Dental Mottling:

"Merely Cosmetic or Dental Damage?"

In much of the literature regarding fluoride, this compound is described as an essential nutrient for proper dental health. However, in the May 14, 1985 Federal Register, the NAS states that, "fluoride has not been shown unequivocally to be an essential element for human nutrition." In fact, it was investigated and discovered as the cause of a public health problem known as dental mottling or fluorosis. While this chalky, yellow or brown staining of the teeth once thought to be "just cosmetic," we know from the literature that it is the outward sign of dental dysfunction.

"Fluorotic enamel is characterized by increased porosity which in severe grades is present as a distinct hypominerlaized "subsurface lesion."

Fluoride 15:2, 70-75, April 1982

"New insights into the nature of dental fluorosis have been gained during the past decade which have underlined that the ***concept of a water level below which no effects on enamel will occur, is not justified.*** *The first of these is that the entire range of enamel fluorosis is from barely discernible minimal effects to gross pitting . . . These consist of varying degrees of* ***subsurface porosity.*** *" "In fluorosis, dentin is affected as well as enamel."*

Comm. Dent. Oral Epidemiology, 11:2, 109-112, April 1983

As early as 1940, Drs. Smith and Smith from the University of Arizona found that mottled teeth were not durable and that dental caries were delayed by fluoride consumption, rather than prevented. And once caries started, the steps taken to repair them were in many cases unsuccessful — the tooth breaking away when attempts were made to anchor the fillings, so that extraction was the only course. More than 50 percent of the 24-26-year-old age group had false teeth. The authors concluded that while the fluorine ingestion may have offered resistance to bacterial invasion, the disadvantage of "poorly constructed and internally weakened teeth" far outweighed the reported benefit. **(American Journal of Public Health, September 1940)**

Fluoride:

Environmental Contaminant or Nutrient?

Fluoride was once called a medication or treatment and fluoridation was an obvious extension of that treatment. But because the public shys away from the concept of mass medication, the USPHS now calls fluoridation "a natural nutrient." What we often fail to recognize is that fluoride is a naturally occuring contaminant and the chemicals used for fluoridation are hazardous wastes.

Referring to these commercial fluoride salts used for fluoridating, an article from the **Journal of Preventive Dentistry** notes that because of the high solubility of these commercial fluorides, they are more readily absorbed in the body. This factor increases substantially their potential for toxic effects.

In another letter, this time from the Massachusetts Department of Environmental Quality Engineering, we are told that, *"Fluoride is one of the substances in our highest hazard category." (August 21, 1984)*

Most recently, a "world class panel" looking into the non-dental adverse effects of fluoride reported to the Surgeon General. In their transcript, they state, *"If we were handling this as an environmental contaminant, we would say we begin to see fluorosis at two parts per million. So, we want a safety factor of four.* ***We recommend that it be kept below a half a part per million. (0.5 mg/1)"***

Unfortunately, the EPA has been under pressure for many years **not** to call fluoride a "contaminant." Instead of objectively and scientifically evaluating data on fluoride toxicity, the EPA has been caught up in a political promotion of compulsory fluoridation.

According to testimony from dental officials, the USPHS and the ADA has been imploring the EPA for the last ten years, since they classified fluoride as a primary contaminant, to take it off this list. So what the Ad Hoc Committee is telling us is that they are not looking at fluoride objectively and scientifically, as they would look at lead or arsenic. With fluoride, they are under political pressure.

Interestingly enough, the EPA's RMCL for lead which is as toxic or less toxic than fluoride, is 0.05 mg/1. That means that the RMCL, now 4 mg/1, for fluoride is 80 times that of lead.

The ubiquitous occurence of fluoride in nature does not make it an essential nutrient. Scientists have not been able to determine any deficiency disease associated with a lack of fluoride under laboratory conditions. Dental decay has a multifactorial etiology and does not result from a lack of dietary fluoride.

Chromosome Damage vs. Absolutely Safe

Health officials tell the public that fluoridation is "absolutely safe and won't harm anyone."

Yet, at one part per million fluoride has been shown to inhibit enzyme systems. The first authors to study the physico-chemical aspects of fluoride reactions with DNA were Emsley et. al. in 1981. **(J Am Chem Soc, 103:24, 1981)**

These authors showed that fluoride forms formamide-fluoride, acetamide-fluoride and methylformamide-fluoride complexes, and that these enter into surprisingly strong hydrogen bonding reactions. Clark et. al. **(JCS Chem Comm, 41: 466, 1981)** showed that the uracil-fluoride complex [a compound made up of the simplest nucleic acid base and fluoride ion] also forms strong hydrogen bonds.

Emsley et. al. **(J Chem Soc Chem Comm, 1378: 476, 1982)** later showed that these organic complexes are thermodynamically stable, even when hydrated. They went on to postulate, *"then we have a mechanism whereby fluorine could play a disruptive role towards RNA and DNA."*

These three studies clearly show that fluorides are capable of entering into a chemical reaction with important components of DNA and RNA. It is generally accepted today that the biological centre of a chemical structure is related to its spatial or three dimensional configuration. A substance which can enter into reaction with DNA or RNA can alter the sequence of the chemical bonds and change the spatial configuration of the chains, thus altering their biologic activity.

The biological effect of this reaction is called a cellular mutation. Cellular mutations are random processes, and not all cells which undergo a single mutation will eventually produce cancer in the living organism. It must be remembered, however, that the process is not selective and that sooner or later the genes responsible for the reproductive processes of cells will undergo changes with predictable results.

This is why most mutagenic substances known today are considered to be carcinogenic. **(J.J. Yunis, Science, 221: 227, 1983)**

In addition to the genotoxic activity of fluoride described above, fluoride is also involved in non-genotoxic reactions.

During normal cell function, a number of events can produce changes in the genetic material of the cells.

Normal cells have the capacity to repair the damage done to their genetic material — and thus undo the harm done. This is called nucleic acid repair process.

The repair mechanism is a living process, and the reactions involved in the resynthesis of normal DNA (to replace the abnormal one) are therefore all dependent on enzymatic activity. A substance known to have a highly toxic effect on many enzymes should be considered a prime suspect of interference with the DNA repair process. **The fluoride ion, having been shown to be highly toxic to some 80 enzymes, must be considered in that capacity.** [**NAS**, "Fluorides," 70-73; **WHO**, "Fluorides and Human Health," 183, 1970; **Handbook of Experimental Pharmacology**, Vol. 20, Part 2, 48-97, New York, 1970; **Journal of Dent Res**, 44:144, 1965]

Recent experiments of Klein et. al. have confirmed the results of earlier studies which showed that low levels of fluorides can interfere significantly with the DNA repair process of cells. They found that, in irradiated spleen cells, DNA repair activity could be decreased by as much as 50% in the presence of fluoride at 1 ppm concentration.

Extrapolating this data in terms of human populations, the question is, **"Can the soft tissue levels of fluoride reach the 1 ppm concentration indicative of enzyme interference?" Yes, the evidence shows that this is, in fact, the case.**

This chart from the **Handbook of Experimental Pharmacology** shows that the soft tissue fluoride levels do reach harmful concentrations.

ACCUMULATION OF FLUORIDE RESULTING FROM FLUORIDE EXPOSURE

	Fluoride Concentrations in Organs of People	
	In 1939 Before Fluoridation Began in the U.S.	In 1960-65 After Fluoridation Began in the U.S.
Brain	0.53 ppm	1.5 ppm
Heart	0.51 ppm	1.8 ppm
Kidney	0.68 ppm	2.3 ppm
Liver	0.54 ppm	1.4 ppm
Lung	0.27 ppm	2.1 ppm
Spleen	0.28 ppm	1.8 ppm
Pancreas	not reported	1.7 ppm
Thyroid	not reported	4.0 ppm