YORK, Πολιτείας NEW YORK, Η.Π. Ἀμερικῆς ἑδρεύουσαν ἑταιρίαν ὑπὸ τὴν ἐπωνυμίαν: "PATENTS INTERNATIONAL AFFILIATES LIMITED" .....

Διὰ τὴν ἐφεύρεσιν: .....

"ΜΕΘΟΔΟΣ ΠΑΡΑΣΚΕΥΗΣ ΜΙΚΡΟΒΙΟΥ ΛΙΟΤΕΛΕΣΜΑΤΙΚΟΥ ΕΙΣ ΤΗΝ ΘΕΡΑΠΕΙΑΝ Η ΠΡΟΛΗΨΙΝ ΤΟΥ ΣΥΜΠΤΩΜΑΤΟΣ ΑΣΘΕΝΕΙΑΣ ΟΔΟΝΤΩΝ (ΤΕΡΗΔΟΝΟΣ) ΕΠΙ ΤΩΝ ΜΑΛΑΚΩΝ (ΛΕΙΩΝ) ΕΠΙΦΑΝΕΙΩΝ ΤΩΝ ΟΔΟΝΤΩΝ" .....

.....

Ἐφευρέτης: GEOFFREY ERNEST SMITH. .....

.....

.....

.....

.....

Τὸ παρὸν ἀπονέμεται ἄνευ προηγουμένου ἐλέγχου, ὑπ' εὐθύνην τοῦ δηλωτοῦ καὶ ἄνευ ἐγγυήσεως τοῦ Κράτους, εἴτε διὰ τὸ πραγματικὸν εἴτε διὰ τὸ νέον, εἴτε διὰ τὴν ἀξίαν ἢ τὴν φύσιν τῆς ἐφευρέσεως, εἴτε διὰ τὴν ἀκρίβειαν καὶ τὸ πιστὸν τῆς περιγραφῆς.

Ἐν Ἀθήναις τῇ 12 Ἰαν. 1974

Ἐντολῇ Ἀναπληρωτοῦ Νομάρχου
Ὁ Διευθυντὴς

Letters patent

Patents Act 1990

No.
613857

PETTY PATENT

I, David Ross Wilson, Acting Commissioner of Patents, grant a Petty Patent with the following particulars:

Name and Address of Patentee:
Geoffrey Ernest Smith, Yallambie RMB 1680 Nagambie Victoria 3608 Australia

Name of Actual Inventor: Geoffrey Ernest Smith

Title of Invention: Methods for manufacture and use of autogenous anti-tooth decay vaccines

Application Number: 58835/90

Term of Letters Patent: Twelve months commencing on 25 June 1991

Dated this 25 day of June 1991

D.R.WILSON
ACTING COMMISSIONER OF PATENTS

MINISTER OF HEALTH
VICTORIA

PLEASE ADDRESS
CORRESPONDENCE TO
BOX 4057
MELBOURNE, VICTORIA
AUSTRALIA, 3001

555 COLLINS STREET
MELBOURNE
TELEPHONE 616 7777
(AREA CODE 03)

82/119

28 FEB 1983

Dr. G. Smith,

56 Surrey Road,
SOUTH YARRA. VIC. 3141

Dear Dr. Smith,

I refer to your letter of 9 December, 1982, concerning the use of your anti-caries vaccine.

As you are using an autogenous vaccine in the treatment of selected patients it is not required that you apply for registration of your product as a proprietary medicine under Division 3 of the Health Act.

Yours sincerely,

TOM ROPER
MINISTER OF HEALTH

THE WALTER AND ELIZA HALL INSTITUTE OF MEDICAL RESEARCH

POSTAL ADDRESS: POST OFFICE, ROYAL MELBOURNE HOSPITAL, VICTORIA, 3050, AUSTRALIA. TELEPHONE 347-1511

AFFILIATED WITH
THE UNIVERSITY OF MELBOURNE
AND
THE ROYAL MELBOURNE HOSPITAL

DIRECTOR: PROFESSOR G. J. V. NOSSAL, C.B.E., F.A.A.

CLINICAL RESEARCH UNIT
THE ROYAL MELBOURNE HOSPITAL
HEAD: DR. I. R. MACKAY

17th January, 1979

Dear Dr Smith,

I recall our meeting two years ago, and must say that I have not been aware of any adverse vibrations in relation to your interest in dental vaccine, or any other inconvenience to the Institute. I remain interested in the possibilities of a vaccine against dental caries, but dental disease is a little outside my normal area of work, and this Institute does not usually become involved in research unless there is a supporting grant of some type - hence the lack of initiative on my part.

All best wishes,

Yours sincerely,

Ian Mackay

Ian Mackay

Dr Geoffrey Smith,
30 Ross Street,
TOORAK. Vic. 3142.

QUEENSLAND HOSPITALS

All Communications to be addressed to The Secretary.

In reply please quote this Number:

PROSERPINE

THE DENTAL CLINIC
Hospitals Board.
P.O. Box 229,
PROSERPINE Q.4800

17th October, 1979

Private and Confidential.

Dear Minister,

Could I stress, in this 'confidential attachment', what is causing me most concern regarding fluoride and the Proserpine school-children.

a. Every child attending for treatment in the School Dental Clinic must receive a topical fluoride treatment. This is 'policy' - apparently.

b. The Therapists (who are very capable), have not been told about dental fluorosis. Hence it is quite common to see children with fluoride-mottled teeth getting this form of treatment. Surely this is absurd?

c. The fluoride gels contain around 12,300 ppm fluoride. The children swallow significant amounts of gel during the treatment and immediately afterwards. Some children complain of dizziness and nausea. Two, to my knowledge, have been sick after the treatment. In one there appeared to be traces of blood in the vomit.

d. Your advisers will confirm that a child in New York died after topical fluoride therapy.[1]

e. Could I respectfully ask you to consider suspending 'topical fluoride treatments' until such products have been tested for potential toxicity?

Yours Faithfully,

Geoffrey E. Smith.

1. Horowitz,H.H. Abusive Use of Fluoride. J.Colo.St.dent.Assoc., 56:]5-]6,]978.

NAT. HEALTH AND MEDICAL RESEARCH COUNCIL

RESOLUTIONS.

54 Session

April 1953

Resolution 1 (Conditional upon Resolution 2).—DENTAL.

(i) This Council is of the opinion that an optimal intake of fluorine is a factor in the prevention of dental caries.

It must be admitted, however, that an adequate supply of fluorine in drinking water will not of itself provide the solution of the problem of dental caries. There are other factors, particularly dietary, involved in the control of dental caries.

(ii) Having considered published reports of the views for and against artificial fluoridation of public water supplies, this Council recommends that, where the optimal intake is not obtained from natural sources, fluorine be added to the public water supply.

(iii) The habitual use, from early infancy onward, in a temperate climate, of water containing 1 p.p.m. fluoride has been shown to confer the greatest degree of freedom from dental caries which can be secured by this means without risk of disturbance to any bodily structure or function.

For such children, the average daily intake of fluoride from all sources, when the water contains 1 p.p.m. fluoride, has been determined for various age groups from one to twelve years. According to age, this intake ranges from 0.4 to 1.7 mg.

For adults, an average daily intake of water ranging from 1,200 to 1,500 ml. would result in an intake of 1.2 to 1.5 mg. fluoride. In addition, there will be a computed daily intake of 0.2 to 0.3 mg. fluoride from food, the total daily intake of fluoride will, therefore, be 1.4 to 1.8 mg.

On the basis of observations made on a population whose daily fluoride intake is within the range stated, and of observations on the excretion of fluoride, there is no evidence that fluoride will accumulate in the body to an undesirable extent when the daily intake is less than 3 mg. fluoride.

(iv) There is no conclusive evidence that any deleterious systemic effects will follow the habitual use of water containing 1 p.p.m. of fluoride.

(v) Although this Council can see no reason why the dental benefits of fluoridation of water should, at this stage, be denied to the Australian people, it is emphasized that concurrent research is essential in order to assess the results of treatment of the water and to determine accurately the optimal concentration of fluorine under Australian conditions.

(vi) Any plan to fluoridate the domestic water supply must be subject to the following conditions:—

(a) The need for increasing the concentration of fluorine in the water supply must be established.

(b) A large proportion of the consumers of fluorine in the water supply must be established, or alternatively, a substantial proportion of the community should desire that fluorine be added to the water supply, before fluorine is added to the water.

(c) The water supply must be amenable and subject to strict supervision and control by qualified engineers and chemists.

(d) The amount of fluorine to be added must be carefully determined and adjusted to meet climatic and environmental changes.

(vii) A properly controlled national study of water fluoridation under Australian conditions should be instituted immediately:

(a) To determine the results of water treatment.

(b) To determine more accurately the efficient concentration of fluorine.

(c) To permit of valid comparisons between observations made in different parts of Australia.

(viii) This study should embrace:

(a) Survey of oral conditions in representative samples of children and adolescents.

(b) Influence of climate upon water consumption.

(c) Excretion of fluoride in the urine of samples groups of children and adults.

(ix) In order to obtain comparable results, the Council recommends the establishment (at the Institute of Dental Research, under the supervision of Dr. N. B. Goldsworthy) of a course of instruction in standardized procedures and practice for dental examinations.

In order to co-ordinate (b) and (c) of (viii) the Council recommends the appointment of an advisory panel consisting of Professor Mackerras, Dr. Hinsley, Dr. N. Crosby and Dr. Goldsworthy.

(x) This Council considered the question of self-medication with fluoride, and strongly deprecates the inexpert and indiscriminate self-medication with fluoride for the purpose of partial control of dental caries.

137th Year. No. 42,525

THE AGE

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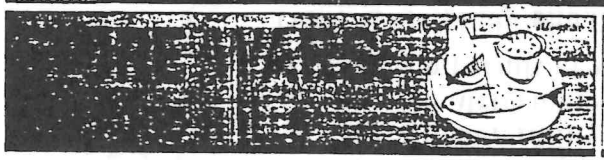
Tuesday 17 September 1991

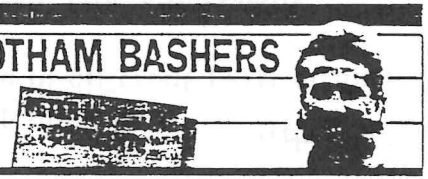
60c (Interstate prices, Page 42)

EPICURE HOME SPORT



RETIREMENT: CHOOSING A VILLAGE

THE BOTHAM BASHERS



Parents warned against giving children too much fluoride

By SALLY HEATH,
Medical reporter

The intake of fluoride — other than in water — should be strictly controlled in children to prevent permanent discoloration of teeth, according to a new policy of the National Health and Medical Research Council.

The policy recommends that strategies, and possibly legislation, be developed to prevent young children taking excessive fluoride through toothpaste, infant formulas and fluoride tablets.

It recommends that the long-term effects of fluoride intake by adults be monitored to assess the effects in older ages. The policy strongly endorses fluoridation in water to the present level of one part per million.

A working group report, adopted as policy in June, said: "Water fluoridation is effective in achieving a lower rate of dental caries (decay, disintegration or destruction of the tooth)."

Fluoridation of the public water supply to one part per million did not appear to have adverse consequences for the health of the population, it said. "The working group concludes that there is no evidence that fluoride is a risk factor for cancer in humans."

PARENTS ARE ADVISED TO:

- Avoid use of fluoridated toothpaste at an early age.
- Use only a pea-sized amount of fluoride toothpaste on the child's toothbrush.
- Supervise tooth-cleaning to ensure that excessive amounts of toothpaste are not regularly swallowed.
- Avoid an early or high-dose use of fluoride tablets.
- Avoid prolonged use of dietary formulas.

Source: National Health and Medical Research Council, Victorian Health Department

The Victorian Health Department has already incorporated the NHMRC policy into its health education program, and has revised advice to staff and parents about the amount of toothpaste used by children.

The state's chief dental officer, Dr Michael Hollis, said: "We are recommending that parents use a pea-sized amount of toothpaste on their child's toothbrush, that they don't spread it along the full length of the brush, and that they supervise their child's tooth cleaning."

Dr Hollis said the effects of excessive fluoride, called fluorosis, were not apparent until children were about 12 — when their permanent teeth came through. White spots or mottling could be seen or, in bad cases, yellowing. For fluorosis to occur, children would have to be exposed to four times the normal intake in water.

The chairman of the NHMRC working group on the effectiveness of water fluoridation, Professor Tony McMichael, said: "It is clear an excessive intake of fluoride in childhood can lead to fluorosis, and that this is not from water but most probably from toothpaste."

"There is a clear need for the federal or state governments to look at legislating to reduce the content of fluoride in toothpaste, or requesting that a child's toothpaste be manufactured with reduced fluoride content, coupled with a public education campaign."

The working group's report said water fluoridation appeared to be of increasing importance to dental health in an ageing population.

The policy says communities that do not fluoridate their reticulated water supply to the level of one part per million should be encouraged to do so.

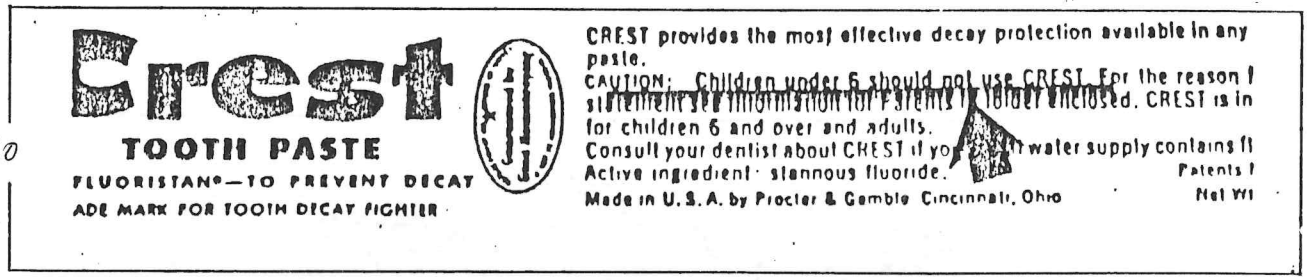
Environment draft keeps control in federal hands

By MICHELLE GRATTAN and ROSS PEAKE, Canberra

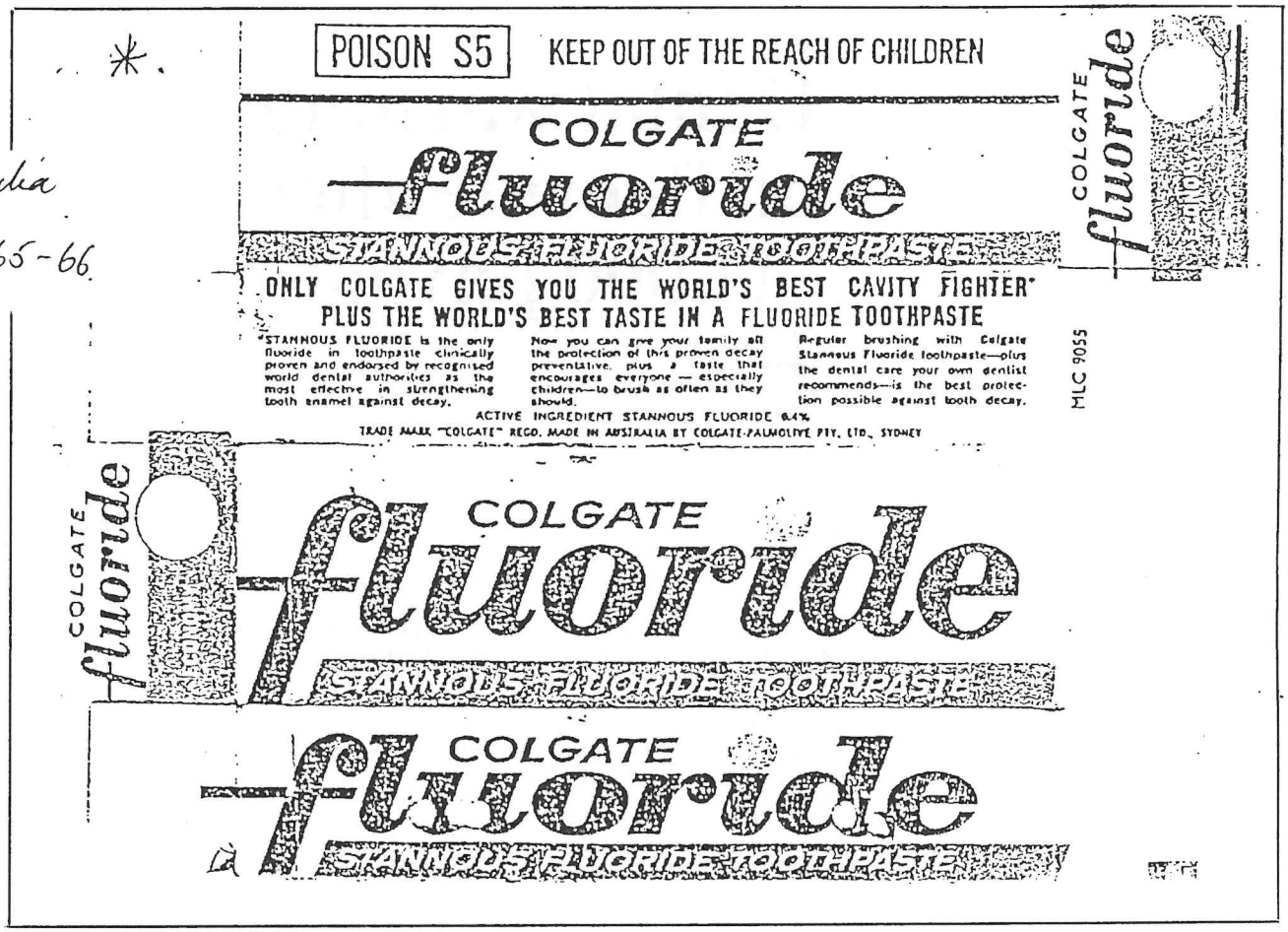
In the latest draft of the federal-state environmental agreement, the Federal Government has insisted on retaining more control over the environment than in an earlier draft that enraged environmentalists.

The conserv[illegible] conc[illegible]

U.S.A.
c. 1959-60

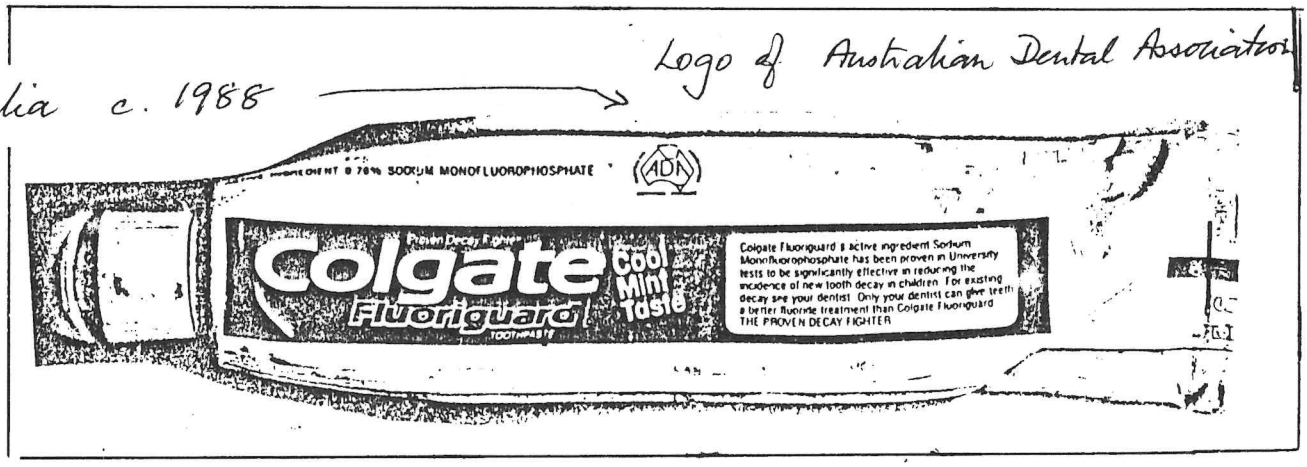


Australia
c 1965-66

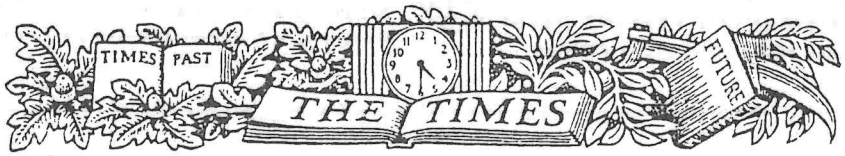


Australia c. 1988

Logo of Australian Dental Association



THE TIMES MONDAY NOVEMBER 25 1996



Dental warning on fluoride after £1,000 payout

TIMES 25/11/96

BY ROBIN YOUNG

THE British Dental Association gave a warning yesterday of the dangers of swallowing fluoride toothpaste after Colgate-Palmolive paid £1,000 to a boy whose teeth appeared to have been damaged because of the habit.

Colgate-Palmolive made the "goodwill" payment to Sharon and Trevor Isaacs of Highams Park, east London, on behalf of their son, Kevin, 10, whose teeth, it was diagnosed, had been mottled by dental fluorosis. Mrs Isaacs said she had always bought Colgate's Minty Gel with added fluoride and made sure her son brushed his teeth twice a day using the pea-sized amount recommended by the manufacturers. She said her son used to swallow the paste but she had rung Colgate to ask whether that would do any harm and had been told it would not.

John Renshaw, a spokesman for the British Dental Association, said yesterday: "If that advice was given it was certainly wrong. No one should ingest products that are not intended to be ingested and that certainly applies to fluoride toothpaste. A child swallowing fluoride toothpaste on a regular basis would certainly run a risk of overdosing with fluoride, which can lead to very unsightly brown mottling of the teeth."

The £1,000 paid in Kevin Isaacs's case relates to the expected cost of coating his teeth after the mottled enamel has been removed.

Dr Renshaw said: "Colgate-Palmolive seem to be opening a very big door for further possible claims, but the British Dental Association's view is very firmly that fluoride toothpaste is a valuable weapon against tooth decay. The trouble is that the concentration of fluoride in a paste intended for topical application, that is by direct use on the teeth in brushing, is much higher than the trace of fluoride that might be added to water for ingestion."

Dr Renshaw added: "We can understand Colgate-Palmolive paying £1,000 if the company is satisfied that it gave Mrs Isaacs wrong advice about her son's habit of ingesting the paste. We would be very unhappy if they paid out for any other reason."

The Isaacs family did not live in an area with fluoridated water. Health organisations are seeking further fluoridation of supplies.

MoD admits 40 years of human radiation tests

Sunday Times 24/11/96 (London)

BRITAIN has sponsored a 40-year programme of secret radiation experiments on humans, according to a report by the Campaign for Nuclear Disarmament (CND). The research is said to have involved volunteers being injected with, inhaling or eating a range of radioactive substances, all having the potential to cause cancer and other diseases.

The report, based on copies of more than 50 Ministry of Defence (MoD) documents, flatly contradicts previous denials by the government that humans have been used for such research. Last night the MoD conceded those denials were wrong.

About 200 people, all government personnel, were used in the experiments and yesterday it emerged that many were women who had yet to have families — raising the prospect the experiments could have affected children born after the tests.

The experiments were carried out at the government's Atomic Energy Research Establishment at Harwell, the Atomic Weapons Establishment at Aldermaston, and at the Chemical and Biological Defence Establishment at Porton Down, according to the report, Nuclear Guinea Pigs, which is due to be published in full today.

A CND spokesman said the information remained top secret in Britain and it was forced to go to the American government for access to more than 50 MoD and other government files.

Those files showed that the 200 volunteers were exposed to about 10 radioactive substances.

One was technetium, a highly radioactive element produced as a waste-product in nuclear reactors, which was injected into volunteers.

Other experiments involved inhaling isotopes of strontium, regarded as some of the most dangerous by-products of the nuclear industry because they are absorbed into the skeleton and cause immense damage to bones.

by Jonathan Leake and Ciaran Byrne

Other British experiments on human subjects included:

- ☐ The injection of strontium-85 into a human subject over 30 years between 1957 and 1987.
- ☐ Repeated inhalation of iodine isotopes over 10 years.
- ☐ Another group which repeatedly inhaled palladium-103, a "mock" plutonium and chromium-51 over three years.
- ☐ A group of 19 people who inhaled niobium-92m, known as mock plutonium.
- ☐ The inhalation of niobium-92m by eight men from 1988 to 1990. This experiment is particularly significant because it shows tests were still happening six years ago.

The report was written by Eddie Goncalves, a CND researcher, who recently helped expose secret government documents about radioactive contamination at Greenham Common. He said: "One issue is to what extent these guinea pigs were volunteers and to what extent they had the risks properly explained to them."

Yesterday the MoD confirmed the experiments had been carried out but insisted they had been "ethical". A spokesman said: "These experiments started in the 1950s and continued until the 1980s and were used to estimate the effects of absorbing nuclear material. The amount of radioactive substances administered was negligible."

Such reassurances may, however, be little comfort to the volunteers and their families.

When the experiments started nearly 40 years ago, scientists far less appreciated the dangers of radioactivity, particularly at low levels.

A CND spokesman said it would have been pointless to conduct experiments using "negligible" amounts of radioactivity because the scientists would have been unable to obtain any results, especially using the relatively insensitive measuring instruments of that era.

The revelations come at a sensitive time. Earlier this year Michael Portillo, the defence secretary, was forced to admit that hundreds of servicemen were used to test nerve gases and other substances developed for chemical and biological warfare.

Last month The Sunday Times also revealed that conscript volunteers at Porton Down, the government's top-secret chemical warfare research establishment, were unwittingly exposed to toxic chemicals and nerve agents during experiments in the 1950s.

Former volunteers claimed the MoD had told them the research was into a cure for the common cold.

The Secret War

DENTAL HEALTH EDUCATION AND RESEARCH FOUNDATION
THE UNIVERSITY OF SYDNEY

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31st DECEMBER, 1979

1978 $		$	1979 $
	RECEIPTS		
151,849	Membership Contributions and Donations	147,354	
69,619	Interest and Distribution of Material	54,745	
221,468			202,099
	PAYMENTS		
74,296	Research and Educational Programmes	48,198	
32,647	Publications, Films etc.	49,044	
—	Fluoridation Promotion	43,100	
23,282	Administration and Associated Costs	23,853	
13,566	Publicity, Promotions and Fund Raising	15,328	
4,861	Fixed Overheads — Rent, Cleaning	5,235	
3,510	Printing and Stationery	6,267	
5,686	Postages and Telephones	4,484	
2,126	Miscellaneous — Advertising, Electricity, Equipment etc.	2,860	
[illegible]	Provision for Long Service Leave	500	
160,294			198,869
61,174*	Excess of Receipts over Payments		3,230
221,468			202,099

*Includes projects expenditure prepaid in 1978.

FUNDS HELD BY THE UNIVERSITY OF SYDNEY AS AT 31st DECEMBER, 1979

1978 $	LIABILITIES	1979 $
34,104	Balance 1st January, 1979	95,278
	Less Adjustment previous year	12
	Less Refund of Unallocated Funds	10,956
	Less Transfer to Reserve	80,000
61,174	Add Excess Receipts over Payments	3,230
95,278		7,540
11,343	Add Reserve for Future Objectives	91,343
8,000	Add Reserve for Long Service Leave	8,500
114,621		107,383
	ASSETS	
620	Cash in Hand and at Bank	620
114,001	Investments — at Cost, University Pool Investment	106,763
114,621		107,383

M. BANNIGAN, BEc BA, AASA ACIS
Acting Accountant

6

1979 Honour Roll of Contributors

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Dental Board of N.S.W.
Johnson & Johnson Pty Ltd.
Stafford Miller Ltd.
The Coca Cola Export Corporation
The Wrigley Co. Pty Ltd.
The Health Commission of N.S.W.

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Tubemakers of Aust. Ltd.

7

Dr. William McBride (Founder Foundation 41) stated recently
(Quote)
'The effects of fluoride had been fully investigated at Foundation 41, it improves children's dental health, healthy teeth result in healthy children. I support fluoride.'

FLUORIDATION AS A COMMUNITY HEALTH BENEFIT HAS THE SUPPORT OF:-
—The National Health & Medical Research Council
—The Australian Medical Association
—The Australian Dental Association
—The World Health Organisation
—The Health Commission of New South Wales
—The N.S.W. State Cancer Council
—The Australian Federation of Consumer Organisations
—The Federal Director-General of Health (Dr. Howells)
—The American Dental and Medical Associations.
And many other authoritative bodies.

This leaflet has been prepared in
the interests of better oral health by the
DENTAL HEALTH EDUCATION AND RESEARCH FOUNDATION,
UNIVERSITY OF SYDNEY
N.S.W. 2006

MARCH 1985

PRESS RELEASE

Fluoride, a sinister threat?

Fluoride has two faces, one apparently benevolent, the other unquestionably sinister.

As the debate on the fluoridation of tap water rages on, the beneficial effect of fluoride in the prevention of dental caries has gone virtually undisputed; the effects on bone have not even been discussed. In the March 1985 issue of **Xenobiotica** (Volume 15, pages 177-186) Dr Geoffrey Smith, a dental surgeon from Melbourne, Australia, presents a disturbing hypothesis that intakes of even the recommended daily dose of fluoride (0.05 to 0.07 mg F/kg body weight) ingested throughout adult life may lead to skeletal fluorosis in a significant proportion of the population. Fluoride may not 'do for bones what it has done for teeth'.

Man is now exposed to fluoride from more sources than at any time in the past. The sources include food, water, processed beverages, dental health care products, medicines, pesticide and fertilizer residues, industrial emissions, even the air we breathe. Whether our knowledge of the biological effects of this important element has kept pace with the advances in industrial and domestic uses is questionable.

It is well established that there is a strong affinity between fluoride and the main bone mineral, hydroxyapatite, and that fluoride is cumulative throughout life. A simple formula used by Dr Smith to estimate the accumulation of fluoride shows that no matter how small the amount of fluoride ingested, one-half of that absorbed is initially incorporated in to the skeleton. Even a low daily intake can lead to skeletal fluorosis after 40-60 years.

Osteoporosis, a degenerative bone disease of middle life, is a common metabolic disease in many western countries. There is a higher incidence of the disease, commonly known as 'postmenopausal' or 'senile' osteoporosis, in elderly women. According to Dr Smith, women are more at risk to the adverse effects of fluoride because of their lower body weights.

Although fluoride is incorporated in the mineralization of bones and teeth this does not mean that it is indispensible nor that it is an essential nutrient. How can the possibility that fluoride is linked to the disease osteoporosis be ignored?

About Xenobiotica

Xenobiotica is a monthly journal now in its fifteenth year of publication. The major interests of the journal include the metabolism and disposition of drugs and environmental chemicals in animals, plants and micro-organisms and the related enzymology and methodology. In addition, papers are published in the fields of toxicology and human kinetics and metabolism. Papers published in Xenobiotica are subject to peer review and the Editor is assisted by a world-wide Editorial board and a panel of referees.

If you would like to see a copy of Xenobiotica Volume 15, Number 3, containing Dr Smith's article, or would like any further information, please contact Jane Crowther at the publisher, Taylor & Francis Ltd, Rankine Road, Basingstoke Hants RG24 OPR. Telephone (0256) 468011, Telex 858540. A cutting of any article which uses this information would be appreciated.

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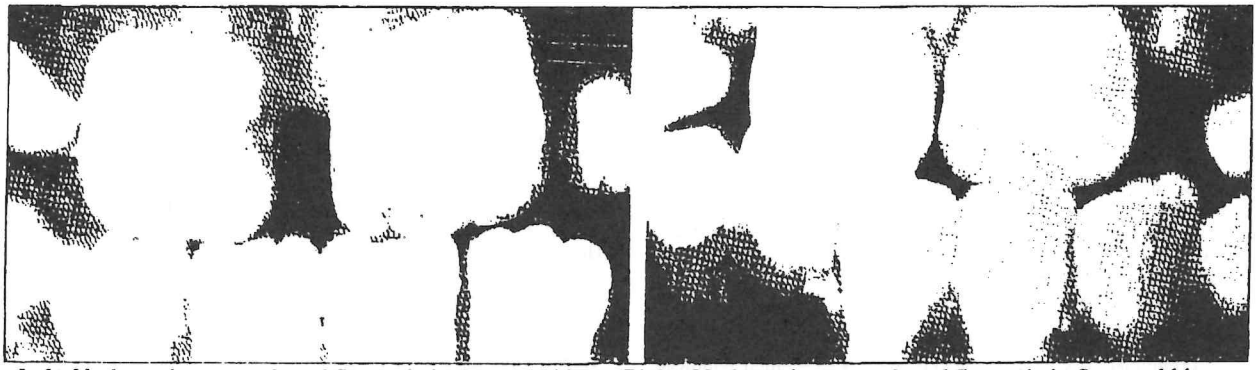
DENTAL RESEARCH



(Left) Moderately severe dental fluorosis in 9 year old boy. (Right) Moderately severe dental fluorosis in 8 year old boy.

FLUORIDE

– dental wonder or medical blunder?

by Geoffrey E Smith, LDS, RCS (Eng), dental surgeon

MY 12-year-old granddaughter, Jade-Emma, has 'mottled' teeth and my wife suffers from osteoporosis.

Jane's disfigured teeth were caused by fluoride and there is now a growing body of evidence suggesting that fluroride can be a factor in the development of osteoporosis.

Is the dental wonder of the 1950s set to become the medical blunder of the 1990s?

Such a thought is particularly frustrating for me since I belong to the profession – dentistry – which has, for the past 40 years, claimed that fluoride was essential for sound teeth and 'good' for bones.

The problem is that fluoride has two faces.

One, apparently beneficial, the other undoubtedly sinister.

Trace amounts of fluoride can help produced stronger teeth, but too much fluoride damages both teeth and bones. Unfortunately, the margin between an apparently safe daily intake of fluoride and a potentially harmful one is impressively small.

Fluoride has held centre stage in dental research for more than 60 years. In 1930, scientists were searching for the cause of unsightly 'mottled' teeth which were quite common in people growing up in certain areas of the west and southern states in the United States.

On May 31, 1931, a headline appeared in the Pittsburgh Press: 'Scientist Here Finds Secret Poison Which Blackens Teeth of Children.'

The article went on to explain how HV Churchill, chief chemist at the Aluminium Company of America (ALCOA) had discovered that high levels of fluoride in drinking water caused the 'mottled' teeth.

No-one had added the fluoride to the water. It occurred naturally and had leached into the water from fluoride-bearing rocks and soils.

Most leading health authorities and medical and dental associations around the world have insisted that fluoridation is totally safe and highly effective in reducing the incidence of tooth decay. However, fluoridation always was, and remains, very controversial

The following year the US Public Health Service (US PHS0) appointed a dentist – Dr Trendley Dean – to investigate the prevalence of tooth 'mottling' in the States and find a way to prevent the disease.

Dean contacted more than 1,000 dentists throughout the country and by 1935 he had mapped the extent of mottling in America.(1)

When he analysed all his data he found that generally speaking, water containing 1 part per million fluoride (1ppm F) caused only mild mottling in about 10 per cent of the population.

However, at two parts per million fluoride over 50 per cent of people drinking the water had disfigured teeth and this increased to more than 95 per cent of people when the water contained more than three parts per million fluoride.

It also became clear that in order to damage the teeth the fluoride had to be ingested during the time the permanent teeth were developing in the jaws – approximately from birth to eight years of age.

By 1938 it was clear that mottling or dental fluorosis could be prevented, either by changing a town's water supply or by removing the fluoride in the existing supply.

This became particularly important since medical scientists in Europe and India had shown that fluoride could not only damage teeth. Over long periods of time the consumption of fluoride-containing water could also damage bones and tendons – skeletal fluorosis.

In 1939, officials of the American Water Works Association suggested that drinking water should contain no more than 0.1 parts per million.

However, Dean was still analysing his data and had noticed that as the incidence of mottling increased, the presence of tooth decay decreased.

He found that people using a water supply with a natural fluoride content of 1ppm had about 50 per cent less tooth decay than those with a supply containing less than 0.3 ppm fluoride.

This observation led to the notion of artificially raising the fluoride content of low-fluoride water supplies to levels sufficient to achieve a reduction in tooth decay without causing an undesirable increase in mottled teeth.

Dean argued that water fluoridated to one part per million would markedly reduce tooth decay and that the expected 10 per cent of very mildly mottled teeth would be an 'acceptable trade-off.'

Between 1940 and 1943, Dean and other officers from the US

International Journal of Alternative & Complementary Medicine, September 1993 9

DENTAL RESEARCH

PHS visited a number of towns in America with natural fluoride in the drinking water. Their findings seemed to confirm Dean's theory. Where the water contained around 1ppm fluoride tooth decay rates were reduced and mottling, minimal

But only about 1.2 per cent of Americans had access to such water. About four per cent were drinking water with too much fluoride and 95 per cent were consuming water with less than 0.3ppm fluoride.

In January 1945 the US PHS decided to test Dean's theory and the water supply of Grand Rapids, Michigan, was artificially fluoridated (to a level of 1ppmF.)

The experiment was scheduled to run for 10 years.

Later in the year three other towns in North America joined the 'artificial fluoridation experiment.'

Preliminary results from the four 'test' towns seemed to indicate that with minimal effort and no essential change in diet, tooth decay could be reduced by up to 60 per cent.

The prospect of extending such an enormous dental benefit to hundreds of millions of people worldwide was breathtaking and rather than wait for the completion of the 10-year trial period, the US PHS endorsed the 'safety and effectiveness of artificial fluoridation' on June 1, 1950.

From that day to this, most leading health authorities including the World Health Organisation, the US PHS, the British Ministry of Health and medical and dental associations around the world have insisted that fluoridation is totally safe and highly effective in reducing the incidence of tooth decay.

However, fluoridation always was, and remains, very controversial.

Indeed, despite more than 40 years' promotion, less than five per cent of the world's population drinks artifically fluoridated water.

Table 1 summarises the present-day status of artificial fluoridation worldwide.

There are two points to note about the table.

First, if artificial fluoridation is so effective, then why have scientifically advanced and health conscious countries such as Sweden, Denmark, Norway, Germany, France and Japan totally rejected the measure?

There is absolutely no credible evidence that children's teeth in those countries are any worse than those in Australia, Canada, Ireland, New Zealand and the United States.

The second point concerns Finland.

In the early 1960s Finnish health authorities set up a longterm experimental project in the city of Kuopio. The object of the experiment was both to determine the effectiveness of fluoridation as a tooth decay preventive measure and to monitor the effects of low-level, longterm exposure to fluoride on bone – something the original American fluoridation experiments failed to do.

After more than 20 years, medical scientists at the University of Kuopio concluded that while fluoride might be beneficial to teeth, some women in the city now had a relatively high content of fluoride in their bones.

The scientists warned that after a lifetime of fluoridation, some women in the area 'might experience adverse effects from the accumulation of fluoride.'[2]

As a result of these findings, the fluoridation experiment in Kuopio was abandoned.

The Finnish experience has to be considered in the light of other research recently published in the United States.

For example, an editorial in the *Journal of the American Medical Association* (Aug 1992) noted that in the past two years,'four separate studies had shown a link between fluoridated drinking water and an increased incidence in hip fractures.'[3]

In the latest study[4], which reported on hip fractures and fluoridation in Brigham City, Utah, the authors concluded: 'We found a small but significant increase in the risk of hip fracture in both men and women exposed to artificial fluoridation at 1 ppm, suggesting that low levels of fluoride may increase the risk of hip fracture in the elderly.'

Brigham City's water supply was fluoridated 25 years ago and it has taken that

Continued on next page

TABLE 1: The present day states of fluoridation worldwide

Country	Population (millions)	% age of population drinking artificially fluoridated water
Australia	17.0	66
Austria	7.6	0
Belgium	9.9	0
Brazil	130.0	4
Bulgaria	9.0	0
Canada	25.9	50
China	1,000	3
Denmark	5.1	0
Finland	4.8	0*
France	55.5	0
Germany	61.4	0
Greece	10.0	0
Hungary	10.6	0
India	800.0	0
Indonesia	160.0	0
Ireland	3.5	50
Iran	42.0	0
Italy	57.4	0
Japan	122.0	0
Netherlands	14.6	0
New Zealand	3.3	66
Norway	4.2	0
Poland	37.7	0
Portugal	10.3	0
Romania	22.9	0
Spain	39.0	0
Sweden	8.4	0
Switzerland	6.6	4
United Kingdom	56.8	9
United States	243.8	50

* one small experimental plant was shut down in 1990

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Continued from previous page

long to recognise the potential harmful longterm effects on fluoridation on bones. But, right from the outset (1945) it was known that fluoride could cause mottled teeth.

By the mottled enamel of dental fluorosis I mean paper-white patches which compare with normal enamel much like the chipped edge of a white china saucer compares with the glazed unbroken surface of the saucer.

Sometimes these patches are very obvious while at other times they can only be seen with difficulty and from a particular angle. They are produced by interference with the calcification of the enamel while the teeth are developing. During the post-eruptive life of the tooth the white patches have a tendency to become pigmented, unsightly and difficult to keep clean.

In other words, mild mottling in a youngster can become an increasingly obvious aesthetic problem for the teenager as the disfigured teeth become more noticeable.

The dental profession is divided over the significance of mottling.

One authority, Prof H M Myers of the University of Rochester (NY) states:

'Dental fluorosis (mottled enamel) can be regarded as perhaps the best example of a completely preventable disease of the teeth.'(5)

On the other hand, many dentists dismiss mottling as nothing more than a minor cosmetic aberration somewhat akin to freckles. As Professor Peter Reade of the University of Melbourne has written: 'Mottling can vary from the level where a dentist must look hard to see it, to the level where it is disfiguring. While sympathising deeply with children who might get mottling badly, late teens is the time to correct it. Without extractions, the disfigurement can be changed to make a child look like a film star.'(6)

What Professor Reade failed to mention was that cosmetic dentistry can be very expensive. If my granddaughter Jade eventually requires four crowns to make her 'look like a film star' it is going to cost someone about $4,000 – at today's prices.

Mottled teeth are one thing, the possibility that fluoridation could be a contributing factor in the development of osteoporosis (and an increased risk of hip fracture) among the elderly is a more serious problem.

Unfortunately, most dentists seem to think that if fluoridation reduces the incidence of tooth decay among children then there is nothing more to be said on the matter.

However, from the legal point of view fluoridation is compulsory medication. It is done without the permission of the person at the receiving end.

Many would argue that the foundation of the legal rights and liberties of the individual is the principle of their responsibility for their conduct and their own interests, chief amongst which is health. As John Stuart Mill put it: 'Over his own body and mind, the individual is sovereign.' The same arguments used to justify fluoridation could also be used to justify adding tranquilisers, antibiotics and even contraceptives to the water supply.

The principal is that the state is sovereign over the mind and body of the individual and, however benevolent in any given case, it is the principle of totalitarianism.

Ethically, fluoridation is repugnant on a number of counts.

It is an assumption of moral superiority. By what right do dentists claim 'some people's wishes can be ignored because we know what is good for you whether you like it or not'.

Such an attitude encourages bad medical ethics – believing it is permissable to prescribe, not for the individual, but indiscriminately for the masses, irrespective of individual differences; and thinking that it is permissable to prescribe and virtually coerce patients to take drugs that many of them strongly wish not to take.

Perhaps the crucial question is, who defines health?

Is it ourselves, or is it a dentist, a doctor or the state?

This is not a simple, technical, medical problem any more than is abortion.

It is a value judgement, to be made in the light of an individual's philosophy of life. Health is one value among many and people are entitled to sacrifice it to some extent for other values if they so wish.

Fluoridation is an assumption of moral superiority. By what right do dentists claim 'some people's wishes can be ignored because we know what is good for you whether you like it or not'

Even if fluoridation does significantly lessen the risk of toothache (which itself is questionable) some people may prefer to take the risk of toothache, which is not a fatal or permanently disabling condition, to the risk of osteoporosis and hip fracture; and some parents may prefer not to expose their children to the riskof developing mottled teeth.

Fluoride can produce both beneficial and harmful effects in humans. It strikingly illustrates the classical medical concept that the effect of a substance depends on *dose*. As Paracelsus (1493-1541AD) said: 'All substances are poisons; there is none that is not a poison. The right dose differentiates a poison and a remedy.'

When a substance – such as fluoride – can be beneficial in moderation but harmful in excess, it is important to ensure that some people are not inadvertently over-exposed to it. But this is difficult to achieve with fluoride because daily intake is derived from a variety of potential sources. These include: water, foodstuffs, processed beverages, dental health products and certain medicines, as well as pesticide and fertiliser residues; and some people may inhale fluoride in the air they breathe, especially in a growing numberof workplaces.

Instead of promoting water fluoridation, health authorities should be developing dosage schedules for fluoride intake which would be based on modern pharmacokinetic principles in order to reach an optimum tooth decay-premature effect without causing any untoward side-effects.

Fluoride has been credited with producing a 'revolution in dental health'. Even if this is true, it does not mean that unnecessary exposure to the element should be tolerated.

The incidence of mottled teeth in many developed countries is increasing; at least four well-conducted studies have suggested a link between fluoridated water and an increased incidence in hip fractures amongst the elderly.

Perhaps the time has arrived to take note of recent editorial comment in the *Journal of the American Medical Association*:

'It is now appropriate to revisit the issue of water fluoridation as a public health measure.'(3)

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Fluoridation—are the dangers resolved?

Fluoride is now added to drinking water to protect teeth. An Australian dentist now suggests that there is serious risk of overdose

Geoffrey Smith

AT THE OUTSET it must have seemed a superbly simple idea. Add a small amount of cheap chemical called fluoride to a community water supply and Hey Presto! a costly and ubiquitous disease, tooth decay, is controlled, and perhaps, in time, even eradicated. Forty years later we are in a stage of chaos and doubt. Is artificial fluoridation really safe? Are some people now ingesting too much flouride from an increasing number of sources?

For more than three decades health authorities in the United States, Britain and Australia insisted that only a lunatic fringe of cranks, flat-Earthers and right-wing reactionaries opposed fluoridation. Now come the reservations.

During the past two years alone, reports in a series of highly respected scientific journals, including *The Journal of the American Chemical Society*, *Science*, and both *The British Medical Journal* and *The British Dental Journal*, have warned that individuals are receiving fluoride from a growing number of sources and that too much fluoride can be harmful. As yet it may be too soon to press the panic button; however, as John Emsley of King's College, London, pointed out in 1981 (*New Scientist*, vol 91 p 293) "A warning bell has sounded: through the agency of the strong hydrogen bond fluoride can change the chemistry of many compounds. What it may be capable of doing in the living cell whether for good or ill remains to be discovered."

Back in 1945, when the first experimental fluoridation projects got under way in Grand Rapids, Michigan, and Newburgh, New York, it was envisaged that drinking about 1 litre of flouridated water a day would provide 1 milligram of flouride. All authorities agreed that adding the substance to water was the best way to limit the daily dosage. In those early days, self-medication with fluoride was frowned upon because of the danger of overdosage.

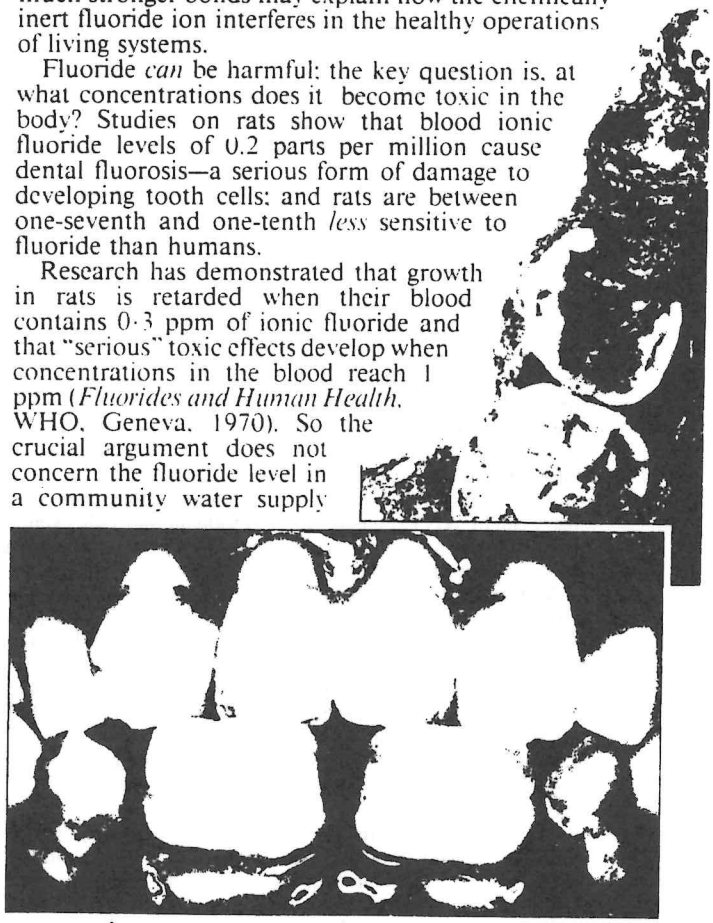
The reasons for the present re-think about fluoridation are twofold. First, people are now ingesting fluoride from many more everyday sources, including water, food, dental health products, and medicines as well as pesticide, insecticide and fertiliser residues and even the air we breathe. Therefore the amount received by the individual cannot be controlled. Secondly, in 1976-77, scientists at Sweden's Karolinska Institute developed a simple and reliable way of measuring levels of ionic fluoride in the blood. They found that even very small dosages of fluoride may cause "normal" blood fluoride levels to surge to potentially harmful values.

Many scientists have long been intrigued by the idea of adding a known toxic substance to water supplies to reduce cavities in teeth. Unlike chlorination, which is designed to treat the *water* and make it safe to drink, fluoridation is meant to influence a human physiological process—the mineralisation of tooth enamel. Veterinarians, horticulturists and environmental scientists have known for years that fluoride at very low concentrations can damage vegetation, aquatic life and livestock; chemists have learnt to expect the unexpected from this unpredictable element; and biochemists, physiologists and toxicologists all know that fluoride is a potent poison of enzymes.

New evidence regarding the possible action of fluoride on human cells and tissues is emerging all the time. The powerful hydrogen bonding capacity of fluoride, discussed by John Emsley, has been known for some time, but its potential for interfering with the vitally important hydrogen bonds between biomolecules has only recently begun to receive attention. In January 1981, Emsley and others reported in the *Journal of the American Chemical Society* (vol 103, p 24) that they had found a new strong hydrogen bond which formed between fluoride and amides—organic salts of ammonia. Many components within living cells contain amide groups, and the hydrogen bonds formed between amides are the most important weak hydrogen bonds in biological systems. Disruption of these bonds by fluoride in the formation of much stronger bonds may explain how the chemically inert fluoride ion interferes in the healthy operations of living systems.

Fluoride *can* be harmful: the key question is, at what concentrations does it become toxic in the body? Studies on rats show that blood ionic fluoride levels of 0.2 parts per million cause dental fluorosis—a serious form of damage to developing tooth cells; and rats are between one-seventh and one-tenth *less* sensitive to fluoride than humans.

Research has demonstrated that growth in rats is retarded when their blood contains 0·3 ppm of ionic fluoride and that "serious" toxic effects develop when concentrations in the blood reach 1 ppm (*Fluorides and Human Health*, WHO, Geneva, 1970). So the crucial argument does not concern the fluoride level in a community water supply



The ill effects of too much fluoride: mottled teeth

per se, but rather whether fluoridation increases the risk that certain people develop, even for a short time, levels of fluoride in the blood that can damage human cells and systems.

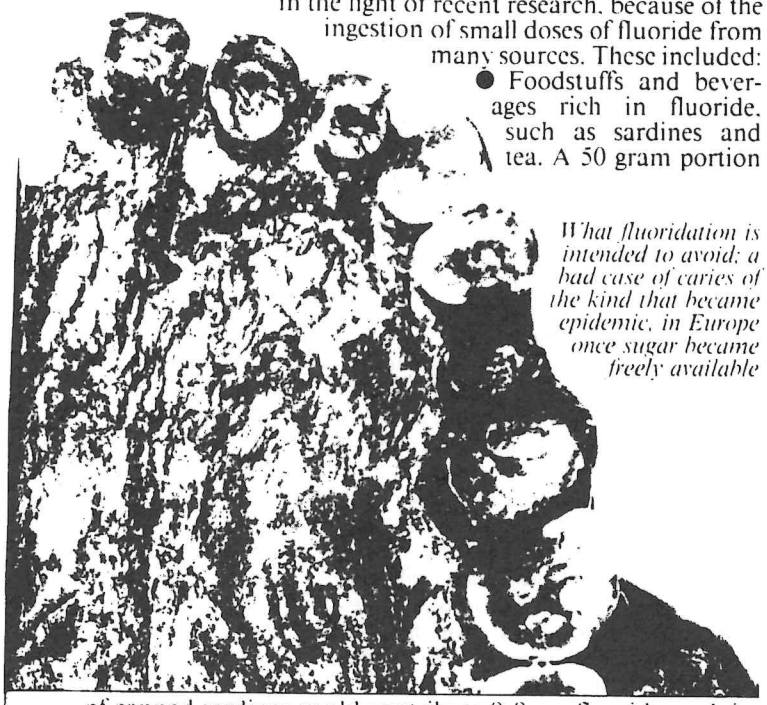
Many proponents of fluoridation insist that this cannot happen; to support their view they cite a well-known study, published in 1960, which purports to show that a physiological mechanism ensures that blood levels of ionic fluoride remain stable no matter what the intake (*Journal of Applied Physiology*, vol 15, p 508). Unfortunately, this work was faulty, as the US National Academy of Sciences—National Research Council pointed out in 1977 (*Report of the Safe Drinking Water Committee*, USNCC-NAS, p 373, Washington DC).

In 1977, J. Ekstrand demonstrated that when a healthy adult male weighing 60 kg swallowed 10 milligrams of fluoride, the levels of ionic fluoride in his blood peaked after about an hour to just over 0·4 ppm per kg of body weight

(*European Journal of Clinical Pharmacology*, vol 12, p 311). As this was a dosage of 0·166 mg fluoride per kilogram body weight, the equivalent amount needed to achieve similar peaks in a 10 kg infant and a 20 kg child would be 1·66 mg and 3·33 mg fluoride respectively. In fact, in a 10 kg infant a dose of only 0·8 mg fluoride could theoretically cause a peak of 0·2 ppm in the blood ionic fluoride: and a dose of just 0·4 mg fluoride, a peak of 0·1 ppm. Such levels can damage developing tooth cells and produce dental fluorosis.

An editorial in the *British Dental Journal* in 1981 (vol 150, p 261) warned that fluoride supplement dosage levels recommended 20 years ago are too high and need modifying in the light of recent research, because of the ingestion of small doses of fluoride from many sources. These included:

- Foodstuffs and beverages rich in fluoride, such as sardines and tea. A 50 gram portion of canned sardines could contribute 0·8 mg fluoride: and, in Britain particularly, many receive more than 1 mg fluoride daily from drinking tea.
- More than 90 per cent of toothpaste now sold contains high concentrations of fluoride. Today, toothbrushing is common even among pre-school children: and more than 75 per cent of children use toothpaste by the age of 18 months. Researchers have shown that children under 3 years are incapable of rinsing effectively due to poorly developed swallowing reflexes. Therefore, youngsters may swallow appreciable amounts of toothpaste. In fact, a pre-school child may swallow 0·3 grams to 0·4 grams of toothpaste at *each* brushing (*Journal of Dental Research*, vol 5 p 1317). Since most pastes contain fluoride at a concentration of 1000 parts per million, a daily intake in excess of 0·5 milligrams fluoride from this source alone is common.
- Many dental and child health authorities still advocate the use of fluoride tablets and drops for pregnant women and for children from birth. However, the use of such supplements could result in a daily intake of fluoride two to six times the recommended dose.
- In dental surgeries one of the now common methods of topical fluoride treatment is to use acidulated gels. The fluoride concentration of these gels varies between 0·5 per cent and 1·2 per cent (up to 6000 ppm fluoride). Each application delivers 3 to 5 ml of gel and the patient is exposed to as much as 60 milligrams of fluoride for four to five minutes. As the gels are both flavoured and acidulated, they stimulate the flow of saliva which leads to the swallowing of excess saliva and gel during treatment.
- Adverse reactions following gel applications were reported in the *British Dental Journal* in 1976 (vol 140 p 307). More recently, in 1980, Swedish researchers found, in a 25-year-old adult weighing 54 kg, that blood ionic fluoride levels of just over *1 ppm* were reached 30 minutes after gel treatment (*Journal of Dental Research*, vol 59 p 1067). This level is close to those reported to result in impaired kidney function.
- Czechoslovakian studies show that children aged 6 to 14 years who reside near an aluminium smelter ingest more than 2 milligrams fluoride a day from air, water, animal foodstuffs and plants although their drinking water was not fluoridated. Aluminium smelters are only one of a score of industries which now pollute the total environment with fluoride emissions and solid wastes.



What fluoridation is intended to avoid: a bad case of caries of the kind that became epidemic in Europe once sugar became freely available

An article in a recent issue of the *British Medical Journal*, pointed out that babies in fluoridated areas who drink dried milk formulae made up with water containing 1 ppm fluoride, are ingesting up to *100 times* the amount of fluoride they would obtain from mother's milk (vol 283, p 76). The researchers demonstrated that there is a physiological plasma/milk barrier against fluoride which protects the infant from more than extremely low concentrations of the halogen. They suggested: "Hence the recommendation made in several countries to give breast-fed infants fluoride supplements should be reconsidered."

Obviously, fluoride ingested from drinking water cannot be considered in isolation from other sources of fluoride intake. Nevertheless, the artificial fluoridation of a community water supply does have certain predictable consequences. First, fluoridation will raise the average steady state or plateau level of ionic fluoride in the blood throughout the total population. Secondly, by introducing large amounts of fluoride into the environment, all locally grown and manufactured foods and beverages may contain increased amounts of fluoride, and foods cooked in fluoridated water will increase the fluoride intake of consumers. Thirdly, because the overall intake has been increased and the average blood ionic fluoride level of the population raised, individuals who ingest submilligram doses of fluoride will run a greater risk of their blood ionic fluoride concentrations peaking to above the threshold level that can cause dental fluorosis or other ill-effects.

Spokesmen for the dental profession have stated that dental fluorosis, the "mild" mottling of the enamel caused by fluoride, is a sign of "good teeth". If unsightly, they say, the appearance can be remedied by the fitting of artificial crowns! But this dental fluorosis is an indication that the person, when a young child, suffered a toxic level of exposure to fluoride. Dental fluorosis, no matter how slight, is an irreversible pathological condition recognised by authorities around the world as the first readily detectable clinical symptom of previous chronic fluoride poisoning. To suggest we should ignore such a sign is as irrational as saying that the blue-black line which appears on the gums due to chronic lead poisoning is of no significance because it doesn't cause any pain or discomfort. Additionally, it is clearly wishful thinking to insist that tooth-forming cells are the only ones in the body sensitive to fluoride. In 1979, Professor Lennart Krook of Cornell University demonstrated that the primary target cells for fluoride poisoning include certain bone cells. (*Cornell Veterinarian, vol 8, supplement* 8). Undoubtedly, the "fluoridation controversy" has entered a new phase in which genuine doubts are replacing previously held certainties. For many years, a number of dentists seemed to believe that if a little fluoride is good for you, then more must be better. This attitude is not only wrong, it is irresponsible.

The issue has also been complicated by legislation making artificial fluoridation compulsory. Repeal of these laws would involve considerable loss of face for some politicians and their advisers. For 40 years the "debate" about fluoridation has been remarkably emotive. Now, at last, scientists appear to be taking a long, hard look at fluoridation and the uncontrolled, indiscriminate use of fluoride-containing dental products. □

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20 October I988.

Deadly risks of lead-free petrol

New petrochemical plants intended to improve city environments by producing "lead-free" petrol have created another, more deadly, environmental hazard. Accidents at the plants could lead to lethal clouds of hydrofluoric acid (HF), putting "tens of thousands at peril", according to the Washington-based Environmental Policy Institute.

The new process for making unleaded petrol involves using HF to achieve high octane ratings without adding lead. But HF is one of the most corrosive chemicals in existence, capable of eating away at glass and dissolving most metals. Dr Jag Cook, from Britain's National Chemical Emergency Group—which is responsible for mopping up any major toxic spills in the UK—said: "HF is about the only chemical that frightens me."

Demand for unleaded petrol is expected to grow dramatically. A major new HF plant is being built by Shell at Stanlow, Cheshire, and will start operation in about six months time. It will be about the sixth such plant in Britain. Another is run by Mobil at Coryton, Essex. The location of the others is, according to the Health and Safety Executive, officially secret.

Recent trials and several accidents in the last year in the US have shown that industrial HF sites are a major threat to public safety. An HF leak on 30 October 1987 at the Marathon refinery in Texas City left 700 people in need of urgent medical treatment. It was only luck that prevented the accident from being the major industrial catastrophe of the year.

Dr Fred Millar of the Environmental Policy Institute said: "The release was from the vapour space of a storage tank. If the same release had been of HF *liquid*, thousands would likely have died in the ensuing gas cloud. It would have been our Bhopal."

Nonetheless no new regulations were introduced—and a few months later another HF explosion occurred at Mobil's refinery in Torrance, California. This led to a raging 41-hour fire and millions of pounds' worth of damage. In March this year, there was a third HF leak, this time in Tulsa, Oklahoma. The disaster at the Sun Company refinery there produced a three-mile-long cloud which engulfed the town. Only a prompt evacuation limited the casualties to 36 people (none fatal).

A US government test at a desert site in 1986 showed that even a relatively small liquid HF accident would release a dense, ground-hugging gas cloud that would remain lethal for five miles.

A report written after the Torrance accident suggested that "the consequences may be so great as to warrant regulations to direct industry to phase out its use or substitute processes with less environmental hazards." US research has shown that there are alternative processes.

Although Friends of the Earth have only recently taken up the issue, it was, said FoE specialist Andrew Lees, "high time this stuff was brought to public attention".

Nigel Townson & Duncan Campbell

APPENDIX

NOT A CARIES IN THE WORLD
THE ALTERNATIVE TO FLUORIDE

Many dentists and health authorities argue that fluoride therapy has brought about a "revolution in dental health", they insist that if the use of fluoride, in a dental context, were abandoned, we would return to the "bad old days" when tooth decay was rampant and the disease would soon be out of control.

The profession has to realise that it is not a matter of IF the 'fluoride era' is abandoned but WHEN. They are now defending the indefensible, and it becomes more difficult as each year passes.

Sooner or later the dental profession will have to face up to the fact that their obsession with fluoride has done great harm, both directly and indirectly. Directly because they used, and encouraged the widespread use of, a potentially harmful chemical. Indirectly because in promoting the apparently beneficial properties of 'fluoride' they have allowed a dangerous industrial pollutant hydrogen fluoride, to achieve the status of a 'privileged' even 'protected' pollutant.

Tooth decay is not caused by a lack of fluoride in the diet. It is not a deficiency disease. Decay is a pathological process involving localised destruction of tooth tissues by *microorganisms*. It is a disease of complex, multifactorial etiology in which a number of interrelated factors must coexist in order for cavities to develop. For example:- Bacteria capable of causing decay (cariogenic) must be present in the mouth; a suitable bacterial food supply, capable of supporting growth of cariogenic organisms, must also be available in the mouth.[a]

Most investigators, but by no means all, now believe that the bacteria named *Streptococcus mutans* [b] are intimately involved in the production of tooth decay in humans.

Before decay can begin, *S. mutans* must first gain attachment to the tooth surface, then it must colonise the surface by producing sticky, tenacious polysaccharide polymers often termed - plaque. Finally, the bacteria consume suitable foods and excrete weak organic acids that can demineralise tooth enamel.

But, before the bacteria can attach to, and colonise the teeth they must overcome the natural defence mechanisms in the mouth, components of the immune system.

NATURE programmed our bodies to defend themselves via an effective and sophisticated immune defence system. But this system must be functioning adequately to prevent disease or, heal the damage inflicted by disease-causing bacteria.

The internal surfaces of the body, such as surface layers of teeth and gums, and the linings of the respiratory, digestive and urino-genital tracts, are defended by the *peripheral* immune network MALT - mucosa associated lymphoid tissue. Key components in this network are a special class of antibody known as secretory IgA immunoglobulins (sIgA). Another important component is a type of white cell called a 'neutrophil polymorphonuclear leucocyte'. These cells are 'phagocytes', and are capable of devouring and destroying disease causing germs.

Simply put, sIgA antibodies can prevent bacteria colonising the surfaces of teeth or, inactivate them on the tooth surface until the phagocytes arrive to destroy them.

In *"The Doctor's Dilemma"*, which he wrote in 1906, George Bernard Shaw said:

> *"Nature has provided in the white corpuscles, as you call them ... phagocytes as we call them... a natural means of devouring and destroying all disease germs. There is at bottom only one genuinely scientific treatment of all diseases, and that is to stimulate the phagocytes. STIMULATE THE PHAGOCYTES."*

Shaw identified only one of the many components of the immune system, nevertheless he was uncannily perceptive. Over the past thirty years scientists have repeatedly confirmed that stimulation, or 'modulation' of the immune system can be crucial in helping the body prevent or fight-off disease causing microbes.

I believe what is true for other diseases is equally true for tooth decay.

Instead of focusing on fluoride, which is a potent enzyme inhibitor and protoplasmic poison, the dental profession must learn to stimulate the phagocytes!

The immune system can be stimulated *naturally* or artificially with a vaccine.

For many years I sought to perfect a safe vaccine to prevent tooth decay. Then, I read a very provocative article written by Antonio Coutinho and some of his colleagues at the Pasteur Institute in which they challenged certain long-standing immunological 'dogma'. Among other things they said:

> *"The horses of picadors in Spanish corridas, when perforated by the bull's horns, are one of the few examples we can recall where vertebrates are immunized intra-peritoneally. Yet, intra-peritoneal (or intra-venous, for that matter) injection of mice with erythrocytes from sheep, hemocyanin from crabs, or albumin from humans, are the methods of choice used by immunologists to study the immune system:*

Coutinho et al., go on:

> *"If we want to know the normal immune system we must attempt to describe it as it is, its structure and its organisation. If we aim at establishing its relevance in the contacts of vertebrates with their environment, we should perhaps avoid this approach of "intra-mouse" injections and instead consider the natural situation where the overwhelming majority of the contacts is established at the mucosal interfaces."*
>
> (my emphasis)

Do you see what they were getting at? Coutinho and his colleagues were pointing out that until very recently, the introduction of antigens (which triggers an immune response) into the bodies of vertebrates occurred in a *natural* manner rather than an artificial one involving needles, scarifying devices, bull's horns, etc.

Further, it is eminently reasonable to assume that the majority of contacts - between antigen and host - occur at mucosal interfaces such as the oral and gut mucosa.

Could the local immune mechanisms in the mouth be 'stimulated' in a *natural* manner as opposed to the use of a vaccine?

Well, it must be happening all the time. Many people are immune to tooth decay; and very few indeed continuously suffer decay.

Triggering an immune response involves, first, the collection of the antigen by a specialised *scavenger* cell. Then, the antigen is held at a strategic site where lymphocytes can brush past. Genetic processes within the body ensure that a vast army of lymphocytes are produced. Each lymphocyte is programmed to form one type of antibody and displays this on its surface as an antenna or receptor. There is a 'complete' repertoire of recognition units, sufficient to function in the recognition of *any conceivable antigen.*

When the right lymphocyte, with specific receptors to the antigen being presented by the scavenger cell, meets the antigen, it is stimulated to divide either into cells that secrete antibody in large amounts or into more lymphocytes with the right antennae, thus creating an enlarged group of lymphocytes ready to defend against a second attack by the same antigens.

The mucosal surfaces of the mouth are subjected to regular antigenic challenge. As a result, they contain many lymphoid T- and B-cells; also present are Langerhans cells, which play an important role in presenting antigens to specific helper T-cells. In addition, Langerhans cells may be responsible for the immunizing capacity of topically applied antigens.[d]

Also in the mouth are collections of organised lymphoid tissue, for example, in the lingual tonsillar crypts that are found on the distal aspect of the dorsum of the tongue, and around the minor salivary glands that are particularly abundant in the soft palate. Most of these glands have short ducts; therefore, they are exposed to oral antigens by natural retrograde flow.[e] Similarly, the lingual tonsillar crypts are ideally situated to entrap antigens as they pass out of the mouth during swallowing movements.

It is conceivable, though yet to be proved, that a local immune system in the mouth operates in the following manner:-

Stage i. - Particularly during swallowing, antigens are trapped in either the lingual tonsillar crypts or the minor salivary glands (the primary challenge). In either of these sites they can be collected by scavenger cells (dendritic macrophages) and presented to passing lymphocytes.

Stage ii. - Antigen-stimulated immature B-cells travel via regional collections of lymphoid tissue to the subsurface layers of the oral mucus membranes.

Stage iii. - Thereafter, similar antigens penetrating the surfaces of the oral epithelium (the secondary challenge) are collected by Langerhans cells and passed to specific helper T-cells. The T-cells then cooperate with B-cells displaying the same Ia-antigen complex.

Stage iv. - Finally, (a) B-cells may synthesise secretory IgA antibodies that are transported into the oral fluids where they may interfere with the ability of bacteria to attach to surfaces in the mouth, or (b) the secretory antibodies may adhere to the 'acquired pellicle' which covers the tooth surface, perhaps as IgA-mucin-bound complexes. There, the antibodies could bind to *S. mutans* and inactivate the organism while it is phagocytosed, killed, and removed by local neutrophil cells and complement.

If sIgA antibodies pass into oral fluids as described in Stage iv(a), then they would be swallowed every few minutes and this seems rather wasteful mechanism. If, on the other hand, sIgA-mucin-bound complexes adhere to the acquired pellicle (Stage iv(b)) then we can speculate that in the healthy mouth the surfaces of both hard and soft tissues are covered by a naturally-produced protective barrier layer.

Perhaps Stages iv (a) and iv (b) have a role in local immunity in the mouth.

The figure below, which first appeared in *Trends in Pharmacological Sciences*[f] (TIPS), illustrates the possible immune mechanisms in the mouth.

TIPS – March 1986

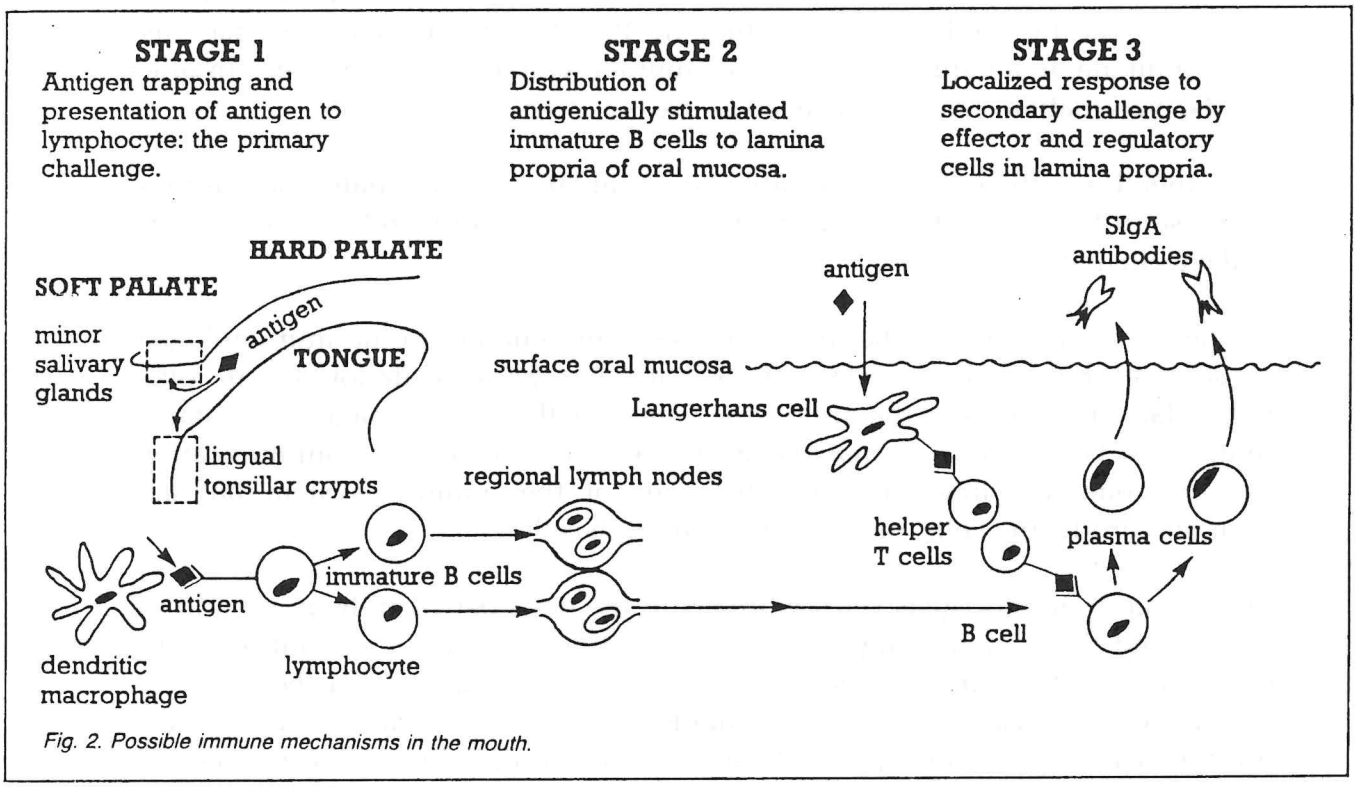

Fig. 2. Possible immune mechanisms in the mouth.

The above might be all very well in theory, but what about practical application.

What mechanisms could *naturally* help introduce antigens into mucus membranes and thus trigger an immune response (the secondary challenge)?

I suggest there are at least two.

1. Vigorous mastication.

Chewing hard and/or fibrous foodstuffs (or even chewing gum) would be expected to drive or 'impact' - and thus introduce - antigenic material into the gums (i.e. food proteins and microbes present in the mouth.)

2. The act of toothbrushing.&

The bristles of a toothbrush, together with the mild abrasives present in most dentifrice formulations, make a very suitable 'instrument' for transferring and implanting antigenic material from around the teeth - and this might include decay-causing bacteria - into the gums; and once there, the antigens could be expected to trigger an immune response.

The dental profession has long promoted the concept that cleaning the teeth and chewing fibrous foodstuffs can help prevent tooth decay. Traditionally, however, these sensible habits were encouraged in the belief that they helped *physically clean* the teeth. Of course they do this, but in addition they may also help stimulate, in a natural manner, the immune systems in the mouth. In other words, 'vaccination' without the need to use 'vaccines'.

It is therefore, theoretically possible to stimulate or modulate the immune response in the mouth by mastication of fibrous foodstuffs and *careful* brushing of the teeth and gums.

Further, we can focus on the immune system in general. Some immunologists argue that the immune system participates in the modulation of all other molecular interactions in the organism. Consider the 'macrophage' for instance, some now believe that it may be a crucial agent in a vast communications network, one that links not only the cells of the immune system but also hormone-producing cells, nerve cells, even brain cells.

Every year, immunologists learn more about the links between the mind and the body. And the evidence suggesting that nutrition and 'stress' can influence the functioning of the immune system becomes more persuasive. Furthermore, we now know that certain industrial pollutants such as lead, cadmium, mercury and fluoride, can depress all aspects of immune functioning. They can reduce cell-mediated and humoral immunity, depress phagocyte response and increase susceptibility to infection. Even at very low concentrations, not generally considered toxic, these contaminants can damage the nervous system.

A new and exciting frontier in pharmacology - still in the stage of exploration and debate - is the development of agents that stimulate or modulate the immune response. Yet not only is dentistry ignoring the recent advances in our knowledge of the immune system, it continues to promote agents such as fluoride that suppress the system.

There are marvellous opportunities for research into the mechanisms of *oral immunity,* but they are being almost totally ignored while dentistry continues with its infatuation with fluoride.

I'm going to finish by saying something about *paradigms.*

Writing in *"The Structure of Scientific Revolutions"*. Thomas Kuhn described a paradigm thus:

> *"A paradigm is what the members of a scientific community share, and conversely, a scientific community consists of men who share a paradigm."*

While there are a number of definitions of paradigm, the above helps when trying to understand the conflicts which may arise when a major breakthrough or 'revolution' occurs in any branch of science. Such 'revolutions' require the establishment of a *new* paradigm. At first, this makes no sense to scientists brought up within the old paradigm. Hence, it is often vigorously resisted and controversy ensues. This only ends when existing scientists have been converted to the new paradigm or have died off and been replaced by a new generation familiar with it.

Needless to say, it isn't only scientists who share paradigms. Most vocations, trades, secret societies and professions have evolved their own particular paradigm. For instance, the dental paradigm is what dentists share, and conversely, dentistry consists of people who share the dental paradigm. This, essentially, encompasses the knowledge and skills passed on (taught) to succeeding generations of dental students. It comprises the art and science of diagnosing disorders and diseases which can occur in the mouth and treating or preventing them.

The paradigm is not cast in stone. Indeed, the search for refinements and improvements in existing treatment techniques is actively encouraged. But, and this is extremely important, the research or 'puzzle-solving' involved *proceeds within the context of the existing paradigm.*

For more than 45 years, fluoride has been an important part of the dental paradigm. It is, the profession claims, the only way to prevent tooth decay on a population scale. However, and despite quite extensive research, the precise cause of tooth decay - the most common disease in the world - remains unresolved; and methods to prevent it are confined to more and more ways of utilising fluoride.

I suggest that particular puzzle CANNOT be solved in the context of the present dental paradigm, and will only be resolved when a new paradigm - taking account of the oral immune system - is evolved and accepted.

However, this new paradigm already exists as the *medical paradigm.*

Medicine has for decades recognised the importance of the immune system and in the past twenty years particularly, immunological research has increased dramatically. Dentistry, therefore, faces a dilemma.

If it asks for help from the immunologists, or encourages too much research involving the immune system, or in other words starts to work within the medical paradigm rather than its own much more limited one, it could cease to

be an independent, self-governing healing profession and become instead, a rather minor speciality of medicine.

Fortunately for dentistry demarcation lines in the healing professions are as tightly drawn as in any trade union. To date, teeth and fluoride - have been seen as the responsibility of dentistry; and medical scientists have been, on the whole, reluctant to become involved in the 'fluoride controversy'.

But that is changing as evidence continues to grow showing that common air pollutants, such as hydrogen fluoride, can have a devastating effect on the immune system.

The dental establishment, strongly convinced of its rightness in the field of dental health, has not hesitated to pose as expert in the use of potentially toxic substances such as fluorides and mercury amalgam as well. More and more dentists are becoming uneasy. They have no direct experience of the facts and have relied on their associations and councils to guide them. Today they realise that Authority is all too human - clever or stupid, honest or false, selfless or power-hungry - no practitioner, medical or dental, wants to wake up one day and find that he or she has been unwittingly harming their patients rather than curing them.

But that is what has happened - and the sooner the situation is acknowledged the better.

Here is just one example of how a *dental* expert went outside his area of expertise and promoted misleading and potentially harmful propaganda.

On October 7 1985, the *Melbourne Age* published a lengthy report in which the late Professor Elsdon Storey of Melbourne University promoted the notion that water fluoridation was not only good for teeth, but that such water could also prevent hip fractures in the elderly.

However, on August 12 1992, an editorial in the *Journal of the American Medical Association* (JAMA) pointed out that hip fractures amongst the elderly are a major community health problem and noted:

> *"In this issue of THE JOURNAL, yet another potentially controllable risk factor has been identified. In a carefully conducted and reported study, Danielson et al document an increased rate of hip fracture (relative risk (RR), 1.27 in women; 1.41 in men) in Brigham City, Utah, one of the few cities in that state with a fluoridated water supply. This is the fourth report of an ecological link between fluoridated water supplies and an increased incidence of hip fracture that has been published in the last 2 years."**

* "Please Pass the Roach Poison Again". Editorial, *JAMA*, Aug. 12, 1992

Elsdon Storey was Professor of Child *Dental* Health at Melbourne University. He was entitled to be considered an authority on that subject, just as he was entitled to promote his opinion that water fluoridation was 'totally safe' and highly effective in reducing the incidence of tooth decay particularly amongst children.

However in claiming that fluoridated water could also prevent hip fractures, Storey stepped outside his province and *may* have done a grave disservice to the community.

Many politicians in Victoria, especially the Shadow Minister of Health at the time, Mark Birrell, accepted Storey's controversial claim without question and used it to further promote water fluoridation.

As a result many people in the State genuinely believe that not only does fluoridation help teeth, but it also helps build "stronger bones."

Unfortunately, a 'myth', especially one promoted by a leading member of the community is not easily dispelled.

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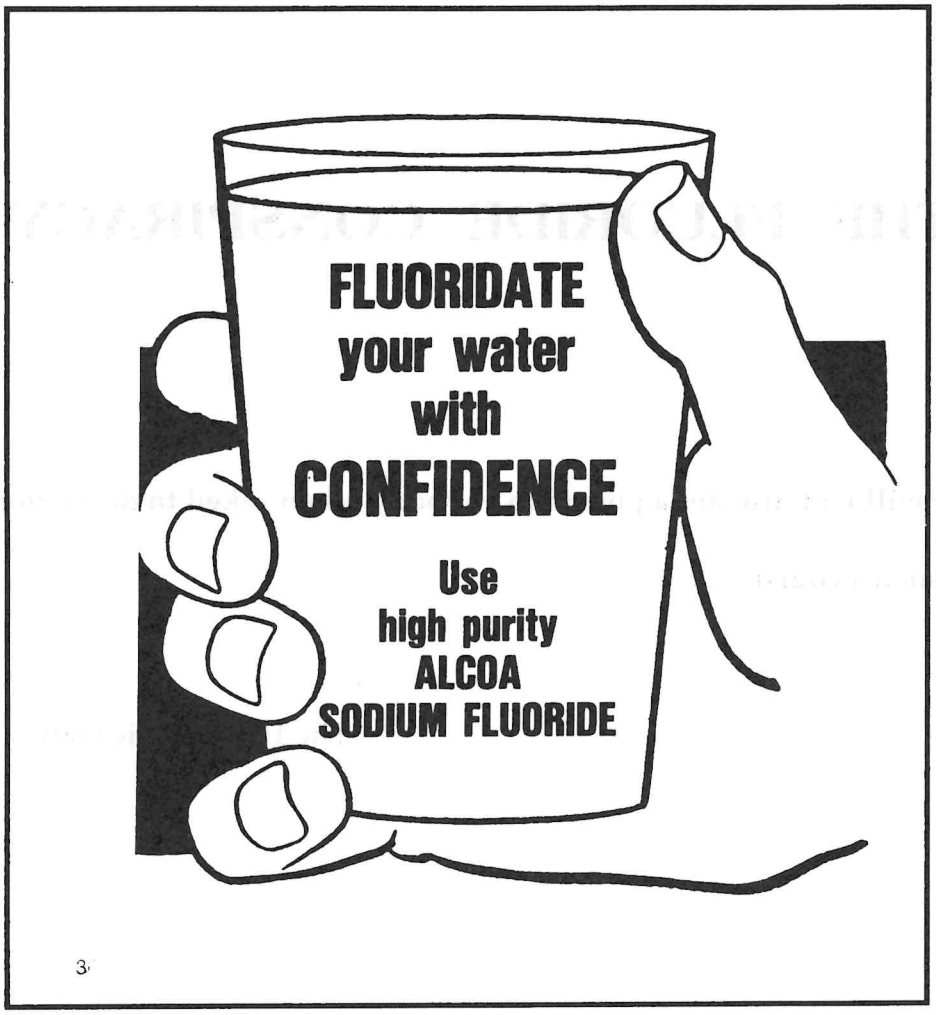
PART TWO

THE FLUORIDE CONSPIRACY

"Neither will I administer a poison to anybody when asked to do so, nor will I suggest such a course ....."

The Hippocratic Oath



An advertisement which appeared in January 1950 in the *Journal of the American Water Works Association,*

THE FLUORIDE CONSPIRACY

CONSPIRACY - A SECRET PLAN OR AGREEMENT TO CARRY OUT AN ILLEGAL OR HARMFUL ACT, ESPECIALLY WITH POLITICAL MOTIVATION.

A statement by the ALUMINUM COMPANY OF AMERICA (ALCOA), in 1972, said:

> *"Sodium fluoride is neither a waste product nor a by-product of the aluminum* industry. It is frequently alleged that fluoridation was encouraged by Oscar Ewing while a federal official and that he did so because he was legal counsel for ALCOA. This is completely untrue."***

An advertisement which appeared in the January 1950 *Journal of the American Water Works Association* read:

> *"FLUORIDATE your water with CONFIDENCE. Use high purity ALCOA SODIUM FLUORIDE. ALCOA sodium fluoride is particularly suitable for the fluoridation of water supplies..... If your community is fluoridating its water supply, or is considering doing so, let us show you how ALCOA sodium fluoride can do the job for you....."*

This advertisement appeared SIX MONTHS before the US Public Health Service and the American Medical Association endorsed water fluoridation.

I will argue that the leading conspirators in the Fluoride Conspiracy included:

OSCAR EWING - Head of the US Federal Security Agency, which amongst other things, made him Chief of the US Public Health Service. Prior to taking up his senior Government Post, Ewing was an attorney with ALCOA on an annual retainer of $750,000.

EDWARD BERNAYS - A "Public Relations Expert". Whose career is well-

(* American spelling)
(** *ADA Fluoridation Reporter,* Vol. X. No. 2. 1972)

documented in the book, *Public Relations, Edward L. Bernays and the American Scene,* (L. Fiaxon, Rumford Press, Concord, NH. 1951). Bernays described public relations counsels as:

"They are the invisible rulers who control the destiny of millions.... the most direct way to reach the herd is through the leaders. For, if the group leaders accept our ideas, the group they dominate will respond..... all this must be planned.... indoctrination must be subtle. It should be worked into the everyday life of the people - 24 hours a day in hundreds of ways."

Bernays went on: *"A re-definition of ethics is necessary.....THE SUBJECT MATTER OF THE PROPAGANDA NEED NOT NECESSARILY BE TRUE."*

Bernays summarised his philosophy as follows:

"The conscious and intelligent manipulation of the organized habits and opinions of the masses must be done by experts - the Public Relations Counsels."

In America during World War II, when aluminium was in unprecedented demand for the production of aircraft, emissions from aluminium smelters were not controlled and were released to the atmosphere.[1]

During the same period, and as the US became the arsenal of the Free World, production of iron ore, steel, copper, zinc, beryllium and high-octane gasoline increased dramatically. All these industries produce vast amounts of gaseous fluoride pollutants such as hydrogen fluoride. In wartime, these pollutants were not 'scrubbed' but released straight into the air. And from 1943 onward, the 'secret' factories producing enriched uranium for the Manhattan Project, and the installations making deadly nerve gases, spewed out extraordinarily dangerous fluoride gases into the environment.

Inevitably, this massive increase in fluoride air pollution would have a predictable and harmful impact on the total environment. It was already well-known that fluoride gases at extremely low concentrations could damage vegetation, livestock and human health.

It was also well-established that excessive exposure to fluoride could damage developing teeth. A condition known as dental fluorosis or 'mottled' teeth.

Hence, because of the enormous amounts of fluoride pollutants generated by US industry between 1942 and 1945, a dramatic increase in the numbers of American children with mottled teeth could be expected *from 1949 onward.*

Fortunately for Oscar Ewing and Edward L. Bernays, a handful of dentists employed by the US Public Health Service had, since 1939, been exploring a rather naive hypothesis which suggested that trace amounts of fluoride could be good for teeth. They argued that 1 part per million fluoride added to drinking water could reduce tooth decay and only produce an "acceptable" degree of mottling which would affect no more than ten per cent of children drinking the water.[2, 3]

Ewing grasped this opportunity and on January 25 1945, ordered the start of an experiment involving 160,000 people in Grand Rapids, Michigan.[4] By the end of the year, people in three other North American cities were also drinking artificially fluoridated water.

So, the Great Fluoridation Experiment was underway and it was scheduled to run for a minimum of TEN YEARS. This was because the US Public Health Service claimed the fluoride could only benefit *developing* teeth.

Permanent teeth begin forming in the jaws shortly after birth, the first of these to appear in the mouth are the central incisors and the first molars. This happens around six-years-of-age.

Since the experiments began in 1945, teeth which had developed under the influence of the fluoridated water would not begin appearing in the childrens' mouths until *1951.*

The Great Fluoridation Experiment had two serious flaws. First, since it was known that fluoridated air, as well as fluoridated water, could affect developing teeth, then prior to the start of the experiments in Grand Rapids, Evanston, Newburgh and Brantford, the investigators should have determined the extent of fluoride air pollution in those cities. They didn't.

Second, and even more serious, on *June 1 1950,*[5] just five years into the planned 10 year experimental period, the US Public Health Service announced that artificial fluoridation was SUCCESSFUL, and cities across America *"should be encouraged to fluoridate their water supplies."*

But how could this be? Before a single tooth which had fully developed under the influence of fluoridated water had appeared in the mouth, the US PHS was claiming a reduction in tooth decay of between 50 and 60 per cent.[6]

Either fluoride was working in a way the US PHS had never suspected, or, something very strange had happened.

The answer is, of course, that children in Grand Rapids, Evanston, Newburgh and Brantford has been breathing fluoridated *air* from 1942-1943 onwards, and drinking fluoridated *water* since 1945.

As a result, the dental effects of fluoride first became visible in *1949.* BECAUSE UNDOUBTEDLY, FLUORIDE CAN REDUCE THE INCIDENCE OF TOOTH

DECAY. HOWEVER - AND THIS IS THE CRUCIAL POINT - THE MECHANISM BY WHICH FLUORIDE PREVENTS CAVITIES IN TEETH CAN, IN CERTAIN CIRCUMSTANCES, BE HARMFUL TO CELLS AND TISSUES WITHIN THE HUMAN BODY.[7]

While fluoride in air can have the same effects on teeth as fluoride in water, the fluoride in the air isn't the same as the fluoride in the water. In air, fluorides are present as either particulates or gases, the fluoride in toothpaste or treated drinking water is present as the *fluoride ion*. AND FLUORIDE GASES SUCH AS HYDROGEN FLUORIDE ARE FAR MORE DANGEROUS TO HUMAN HEALTH THAN THE FLUORINE ION - ALTHOUGH IT TOO IS VERY TOXIC ABOVE CERTAIN CONCENTRATIONS.

The dangers of the air pollutants HYDROGEN FLUORIDE and SILICON TETRAFLUORIDE were demonstrated dramatically in *1948*.

THE DEATH FOGS, DONORA, PENNSYLVANIA, 1948

The Pennsylvanian towns of Donora and Webster lie in a deep, narrow valley of the Monongahela River, shaped like a reversed letter 'C' and tightly enclosed on all sides by hills rising four to five hundred feet above the river. Within these narrow confines were zinc mills, a steel plant with blast and open furnaces, a wire mill, and two nail galvanising factories. For years residents had complained of air pollution and there had been several successful law-suits for damage to health and property.

Between October 27 and 31 1948, a temperature inversion confined the pollution in an estimated 500 million cubic metres of trapped air. 6,000 of the 13,000 residents became ill and on the fourth day, 17 died. No-one knows what would have happened if the fog hadn't cleared the following day. Two more people died that day, and another eight days later, making it 20 in all.

A leading forensic chemist, Philip Stadtler, was the first to investigate the tragedy. He reported both direct and indirect evidence of acute fluoride poisoning. This included excessively high blood/fluoride levels in some of the survivors. He also noted that some of the children who had grown up in the town had fluoride 'mottled' teeth.

Stadtler's report appeared in the industry journal, *Chemical and Engineering News*,[8] under the headline:

> "FLUORINE GASES IN ATMOSPHERE AS INDUSTRIAL WASTES BLAMED FOR DEATH AND CHRONIC POISONING OF DONORA AND WEBSTER."

The steel-workers of America promptly donated $10,000 for a full-scale study of the disaster and suggested that Dr Kehoe of the Kettering Laboratories do the work. However, Kehoe had already been retained by US STEEL. A separate study was conducted by the US Public Health Service. The Kettering Laboratories Report was never published, nor can it be without the consent of US STEEL. Eventually, the US PHS published their report and concluded: "NO POLLUTANT PRESENT COULD HAVE CAUSED THE DISASTER."[9]

In other words, the US PHS report was a classic cover-up. However, as a direct consequence of the Donora Disaster, officers in the Air Pollution section of the US PHS began sampling fluorides in the air over 27 major US cities. At first levels of hydrogen fluoride (HF) were measured; two years later the analytical methodology was changed to record levels of *fluoride ion* in air.[10]

I've already explained that its rare to detect fluoride ions in air, anyway, hydrogen fluoride is more dangerous. Why record the fluoride ion and not HF?

It is true that one way of determing HF in air involved 'breaking-down' the gas and presenting the reading in terms of the fluoride ion, but even so the correct way to present the finding is thus:

FLUORIDE ION (AS HF)

Do this and everyone knows what you are talking about, but the US PHS didn't do it this way and they had good reason for the 'deception'.

People in the four experimental cities - Grand Rapids, Newburgh, Evanston, and Brantford, were drinking water containing 1 part per million *fluoride ion;* On the other hand, people in a *dozen* US cities were breathing air containing up to 80 parts per *billion* hydrogen fluoride.

Now, lets pretend the air in those 12 cities contains 80 parts per *billion fluoride ion.* How could that be dangerous? 1 part per million equals 1,000 parts per *billion,* hence apparently, the people drinking the fluoridated water were ingesting 12 TIMES AS MUCH FLUORIDE ION AS THOSE BREATHING THE CONTAMINATED AIR. By pretending that the contaminated air contained fluoride ions, NOT HF, the US PHS was guilty of a grave deception. REMEMBER, HF IS FAR MORE REACTIVE AND HARMFUL THAN THE FLUORIDE ION.

In 1950, the initial Fluoridation Experiment was half way through its scheduled 10 year period; but the US PHS now had confirmation that a serious fluoride air pollution existed in at least a dozen major cities. The experiment was declared a success and the rush was on to introduce water fluoridation in those cities with fluoride air pollution problems.[11]

The scene was set for the second phase in the Fluoride Conspiracy.

The chief conspirators now included senior dentists and health officials from the US PHS and the American Dental Association. Most of them were totally unaware of the roles played by Ewing and Bernays in 1944. They didn't need to be. Water fluoridation was now endorsed as "safe" and "effective" by the leading health authority in the United States - the Public Health Service.

Early in 1951, Oscar Ewing allocated $2,000,000 to "promote fluoridation nation-wide".[12] In June that year, Surgeon-General Leonard Scheele opened a conference in Washington DC[13] attended by all State Dental Officers and selected senior representatives from the American Dental Association - leaders of the HERD.

The main speaker at the conference was Dr Francis Bull from Wisconsin. He began by focusing on 'mottled' teeth - dental fluorosis. Bull told his audience that the chief problem to overcome was in explaining the increase in 'mottled' teeth. His colleagues *must* describe such teeth to the public as:

"EGG-SHELL WHITE - THE BEST LOOKING TEETH THAT ANYONE EVER HAD."

Now, this was an interesting way to begin the 'indoctrination'. Water fluoridation only began in 1945, so few 'mottled' teeth due to fluoride in treated water would have appeared; on the other hand, the incidence of 'mottled' teeth was certainly on the increase - but many of them were the result of fluoride pollution of AIR.

Bull didn't like the term "artificial" fluoridation:

> *"There is something about the term that means a phoney. We call it 'controlled' fluoridation. Never use the word 'experiment' either. To take a city of say 100,000 people and tell them, we are going to experiment on you, and if you survive we will learn something, is kind of rough treatment on the public. In Wisconsin, we set up 'demonstrations', not ' experiments'; we have told everyone fluoridation works, we can't go back on that. So, no more talk of experiments."*

Bull also told his colleagues to drop the name 'Sodium fluoride' since the compound was widely known as a rat poison. "The term 'fluoride' *is less objectionable,*" he explained. But a more serious problem had to be dealt with. At the Clayton Biochemical Institute, University of Texas, a well-known cancer researcher, Dr Alfred Taylor, had just published evidence which suggested that fluoride could cause earlier tumour formation and shorten the life-span of cancer prone mice.

Bull commented on this:

> *"When this thing came out we never mentioned it in Wisconsin. All we did was to get some publicity on the fact that there is less cancer and polio in high fluoride areas. We got that kind of information out to the public so that if*

the opposition did bring up this rumour, they would be on the defensive rather than have us on the defensive. The best technique is the reverse technique, not to refute the thing but to show where the opposite is true."

There was absolutely no evidence at all that fluoridation could reduce cancer rates or polio, but then remember what Bernays had said: "The subject matter of the propaganda need not necessarily be true."

Bull elaborated on this point:

"You know it was a technique in advertising years ago to take the weakest point and stress it as the best part of the thing you are trying to sell."

A large section of Bull's speech was devoted to how the press, the dental societies and the citizens of the community should be swayed. He strongly recommended public meetings to which journalists should be invited; opposition speakers were to be excluded or at least, given minimal time. Bull stressed that a dentist should always be looked upon as THE AUTHORITY on the subject.

Public meetings should be sponsored by lay groups and service clubs. Bull singled out Parents and Teachers Associations as:

"A honey when it comes to fluoridation. Give them all you've got."

He also urged that local physicians be enlisted in the cause:

"The medical audience is the easiest audience in the world to present this thing to. A resolution by the county medical society would be easy to obtain. You build a fire under someone at the local level in medical societies."

Bull ended by admitting:

"This toxicity question is a difficult one. I can't give you an answer on it. But if some individuals are against fluoridation, you have just got to knock their objections down. The question of toxicity is of the same order. Lay off it altogether. Just pass it over - 'we know there is absolutely no effect other than reducing tooth decay' - you say, and go on. If it becomes an issue then you will have to take it over, but don't bring it up yourself."

The promotional strategies evolved by Edward L. Bernays and explained by Dr Francis Bull to leaders of the herd, were further refined by top officials of the American Dental Association (ADA).

The ADA issued a booklet [14] which was sent out to every dentist in the United States. It gave the ADA's *official view* regarding fluoridation, and in a section headed: "DOWN-GRADING THE PUBLIC IMAGE OF OPPONENTS OF FLUORIDATION", it spelt out the tactics dentists were to use. ALL opponents to the measure MUST be categorised as belonging to one of the following groups:

- DRUGLESS HEALERS OF ALL TYPES.
- MEMBERS OF RELIGIOUS GROUPS, WHO BELIEVE FLUORIDATION IS MASS MEDICATION.
- THOSE WHO OPPOSE FOR POLITICAL REASONS.
- THOSE FEARING AN ECONOMIC THREAT TO THE SALE OF SUCH THINGS AS VITAMIN PREPARATIONS AND MINERAL SUPPLEMENTS.
- OBSCURE SCIENTISTS AND SELF-APPOINTED 'PROTECTORS' OF THE PUBLIC WHO OBJECT TO EVERY PUBLIC HEALTH MEASURE.

Now, remember, this was in the early 1950's and NOT ONE PAPER HAD APPEARED IN THE SCIENTIFIC LITERATURE DEMONSTRATING THE SAFETY OF ARTIFICIAL FLUORIDATION. Many individual dentists, doctors and scientists had genuine doubts and reservations about the measure, and they included at least four Nobel Laureates, Otto Warburg, Herman Muller, Hugo Theorell and William Murphy.

By 1952, Oscar Ewing, ably assisted by Edward L. Bernays, Dr Francis Bull and the American Dental Association, had achieved the seemingly impossible.

They had turned a dangerous chemical into an apparently safe one. In the 1950's, of course, few people were interested in environmental pollution and dentists were primarily interested in teeth.

What better way, therefore, to disguise the hazards of an industrial pollutant than by having it promoted by a respected healing profession as an 'essential' element.

Ewing could afford to ignore the respected radiologist, Dr Frederick Exner,[15] who wrote:

> *"If American Industry had to stop polluting our air, water, and our countryside with fluoride fumes and fall-out, and to dispose of its fluoride wastes without creating a public hazard, it would cost, not mere millions, but countless billions of dollars. And therein lies the explanation for the utterly relentless drive to fluoridate our water supplies by any means, fair or foul, and many other puzzling aspects of the drive to fluoridate."*

Industry welcomed fluoridation with open arms. Not only did fluoridation deflect attention away from gaseous fluoride pollutants, but companies now had a ready market for their *solid* fluoride wastes.

As *Chemical Week*[16] reported:

> *"All over the country, slide rules are getting warm as waterworks engineers figure the cost of adding fluoride to their municipal supplies. They are riding a trend urged upon them by the US Public Health Service, the American Dental Association, the State Dental Health Directors, various state and local health bodies, and vocal women's clubs from coast to coast.*

> ..... *it adds up to a nice piece of business on all sides and many firms are cheering the US PHS and similar groups as they plump for increasing adoption of fluoridation."*

The beneficiaries named in the article included a number of large chemical companies and, the Aluminum Company of America (ALCOA).

First America, now the WORLD!

The campaign to encourage fluoridation in overseas countries was spearheaded by top dentists from the Dental Corps of the US PHS and members of the American Dental Association who also belonged to an elitist secret society of dentists called DELTA SIGMA DELTA.

The US PHS is organized in a similar way to the US Armed Forces. Its officers are 'commissioned' and have uniforms. At its head is the SURGEON GENERAL. Officers of the US PHS are expected to obey orders - or else!

Top officers of the Dental Corps are closely associated with those in the ADA and hold interlocking memberships on its boards, committees, and councils. The US PHS reaches into every State and into every scientific organization. It maintains close links with Congress, the Army, the Navy, the Air Force, the Food and Drug Administration (FDA) and the Environmental Protection agency (EPA). It liases with industry through the National Research Council of the National Academy of Sciences, a body of leading scientists who furnish scientific data to government agencies.

Significantly, officers from the US PHS also sit on editorial boards of *every* important medical and dental journal in the United States, and their public relations counsels are in constant contact with press, radio, television, medical writers and news commentators.

The very first artificial fluoridation experiment began in Grand Rapids, Michigan. The experiment was organised and administered by dentists from the US PHS and the University of Michigan.[17]

DELTA SIGMA DELTA evolved from a Greek-letter fraternity founded at the University of Michigan in 1882. In the same year, at the same University, the first fraternity for medical students was formed - NU SIGMA NU.

In the 1930's, and unlike most college fraternities, DSD went international, although it confined its membership overseas to dentists not students. Today, the society has several thousand members with the great majority coming from the United States and Canada. Particularly active Delta Sig 'chapters' have, however, been established in the United Kingdom, Australia, New Zealand, South Africa and the Republic of Ireland.

Membership is by invitation only, and is restricted to male dentists. Each 'chapter' is headed by a Grand Master. Members take an oath of secrecy, and the

society has a monthly newsletter with restricted circulation called DESMOS, which in Greek means 'chain' or 'bond'.

In Britain, out of more than 17,000 dentists, under 250 are Delta Sigs, but some of the best-known members of the profession belong to this American secret society. In Australia, where there are some 6,500 registered dentists, 270 belong to DSD. During the past twenty years all but two Presidents of the Australian Dental Association have been members of the society, and three-fifths of dentists on the Federal Executive are members of this elite brotherhood. Its members also figure prominently on most Federal and State Councils of the Dental Association, as well as the State Dental Boards which are the watch-dogs of professional ethics.

According to the former Grand Master of an Australian 'chapter', Delta Sigs are:

> *"like-minded men who are dedicated to advancing dentistry. The dentist must have contributed to the profession and the community. Its in day-to-day life that members have influence over other people. Delta Sigs, by virtue of their prominence and dedication are leaders in the profession."*

Early in 1953, American Delta Sigs met with their 'brethren' in Sydney. A fortnight later, the New South Wales branch of the Australian Dental Association and the Dental Faculty at the University of Sydney, submitted an URGENT report to the Federal Government stating that steps should be taken immediately, to introduce fluoridation in Sydney and other major cities around the Commonwealth.

The Federal Health Department replied that the National Health and Medical Research Council (NH MRC) - the leading advisory body on health matters - had not yet even considered fluoridation, but planned to do so in DECEMBER 1953.[18] But then an extraordinary thing happened.

You need a very large-scale map of Australia to find BEACONSFIELD, Tasmania. Even today its population is just 1400 persons. Yet Beaconsfield has the dubious distinction of being the first place in Australia to receive artificially fluoridated water. This happened in the spring of 1953 - before the NH MRC had even considered the subject.

Why the rush to fluoridate Beaconsfield's water? In 1952, the Federal Government decided it was time the country had an *aluminium smelter,* and the site chosen was BELL BAY - just two miles or so as the crow flies, from Beaconsfield.

By the end of the following year the foundations of the smelter had been laid, and it became operational in 1956. In those days, 'environmentalists' and 'greenies' were few and far between, and the anti-pollution devices fitted at the Bell Bay smelter were notoriously rudimentary. As a consequence, large quantities of fluoride pollutants contaminated the surrounding countryside daily.

Locally grown fruit and vegetables were affected and people in the area - including young children - were now breathing fluoridated air as well as drinking fluoridated water.

By the early 1960's Tasmanian health officials were claiming that children who had grown up in Beaconsfield had the best teeth in the State. Sure, they admitted, some of the teeth were 'mottled' - but so what? Hadn't the US Public Health Service described such teeth as, "The best looking teeth that anyone ever had."[19]

SUPPOSE BEACONSFIELD'S WATER HADN'T BEEN FLUORIDATED IN 1953? The smelter came on line in 1956 hence 'mottled' teeth - caused by fluoride *air* pollution - could have been expected to appear from 1962 onward. If that had happened, then some 'over-zealous' conservationist could have pointed the finger at the smelter and demanded more stringent anti-pollution regulations.

In many American cities fluoride air pollution *preceded* fluoridation, at Beaconsfield it was the other way around. But the result was the same - the authorities could describe the 'mottled' teeth as an "acceptable trade-off" for the caries-preventive properties of fluoridated water.

However, knowing that an aluminium smelter was planned for Bell Bay, with its inevitable fluoride fall-out, Beaconsfield should have been the last locality in Australia to adopt water fluoridation, yet it was the *first*.

Coincidence? I think not.

The dental profession is restricted by law to treating diseases and disorders which occur in the mouth. They have no mandate to operate outside this restricted area. The British *medical* scientists Margaret Murray and Dagmar Wilson (and others) pointed out that fluoride seemed to have a dual role, at one level it *apparently* reduced tooth decay, but at another it was *undoubtedly* deleterious to cells and tissues inside the body. Surely common sense required that these deleterious effects be clarified before water fluoridation was introduced.

Some dentists were enthusiastically promoting the measure because of their interest in teeth. But what about the medical profession - were they satisfied that fluoride would confine its activities to teeth?

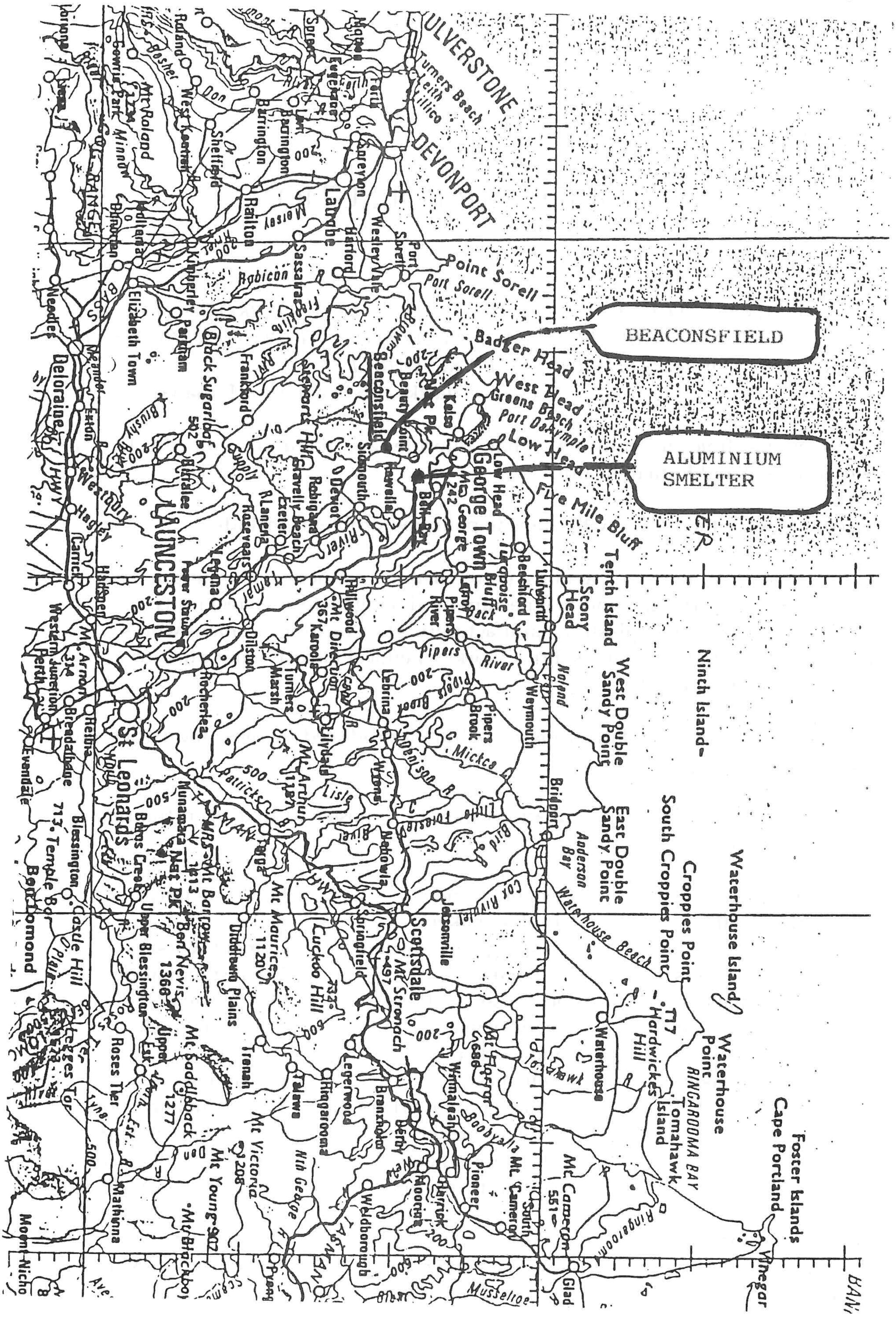
Oscar Ewing had recognised this potential problem and in 1951 he moved to neutralise it. At that time, and in his role as head of the Public Health Service, Ewing was sponsoring a Bill which the ultra-conservative American Medical Association (AMA) claimed as the first step toward 'socialised' medicine. The AMA appealed to its members for a 'fighting fund' to defeat the Bill and $3,000,000 was raised.

But, at the AMA convention in Los Angeles, Ewing notified the Committee that the Bill was to be withdrawn. That same Committee, which had never before

considered the subject, suddenly released a statement saying that the AMA totally endorsed the "safety of fluoridation." Another coincidence?

At that time there was not one single published paper providing evidence to support the AMA endorsement. But from then on, the medical professions in Britain and Australia followed the lead of the AMA and left fluoridation to dentists - and to those powerful forces which were manipulating the profession.

> (for more information regarding Ewing's deal with the AMA, see *Fluoridation and Truth Decay,* Caldwell G. and Zanfagna P.E., Top-Ecol Press, Reseda CA. 1974 pp.21-22).


BEACONSFIELD
ALUMINIUM
SMELTER
ULVERSTONE
DEVONPORT
Point Sorell
Port Sorell
Badger Head
West Head
Greens Beach
Port Dalrymple
Low Head
Five Mile Bluff
Beaconsfield
George Town
Bell Bay
LAUNCESTON
St Leonards
Deloraine
Westbury
Hagley
Carrick
Latrobe
Railton
Elizabeth Town
Exeter
Lilydale
Scottsdale
Bridport
Tenth Island
Stony Head
West Double Sandy Point
East Double Sandy Point
Ninth Island
Waterhouse Island
Croppies Point
South Croppies Point
Waterhouse Point
Waterhouse
Tomahawk
Cape Portland
Foster Islands
Ringarooma
Derby
Ben Nevis
Mt Barrow
Legana
Pipers River
Windermere
Evandale
Perth
Longford
Mathinna

FLUORIDE AIR POLLUTION

"A RUNAWAY TECHNOLOGY, WHOSE ONLY LAW IS PROFIT HAS FOR YEARS POISONED OUR AIR, RAVAGED OUR SOIL, STRIPPED OUR FORESTS BARE, AND CORRUPTED OUR WATER RESOURCES."

(Vance Hartke, US Senator for Indiana).

Perhaps its time to consider what fluoride air pollution can do to the environment and human health.

First, the *major* industries with fluoride pollution problems include:

> coal-burning power stations, petro-chemical refineries, aluminium, zinc, copper, beryllium and magnesium producing factories, steel mills, fertilizer works, plastics manufacturers, glass factories, cement works, pottery and tile makers, brick works, chemical factories and nuclear processing plants.

The most common and dangerous air pollutant produced by these industries and many others, is *hydrogen fluoride.*

Workers in the following occupations may be exposed to hydrogen fluoride in the workplace air:[20]

Aircraft workers
Alkylation plant workers
Alloy steel cleaners
Alloy steel makers
Aluminium fluoride makers
Aluminium makers
Bleachers
Brass cleaners
Brewers
Brick makers
Brick cleaners
Casting cleaners
Ceramic workers
Chemists
Copper cleaners
Cryolite makers
Crystal glass polishers
Dye makers
Electric arc welders
Electroplaters
Zinc workers
Enamel etchers
Fermentation workers
Fertilizer makers
Filter paper makers
Fluoborate makers
Fluoride compound makers
Fluorine makers
Fluorocarbon makers
Fluorochemical makers
Cement workers
Neon sign makers
Ore dissolvers
Phosphate rock workers
Polish makers
Rocket fuel handlers
Silicon chip makers
Stainless steel cleaners
Steel casting picklers
Tile makers
Yeast makers
Power station workers
Fluosilicate makers

Freon makers
Genetron makers
Glass etchers
Graphite purifiers
Hydrogen fluoride makers
Isotron makers
Laundry workers
Metal cleaners
Metal polishers
Oil well acidizers
Petrol refinery workers
Plastic makers
Quartz crystal makers
Rocket fuel makers
Stainless steel makers
Steel mill workers
Stone cleaners
Uranium refiners
Beryllium workers
Pottery workers

Fluoride air pollution can have a devastating effect on the *total* environment.

Angus Lazores is a Mohawk Indian.[21] For centuries before the white-man reached Canada and the United States, the Mohawks hunted, fished, trapped, and farmed the islands of the Gulf of St. Lawrence, now known as the St. Regis Akwesasne Indian Reserve.

Angus Lazores, along with 1,500 other Mohawks, lives on Cornwall Island, a part of the reserve straddling the borders of Quebec, Ontario, and Upper New York State. The St. Regis Mohawk Band settled Cornwall Island just over a hundred years ago; they soon became known as an efficient and self-sufficient agricultural community. In 1959, there were 45 farmers, forty cattle barns and 364 dairy cattle on the Island.

Twenty years later, only eight farmers and eight cattle barns were left. During the twenty years the cattle population was decimated; all the bees on the Island had disappeared; crop yields had fallen; partridges, after which the Akwesasne Reserve is named, had declined drastically; and the white pine trees on the Island were dying.

In 1959, Reynolds Metals Company had built an aluminium smelter on the south bank of the St. Lawrence River near Massena, New York State. Cornwall Island is downwind of the smelter at least 60 per cent of the time.

Angus Lazores dates his problems on the Island to 1962, just three years after the smelter became operational.

In that year, cattle became lame and developed swellings on their legs, eventually the lameness became so severe that the animals could no longer graze normally. They laid down to eat on pasture and then crawled to the next place to eat. With increasing age the cows had difficulty drinking cold water, and chewing was obviously painful. The animals would grab hay but let it go after unsuccessful attempts at mastication.

The first pregnancy and calving were usually uneventful, but the cows had small udders and too little milk for the calf. At the third pregnancy and delivery, the native cows had usually deteriorated, being unable to drink or chew properly. Cows died during delivery and neonatal calf mortality was high. If cows survived the third pregnancy they were sold for slaughter.

By 1971, the majority of farmers had switched from dairy to beef cattle and by November 1977, there were only 177 cattle on the Island compared with 364 in 1959.

The cause of the cattle disease was admitted only after many years. In 1969, officials of the Canadian Ministry of the Environment had expressed concern to Reynolds Metals about fluoride emissions impacting on the Island. Four years later, the St. Regis Local Council authorised an investigation into pollutants emitted by the smelter. In July 1973, the Council were advised that damage to the pine trees on the Island was due to fluoride gases.

Two years later, urine samples from Cornwall Island cattle showed abnormal levels of fluoride.

In November 1975, Angus Lazore's cattle were examined by a veterinarian called Abbey, sent by Reynolds Metals. He claimed that internal and external parasites were responsible for the condition of the cattle - *fluoride wasn't even mentioned.*

The Mohawk elders were disturbed by Abbey's diagnosis and approached Professor Lennart Krook, an eminent veterinary scientist at Cornell University.

Krook ran extensive diagnostic and pathological tests on the St. Regis cattle, then announced his findings:

> *"Owing to extensive and serious chronic fluoride poisoning, no cattle born on Cornwall Island were going to live for more than five years."*

During 1977 and 1978, the situation which had developed on the Island was investigated by a team of scientists from the New York State College of Veterinary Medicine, Cornell University. Leaders of the team were Professor Krook and Dr George Maylin. In the introduction to their published report,[22] they point out:

> *"Of all pollutants that affect farm animals, fluorine has caused the most severe and widespread damage. The object of the present study is to record yet another man-made fluorine pollution disaster and to interpret the pathogenesis of the osseous changes in view of recent advances in the understanding of bone metabolism."*

While Krook and Maylin focused on the cattle, Dr Clancy Gordon of the University of Montana, examined 2,600 plant samples from Cornwall Island and found very high levels of fluoride in all the vegetation tested.

University of Illinois scientists were then recruited to see if the Islanders themselves were suffering health problems resulting from excessive exposure to fluoride. Doctors Bertram Carnow and Shirley Conibear reported:

> *"Significant numbers of people with abnormalities of the muscular, skeletal, nervous and blood systems."*

In addition, Cornwall Island physicians had noted high rates of anaemia, rashes, irritability, diabetes, high blood pressure and thyroid disease.

Carnow and Conibear concluded that there had been;

> *"Unquestionably heavy exposure to fluorine compounds that has affected all the life forms studied."*

They recommended an immediate reduction in smelter fluoride emissions. Chief Francis of the Mohawk Indian Band put it more dramatically, he advised anyone living in areas where smelters might be built, to:

> *"Block the project. Block them with everything you have. If you fail, then move. Move as quickly as you can because there's no money that can buy your health back."*

Reynolds Metals spent its first ten years of operation spewing over 130 kilos of fluoride emissions an hour, directly downstream to Cornwall Island. Even after New York State regulations forced the company to reduce its emissions to 30 kilos an hour by 1975, Reynolds' 'gift' to the Mohawks had been an appalling 12 MILLION KILOS OF AIRBORNE FLUORIDE CONTAMINANTS OVER TWENTY YEARS.

The Mohawk way of life became a victim of a *preventable* man-made plague. And you don't have to go to Canada to find fluoride pollution problems. For more than a century, the Hunter Valley Region of New South Wales has produced some of Australia's finest wines.

On Tuesday July 8 1980, the Tyrrell's and the Tulloch's, Reg Drayton and Dr Max Lake together with Chris Barnes, who, as President of the Hunter Valley Vineyard Association represented virtually all the other wine-makers, held a press conference at the Hilton Hotel, Sydney.

Their message was simple - they could foresee the day when the Hunter Valley was finished as a wine-growing area. And the reason? For the past ten years the ALCAN aluminium smelter at Kurri-Kurri had rained 600 to 700 tonnes of fluoride pollutants onto the surrounding landscape annually. The wine-makers said they had known nothing about these fluoride emissions until 10 months previously, yet fluoride pollutants have, in the past, reduced grape yield and decimated vineyards in Spain, Greece, Bulgaria and the Rhone Valley.

Ever since the beginning of the industrial revolution but particularly in the second half of this century, wholesale pollution of air and of the countryside with fluoride fumes and fall-out has taken place; and the most common and most dangerous fluoride air pollutant is HYDROGEN FLUORIDE.

As mentioned previously, Dr Jag Cook,[23] from Britain's National Chemical Emergency Group - which is responsible for mopping up any major toxic spills in the UK - has said: "Hydrogen fluoride is about the only chemical that really scares me."

Hardly surprising since amongst other things, hydrogen fluoride (HF) eats up glass and dissolves most metals.

Alright, you say, its dangerous, but I don't live near a factory that releases HF into the atmosphere, nor do I work in an environment where HF is present. But consider this. Demand for lead-free petrol is growing quickly and the processes for making it involve the use of HF to achieve high octane ratings without using lead. In fact, between 1.26 and 3.14 kilos of HF are used in the production of every six barrels of alkylate. As a result HF is present in the exhaust gases from vehicles using lead-free petrol. The levels of HF, three inches from the exhaust outlet measure 30 parts per billion, and remember at that concentration, HF can impair reflex activity in rats by acting as a CNS depressant - in other words, a mind-dulling drug.

HYDROGEN FLUORIDE is used by an increasing number of industries, and it is also produced as a pollutant by an increasing number of industries.

A series of accidents in the United States have recently demonstrated that industrial HF sites are a major threat to public safety.

For instance, an HF leak on 30 October 1987 at the Marathon refinery in Texas City left 700 people in need of urgent medical treatment. Dr Fred Millar, of the Environmental Policy Institute, said that only luck had prevented the accident from becoming the major industrial catastrophe of the year. He pointed out:

> *"The release was from the vapour space of a storage tank. If the same release had been of HF liquid, thousands would likely have died in the ensuing gas cloud. It would have been our Bhopal."*

A few months later, another HF leak occurred at Mobil's refinery in Torrance, California. This caused a raging 41 - hour fire and millions of dollars worth of damage. An official report of the accident suggested:

> *"The consequences may have been so great as to warrant regulations to direct industry to phase out its use or substitute processes with less environmental hazards."*

In March 1988, there was another HF leak, this time in Tulsa, Oklahoma. There, an accident at the Sun refinery produced a three-mile-long cloud which engulfed the town. Only a prompt evacuation limited the casualties to 36 persons (none fatal).

A recent test by the US Government showed that relatively small amounts of HF liquid will release a dense, ground-hugging gas cloud which remains lethal for five kilometres.

In Britain, the location of HF manufacturing plants are, according to the Health and Safety Executive, officially secret - to prevent them becoming targets for terrorists.

Many people, particularly those working in the pot-rooms of aluminium smelters, are exposed to relatively high concentrations of hydrogen fluoride. What can it do to them? Well, lets see.

In the spring of 1986, one of the most modern aluminium smelters in the world went into production in Portland, Victoria. The smelter had been built by the Aluminum Company of America (ALCOA), who also owned a much older smelter at Point Henry, Geelong.

Two years later, on December 2 1988, the *Melbourne Age* reported:

> "SMELTER WORKERS CLAIM FOR ASTHMA."
>
> *"Twelve workers from the 35 per cent State-owned Portland aluminium smelter have issued common-law claims against the joint-venture seeking damages for occupational asthma.*
>
> *The chairman of the Aluminium Development Council, Mr. Bruce Heister, said the incidence of occupational asthma varied from smelter to smelter but the reasons for this were not clear.*
>
> *Damages for a case of occupational asthma were claimed against another big aluminium producer, Comalco, at its Queensland smelter a few months ago.*
>
> *The cause of pot room asthma is suspected to be an agent, or agents, in emissions from smelter pot lines.*
>
> *Since production started in Portland in October 1986, 65 workers have been diagnosed as having occupational asthma."*

In other words, after just 25 months in operation, 65 workers at one of the most modern aluminium smelters in the world had been affected by mysterious agents in the pot room.

Worse was to follow. On 27 April 1989, the *Melbourne Herald* reported:

> "ALUMINIUM IS LATEST WORKER HEALTH SCARE".
>
> *"A senior Victorian union official claims workers at Geelong's ALCOA*

smelter are suffering respiratory ailments potentially as deadly as those found in the asbestos industry.

Mr. Royce Bird, state secretary of the Federated Iron-workers Association, has called for a national inquiry into respiratory disease in aluminium smelter workers after a report by New South Wales researchers found evidence of long-term irreversible lung damage.

The report, by a team from Newcastle University medical school, found workers at Alcan Aluminium's Kurri-Kurri smelter suffered reduced lung function equivalent to smoking a packet of cigarettes a day.

Mr. Bird, who has worked in the industry for 18 years, claimed the findings had serious implications for the aluminium industry world-wide and for workers at Geelong. He said he believed that apart from respiratory diseases, aluminium workers were at risk of contracting cancer.

He claimed to have observed a "slow but gradually developing history of cancers" at the Point Henry Plant in Geelong.

He also claimed workers at the Portland smelter, partly owned by the State Government, were suffering higher rates of pot room asthma than at Point Henry.

Union solicitors had confirmed 176 cases of pot room asthma at Point Henry since 1964, compared with 76 at Portland. At least 20 more cases were being processed by other solicitors, he said."

A few days later, a cancer specialist supported Mr Bird's claim when the *Melbourne Sun* published the following article on May 1 1989:

"CANCER RISK AT SMELTERS: DOCTOR".

"Workers at aluminium smelters are at risk of developing cancer as well as chronic asthma, according to a leading cancer specialist. At least 39 smelter workers across Australia are believed to have already died from work-related cancer.

Dr Cyril Minty, a specialist at the Peter McCallum cancer hospital, said fumes emitted from the smelters' pot rooms could contain cancer-causing chemicals as well as irritants that produced the respiratory condition known as 'pot room asthma'.

Dr Minty said more than six suffers of industrial asthma from Portland and ALCOA's Geelong smelter had been referred to him during the past year."

Now, there is no mystery at all. The major pollutants in the pot room are gaseous and particulate fluorides; and HYDROGEN FLUORIDE is the most common fluoride gas.

HYDROGEN FLUORIDE IS THE MAJOR CAUSE OF POT ROOM ASTHMA AND A CONTRIBUTING FACTOR IN THE DEVELOPMENT OF LUNG CANCER IN SOME ALUMINIUM WORKERS.

But, industrialists live in fear of conclusive evidence linking a pollutant to 'new' occupational or Neighbourhood diseases. The reason is obvious. Employers and their insurers will face claims for compensation.

(Note: a *"Neighbourhood disease"* is one affecting people living in the vicinity of a pollutant producing factory.)

Industries with major fluoride pollution problems are amongst the most powerful interest groups in society. Fluoride emissions are amongst the most difficult of all pollutants to control effectively, and in a highly competitive economic system, many companies will fight for their very lives to avoid spending large amounts of money to control pollution since this will, almost inevitably, increase the price of the end-product.

Certain sections of industry will go to great lengths to suppress stories about fluoride pollution. Such reports might encourage people to sue for damages or, result in pressures for tougher anti-pollution laws.

The first symptoms of exposure to trace amounts of hydrogen fluoride are NOT physiological but psychological, and include such symptoms as confusion, fatigue, partial loss of memory and mental dullness. To put it another way, behaviour is exquisitely sensitive to minute traces of hydrogen fluoride (and other pollutants) in the environment.

Unfortunately, the tests to which chemical substances are usually subjected in efforts to determine their so-called *"maximum permissible doses or concentration"* do not take into account possible changes in mental function, and also would often fail to pick up long-term or chronic effects on the organism.

Minute concentrations of hydrogen fluoride inhaled over lengthy periods of time CAN DAMAGE VITAL COMPONENTS OF THE IMMUNE SYSTEM - this leaves the individual vulnerable to opportunistic diseases.

Last century, canaries were taken down coal mines because of the presence of trace amounts of deadly gases in the mines. The gases were undetectable by smell but if the canary died, the miners got out - quickly!

Some scientists suspect that FROGS have become analogous to the coal-mine canaries. All over the world frogs are disappearing and no-one knows why. The best guess so far is that pollution of the environment is responsible. I'd like to tell you about an experiment I recently completed.

In the adult human the immune system weighs about two pounds and consists of around a trillion lymphocytes and about 100 million trillion molecules called antibodies that are produced and secreted by the lymphocytes.

In a mouse, the immune system consists of about 300 million lymphocytes and around a trillion antibodies.

The smallest known immune system, that of a *tadpole,* is estimated to have a million lymphocytes and an antibody repertoire of about 10 million. Smaller immune systems do not exist presumably because such systems would recognise antigen so infrequently that they would provide little, if any, protective advantage.

I exposed tadpoles to a number of increasingly common environmental pollutants, including mercury, cadmium and hydrofluoric acid - which is hydrogen fluoride in water, and both gas and acid have the same formula, HF.

Incredibly low concentrations of these chemicals proved lethal to the tadpoles.

But technically speaking, the tadpoles didn't die of "mercury poisoning" or "cadmium poisoning", or "hydrofluoric acid" poisoning. They died because the chemicals 'wrecked' their immune systems leaving the tadpoles vulnerable to all the germs and parasites in their environment.

The significance of this is that scientists still evaluate the toxicity of a chemical by determing what amount of the chemical causes *obvious* damage or death.

For instance, lets look at a common chemical - sodium fluoride.

It would take at least 3 grams of sodium fluoride to kill a healthy adult. That's the amount in 3,000 litres of fluoridated water.

If you ingested about *8 milligrams* of sodium fluoride daily for ten years or more, you would develop a well-defined disease called skeletal fluorosis, which affects bones, tendons and secondarily, the nervous system. If an infant ingested 2 milligrams of fluoride daily, they would develop *dental fluorosis* or 'mottled' teeth.

Apparently therefore, the only problems that low doses of sodium fluoride can cause are either dental fluorosis or skeletal fluorosis. The *CLINICAL* symptoms of these conditions are easily detected - 'mottled' teeth and 'bony outgrowths' and the calcification of tendons in skeletal fluorosis.

BUT WHAT ABOUT <u>SUB-CLINICAL</u> SYMPTOMS - THOSE THAT WE CAN'T SEE?

Experiments have shown water containing 1 to 4 parts per million can have an effect on the Central Nervous System - a mind-dulling effect! Experiments have also demonstrated that fluoride at a concentration of just *0.6 parts per million* can

disturb antibody production, and thus interfere with *the functioning of the immune system.*[24]

And many experiments have shown that concentrations of fluoride of about *4 parts per million* can damage DNA[25] - the vital core of every living cell.

In other words, at very low concentrations, fluoride can cause subtle changes in enzyme activities, nerve action potentials, altered behavioural reaction, and the immune system.

AND YOU WERE TOLD FLUORIDE WAS SAFE?

FLUORIDE AND THE MULTI-NATIONALS

In December 1950, ALCOA's Vancouver, Washington plant was found guilty of dumping from 1,000 to 7,000 pounds of fluoride solid wastes each month into the Columbia River; the Company was also fined for airborne fluoride gaseous pollutants "which resulted in injury and death to cattle."

GEELONG, the second city of Victoria has serious fluoride air pollution problems. Some of the workers in the motor gasoline alkylation unit at the Shell Petro-chemical installation in Geelong are regularly exposed to levels of between 20 and 200 parts per billion hydrogen fluoride.

A fertilizer works pollutes the city air with hydrogen fluoride and silicon tetrafluoride - another intensely poisonous fluoride gas.

But the major culprit in Geelong is the ALCOA smelter at Point Henry. In 1979, the ALCOA smelter was pouring out fluoride emissions at a rate up to 4.1 kilos of fluoride per tonne of aluminium produced - more than three times the amount that would be *permitted under US Clean Air Regulations.* ALCOA operated under an agreement with the EPA of Victoria - Licence No. EA 000198/6 of June 1 1973, amended December 20 1974, which permitted the Company to discharge 'vertically upward' into the atmosphere 15 toxic wastes, and -

> *"Fluorine compounds as hydrogen fluoride may be discharged at a maximum rate of 16.8 kilograms per hour."*

The EPA - by agreement amended on June 10 1977 - permitted ALCOA to discharge solid fluoride waste directly into Corio Bay at a rate of 195 cubic metres per 24 hours, the maximum concentration being 20 grams fluoride/cubic metre. Finally, ALCOA has for years been burying, on site, slag from spent graphite electrodes.

This 'slag' is incredibly toxic. It contains high levels of fluorides and *cyanides.* No other State permits such slag to be buried because of seepage of cyanides and fluorides into soil and water sources.

ALCOA IS A COMPANY WHICH MAKES ITS OWN RULES.

On March 1 1979, Sir Rupert Hamer, Premier of Victoria, had a personal meeting with the Chief Executive of ALCOA of Australia; on the same day he received a letter from ALCOA confirming their intention to build a second aluminium smelter in the State at Portland.

A fortnight later, Premier Hamer appointed a three-man committee to: "Inquire into the Fluoridation of Victorian Water Supplies". The terms of reference for the inquiry were:

(1) To receive submissions from any person or organization providing new evidence concerning the effects on humans of fluoridation of water supplies.

(2) To advise the Premier whether any submission, as in paragraph (1) has in fact produced new evidence which would warrant a review of the Health (Fluoridation) Act 1973.

The terms of reference were restrictive. Fluoridated water is but one source of intake. Toxicity of a substance depends on *dosage,* and the total daily dosage of fluoride is made up of the sum of overall fluoride intake from water, food, air and other possible sources such as fluoridated dental health products.

This important point was recognised by a similar 1979 Inquiry into fluoride commissioned by the Government of Quebec, Canada.[26] This Inquiry noted:

- Fluoride is the most dangerous atmospheric pollutant next to sulphur dioxide and ozone.

- The number of industries using fluorides and fluorine compounds increases each year.

- The difference between harmless and dangerous doses of fluoride is slight, and there is no doubt that in fluoridated areas, and elsewhere, doses higher than the dose considered safe are frequently ingested.

- Given the various and often highly toxic fluoride sources to which humans and ecosystems are exposed, it is important to establish just how much fluoride is being gradually ingested in order to prevent cumulative effects and the onset of long term toxicity from repeated absorption.

- The synergistic effects of general fluoridation and the serious threat they pose to human health and the natural environment must be carefully studied, and fully understood.

In September 1979, the Portland Smelter Project was publicly announced and ALCOA lodged an environmental impact study for public scrutiny.

FIVE Government bodies in Victoria opposed the siting of the smelter; the chief concern expressed was about the impact of fluoride emissions on fauna and flora in the surrounding countryside.

On 30 April 1980, the ALCOA PORTLAND SMELTER BILL was debated in the Victorian Parliament.[27] During the debate the main speakers for the Opposition (then the Australian Labor Party), repeatedly stressed the need for the smelter to be capable of meeting stringent standards for its emissions.

For instance, the Hon. David White said:

> *"Particular study should be given to the effects of fluoride on terrestrial fauna, including grazing animals, on vegetation, on marine life and on birds....."*

The Opposition Shadow Minister of the Environment, the Hon. Evan Walker, made a lengthy speech in the course of which he pointed out:

> *"It could be critically expensive for ALCOA to install machinery to ensure clean air at the boundary of the plant. ALCOA knows, the Government knows, and I know that if the Government were to demand stringent standards on the emission of fluorides at the boundary the company would have to invest large sums of money for some of that scrubbing to occur within the building.*
>
> *The standard agreed to by the Government on fluoride emission is such that the Government will be allowing 1.38 kilograms of fluoride per tonne of aluminium produced at the border of the site. The standard in the United States of America is one kilogram. That is a large difference. If one considers micrograms of fluoride per cubic metre, the standards are worse. Australia is asking for standards that are lower than the American standards. It would cost millions of dollars extra to achieve the standards that the American authorities demand."*

The Hon. Evan Walker went on:

> *"Fluorides are dangerous. If lower standards are allowed, environmental degradation will occur well away from the site. There are other gaseous pollutants such as sulphur dioxide, carbon monoxide and carbon dioxide...*
>
> *The most serious pollutants are the fluorides. At full production, the proposed plant will produce approximately 700 tonnes of fluoride per annum....."*

Evan Walker concluded his speech:

> *"Finally, I shall talk a little about people. There are industrial illnesses related to an industry of this kind, especially for pot room workers. That is a known fact. At Point Henry (the aluminium smelter in Geelong), ALCOA closely monitors the health of its workers in and around the smelter because it knows a number of industrial illnesses can occur. It is not yet fully aware of long-term results, as with asbestosis. In that case it took years before the results showed up in the workers within the industry.*
>
> *There is evidence that in the aluminium industry there have been longitudinal studies that show certain illnesses I will mention. A paper was prepared by the*

Parliamentary Research Library in Canberra which shows problems associated with long-term effects - overseas studies - of skeletal fluorosis which is a change in bone density, chronic pulmonary disease and cancer.

In 1972-1973 team from Prince Henry's Hospital carried out studies in three Australian aluminium smelters. Reports were made available to the companies but they have not been made publicly available. This indicates the existence of serious problems.

The suggestion is that they were of such a serious nature that the companies decided not to let the public know the results of the studies. The studies did show a correlation between asthma and the length of pot room exposure. It is now a known fact that any worker who suffers from asthma is not allowed to work in the pot room. In fact, they are more susceptible to some pulmonary diseases.

Honorary Members should be allowed to see the Prince Henry's study. Finally I deal with cancer. There is evidence from the United States of America, produced during the 1970's, and some from Canada and Russia that work within the pot room environment can be cancer producing."

In September 1980, the ALCOA PORTLAND SMELTER BILL became Law.

One week later, Premier Hamer tabled the Report of the Victorian Committee of Inquiry into Fluoridation[28] and told Parliament:

"This committee of inquiry invited and received a large number of submissions and was able to interview the main protagonists and antagonists of the alleged new scientific evidence which claimed harmful effects could result from fluoridation of public water supplies.

This report is a scholarly, erudite overview of the fluoridation controversy. It is impartially written giving full credence to the sincerity of the views of all parties. It traverses in depth the arguments for and against fluoridation. The Committee did its task scientifically and logically. In brief, however, in regard to the claims that fluoridation of public water supplies has, or has the potential for, toxic, carcinogenic, teratogenic or allergenic effects on human beings, the Committee concluded that:

There is massive evidence to show that fluoridation at recommended levels has no harmful effects on the health of the community."

As was clearly demonstrated in the debate on the ALCOA SMELTER BILL and in the Report of Premier Hamer's Committee of Inquiry, fluoride has two faces. One is apparently benevolent because of its ability to reduce the incidence of tooth decay; the other is undoubtedly sinister because, at very low levels it can devastate susceptible vegetation, cripple and kill livestock, and damage human health.

DID THE HAMER COMMITTEE OF INQUIRY DO "ITS TASK SCIENTIFICALLY AND LOGICALLY," AS THE PREMIER CLAIMED?

I suggest that no scientist with any knowledge of the subject could have accepted the Premier's restrictive terms of reference.

For the following reason. Using the latest 'endorsement' of water fluoridation, the Victorian Government began a campaign to 'encourage' Geelong to adopt the measure. But, within the city boundaries were three major industries with fluoride-pollution problems - ALCOA, a large fertilizer works and the Shell petro-chemical refinery. As a result, the citizens of Geelong breathed fluoridated air, ate fluoride-contaminated locally-grown foodstuffs and most used fluoride-containing toothpaste. Why should anyone *insist* that they must also drink fluoridated water?

Indeed the World Health Organization's recommendations on the subject are quite specific. WHO suggests that any community considering fluoridation should *first determine how much fluoride people in the area are already receiving from all possible other sources.*[29]

Failure to do this might mean that some people are inadvertently exposed to excessive amounts of fluoride.

Why did the Victorian Committee of Inquiry totally ignore the "scientific and logical" recommendation of the World Health Organization? If they were unaware of it, then they weren't qualified to sit on the Committee of Inquiry; if they did know of it, then why disregard it?

There is a possible reason. In determining the levels of fluoride air pollution in Geelong the Committee could have opened a 'can of worms'. Remember, at the same time as the Committee were sitting, ALCOA and the Victorian Government were negotiating about a new smelter to be built in Portland. The Opposition had already focused attention on the problems of fluoride emissions.

Imagine the outcry there would have been if Mr. Hamer's Committee of Inquiry had investigated the level of fluoride air pollution in Geelong and found it to be far above acceptable levels. This could very well have been the case. FOR MANY YEARS THE ALCOA SMELTER IN GEELONG HAD SPEWED OUT THREE TIMES THE AMOUNT OF FLUORIDE EMISSIONS PERMITTED UNDER UNITED STATES REGULATIONS.[30]

In January 1982, senior executives of ALCOA flew in from Head Office in the States to meet with Victoria's Environmental Protection Authority and *discuss* the standards for emissions from the new smelter *proposed* by the EPA. I was an observer at the meeting and found it quite enlightening.[31]

In most developed countries, such as the United States, Canada, Germany, France, Sweden and Japan, for example, environmental regulatory bodies have *established* the standards for emissions with which any proposed new company *must comply.*

When a company is given approval to build a new smelter, then that smelter must be designed to comply with the standards.

In Victoria, it worked the other way round. ALCOA was given approval to build the Portland smelter and then sat down with the EPA to *negotiate* the standards ALCOA WERE PREPARED TO ACCEPT.

Of course it was an unequal contest. The Government - the Hamer Government in 1980, then the following Labor Government - were totally committed to the smelter. After all it was going to provide employment in Portland, and, a 'massive' future revenue for the State. What official in the EPA would dare ring the Premier's office and say: "I've just knocked back the Portland smelter project because ALCOA want to make their own rules."

Immediately the meeting started, ALCOA tabled their objections to the EPA draft document outlining the *proposed* standards. There were over *350 ALCOA objections,* and the first was typical:

1. ALCOA objects to the figure of 0.68 kilograms of fluoride per tonne of aluminium produced on the basis that it is incorrectly deduced by the EPA from the licence application.

Throughout the meeting ALCOA executives repeatedly challenged the proposed EPA standards and made it very clear to all present, that ALCOA was only going to accept standards the company agreed to. It even seemed that ALCOA would be responsible for monitoring most of the emissions and not the EPA. The traditional roles of the gamekeeper and poacher were reversed!

It was also interesting to note that the Hon. Evan Walker, who spoke so eloquently about the dangers of fluoride during the debate of the ALCOA SMELTER BILL, was now a member of the Labor Cabinet. We heard no more from him about the hazards of fluoride or its possible role in producing pot room asthma and cancer.

ONLY YOUR DENTIST CAN GIVE YOU A BETTER FLUORIDE TREATMENT

Colgate-Palmolive advertising slogan.

In his book, *Science: The Glorious Entertainment,* Professor Jacques Barzun, of Columbia University, wrote, tongue in cheek,

> *"One hopes that behind the fluoridation scheme there are politics and selfish business interests; the presence of solid, ulterior motives would restore one's faith in common intelligence."*

Big business rarely misses an opportunity. When Oscar Ewing and the US Public Health Service 'miraculously' turned a dangerous chemical into a beneficial one, there were plenty of companies eager to exploit fluoride's commercial potential.

On January 26 1956, the Procter and Gamble company took a full-page advertisement in the *New York Times* to modestly proclaim:

"TRIUMPH OVER TOOTH DECAY"

> "PROCTER and GAMBLE'S NEW FLUORIDE TOOTHPASTE CREST IS THE ONLY TOOTHPASTE THAT MAKES POSSIBLE A MAJOR REDUCTION IN TOOTH DECAY FOR PEOPLE OF ALL AGES."

CREST was then described as: "AN IMPORTANT MILESTONE IN MEDICINE", and compared to - Dr Jenner's discovery of vaccination; Dr Morton's discovery of ether; and, Dr Fleming's discovery of penicillin.

However, since the company had never published any evidence to support these extravagant claims, the American Dental Association and the US Public Health Service were less than pleased. Anyway, they were supporting *water* fluoridation.

In fact, when the American Medical Association had endorsed the safety of fluoridation in 1953, they had pointed out that such an endorsement should NOT lead to the manufacture of dental health products incorporating fluoride since this could easily lead to inadvertent overdosage with fluoride.

And, in response to Procter and Gamble's advertisement, Harold Hillenbrand, secretary of the ADA, angrily retorted that there was no evidence that any fluoride paste could prevent tooth decay.

Business Week reported that the Food and Drug Administration (FDA) were insisting on a warning label on CREST stating that it should not be used by children under six-years of age or by anyone drinking fluoridated water. Some

cartons of CREST did carry such a warning, but only until 1958 - then it 'disappeared'. No-one ever explained why.

Nor can anyone explain why the American Dental Association suddenly, and officially endorsed CREST as "SAFE AND EFFECTIVE IN PREVENTING CAVITIES", in August 1960.[32] Indeed, this enraged many members of the ADA because immediately following the endorsement P & G stock rose by $8 a share and some senior ADA officers appeared to have profited from the rise in Procter and Gamble shares.

By May the following year, sales of CREST had doubled gaining 25 per cent of the US toothpaste market. And, of course, the flood-gates had opened. Toothpaste manufacturers around the world jumped aboard the fluoride bandwagon.

From now on, the advertising gurus on Madison Avenue took on the job of promoting fluoride; and they were funded by the wealthiest toiletry companies - Procter and Gamble, Colgate-Palmolive, Unilever, and Beechams.

The first problem to resolve was the apparent conflict of interest between water fluoridation and fluoridated toothpastes. All the early pioneers of water fluoridation had argued that the measure was designed to deliver a "controlled" dose of fluoride to the consumers. Since even they admitted that the margin between a "safe" and potentially harmful daily intake of fluoride was impressively small, they had argued that fluoridated pastes could be harmful because young children particularly, swallow significant amounts of paste every time they brush their teeth.

Madison Avenue came up with the answer. Procter and Gamble [33] sponsored a $250,000 hour-long TV show featuring film star Henry Fonda, to promote *water* fluoridation during National Children's Health Week.

Thereafter, P & G went back to promoting CREST. *On the 5th March 1990,* the American Dental Association *News*, published a photo of ADA President Mike Overbey accepting a cheque for $100,000 from Procter and Gamble: "To commemorate the 30th Anniversary of ADA's recognition of CREST." In the same year, P & G spent $30,000,000 advertising CREST on US television.

Over the past 30 years, its doubtful if any other single product has had more money spent on its promotion than fluoride toothpaste. Every night, on commercial TV stations around the world, the message goes out: FLUORIDE IS ESSENTIAL FOR HEALTHY TEETH; implicit in the message is the inference that FLUORIDE MUST BE SAFE - who would put it into an everyday product like toothpaste if it wasn't?

But, fluoride-containing toothpastes are NOT safe! The multi-national toiletry companies, in particular Procter and Gamble, Colgate-Palmolive, and Unilever (through Gibbs), have spent millions of dollars to *buy professional endorsement* of their products by national dental associations such as the American Dental

Association and the Australian Dental Association. Yet not one of these products has ever been tested to establish its potential toxicity *in the manner now mandatory for medicinal products.*

All the "university" tests and trials which manufacturers claim establish the efficacy of their products are at best worthless, and at worst - **fraudulent.**

First, the question of toxicity of fluoride-containing toothpastes.

The first nerve gases, or G-agents, were developed in secret by the German chemical industry shortly before and during World War II. They are quick-kill agents of tremendous potency.

The nerve gases are *anti-cholinesterase* agents, working by blocking the enzyme which the body uses to destroy one of its chemical nerve signal transmitters after it has done its job. This has two effects. One is that control is lost over the affected part of the nervous system. The other is that a large concentration of the chemical transmitter rapidly builds up within the body, and that chemical is itself a powerful poison. The body is first incapacitated and then forced to poison itself!

A number of enzymes in the human body are extremely sensitive to fluoride, including - human plasma *CHOLINESTERASE.*[34]

Fluoride is an anti-cholinesterase agent.

Hydrogen fluoride has an anti-cholinesterase action at between 30 and 100 parts per BILLION in air.

The fluoride in toothpaste, if swallowed, can affect human plasma cholinesterase in the following manner:

FLUORIDE at a concentration of 0.95 parts per million INHIBITS CHOLINESTRASE ACTIVITY BY *61 per cent;* at a concentration 0.095 parts per million it inhibits the enzyme activity by *12 per cent;* at a concentration of 0.038 ppm by *7 per cent* and at a concentration of 0.0095 ppm by *1 per cent.*

Now, if a toddler swallows *0.5 milligrams* of fluoride contained in half a *gram* of fluoridated paste, the fluoride level in the child's blood plasma surges to a level of about *0.13 parts per million F,* a concentration sufficient to have *a significant anti-cholinesterase effect.*

EVEN IN FLUORIDATED AREAS THE AVERAGE PLASMA FLUORIDE CONTENT IS 0.018 ppm F.

Interestingly, in non-fluoridated areas the average normal plasma fluoride is 0.009 ppm.

Some toxicologists believe that the most subtle indicator of a chemical's toxic potential is its action on essential enzymes. Other toxicologists, and most dentists, however, believe that the low toxic dose is that which causes *obvious* adverse effects, i.e. in the case of fluoride, "mottled" teeth. They claim that "mottling" will only occur if the plasma fluoride level exceeds 0.05 parts per million fluoride. Even by this criteria, fluoride toothpaste is dangerous.

On Tuesday 17 September 1991, the *Melbourne Age* carried the following front-page headline: "PARENTS WARNED AGAINST GIVING CHILDREN TOO MUCH FLUORIDE". The article went on to report a 'new' policy on fluoride announced by the National Health and Medical Research Council which made the following recommendations:

> *"Parents are advised to:*
>
> * *Avoid use of fluoridated toothpaste at an early age.*
> * *Use only a pea-sized amount of fluoride toothpaste on the child's toothbrush.*
> * *Supervise tooth-cleaning to ensure that excessive amounts of toothpaste are not regularly swallowed.*
> * *Avoid an early or high-dose use of fluoride tablets.*
> * *Avoid prolonged use of dietary formulas".*

In the article, Professor Tony McMichael, Chairman of the NH MRC working group, said:

> *"It is clear an excessive intake of fluoride in childhood can lead to fluorosis, and that this is not from water but most probably from toothpaste.*
>
> *There is a clear need for the federal or state governments to look at legislating to reduce the content of fluoride in toothpaste, or requesting that a child's toothpaste be manufactured with reduced fluoride content, coupled with a public education campaign."*

Professor McMichael was saying this in *1991*! But remember, in the States, the FDA had required a warning on CREST between *1956 and 1958,* then they dropped the regulation - without explanation. In Australia, prior to 1960, Colgate-Palmolive's fluoride toothpaste cartons stated: "POISON S5, KEEP OUT OF REACH OF CHILDREN". After 1960, the poison label was removed which allowed supermarkets to sell what was previously obtainable only from chemists.

Originally, IPANA fluoride toothpaste also carried a warning:

> "THIS CONTAINS SODIUM FLUORIDE (0.22%) and the LABELLING POISON IS REQUIRED".

For almost 50 years, in fact, we have known that an excessive intake of fluoride in children can cause mottled teeth, and youngsters do not swallow paste simply because they like the taste; but because until a child reaches 4 to 5 years of age

the 'swallowing reflexes' are poorly developed so they *cannot* rinse and 'spit-out' like an older child or adult.

Surely we are entitled to ask why the warning labels were ever taken off fluoridated pastes. Was it simply to accommodate the multi-nationals who can achieve far greater sales of their products in supermarkets than they would if restricted to chemist shops?

And what about the role of the dental profession? The "proven decay fighter" COLGATE FLUORIGUARD even carried the logo of the Australian Dental Association stating - CERTIFIED PRODUCT.

What was involved in this certification? Can anyone imagine the Australian Medical Association 'endorsing' one particular over-the-counter painkiller above all others?

Any manufacturer of analgesics would pay a king's ransom for such an endorsement. How much has Colgate paid the ADA to become 'market leader' in Australia?

The Dental Health Education and Research Foundation[35] has close links with the ADA and is a body with the expressed objective of "improving dental health education and improving dental research". However, it seems to devote most of its effort to promoting fluoridation and the use of fluoridated dental health products.

In 1980 it had six 'governors' - representatives of COLGATE-PALMOLIVE, JOHNSON and JOHNSON, COOPER LABORATORIES, BEECHAM Pty. Ltd., STAFFORD MILLER, and the NSW Department of Health. The 'governor' entitlement comes through the donation of $3,000 or more to the DHERF. Needless to say, all the commercial 'governors' represent companies making fluoride-containing dental health products.

COLGATE-PALMOLIVE has also produced a whole range of costly pamphlets and leaflets extolling the miraculous properties of fluoride which are made freely available to dentists for display in waiting-rooms. Furthermore, COLGATE manufactures a series of fluoride products for surgery use, or for recommendation for patient use at home. Like their toothpaste NOT ONE OF THESE PRODUCTS HAS BEEN TESTED FOR POTENTIAL TOXICITY, and they certainly should have been.

Let's look at some of them.

LURIDE FLUORIDE TABLETS

Fluoride tablets were first manufactured for dental use in the late 1940's. Each tablet contains 2.21 milligrams of sodium fluoride - which is the lethal dose for a

mouse, which shouldn't surprise anyone because until it became a dental 'miracle', sodium fluoride was sold as a potent rat-poison. Originally, the tablets were designed to be dissolved in *one litre of water,* hence creating fluoridated water at 1 part per million. But, few mothers could be persuaded to buy the tablets then prepare the 'treated' water, so manufacturers made pleasantly flavoured tablets to be chewed and swallowed.[36]

However, this meant the child received a dose of 1 mg fluoride when it swallowed one tablet instead of the *divided* and *diluted* dosages it would receive by drinking 1 litre of fluoridated water in say, five sittings.

Lets return to the anti-cholinesterase activity of fluoride and our toddler who swallows about 0.5 mg fluoride every time the child brushes its teeth. The child leaves the bathroom after cleaning its teeth; in the kitchen the mother gives the child a pleasantly flavoured fluoride tablet. The child has now ingested 1.5 mg of fluoride in a short space of time.

As a result, the plasma fluoride level surges to around *0.4 parts per million.* A LEVEL THAT COULD INHIBIT CHOLINESTERASE ACTIVITY BY AROUND 30 per cent!

And, there's another problem. Drop a fluoride tablet into a litre of water and the compound - sodium fluoride - dissociates into its component parts, i.e. sodium (Na^+) and fluoride ion (F^-). However, when a fluoride tablet enters the stomach it meets hydrochloric acid (digestive juices) and this can react with the fluoride to form highly corrosive hydrofluoric acid which can damage the stomach wall.

Anyone who has been persuaded to give their children fluoride tablets should realise that EACH TIME THEY DO SO THEY ARE ADMINISTERING A SMALL DOSE OF A POTENT RAT POISON. Please don't do it.

COLGATE'S THIXO-FLUR TOPICAL GEL

This product is designed for application to children's teeth by a dentist or dental therapist. How on earth the product (and others like it such as COLGATE LURIDE TOPICAL GEL, and COLGATE LURIDE TOPICAL SOLUTION) was allowed on the market is a mystery. Except that it makes money for dentists and promotes the close links between COLGATE and the profession - ONLY YOUR DENTIST CAN GIVE A BETTER FLUORIDE TREATMENT!

THIXO-FLUR contains: 131 mg sodium fluoride (NaF),
25.5 mg hydrofluoric acid (HF), and,
57.2 mg phosphoric acid.
PER *5 millilitres.*

The standard container contains 940 millilitres.

Each application of gel delivers about 5 ml, hence the patient is exposed to 131 mg sodium fluoride and 25.5 mg hydrofluoric acid for 4 to 5 minutes. As the gels are both acidulated and flavoured (raspberry, bubble-gum, orange, etc.), they stimulate salivation which leads to the swallowing of excess saliva and gel during treatment. Adverse reactions following gel applications to both children and adults have been reported.[37]

In 1980, researchers at Sweden's famed Karolinska Institute[38] reported that in a 25 year-old adult weighing 54 kg plasma fluoride levels of just over *1 ppm* were reached 30 minutes after gel treatment. This level is close to those which may result in impaired kidney function to say nothing of the anti-cholinesterase effect. The authors of this study said:

> *"Since the use of fluoride gels is increasing, and twice daily applications at home has been recommended even for small children (W. J. Loesche and T. Pink, IADR Progress and Abstracts 58, 815, 1979), the findings of the present experiment should be taken into account when doses of fluoride are discussed as in the case of small children."*

More recently,[39] the same team of researchers found that in a child undergoing gel treatment, the subject, who weighed 22 kg, ingested fluoride equivalent to 1.8 mg F per Kg body weight. This resulted in plasma fluoride levels which *peaked at a staggering 1.5 parts per million fluoride.*

In one of their most recent papers the Swedish scientists studied the effects when volunteers swallowed about 30 mg of fluoride - the amount some children inadvertently swallow during gel treatment - they observed:

> *"A layer of clotted blood was found over a large part of the gastric mucosa."*

The authors of the studies suggested that the widespread use of fluoride gels should be reviewed in light of their findings.[40] But, their report was published in the *British Medical Journal,* and few dentists read medical journals, after all, they are primarily interested in teeth.

The toiletry companies which manufacture fluoride-containing dental health products enjoy the best of two worlds. They claim the products help prevent a disease - tooth decay, and this should mean that the products are categorised as *medicinal products.* BUT, such products must undergo extensive testing to establish their 'parameters of toxicity' before they are permitted onto the market. However, dental health products are classified by regulatory bodies as 'topicals' (for surface use only), or 'toiletries', which require no testing.

The multi-nationals who have made billions of dollars marketing untested fluoride-containing products should be required to withdraw all such products from the market until each and everyone of them has been tested for toxicity in the manner now mandatory for medicinal products.

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Tissue response of gastric mucosa after ingestion of fluoride

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Fluoride has been used successfully to prevent dental caries and has also been used to treat osteoporosis. Doses of sodium fluoride of about 50 mg a day have long term beneficial effects on the mineral content of bone and the incidence of fracture.[1] These doses, however, have resulted in gastric disturbances in some patients.[1,2] We studied the response of the gastric mucosa after a single dose of fluoride.

Methods and results

Twelve healthy volunteers (age range 22-45, four men and eight women) underwent two endoscopies after overnight fasts. One endoscopy was a control and the other was performed two hours after subjects ingested 20 ml sodium fluoride solution containing 20 mg fluoride (53 mmol/l). There was at least two weeks between endoscopies to assure complete recovery of the mucosa in case of iatrogenic injuries from the gastroscope. During the endoscopy the mucosa was graded according to an arbitrary scale (0 to 4), slightly modified from that of Lanza.[3] The stomach was also videotaped and the tape later examined by another gastroenterologist. The results of both examinations were similar ($p<0.01$, Wilcoxon's signed rank test). Two biopsy specimens were taken from the antrum and two from the body of the stomach. The histopathological changes were assessed on an arbitrary scale from 0 to 3.

After taking fluoride all subjects had petechiae or erosions (graded 3 or 4) in the body of the stomach and six had changes (graded 1-4) in the antrum. No petechiae or erosions were recorded in the oesophagus or the duodenum. In four subjects a layer of clotted blood was found over a large part of the gastric mucosa. The table shows the results of the macroscopic and microscopic evaluations. Three components of the gastric mucosa were affected by fluoride: the surface epithelium, the gastric pits, and the superficial stroma. The damaged epithelial cells were smaller than undamaged ones, and the vacuoles containing mucus were reduced in size or had disappeared. The most severely damaged epithelium was disrupted or totally lost. The most characteristic changes in the gastric pits were irregular dilatation and flattening of the epithelial cells. There was also a noticeable loss of mucin.

Results of macroscopic and microscopic evaluations of gastric mucosa and presence of nausea at control endoscopy and endoscopy after ingestion of 20 mg fluoride

Case No	Macroscopic evaluation*				Microscopic evaluation†				Nausea
	Body of stomach		Antrum		Body of stomach		Antrum		
	Control	Fluoride‡	Control	Fluoride‡	Control	Fluoride‡	Control	Fluoride‡	
1	1	4	0	4	0	2	0	2	Present
2	0	4	0	2	0	2	0	2	
3	0	4	0	2	0	3	0	2	Present
4	0	4	0	0	0	2	0	2	
5	0	4	0	1	0	2	0	1	
6	0	1	0	3	0	1	0	2	Present
7	0	4	0	0	0	3	0	1	
8	0	3	0	0	0	1	0	0	
9	0	4	0	0	0	2	0	2	
10	0	4	2	0	0	1	0	2	
11	0	4	0	2	0	1	0	0	Present
12	0	4	0	0	0	1	0	1	

*Arbitrary scale: 0 = normal, 1 = one petechia or erosion, 2 = two to five, 3 = six to 10, 4 = > 10.
†Arbitrary scale: 0 = normal, 1 = either change in surface epithelium with oedema and haemorrhage of stroma or damage to gastric pits, 2 = damage to both surface epithelium and gastric pits, 3 = as 2 combined with acute inflammatory cellular response.
‡ = Significant difference between fluoride and control according to Wilcoxon's signed rank test, $p<0.01$.

Comment

Our study showed that one ingestion of fluoride at a dose used to treat osteoporosis affects the gastric mucosa. We do not know, however, to what extent repeated doses affect the mucosa, which might adapt after a while, as occurs with regular treatment with aspirin.[4] Our findings confirm data from experiments on animals, which showed that fairly low concentrations of fluoride can damage the surface of the gastric mucosa.[4]

The low pH of gastric juice and the formation of hydrogen fluoride probably caused the mucosal injuries. The uncharged molecule can easily penetrate the lipid cell membranes, enter the cell, and dissociate to fluoride and hydrogen ions, which may have toxic effects on enzyme systems and cause structural damage.

Symptoms like nausea and vomiting are not unusual when fluoride is used to treat osteoporosis.[2] They also occur occasionally when high doses are used for dental prophylaxis.[1] In our study only four subjects developed nausea, which suggests that using nausea as the first sign of fluoride toxicity might not be valid as all our subjects showed mucosal damage.

Finally, our results are also clinically important in dentistry because as much as 30 mg fluoride may be swallowed by children after prophylactic treatment with fluoride gel (1·23% fluoride).[5] If the risk of subsequent gastric injury is as high as our results suggest the use of such large amounts of fluoride in children should be questioned.

Part of this study was supported by grants from the Swedish Medical Research Council (No 6002) and the

"NESTLE AND THE OTHER COMPANIES MADE A LOT OF MISTAKES....."

(M. Muller, *The Health of Nations,* Faber and Faber, London 1982).

Its not part of my brief to argue the relative merits of human breast milk versus manufactured infant formulas.

However, I'm going to mention a point which is often missed by the layman. The human baby at birth is not fully developed.

Of course this is obvious in terms of speech, sitting, standing, and walking; what is less obvious is that the organs - the brain, kidney, heart, liver, and so on - are also not fully developed.

Hence the baby fed on milk from other animals may be deprived, during this crucial period of development, of essential nutrients for future mental and physical development.

The baby may not realise his full IQ potential in adult life. He may have 'seeds' of coronary heart attacks, kidney failure, etc., laid down the moment he is born because he has been denied his birthright - human breast milk.

Many authorities believe that manufactured infant formulas are a poor substitute for human milk particularly during the early weeks of life of the rapidly developing baby.

Which brings us to a serious situation which has developed; and this concerns the fluoride content of infant formulas. In 1980, The Victorian Committee of Inquiry into Fluoridation[41] claimed:

> *"Manufactured infant foods are invariably low, to very low in fluoride, commonly less than 0.2 ppm F. on a fresh weight basis."*

Even if this was true 17 years ago, it certainly isn't true today. Indeed, the 1991 Report of the National Health and Medical Research Council[42] warned mothers to: "avoid prolonged use of infant formulas."

The basis for their concern is spelt out in the following Table 2 which records fluoride levels in widely used infant formulas.

MEAN FLUORIDE CONCENTRATIONS OF INFANT FORMULAS [42]

Table 2

FORMULA	Fluoride concentration (ppm) of non-reconstituted powder/liquid	
	MEAN	RANGE
Enfamil	0.28	0.26 - 0.31
SMA	1.47	1.33 - 1.63
S26	1.89	1.71 - 2.14
NAN	3.74	3.28 - 3.98
Digestelac	0.14	0.04 - 0.24
Enfelac	0.22	0.17 - 0.25
Lactogen	0.91	0.50 - 1.36
Delact	1.60	1.22 - 1.86
Pregestemil	2.83	2.60 - 3.24
Infasoy	0.32	0.14 - 0.45
Proso Bee (liquid)	0.68	0.66 - 0.70

Commenting on these figures the 1991 NH MRC working group on fluoride noted:

> *"These findings, and the evidence that the duration of infant formula usage is a risk factor for dental fluorosis, suggest a need to limit infants' ingestion of fluoride.*
>
> *Manufacturers should assume that infant formula will be reconstituted in fluoridated areas. It is therefore preferable for manufacturers to use non-fluoridated water in semi-constituted formula and to take other measures which may be necessary to reduce the concentration of fluoride in manufactured infant formulas. The public could then treat it as equivalent to breast milk or cow's milk (i.e. negligible fluoride content)".*

There are two points to note here. The first is that the NH MRC are rightly concerned that fluoride in infant formulas could cause dental fluorosis, far more important, however, is that infant formulas with high fluoride content may be a contributing factor in some cases of *Sudden Infant Death Syndrome* (SIDS).

The second point is that the NH MRC mention, in passing, that human breast milk has a negligible fluoride content. In fact, *nature* ensured that even if the mother lived in a fluoridated area, breast milk contained only 0.01 parts per million fluoride, yet NESTLE'S NAN INFANT FORMULA CONTAINS NEARLY 4 PARTS PER MILLION FLUORIDE.

In the early 1970's scientists confirmed the low fluoride content of human breast milk and this posed a problem for the promoters of fluoridation. Surely nature couldn't know best?

The 'father of fluoridation' in Australia, Professor Noel Martin, of Sydney University, addressed the problem and published an article in the *Medical Journal of Australia* [43] entitled, "Optimum Fluoride Intake,." The article was endorsed by the NSW Department of Health and "adopted as a statement of policy on this matter."

Professor Martin said:

> *".... as the amount of fluoride excreted in breast milk is extremely low"*
> *...."the breast-fed child should be given a fluoride supplement even though the mother is consuming fluoridated water."*

Martin recommended "half a milligram of fluoride per day for children to the age of one year".

It seems logical to assume that breast milk contains optimal amounts of nutrients for proper development of the child, and the absence of a particular substance is *evidence that the substance is not required for normal development of the child.*

In 1978, Professor Arvid Carlsson of the University of GOTEBORG,[44] Sweden, pointed out that animal experiments have shown that some chemicals can: "produce specific permanent disorders in the learning ability and other subtle behavioural components," he said:

> *"One wonders what a 50-fold increase in the exposure to fluoride, such as occurs in infants bottle-fed with fluoridated water - diluted preparations, may mean for the development of the brain and other organs."*

But it isn't just a 50-fold increase! A paper published in the September 1981 edition of the *British Medical Journal,*[45] pointed out that babies in fluoridated areas who drank formulas made up with water containing 1 ppm fluoride, are ingesting 100 TIMES THE AMOUNT OF FLUORIDE THEY WOULD OBTAIN FROM MOTHER'S MILK.

The researchers demonstrated that there is a physiological plasma/milk barrier against fluoride which protects the infant from the chemical. They suggested:

> *"Hence the recommendation made in several countries to give breast-fed infants fluoride supplements should be reconsidered."*

One in the eye for Professor Martin you might imagine? Not at all. The Swedish studies published in the *British Medical Journal,* were totally ignored by Australian Health Authorities.

On 14th November 1991 - 10 YEARS AFTER THE *BMJ* ARTICLE - the Victorian Minister of Health, Mrs Maureen Lyster, wrote to the Hon. Geoffrey Connard in reply to a question he asked in the Legislative Council relative to the NH MRC warning on fluoride overdosing of babies with infant formulas made up with fluoridated water. In her reply the Minister avoided specifics and stated:

> *"For example two strategies aimed at reducing the fluoride swallowed by young children from toothpaste are under consideration."*

NO MENTION OF INFANT FORMULAS - PARTICULARLY, NESTLE's NAN, A MARKET LEADER WHICH IS AVAILABLE NOT ONLY IN CHEMISTS, BUT ALSO IN SUPERMARKETS.

Consider the following letter from the Sudden Infant Death Research Foundation dated April 1992, in reply to a suggestion made to them that fluoride might be involved in some cases of SIDS. The research officer at the Foundation said:[46]

> *"During the years 1988 - 1990 the SIDS in Victoria was 1.91 per 1000 in fluoridated areas, and 1.71 per live births in non-fluoridated areas. As you will appreciate there is no significant difference between the two areas."*

The research officer went on:

> *"I do not believe that using infant formula and baby food would result in an infant receiving more than 1 part per million of fluoride, since fluoride is not added to these foods during manufacture."*

To start with there is a difference of 10 per cent showing less SIDS in non-fluoridated areas, but more importantly we are talking about *total fluoride intake from all sources* - not just the amount received from treated water. NESTLE's NAN formula contains about 3.74 ppm fluoride while Enfelac, for instance, contains far less - 0.22 ppm fluoride. If the two formulas were made up with fluoridated water, then the baby receiving NAN would be ingesting significantly more fluoride than the baby drinking Enfelac. And suppose the NAN mother had been told by her physician to give the baby *fluoride tablets*?

And one must ask what the 'research officer' means when saying the infant wouldn't receive more than 1 part per million of fluoride. This is an expression of concentration, not dosage!

The Victorian public has donated large amounts of money to the Sudden Infant Death Research Foundation, and researchers around the world are still seeking the cause, or causes, of SIDS.

Fluoride is a known anti-cholinesterase agent. NATURE designed human breast milk to be essentially free of fluoride. Even the NH MRC admit that the fluoride content of infant formulas may lead to an excessive intake of the chemical. Their chief concern is dental fluorosis; have they even considered the possibility of an association between fluoride and SIDS? If not, why not? After all, it shouldn't be

difficult to establish whether or not certain baby formulas were associated with SIDS.

Of course, the NESTLES of this world, like the ALCOAS and the COLGATE-PALMOLIVES will go to great lengths to prevent or suppress any adverse publicity. Not many years ago, NESTLES and other infant formula manufacturers were confronted with proof that many Third World children were dying through the inappropriate use of their products - yet they refused to accept any responsibility. So crass and insensitive was their response that they succeeded in uniting 118 of the 122 WHO member countries which voted to recommend that all governments introduce stringent controls to force the companies to face their responsibilities.

This brings us to the crux of the matter. Who makes the rules in the "Secret War?" Society, through its elected representatives, or the MULTI-NATIONALS with their seemingly bottomless purses, and 'hired' experts?

The first person to raise the spectre of a possible 'Secret War', was the French physicist, Frederic Joliet-Curie, over 45 years ago. He was the chap who first demonstrated that in atomic fission, vast amounts of energy were liberated. In the tiniest fraction of a second, the chain reaction would generate an explosion of unprecedented power. Joliet-Curie confirmed without doubt that an atomic bomb could be made.

He published his results in *Nature* (22 April 1939), and incurred the wrath of all his colleagues. They believed Joliet-Curie should not have published. The information was too 'dangerous', 'people wouldn't understand it', 'they would misinterpret it.'

But Joliet-Curie believed scientists MUST publish their findings - in the open literature. After the war he challenged the scientists who had worked on the Manhattan Project. Behind the sky-high walls of secrecy they had produced the BOMB. They had condoned the secrecy, so that it became the physicist's Bigger and Better Bomb, without any account being taken of the biological effects of radiation, without any of the premonitions, safeguards, and interdisciplinary reminders that come from free scientific exchanges - and without any sanctions on its use which proper information exerts.

Joliet-Curie extended the example of nuclear security to biological security. He foresaw the day when chemicals in widespread use would *very insidiously,* lead to crop failures, devastation of livestock, mysterious new diseases affecting human populations, and a slow but steady increase in genetic diseases. And the reason, he argued, would be because in certain areas at least, science would lose its objectivity.

Powerful forces, such as multi-nationals or totalitarian governments, could quite easily 'prostitute' science to their own advantage by suppression or intimidation of any scientist who challenged their objectives.

FREE DISSEMINATION OF INFORMATION AND OPEN DISCUSSION IS AN ESSENTIAL PART OF THE SCIENTIFIC PROCESS.

This is because each separate study of nature yields an approximate result, and inevitably contains some errors and omissions. Science tries to get at truth by a continuous process of self-examination which remedies omissions and corrects errors.

This process requires free disclosure of results, general dissemination of findings, interpretations, conclusions, and widespread verification and criticism of results and conclusions.

In the FLUORIDE CONSPIRACY, the dental profession became the respectable *front* for the most cruel hoax in the history of medicine. The fact that fluoride, (because of its toxic potential) could help reduce the incidence of a minor ailment - tooth decay - was ruthlessly exploited by some of the most powerful industrial and commercial groupings in present-day society.

But its time to do something about it. To challenge ALCOA, COLGATE-PALMOLIVE, NESTLES, Australian Health Authorities, and certain sections in the Australian Dental Associations.

It's time to persuade ALCOA to track down the 'mysterious' agents in the pot room which are disabling workers at the Point Henry and Portland smelters. It's time to persuade the EPA to routinely monitor the air over Victorian cities - especially Geelong - for fluoride gases, which may well be contributing to the growing incidence of asthma.

It's time to convince COLGATE-PALMOLIVE to withdraw all their fluoridated dental health products from the market until each and every one of them has been tested for toxicity in the way required for 'medicinal' products.

It's time to demand that the Sudden Infant Death Research Foundation seriously study the possibility of a link between high fluoride intake and some cases of SIDS.

Clarifying the toxic potential of fluoride requires further research, and research costs money. But lets extend the principle of POLLUTER PAYS to include POISONER PAYS. ALCOA, COLGATE-PALMOLIVE and NESTLES aren't short of money.

ALCOA has a duty to demonstrate, unequivocally, that its manufacturing processes are safe, both to workers in the smelters and people living near to them. PROCTER and GAMBLE, COLGATE-PALMOLIVE and NESTLES have a duty to show, beyond reasonable doubt, that their products are safe to those who use or consume them.

As for the politicians. Well, where do we begin? What we don't want are 'Inquiries' into fluoride with such restrictive terms of reference that the result is a

foregone conclusion. We don't want politicians who act as lap-dogs for overseas business-men. Nor do we need politically-orientated scientists who can be hired to do their master's bidding.

Of course there are problems! Politicians are increasingly being asked to make decisions about environmental and health issues which have enormous implications for key sectors of industry. Very often they have to do it on the basis of evidence which can be interpreted in a variety of ways. Then there is the argument that all consumers contribute to pollution by the very act of consumption. Every aluminium can purchased by members of society contributes to the emission of fluoride by the industry; but aluminium cans are only produced because the public buys them.

It is, at the present time, unrealistic to argue for zero pollution. But Australia should have pollution controls *at least as stringent* as those existing elsewhere in the world; and it must have Environmental Protection Authorities that can enforce the regulations - even if the culprit is an extremely powerful American based multi-national.

Contamination of the environment by pollutants is everybody's concern. Every aspect of environmental pollution is important whether of earth, air, water, or foodstuffs.

The first and most important target in dealing with the environment is to try and make it safe. We cannot, of course, create a world entirely free of risk, but no individual or population should be compelled to expose themselves to *preventable* risk of disease or disability as a condition of employment, or as a condition of urban and rural living.

Today, the air over our cities contains many dangerous substances; tens of thousands of workers in many industries are exposed to hazardous chemicals in the workplace; and dozens of harmful chemicals can be detected in our food and water.

In this monograph I've focused on fluoride - the "protected" pollutant because over the past 50 years fluoride compounds have been allowed to increasingly contaminate the total environment. On the other hand, our knowledge about the biological effects of this element remains incomplete and highly controversial.

Dentists will argue, correctly, that mankind has always been exposed to fluoride in the environment. We have also been exposed to *trace* amounts of arsenic, lead, cadmium, and background radiation. The human body can handle certain levels of potentially harmful substances, there's no doubt about that. But, remember, there are 'threshold levels' above which the poison begins to harm the body or the way it functions. Since each one of us is metabolically unique, some people are more sensitive to fluoride than others. Today, a significant proportion of the fluoride that enters the human body is from modern man-made sources, and all the indications are that you and your family are now being over-exposed to what scientists in the Manhattan Project named - the Devil's Element.

LITIGATION ON AN UNPRECEDENTED SCALE

Finally, I'm going to try and answer the $64,000 question. If fluoride can do the sort of damage to human health that I have described in this monograph, then how on earth can Health Authorities accept the situation?

THE ANSWER IS, FEAR OF LITIGATION. Litigation on an unprecedented scale. Indeed, the dental profession stands on the brink of disaster; and the US Public Health Service and similar bodies in many countries, face the greatest crisis in their history.

Because of the dental profession's infatuation with fluoride, *tens of millions* of people around the world have 'mottled' teeth caused by fluoridated drinking water, fluoridated dental health products, or fluoride air pollution. The evidence is inescapable.

It's no good dentists saying that with modern restorative materials, the blemishes can be hidden. Cosmetic dentistry is costly - but it is very profitable for dentists!

THE PROFESSION'S PROMOTION OF FLUORIDE PREVENTIVE MEASURES HAS CREATED A HUGE DEMAND FOR COSTLY COSMETIC DENTISTRY! YET FOR YEARS DENTISTS ARGUED THAT IN PUSHING FLUORIDE THEY WERE DOING THEMSELVES OUT OF WORK!

Well, the litigation is starting.

AND ONCE A JURY ACCEPTS THAT FLUORIDE CAN HARM DEVELOPING TEETH, THEN HOW LONG BEFORE SOMEONE POSES THE OBVIOUS QUESTION: IF FLUORIDE CAN DAMAGE TOOTH CELLS, WHAT OTHER CELLS AND TISSUES IN THE HUMAN BODY MIGHT IT BE HARMING?

The flood-gates will open. Over the next decade it is quite conceivable that in North America, Britain and Australia, at least 15,000,000 people will be seeking damages for 'mottled' teeth from toothpaste manufacturers, local authorities who permitted fluoridation and dentists. A lot of money will be involved; even at $10,000 a time, a pretty modest sum these days, we are talking about $150 BILLION.

Are you beginning to get the picture? The dental profession, Federal and State health authorities, and certain important industries, CANNOT now admit that fluoride has been damaging human health; the consequences are almost unthinkable.

Mistakes have been made in medicine before - but never on such a grand scale! Because we are not just talking about mottled teeth. The 'mysterious' agents in the pot rooms of aluminium smelters are fluoride gases, there is very little doubt about that. And *they*, are causing pot room asthma and *cancer*. And what about the high levels of fluoride in NESTLE's NAN baby formula? COULD THAT BE RELATED TO SOME CASES OF SIDS? It's an almost impossible situation, but something has to be done about it.

As Professor Albert Schatz, a long-time opponent of water fluoridation, has pointed out, Emile Zola once wrote:

> *"If you shut up the truth and bury it under the ground, it will but grow and gather to itself such explosive power that the day it bursts through it will blow up everything in its way."*

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11. (on the opposite page)

11. (Cont'd.)

The following table shows the worst fluoride air polluted cities in the US and the years their drinking water was fluoridated.

Table 3

LOCATION	HYDROGEN FLUORIDE in AIR	YEAR ARTIFICIAL FLUORIDATION STARTED
Pittsburgh	HIGH	1952-1953
Baltimore	HIGH	1952
Chicago	HIGH	1956
Cleveland	HIGH	1953
Milwaukee	HIGH	1955
St. Louis	HIGH	1954
Philadelphia	HIGH	1954
San Francisco	HIGH	1952
Buffalo	HIGH	1955
Denver	HIGH	1954
Oklahoma City	HIGH	1954
Indianapolis	HIGH	1951
note: HIGH means up to 80 parts per billion hydrogen fluoride; LOW means from 0 to 10 parts per billion HF.		
There was obviously no rush to fluoridate the following cities!		
Atlanta	LOW	1969
Seattle	LOW	1969
San Antonio	LOW	not to date
Dallas	LOW	1966
Boston	LOW	not to date
Newark	LOW	not to date
Los Angeles	LOW	not to date

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APPENDIXES

APPENDIX 1: HOW FLUORIDE PREVENTS CAVITIES AND WHY THE MECHANISM INVOLVED CAN BE HARMFUL TO OTHER CELLS AND TISSUES WITHIN THE HUMAN BODY

APPENDIX 2: FLUORIDES IN GENERAL MEDICINE

APPENDIX 3: WATER FLUORIDATION AND CANCER

APPENDIX 4: TERMINOLOGY

APPENDIX 5: INDUSTRIAL SOURCES OF FLUORIDE IN THE ENVIRONMENT

APPENDIX - for the more technically minded.

APPENDIX 1.

HOW FLUORIDE PREVENTS CAVITIES AND WHY THE MECHANISM INVOLVED CAN BE HARMFUL TO OTHER CELLS AND TISSUES WITHIN THE HUMAN BODY

Despite their fatal fascination with fluoride for fifty years, dentists still insist that the precise mechanism by which fluoride prevents tooth decay is, *"unclear"*.

They argue, because they have been told to, that:

> *"Fluoride probably reduces caries because it possesses a unique combination of properties all of which may play some part."*[a]

They also claim that the precise manner in which fluoride can produce 'mottled' teeth is also *"unclear"*.

Some of you, I'm sure, will find it hard to believe that the profession could promote fluoride so vigorously while the answers to two key questions remains *"unclear"*.

But, in *1986*, the US National Preventive Dentistry Demonstration Program (NPDDP), the largest and most comprehensive preventive dentistry program ever conducted, published its Report.[b] Amongst the conclusion was the following:

> *"A second important principle arising from this project is that it is very dangerous to neglect basic research into the mechanism of action of preventive measures while pushing ahead with their practical application. The case in point here is that basic research to reveal the mechanism of action of fluoride in the prevention of dental decay and the reason it may produce dental fluorosis has not been a major area of research supported by the National Institute of Dental Research, while clinical studies have received emphasis. As a consequence, the mechanism of action of fluorides still is unsettled...."*
> (EMPHASIS IN ORIGINAL)

In other words, we still do not know how fluorides prevent cavities or cause mottling of teeth.

RUBBISH!

We have known the "mechanism of action of fluorides" for years; but to admit the obvious is to focus upon the *toxic potential* of fluoride. I'll explain.

Tooth decay is caused by bacteria - single-celled organisms, which, like all cells - both animal and vegetable - are extremely sensitive to fluoride, which above certain concentrations, is a potent poison.

The most common bacterium implicated in the cause of caries is *Streptococcus mutans.* Levels of fluoride above 20 parts per million are lethal to *S. mutans;* levels as low as 0.19 ppm F. can interfere with certain essential metabolic enzymes in the bacterium; and concentrations of fluoride between 4 and 20 ppm can cause *S. mutans* to - mutate.

In other words, fluoride is an anti-microbial agent of great potency.

The development of a cavity in a tooth proceeds in the following manner. *S. mutans* (or other cariogenic bacteria) must first gain attachment to the tooth surface. Once attached, and given a suitable food supply, the bacteria thrive and multiply, producing colonies - dental plaque.

Within the plaque millions of microbes are consuming carbohydrates and excreting *dilute acids* as waste products.

These acids begin to eat away - demineralize - the surface layers of the tooth enamel. As a result, the enamel is broken down into its component parts, which include, calcium, phosphate, carbonate and *trace amounts of fluoride* (which was incorporated into the enamel as it developed).

Gradually, the fluoride level in the plaque fluid builds up. When it reaches 0.19 ppm the metabolism of the bacteria slows down - less food is consumed and fewer acid wastes produced. As the level rises above 4 ppm fluoride, the 'mutation rate' of the bacteria increases dramatically. Finally, as the fluoride concentration in the plaque rises to lethal levels, the bacteria die. And, there may even be some re-mineralisation of the enamel.

Wonderful, a cavity has been prevented! But all this has taken place on the *surface* of the body, not inside it.

And, of course, fluoride is not the only element that can prevent decay in this way. ANY POTENTIALLY TOXIC ELEMENT WHICH CAN BECOME INCORPORATED IN TOOTH ENAMEL, SUCH AS THE *BONE-SEEKING ELEMENTS* - RADIUM, URANIUM, CADMIUM, LEAD AND STRONTIUM-90, WILL KILL CARIOGENIC BACTERIA AS THEY ARE RELEASED FROM ENAMEL AS A CONSEQUENCE OF THE DE-MINERALISING EFFECT OF THE MICROBES' ACID WASTES.

Now, trace amounts of fluoride are present in bone mineral - which is very similar to the mineral in tooth enamel. However, there is a crucial difference between bone and enamel. Once fully formed, tooth enamel is static - it doesn't undergo metabolic changes. Bone, on the other hand, is constantly being re-modelled. This involves 'old' bone being resorbed and 'new' bone laid down.

Cells called osteocytes and osteoclasts dissolve the 'old' bone and osteoblasts help form 'new' bone.

ALL BONE CONTAINS SOME FLUORIDE, and as old bone is dissolved it is released into the vicinity of the resorbing cells, and evolution has ensured that the bone cells can withstand *very low* levels of fluoride.

But, just as the cariogenic bacteria can be harmed by excessive levels of fluoride, so too can bone cells *and* bone marrow cells - which include the progenitors of immune system cells.

The events described above explain the symptoms associated with both dental and skeletal fluorosis; unfortunately they also raise the spectre of bone cancer and leukaemia.

In 1984, a well-respected Japanese scientist, Takeki Tsutsui published a series of papers in the international journals, *Cancer Research* and *Mutation Research.*[c] The results of his experiments indicated that sodium fluoride is genotoxic (can damage DNA) and, "capable of inducing neoplastic transformation of Syrian hamster embryo cells in culture."

Tsutsui concluded:

> *"A potential for carcinogenicity of this chemical, which is widely used by humans, is suggested."*

Since then Tsutsui's findings have been confirmed by reputable, independent researchers in both England and the United States.[d]

In 1990, the US National Toxicology Program released a report titled:

> "Toxicity of Sodium Fluoride."[d]

One significant finding was the occurrence of an extremely rare form of liver cancer, hepatocholangiocarcinomas, in fluoride-treated male and female mice. In another study, osteosarcomas (bone cancers) were found in one mid-dose male rat, and three high-dose male rats. An additional subcutaneous osteosarcoma was found in a fourth high-dose male rate.

Initially, and referring to this report, a memo from the office of Michael Cook, the chief drinking water official at the US Environmental Protection Agency, noted:

> *"Very preliminary data .... indicate that fluoride may be a carcinogen."*

This produced the following response from John Sullivan, deputy director of the American Water Works Association:

> *"My God - you can well imagine the ramifications if we had evidence that fluoride was a carcinogen. The toothpaste industry would go crazy."*[e]

Of course it wouldn't only be the toothpaste industry that went "crazy". What about the US Public Health Service and the Dental Profession, not to mention Sullivan's own colleagues in the water business.

In fact, the US National Toxicology Program Report provides evidence that fluoride is a carcinogen.

But, there have been many strange twists in the Fluoride Conspiracy. The evidence is there for everyone to see, so what can the US PHS do? They play with words. They admit the evidence but call it EQUIVOCAL - maybe the fluoride caused the cancers, maybe it didn't. And that is supposed to satisfy everyone - you, me, dentists, toothpaste makers, politicians, and fluoride polluters.

It doesn't satisfy me. Are you happy about it?

I'm going to reproduce two letters and one short paper of mine which have appeared in the medical literature. The short paper which appeared in the specialist journal *Fluoride,* describes how dental fluorosis is caused (see p.155-57).

The two letters have interesting backgrounds. Remember the KGB, strontium-90 and bone? Well, in 1983, the US Surgeon General appointed an Ad Hoc Committee to investigate the "non-dental health effects of fluoride in drinking water."

Since teeth were excluded, most of the committee were medically qualified, and several were paediatricians. They met, and talked, and prepared their report. Unfortunately, they didn't see the final text of the report until after it had been published.

Several years later I met one of the paediatricians who had sat on that Ad Hoc Committee. He explained that the *draft report* - which he and his colleagues had prepared, was 'doctored' before publication. And one important section that was deleted from the final product concerned the issue of whether fluoride, by stimulating denser (but not stronger) bone, might lock ionising radiation into the bones for a dangerous length of time.

When the paediatrician complained about the missing section to the US PHS, he was told not to worry about it, "because in fact, fluoride can protect against ionizing radiation, its been known for some time that fluoride prevents the build-up of Strontium-90 in bones."

I thought it was time to publish the results of a study I'd done years ago which challenged the KGB theory on Sr^{90} and fluoridation (see p.151).

The second letter is interesting because the editor sat on it for nearly three years, and then, because the US National Toxicology Program report showed a

statistically significant increase in bone cancer, decided to publish it. A very honest editor! Which is rare when the subject is fluoride.

Strontium-90 and fluoride

Sir, – In 1967 it was claimed that levels of strontium-90 in human bones and teeth were lower in towns using fluoridated drinking water than in control towns with low fluoride water [1].

In 1983, however, the US Surgeon-Generals Ad Hoc Committee on the Non Dental Health Effects of Fluoride in Drinking Water expressed concern that an excessive fluoride intake might help hold radiation in the bones of young children for an undue length of time [2]. Global discharges of ^{90}Sr from nuclear power stations are about 2 10 ^{12}Bq per annum [3], and both France and China did not sign the nuclear test ban treaty of 1963. Recently, ^{90}Sr levels in the crowns of premolar teeth from a number of different locations were measured and compared.

Methods: Between 50 and 60 healthy premolar teeth (extracted for orthodontic reasons) were obtained from each of eight locations, six in the UK and Ireland, and two in Australia. The analytical techniques used were those described by Bryant et al [4] and Starkey et al [5]. Essentially, the separation of strontium from calcium depends on the preferential solubility of calcium in fuming nitric acid. The radioactive sources were counted in Geiger-Muller tubes arranged in anticoincidence with an overall background of less than one count/min. Natural strontium content was determined spectrographically by the methods of Bryant et al [6].

Results: Figures in Table 1 show the ^{90}Sr content of crowns of premolar teeth from paired locations differing in fluoride concentration in drinking water (pCi $^{90}Sr/g$ Ca).

Table 1.—Strontium-90 content of crowns of premolar teeth from paired locations differing in fluoride concentration in drinking water

Location	^{90}Sr content of crowns pCi $^{90}Sr/g$ Ca (SD)	p
Belfast (NF)*	0.65 (0.03)	<0.01
Dublin (F)**	0.69 (0.05)	
Hatfield (NF)	0.66 (0.04)	<0.05
Watford (F)	0.74 (0.03)	
Manchester (NF)	0.39 (0.04)	<0.01
Birmingham (F)	0.61 (0.03)	
Brisbane (NF)	0.48 (0.02)	<0.05
Sydney (F)	0.60 (0.04)	

* = not fluoridated
** = fluoridated

Data in Table 1 do not appear to support the long standing belief that the use of fluoridated water will reduce ^{90}Sr uptake by bone and developing teeth [1]. Excessive fluoride intake can lead to denser bones, due to the formation of mixed hydroxylfluorapatite which may inhibit osteoclastic bone resorption [7]; this in turn could interfere with normal processes of bone remodelling and the release of undesirable foreign ions [8]. A variety of elements other than the classical constituents of hydroxyapatite are found in bone. Fluoride is known to influence the metabolism of magnesium in bone [9], and may interfere with zinc metabolism in bone [10].

Possible interactions between fluoride and other foreign ions in bone, especially ^{90}Sr and ^{226}Ra, should be the subject of further research.

Yours faithfully,
Geoffrey E Smith,

South Yarra,
Melbourne,
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MUTATION RESEARCH

International Journal on Mutagenesis, Chromosome Breakage and Related Subjects

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Leiden, 13 March 1990

Dear Dr. Smith,

Coming to my office, I found a recent letter from Dr. John Ashby who runs a continuing series in Mutation Research entitled "Current Topics in Genetic Toxicology", concerning publication of your letter to the Editor received 18 November 1987. Ashby suggests that we should publish your letter now, preceded by his short introduction and followed by a referee comment made in 1987. In his accompanying letter he writes me as follows: "I enclose the Smith/Fluoride file. I've changed my mind, I think we should publish, for the reasons I've given. If you agree, can you get it in as soon as possible, because this topic will take off after the Peer review in April (at which I will be present). As it was I who eventually decided not to publish I think its appropriate if I sign the introduction so that responsibility is correctly located. I suggest you'd best let him know what we are doing, but he's unlikely to disagree. So I'd set it on its way in the press and comcomitantly send him a copy of my composite sheet.

I will try to bring this out as soon as possible in the section Genetic Toxicology Testing, and hope that you will agree on the course of how your letter is going to be published.

Sincerely yours,

F.H. Sobels,
Editor in Chief

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cc. Dr. J. Ashby

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Introduction

In November 1987, Geoffrey Smith submitted a short letter to *Mutation Research* drawing attention to the possible accumulation of fluoride ions in the extracellular fluid of bones. The speculative nature of the letter led to disagreements among the referees who had been consulted, and eventually it was decided not to publish. In February 1990, the United States National Toxicology Program (NTP) issued a press release indicating the date when the results of a rodent carcinogenicity bioassay of sodium fluoride would be peer reviewed. The possible chemical induction of osteosarcomas by fluoride was mentioned. Within that context it seems appropriate to publish the letter by Smith even though it will remain speculative until the rodent carcinogenicity of sodium fluoride is formally considered by the NTP in April 1990. For interest, part of the referee report provided by a medical consultant is reproduced after the Smith letter as it provides balance and illustrates the discussions that took place when the paper was first considered for publication in 1987.

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Letter to the Editor

Genotoxic effects of fluoride

Dear Sir,

A number of recent papers suggest that fluoride may be genotoxic at concentrations between 10 μg/ml and 300 μg/ml F. (Cole et al., 1986; Caspary et al., 1987; Scott and Roberts, 1987). As Scott and Roberts (1987) point out, genotoxicity observed only at high doses in vitro will be unimportant if such doses cannot be achieved in vivo.

In vitro, the lowest effective genotoxic dose was around 10 μg/ml NaF (which is equivalent to 4.5 μg fluoride ion). This concentration is about 100 times the steady-state level of fluoride in human plasma (0.02–0.06 μg/ml F), even in areas where water supplies are fluoridated (Scott and Roberts, 1987).

In 1970, Rich and Feist pointed out that fluoride accumulates in bone; they postulated that fluoride is concentrated mainly in a surface layer of mineral at the border of the osteocyte lacunae and canaliculae. If this hypothesis is correct, then any cells which resorb bone could be exposed to

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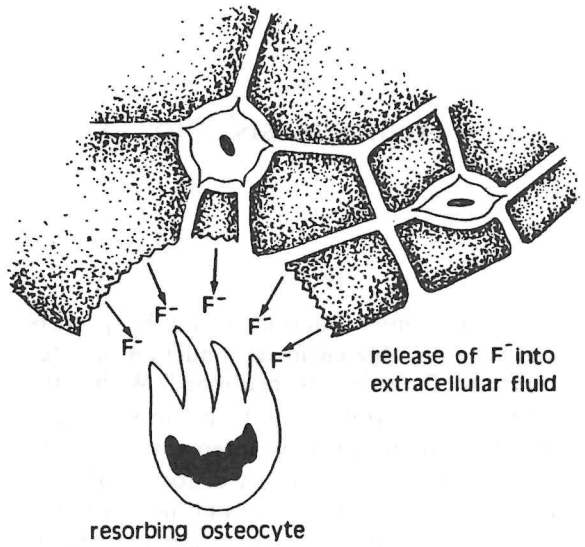

Fig. 1. Release of fluoride into extracellular fluid of bone. Note: Intense stippling represents areas of high concentration of fluoride.

significant concentrations of fluoride in extracellular fluid of bone during the resorptive process (see Fig. 1).

Other workers (Weatherall, 1969; Weatherall et al., 1982) have also suggested that local rises in the fluoride concentration in extracellular fluid of bone might be expected to affect nearby cells, and these could include bone cells and, bone-marrow cells.

The action of fluoride on bone is not yet clearly understood. Until it is, it is perhaps premature to assume that potentially genotoxic concentrations of fluoride cannot arise in extracellular fluid of bone.

Yours etc.,

Geoffrey E. Smith 11 November 1987
South Yarra, Melbourne 3141, Vic. (Australia)

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A referee comment made in 1987:

The details quoted in the first two paragraphs of this letter are correct, and certainly the logical next question is whether levels of the order of over 5 μg/ml could occur inside cells in humans. The scenario developed in Mr. Smith's letter is certainly theoretically possible — although I am unaware of any experimental evidence either for or against it and suspect that such information would be difficult to obtain. However, while osteoclasts may indeed by surrounded by fluid with a relatively high fluoride concentration, fluoride does not enter cells very easily and so it is perhaps less likely that the fluoride concentration *inside*, the osteoclast will be raised to the same extent.

Furthermore, one should perhaps point out that while there is evidence of in vitro genotoxicity of fluoride at levels over 5 μg/ml, an extensive range of in vivo mutagenicity tests are negative, and that the (admittedly few) epidemiological studies that have examined the incidence of bone sarcomas (either in those drinking artificially fluoridated water, or in those suffering from skeletal fluorosis) have not mentioned elevated bone sarcoma rates.

In conclusion, therefore, the hypothesis raised by Mr. Smith is an interesting one which is likely to be difficult to either prove or disprove. The human data that *is* available does not suggest that exposure to fluoride causes bone cancers, and this provides some reassurance that such an effect is unlikely to be significant in vivo. However, the letter may conceivably stimulate further work in this area, and therefore, on balance I would favour publication.

Editorial

THE PATHOGENESIS OF DENTAL FLUOROSIS

An Editorial Hypothesis

by

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Dental fluorosis is due to fluoride overdosage during the mineralization of the teeth. During the past decade new insights into the nature of the condition have been gained (1), but the exact mechanism by which dental fluorosis occurs is not yet fully understood (2). Taves and Guy (3) found that, in an area where average plasma fluoride levels were 4.2 µM/l (0.08 ppm F), there was an undesirable degree of dental fluorosis. Ericsson (4) has reported that plasma peaks of around 0.2 ppm F produce "mottling" in rat incisors; and Hodge (5) has suggested that dental fluorosis of moderate to severe degree can develop in man when plasma levels reach 0.05-0.1 ppm fluoride.

It is difficult to understand how such low concentrations of fluoride could interfere with normal cell function. Many workers have studied the in vitro effect of fluoride on cells (6-11). It seems clear that levels of at least 20 ppm F are required to affect cell growth and function; such levels are inconceivable in circulating plasma and extracellular fluid because they would be incompatible with life (12).

In 1970, Rich and Feist (13) proposed a hypothetical mechanism to explain the action of fluoride on bone. They suggested that fluoride is not evenly distributed throughout bone, rather, that it is concentrated in two specific regions, namely: 1] areas of bone formed when blood concentrations of fluoride are relatively high; and 2] the surface layer of bone immediately bordering on the osteocyte lacunae and canaliculae. After absorption of fluoride, its concentration in blood and extracellular fluid rises. Fluoride-containing extracellular fluid perfuses the osteocyte lacunae and canaliculae where presumably it is absorbed at this interphase and incorporated into the crystal lattice. Since it must pass from this region if it is to reach interlacunar bone, it can be concluded that the concentration in this region will be greater than in interlacunar bone. However, it is unlikely that fluoride would migrate deeply into interlacunar bone, since crystals in fully calcified bone are so closely packed as to partially exclude fluid and strongly impede diffusion of ions.

Accordingly, Rich and Feist postulate that fluoride is concentrated at the lacunar and canalicular surfaces. They conclude: a] Fluoride in bone is concentrated mainly in a surface layer of mineral at the border of osteocyte lacunae and canaliculae; and, b] That fluoride in extracellular fluid of bone is in a slow equilibrium with fluoride in this mineral phase.

If this hypothesis is correct, then any cells which resorb bone could be exposed to significant concentrations of fluoride during the resorptive process. This would hold for both osteoclasts and resorbing osteocytes which would be subjected to a concentration of fluoride approximately proportionate to the intensity of the resorptive process. Osteocytes however, which are entirely surrounded by surfaces on which fluoride may be concentrated, and which exist

further away from the blood stream, would be subjected to a higher concentration of fluoride upon resorbing bone than would the osteoclasts.

Bone resorption and new bone formation are processes that occur intermittently in all bones throughout the life of the individual. During the time of permanent tooth development and eruption, alveolar bone turnover is particularly rapid as tooth organs develop and grow, and their bony crypts enlarge to accomodate this growth. Figure 1 illustrates a developing tooth germ and Figure 2 represents some of the events which may occur when the crypt is being remodelled. The events illustrated in Figure 2 are self-explanatory. Any

Figure 1

Developing tooth in bony crypt.

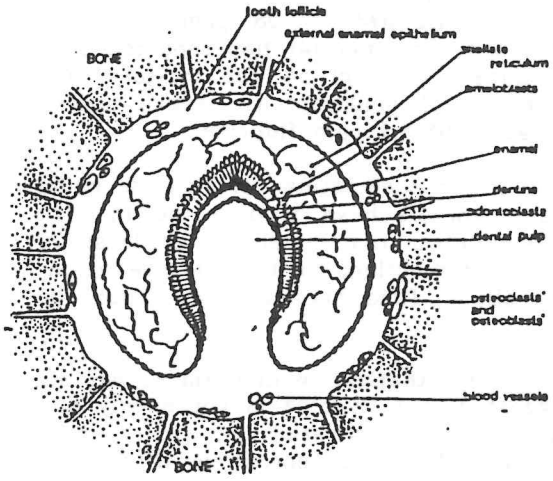
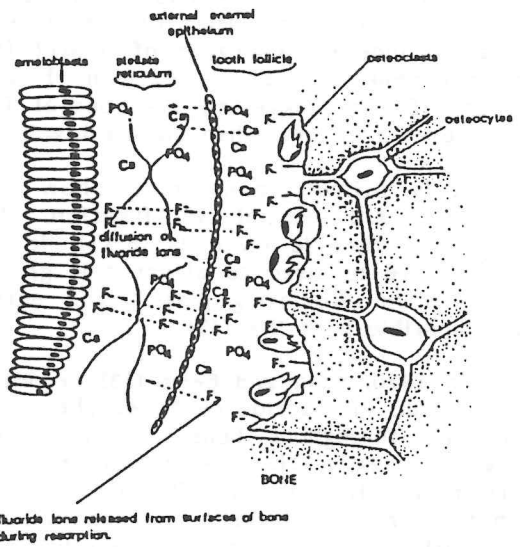


Figure 2

Resorption of bony crypt releases fluoride in bone.



(Note: in Figures 1 and 2 areas of intense stippling represent high fluoride concentrations in bone.)

fluoride concentration in bone being resorbed will be released into extracellular fluid. The local concentration could be relatively high and will depend on a) the level of fluoride in preformed bone prior to resorption; and, b) the intensity of the resorptive process. In Figure 2, fluoride is shown diffusing through the external enamel epithelium, across the stellate reticulum and into the immediate vicinity of ameloblasts.

In 1969, Weatherell (14) suggested that local rises in the extracellular concentration of fluoride might affect nearby cells. In a more recent paper, Weatherell et al. (15) showed that developing enamel not only absorbs fluoride but may raise the extracellular concentration of fluoride ion locally. Hence, the hypothesis presented in this paper is not new, but it suggests that fluoride in alveolar bone may be released during the growth of the tooth germ and expansion of the crypt. Such a mechanism may explain how concentrations of fluoride sufficient to damage cells (above 20 ppm F) could reach the vicinity of tooth-forming cells and lead to dental fluorosis.

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Note:
The spectre that fluoride might cause cancer re-emerged with the publication of lifetime rat and mouse studies conducted by the US NTP in 1990 (ref.d). However, the NTP Report and the 1991 Report published by the National Health and Medical Research Council *totally ignore* an early and clearly important study published in *1949*.

Albert Tannenbaum was a highly regarded American cancer researcher. In a series of elegant experiments he demonstrated that chronic calorie restriction inhibits the formation of various spontaneous and induced tumours in strains of cancer-prone mice.

Now, feeding mice with a diet containing significant amounts of fluoride causes a marked retardation in body weight without a parallel change in food consumption.

Tannenbaum found that induced primary lung adenomas were significantly fewer in mice given a diet containing sodium fluoride. But, he also found that there was *a marked increase in induced sarcomas* in the mice receiving sodium fluoride.

This experiment involved three groups of mice: in Group A, the sarcomas were induced with 0.15 mg 3:4 benzpyrene (a known carcinogen); in Group B mice the tumours were induced with 1.5 mg 3:4 benzpyrene, and in Group C with 0.1 mg 3:4 benzpyrene.

The results are summarised in the following table.

TABLE: EFFECT OF SODIUM FLUORIDE ON FORMATION OF BENZPYRENE INDUCED SARCOMAS

TABLE 4

GROUP	Number of mice	Mice developing sarcomas Number	Per cent
A			
CONTROL	39	19	49
NaF	39	22	56
B			
CONTROL	40	20	50
NaF	39	25	64
C			
CONTROL	40	7	18
NaF	40	13	33

(Tannenbaum A & Silverstone J., *Cancer Research*, 9, 403-410, 1949).

The figures in the table above clearly show that in all three groups there is a consistent suggestion that fluoride is augmenting the ability of the carcinogenic hydrocarbon - benzpyrene - to induce sarcomas.

In other words, the data suggest a *synergistic action* between fluoride and benzpyrene. And this could be very important.

Aluminium production workers have been subject to lung cancer more frequently than expected, and a very large study, while not confirming an excess pulmonary cancer rate, did find excesses in pancreatic, lymphohaematopoietic, and genito-urinary cancers (references below).

In the pot room of smelters workers are exposed to fluoride gases and particulate *and* aromatic hydrocarbons.

The possibility of a synergistic action between fluorides and certain hydrocarbons should be investigated.

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APPENDIX 2.

FLUORIDES IN GENERAL MEDICINE

Fluoride rapidly becomes incorporated in bone and is a potent stimulator of bone formation, but how fluoride stimulates bone formation is not known.[a] One mechanism involved could be that when osteoclasts and osteocytes resorb bone with a high fluoride content, they are exposed to levels of fluoride sufficient to kill them. This leads to a histological picture which suggests an increase in bone-forming cells - osteoblasts.[b]

The idea that medium to high dosages of fluoride might either prevent or cure osteoporosis and other bone diseases accompanied by demineralization was conceived in the mid-1960's and was based on several experimental facts and lines of thought. For example:

- the apparently excellent effect of small doses of fluoride against dental caries.
  Rose[c] expressed the hope that - "fluoride (might) do for bones what it has done for teeth."

- Several statistical studies appeared to show that osteoporosis occurs less frequently in regions with a high water-fluoride content than in those where the inhabitants consume water with little fluoride. None of these statistical studies was, however, sufficiently extensive to be convincing[d] and may have been biased.[e]

- Advanced skeletal fluorosis is often characterised by a certain amount of osteosclerosis, and this led to the notion that to an osteoporotic an induced degree of osteosclerosis might be of benefit. In other words, treat one bone disorder by inducing another.

Results of extensive research undertaken since have cast grave doubts on these basic assumptions, and fluoride treatment of osteoporosis remains an *experimental* and controversial measure.[f]

In an extensive report in the *New England Journal of Medicine* (1990)[g], the authors raised concern that fluoride treatment for osteoporosis may increase the risk of hip fracture. Exposure to fluoride apparently causes new bone formation of an *inferior quality*, especially in the femoral head. The physical properties of bone exposed to high concentrations of fluoride show that its compressive strength increases, but its tensile strength decreases.[h]

Side-effects from fluoride therapy are common, especially with high doses.[i] An isolated report in the literature [j] showed that three elderly osteoporotic patients who received 16 to 150 mg sodium fluoride daily for 1 - 36 months developed giant monocytoid cells suggestive of reticuloendothelial malignancy in the bone marrow.

After more than 35 years experimentation with fluoride therapy for osteoporotic patients, the measure remains highly controversial, and is the treatment of choice adopted by a minority of physicians.

However, some supporters of fluoridation still argue that since some patient's can tolerate high levels of fluoride - then fluoridation must be safe. This is an extraordinarily naive argument.

When a physician prescribes fluoride for an osteoporotic patient he is doing it on a one-to-one basis. He knows the medical history of the patient, he takes personal responsibility for the treatment, and he can monitor the patient's response to the treatment. If side effects occur, as they often do, the treatment will be stopped.

Fluoridation, however, is mass medication. Fluoridation compulsorily medicates every member of the community with small doses of a poisonous substance through their domestic water supply. It contravenes long-standing medical ethics and may violate religious and personal convictions. It should not be confused with chlorination, which is intended to treat the water, not the consumer.

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APPENDIX 3.

WATER FLUORIDATION AND CANCER

In 1977, two American biochemists, John Yiamouyiannis and Dean Burk[a], startled supporters of water fluoridation when they claimed that the measure could cause cancer.

Dean Burk had worked for 35 years at the US National Cancer Institute, authored several text-books on cancer, published over 250 papers in the scientific literature, and co-authored one of the most cited papers in biochemistry describing the Lineweaver-Burk curve for enzyme kinetics.

Yiamouyiannis and Burk compared cancer mortality rates in the 10 largest US cities with fluoridated water, with cancer mortality rates from 10 of the largest cities with non-fluoridated water. They claimed that after 1952, the cancer death rates for people over 45 years of age in the cities with non-fluoridated water were 4 to 5 per cent *lower* than those for the cities with fluoridated water.

In England, Sir Richard Doll and Dr Leo Kinlen[b] and P.D. Oldham and John Newall[c] completed studies which showed no excess cancer mortality in those same cities in the United States with fluoridated water.

The US National Research Council[d] reviewed these conflicting results and concluded they could be explained by the different data sets and different analytical approaches used by the investigators. According to the US NRC analysis, the margin of possible error in the most sensitive cancer study is about three cancer deaths per 100,000 people, or 4,000 possible excess or fewer cancer deaths per year among the 130 million individuals drinking fluoridated water in the United States.

A more recent article by Graham, Burk and Pierre Morin[e] also reviews this controversy. It concludes, that compared with the unfluoridated cities, there is an excess of 20 to 30 cancer deaths per 100,000 people who live in the major fluoridated cities of the United States for at least 15 to 20 years.

Other investigators have looked for a more specific relationship between stomach cancer and fluoridation. The hypothesis here is that fluoride would be more likely to cause stomach cancer than any other type since fluoride in the stomach forms hydrofluoric acid - a powerful irritant which is mutagenic. The Yiamouyiannis/Burk data appear to show a statistically significant relationship between fluoridation and stomach cancer in males ($p = 0.05$) but the US NRC claim that since one 'positive' site could be due to chance, this does not prove that fluoridation and cancer of the stomach are linked.

In 1978, Erickson[f], after correcting for age, race, and sex, found the death rate from cancer of the digestive system was 9 per cent higher in cities with fluoridated water.

When he subtracted all the subjects with Asian and Hispanic surnames, and 'corrected' for education and population density, the excess disappeared. Yiamouyiannis has pointed out that there never has been any study showing that a person is more or less likely to die of cancer depending on the number of years they went to school. Nor is there any evidence that people living in eight storey apartments are more susceptible to cancer than people living in four-storey apartment houses.[g]

Professor Donald Taves,[h] a highly respected biochemist, has pointed out that there was an observation in one of the first fluoridation studies (Kingston = Newburgh) that was considered spurious and has never been followed up. There was a 13.5% incidence of cortical defects in bone in the fluoridated community but only a 7.5% incidence in the non-fluoridated community. With 474 and 375 children in the respective groups, the t-value was 2.85, which is statistically significant. Caffey[i] noted that the age and sex of the afflicted persons and the anatomical distribution of these bone defects are "strikingly" similar to the case with osteogenic sarcoma. Although progression of cortical defects to malignancies has not been observed clinically, it would be important to have direct evidence that osteogenic sarcoma rates in males under 30 have not increased with fluoridation. The overall bone cancer rates do not appear to have been affected by fluoridation. However, bone cancer rates are dominated by the older age groups, which could obscure a difference in the younger ages.

The Knox Report[j], a comprehensive review of most fluoridation - cancer studies that was completed in 1985, concludes that there is no convincing evidence that cancer death rates are higher in areas with fluoridated water. However, a series of reports from the US State of Iowa[k] may be relevant. These studies found that levels of strontium, lead and Radium-226 were positively correlated with natural fluoride levels present in water from deep wells. Further, the studies showed an association between cancer incidence and Radium-226 in water. This suggests that future epidemiological studies evaluating the effect of fluoride in water should also address other water variables, and, consider the potential synergistic effect of fluoride and bone-seeking radioactive elements.

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APPENDIX 4.

TERMINOLOGY

Many continental scientists refer to 'fluorine' while English-speaking ones prefer 'fluoride'. This can lead to confusion, some explanation is necessary.

FLUORINE *properly* refers to the atom, fluorine (F); or, the molecule F_2, which is elemental fluorine gas.

FLUORIDE, on the other hand, is often used to denote the fluorine component of an inorganic compound containing fluorine. Examples are: sodium fluoride (NaF), calcium fluoride (CaF_2), and sodium silicofluoride (Na_2SiF_6).

However, the term fluoride also reflects the fact that in many inorganic combinations or salts the method of chemical bonding between fluorine and the other element or elements involved is *ionic,* i.e. there has been an exchange of orbital electrons. This means that the fluorine atom has been changed in the process of ionization by the loss of one electron, and the derivative term fluoride is used to denote its ionized form. The fluoride ion is symbolised as F^-. The process also involves a change in electrical charge between the atom (F) and its ionized form (F^-).

In organic compounds and in some important inorganic forms, the method of bonding is different in that there is an electron sharing. For example, in hydrogen fluoride (HF) the bonding is not ionic but via the hydrogen bond.

When in combination with other elements as an inorganic salt, the elemental fluorine atom has been structurally changed and its physical properties altered. When dissolved in water the ionized particles of the molecule of the compound dissociate as a result of the process of hydration or hydrolysis or a combination of both. This means, in simple language, that when the elemental particulars of the dissolved molecule dissociate, they do *not* regain their elemental form but continue to retain their ionized form. Since there are physical differences of structure and electrical charge between F and F^-, it follows that the atom of the element (F) and the ion of the same element (F^-) have differing chemical characteristics and behave differently from one another.

However, the presence of hydrogen ions (H+) in aqueous solutions means that some HF is always present, and the HF content increases about ten-fold per unit decrease in pH; and this may have profound physiological significance.

For example,[a]

> At pH 7 the HF/F^- ratio is 0.00015 and the percentage of HF present is 0.015

At pH 6 the HF/F^- ratio is 0.0015 and the percentage of HF present is 0.15%

At pH 5 the HF/F^- ratio is 0.015 and the percentage of HF present is 1.5%

At pH 4 the HF/F^- ratio is 0.15 and the percentage of HF present is 15%

This may be important since the transport and build-up of inorganic acids and their conjugate bases are the subject of intense study in toxicology and physiology. Todate, however, the mechanisms of these processes are poorly understood.

For instance, nitric and sulphuric acid are the principal components of 'acid rain' which is highly toxic to aquatic plants and animals. [b, c] A reasonable hypothesis to explain the toxicity is related to the rates at which the protonated (non-ionic) forms of the acids diffuse through cell and epithelial membranes. Now, in some parts of the industrialised world hydrofluoric acid (HF) is also a component of 'acid rain', and several studies indicate that the fluoride ion (F^-) crosses cell membranes in the non-ionic form, i.e. as HF.[d, e]

During the past 50 years, research has consistently shown that the biological effect of fluoride is increased as solution pH is decreased. In a comprehensive review, Borei[f] reported that fluoride inhibition of metabolism in mammalian, plant and yeast cells was a function of pH. He suggested that the pH-dependence of fluoride inhibition might be explained provided that fluoride penetrates into cells as undissociated HF. In addition to the permeability aspect, hydrogen fluoride may exert a direct metabolic inhibitory effect since the pH-dependence was also present in broken cell preparations.

There are a number of scenarios in the human body where the fluoride ion can be converted to HF. For example, in the acid environment of the stomach, the fluoride ion would be present as HF. Hydrogen fluoride may also be present in the extracellular fluid of bone during the processes of resorption and renewal of bone; and this could endanger both bone and bone marrow cells. Non-ionizable fluorine has been detected in the plasma of several species including man. Recent studies suggest that HF is the ultimate source of this low molecular weight non-ionizable fluorine.[g]

Finally, the presence of HF in acidic plaque fluids on the surfaces of teeth would have a potent anti-microbial action on decay-causing bacteria.

Unfortunately, in fluorine chemistry, little is 'simple'. Despite what dentists may say.

Hydrogen fluoride is not just HF. In the gaseous state at its boiling point, 19.44° C, it exists as $(HF)_6$, or H_6F_6. This represents a very strong association of the molecules and at higher temperatures it is still associated as H_3F_3.

In solution in water, hydrogen fluoride is associated as H_2F_2 so that normal hydrofluoric acid is not a solution of HF but of H_2F_2.

This means that in a solution of hydrofluoric acid in water we do not have H+ and F^- ions, but $(H.H_20)+$ and HF_2^- ions, the hydrogen ions being hydrated or solvated, while the fluoride ions are associated with undissociated HF molecules and become HF_2^-.

THERE IS NO SIMPLE WAY OF TELLING WHETHER THE ION BEING MEASURED IN WATER OR BODY FLUIDS, IS THE F^- OR, THE HF_2^- ION; AND OBVIOUSLY THEY MAY HAVE VERY DIFFERENT PROPERTIES.

In fact, the HF_2^- ion is certain to be far more active than the F^- ion, if only because the hydrogen ion's hydration and the fluoride ion's association increase the distance between them and reduce their binding or attraction so that the fluoride ion is comparatively free to exert its effects.

As explained earlier, while a neutral solution will contain F^- ions, an acid solution depending on its pH, may contain a preponderance of HF_2^- ions.

The reason for the existence of the HF_2^- ion is therefore, that the fluoride ion bonds to a FH molecule to give HF_2^-, $(FH--F)^-$, forming a very strong bond in comparison to the normal hydrogen bond.

The reason for the rather complicated preceding section is that it has very real significance. For instance, the topical fluoride gels manufactured by Colgate-Palmolive and others are supposed to contain 12,600 parts per million *fluoride ion.*

Since they are acidulated (to around pH 3), DO THEY CONTAIN ANY FLUORIDE *ION* AT ALL? AND THE PROPERTIES OF F^- and HF_2^-, *are different.*

Recent studies in Britain and the United States, have demonstrated that fluoride is mutagenic.[h] The precise mechanism involved has yet to be clarified. But, William Caspary and his colleagues at the US National Institute of Environmental Health sciences, have suggested:

> *".. there may have been a role for HF or HF_2^- in causing toxicity and mutagenesis. Further studies are necessary to determine whether H^+ ion potentiates the toxicity of F^- ion or whether minor amounts of HF or HF_2^- are especially effective in causing toxicity and associated mutagenesis."*

Dentists and health authorities repeatedly assert that fluoride ions are the only source of the element to which people are exposed. This is patently absurd.

Individuals in many workplaces inhale HF and other fluorine gases; and people living near industrial plants with fluoride-pollution problems are constantly exposed to trace amounts of non-ionic fluoride.

The only people that benefit from the mischievous assertion are the fluoride-polluters, and since the late 1930's they have actively encouraged such statements. Unfortunately, their 'disinformation' campaign has been helped by a number of gullible dentists who have established their reputations and progressed their careers by 'misinterpreting' certain aspects of fluorine chemistry.

When workers in the pot room at ALCOA's Point Henry smelter finish their shift they give a urine sample which is analysed for the presence of fluoride ions. But, the workers have been exposed to both fluoride dusts and *gases* in the pot room, and the gases are more dangerous than the dusts.

The fluoride in the urine may be in the form of F^-, HF, or HF_2^-. The method of analysis used will NOT DETECT HF, and CANNOT DISTINGUISH BETWEEN F^- and HF_2^-.

NO WONDER THE 'MYSTERIOUS' AGENTS WHICH CAUSE POT ROOM ASTHMA REMAIN UNDETECTED.

The analytical techniques used by ALCOA's medical staff to 'protect' their workers are nothing more than a cruel hoax. They give absolutely no indication of the extent to which workers in pot rooms have been exposed to fluoride *gases*.

The pot rooms should be fitted with automatic monitoring systems designed to detect the presence of a range of fluoride gases. Some of these gases are so toxic that only the most sophisticated 'gas-masks' could protect the workers.

FLUORINE is the most electronegative of the chemical elements and easily the most reactive. It is too reactive to remain uncombined in air for a very long but can sometimes be detected in the immediate vicinity of high temperature - high energy processes such as *electrolytic reduction cells in the manufacture of aluminium.*

Fluorine reacts rapidly with moisture to give hydrogen fluoride and hypofluorous acid, and thence *OXYGEN DIFLUORIDE.*

In man, inhalation of oxygen difluoride (OF_2), at fractions of a part per million produces an intractable headache, is soporic, and an irritant to the entire respiratory tract.

The US National Institute of Occupational Health and Safety (NIOSH) warn about oxygen difluoride:

> *"A ceiling limit of 0.05 ppm is recommended, both on the basis of experimental demonstration and by analogy with ozone and fluorine gas. In view of its great acute toxicity, especially for small rodents, the margin of safety may not be particularly great."*

Australian health authorities also *recommend* an occupational exposure limit of 0.05 ppm for oxygen difluoride (remember the exposure limit for HF is 3 ppm).

Recommending is one thing, enforcing the limit quite another.

DO ALCOA CONTINUOUSLY MONITOR POT ROOM AIR FOR HYDROGEN FLUORIDE, FLUORINE AND OXYGEN DIFLUORIDE?

AND IF NOT, WHY NOT?

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APPENDIX 6.

INDUSTRIAL SOURCES OF FLUORIDE IN THE ENVIRONMENT

Vast quantities of fluoride dusts and gases are emitted to the atmosphere by many types of industrial operations. Precise figures are difficult if not impossible to obtain, but in 1977, the Canadian National Research Council[a] estimated the global figure to be around 500,000 tonnes a year, and to this figure must be added large amounts of solid wastes containing fluoride.

Some of the chief industrial processes that release fluoride dusts and gases to the atmosphere are described in this appendix.

Manufacture of Steel

Fluorspar is used as a flux in open-hearth, basic-oxygen, and electric-furnace steelmaking operations to increase the fluidity of the slags and enhance the removal of phosphorus and sulphur impurities from the melts.

Fluoride emissions from steel mills are chiefly calcium fluoride particulates and hydrogen fluoride. In 1968, in the United States alone, fluoride emissions from the three types of steelmaking processes were: open-hearth, 16,800 tons; basic-oxygen, 8,400 tons; and electric-furnace, 14,900 tons.[b]

Combustion of Coal

Samples of coal from various parts of the world have been analyzed and found to contain 0.001 - 0.048 per cent fluoride, usually as fluorapatite or fluorspar. During combustion approximately half the fluoride in the coal is evolved as gaseous hydrogen fluoride, silicon tetrafluoride, and particulate matter.

From a total of 402.3 million tons of coal burned in the United States in 1968 for steam and energy production, fluoride emissions to the atmosphere were estimated at 16,000 tons.[b]

Most of the emissions occur in coal-burning electric-power plants. At present, electrostatic precipitators are generally used to remove particulate matter from the combustion products, *but gases are released to the atmosphere.*

A study of relative pollutions from power-generating stations fuelled by various materials was carried out in the Federal Republic of Germany[c] in the early 1970's. There are, of course, difficulties in comparing a burden of sulphur dioxide with a burden of fluoride. The existing standards for each of the individual pollutants were taken, therefore, and the values of ambient dose rates (obtained from a meteorological model) were normalised by these standards. The normalised

values were then added to give a total pollution figure as shown in Table 5.

Table 5

	SO_2	DUST	NO_x	FLUORIDE	TOTAL
Anthracite	0.94	0.45	0.17	0.75	2.31
Brown Coal	1.20	0.86	0.28	1.65	3.99
Oil	1.16	0.22	0.20	0.06	1.64
Natural gas	$3.1x10^{-4}$	0.00	0.16	0.00	0.16

Uranium Energy Source of The Future? The case for, E.W. Titterton, The case against, E.P. Robotham, Thomas Nelson, Aust. 1979.

The final column (TOTAL) clearly demonstrates that brown coal is the worst polluter, followed by anthracite, oil and natural gas, in that order.

Operation of Atomic Energy Installations and Production of Uranium Hexafluoride

Gaseous diffusion plants that use uranium hexafluoride (UF_6) to separate uranium isotopes have been built in the United States, England, Russia, China and France. The plants produce U^{235} which undergoes fission with slow neutrons, for nuclear weapons and also produce uranium enriched in U^{235} for nuclear power reactors of various types.

An elaborate, and often still 'classified', technology has evolved for the production and handling of UF_6 and several other fluorides, such as UF_3, UF_4, U_4F_{17}, U_2F_9, and UF_5.

Uranium hexafluoride is usually produced from uranium oxides in several stages with uranium tetrafluoride (UF_4) as an intermediate; hydrogen fluoride can be used to prepare the tetrafluoride. In one method, uranium trioxide (UO_3) is reduced to the dioxide (UO_2) with hydrogen at approximately 700 C; the dioxide is then converted to the tetrafluoride with hydrogen fluoride at 500 C, and uranium hexafluoride is formed through the reaction of the tetrafluoride with fluorine at 350 C.

$$UO_3 + H_2 \text{ --------> } UO_2 + H_20$$

$$UO_2 + 4HF \text{ ------> } UF_4 + 2H_20$$

and,

$$UF_4 + F_2 \text{ --------> } UF_6$$

Only one third of the total fluoride in uranium hexafluoride is provided by the relatively expensive elemental fluorine in this method.

Other methods for producing uranium hexafluoride with halogen fluoride reagents (ClF_3, BrF_3, and BrF_5) have been developed and have great potential value for reprocessing irradiated fuels (to separate the uranium, plutonium, and fission products), as well as for initial production of uranium hexafluoride. Fused-salt processes using either elemental fluorine or halogen fluorides to produce uranium hexafluoride and plutonium hexafluoride have also been developed.

Because uranium is radioactive and the hexafluoride extremely volatile, strict emission control measure are applied in atomic energy installations, nevertheless, some accidental releases of uranium hexafluoride to the atmosphere have been recorded.

Manufacture of Phosphate Fertilizers

In the manufacture of normal superphosphate fertilizer, ground phosphate rock is treated with sulphuric acid and both hydrofluoric acid and silicon tetrafluoride are formed. The reactions can be written as follows:

$$Ca_{10}F_2(PO_4)_6 + 7H_2SO_4 + 3H_2O \text{ -----> } 3CaH_4(PO_4)_2 \cdot H_2O + 7CaSO_4 + 2HF$$

$$SiO_2 + 4HF \text{ -------> } SiF_4 + 2H_2O$$

Hydrofluoric acid and silicon tetrafluoride are also formed in the production of wet-process phosphoric acid and triple superphosphate fertilizer (from the phosphoric acid). The two initial reactions are:

$$Ca_{10}F_2(PO_4)_6 + IOH_2SO_4 + 2OH_2O \text{ ------> } 6H_3PO_4 + IOCaSO_4 \cdot 2H_2O + 2HF$$

and,

$$Ca_{10}F_2(PO_4)_6 + 14H_3PO_4 + IOH_2O \text{ ------> } 1OCaH_4(PO_4)_2 \cdot H_2O + 2HF$$

Again, volatile silicon tetrafluoride is released through the reaction of hydrofluoric acid with silica in the phosphate rock.

In modern plants that practice good emission control, the off-gases are passed through water-spray towers or other types of scrubbers. Most of the silicon tetrafluoride is removed through reaction with water to form aqueous fluorosilicic acid (H_2SiF_6). Hydrogen fluoride vapour is also removed by the scrubbing system through formation of aqueous hydrofluoric acid. However, the efficiency of emission control varies widely from one plant to another, and some of the older plants permit the escape of large amounts of silicon tetrafluoride and hydrogen fluoride to the atmosphere.

Manufacture of Aluminium

The major pollutants in the pot room of aluminium smelters are gaseous and particulate fluorides.[d]

Hydrogen fluoride accounts for approximately 90 per cent of the gaseous fluoride emitted. The only other major gaseous pollutant is sulphur dioxide resulting from the oxidation of sulphur present in the coke and pitch used in the electrodes.

Minor gaseous emissions include: carbon dioxide, carbon monoxide, nitrogen dioxide, hydrogen sulphide, carbonyl sulphide, carbon disulphide, sulphur hexafluoride, sulphur pentafluoride, and gaseous fluorocarbons.

Elemental fluorine is too reactive to remain uncombined in air for very long, however, it can sometimes be detected in the immediate vicinity of high temperature/high energy processes such as electrolytic reduction cells in the manufacture of aluminium.

Fluorine reacts rapidly with moisture to give hydrogen fluoride and hypofluorous acid, and thence oxygen difluoride.

The following Table 6 lists the fluoride gases which may be detected in the pot room together with the standards for occupational exposures to the gases.

Table 6

Fluoride Gas	ACGIH Threshold Limit Value (TLV)	
	ppm	mg/m^3
Hydrogen fluoride	3.0	2.5
Fluorine	0.1	0.2
Oxygen difluoride	0.05	0.1
Sulphur pentafluoride	0.025	0.1
Sulphur hexafluoride	1000.00	6000.0
Various fluorocarbons	500-1000.00	4000-7000.0

Particulate fluorides found in the pot room atmosphere include: cryolite, aluminium fluoride, calcium fluoride and chiolite ($Na_5Al_3F_{14}$).

Manufacture of Bricks, Tiles, Pottery and Cement

Clays used in the manufacture of bricks, tiles, pottery and cement generally contain 0.02 to 0.3 per cent of fluoride in the form of hydrated micas, such as muscovite and illite.

During the firing process of bricks, tiles and pottery, gaseous hydrogen fluoride and silicon tetrafluoride are liberated. Estimates of the amounts released in brickmaking range from approximately 30% to 95% of the fluoride initially present in the clays.

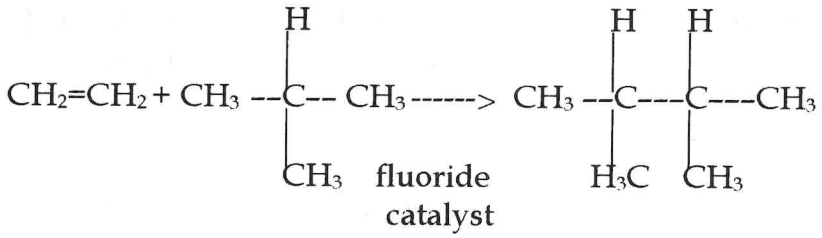
Gases and dusts from the kilns are usually discharged directly to the atmosphere without any cleanup. Many instances are known of injuries to plants and animals caused by the emissions.

In the manufacture of Portland cement, fluoride in the clay reacts with lime during the firing forming calcium fluoride. These operations produce large amounts of dust, which in modern plants is collected by cyclones and glass-fabric filters. If the dust collection is efficient, fluoride emission to the atmosphere is low.

Petroleum Refining

Hydrogen fluoride is widely used by the petroleum industry as an alkylation catalyst for producing high-octane gasolines. Boron trifluoride (BF_3) is also used for this purpose, and hydrogen fluoride and boron trifluoride are sometimes used together.

In an alkylation reaction, a paraffin hydrocarbon or an aromatic compound is added to the double bond of an olefin to form a compound of higher molecular weight. The reaction of ethylene ($CH_2=CH_2$) with isobutane - $(CH_3)_3CH$ to form 2,3-dimethylbutane, $(CH_3)_2CHCH(CH_3)_2$ is a typical example:



Via reactions of this type, low-boiling isoparaffins are converted to high-boiling isoparaffins with improved antiknock properties. The reactions are carried out in large pressure vessels, with reactants and catalysts in either the gas or liquid state.

Volatile fluorides may be released to the atmosphere during loading and unloading operations (for example, during purging of transfer lines from hydrogen fluoride tank cars), and during disposal of waste products. Tarry residues that liberate fluoride fumes on exposure to air are frequently produced.

Metal Casting, Welding and Brazing

In magnesium and aluminium foundries, fluorides are used as fluxes and as coatings for sand moulds in metal-casting operations. On contact with the hot metals the fluoride compounds vaporize and partially decompose into such products as hydrogen fluoride, silicon tetrafluoride and boron trifluoride. In such workplaces, efforts are seldom made to reduce fluoride emissions to the atmosphere by wet scrubbers or other devices.

In arc welding of ferrous and nonferrous metals, it is now common practice to use electrodes coated with calcium fluoride or other inorganic fluorides, which serve as fluxing agents at the high temperatures generated by the arc. Hydrogen fluoride, silicon tetrafluoride and particulate fluorides are released when the coated electrodes are used.

Fluxes containing metal fluorides are used in silver soldering and other types of metal brazing. Brazing is performed in many manufacturing operations and is a further potential source of gaseous and particulate fluoride pollutants in the atmosphere in some industrial districts.

NATURALLY OCCURRING FLUORIDE IN THE ENVIRONMENT

Fluorine constitutes 0.065 per cent of the elements of the earth's crust and is a significant component of the total biogeochemical cycle in which life has evolved. Mankind has always been exposed to fluoride in the environment; and fluoride has always been a trace constituent of our diet and a component of our body fluids, tissues and skeleton.

Indeed, the ubiquitous occurrence of fluoride in nature means that it would be virtually impossible to prepare a diet entirely free of fluoride.

But, until the start of the industrial revolution, most of the fluoride in the environment was safely 'locked-up' in rocks, coal and clays, and only relatively small amounts were released either as a result of volcanic activity (HF can be detected in volcanic gases), coal burning, or the slow leaching of fluoride into some waters.

Today, most of the fluoride that enters the human body is from man-made sources.

Over the past 50 years, a variety of industries have released into the atmosphere *more than 25,000,000 tonnes of fluoride gases and particulates.*[e]

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CHRONOLOGY OF THE FLUORIDE CONSPIRACY

1886: Two scientists, Charles Martin Hall of the United States and Paul L.T. Héroult of France, develop and inexpensive way to make aluminium. The method will produce 8 kilos of fluoride gaseous and particulate pollutants for each ton of aluminium produced.

1901: Surgeon-Lieutenant, J.M.Eager of the US Public Health Service describes 'mottled' teeth which were common in Naples, Italy and surrounding villages. He notes, "The etiology seems to be connected with volcanic fumes or the emanations of subterranean fires...The theory most generally received in Italy is that these gases have a selectively hurtful effect on enamel formation in early childhood."

1907: Fluoride damage to cattle from industrial pollution identified.

Hall and business associates had formed the Pittsburgh Reduction Company in 1888, in 1907, it changed its name to the Aluminum Company of America (ALCOA) and by 1909, ALCOA was producing 16,500 tons a year. At the same time it was producing 132 tons of hydrogen fluoride air pollutants per year.

1909: Dr. Ronzani published the results of his investigations on hydrogen fluoride which concerned him from the point of view of its effects upon the immune mechanism of the body.

1914: Aluminium production soared during World War I (1914-1918) as the fighting nations increased output to help fill their military needs.

1920: During the 1920's the development of new aluminium alloys and of improved methods of turning aluminium into useful products continued to boost production.

1925: Andrew Mellon, co-founder of ALCOA becomes US Treasurer; the US Public Health Service is part of the Department of the Treasury.

1928: A number of European scientists question the safety of aluminium cooking utensils. Fluoride air pollution damage to crops and livestock increasingly reported in the scientific literature.

1929: WALL STREET CRASH. The Great Depression of the 1930's was to cut world aluminium output almost in half.

1930: *THE MEUSE AIR POLLUTION DISASTER* focuses attention on the dangers of fluoride air pollutants to human health.

1930: H.V. Churchill head chemist of ALCOA ordered to investigate the cause of 'mottled' teeth.

1931: Churchill announces that excessive levels of fluoride in *drinking water* causes 'mottling'. He ignores fluoride in air as a possible cause. Scientists in Britain and Europe recognise that an excessive intake of fluoride from any source (water, food, air) can cause 'mottling'.

1935: From now on the US Public Health Service described 'mottling' as a "water-borne disease", and begin investigating the extent of the disorder in the United States.

1935: Scientists from the US Department of Agriculture warn that the growing use of superphosphate fertilizers is adding increasing amounts of fluoride to soil. They also condemn manufacturers who dump solid fluoride industrial wastes into waterways.

1938: Trendley Dean suggests that when water contains 1 ppm fluoride there is a decrease in tooth decay with only an 'acceptable' degree of mottling.

1939: Gerald Cox, working at the Mellon Institute claims that trace amounts of fluoride in water may prevent tooth decay.

However, the American Water Works Association, having accepted that mottling was a water-borne disease, suggest that drinking water should contain no more than 0.1 ppm fluoride.

1941: A symposium convened by the American Association for the Advancement of Science (AAAS) discuss 'fluoride and dental health'. Dean and Cox present their theory, but most delegates suggest that far more studies are needed to demonstrate the safety of fluoride at 1 ppm.

1941: In December Japan attacks Pearl Harbor, World War II led to a tremendous expansion in the production of steel, copper, zinc, iron ore, aluminium and high-octane gasoline. All anti-pollution regulations were suspended. Many parts of America now suffered fluoride air pollution on an unprecedented scale.

1944: OSCAR EWING, a former ALCOA attorney, appointed Federal Security Administrator, and head of the US PHS. The Dental Corps of the US PHS plan 'artificial fluoridation experiments' to take place in four cities.

1944: British medical scientists, Margaret Murray and Dagmar Wilson warn that while trace amounts of fluoride appear to have a beneficial effect on teeth, the same levels may have deleterious effects on other cells and tissues. They also stress that total intake from all sources must be considered.

1945: January. Without any animal experimentation or small-scale human studies, and at the height of the fighting in Europe and the Pacific, Oscar Ewing orders the Grand Rapids experiment under-way. No-one had attempted to determine how much fluoride the citizens of Grand Rapids were already receiving.

1949: THE DONORA AIR POLLUTION DISASTER. The first published report blames fluoride gases for the tragedy. Officers from the Air Pollution branch of the US PHS find that at least a dozen American cities have serious fluoride air pollution problems.

1950: JUNE. Less than half-way through the proposed experimental period the US PHS declares fluoridation is safe and successful. Towns and cities across the country are urged to adopt the measure.

ALCOA advertises high-quality ALCOA sodium fluoride as the ideal chemical for water fluoridation.

1951: Oscar Ewing allocates $2,000,000 to promote fluoridation and does a deal with the American Medical Association to endorse the measure.

1952: The US PHS invited a delegation from the British Ministry of Health to study the fluoridation programs now underway in America. On their return the delegation wrote enthusiastically about the measure. However, Murray and Wilson urged caution. In a letter to the *Lancet*, Wilson noted that in a recent experiment involving rats fluoride had caused impaired kidney function.

The Ministry of Health proposed that fluoridation be introduced in three 'test' sites in Britain.

One of these, Anglesea, was also the site for a proposed future aluminium smelter.

1953: Beaconsfield, Tasmania, became the first place in Australia to receive artificially fluoridated water. An aluminium smelter was being built two miles away at Bell Bay; it came 'on line' two years later.

By now, all the American cities with major fluoride air pollution problems were receiving fluoridated water. The 'mottling' was described as an acceptable trade-off for the 'benefits' of fluoridation.

1954: Fleming and Greenfield, respected researchers at Yale University School of Medicine publish a paper showing that fluoride given to pregnant mice could cause resorption of foetuses and birth defects in the offspring.

1956: Dr Ionel Rapaport, a French-trained doctor and endocrinologist, published

an article in the *Journal of the French National Academy of Medicine* in which his data suggested a link between fluoride and Down's syndrome.

1958: In a paper in the *Medical Journal of Australia,* Professor Sir Arthur Amies and Dr Philip Sutton cast grave doubts on the credibility of the studies claimed by the US PHS to demonstrate the safety and effectiveness of artificial fluoridation.

Scientifically-based opposition to fluoridation was growing rapidly, especially in the United States.

1960: Suddenly, and with no scientific evidence available, the American Dental Association endorsed the 'safety and effectiveness' of a fluoridated toothpaste, CREST. From now on the apparent benefits of fluoride were promoted vigorously by leading advertising agencies employed by major multi-national toiletry companies.

1970: Over 90 per cent of toothpaste sold now contained fluoride. An incessant and unparalleled advertising campaign established in the public mind the image of fluoride as a beneficial even essential element. Mottled teeth could now be caused by fluoridated water or air, or by youngsters inadvertently swallowing fluoridated toothpaste. A plethora of fluoride-containing dental health products were launched into the market place - tablets, gels, paints, mouthrinses, even fluoride-impregnated dental floss and toothpicks. It seemed that if a little fluoride was good, then more must be better.

1976: Two American biochemists, Dean Burk and John Yiamouyiannis stunned supporters of fluoridation by claiming that the measure could cause cancer.

1977: A US Congressional Sub-committee ordered the US PHS to test sodium fluoride as a possible carcinogen in an animal bioassay study. TWO SUCH STUDIES WERE STARTED AND THEN ABANDONED. FINALLY, IN 1991, THE US TOXICOLOGY PROGRAM ANNOUNCED THAT THERE WAS "EQUIVOCAL" EVIDENCE THAT SODIUM FLUORIDE WAS A CARCINOGEN.

1989: The well-known American commentator, Jack Anderson wrote: *"Shelves of studies have asked the question, does fluoride prevent tooth decay? The resounding answer is, maybe. An equal number of studies have asked the questions, does fluoride cripple the bones, discolour the teeth and cause birth defects and cancer? The resounding answer has been, who knows?"*

1992: An editorial in the *Journal of the American Medical Association* points out that four recently published papers suggest a link between fluoridation and an increased incidence of hip fractures amongst the elderly.

The writer of the editorial, Dr Michael Kleerekoper, concludes that while

a potentially controllable risk factor for hip fractures has been identified:

"For now, it is premature and unwise to provoke an angry public outcry calling for an end to fluoridation programs."

1996: Please see Editorial from the journal *Fluoride* reproduced on the next page.

CONCLUSION

In this monograph I have argued that fluoridation was a conspiracy. FLUORIDE AIR POLLUTION IS A SERIOUS PROBLEM IN MANY PARTS OF THE WORLD - AND YET WE HEAR VERY LITTLE ABOUT IT. WHY?

For me, the key question is this:

COULD DENTISTRY *ALONE* HAVE SUSTAINED THE MYTH THAT FLUORIDE IS A BENEFICIAL AND ESSENTIAL ELEMENT FOR 50 YEARS?

How could a minor healing profession whose expertise is confined to the treatment of disorders and disease *in the mouth,* so summarily dismiss the evidence of reputable and highly qualified researchers who have shown that fluoride can damage DNA, cause birth defects and cancer, damage the kidneys, bones and tendons, and increase the risk of hip fractures amongst the elderly?

I SUBMIT THAT THE FLUORIDE MYTH HAS BEEN, AND STILL IS BEING SUSTAINED BY POWERFUL INDUSTRIAL AND COMMERCIAL INTERESTS WHO HAVE RUTHLESSLY MANIPULATED THE DENTAL PROFESSION.

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NEUROTOXICITY OF FLUORIDE

The August 1995 issue of this journal contained an abstract (pages 151-152) of an interesting paper by Dr Phyllis Mullenix and her collaborators.[1] They recorded behavioral changes in rats after ingestion of fluoride, and found that the severity of the effect on behavior increased directly with plasma fluoride levels and fluoride concentration in specific brain regions. A reading of the full paper is well worthwhile. In their Introduction, after referring to the increase in dental fluorosis in humans after decades of water fluoridation, the authors comment:

"One concern that has not been fully investigated is the link between fluoride and effects on the central nervous system (CNS).... Many years of ubiquitous fluoride exposure have not resulted in obvious CNS problems such as seizures, lethargy, salivation, tremors, paralysis, or sensory deficits. Still unexplored, however, is the possibility that fluoride exposure is linked with subtle brain dysfunction."

The carefully designed animal experiment which they report revealed subtle but very real changes in behavior patterns following fluoride ingestion: hyperactivity after prenatal exposure, and cognitive deficits after weanling and adult exposure. Fluoride accumulation in important regions of the rat brain, especially the hippocampus, was found to increase as the drinking water fluoride levels increased. These effects, and the sex differences observed, corresponded to those observed in other studies of hippocampal brain damage.

The authors point out that the plasma fluoride levels recorded in the rats were the same as those sometimes recorded in humans - for example, in children one hour after receiving topical fluoride treatment of their teeth. In their conclusion calling for further rat and human studies they state:

"Experience with other developmental neurotoxicants prompt expectations that changes in behavioral function will be comparable across species, especially humans and rats. Of course behaviors per se do not extrapolate, but a generic behavioral pattern disruption as found in this rat study can be indicative of a potential for motor dysfunction, IQ deficits and/or learning disabilities in humans."

The authors draw attention to reports from Chinese investigators that high levels of fluoride in drinking water (3-11 ppm) affect the central nervous system directly without first causing the physical deformations of skeletal fluorosis.[2-4] Readers of *Fluoride* will recall the recent (November 1995) research report from China indicating adverse neurological effects on the brain from fluoride exposure.[5] This work also suggested that children with dental fluorosis are at greater risk of decreased mental acuity. One can only wonder whether the effects of fluoridated water might extend beyond the appearance of the teeth and include neurotoxicity among children afflicted with dental fluorosis.

Some of our readers may recall also pertinent early clinical findings reported by our founding editor, Dr G L Waldbott, of which Dr Mullenix and her co-workers do not appear to have been aware. These involved a wide range of reversible toxic effects of fluoridated drinking water, including diminished mental acuity and

impairment of memory.[6-8] In a separate report, Dr Waldbott even gave an account, supported by laboratory data, of a case of tetaniform convulsions induced by drinking fluoridated drinking water.[9] For decades proponents of water fluoridation have questioned the validity of these reports without, however, offering objective evidence to refute them. But in the light of the human research in China, and now the animal research in the United States, these clinical observations by Dr Waldbott on the neurotoxicity of fluoride in drinking water clearly deserve greater attention and credence.

AWB and JC

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XXIst WORLD CONFERENCE of the INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH in association with the HUNGARIAN SOCIETY FOR FLUORIDE RESEARCH, will be held in BUDAPEST, HUNGARY. AUGUST 25 - 28, 1996. Three-day **SCIENTIFIC PROGRAM** (26th, 27th, 28th) includes discussions on effects of fluoride on humans, animals, plants, and the environment. All proceedings in English. **REGISTRATION FEE:** Delegate US$300, accompanying guest US$150 (includes lunches and coffee breaks). **VENUE:** Aquincum Hotel. **ACCOMMODATION** (at Hotel) for 4 nights (25th, 26th, 27th, 28th): single room US$149 per night double room US$97 each person per night. Book direct with hotel: H-1036 Budapest, Árpád fejedelem útja 94, Hungary. (Phone 361 250 3360. Fax 361 250 4672). **SOCIAL:** Farewell Banquet US$100. Conference days will be free after 2 pm, with special programs planned. Daily and Post-Conference **TOURS** at special rates have been arranged. For costs and other information, direct enquiries to: Dr Miklós Bély, National Institute of Rheumatology, Department of Morphology, PO Box 54, H-1525 Budapest 114, Hungary (Phone 361 212 2689. Fax 361 212 2676).

THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH

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Dr Smith also writes extensively for national and international newspapers and magazines. For example, he has written more than two dozen feature articles for Playboy and Penthouse, and his writings have also appeared in Der Spiegel, Business Week, the Sunday Times, the Guardian, etc.

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About the Author

Dr Geoffrey Smith qualified as a dental surgeon at the Royal College of Surgeons in England in 1956. He then undertook post-graduate studies at Queens University, Belfast, and Ibadan University, Western Nigeria.

In 1959-1960 he led a field research project through seven countries in West Africa. The work was financed by the UK Medical Research Council and Her Majesty's Secret Service (MI 6). In the 1960's and 1970's Dr Smith worked as a consultant to a number of leading research-based pharmaceutical companies, including the GLAXO GROUP and Nicholas International. In 1972 Dr Smith announced the development of a tooth decay vaccine in New York.

Dr Smith has published a great many articles and papers in scientific, medical and lay journals and magazines. He has also prepared and processed over one hundred patent applications describing therapeutic products and appliances. Since his retirement in 1996, Dr Smith has taken up painting and has held a number of successful exhibitions.

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Note: *The Secret War* was originally prepared as a personal submission to the Brisbane City Council's Task Force on Fluoridation, in March 1997.

It has now been printed in a limited edition of 750 copies.

THE SECRET WAR

Fluoride - the supposed miracle ingredient in your toothpaste is also the chemical ingredient added to 66% of Australia's water supplies. However, fluoride is **not** "both safe and effective in reducing tooth decay" as health authorities would have you believe.

Indeed, reputable scientists worldwide have repeatedly shown that fluoride can damage DNA and cause both birth defects and cancer. Excessive fluoride leads to skeletal fluorosis, which affects bone and tendons in tens of millions of sufferers around the world.

The fluorine gas propellants in medications such as Ventolin may be life-threatening, and recently, fluoride has been implicated as a causative factor in osteoporosis and increasing hip fractures in the elderly. Perhaps most disturbing; fluoride is a 'mind-dulling' drug which accumulates in, and damages, the hippocampus, a major memory centre in the brain.

In *The Secret War* Dr Smith explains:-

- Why many Australians including the late Sir Edward Dunlop openly opposed water fluoridation.
- How fluoride can prevent decay on the surface of the tooth **but** why the mechanisms involved may harm cells and tissues **inside the body.**
- How fluoride entraps radioactive elements in bone thus increasing the risk of bone cancer and leukaemia.
- Why the CIA, the KGB and Britain's MI 6 became involved in the **Fluoride Conspiracy.**
- How fluoride compounds are used to make nerve gases, nuclear bombs and high energy chemical laser weapons.

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