

# LOW-LEVEL FLUORIDATION AND LOW-LEVEL RADIATION TWO CASE HISTORIES OF MISCONDUCT IN SCIENCE

by Albert Schatz, Ph.D, ©1996 , Philadelphia, Pennsylvania

## Abstract

Poor, malnourished children, especially infants, are the most sensitive barometer of fluoride toxicity. Low-level fluoridation (fluoridation of drinking water) and low-level radiation are similar in many respects. Paradoxical effects of fluoride must be considered in determining harmful effects of both low-level fluoridation and low-level radiation. It is not surprising that low-level fluoridation is associated with paradoxical effects. It would be surprising if it were not. The occurrence of paradoxical effects with low-level fluoridation and low-level radiation shows that **there is no threshold level below which fluoride and radiation are harmless**. My article in Appendix C shows that fluoridation does not prevent dental caries. Iodination of drinking water was discontinued in the 1920s because it was harmful and did not prevent goiter. Fluoridation of drinking water should be discontinued now because it is harmful and does not prevent dental caries.

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## Dedication

This report is dedicated to Salvador Allende, M.D., for the same reasons<sup>1</sup> that my first report, *Increasing Death Rates in Chile Associated with Artificial Fluoridation of Drinking Water, with Implications for Other Countries*, was dedicated to him. Dr. Allende was elected President of Chile on September 4, 1970, and was assassinated by a military junta on September 11, 1973. As a result of health measures he instituted, the birthweight of babies increased for the first time in 50 years. Dr. Allende, as a doctor and as President, was concerned about the poor people of Chile. These are the people in all countries who, because they are malnourished, are most susceptible to the harmful effects of fluoridation.

My research on the harmful effects of fluoridation in Chile was the first study specifically concerned with poor, malnourished people. I chose Chile for my research because (a) the majority of the population of Chile is poor and malnourished, and (b) pro-fluoridationists have never adequately studied the effect of fluoridation on poor, malnourished people as a specific group of the total population.

In the United States and other developed countries, poor and malnourished people are a minority that is statistically drowned out in the total population which is researched for harmful effects of fluoridation. The increased death rates associated with fluoridation in Chile tell us that fluoridation is also killing poor, malnourished people in all countries that have fluoridation.

## Prologue

Opponents of fluoridation have for decades pointed out numerous errors, omissions, and inaccuracies in what proponents of fluoridation have published. This present report continues that criticism. However, it is qualitatively different because (a) it reports the widespread occurrence of paradoxical effects and emphasizes the importance of paradoxical effects in evaluating the safety of fluoridation, (b) it points out similarities between fluoridation, which I call low-level fluoridation, and low-level radiation, and (c) it highlights the well-earned position of fluoridation as a well-documented case history in the well-recognized category of scientific misconduct.

Fluoride is now recognized as a legally sanctioned environmental pollutant<sup>2</sup> that is part of an increasing number of chemicals which are threatening our survival as a species. Fortunately, however, "more and more scientists insist that they are in a better position to understand the significance and implications" of science "for society than are the official decision-makers who may be paying their salaries or subsidizing their work. The point is that the real division is no longer between science and the humanities - the two cultures described by scientist-philosopher C. P. Snow - but between those who attach primary importance to human life and those who view their own discipline as sovereign."<sup>3</sup>

*We ... see ... the difficulty that may arise in the attempt to persuade others to accept a new ... way of reasoning. We cannot convince others of it by formal argument for, so long as we argue within their framework, we can never induce them to abandon it. Demonstration must be supplemented, therefore, by forms of persuasion which can induce a conversion. The refusal to enter the opponent's way of arguing must be justified by making it appear altogether unreasonable.*— Michael Polanyi, physical chemist

## **Mitchell, Thompson and Borman's research shows that fluoridation is harmful**

Mitchell *et al*'s report *No Association between Fluoridation of Water Supplies and Sudden Infant Death Syndrome*,<sup>4</sup> unjustifiably exonerated fluoride as a cause of sudden infant death syndrome (SIDS). The authors interpreted their data correctly, but then, by a verbal legerdemain shell game, drew the erroneous conclusion which their title reflects. The very fact that the straight line in their [Figure 1](#) is not horizontal suggests an association between fluoride and SIDS.

What Mitchell *et al*'s data clearly indicate is an inverse relationship between fluoride concentration in the drinking water and SIDS. Their interpretation of their results also clearly recognize this inverse relationship. "If anything" they wrote, "the higher the SIDS mortality rate the lower the fluoride concentration." However, in their very next sentence, they contradicted that interpretation by concluding that their "study clearly shows ... no indication of a relationship between fluoridation ... and SIDS".

According to Mitchell *et al*, "Analysis was carried out to find the correlation between variables and then simple linear regression was used".<sup>4</sup> Their arbitrary selection of linear regression provided a straight line which is very different from the curve of a paradoxical effect (which I shall define and discuss). The typical paradoxical effect curve that I have inserted in their [Figure 1](#), reproduced below, shows the increase in deaths as the fluoride concentration decreases in the very low concentration range. Dr. Albert W. Burgstahler, in the University of Kansas Department of Chemistry, kindly provided the paradoxical effect curve. This was derived by a computer-generated least squares best line fit.

Mitchell *et al* apparently did not know that the inverse relationship, which they acknowledged, suggests a paradoxical effect.<sup>5,6</sup> This phenomenon is paradoxical because there is a critical dose below which one observes an increased adverse effect. This paradoxical effect is precisely what Mitchell *et al*'s data clearly reveal. Within that low concentration range, the infant death rate increased as the concentration of fluoride decreased. Consequently, there is a relationship between fluoride concentration and infant deaths, but it is an inverse relationship.

At concentrations above the low concentration range, dose-responses show the direct, linear relationship with which we are familiar. Increasing doses are increasingly toxic until a particular dose kills most or all the test subjects. This is what one expects and observes. Consequently, there are two different dose-responses to fluoride — a paradoxical effect at very low levels and a linear relationship at higher levels. These two dose-responses are not mutually exclusive; one does not preclude the other.

The paradoxical effect curve explains what the data of Mitchell *et al* clearly reveal and what they clearly acknowledge; namely that there are more deaths at the low doses of fluoride than at the higher doses. The straight line which they derived from their linear regression analysis does not explain the increased deaths at the lower doses. Mitchell *et al* and all other researchers who are interested in knowing whether fluoridation produces harmful effects should familiarize

themselves with paradoxical effects<sup>5,6</sup> and understand that they "cannot exclude" an "explanation" they "have not considered".<sup>7</sup>

### **Paradoxical effects show that fluoridation is not safe at any level**

There many reasons why fluoridation has been highly controversial since its conception half a century ago. We can now add another reason — ignorance of paradoxical effects. If Mitchell *et al* had been familiar with paradoxical effects, Occam's razor would have directed them to a paradoxical effect. The cluster of infant deaths at very low fluoride levels suggests that the relationship between fluoride concentration and SIDS is paradoxical, not linear.

Most research which purports to demonstrate the safety of fluoridation has not been concerned with very low concentrations of fluoride, at which paradoxical effects occur, for three reasons. (1) Individuals vary significantly in fluoride uptake. (2) There is considerable individual variation. (3) It has been unjustifiably assumed that there is a threshold level; namely, the sacrosanct one part per million in drinking water, below which fluoridation is safe. The occurrence of paradoxical effects at very low levels of fluoride means that there is no threshold level below which low-level fluoridation is safe. There is also no threshold level below which low-level radiation is safe. We call fluoridation low-level fluoridation because that term associates it with the well-known low-level radiation. Both are harmful and similar in other ways.

The paradoxical effect in the report by Mitchell *et al* is similar to what has been observed in a variety of fluoride systems where paradoxical effects occur.<sup>5</sup> Paradoxical effects may be involved in SIDS in some fluoridated cities in Australia.<sup>8</sup> The data in the Australian report, which claimed that there was no linear relationship between fluoridation and SIDS, should be reexamined to see if there are inverse (paradoxical) relationships.

Paradoxical effects occur in complex systems where they are influenced by conditions that vary from time to time within the same system.<sup>6</sup> For these reasons, paradoxical effects may not always appear in a very low concentration range. But a linear dose-response always appears at higher concentrations which, in the case of fluoride, begin at the arbitrarily defined safe level of one part per million. Therefore, the relationship between fluoride concentration and SIDS may be linear and/or paradoxical, depending on the concentration range of fluoride and other variables. This variability and, at times, even irreproducibility of results are characteristic of paradoxical effects.<sup>6</sup>

### **Statistics can conceal paradoxical effects**

Because Mitchell *et al* used linear regression, the only conclusion they could draw from their straight line is that there is no linear relationship between fluoride concentration and SIDS. But they unjustifiably concluded that there is no relationship with fluoride at all. The fact that their statistics reveal no significant linear correlation does not mean that there is no other significant correlation. Their linear regression analysis may be mathematically correct, but it is inappropriate to ascertain whether there is another kind of relationship; namely, a paradoxical effect. Like the Sufi Mulla Nasrudin, they looked for the key in the wrong place.

*There is "a famous Sufi story" about "Mulla Nasrudin, an enlightened fabled teacher. While on his hands and knees, peering on the street for a lost key, he was approached by a friend. 'You lost your key here, Mulla?' his friend inquired. 'No,' said Nasrudin, 'I lost it in my house.' 'Then why are you looking here?' asked his friend. 'Because.' said Nasrudin, 'the light is better here.'"*  
— Larry Dossey

It is paradoxical that statistics, employed to assure the validity of conclusions drawn from data, can be responsible for concealing paradoxical effects." 6 "The fact that statistical analysis of experimental data does not reveal paradoxical effects does not mean that such phenomena do not exist. On the contrary, statistical methods of analysis can effectively prevent recognition of paradoxical effects if the methods do not consider these phenomena. With scattered points, statistical methods are too frequently used to determine where a straight line should be drawn. Too often, the statistical approach assumes that straight lines are the correct lines. Deviations or irregularities caused by paradoxical effects have too often been attributed to experimental variation or errors.<sup>6</sup> More information about paradoxical effects and risk assessment is in Appendix B.

### **The pig mentality**

"If artificial fluoridation causes deaths among individuals who are for one reason or another more sensitive to fluoride toxicity than in the total population taken as a whole, then the controversy over whether fluoridation does or does not reduce caries becomes purely academic because it is criminal to implement a so-called public health measure which kills certain people even if it does reduce tooth decay in some of the survivors."<sup>1</sup>

We have been told that fluoridation is economical because it lowers the cost of dental care. But, even if that were true, "let us get our priorities right. If it is economic to poison people, then there must be something wrong with economics." 9

With respect to economics, let us look at fluoride and what I call the *pig mentality*. In 1952, seven years after fluoridation was started, some U.S. government agencies were concerned about possible harmful effects of fluoride. But they were more concerned with safeguarding pregnant pigs than pregnant women and their unborn children. Their reason for giving priority to the welfare of pregnant pigs was that pregnant pigs were economically more important than pregnant women.

The following testimony, which reports this shocking revelation, is taken from a U.S. Congressional investigation held in 1952.<sup>10</sup>

**Dr. Miller:** The United States Department of Agriculture made some examination as to what happened in brood sows. They recommended to the farmers that fluoride not be added to the water or feed of brood sows because it did something to pigs that were unborn.

**Dr. Porterfield:** Yes.

**Dr. Miller:** Do you think it might be wise for the Public Health Service or some group of people to inquire what might happen to pregnant women and the unborn child when they are given

fluoride? Do you think it is necessary to complete the examinations that have already been started on that subject?

**Dr. Porterfield:** I do not think there is enough money, sir, from the Federal Government or any other source, to pursue all of the possible hypotheses that may be proposed for most of our programs. We have to screen them from the point of view of greatest probability, and since we can find no cause from the physicians or the dentists or the investigating scientist pointing to this, it would seem to us not of a high priority to devote money for something that has shown no suggestive indications.

**Dr. Miller:** Would you say that the agricultural Department went off on a tangent then when they investigated what might happen to pigs or brood sows?

**Dr. Porterfield:** No, sir, I think there is a difference.

**Dr. Miller:** It is alright to do it with pigs, but you do not want to do it with women. Is that the attitude you take?

**Dr. Porterfield:** They have different objectives in mind, sir. There is more money available for matters that have economic value than there is for health.

Have the fluoridationists, like Dr. Faustus, no understanding of "the morality of knowledge" (Erich Heller) and no "insight into ultimate meanings"? (Victor Lange) Did they, like Faustus, "outwit the Devil by creating a Hell of" their "own"? (Victor Lange11) No wonder fluoridation calls to mind Albert Einstein's lament: "Strange that science, which in the old days seemed harmless, should have evolved into a nightmare that causes everyone to tremble." And Linus Pauling's comment: "Most problems in the modern world are the result of the contributions of science."

### **More criticism of Mitchell, Thompson and Borman's research**

There are additional reasons why the research of Mitchell *et al* has "been weighed and found wanting". The variables they considered were SIDS, mean daily temperature and median fluoridation. The validity of their research is questionable because they did not consider other important variables. Walker pointed out that Mitchell *et al* did not consider a significant intake of fluoride from sources other than fluoridated water.<sup>8</sup> The National Health Council and the Medical Research Council of Australia reported that babies were being overdosed with fluoride from many sources, especially formula foods prepared with fluoridated water.<sup>8</sup> It would be surprising if that overdosing did not also occur in New Zealand where Mitchell *et al* did their research. Mitchell *et al* provided no information at all about "background fluoride"; that is, fluoride from other sources; e.g., air, food, tea (dry tea leaves are high in fluoride) and baby formulas prepared with fluoridated water. The terms background fluoridation and background radiation apply to fluoride and radiation from sources that are not always taken into consideration.

Mitchell *et al* (like Nelson and Taylor whom they cite) found a correlation between mean daily temperature and SIDS. People generally drink more liquids in warmer weather. One would

therefore like to know, for example, whether the dead infants had been nursed and how much water and tea their mothers consumed. Tea is notoriously high in fluoride. But Mitchell *et al* did not estimate each infant's total daily fluoride intake. The correlation of infant deaths with mean daily temperature suggests that more infants may die in hotter weather when mothers and infants consume more tea and other fluids and therefore more fluoride. Finally, Mitchell *et al* and all proponents of fluoridation apparently also do not understand why it is inappropriate to apply the results of random testing to an individual.<sup>12</sup>

Another variable overlooked by Mitchell *et al* is nutrition, especially calcium intake. The consumption of milk, which is the major source of calcium for infants, is especially important. Our research on fluoridation in Chile (like many other studies) points out that malnourished infants comprise the human population that is most susceptible to fluoride toxicity. It is also well known that calcium protects against fluoride. When Salvador Allende, M.D. became president of Chile in 1970, he initiated a government program under which "pints of ... free ... milk were delivered ... daily ... to pregnant mothers, nursing mothers and every child under the age of 15." <sup>1</sup> At that time, "half the children in Chile under 15 years were undernourished, and 600,000 were mentally retarded thorough lack of protein, especially during the first months of life." <sup>1</sup> This was the health status of half the children who were being fluoridated in Chile.

I am not implying that malnutrition and/or calcium deficiency were significant factors in SIDS researched by Mitchell *et al*. No one knows because Mitchell *et al* did not provide that and other information. To properly evaluate the role of fluoride in SIDS, it is necessary to consider nutrition, especially calcium intake, and total fluoride intake.

### **Promoters of fluoridation are in Plato's cave**

*"Plato's famous parable of the cave describes a group of people who are chained inside a cave in such a way that they can see only the shadows on the wall of the cave. These shadows are the only world that these people know. One day one of them escapes into the world outside the cave. At first he is blinded by the sunlight, but when he recovers, he realizes that this is the real world, and what he previously considered to be the real world was, in fact, only the projection of the real world onto the wall of the cave. Unfortunately, when he returned to the people who were still chained inside the cave, they thought he was mad." — G. Zukav*

Those who are for and against fluoridation have little in common other than the issues they disagree on. They cannot dialogue objectively because they have different realities. They see things differently, and have different criteria for determining validity. Our lives are enriched by artists for whom "beauty is in the eyes of the beholder." But our lives are often endangered when scientific truth is in the eyes of the beholder.

### **"There's something rotten in Denmark"**

Mitchell, Thompson and Borman's publication<sup>4</sup> is a classic, textbook case history of the pathology of (i.e., what is wrong with) epidemiological surveys which have concluded that fluoridation is safe. Such studies, are invalid for the following reasons.

1. Researchers assumed that there is only one dose-response to fluoride and that dose-response is linear. They do not know that there are two distinctly different dose-responses which occur

within two different concentration ranges of fluoride. The dose-response which they completely overlooked is the paradoxical, non-linear dose-response. This occurs only with low-level fluoridation, just as it also occurs only with low-level radiation,<sup>13,14</sup> where it is described as supra-linear, quadratic and non-linear. (I shall shortly discuss low-level radiation and what it has in common with low-level fluoridation.) The reasons why paradoxical effects occur at low levels of fluoride and other chemicals,<sup>5</sup> and why supra-linear dose-responses occur at low levels of radiation are beyond the scope of this report, but have been explained elsewhere.<sup>5,6,13,14,15</sup>

2. Researchers did not selectively study minority populations, such as infants, that are most susceptible to fluoride toxicity. But it is not enough to study infants. One must select infants who are malnourished and whose mothers received little or no prenatal care. Otherwise, as I discussed in detail in my report on deaths association with fluoridation in Chile, "the relatively well-nourished majority overwhelms ... the undernourished minority which is most susceptible to fluoride toxicity." <sup>1</sup>

The importance of selecting a minority population of infants that are malnourished and disadvantaged in other ways is clearly revealed by the shockingly high variation of infant deaths in different sections of Philadelphia. This variation is directly related to poor nutrition, inadequate prenatal care and other factors.<sup>16</sup> No one knows how many poor, malnourished children in Philadelphia, which is fluoridated, are being killed or otherwise harmed by fluoridation?

Spittle recognized the importance of working with a malnourished minority,<sup>17</sup> which I had pointed out in my Chile report. Both Brown<sup>18</sup> and the same Mitchell,<sup>19</sup> who criticized my Chile report, did not recognize (1) the above-mentioned inadequacies in the report of Mitchell *et al*, and (2) the importance of focusing research a malnourished minority.

The 1994 report by the New Zealand Public Health Commission,<sup>20</sup> which endorsed fluoridation, accepted without question the erroneous conclusion of the report by Mitchell *et al*,<sup>4</sup> and Brown<sup>18</sup> and Mitchell's<sup>19</sup> unjustified criticism of my report on fluoridation in Chile. The New Zealand report referred to my article in its text, but did not cite it in its bibliography. The results of Mitchell *et al* which, despite their inadequacies, show that fluoridation is harmful as very low levels, are all the more significant because the infants they researched were not specifically selected as a malnourished population. Despite that limitation, their results support my report of increased deaths associated with fluoridation in Chile.

This New Zealand Public Health Commission report has as little scientific validity as a British report on the effectiveness of fluoridation drafted by a special Committee on Research into Fluoridation. This is Report No. 122 published by the British Department of Public Health and Social Security in London. I challenge Brown<sup>18</sup> and Mitchell,<sup>19</sup> who criticized my report on fluoridation in Chile, to publish a criticism of my analysis<sup>21</sup> (See Appendix C) of that British report. This British report has to be seen to be believed. This and many other reports that support fluoridation reveal incompetence, bias, and arrogance, and are examples of pseudoscience. One does not know whether to accuse the authors of misconduct in science or conclude that they just don't know any better.

Those who do research in Plato's cave do not realize that: (1) All they see are only shadows on the wall. (2) They "can fool some of the people all of the time, and all of the people some of the time, but" they "cannot fool all of the people all of the time." (3) "No man was ever so much deceived by another as by himself. (Greville) and (4) "The learned fool writes his nonsense in better language than the unlearned, but still 'tis nonsense." (Benjamin Franklin)

### **Low-level fluoridation and low-level radiation are both harmful**

*"New scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a generation grows up that is familiar with it."* Max Planck, the father of quantum physics

The history of progress is the history of controversy. The antifuoridation movement has made both history and progress. The report you are now reading contributes to both. Its objective is to provide new information about the nature of the sand upon which the house of fluoridation has been built. It points out the importance of paradoxical effects which have not received adequate attention with respect to fluoridation. These effects occur at low levels of fluoride and radiation. We call fluoridation low-level fluoridation because that term associates it with the well-known low-level radiation. Both are harmful and similar in other ways.

For low-level radiation, we now know that "linearity underestimates the true cancer risk per rad when one derives values from studies based on higher doses of radiation than the" low "doses at which we wish to apply those values." <sup>13</sup> We now know that linearity also underestimates the risk of low-level fluoridation. This is why we criticize those who have disregarded paradoxical effects associated with low-level fluoridation.

Low-level fluoridation, like low-level radiation, may produce adverse effects that appear after prolonged periods of time. For this reason, a cause and effect relationship is not always clear. The adverse effects of large doses of fluoride and radiation, with which this report is not concerned, occur sooner after exposure and are therefore clearly associated with the cause.

Low-level fluoridation and low-level radiation have both been controversial for decades. Both have used human beings as guinea pigs. They have killed and continue to kill untold numbers of people. There is no threshold level below which fluoride and radiation are harmless. Background radiation, such as radon gas, is harmful; and background fluoride (from sources other than drinking water; i.e., air, food and tea) is harmful. Topical application of fluoride and topical application of radiation (e.g., for skin cancer) are harmful. The dose-response to both low-level fluoridation and low-level radiation is not linear but paradoxical.

Low-level fluoridation, like low-level radiation, is a major pollutant which environmentalists should recognize as such. Like other pollutants, the harmful effects of both low-level fluoridation and low-level radiation have a history of denial which is associated with scientific, professional and academic misconduct. Tolerance levels for low-level fluoridation and low-level radiation are not based on scientific findings. Instead they are determined by special interest groups which have enough money to buy enough political clout to influence government and other high-level agencies.<sup>2</sup> "The wages of sin are death." But those who die from low-level fluoridation and low-level radiation are not the sinners, but their victims.

### **Supra-linear (paradoxical) effects of low-level radiation**

Paradoxical effects may not make sense to those who are unfamiliar with these peculiar dose-responses. Nevertheless, these phenomena, disquieting as they may be, are irrefutable. A wide variety of paradoxical effects has been reported with fluoride<sup>5</sup> and many other chemical substances.<sup>6</sup> In radiation, the paradoxical effect is known as a non-linear, quadratic and supra-linear dose-response.<sup>13,14</sup> It is also called the Petkau effect.<sup>15</sup> All these peculiar phenomena, associated with both chemicals and radiation, are characterized by a low concentration range within which the adverse effect increases as the dose decreases.

Gould and Goldman, in their book *Deadly Deceit. Low-Level Radiation, High-Level Cover-Up*,<sup>15</sup> report the results of Charles Walden *et al* who observed a supra-linear effect of ionizing radiation on human chromosomes. "Their findings contradict the conventional scientific dogma that the dose-response is linear, and that a straight line can be used to estimate low-dose effects from studies of high doses." Gould and Goldman also discuss the "Petkau effect." In 1971, Abram Petkau, a physician and biochemist, observed an unusual and entirely unexpected effect of radiation. He found that low levels of radiation produced more damage to fresh beef brain cellular membranes than higher doses did.

Gofman pointed out, in his book *Radiation and Human Health*,<sup>13</sup> that "Enthusiasts of nuclear power and of medical irradiation are forever hoping, quite understandably, that there will be found some threshold — a dose of radiation below which no harm would occur." But "It turns out that nuclear-power and medical-irradiation enthusiasts have all been going in exactly the wrong direction, They have consistently suggested that linearity may overestimate the true cancer risk per rad. The real problem is that linearity underestimates the true cancer risk per rad when one derives values from studies based on higher doses of radiation than the doses at which we wish to apply those values."

According to Gofman and O'Connor (in their book *X-Rays: Health Effects of Common Exams*), "It is natural for everyone, ourselves included, to wish that radiation would be less harmful per rad at low dose-ranges than at high dose-ranges... Those who cling to this wish, in spite of all the evidence, claim that the linear 'hypothesis' exaggerates the risk of getting cancer from irradiation at low doses. But wishful thinking is gradually yielding to evidence." <sup>14</sup>

The books by Gofman<sup>13</sup> and Gofman and O'Connor<sup>14</sup> are replete with reports which prove that low doses of radiation are in many cases more harmful than higher doses. These data fit what is called a supra-linear dose response curve, which is significantly different from a linear curve. Gofman and O'Connor<sup>14</sup> conclude that the "linear model may actually underestimate the risk of getting cancer and leukemia. There is, unfortunately, evidence which is accumulating and growing ever stronger that the cancer risk per rad of dose is worse in the low-dose range than in the high dose... Moreover, during the nearly four years of extraordinary scrutiny and widespread peer review of the book<sup>13</sup> in professional journals, scientific symposia and in trials concerning radiation injury, no one has made a single scientifically valid refutation of any of its data, methods, or conclusions. Probably no work in this field has received more review by peers." <sup>14</sup>

## **Who is John W. Gofman?**

Because it is so difficult for some to accept the unusual supra-linear effects, let us familiarize ourselves with the credentials of the individual who has done decades of research on these phenomena. John W. Gofman is a physician with a doctorate in nuclear/physical chemistry, who is recognized as one of the world's leading medical experts on low-level radiation. He has been Professor of Medical Physics at the University of California in Berkeley, and a member of the Clinical Faculty at the University of California School of Medicine in San Francisco.

As a graduate student at Berkeley, he was one of those who discovered uranium-233, and demonstrated that it was fissionable. In 1941-1943, he developed a method for isolating plutonium and provided the plutonium first used at the Manhattan Project. From 1962-1969, he was Associate Director of the Lawrence Livermore Laboratory, and set up the Laboratory's Biomedical Division. From 1963-1972, he directed research in that Division. This research, requested by the Atomic Energy Commission, evaluated ionizing radiation and chromosome injury as causes of human cancer. Gofman has received many awards and honors, including a citation from the American College of Cardiology. He has written six books.

## **Fluoridation is iatrogenic and pathological science**

Fluoridation is iatrogenic science because it creates more serious problems than the problem it was originally designed to resolve, but did not. Fluoridation also conforms to what Irving Langmuir, the 1932 Nobel laureate in chemistry, called the dynamics of "pathological science — the science of things that aren't so. The basic progression is that sloppy work by sloppy scientists gets picked up by even worse scientists, who do worse and worse work... But the kicker is that this kind of bad science may not completely die for a very long time, but just take on more and more peculiar forms." 22

One of these forms was pointed out by Sutton in his cogent article *Are Most Fluoridation Promoters Neurotics?*<sup>23</sup> Sutton quoted Kurt Thoma, Professor of Oral Pathology at Harvard University: "The neurotic depends on opinions other than his own and is swayed by remarks of others without analyzing the facts. He feels that his opinions must be enforced, and even if proven in error he will not 'give in' because this hurts his ego ideal."

This is why the pathology of fluoridation is so easily diagnosed. Its distinctive syndrome consists of hype, brouhaha, hullabaloo, echolalia, pleonasm, tautology, propaganda, weasel words, propaganda, recycled nonsense, double speak,<sup>24</sup> the invention of reality, <sup>25</sup> denial, the graying of reality and the manufacture of consent,<sup>26</sup> Fluoridation is part of "the new age mythology"<sup>27</sup> in which, as Werner Erhard proclaimed, "Reality is make-believe." Wishful thinking is presented as scientifically established fact to achieve self-serving ends. An egregious example of the pathology of fluoridation is Report No 122, compiled by a special Committee on Research into Fluoridation and published by the British Department of Public Health and Social Security in London. See Appendix C for my analysis<sup>21</sup> of this British report, which erroneously concludes that fluoridation is effective in preventing tooth decay.

## **The denial syndrome**

Unfortunately, those who question fluoridation are ignored as if they did not exist, or are attacked and derogated by foxes who are guarding the fluoridation chicken coop. A recent

example of this is the hit- and-run attempt to discredit John Yiamouyiannis. This is discussed in the section "Truth will come to light. Murder cannot be hid."

A clinical psychologist whom I consulted about fluoridation referred me to the psychiatric definition of *denial* which includes "refusal to admit ... reality... Known also as negation, denial is a primitive defense ... consisting of an attempt to disavow the existence of unpleasant reality."<sup>28</sup>

Denial is not isolated and sporadic, but may be pandemic in science, medicine, academia, and elsewhere. It occurs in the controversial fluoridation of drinking water which, contrary to what authorities claim, does not prevent dental caries and is not safe.<sup>1,23</sup> In quantum physics, physicists have for decades refused to acknowledge an inconsistency in Einstein's special theory of relativity.<sup>29</sup> They also have been slow to recognize Bohm's alternative.<sup>30</sup> Quantum theory is itself paradoxical because it "demands conflicting or mutually incompatible descriptions — an example of this is the description of an electron as both a wave and a particle." A well-known scientist wrote an unfavorable review of one of Velikovsky's books without (she admitted) having read it. Other well-known scientists who edited prestigious scientific journals rejected papers, which Velikovsky submitted for publication, without (they admitted) having read them.<sup>31</sup>

Hendershot, editor of the *Journal of the American Dental Association*, provided another example of denial. I wrote Hendershot to ask if he would be interested in seeing my report on harmful effects of fluoridation in Chile.<sup>1</sup> When he did not reply, I sent him copies of my report on three separate occasions, one month after another. He rejected my report three times without ever having even seen it. To publicize his censorship, my report, which then appeared in the *Journal of Arts, Science and Humanities*, included a photograph of three envelopes, each of which contained a copy of my manuscript and was addressed to Hendershot. These letters were certified so that the recipient had to sign a receipt of delivery. All three envelopes were stamped **REFUSED - RETURN TO SENDER.**

### **Misconduct in science**

Misconduct and denial are two sides of the same coin because denial is a form of misconduct and misconduct often involves denial. Fluoridation is an example par excellence of denial and misconduct in science but it is in good company, whatever that means. The 1992 report on *Responsible Science. Ensuring the Integrity of the Research Project*, Volume I (by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine)<sup>32</sup> received a "cool response" and "can be credited with adding silt to muddy waters".<sup>33</sup>

Some areas of higher education are also hotbeds of misconduct by academic robber barons in administration, research, and teaching.<sup>34,35,36</sup> The May/June, 1994, Special Issue of *The Journal of Higher Education* was devoted to "Perspectives on Research Misconduct".<sup>35</sup> In some colleges and universities, plagiarism, falsification of data, and other kinds of individual and institutional misconduct appear to be pandemic.<sup>30</sup> Much of this pollution of the ethical environment of research and graduate education is covered up by structured silence.<sup>36</sup> Structured silence denies misconduct by ignoring it. Unanswered questions are ignored, as if they did not exist. Denial preserves the illusion that all is well, and perpetuates false public

images of academia and science. Brown<sup>18</sup> and Mitchell<sup>19</sup> used structured silence when they selectively criticized my data but not Briner and Carmona's data, included in my report.<sup>1</sup>

The most recent and most comprehensive report<sup>36</sup> of misconduct in colleges, universities and science was rejected for publication by Koshland, the editor of *Science*. This is a prestigious journal published by the American Association for the Advancement of Science. Koshland had previously claimed that 99.9999% of scientific reports are accurate and truthful, without having any justification for using that figure! He then did not publish a report<sup>36</sup> which proved him wrong.

Thirty years earlier, Abelson, editor of the same journal, *Science*, did not publish one of Velikovsky's papers, without having read it.<sup>31</sup> In 1992, the same Abelson was a member of the panel which produced the *National Academy of Sciences report on Responsible Science, Ensuring the Integrity of the Research Process*.<sup>32</sup>

Several years before Abelson rejected Velikovsky's paper, without having read it, there was a high-level effort to censor scientific publications which presented new ideas that were at variance with what so-called authorities defined as truth. The American Association for the Advancement of Science seriously considered, but fortunately did not approve, a resolution "that henceforth any publication that presents new scientific hypotheses should not be allowed to be printed without the imprimatur of a proper professional body." <sup>31</sup> If this resolution had been accepted and implemented, it would avoid the problem of having to deny something because that something would never have appeared in print. There would thus be nothing to deny and therefore no controversy.

Those who are opposed to fluoridation usually find it impossible to publish in so-called reputable dental and medical journals. So they publish in whatever ways they can. Pro-fluoridationists then criticize them and derogate their research because they did not publish in reputable journals. That is precisely what Brown<sup>18</sup> and Mitchell<sup>19</sup> did to me and my report on fluoridation in Chile. They not only criticized my research, but also derogated the journal in which it appeared and the university which published that journal.

### **"Those who ignore history are destined to repeat it"**

People have been and are still being harmed by fluoride because those who are responsible for fluoridation have, among other things, ignored history. They have ignored what happened when the drinking water of several cities was iodinated in the 1920s. Iodination of Rochester, NY, water began on April 24, 1925.<sup>37</sup> It was discontinued officially because it "did not seem practical owing to the great waste." <sup>38</sup> However, complaints of adverse results engendered widespread opposition. "Iodination was practiced for a short time in Sault Ste. Marie, MI, and Virginia, MN, but was speedily abandoned because of numerous objections from residents." In Duluth, MN, "objections ... prevented the inauguration of" iodination of the drinking water.<sup>37</sup> "Iodination of the Anaconda, Montana, water supply began in April, 1925, and was continued in October, 1925, April, 1926, and October, 1926. Children in the Anaconda schools [were] also receiving 10 milligrams of chocolate-iodine tablets once a week for 30 weeks during the school year."<sup>37</sup>

"Some physicians [were] apprehensive lest the 'promiscuous distribution of iodine,' as they put it, to those not in need of the element, cause a marked increase in hyperthyroidism."<sup>37</sup> This was actually observed in Derbyshire, England, where it was reported that "An increase in the prevalence of goiter among children following the use of iodine [including 'iodized water'] is most unusual."<sup>37</sup> This increase in the prevalence of goiter in Derbyshire may well be due to a paradoxical effect of iodine. Iodine is a close relative of fluorine and both are in the same chemical family known as halogens. Data suggestive of a paradoxical effect of fluorides and iodides on the clotting of milk by pepsin were published in 1928.<sup>39</sup> "Thyroid disorders associated with iodine deficiency and excess" also suggests that iodine produces paradoxical results.<sup>40</sup>

The results of iodination of drinking water in the above-mentioned cities led Robert Olesen, Surgeon in the United States Public Health Service, to conclude in 1927 that "So far, there is considerable doubt as to the ability of iodinated water to reduce the incidence of endemic goiter." And, "The iodination of public water supplies, in its present state of development, can not be recommended for widespread use."<sup>37</sup> Olesen's report was published in *Public Health Reports* issued weekly by the United States Public Health Service.<sup>37</sup> One year before Olesen's report appeared, Hartsock pointed out, in the *Journal of the American Medical Association*, that "The continuous use of iodine over a long period of time should never be prescribed for adults, and when its periodic use is prescribed, frequent observations of the pulse and weight should be made."<sup>38</sup> In 1931, Weston concluded, in the *American Journal of Public Health and the Nation's Health*, that "The addition of iodine in drinking water [to prevent goiter] has also proved disappointing."<sup>41</sup>

I should not have implied, without qualification, that proponents of fluoridation have ignored history. What they have learned from history is that they should not permit opponents of fluoridation to publish in professional medical and dental journals. As I already pointed out, that is precisely what Hendershot, editor of the *Journal of the American Dental Association*, did to me.

The fluoridators have also ignored the history of what Schubert and Lapp called "radioactive poisons" that were used therapeutically for over half a century with disastrous results."<sup>42</sup> Following the therapeutic use of radon drinking water in 1903 and 1904, first radium salts and then Thorotrast (a commercial product which contained a radioactive isotope and became popular in 1929) continued to be used well into the 1960s. In 1913, the *Journal of the American Medical Association* reported that "the value of [radon] is unquestionably established." Over 80% of 1038 patients with a variety of ailments, recalcitrant to other treatments, "were considered ... by 20 foreign doctors ... to have been improved by the use of radium emanation." Radium was also injected into mental patients to treat psychoses and other mental problems.

In 1916, an article in the journal *Radium* declared that "Radium had absolutely no toxic effects, it being accepted as harmoniously by the human system as is sunlight by the plant." Radium therapy was listed in the New and Non-official Remedies of the American Medical Association until 1932.<sup>42</sup> In 1936, Percy Brown, M.D., who died from overexposure to X-rays, published his book *American Martyrs to Science through the Roentgen Rays*.<sup>43</sup> This book presented the biographies of professionals who died from the effects of X-rays.

In the 1950s, articles in medical journals recommended Thorotrast treatment for children. In 1953, a Denver company was marketing a contraceptive jelly containing radium.<sup>42</sup> In the 1940s, 1950s and 1960s, hundreds if not thousands of military personnel and civilians were given radium treatments to prevent and cure colds, hearing loss and other ear ailments, and adenoid problems. The victims attributed head and neck cancers, miscarriages, and thyroid and other problems to the radium treatment.<sup>44</sup>

### **Fluoridation déjà vu**

For half a century, promoters of low-level fluoridation and low-level radiation have denied repeated and continuous warnings about the dangers they both pose.

In 1957, Schubert and Lapp pointed out that "One of the strangest aspects of the attitude toward radiation poisoning is that as late as 1924 — nearly twenty-five years after the discovery of radium — no one seemed to understand that when radioactive substances were taken into the body they emitted radiations just as damaging as those produced by an X-ray machine. This seems incomprehensible in view of the fact that it was well known by then that all kinds of radiation — whether X-rays, alpha rays, beta rays, or gamma rays — damage tissues." <sup>42</sup>

Actually, many people not only understood but warned about the dangers of radiation. Schubert and Lapp themselves comment on numerous reports of injury and death, caused by radiation, which continuously appeared in newspapers and in medical and scientific journals. But the so-called experts ignored these reports while people died, in some cases agonizing deaths.

In the case of fluoridation, the so-called experts also have also ignored repeated warnings about the toxicity of fluoridation while people have been harmed and in some cases killed. For information about the political, economic and social syndrome of low-level fluoridation pathology, read Joel Griffiths' *Fluoride: Commie Plot or Capitalist Ploy*.<sup>2</sup>

### ***Sartor Resartus***

I shall now respond to criticism of my report on fluoridation in Chile<sup>1</sup> by Brown<sup>18</sup> and Mitchell.<sup>19</sup>

I did not select the three communities in Chile which I researched. They were the ones selected by the National Health Service of Chile. The demographic data I used are taken from official government reports. In my report, I also analyzed Briner and Carmona's data and took issue with their conclusions. Briner and Carmona were high-ranking officials in the National Health Service of Chile. Brown and Mitchell criticized my conclusion that fluoridation is harmful because the three communities are not comparable in certain respects. But they did not criticize Briner and Carmona's conclusion (based on data from the same communities) that fluoridation is safe. Brown and Mitchell's selective criticism is a form of structured silence, as I have already pointed out.

Brown and Mitchell also ignored Briner and Carmona's erroneous claim that fluoridation had no effect on the death rates of individuals with congenital malformations. In fact, Briner and Carmona's data revealed that fluoridated Curico had 244% more such deaths than non-

fluoridated San Fernando, and 288% more such deaths than the entire country of Chile taken as a whole.

Finally, neither Brown nor Mitchell commented on any of the other serious errors and inadequacies in Briner and Carmona's publication, about which my report presented detailed information. Their silence about the deficiencies in Briner and Carmona's work raises questions about their objectivity.

Briner and Carmona were the two highest ranking officials in the National Health Service of Chile, Section of Odontology, when they presented their report in 1965 at the Fifth International Odontological Congress of Chile. The Commission of Dental Health of that Congress endorsed the safety of fluoridation in Chile on the basis of their report.

**The *Journal of Arts, Science and Humanities* and Anthony University exist**  
Brown<sup>18</sup> and Mitchell<sup>19</sup> attempted to cast doubt about the validity of my Chile report by pointing out that it was published in an obscure journal. They thus obscured the real issue which is why responsible scientists and other professional researchers have been blackballed and denied the opportunity to publish their criticism of fluoridation in professional dental and medical journals in the United States.

Despite the fact that my report on fluoridation in Chile was published in an obscure journal, that report was directly responsible for terminating fluoridation in Chile. As soon as it was printed, I sent copies to every dental and medical officer in the Pan-American Health Organization and the National Health Service of Chile. I also sent copies to professors in the faculties of medicine, dentistry and pharmacy in the University of Chile. Shortly thereafter, fluoridation was discontinued in Chile. However, the fight may not be over. Present-day bureaucrats may not know that some 20 years ago fluoridation was discontinued in Chile because it was killing people in the experimental city of Curaco..

The existence of the *Journal of Arts, Science, and Humanities* and Anthony University which published that journal has also been questioned (The name Anthony University has since then been changed to Susan B. Anthony University.) The university was established as a not-for-profit corporation in the State of Missouri on June 13, 1973. This can be verified by directing an inquiry to the Secretary of State, Department of State, Jefferson City, Missouri.

Doubts about the existence of the *Journal of Arts, Science and Humanities*, which contains my report, can also be easily laid to rest. This journal was copyrighted in 1976, which is its legally documented year of birth. The copyright and date of publication can be verified by directing an inquiry to the Library of Congress, Copyright Office, Washington, D.C. Copies of this publication can be ordered from the Copyright Office, Library of Congress.

Additional evidence that the *Journal* exists is the fact that copies of that journal, containing my report on fluoridation in Chile, have been distributed by the National Institute of Dental Research. This is part of the National Institutes of Health in the U.S. Public Health Service (Bethesda, Maryland). On October 28, 1986, John S. Small, Information Specialist at the National Institute of Dental Research, wrote me as follows on official, government letterhead

**Dear Dr. Schatz:**

We would appreciate having a few more reprints (3-5) or your permission to reproduce several copies of your January 1976 article on fluoridation in Chile (Anthony University *Journal of Arts, Science, and Humanities*. v. 2, no. 1)

The needed copies would be for distribution to interested health professionals or writers specializing in health sciences as requests arise.

A postage-free envelope is enclosed for your use in sending copies or your note or permission to make copies. Thank you.

**"Truth will come to light. Murder cannot be hid"**

The *hit-and-run tactic* is an appropriate way to describe how proponents of fluoridation attempt to discredit those who oppose them. They publish a critique of one sort or another in a professional journal, but the individual they attack cannot publish his rebuttle in the same journal. An example of this *hit- and-run* is the recent attempt to discredit John Yiamouyiannis by John Hunt, chief executive of the British Dental Society, and four of his colleagues with supposedly impressive credentials.<sup>45</sup> Unfortunately, few if any readers of the British Dental Society, in which Hunt *et al* published their critique, will see Yiamouyiannis' reply.<sup>46</sup> They will therefore not be able to decide for themselves "where ... misleading statements are coming from, who is using 'deception by omission,' and whose references do not support their claims."<sup>46</sup>

In his reply, Yiamouyiannis poses an important question, "If one doesn't 'have a complete knowledge of the detailed and voluminous scientific literature on the relationship of water fluoridation to dental caries,' or close to [that], how [is he] going to respond to someone with an opposing viewpoint who does? [Will it be] by name-calling, by character assassination, by distortions, by misrepresentations, by undocumented fabrication?"<sup>46</sup>

But there are other important questions that should be asked about low-level fluoridation because of what we know about low-level radiation. Does low-level fluoridation, like low-level radiation, involve something far more serious than the usual misconduct of science? John Gofman's realization of the profound responsibility that scientists have to warn people about the danger of low-level radiation are best described in his own words.

"I was stupid in those days. In 1955, '56, people like Linus Pauling were saying that the bomb fallout would cause all this trouble. I thought, 'We're not sure. If you're not sure, don't stand in the way of progress.' I could not have thought anything more stupid in my life.

"The big moment in my life happened while I was giving a health lecture to nuclear engineers. In the middle of my talk it hit me! What the hell am I saying? If you don't know whether low doses are safe or not, going ahead is exactly wrong. At that moment, I changed my position entirely."<sup>47</sup>

In 1979, Gofman expressed his feelings as follows. "There is no way I can justify my failure to help sound an alarm over these activities many years sooner than I did. I feel that at least several hundred scientists trained in the biomedical aspect of atomic energy - myself definitely included - are candidates for Nuremburg-type trials for crimes against humanity for our gross negligence and irresponsibility. Now that we know the hazard of low-dose radiation, the crime is not experimentation - it's murder." 48

Now, back to questions about fluoridation which is still highly controversial after half a century. Are the harmful effects of low-level fluoridation due to "gross negligence and irresponsibility"? If so, is low-level fluoridation a "crime against humanity? If it is, should those responsible for the harmful effects of low-level fluoridation be considered "candidates for Nuremburg-type trials for crimes against humanity."?

### **Acknowledgement**

I salute John Yiamouyiannis and others for what they have been doing to inform people about the dangers of low-level fluoridation, just as I salute John Gofman and others who have been informing people about the dangers of low-level radiation. Many of these people, however, pay a high price for what they do because they have publicly questioned the integrity of the scientific establishment.

Gofman has recounted some of that happened to him.<sup>47</sup> Robert O. Becker, who refused to keep silent about electropollution - the dangers of manipulating our electromagnetic environment - has told the sad story of what happened to him. His account is in the last chapter in his book *The Body Electric*, that he co-authored with Gert Selden.<sup>49</sup> Becker explained as follows why he revealed the retribution he experienced.

"I've taken the trouble to recount my experience in detail for two reasons. Obviously, I want to tell people about it because it makes me furious. More important, I want the general public to know that science isn't run the way they read about it in the newspapers and magazines. I want lay people to understand that they cannot automatically accept scientists' pronouncements at face value, for too often they're self-serving and misleading. I want our citizens, nonscientists as well as investigators, to work to change the way research is administered. The way it's currently funded and evaluated, we're learning more and more about less and less, and science is becoming our enemy instead of our friend."<sup>49</sup>

### **Both sides of the coin are important**

"The importance of scientists' writing their own personal accounts of their discoveries is now recognized. "For the historian of science, few documents are as valuable as the description of a discovery by the scientists involved in the action. Unfortunately few scientists take the time to record for posterity the course of events which led to the discoveries which were the fruit of their labor." (Lechevalier)<sup>50</sup>

"I have often thought how much more interesting science would be if those who created it told how it really happened, rather than reported it logically and impersonally, as they often do in scientific papers." (Beadle)<sup>50</sup>

"Over the years, the story of streptomycin's discovery has been terribly garbled. I think ... it would be a great service if ... Dr. Schatz told his own accurate and interesting account of his finding. Streptomycin turned out to be a milestone in the history of drugs to treat tuberculosis and other infections. Dr. Schatz's role has been largely ignored. The record about this discovery should be set straight." (Doris Jones Ralson, a fellow graduate student of Schatz when he did the streptomycin research)<sup>50</sup>

### **Our survival as a species is now threatened**

I agree that personal accounts of discoveries by the scientists who made those discoveries are important. That is why I wrote *The True Story of the Discovery of Streptomycin.*, which my friend and colleague Doris Jones Ralston suggested I do.<sup>50</sup> However, it may be even more important for whistleblowers to publish detailed accounts of how the scientific establishment has attempted to silence and punish them.

We are now at a critical time in history because our survival as a species is threatened as a result of our global devastation of nature. Science is the main force that has been used for the manipulation, exploitation, and devastation of nature. It is therefore important for the history of science, for the welfare of life on this planet, and for our survival as a species that those who have been pilloried for questioning the integrity of science and exposing misconduct by scientists tell, in their own words, the stories of what happened to them.

Fluoridation, is a major environmental pollutant,<sup>2</sup> which along with many other chemicals is now a major part of the threat to our survival. Those scientists and other professionals who have opposed fluoridation have a unique opportunity to make a major contribution to history, to science, and to the survival of our species by telling the stories of how they were persecuted for their continued determination to inform their fellow men and women about the dangers of fluoridation.

### **Epilogue**

*"Until about a hundred years ago, rational men lived like spies in an enemy country. They never walked abroad unless disguised in irony or allegory. To have revealed their true selves would have been fatal.*

*"Today their status is more that of guerillas. They snipe from cover, ambush stragglers, harass retreating rear guards, cut communications, and now and then execute swift forays against detached units of the enemy. But they dare not yet risk an open engagement with the main force; they would be massacred. Their life is dangerous but exciting and is warmed by a sense of camaraderie not often known among the dull conscripts of orthodoxy.*

*"This" report "is intended as a sort of handbook for ... recruits in the ... cause of common sense. It indicates where the main armies of ignorance are now encamped and tells in a secret code what garrisons are undermanned or mutinous. It tries to show the use of cover and camouflage and the techniques of infiltration and retreat. It maps road blocks and mine fields and shows how to rig a booby trap. It warns of counterespionage and gives — again in code — the ... infallible signs to know a fool.*

*"When the recruit has finished with it, he can toss it over the walls into the enemy's barracks. It may encourage desertion."*51

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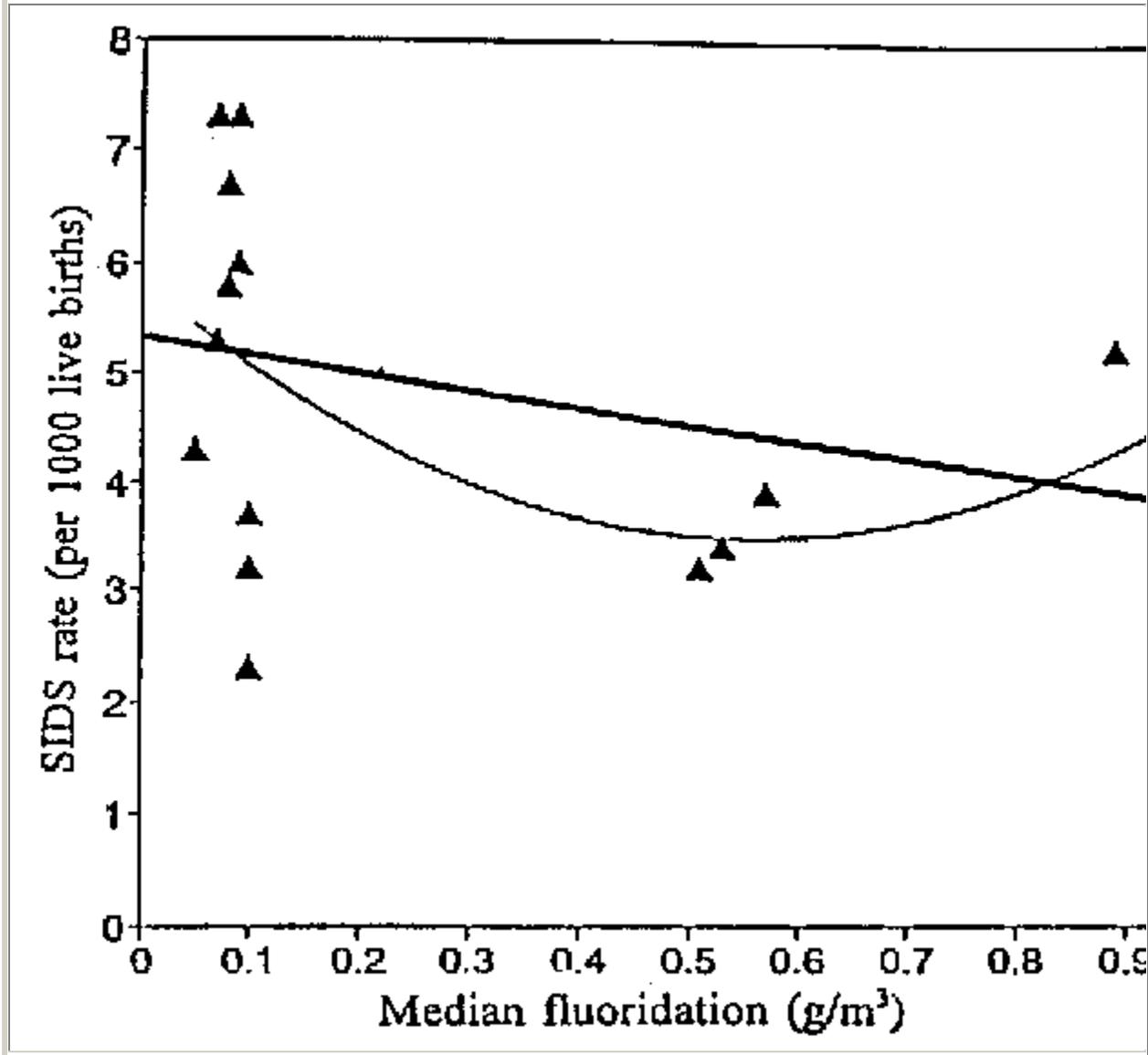
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Appendix A:

[Who is Albert Schatz, the author of this report?](#)

FIGURE 1,  
Figure 1. Mean SIDS mortality rates (1980-1984) and median fluoridation in reticulated water supplies for New Zealand health districts.



## **Appendix B:** Risk assessment and paradoxical effects

This is not the place to review the literature on the limitations of risk assessment. Suffice it to say that we need adequate and reliable risk assessments for many pharmacological products, food additives, chemical environmental pollutants such as pesticides, radioactive contamination, hazardous wastes, and other harmful and potentially harmful substances that pollute our air, water, food, homes, work places, schools, recreational areas, etc. Unfortunately, risk assessment is too often little more than guesswork or a trade-off. Also unfortunately, political considerations not infrequently influence decisions as to how much exposure is permitted. What is even more deplorable is that there is no risk assessment at all for many toxic and potentially toxic substances to which we are frequently exposed.

It is not surprising that the risk assessments of low-level fluoridation and low-level radiation are highly controversial issues because there is disagreement on methods of determining risks and interpretation of research results. At the same time, it is inconceivable that meaningful risk assessment can be done without ascertaining whether paradoxical effects are involved. If they are, then risk assessment becomes considerably more complex, time-consuming, and costly. Nonetheless, the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and other state and federal agencies should seriously consider paradoxical effects.

In 1964, Schatz, Schalscha, and Schatz published the first review of paradoxical effects<sup>6</sup> in which they pointed out that "Paradoxical effects occur more frequently and are more widely distributed than one would ordinarily assume from scattered reports.... Paradoxical effects have been produced by radiation, temperature, mutagenic and carcinogenic chemicals, steroid hormones, dextran, detergents, trace metals, herbicides, fungicides, insecticides, germicides, antibiotics, drugs, and a host of other agents...

"Since numerous chemical and physical agents cause paradoxical effects by different mechanisms in many biological systems, these reactions will no doubt become increasingly important in pharmacology, toxicology, chemotherapy drug idiosyncrasies, air pollution, chemical carcinogenesis, fluoridation, fallout, radiation effects, nutrition, biogeochemistry, the weathering of rocks and minerals, soil formation and soil fertility, and many other areas"<sup>6</sup> including behavioral toxicology.

Also in 1964, Schatz and Martin published the first review on *The Importance of Paradoxical Effects of Fluoride with Respect to Fluoridation and the Toxicology of Fluoridation*.<sup>5</sup>

Thirty years later, in 1994, Milton Wainwright (in the Department of Molecular Biology and Biotechnology, at the University of Sheffield, England) published a review of our two reports which he called *Strange bumps in the data - mycological implications of the paradoxical concentration effect*.<sup>52</sup> In his review, Wainwright commented as follows, "Schatz himself experienced difficulty in publishing his work on paradoxical effects in 'front-ranking' journals. His work on the subject, including two reviews, which are well written and thought-provoking by any standards, were eventually accepted for publication in *Compost Science* <sup>6</sup> and the *Pakistan Dental Review*<sup>5</sup> and so have probably been read by only a few microbiologists.

"I hope this article has highlighted the fact that unusual bumps in data are not always the result of an experimenter having a bad day. Perhaps under the umbrella of Schatz's 'paradoxical effect', this potentially important phenomenon will gain respectability and receive the attention it deserves."<sup>52</sup>

It is interesting that Wainwright was the first to publish information on (a) the importance of my work on paradoxical effects<sup>x</sup> and (b) my role in the discovery of streptomycin. <sup>53</sup>

Unfortunately, the FDA, the EPA, other agencies, and individuals concerned with toxicology and other areas in which paradoxical effects undoubtedly occur, have yet to pay attention to this important phenomena which may literally influence not only health but also determine whether people live or die.

Aside from paradoxical effects, there is another reason to doubt the claim that low-level fluoridation is safe. When radiation and medication are administered, the dose is quantitatively adjusted daily for each individual. But fluoridation disregards "the uniqueness of each individual and the degree of variability of response among individuals."<sup>12</sup> Individuals differ in how much water they consume daily. Furthermore, the fluoride content of drinking water varies from day to day. It is not invariably one part per million, which it is supposed to be. Therefore, the risk assessment of fluoridation is based on an average daily intake of fluoride from a source whose fluoride content varies daily. Consequently, no one knows how much fluoride each individual ingests daily from drinking water, and from other background sources. This is "playing with fire" because fluoride is a highly toxic substance. For these reasons, independently of paradoxical effects, it is not surprising that low-level fluoridation is harmful to some people. It would be surprising if there were no harmful effects.

"The fluoridation bottom line floats to the top when realizing governments and responsible scientific documentation on fluorides and fluoridation confirm that after 50 years of forced fluoridation, no government has felt it necessary or morally obligated to study the effect of fluoridation on human fertility and fluoride damage to the foetus, and the subsequent birth of babies.

"No drug except fluoride is allowed such evil medical exception from government, pharmaceutical and poison laws, and that evil is compounded when the same responsible people force fluoridation against the wish of the people.

"As it cannot be judged democratic, one may consider it the enemy of freedom, honesty, science, and morality, all based on their [the promoters' of fluoridation] fear of the dreadful truth about fluoridation and fluoride chemicals...

"Hidden on page 91 of the U.S. Department of Health and Human Services [in the section *Review of Fluoride, Benefits and Risks*, 1991] the authors make this recommendation: 'Conduct studies on the reproductive toxicity of fluoride using various dose levels including minimally toxic maternal dose.'

"Question - Why not?"<sup>54</sup>

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**Appendix C: The failure of fluoridation in England<sup>21</sup>**

The title of this Appendix is the title of an article which I published in 1972.<sup>21</sup> It is reproduced on pages 17,18,19, and 20 of this report because (a) it is not otherwise readily available and (b) as I have already said, "It has to be seen to be believed." My 1972 publication shows that fluoridation does not prevent dental caries.

The information in the following two paragraphs was inadvertently left out of the original manuscript of the 1972 article when it was submitted for publication.

"There is a flaw in this British study which the authors were unaware of. The flaw invalidates epidemiological surveys that show less decay in fluoridated children than in non-fluoridated children of the same age. The flaw involves the difference in the age of the children versus the post-eruption age of their teeth; that is, the age of the teeth after they appear above the gum line. Although the two groups of children are the same age, the teeth of the children in the two groups are not the same age because fluoride delays tooth eruption.

"The teeth of fluoridated children, which erupt later, are younger than the teeth of non-fluoridated children, which erupt earlier. Because the teeth of the fluoridated children are younger, they have been exposed to cariogenic conditions in the mouth for less time than the teeth of non-fluoridated children. Because of this shorter exposure to cariogenic conditions, the teeth of fluoridated children understandably have less decay. Therefore, the less tooth decay that occurs in fluoridated children cannot be attributed to any cariostatic action of fluoride. This conclusion is supported by the fact that the rate at which tooth decay occurs is the same in both groups, as shown in [Figure 1](#)."

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FIGURE 1, Curves showing that dental caries develops at the same rate in the permanent teeth of fluoridated and non-fluoridated children

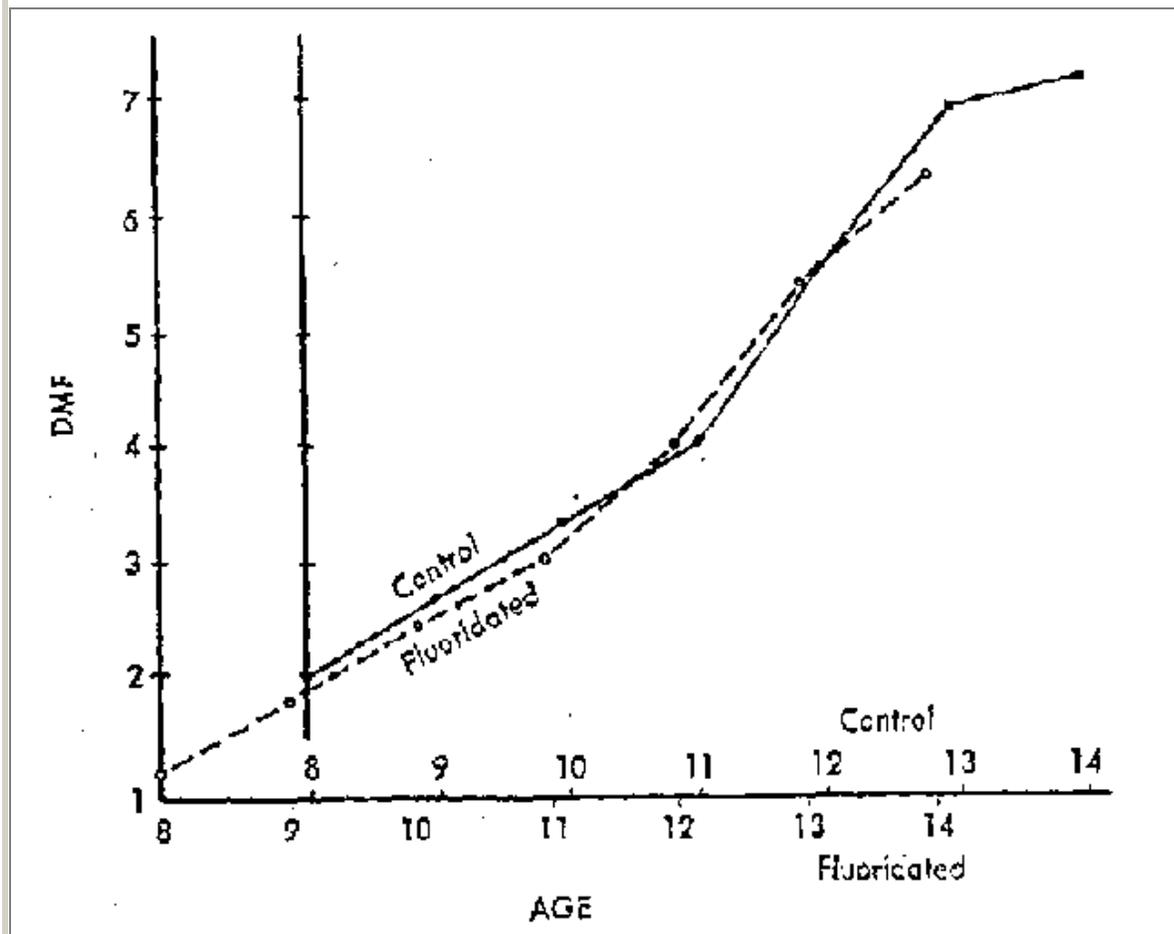


TABLE I  
DMF for permanent teeth of fluoridated and non-fluoridated children.  
Average DMF per child

Age	Fluoridated Areas	Control Areas	% Difference in DMF
8	1.2	2.0	67*
9	1.8	2.7	50
10	2.4	3.3	37
11	3.0	4.0	33
12	4.0	5.6	40
13	5.4	6.9	28
14	6.3	7.2	14

\*67% = (2.0 - 1.2)/1.2 x 100.

