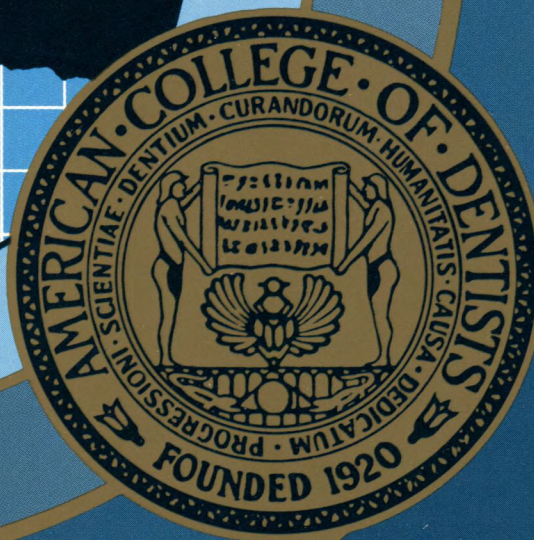
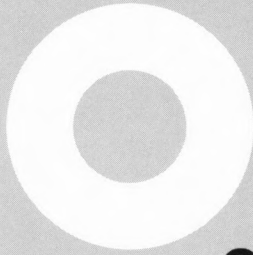


The JOURNAL

of the AMERICAN COLLEGE of DENTISTS





OBJECTIVES of the AMERICAN COLLEGE of DENTISTS

The American College of Dentists in order to promote the highest ideals in health care, advance the standards and efficiency of dentistry, develop good human relations and understanding, and extend the benefits of dental health to the greatest number, declares and adopts the following principles and ideals as ways and means for the attainment of these goals.

(a) To urge the extension and improvement of measures for the control and prevention of oral disorders;

(b) To encourage qualified persons to consider a career in dentistry so that dental health services will be available to all and to urge broad preparation for such a career at all educational levels;

(c) To encourage graduate studies and continuing educational efforts by dentists and auxiliaries;

(d) To encourage, stimulate and promote research;

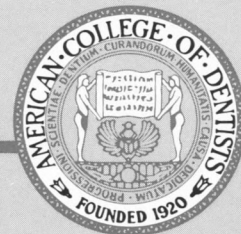
(e) To improve the public understanding and appreciation of oral health service and its importance to the optimum health of the patient;

(f) To encourage the free exchange of ideas and experiences in the interest of better service to the patient;

(g) To cooperate with other groups for the advancement of interprofessional relationships in the interest of the public;

(h) To make visible to professional persons the extent of their responsibilities to the community as well as to the field of health service and to urge the acceptance of them;

(i) To encourage individuals to further these objectives, and to recognize meritorious achievements and the potentials for contributions to dental science, art, education, literature, human relations or other areas which contribute to human welfare—by conferring Fellowship in the College on those persons properly selected for such honor.



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Fluoridation in the 1990's

This issue of the JOURNAL is a special issue presenting a *Symposium on Fluoridation in the 1990's*. It deals with the benefits and risks of fluoridation, its legal and political issues, ethical questions and options for its use.

The effect provided by fluoride is truly miraculous as it relates to dental decay prevention and oral health. In just slightly over fifty years since its discovery, fluoride has effectively reduced dental caries to one-third of its former prevalence in the United States and is responsible for over fifty percent of the current generation of children having no dental caries. At this time, over 7000 communities in the United States are adding fluoride to their drinking water, therefore providing the benefits of fluoridation for present and future generations.

Community water fluoridation is the single most effective, most efficient and most economical means for preventing dental caries in children and adults, regardless of race, religion or socio-economic status. The average annual per capita cost of fluoridation is estimated to be only 51 cents while, by comparison, the average cost of a single restoration today is over \$50.00. It is easy to see that the cost of providing fluoride in drinking water for the entire lifetime of an individual is less than the cost of one restoration.



Keith P. Blair

In spite of its long record of remarkable benefits and extremely low risks, however, fluoridation has had its outspoken opponents over the years. They have persistently created fears by the public about the safety of fluoridation and have repeatedly gone to court to challenge the legality of providing fluorides to the public through community water systems. The reasons for current opposition to fluoridation appear to be centered on health and environmental concerns. A skilled anti-fluoridationist can convince the uninformed that fluoridation is in the same category as uncontrolled radiation, toxic chemical waste and acid rain.

FROM THE EDITOR'S DESK

Nevertheless, and regardless of the efforts of the opposition, fluoridation laws have been upheld by the courts against a variety of legal objections and the courts are continuing to become more sophisticated in dealing with and understanding scientific evidence. The highest courts in over a dozen states have upheld fluoridation ordinances by water districts in their states.

It is difficult to understand that there remains large metropolitan areas in the United States involving many millions of people where there is still no fluoridation. In these areas, instead of health authorities acting to provide fluoridation, the issue was placed on the ballot. This allowed anti-fluoridationists to raise enough fears in the community to prevent a necessary two-thirds approval vote. These fluoride-deprived communities should be targeted for special programs of education on fluoridation benefits. It is highly recommended that communities and schools keep on educating the American public on the benefits of instituting and continuing fluoridation in all areas of the country.

Fluoride has proven itself to be the most effective means of preventing dental caries. We should send the message of the fluoride miraculous effect to all areas of the country and the world.

Keith P. Blair

FLUORIDATION:

Fluoride: Benefits and Risks of Exposure

The Preparation of a Report

L.S. Kaminsky *
M.C. Mahoney **
M.J. Miller ***

Introduction

In response to a directive from the Governor of the State of New York, the New York State Department of Health (the Department) has undertaken a review of the scientific literature and prepared a report on the efficacy of drinking water fluoridation for dental health, and the risks of human exposure to fluoride. This report was prepared and, after extensive review, was published.¹ Subsequently the US Public Health Service published a report on the same topic,² which reached essentially the same conclusions as the Department of Health report.

This paper summarizes the major conclusions of the Department of Health report and describes the review process used.

Summary of Conclusions

1. The preponderance of evidence indicates that fluoride can reduce the incidence of dental caries and that fluoridation of drinking water can provide such protection. Due to the ubiquitous nature of exposures to fluoride sources other than drinking water, it is impossible at present to draw firm conclusions regarding the independent effect of fluoride in drinking water on caries prevalence, using an ecologic study design.

2. Moderate dental fluorosis occurs in one to two percent of the population exposed to fluoride at 1 mg/l in drinking water and in about 10 percent of the population exposed at 2 mg/l; moderate/severe fluorosis occurs in variable percentages ranging up to 33 percent of the population exposed to fluoride at 2.4 to 4.1 mg/l in drinking water. Whether moderate or severe dental fluorosis represents an adverse health effect is still a controversial issue.

3. There is no evidence of skeletal fluorosis among the general U.S. population exposed to drinking water fluoride concentrations lower than 4 mg/l. Radiographically detected osteosclerosis after chronic exposure to fluoride in drinking

water at 8 mg/l was not associated with clinical symptoms. Reports of crippling skeletal fluorosis associated with low concentration of fluoride in drinking water in tropical countries have been attributed to other dietary factors.

4. The available data suggest that some individuals may experience hypersensitivity to fluoride-containing agents. Further studies on hypersensitivity are required.

5. There is no evidence of increased incidence of renal disease or renal dysfunction in humans exposed to up to 8 mg fluoride/l in drinking water. Structural changes in kidneys of experimental animals have been detected at doses exceeding 1 to 5 mg fluoride/kg/day.

6. Based on four case reports, individuals with renal insufficiency who consume large volumes of naturally fluoridated water at 2 to 8 mg/l may be at increased risk of developing skeletal fluorosis. Studies on the effects of fluoride in individuals with renal insufficiency are needed.

7. There is no evidence that chronic exposure to concentrations of fluoride reported to be >2 mg/l in drinking water increases human cancer incidence or mortality. A study of lifetime exposure

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A SYMPOSIUM

to fluoride on cancer incidence in rats and mice has been completed, but the results have been assessed to be equivocal or uncertain.

8. There is no evidence that fluoride is genotoxic except in some *in vitro* assays at cytotoxic concentrations.

9. There is no *in vivo* evidence that fluoride affects human cellular enzyme activities. Fluoridated drinking water at 5 mg/l slightly increased renal enzyme activities in monkeys when ingested chronically for 18 months. There is no evidence that fluoride hydrogen bonds to cellular macromolecules under physiological conditions with toxic consequences.

10. There is no evidence that exposure of pregnant mothers to fluoride at up to 2 mg/l in drinking water causes Down's syndrome or other congenital malformations. Studies at higher concentrations have not been undertaken. There are no studies relating human reproductive performance to fluoride exposure.

11. Children living in fluoridated areas or receiving fluoride supplements (0.5 to 1.0 mg fluoride/day) have a one and one-half-to three-fold margin of safety from moderate or severe dental fluorosis. A higher margin of safety (seven- to eight-fold) has been demonstrated for children living in non-fluoridated areas who do not receive fluoride supplements.

12. The margin of safety from preclinical and clinical stages of skeletal fluorosis among adults living in fluoridated areas is four- to eight-fold and 10-fold, respectively; adults living in non-fluoridated ar-

reas have a 13- to 26-fold and a 33-fold margin of safety from these effects, respectively.

Review Process

The report "Fluoride: Report on Benefits and Risks of Exposure" has undergone an extensive review process. After initial review within the Department the report was distributed, and an oral presentation was made, to representatives of the American Academy of Pediatrics and the Dental Society of the State of New York. Written comments were subsequently received from these groups. The report was revised and then distributed to all individuals and organizations which had previously expressed an interest in the topic, with a request that written comments be submitted to the Department. Additional individuals and groups also submitted responses.

Fifty-eight written responses were received, one originating in Denmark, three in Canada, three in Australia, one in Austria, one in India, and 49 in the USA. One letter included 50 signed, form letters. Of the 58 responses, five were completely supportive, requesting no changes in the report, eight suggested that the report inadequately supported policies of fluoridation, and 45 suggested inadequate references to studies in opposition to fluoridation. All critiques were reviewed by the authors of the report. Every specific comment on errors or omissions was checked by referral to the references provided. The authors alone, without any other input, then determined whether additions, deletions or modifica-

tions of the report were required in response to the criticisms.

Summary of Criticisms Received from the Public

Pro-Fluoridation:

The central theme of the responses which favored fluoridation of drinking water was that the language of the report was not sufficiently, unambiguously in favor of fluoridation. It was suggested that stronger and undeniable support for community fluoridation should be included; that the report is indecisive, and its language and content are misleading, controversial, and confusing; that dental fluorosis and preclinical skeletal hardening are not adverse health effects; that the concentrations of fluoride present in drinking water should be eliminated from conclusions so that conclusions would be apparently broadened and strengthened; that suggestions for further studies particularly on hypersensitivity be eliminated or that it be indicated that the studies leading to such suggestions are very weak; that statements in support of the efficacy of fluoride for dental health be strengthened by removal of qualifying terms such as "suggests"; that criticisms of epidemiology studies on the dental benefits of fluoridation be muted; that in non-fluoridated areas, which have exhibited declines in dental caries, the rates of caries are still significantly higher than in fluoridated areas; that fluoride in drinking water is more effective than fluoride from other sources in preventing caries; that there is no evidence for any fluoride-mediated renal damage; that there is "no cred-

ible evidence" of increased rates of cancer at any concentration of fluoride; that the title of the report does not reflect the content; that community water fluoridation is the most cost effective means of reducing tooth decay; that the report should be written from a public policy perspective rather than a laboratory research perspective; that the issue of root caries should be addressed; that some of the word choices and caveats tend to diminish the positive aspects of the report; that the reference to animal studies on cancer and fluoride be eliminated; that adults do not swallow dentifrices; that the method of assessment of caries is standardized and reproducible; and that there is no evidence that humans experience enzyme toxicity from drinking water fluoridated at any concentration.

Anti-fluoridation:

The central theme of the responses, which opposed fluoridation of drinking water, was that the report is biased in that it reviews only those references which support fluoridation. In summary it was suggested that the report lacks scientific objectivity and is self-contradictory; that there was no dialogue between the authors of the report and opponents of fluoridation; that numerous specific reports indicating the toxicity of fluoride are omitted from the report; that the authors of the report are committed to fluoridation; that fluoridation is the greatest hoax of the twentieth century; that studies indicating that non-fluoridated communities have better dental health than fluoridated communities are

omitted; that the report is too complacent about the hazardous effects of fluoride; that with drinking water fluoridated at 1 mg/l, recommended dosages for children can be exceeded; that any dental fluorosis is evidence of an adverse effect; that fluoride in drinking water does not diminish dental caries; that the discussion concerning fluoridation in Antigo, Wisconsin is erroneous; that the epidemiologic data reviewed in the report is subject to observer bias; that fluoride overdosage in drinking water from equipment failure is a current threat to health; that any systemically administered fluoride is hazardous to health; that individuals should be free to choose whether they ingest supplemental fluorides; that there is an untested connection between water fluoridation and Alzheimer's Disease; that the entire study (report) is a whitewash of the fluoridation program; that fluoride is a medication which thus should be administered based on body weight of the recipient rather than randomly in the drinking water; that Americans are consuming many times more fluoride than in previous generations; that fluoride is a carcinogen; that non-standard scientific notation was used in the bibliography of the report; that higher fracture incidences occur in women living in more highly fluoridated communities; that all studies indicating a beneficial effect of fluoride are essentially useless and should be discarded; that fluoridated toothpaste is superior to water fluoridation in benefitting dental health; that the discussion of decreasing prevalence of caries in non-fluoridated areas is incomplete, and that

in several areas this decrease occurred before the widespread use of fluoride began; that total fluoride intake from all sources should be below the level which causes moderate dental fluorosis; that there is a generation effect of chronic exposure of animals to fluoride; that fluorosis has a psychological effect on the afflicted person; that the authors of the report were carefully selected to promote fluoridation; that the report is anonymous because of the uncertainty of the authors of their statements; that the numbers presented in Figure 1 are incorrect; that systemic mechanisms play at best a minor role in the effect of fluoride on dental caries; that statistical analyses of all studies demonstrating the benefits of fluoridation are incorrect; that a discussion of fluoride-containing mouth rinses is missing from the report; that the gastrointestinal system is one of the systems most sensitive to fluoride toxicity; that an abstract is referenced in the report; that the report fails to indicate the extent and degree of scientific opposition to fluoridation; that the fact that some European countries have stopped fluoridation is ignored in the report; that margins of safety as calculated in the report are unusually low; that the reason skeletal fluorosis is not seen in the USA is because it is not looked for; that the names of the cities of Deming and Lordsburgh are reversed in the text of the report; that there are some typographical errors in the report; and that criticism of the Grimbergen report could not have been made by the American Academy of Allergy in its 1971 report since it was not yet published at that time.

Summary Of Responses To Criticism Received From The Public

Pro-fluoridation:

Overall the strength of the individual conclusions drawn is, in the view of the Department, supported by the data in the references used. Epidemiologic data produced from studies at particular fluoride concentrations, which should be stated, cannot be extrapolated to produce conclusions at higher concentrations. The Department considers that the question of whether preclinical symptoms of skeletal and dental fluorosis are adverse effects is not one that can be resolved scientifically; that for issues which have not been adequately resolved, outstanding questions should be stated in the text of the report; that caveats and qualifying terms should be included when the data under review warrant it; that there is evidence for renal toxicity at high doses of fluoride; that the title of the report does reflect its content; that the intent of the report, i.e., to review the scientific status of the efficacy and toxicity of fluoride, has been realized; that the issue of root caries should be addressed in the report; that the assessment of DMF is sound and this should be in the report; and that the swallowing of dentrifices is unlikely in adults.

Anti-fluoridation:

The authors of the report are New York State Department of Health staff scientists, who were selected based on their previous experience in scientific report preparation, and who had neither previous involvement nor precon-

ceived ideas on fluoride and fluoridation toxicity and efficacy. The report was prepared using peer-reviewed, scientific publications, which were selected by computer-based searches of the scientific literature. The authors did not consult with other scientists or members of the dental community during their preparation of the report. Subsequent to completion of the first draft the report was extensively reviewed as previously described, and modified by the authors based purely on scientific considerations. When respondents suggested the inclusion of references, which on review were determined to be scientifically valid, these were included if they added a new perspective to the report. However, if no new insights were provided by the papers, they were not included.

The Department considers that the report provides a balanced review of the current scientific status of the toxicity and efficacy of fluoride; that the derived margins of safety should be used in conjunction with a consideration of the beneficial aspects of fluoride; that there is no indication that American intake of fluoride is increasing rapidly; that standard scientific notation is used in the bibliography of the report; that a discussion of fracture rates in women should be included in the text; that the issue of rates of decrease in dental caries in non-fluoridated areas has been adequately addressed in the report; that inadequate data are available to warrant claims of a generation effect of chronic exposure to fluoride in animals; that the names of the

authors should be added to the report; that the mechanisms of fluoride action in preventing dental caries have not been adequately resolved; that a discussion of the acute toxicity of fluoride-containing toothpastes, rinses, and tablets be included in the report; that the use of an abstract as a reference is acceptable when no subsequent paper has been published, and when the abstract is used as a supporting, rather than sole, reference; and that all typographical errors indicated have been corrected.

After further internal review the report was submitted to "Critical Reviews in Oral Biology and Medicine" for publication. Under the title "Fluoride: Benefits and Risks of Exposure", it was reviewed by two anonymous referees selected by the journal. Minor modifications were made in response to their critiques and the report was published.

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FLUORIDATION SYMPOSIUM

Fluoridation: Legal and Political Issues

Tom Christoffel*

As the decade of the 90's got under way, public attention was once again directed at the safety of drinking water fluoridation. In 1990, the National Toxicology Program (NTP) of the United States Public Health Service released findings of a long-term study of the toxicity and carcinogenicity of sodium fluoride exposure in rodents.¹ The study found no evidence of carcinogenicity in female rats or in mice of either sex, but did find:

"equivocal evidence" of carcinogenicity based on a small number of osteosarcomas in male rats in the medium- and high-dosed exposure groups. The term "equivocal evidence" is one of five standardized categories used by NTP to describe the strength of evidence of carcinogenicity of individual experiments. The category "equivocal evidence" is used to describe the results of studies in which an association between administration of a chemical and a particular tumor response is uncertain.²

Subsequently, in February 1991, the United States Public Health Service published its *Review of Fluoride Benefits and Risks; Report of the Ad Hoc Subcommittee on Fluoride of*

*the Committee to Coordinate Environmental Health and Related Programs.*³ This report concluded that "there is a lack of evidence of associations between levels of fluoride in water and birth defects or problems of the gastrointestinal, genitourinary, and respiratory systems."² As regards cancer, the Committee reviewed the NTP animal studies and numerous epidemiological studies, as well as the findings of a National Cancer Institute study of cancer mortality in relation to water fluoridation. The Subcommittee noted that:

Both this report and the reports from previous international expert panels which have reviewed earlier data concluded that there is no credible evidence of any association between the risk of cancer and exposure to either natural or adjusted fluoride in drinking water.²

And in June 1991, James O. Mason, Assistant Secretary for Health and Head of the U.S. Public Health Service, reported in the *Journal of the American Medical Association* that an extensive investigation of fluoride conducted by the Public Health Service "found no evidence establishing a link between fluoride and cancer in humans—reassuring news, indeed, to health professionals who have witnessed firsthand the dramatic decline in dental caries that is attributable to fluoride."⁴

Although this latest information seemed to provide overall reassurance regarding safety, the attention of the media focused on the equivocal findings of the National Toxicol-

ogy Program (NTP). What impact will renewed scientific controversy have on laws authorizing the fluoridation of community drinking water? The immediate impact may be to encourage the opponents of fluoridation to undertake new electoral and judicial assaults on the laws authorizing community fluoridation. The more complicated question is whether this renewed attention, particularly the NTP report, will significantly affect the ultimate results of these challenges.

In the long run, the worst case scenario is one in which sodium fluoride will indeed be shown to be a weak carcinogen. The next worst scenario is one in which it takes years to ascertain that these preliminary results had raised a false fear. In any event, the political position of the opponents of fluoridation—the fluorophobics—will be strengthened. This will be particularly true of public referenda aimed at stopping community fluoridation programs. When it comes to court challenges of fluoridation laws, however, change is unlikely—fluoridation laws will continue to be upheld by the courts.

The irony is that, at the very time the fluorophobics are able to present a somewhat more credible scientific argument to the courts, the courts in the United States are becoming significantly more adept at dealing with the type of science and public policy issue represented in the fluoride controversy. Today's judges are quite able to properly interpret epidemiological data. Renewed legal challenges will be as unsuccessful as those of the past have been.

Even before the NTP data were

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This article is based on a presentation at the Symposium on Dentistry for the 90's: Fluoride and Public Policy, School of Public Health, University at Albany, State University of New York, September 27, 1990.

released, they had engendered widespread media coverage of a possible fluoridation and cancer connection in publications ranging from *Science*⁵ to *Newsweek*.⁶ As the headline of a March 1990, article in *The Nation's Health*⁷ put it: "Furor Begins Before Fluoride Study is Complete." That the NTP's Technical Reports Review Panel rated the study results as "equivocal" was a detail immediately lost by most of the press, which loves this type of "see, the experts

Fluoridation laws have been upheld against a variety of legal objections, including the claim that the addition of fluorides to drinking water constitutes the unauthorized practice of medicine and the argument that fluoridation of community water supplies subjects citizens to compulsory medication

were wrong" story. A two-page *Newsweek* article in February of the same year quoted *Consumer Reports* from over a decade ago, saying of the anti-fluoridation movement that "The survival of this fake controversy...represents one of the major triumphs of quackery over science in our generation."⁸ But the *Newsweek* article immediately went on to predict that the fluoridation debate may now "explode as never before."

The impact of this media treatment on the general public explains why anti-fluoridation referenda will make for some difficult battles during the next few years. But how will the judges react to the this media-exaggerated controversy? The fluorophobics have rarely prevailed in court, and their handful of trial court victories were eventually re-

versed. Will the NTP study results change this in any way?

The reason for past judicial support for fluoridation of drinking water is that the courts of the various states have routinely viewed the laws authorizing or requiring fluoridation of public water supplies as legitimate employment of a state's "police power", which is the traditional power of government to enact those laws needed to protect the public's health, safety, and welfare.⁹

The Supreme Court of the United States has referred to the police power as the "least limitable of governmental powers."¹⁰ Laws aimed at protecting the public's health and safety have been routinely upheld by the lower courts even when such laws restrict property rights and individual autonomy. Fluoridation laws have been upheld against a variety of legal objections, including the claim that the addition of fluorides to drinking water constitutes the unauthorized practice of medicine and the argument that fluoridation of community water supplies subjects citizens to compulsory medication in violation of various Constitutionally-protected rights (such as First Amendment freedom of religion and the right to privacy).¹¹⁻¹²

The key to understanding the proper exercise of the police power is to be found in the concept of balancing, i.e., weighing the factors legitimating a specific exercise of the police power against the individual and social costs involved. On that side of the balancing which would favor police power authority would be placed the importance of the state interest in the subject of particular legislation and the closeness of the connection between that state interest and the particular legislation, including the likely effectiveness of the legislation. The com-

peting considerations in the balancing would be the possible intrusion into areas of constitutionally-protected rights.

Public health laws will survive legal challenge as long as they can be shown to be reasonable attempts to protect and promote the public's health and safety in a manner plausibly designed to accomplish such a goal. Thus, for example, in a leading fluoridation case—*Schuringa v. City of Chicago*,¹³—the Illinois Supreme Court ruled that fluoridation of water was reasonably related to, and suitable and necessary for, the protection of the public's dental health. As the court put it:

fluoridation programs, even if considered to be medication in the true sense of the word, are so reasonably related to the common good that the right of the individual must give way.

As long as a reasonable case for public benefit can be made, it is all but impossible to establish an overriding individual right. It is only when the initial reasonable-

Public health laws will survive legal challenge as long as they can be shown to be reasonable attempts to protect and promote the public's health and safety in a manner plausibly designed to accomplish such a goal.

ness of the public health action is put in doubt that courts have some difficulty upholding public health laws.

In the case of fluoridation a paradox exists: it seems to have become somewhat harder to defend against challenges on both sides of the bal-

ancing. As far as benefits are concerned, it is simply that the widespread availability of fluoride from other sources, combined with generally improved nutrition and greater awareness regarding proper dental hygiene, have made it more difficult to document the benefits of fluoridating drinking water. Unfortunately, the possibility that such fluoridation presents a health risk has been given some credibility by the NTP study at the very time that documentation of benefits has become more difficult. How might all of this play out in the courts?

In reviewing the reasonableness of community fluoridation laws the courts can either defer completely to the legislative body which enacted a fluoridation statute or they can hold the legislature to some standard of legislative reasonableness. The highest courts of over a dozen states have upheld the constitutionality of fluoridation ordinances. And while most of these decisions have been appealed to the U.S. Supreme Court, the Supreme Court has never accepted any of these cases for review and therefore has never considered the fluoridation issue directly. All in all, as far as legal principles are concerned there is really no substantial constitutional question to be raised here.

But it could be made to look as if there were more of a factual balancing difficulty than is actually the case. This could be done by exaggerating the risks involved and minimizing the benefits of fluoridation to the point that it no longer seems reasonable to add fluoride to water supplies. This could then bring into the question the very reasonableness of this particular approach to improving dental health. This is why it is so very important for public health and den-

tistry to clearly and forcefully present the case for fluoridation of drinking water.

The strategy of the fluorophobics has long been one of seeking to establish an aura of scientific controversy and debate. They have previously found this hard to do with any success. They are therefore greatly

As a *system*, the courts in the United States have been getting more sophisticated in dealing with scientific evidence. This is especially true as regards the value and use of epidemiological evidence.

aided by the NTP study. No longer are they so isolated from the mainstream; they have a slender reed of respectability. But more important, the fluorophobics can relate this increased credibility to a legitimate and growing popular concern with and distrust of government as an adequate protector of public health. Hanaford and Rocky Flats, asbestos and dioxin—these and other hazardous exposures have done nothing to bolster faith in government as protector; instead, they have conveyed a message of caution and mistrust.

This is certainly a legitimate type of fear. And it is one that many judges are particularly responsive to, viewing their role as one of filling the protective vacuum when the other branches of government have seemed to abdicate responsibility. This is what happened in an Illinois fluoridation challenge in the mid-1980's. The trial judge in that case took pains to place the case in a broader social context, noting the erroneous assurances initially provided to those fearful of the health effects of asbestos, of Love Canal, of PCBs entering the food chain, of

toxic shock syndrome, and other environmental hazards. In all of these instances, the judge suggested, government should have taken a "harder look" when the possibility of harm to humans was first raised.

Even though the trial judge in this case, *Illinois Pure Water Commission v. Director of the Department of Public Health*,¹⁴ held that the Illinois fluoridation law was an unreasonable exercise of the police power, and therefore unconstitutional, the opinion is one deserving respect. The problem in that particular case was not one of a neanderthal judge unable to understand the scientific evidence presented to him. Rather, the problem was one of a failure on the part of the state to aggressively present testimony regarding the benefits of fluoridation.¹⁵ This failure left the judge in a difficult position. Faced with that small part of the plaintiffs' case which had not been fully or successfully refuted, together with what the judge labeled "the failure of the State to adequately explain the scope of the risks to the public...", the judge felt he had no alternative but to rule on the side of caution. As far as the court was concerned, the absence of evidence regarding benefit shifted the burden of proof from the plaintiffs onto the defendant government "to justify its intrusion into the life and health of the individual."

...decisions that touch the environment and affect the lives and health of all (wrote the judge) are entitled to a special claim of judicial protection requiring more precision and persuasion than presented by the State in this case....

The Court cannot weigh the reasonableness of the State action because of the absence of evidence from the State of Illi-

nois as to how it tests the effects of artificial fluoridation on the public at large....This record is barren of any credible and reputable scientific epidemiological studies and/or analysis of statistical data which would support the Illinois Legislature's determination that fluoridation of public water supplies is both a safe and effective means of promoting public health....To carry the burden of proof in this case the plaintiff's evidence need not be conclusive that fluoride will cause adverse health effects. Because public health is at stake the burden is *that if* the addition of artificial fluorides to the public water supply *may* have adverse health effect, that must be weighted against the benefits alleged to determine if it is a reasonable exercise of the police power afforded the State.

The greatest cause for concern in future fluoridation cases is an ineffectively presented defense by government. While it is always possible to run up against an aberrant judge, decisions can be appealed. And as a *system*, the courts in the United States have been getting more sophisticated in dealing with scientific evidence. This is especially true as regards the value and use of epidemiological evidence.

Although epidemiology has played a role in the courtroom for some time, this role was previously quite limited. But beginning with the swine flu litigation in the early 1980's, epidemiological evidence began to play a more prominent and more effective role in helping courts determine the likelihood that a plaintiff's disease was caused by the defendant. And as judged by the number of conference announcements and articles in legal journals

and trade papers, the attention paid to the interaction of epidemiology and the law has increased tremendously in the past few years.

The driving force behind the use of epidemiology in the courtroom has been tort litigation. And the common element in the lawsuits involved is that some activity of the defendant is associated with increased rates of a particular type of physical harm. Whether the defendant is selling a pharmaceutical or contaminating ground water or releasing radioactive debris into the atmosphere, the activity can be shown to be responsible for greater numbers of disease rates than would normally be expected in a particular population. But even if the defendant has caused a tripling of disease X, the difficulty for the individual plaintiff suffering from disease X is demonstrating that his illness is one of the excess cases of the disease, rather than one of the cases that would have occurred even if the defendant had never done anything.

It is important to understand that the judiciary has become increasingly sophisticated in dealing with epidemiological evidence. In an earlier day, many courts seemed almost hostile to epidemiological evidence, preferring the firsthand "eyewitness" testimony of individual treating physicians over that of experts on population data. Perhaps the most extreme version of this earlier refusal to accept population based evidence is a well-known federal case from the 1970's, *Reyes v. Wyeth*.¹⁶ Because polio was wild in the plaintiff's community, a mass immunization program had been conducted. Infant plaintiff was immunized and subsequently contracted polio. Epidemiologists testified that the likelihood of contracting the disease from community contact was 1 in 300; the likelihood

of contracting the disease from the vaccine had been well documented as one in five to six million. The treating physician, a local MD, untrained in epidemiology, testified that he was certain that the vaccine was the cause. In a lawsuit against the vaccine manufacturer the plaintiff prevailed and a federal appellate court upheld the verdict.

In some of the swine flu cases, judges also rejected or ignored epidemiological evidence in favor of testimony from treating physicians regarding their hands-on experience with the plaintiff. For example, in *Sulesky v United States*,¹⁷ the judge wrote that:

while the Court has found the testimony and documentary evidence of the epidemiologists extremely valuable, and while it is not rejected out of hand, the Court does find that expert epidemiological testimony is not determinative of the issue of causation in this case....

But contrast that with the opinion in *Cook v. United States*,¹⁸ decided the same year. In *Cook* the judge noted that:

plaintiff's joint offer of proof, submitted pursuant to an order of this Court, relied on statistical correlation to establish causation, interpreting the CDC data differently than did the doctors who worked with CDC, in order to show a connection between vaccination and [development of Guillain-Barre syndrome]....

In other words, the court not only relied on epidemiological data, but pushed the case to the point where the parties were pitting epidemiological expert against epidemiological expert.

But most notable as an example of the epidemiological revolution in the courts is a 1989 federal appeals court decision in *Brock v. Merrell Dow Pharmaceuticals, Inc.*¹⁹ In *Brock* plaintiffs filed suit to recover damages for birth defects that allegedly resulted from Mrs. Brock's ingestion during her pregnancy of the anti-nausea drug Bendectin. The jury awarded the Brocks \$1,100,000.00 and the award was approved by the federal trial judge. But the Fifth Circuit U.S. Court of Appeals reversed the judgment, notwithstanding the verdict.

This is a highly unusual action by a reviewing court. On appeal, courts restrict themselves to looking at the evidence as it was presented at trial and they weigh that evidence in the light most favorable to the party successful in the lower court, giving that party the benefit of all reasonable inferences from the evidence. A judgment notwithstanding the verdict is therefore proper only when the reviewing court determines that there can be only one reasonable conclusion drawn from the evidence and it is a conclusion other than that reached below.

In *Brock*, the Court of Appeals, after noting that "medical science is now unable, and will undoubtedly remain unable for the foreseeable future, to trace a known birth defect back to its precipitating cause," went on to state that: "Undoubtedly, the most useful and conclusive type of evidence in a case such as this is epidemiological studies." The court then went on to carefully analyze the epidemiological evidence in the trial record, looking in particular at the nature of the relative risk and of the confidence intervals involved. The court noted that the plaintiffs had relied on an analysis of data that found a relative risk of 1.49. The court also noted that plaintiffs' ex-

pert had admitted that the confidence interval was from 0.17 to 3. The court concluded that:

this renders the study statistically insignificant. The plaintiffs did not offer one statistically

Reasons for opposition to fluoridation at present appear to be centered on health and environmental concerns. A skilled antifuoridationist can convince the uninformed that fluoridation is in the same category as uncontrolled radiation, toxic chemical waste, and acid rain....it needs to be demonstrated that fluoridation of water does not properly fit into this category of concern; toxic chemical contamination carries no known benefit.

significant (one whose confidence interval did not include 1.0) study that concludes that Bendectin is a human teratogen. No published epidemiological study has found a statistically significant increased risk between exposure to Bendectin and birth defects. One of plaintiff's experts...conceded that he was not aware of any such studies...

Although we find [plaintiff's expert's] results inconclusive due to the fact that the confidence intervals include 1.0, we further note that (he) has not published his study or conclusions for the purposes of peer review. While we do not hold that this failure, in and of itself, renders his conclusions inadmissible, courts must nonetheless be especially skeptical of medical and other scientific evidence that has not

been subjected to thorough peer review....

While we do not hold that epidemiologic proof is a necessary element in all toxic tort cases, it is certainly a very important element. This is especially true when the only other evidence is in the form of animal studies of questionable applicability to humans....

This circuit has previously realized the very limited usefulness of animal studies when confronted with questions of toxicity.

This language from the *Brock* case may well anticipate the way in which the judiciary will deal with renewed fluoridation challenges in light of the NTP study. That is, they will find that "equivocal" laboratory findings from animal studies are heavily outweighed by the epidemiological evidence regarding dental health. At least they will do so if properly presented with all of the relevant evidence.

A decade ago there was considerable debate within legal circles as to whether judges could and should deal with complex scientific issues, especially at the appellate review level. Some judges suggested establishing special science courts or allowing judges to appoint science clerks. But those suggestions received little support. Instead the courts have taken on the scientific questions directly. There is no good reason that that approach will not continue. And that means a continuation of the virtually unbroken judicial support for fluoridation of community drinking water.

The tougher fluoridation fights will be public referenda. Ballot referenda are possible in 36 states and the District of Columbia and have proven an effective technique for the fluorophobic, who have pre-

vailed in 2/3 of such referenda. Too often the problem has been one of a public health community uneasy in the electoral arena, unsympathetic to some of the underlying environmental concerns, and too reliant on experts separated from the public.

Brian Burt has written that:

Reasons for opposition to fluoridation at present appear to be centered on health and environmental concerns. A skilled antifluoridationist can convince the uninformed that fluoridation is in the same category as uncontrolled radiation, toxic chemical waste, and acid rain....²⁰

It is critical that this concern not be rejected as illegitimate. Instead, it needs to be demonstrated that fluoridation of water does not properly fit into this category of concern; toxic chemical contamination carries no known benefit.

What is called for in referenda struggles is the same positive, aggressive stance needed in the courtroom, as well as the same careful balancing of benefit and risk. Not only must allegations of dire hazards be refuted, but studies supporting both the benefits and the safety of fluoridation are needed. Most of those who have written about their own involvement in such campaigns emphasize the importance of using specific details to counter the wild allegations of the fluorophobics. It is usually best to avoid engaging the fluorophobics directly—as in public debates—since this only enhances their strategy of showing that the issue is one of controversy and confusion. But this does not mean to say that the fluorophobics and their arguments should not be sharply criticized. It is as important in the referenda context to aggressively present full in-

formation as it is in courts. And in case anyone should be concerned that honest, forceful criticism will lead to a counter-attack in the form of charges of defamation, one should note that past efforts by fluorophobics to use libel law against their critics have been ineffective, as borne out by summary dismissals in cases brought against the American Dental Association and Consumers Union of the United States.²¹⁻²²

In summary, the recent attention paid to the National Toxicology Program study results will undoubtedly provoke electoral and judicial challenges to existing community fluoridation programs. The fluorophobics have long proven adept at public campaigns, so public health and dentistry will need to work energetically to preserve the gains of the past at the ballot box. But when it comes to legal challenges, where success by the fluorophobics would be more devastating, it seems highly unlikely that the past pattern of judicial support for fluoridation will be altered.

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FLUORIDATION SYMPOSIUM

The Ethical Issues of Fluoridation

Kathryn A. Atchison*

When considering the topic of water fluoridation, one is generally concerned with issues of fluoridation's safety and the effectiveness of fluoridation in preventing caries. Recently, dental students in an ethics class at UCLA were asked whether they felt that promoting water fluoridation was one of their responsibilities as dental practitioners. Many of them said no. Their reasons though, had nothing to do with safety or effectiveness. Rather, they felt that with a business problem in the profession, they should not be obliged to promote something that would decrease their business of providing dental treatment. Opinions like that certainly highlight the need to examine issues beyond safety and effectiveness, that of the responsibility of a dental professional or the ethical issues. Of late, interest in ethics has developed among health care providers as they are faced with increasingly complex decisions.

The purpose of this paper is to examine ethical issues regarding fluoridation. The framework that will be used will be to describe basic ethical principles; explore the ethical issues related to water fluoridation; and finally broaden the hori-

zon to examine issues of how the promotion of fluoridation fits into the overall public health philosophy or policy for the United States. The particular viewpoint used will be that of a dental public health professional.

There are four basic principles of ethics which are fairly universal in their acceptance as guides for decision-making. These are beneficence, autonomy, veracity and justice.¹ Often these principles come directly into conflict when choosing one's course of action.

Beneficence

At its most basic, beneficence requires one to abstain from injuring others (nonmaleficence) and encourages one to promote good for others.¹ Clearly, one must decide that water fluoridation is safe and represents no risk greater than the

There are four basic principles of ethics which are fairly universal in their acceptance as guides for decision-making. These are beneficence, autonomy, veracity and justice.

risk of its alternative, dental caries, for this principle to be fulfilled. Scientists must provide dental public health professionals with the best evidence of the benefits and risks of water fluoridation. The challenge for the public health professional is to determine, based on the evidence,

whether benefits outweigh risks. This is extremely difficult since science gives answers in probabilistic terms. The benefit of a 20% decrease in caries, given other available fluoride options may not seem prudent weighed against even a .1 or .2% risk of cancer.

Once satisfied with respect to fluoridation's safety, the public health professional can examine the issue of promoting good (reduction in caries) for others. To do this, he or she must be an inquisitive researcher and ask, "Who will benefit from the addition of fluoride to the water?" To understand who will benefit from a water fluoridation program requires a careful examination of the rate of dental caries, as well as an acknowledgement of the community's level of participation in other available caries reduction programs. It is widely accepted that dental utilization has increased and caries rates are decreasing. Further research on fluoride must be continued as caries decreases in the overall population to determine the added benefit of water fluoridation to a population already engaged in prevention.

Autonomy

Do public health professionals have the right to superimpose their notion of 'good' over the patient's judgment of what he wishes for his own body? Questions such as these lead to the next principle, that of autonomy. The principle of autonomy can be defined as one of

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respect for persons.¹ All persons are viewed as having value as well as having the capacity to make a rational choice. When applied to water fluoridation, this principle is most often expressed as water fluoridation restricting a person's right to individually choose whether he wishes to use fluoride. Group choice is made possible through a referendum vote required to implement a water fluoridation program for many communities. But, is individual choice respected once a water fluoridation program has been implemented?

The answer is often given in terms of saying that people do really have options. For example, an individual exercises free choice by choosing not to live in a fluoridated area. For most people, however, this is not a realistic choice. Individual choice is also available to those who choose to purchase bottled water. But clearly, this option is not available to those who lack the discretionary income to buy bottled water.

One must also look at the other side of this issue. Does a person of limited means truly have autonomy? Imagine the family of four who earns barely more than the poverty classification and has no money to use for routine dental care. This family could be devastated by the cost to restore four permanent molars for each of their two children. And the cost of restoring bottle caries could lead to a decision to extract teeth critical to a child's normal development. These pressures do not encourage rational decision-making. Recall that the definition of autonomy stated that the person must 'have the capacity to make an informed or rational choice'. Given that certain segments of society may have greater disease and also given that the same segments of society do not utilize dental services as fully,

can one truly state that the individual is making a rational decision? Children, and those who lack the knowledge of how to protect themselves from disease, certainly lack autonomy.

This could be construed as precisely the responsibility of public health professionals, to protect these individuals. Society has established certain jobs with set responsibilities to protect the good of the community. The goal of dental public health is to improve the oral health of the public.² To go one step further, Public Health professionals have a *moral* responsibility to protect and promote the public's health. The notion that one individual should make treatment decisions for another, however, has stirred much controversy in recent times among medical and dental practitioners, as well as public health practitioners who are viewed as paternalistic toward the patients in their care. In a recent book on paternalism, Brock explored this issue in relation to promoting good. Paternalism entails an "action by one person for another person's good, but contrary to their present wishes or desire."³ Paternalism can be justified, Brock argues, if the person whose good is promoted is not fully competent in making a decision about what would best improve his/her own good. This is consistent with many cases where the State has declared a guardian to care for a child or an adult who is found to be incompetent. What is unusual, however, is his definition of full competence. He defines competence in a broad sense as "nothing less than the capacity to make the best possible choice for promoting one's good."³ In this instance, a person who does not avail himself of water fluoridation when possible, but later develops caries and mourns the monetary cost, as well as the

pain and time spent in securing treatment, or even the eventual loss of a tooth, is showing that he was not capable of making a rational decision to utilize fluoridated water. For this person, then, paternalism is ethically permissible to assist the person in obtaining the most good in his life. If one does not regret the decision - i.e., values his concept of "pure water" above the pain and expense of disease, paternalism could not be justified. This places a significant ethical burden on professionals to carefully weigh the values and alternatives of the community as well as the benefits and risks already mentioned. How does one carefully convey information about these risks and benefits to the community in an informative but non-threatening way to allow individuals to make their own informed decisions?

Veracity

The principle of veracity states that one must be honest in his/her dealings with others.¹ In terms of fluoridation, this requires professionals to be honest and upfront in their presentation of risks and benefits of fluoride and avoid a paternalistic editing of such information. A 1974 copy of an ADA brochure, "Fluoride Helps Prevent Tooth Decay," was strictly promotional and carried no information on safety.⁴ A brochure like this, which is intended for distribution to parents from a dentist or school is not honest in providing information that allows informed decisions. It becomes even more difficult to be honest as fluoride is often dealt with in a political arena where information can sway the final result.

If public health professionals have a moral right and responsibility to promote good health for the public,

must they also determine who will benefit the most from water fluoridation, and is it their responsibility to direct the benefit of fluoride to those who stand to benefit the most?

Justice

Questions such as these lead us to our fourth principle, that of justice, or providing a person with what is deserved or due.¹ These questions are particularly germane to the principle of distributive justice, that is, the proper distribution of social benefits and burdens.¹ Not only that equals should be treated equally, but also providing a decent minimum level of health care to all to meet their basic needs. The dental profession, perhaps due to the non-life-threatening nature of dental disease has often distributed dental services unequally, to those who can pay rather than those with the greatest need. This goes against the principle of justice. Questions on justice in dentistry have been confronted in examining another preventive service, the appropriate distribution of sealant programs. The results of an NIH consensus conference presented a majority opinion that sealant programs should be implemented in a cost effective manner, that of maximizing the efficiency of the program by encouraging their use in fluoridated communities first, rather than one of maximizing the benefit to all segments of society in terms of decreasing dental disease.⁵ One hopes that public health professionals would not make a similar interpretation of justice when dealing with fluoridation programs. Clearly, there are limited resources and some rationing decision may have to be made. Cost effective use of resources is an admirable goal. It is plausible, though, that a more cost effective use of resources could

The purpose of water fluoridation is to prevent dental caries. However, this is not a one step process like a vaccine where a single shot will provide immunity from disease. Rather, it is a change to the environment that produces an ongoing process to reduce caries.

be achieved by using resources to generate the greatest reduction in dental disease for those with dental disease, in order to remain consistent with the goal of improving the community's oral health. If the benefit of fluoride is not targeted to people with dental needs, it is likely that not all people will benefit equally. Thus, possibly a 40% benefit will be realized by the poor who may not currently use fluoride treatments, tablets or rinses while at the same time the affluent dental users may realize only a 1% to 20% reduction in caries. This use of resources is inconsistent with justice however, because the poor have a greater need for caries reduction.

An example of the community sensing a lack of justice among public health dentists occurred in the 1970's in Los Angeles. In 1973 the American Civil Liberties Union became interested in the topic of fluoridation when they became aware that Los Angeles water, which is received from three separate sources, contained differing amounts of fluoride. The water with the highest fluoride content, 0.6 ppm, went to the Westside, a white and affluent area. Mixed water, with a fluoride content of 0.3 ppm went to another predominantly white area. But, "it is in the heart of the ghetto and the barrio that the water

with the lowest fluoride content is delivered."⁶ "ACLU Counsel Fred Okrand advises that this discrimination constitutes a denial of equal protection as guaranteed in the Constitution." Cases such as this show that public health professionals must be careful to respect the needs of all of their constituents to be just. Justice in decay prevention can best be achieved through a community program and it is not just to deny the poor caries prevention because the wealthy can afford to provide for themselves.

Finally, a contemplation of the larger issue is needed. How does water fluoridation fit into the United States public health policy? Are there ethical issues in the very choice of topic for health promotion? Should public health professionals continue to target a reduction in dental disease as their most important goal for improving the health of the public? To examine this issue, let us first agree on a definition of health. Although there are many good definitions of health, Milio presents one which is pertinent to a discussion of public health policies. Milio defines health as "the response of people to their environments," rather than a "state to be captured" or an "achievement to be attained with finality."⁷ She further defines it as "a response that allows them (people) to go about their daily activities *without personal restrictions that can be prevented* (emphases added)."⁷ This is a very relevant definition to keep in mind for water fluoridation. First, the purpose of water fluoridation is to prevent dental caries. However, this is not a one step process like a vaccine where a single shot will provide immunity from disease. Rather, it is a change to the environment that produces an ongoing process to reduce caries.

In many respects the dental pub-

lic health community should be congratulated on its strong stance on promoting oral health at the community level by changing the environment and not concentrating all of its efforts on individual dental care treatment programs. At a recent "State-wide Conference on the Future of Public Health in California" a main focus by Dr. Len Syme was to encourage public health professionals to regain a proper public health focus on the community and its environment, rather than trying to invade the health delivery segment by targeting individuals for specific treatment.⁸ If an environmental change such as the addition of fluoride to water (a natural occurrence in some areas) can drastically improve people's oral health (I think none will argue that it can), then water fluoridation is a worthwhile public health focus. There is no doubt that caries, if not prevented, can result in personal restrictions due to the physical and social debilitation it can cause.

Under the utilitarian model, water fluoridation is "right" if it produces more value (prevention of caries) than disvalue over alternative actions.¹ The aspect of appropriate alternative actions to which to compare fluoride is a major question. One obvious alternative action is to do nothing to promote prevention of caries. Would that be an ethically sound decision for public health practitioners? If we accept that their moral responsibility is to promote the community's oral health, then clearly, to fail to promote caries reduction would not be an ethically 'right' decision unless caries is no longer a widespread oral health problem.

Numerous reports lately have suggested that caries is on the decline. Is there still a pressing need for public health professionals to encourage use of water fluoridation, or is caries under control? In other words, is pre-

vention of caries important or should all public health professionals switch their efforts to health promotion of something like childhood vaccines for measles or smallpox?

A close look at the Draft of the National Oral Health Objectives for the Year 2000 shows that caries is not under control.⁹ The National Oral Health Objectives represent a collaborative effort of dental professionals and the public to identify objectives, or goals to improve the oral health of the American people. These objectives, including reduction in edentulism, and reduction in caries show clearly that dental disease is not controlled, and that there are segments of our society where dental disease is a major problem. For example, objective 14.4a states a goal of decreasing the proportion of low socioeconomic children 6-8 years of age, who have experienced dental caries in permanent or primary teeth, to 45% by 2000 (down from 70%).⁹ Clearly, this goal will not be realized through the use of water fluoridation alone. However, it may never be realized without the assistance of water fluoridation, because of other known impediments to improving the oral health status of children who lack educated parents who know how to take care of their children's teeth or have the economic wherewithal to obtain assistance from the professional community.

Finally, then, the issue comes down to prioritizing the problems of the American public and determining where public health professionals should put the nation's scarce resources. How does caries stack up against low birth weight babies, or children without proper immunization? A quick look at the National Institutes of Health gives a twinge of concern. There is a National Institute of Dental Research, an Institute of Mental Health, an Institute of Arthri-

tis. Clearly, some differentiation of disciplines is imperative to prevent a loss of focus for the discipline within a politically charged budget setting. However, can we afford to allow public health professionals to also fragment into disciplines, or is it time for all public health professionals to cooperate and consider a comprehensive health policy that considers all of our people's problems?

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FLUORIDATION SYMPOSIUM

Policy Options For Fluoride Use

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I was struck as I sat here today and listened to the presentations about the scientific evidence of benefits and risks from fluoride and the comments from the audience. I really did not sense much disagreement or questioning. There were but a few minor points offered contrary to the summary statements of the presenters. Here we are in Albany, New York, some of us having traveled a long way to talk only about fluoride, but as we sit here, why is there not more controversy? It strikes me, that when one considers the level of attention this issue has been receiving in the press, within the federal, state, and local governments, and with those who oppose the practice of water fluoridation or the use of fluorides, there is a lack of fit between the portrayed level of scientific controversy and what we have seen here. This leads me to postulate that maybe we are handicapped by not having more sociologists, anthropologists, psychologists or psychiatrists among us today. Maybe we are preaching to the choir. Be that as it may, I will forge ahead with my parochial presentation, from my biased position, and see if I can help stimulate some discussion or possibly even debate.

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You were treated to a very adequate presentation of the state of the science on fluoride's benefits and risks this morning, though certainly not exhaustive. We could have spent an entire week listening to the scientific evidence on the benefits of fluoride. We could have spent another week considering evidence that might relate to potential toxic effects of fluoride exposure. But in the end, the conclusions we would have arrived at would have been exactly the same ones that were presented to us today. Over the next half hour, we are going to consider fluoridation policy options by participating in a fluoridation policy options development exercise. I want to fully engage you in this and have you internalize it so that it will seem real.

Federal Fluoridation Policies

In considering various policy options one cannot work in a vacuum. It is not as if fluoride was discovered yesterday and today we are going to make the initial decision about what to do. We must examine existing fluoride policies at the national, state, and local levels. We will consider the national level, specifically the federal level, first. Dr. C. Everett Koop, our immediate past Surgeon General, in 1983 stated that, "The United States Public Health Service re-affirms its strong endorsement for fluoridating community water supplies to an optimum level..."¹ He went on to say conclusively, that fluoridation is "...the most important commitment that a community can make to the oral

health of its children and its future generations." Additionally, the Assistant Secretary for Health, Dr. James Mason, amidst the storm of the National Toxicology Program Rodent study, stated, "There is no information available at this time that would indicate need for any change in the Public Health Service policy of continued support for the use of fluorides for the prevention of tooth decay."² Even more recently, and I would say that this is not solely federal policy, but rather a national statement of intent reflected in the Year 2000 Health Objectives for the Nation,³ there is an objective to increase to at least 75 percent, the proportion of people served by community water systems providing optimal levels of fluoride. Currently, the level is about 62 percent. If you are familiar with progress in extending water fluoridation in recent years, you understand that if we could achieve 75 percent by the Year 2000, that would be a very aggressive goal and one that would have a significant impact on the oral health of the nation. Continuing with the Year 2000 Objectives, there is the proposition that we increase the use of professionally or self-administered topical or systemic fluorides to at least 85 percent of the people not receiving optimally fluoridated public water. It is clear that between these two objectives we are pointing to public health coverage, that is, access to the preventive benefits of fluorides for the entire population. Within the narrative portion of the year 2000 document, there is the statement that "Community water fluoridation is the single most

effective and efficient means for preventing dental caries in children and adults, regardless of race or income level." It is important to recognize that the Year 2000 Objectives represent the consensus thinking of literally thousands of individuals, pursuant to 3 years of scientific review, deliberation, and development. The Year 2000 Objectives are not professed from a narrow institutional bias.

"Community water fluoridation is the single most effective and efficient means for preventing dental caries in children and adults, regardless of race or income level."

At the federal level, beyond the written words, resources are provided for fluoridation and other fluoride modalities through the Preventive Services Block Grant, Maternal and Child Health Block Grant and Special Projects of Regional and National Significance (SPRANS). Within the Indian health programs, a specific piece of legislation was passed some 30 years ago, the Sanitation Facilities Construction Act, which has resulted in the fluoridation of hundreds of Native American community water systems. The Department of Defense has established regulations about fluoridating their facilities. Even the Department of Veteran Affairs has fluoridated some of its facilities. The Environmental Protection Agency (EPA) has been involved with drinking water because of its responsibilities under the Safe Drinking Water Act of 1974. They have established a mandatory primary standard for fluoride in drinking water of 4 milligrams per liter, which the states must comply with. The purpose of this standard is to prevent skeletal fluorosis

from occurring, while allowing for a reasonable margin of safety. They have also established a secondary standard for fluoride in drinking water at 2 milligrams per liter, which is voluntary. Community water authorities are required to inform community residents when the water fluoride level exceeds 2 parts per million so that residents will be aware of the potential to prevent dental fluorosis in children by altering their water supplies. Moderate and severe forms of dental fluorosis are generally viewed as being of esthetic consequence. Although these more advanced forms of dental fluorosis are not viewed by the EPA as adverse health effects, they have been viewed as an issue of general public welfare.

The Food and Drug Administration (FDA) picture is a little bit more cloudy. There are minimum and maximum concentrations of fluoride that are permitted in over-the-counter dental products.⁴ For example, any dentifrice that claims caries-preventive effects must have at least 650 parts per million (ppm), but no more than 1,000 ppm available fluoride, with the exception of one brand that has received approval at 1,500 ppm. The FDA also regulates prescription drugs, but thus far has not established any regulations relative to fluoride tablets since FDA does not anticipate that there is any real problem or health threat. As of today, no company is attempting to manufacture fluoride tablets in dosages higher than 1 milligram fluoride. FDA also regulates the contents of bottled water and goes along with the EPA community standards (maximums) although the FDA does not require that the water be labeled in terms of fluoride content, something that could be quite confusing for consumers. There are many bottled waters on the market, most deficient in fluoride and lacking fluoride labeling. Relative to foods, there

are regulations that establish maximum permissible levels of fluoride in foods in varying degrees.

State Fluoridation Policies

Looking at the state level, several states have mandatory requirements for fluoridation of communities of certain size:⁶ Connecticut, Georgia, Illinois, Minnesota, Nebraska, Ohio and South Dakota. There are 43 states that permit fluoridation and it is worth noting that Michigan, Kentucky and Puerto Rico not only permit, but they strongly encourage it. The District of Columbia has been fluoridated for many years.⁶ Five states have restrictive fluoridation laws requiring a public referendum before fluoridation can be implemented: Delaware, Maine, Nevada, New Hampshire and Utah.⁶ At this time, over 7,000 communities in the United States are adding fluoride to their drinking water. One anomaly worth noting is the state of Pennsylvania, which does not require fluoridation, but has required that once a community starts fluoridating, it may not cease.⁷⁻⁹ On at least three occasions, when water systems that were fluoridating requested to

At this time, over 7,000 communities in the United States are adding fluoride to their drinking water.

stop, the state of Pennsylvania said no. They could not stop because the removal of fluoride from the drinking water would render that water less healthful.

Local Fluoridation Policies

The third level at which fluoride policy is established is at the local level. The local water supplier could be public or private and the decision

to fluoridate could come down to an individual water plant manager making the decision to add fluoride to the drinking water. This has happened in many instances, because most of these people are oriented toward adding whatever is needed to make the water more fit for drinking. Most commonly, though, city councils get involved in the decision about fluoridation. Sometimes this occurs with one or more public hearings and there are instances where public referenda processes are instituted which can be drawn out, bellicose, and frequently result in a vote that is inconsistent with what community opinion polls had demonstrated only days earlier. This is one of the big dangers of the public vote approach - that it does not always reflect true public opinion. Then one must question where free choice ends and paternalism begins and what the appropriate role of public officials and public health officials should be. Professional and scientific organizations also issue opinions about fluoridation. They do not establish policy that anyone is bound to, but, certainly, opinions by scientific organizations have an impact and virtually all have said that fluoridation is a very effective means of preventing dental decay. The National Academy of Sciences is the only scientific body that has described levels of total fluoride intake on a daily basis for children and adults that they view as both "safe and adequate."¹⁰

Fluoridation Policy Options

In considering the various fluoride and fluoridation policy options, one must perform a situation analysis. I have developed some epidemiologic scenarios with the assistance of a group of expert dental researchers and epidemiologists earlier this year. While there are no straightforward answers to the questions that I will pose, there is a reasonable body of

We need to get in there and educate the American public with a combined civics and science curriculum, starting at the elementary grades.

science from relevant studies that enables one to develop informed projections. There can be no perfect and precise foreknowledge. This is one of the big hangups that the public and the media, to an extent, are having. There is a strong and unrealistic expectation that science is black and white and that scientists should know. I have consistently heard this expressed in public policy forums. I fully support the statement made a few minutes ago, that we need to get in there and educate the American public with a combined civics and science curriculum, starting at the elementary grades. We are about 20 years behind the curve on having an informed public on issues of health risk and benefit and we had better get on top of it real soon.

Since time is limited today, and for purposes of this exercise, you will need to accept the propositions I offer of likely epidemiologic outcomes from implementing various policy options. From scenarios that I present, you will need to identify and think about important subtleties. Also, remember that relatively small percentage increases or reductions in disease occurrence when applied at the national level, can have significant impacts in terms of total amounts of disease and costs for treating disease, even to the point of affecting the national deficit.

The health benefits that I am willing to consider in this exercise are reductions in dental caries and reductions in teeth lost due to dental caries. The avoidance of orthodontic, endodontic, periodontic, etc. problems are beyond the scope of our

exercise, but are real and important. A sense of wholeness, psychological well-being, loss of productivity from work and school, etc., are harder to quantify, although some have attempted it. I do not wish, however, to spend a lot of time with them today. On the risk side, I will consider dental fluorosis and its sequelae; i.e., the potential need to provide aesthetic restorations, or vital tooth bleaching or polishing to deal with those individuals who are bothered by their dental fluorosis. This is the only risk factor that I can legitimately consider, since the weight of scientific evidence¹⁰ today does not identify other risks relative to optimally fluoridated drinking water and the use of approved fluoride containing products.

In terms of goals and considerations, we should be looking to balance gains, if real, in margins of safety, against losses in benefits if we were to decrease the availability of fluorides to the American public. Key questions would be who gains the safety and who loses the benefit. This could be expressed as coverage, our ability to reduce a public health problem by protecting a segment of the population. It is very comforting for public healthers to be able to say we have 84 percent of the children immunized, or we have 62 percent of the population on public water supplies with access to effective levels of fluoride for preventing caries. Also, we need to consider the issue of equity, which is different from coverage, groups that might be adversely affected by various policy options, and the alternatives, especially for the most affected groups.

If we were to reduce the availability of fluoride, what would the most affected groups do? Would they have any realistic alternatives? Who would bear the costs? The annual mean per capita cost of fluoridation is estimated to be 51 cents.¹² The average cost of a

single restoration today is over \$50.00. It does not take a lot of calculation to recognize that one could provide fluoride in drinking water for an entire lifetime of an individual for the cost of one restoration. There are not many bargains like that available today in public health or anywhere else.

I need to mention a phenomenon that has been referred to as the "halo effect,"¹² the effect by which fluoridated water is incorporated into processed beverages and foods that become available in "non-fluoridated" communities. We really should be talking about "fluoride" and "non-fluoridated" since non-fluoridated communities do have access to fluoride from many sources.^{4,13} There is no "zero fluoride control group" anymore, and likely there will never again be one in the U.S. But, when individuals living in non-fluoridated communities have their caries rates lowered because they consume beverages and foods processed in fluoridated communities, they are receiving the benefits of fluoridated drinking water, albeit in an indirect fashion. Public healthers, must be vigilant in making this message clear to the people who might not understand. It is a subtle, but critical point. Many individuals who are opposed to fluoridation miscommunicate the scientific message, claiming that fluoridation does not work any longer because measurable caries differences have declined between fluoridated and non-fluoridated communities.

Fluoride Policy Options

There are dozens of fluoride options and scenarios that could be considered, but I have selected seven that I think reasonably represent dicotomized alternatives. You are the policy maker; you cannot dodge a decision. You were told this morning that by the end of the day, you were going to have to make a decision

about what you were going to do about fluoride in your state, or in your city. You were presented with masses of scientific and promotional information, more than most policy makers have when they make a policy decision.

Option 1: Continue the current policy at all levels, federal, state and local. What would be the likely outcomes of this? My group of experts believes that under this option, caries continues to decline among children and young adults.¹⁴ Tooth loss continues to decline. Tooth loss is very low when the population groups are at middle income and higher. But, even in the lower income groups, tooth loss will continue to decline. Dental fluorosis will probably increase marginally, or start to plateau.

Whether it increases or plateaus, dental fluorosis still remains predominately of the milder varieties. Option 1A, is that we continue what we have been doing, but we adopt a very aggressive public and professional education program to improve the quality of implementation; that is, reduce inappropriate or unnecessary exposures such as prescribing fluoride supplements in fluoridated areas, prescribing the wrong fluoride supplement dosage, or permitting children

It does not take a lot of calculation to recognize that one could provide fluoride in drinking water for an entire lifetime of an individual for the cost of one restoration.

under age 6 years to have unsupervised use of fluoride dentifrice or fluoride mouthrinse. Another issue which is not a matter of safety, but more an issue of the judicious use of health resources, is whether individuals with little or no caries experience really need one or two professionally-ap-

plied topical fluoride treatments a year.

Option 2: This would be to eliminate virtually all of the fluoride in drinking water and dental products, i.e., get rid of as much fluoride as we could. Dental fluorosis would decline dramatically; indeed, by definition, it should virtually disappear. Over time, caries and tooth loss would increase dramatically and would, of course, increase most in the lower SES groups that had fewer treatment options. It is the consensus opinion of my expert group that caries levels could eventually, in 10-15 years, approach the levels of the 1940s, before fluoride was available in drinking water and other products. This would be a caries level four times as high as today.¹⁵

The direct costs for stopping the purposeful addition of fluoride, would be minimal. One would simply unhook the fluoridator. But, for those naturally fluoridated communities that would have to get fluoride levels down to negligible. (0.1, 0.2, or 0.3 ppm) the costs would be great. Most likely, local bond issues would have to be voted in order to finance the defluoridation operations. Further, it is also absolutely necessary from an ethical and public policy perspective, that if we were to eliminate fluoride from products and drinking water, we would be forced to consider alternatives for preventing caries, if there really are any realistic alternatives, or at least for treating caries. As Dr. Atchison pointed out, we have a responsibility to first do no harm. There are a number of alternatives that have been proposed by those who are opposed to fluorides and fluoridation, as more effective. However, oral hygiene, whether self or professionally administered, has never been demonstrated by itself to be an effective public health approach to reducing dental caries. Diets that are high in carbohydrates and simple sugars do contribute to dental caries.¹⁶ Certain

types of foods that are more retentive contribute to dental caries, with frequency of consumption being more important than the total amount of sugar consumed. Still, it has not been demonstrated that dental caries can be controlled in any United States population through the use of diet modification. Dental sealants can well control fissure decay. But before the era of fluoridation and fluorides, smooth surface decay was a common form of caries in this country. It has been virtually eliminated in most children due to the availability of fluorides.¹⁶ Sealants remain a most appropriate choice for fissure decay, and in conjunction with fluoride, provide virtual immunity to caries in children. How about dental restorations or extractions? We tried that in the 1930s, through the 1940s and 1950s, and it did not work out well. This would be a poor scientific and economical choice and a poor ethical choice. In terms of an anti-caries vaccine, it is not imminent. While we have heard promises about the caries vaccine for about a decade, I would not expect one to be commercially available before the year 2000. And if it were available, how are we going to promote a vaccine for a non-fatal disease in an era when caries prevalence is lower and when there is increased concern about vaccine side effects? There are all kinds of implementation questions that arise with a vaccine. So really, the reasonable alternatives to the use of fluorides now and for the foreseeable future do not seem to be very good.

Option 3: Reduce the availability of fluoride in drinking water while keeping other fluoride sources constant. Federal standards, guidelines and recommendations would be altered and states and localities would follow suit. The likely outcomes would be that fluorosis declines, and caries increases over time, especially in lower socio-economic groups. Tooth loss would increase significantly in these

groups. The degree of effect would obviously be dependent on the amount of reduction of fluoride.

Option 4: Reduce the availability of fluoride in dental products, keeping water fluoride levels constant. A likely outcome would be reduced dental fluorosis. There is evidence that many young children swallow significant amounts of dentifrice. The caries impact from this option might not be that large. Recall that the FDA guidelines require at least 650 ppm fluoride in dentifrices making caries prevention claims and currently the commonly marketed brands have about 1,000. So it seems that there may be some room to play with in terms of efficacy, while possibly expanding the range of safety relative to dental fluorosis. Dose controlling dispensers may be an adjunct. I am not sure that we have any evidence for this, but it would probably be worth a try. In terms of modifying fluoride supplement schedules, again we might be able to bring about reduced fluorosis and I would posture that fluoride supplement usage may contribute more to the national dental fluorosis profile than it does to the national caries reduction profile. There is emerging evidence that fluoride supplements are being used inappropriately in too many instances around the country.⁴ This is a problem that the profession is going to have to come to grips with.

Option 5: Reduce, but do not eliminate, the level of fluoride in drinking water and dental products. The likely outcomes would be marginal increases in caries on average. Lower socio-economic groups would again be most impacted because they are not using as many of the alternative products. Fluorosis would decrease, the amount depending on the level of fluoride reduction. One of the likely outcomes that I would expect is confusion, because if we change the level of fluoride in drinking water and dental products at the

same time, we create a changing mix of independent variables, and we might never have any better knowledge about the relative contributions of fluoride sources to clinical outcomes than we do now.

Option 6: Do more research and study before considering policy changes. This is generally a popular option of any policy-making body. In other words, first do no harm. Do not remove something that may be providing a benefit if you do not have any solid evidence that it is doing any harm. Of course it is imperative that a real commitment be made to appropriate research follow up. The outcomes here would be the same as for Option 1, so I do not need to repeat them.

Option 7: Make policy changes, then do research, and evaluate to see if the policy changes were appropriate. This is the argument of why take chances? If there is the possibility that there might be some harm, even if an infrequent occurrence, but with potential serious consequences, why take chances? Play it safe! The likely outcome depends on the choice you make. How far do you reduce the availability of fluoride in the products? One problem is that once you reverse a policy, no matter how much science emerges afterwards, it is very difficult to go back to your previous position. I find this to be one of the worst options of all, because it is like throwing a dart at the policy option board and letting it land where it may. I should point out that the same type of sensitivity analysis that can be done with data can be done in policy formulation, by varying qualitative or quantitative aspects of factors that are considered. For example, in identifying the assumptions, I said that I am willing to consider dental fluorosis as a potentially adverse outcome. However, if I included hypersensitivity, or cancer, as real risks, indeed the policy considerations would have to change. If the time should ever come,

when the weight of scientific evidence indicates that these are realistic health effects that have to be factored in, then, indeed, they would be factored in.

We must keep in mind the different loci of responsibility for establishing fluoride policy - federal, state and local governments and professional organizations. Historically, where authoritative federal bodies have provided guidance, the states and locales have followed. In weighing fluoride policy options, a number of costs must be considered. Most importantly, the health costs; that is the costs of increased levels of disease, pain, and suffering, and decreased levels of function. The political costs for supporting fluoridation can also be high. There have been local officials who failed to be re-elected for siding with fluoridation. Certainly, there can be a high level of dissidence. There are financial costs that I mentioned for the country, for employers, for the public. How are we going to afford those \$50+ restorations when we stop the \$0.51 fluoridation?¹² As a taxpayer, I do not wish to pay the extra costs. I do not know how the country could pay for it. And currently, there is no serious plan on the horizon for universal access to dental care in this country.¹⁸ There are social costs to all of the options, shifting the health equity imbalance even further to the detriment of those in the lower SES groups, who do not have access to care providers. Alternatively, there is the issue of increased occurrence of cosmetically objectionable dental fluorosis that requires treatment to restore cosmetic appearance. In the end, the bottom line is not going to be a simple algorithm. Fluoride has been a miracle drug relative to dental decay prevention and oral health. It may not be as important as penicillin, but I would place it in the top 5 percentile of miracle drugs. I hate to use the word drug, because I know I am going to be quoted that fluoride is

a drug. But, if you will stick "miracle" in front of it, I will accept drug.

When we make public health policy decisions, we are playing physician to the community. Experimentation with unfounded approaches can be risky for the community's health. Also, there is an important difference between balanced reporting by the media and the weight of scientific evidence. This is something we are going to have to come to grips with. I have been naive enough to expect that people will look at a range of information on a subject and make decisions based on where the weight of scientific evidence lies. But that does not necessarily work relative to the public. The public may respond hysterically in some instances and will be more impressed by issues of harm than issues of benefit. The media and the press honestly feel that they are doing their job when they equally present both sides of an argument. For scientists, though, the weight of scientific evidence is the critical factor. If we as scientists, educators and policy makers are going to be effective in the public information arena, we are going to have to learn the skills of dealing with the public and helping them to understand. Now, go ahead and choose your policy option!

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NEWS OF FELLOWS

Walter C. Buchsieb of Dayton, Ohio was recently honored by the American Association of Orthodontists (AAO) when he was the recipient of the AAO's highest honor, the James E. Brophy AAO Distinguished Service Award. The award was presented during the 92nd Annual Session of the AAO in St. Louis, MO and recognizes significant contributions to orthodontics. Dr. Buchsieb is a former Speaker of the AAO House of Delegates.



Walter C. Buchsieb

John I. Haynes has been named the recipient of the Alumnus of the Year Award by the University of Missouri at Kansas City School of Dentistry. Dr. Haynes was recognized for his extensive and significant service to his Alma Mater, profession and community. He is a Fellow of the American Academy of Pediatric Dentistry and Secretary-Treasurer of the Kansas City Midwest Section.



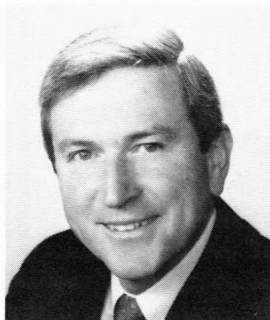
John I. Haynes



Robert W. Elliott, Jr.

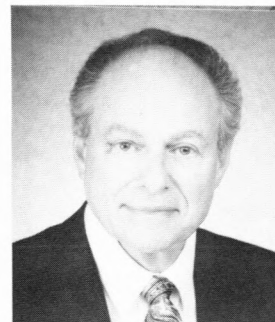
Robert W. Elliott, Jr. has been elected Chairman of the Advisory Board of the Lower Keys Branch of the American Red Cross, and Vice President of the Key West Maritime Historical Society. He is President-Elect of the Academy of Dentistry International, an organization founded by ACD President-Elect Albert Wasserman. A Past President of the College, Dr. Elliott was formerly Chief of the Navy Dental Corps.

Thomas J. Ginley recently retired from his position as Executive Director of the American Dental Association. Dr. Ginley served the American Dental Association with distinction in a variety of capacities for the past 30 years.



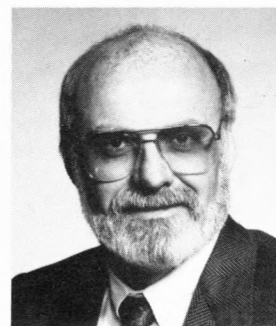
Thomas J. Ginley

Eric J. Hovland, Chairman of the Department of Endodontics at the Baltimore College of Dental Surgery, University of Maryland, was named Administrator of the Year by the Maryland Association of Higher Education. Dr. Hovland served as Vice President of Academic Affairs at the University of Maryland at Baltimore last year and will be installed as President of the American Association of Endodontists in 1993.



Albert Wasserman

Albert Wasserman, ACD President-Elect, recently received several honors: he was honored as the "Distinguished Alumnus of the Year," conferred by the University of California School of Dentistry at the UC commencement ceremonies. He was also elected to Honorary Membership in the Omicron Kappa Upsilon national honor society by the University of California School of Dentistry. In addition, he was presented with the first "FOUNDERS" Award by the Northern California Chapter of the Academy of Dentistry International which will, in the future, be called the Albert Wasserman Award.



James L. Gutmann

James L. Gutmann, Chairman of the Department of Endodontics at Baylor University College of Dentistry was recently elected President of the Marquette University Dental Alumni Association.



Eric J. Hovland

Samuel D. Harris Donates \$1 Million to National Museum of Dentistry

Samuel D. Harris of Detroit, Michigan donated \$1 million to the National Museum of Dentistry located on the campus of The University of Maryland at Baltimore. To honor Dr. Harris for his successful career in dentistry and his support of dental history, the museum will be named The Dr. Samuel D. Harris National Museum of Dentistry. In making this announcement, the University of Maryland at Baltimore President Errol L. Reese stated that Dr. Harris has long advocated the establishment of a national museum devoted to dentistry's rich history and accomplishments.

Dr. Harris received his D.D.S. degree from the University of Michigan in 1924 and established his private practice in Pediatric Dentistry in Detroit the following year. A pioneer in children's dentistry, Dr. Harris founded the American Society of Dentistry for Children and served as the first editor of the *Journal for Dentistry for Children* from 1932 to 1942. During his illustrious career Dr. Harris has received a significant number of recognitions and awards.

Samuel D. Harris, right, cuts the cake at ceremonies renaming the National Museum of Dentistry the Dr. Samuel D. Harris National Museum of Dentistry. Assisting him, left, is the University of Maryland at Baltimore President Errol L. Reese.



Jeanne C. Sinkford, Professor and Dean Emeritus of Howard University, College of Dentistry received an Honorary Doctor of Science Degree from the University of Medicine and Dentistry of New Jersey. Dr. Sinkford was honored as the first female dental dean in the United States and for her distinguished professional career spanning several decades. Dr. Sinkford is presently the Special Assistant to the Executive Director for Minority and Women's Affairs for the American Association of Dental Schools.



Jeanne C. Sinkford



Joe J. Simmons, Jr.

Joe J. Simmons, Jr., has been named the 1992 Distinguished Alumnus of Baylor University College of Dentistry. Dr. Simmons practices general dentistry in Dallas and is also actively involved in clinical research. He is the author of several scientific articles and co-author of two text books. Dr. Simmons is a Past President of the Flying Dentists Association and is a member of the AirLifeLine of Texas which provides volunteer air emergency health service to transport indigent patients as well as critical medical supplies.

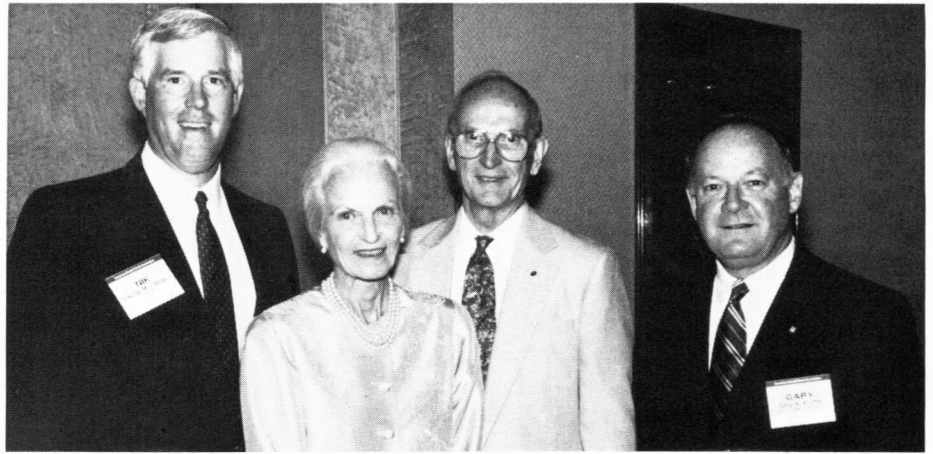
Gordon B. Stine recently received the Pierre Fauchard Academy's State Award in recognition of outstanding contributions to the art and science of dentistry. Dr. Stine is serving as Director of Dental Continuing Education at the College of Dental Medicine and as Special Assistant to the President of the Medical University of South Carolina. He is also the Coordinator for the South Carolina Area Health Consortium.



Gordon B. Stine.

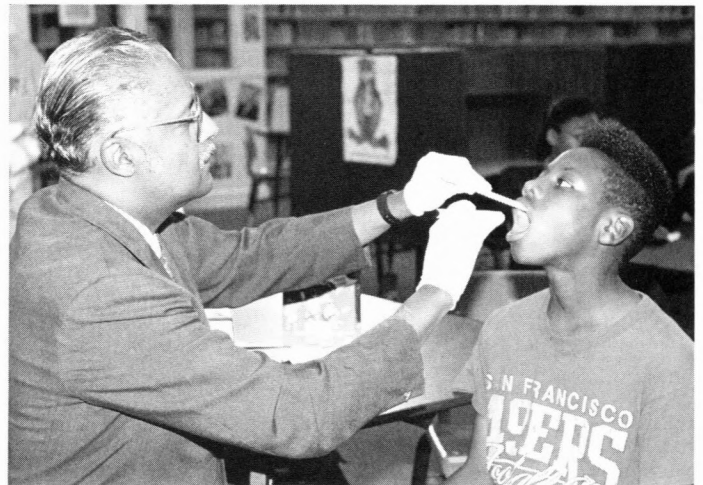
Executive Director Gordon H. Rovelstad represented the American College of Dentists at the Annual Spring Board of Directors Meeting of the American Dental Trade Association (ADTA) in Washington, D.C. recently.

Photographed from the left are: Mr. Nikolaj (Nick) M. Petrovic, President and CEO, American Dental Trade Association, Mrs. Barbara Rovelstad, Dr. Gordon H. Rovelstad and Mr. Gary K. Porter, Chairman of the ADTA Board of Directors.



Lewin R. Manly of Atlanta was recently named the Turner Broadcasting System, Inc. "Super Citizen of the Week." Dr. Manly was recognized for his humanitarian service to the community and for his spirit of volunteerism. Dr. Manly has gone into Atlanta area public schools for the past 8 years and screened and provided treatment for young children who may not otherwise have received dental care and education.

Dr. Lewin R. Manly photographed examining a sixth grade student. (Photo by Teryl Jackson)



SECTION ACTIVITIES

Upper-Midwest

The Upper-Midwest Section recently held its annual meeting in Minneapolis. Section Chairman Kenneth J. Buechele welcomed 32 Fellows in attendance and recognized ACD Past Presidents Stanley A. Lovested and Odin M. Langsjoen, ADA Past President Donald E. Bentley, Minnesota Dental Association President Dennis Brandstetter and ACD Regency 5 Regent Perm S. Sharma.

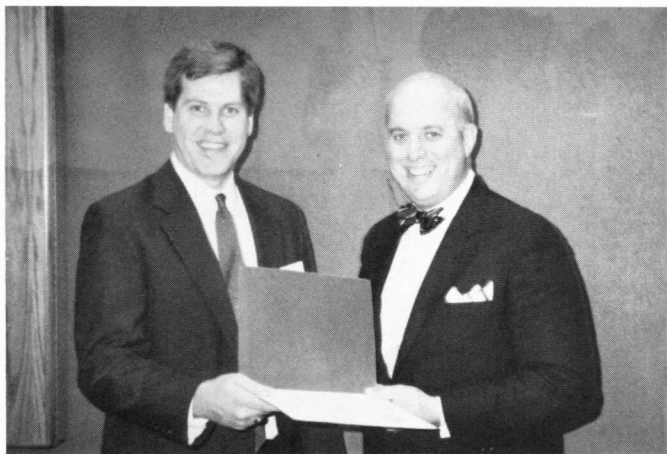
Fellows Howard A. Sather and Charles M. Reeve were recognized for 25 years of Fellowship and service to dentistry. Honorary Fellow Muriel J. Bebeau presented a report on the University of Minnesota School of Dentistry's Ethics Curriculum and Student Feedback Program. Certificates of Participation were presented to

several Fellows who have served as Expert Assessors for the Ethics Curriculum.

Regent Prem S. Sharma addressed the meeting and installed the following new officers of the Section: Chairman Douglas A. Nelson, Vice Chairman James R. Jensen, 2nd Vice Chairman Donald W. Johnson, 3rd Vice Chairman Paul O. Walker and Secretary-Treasurer Kenneth J. Buechele. Odin M. Langsjoen received a Certificate of Appreciation in recognition of six years of service as Secretary-Treasurer and Kenneth J. Buechele was presented with a Certificate of Recognition for having served a term as Chairman.

Carolinas

The Carolina Section conducted its annual luncheon meeting in conjunction with South Carolina Dental Association Convention in Asheville, North



Dr. B. Thomas Kays, Chairman of the Carolinas Section, on the right is photographed presenting the Section's Senior Student Award to Thomas McDonald.

Carolina. The Section presented an award to a member of the 1992 graduating class of the Medical University of South Carolina Dental School.



Photographed at the Carolinas Section meeting are from the left: ADA Sixteenth District Trustee James H. Gaines, Mrs. Tom McDonald, Senior Student Award Recipient Tom McDonald and ADA President Geraldine T. Morrow.

Colorado

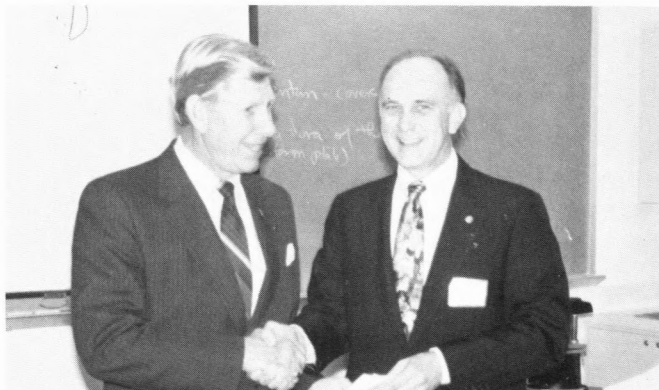
The Colorado Section annually recognizes a graduate from each of the five dental hygiene programs as well as from the University of Colorado School of Dentistry for qualities of professionalism and service to the community and the profession. The 1992 award to a graduating dental student was presented to Dr. Lucinda Ann Lewis. Dr. Lewis is the second Navaho ever to become a dentist. Following a year in general practice residency at the Oklahoma Medical Center in Oklahoma City, she will return to the reservation where she was born to work at an Indian Health Service Dental Clinic.

Photographed presenting the Colorado Section's Award to Dr. Lucinda Lewis is Dr. Ralph L. Lambert, left.



Florida

The Florida Section held its Annual Breakfast meeting in conjunction with the Florida National Dental Congress. Section Chairman Robert T. Ferris presided at the meeting which was attended by 98 Fellows and 17 students. Lapel pin attachments for 25 years of Fellowship were presented to John L. Bomba and Rueben P. Groom. A plaque and a check for \$200 was presented to Kirk Henry Solberg in recognition for outstanding professionalism and ethics while a student at the University of Florida College of Dentistry. Executive Director Gordon H. Rovelstad brought greetings from the Officers and Regents of the College. ADA 5th District Trustee Heber S. Simmons, Jr. gave a stimulating talk.

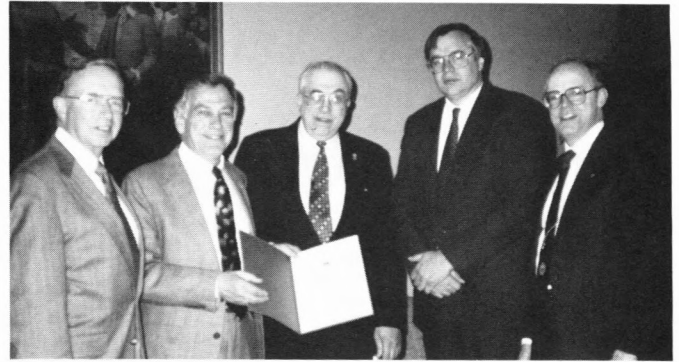


The Florida Section contributed \$500 for a Scholarship to a dental hygiene student from the Pasco-Hernando Dental Hygiene School. Photographed on the left is Milton Jones, Dean of the Dental Hygiene School receiving the check from Florida Fellow Donald Cadle.

Hudson-Mohawk

The Hudson-Mohawk Section held its annual meeting April 29th in Albany with a large number of Fellows in attendance. Dr. Ernest F. Reimann was presented with a certificate for having served as the Chairman of the Section.

Photographed at the Hudson-Mohawk Section's Annual meeting are, from the left: Secretary-Treasurer Gerard A. Ripp, Chairman Arnold A. Ruxin, Past Chairman Ernest F. Reimann, Mr. Roy Lasky and ACD Regent Edward C. McNulty.



A large number of Fellows attended the annual meeting of the Hudson-Mohawk Section.

Iowa

The Iowa Section held its Annual Meeting in Des Moines on May 4 in conjunction with the Annual Meeting of the Iowa Dental Association. Section Chairman John Montgomery presided at the meeting and recognition was presented to Fellows completing 15 and 25 years of Fellowship. ACD Regency 5 Regent Prem S. Sharma addressed the meeting reporting on the activities of the Board of Regents and reminding

the Fellows of the Iowa Section that the very idea of forming the American College of Dentists first surfaced in the early spring of 1920 when four leaders of the dental profession met at the home of Dr. and Mrs. John Finn in Cedar Rapids. Dr. Thomas V. Gardner, Jr. presented the Iowa Section's Outstanding Student Award to Blair Moser of the University of Iowa, College of Dentistry.

New England

The New England Section welcomed President Tom Slack as its guest speaker at its Annual Awards Luncheon held in conjunction with the Yankee Dental Congress. Leadership and Professionalism Awards were given to outstanding students from the four dental schools in New England.

Photographed at the New England Section's meeting held earlier this year are from the left: ACD Regency 1 Regent Edward C. McNulty, ACD President Thomas W. Slack, New England Section Editor Barbara C. Kay, Secretary-Treasurer Thomas F. Winkler, Chairman A. Howard McLaughlin and Vice Chairman Donald B. Stackhouse.



Mississippi

The Mississippi Section held its annual meeting in Biloxi on June 7 with Section Chairman Harry D. Halliwell, Jr. presiding. ACD Regent Richard J. Haffner addressed the meeting and presented the 25 year Fellowship pin to Dr. William N. Alexander. The Section also presented an Outstanding Senior Dental Student



Photographed at the Mississippi's Sections annual meeting are from the left: ACD Regency 6 Regent Richard J. Haffner, Dr. John H. Hembre, Jr. and Secretary-Treasurer Robert T. Ragan.

Award to Lonnette Phipps from the University of Mississippi School of Dentistry. Section Secretary-Treasurer Robert T. Ragan presented an award for Outstanding Contributions to Dentistry to the outgoing Dean of the University of Mississippi School of Dentistry Dr. John H. Hembre, Jr.



Photographed from the left are: Section Vice Chairman Donald B. Hall, Chairman Peter B. Perkins, Regent Richard J. Haffner, Secretary-Treasurer Robert T. Ragan and outgoing Chairman Harry D. Halliwell, Jr.

Oklahoma

The Oklahoma Section held its Spring meeting in Oklahoma City and honored four University of Oklahoma dental students for academic excellence, leadership and participation in the Section's Dental Student Recruitment program. The following officers were elected and installed: Chairman W. Scott Waugh, Vice Chairman James S. Torchia and Secretary-Treasurer James R. Roane.

The Oklahoma Section intends to continue working to help Oklahoma dentistry maintain high standards of ethics. The second Conference on Ethics presented by Section Fellows is being planned and will be offered to senior dental students. Dr. Emmanuel DeLaPaz addressed the Oklahoma Section meeting and gave a report on his experiences in helping with the Oklahoma Section's dental student recruitment efforts. Seated to



Incoming Chairman W. Scott Waugh addressed the meeting after his installation. Seated on his left is Past Chairman Robert E. Hess and on his right Mrs. Jean Gumerson, of the Presbyterian Health Foundation and Dean Robertson, the outgoing Section Chairman.



his left is Dr. Ken Templeton, a participant in the recruitment program and Section award recipient Dr. Val Garn who recently graduated summa cum laude.



Dean of the University of Oklahoma School of Dentistry Russell J. Stratton presents the ACD award for Academic Excellence to Dr. Val Garn.

Washington

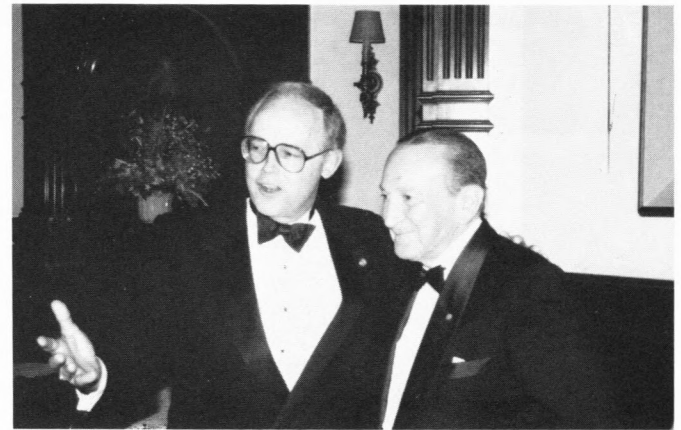
During the Washington Section's Annual Dinner Meeting at the Seattle Yacht Club, dental student Ted Pilot was presented with the Section's American College of Dentists Ferrier Memorial Award. The Ferrier Award is presented annually to a third-year dental student at the University of Washington whose interest and excellence in restorative dentistry has been demonstrated. The award is accompanied by a check for \$1,000.



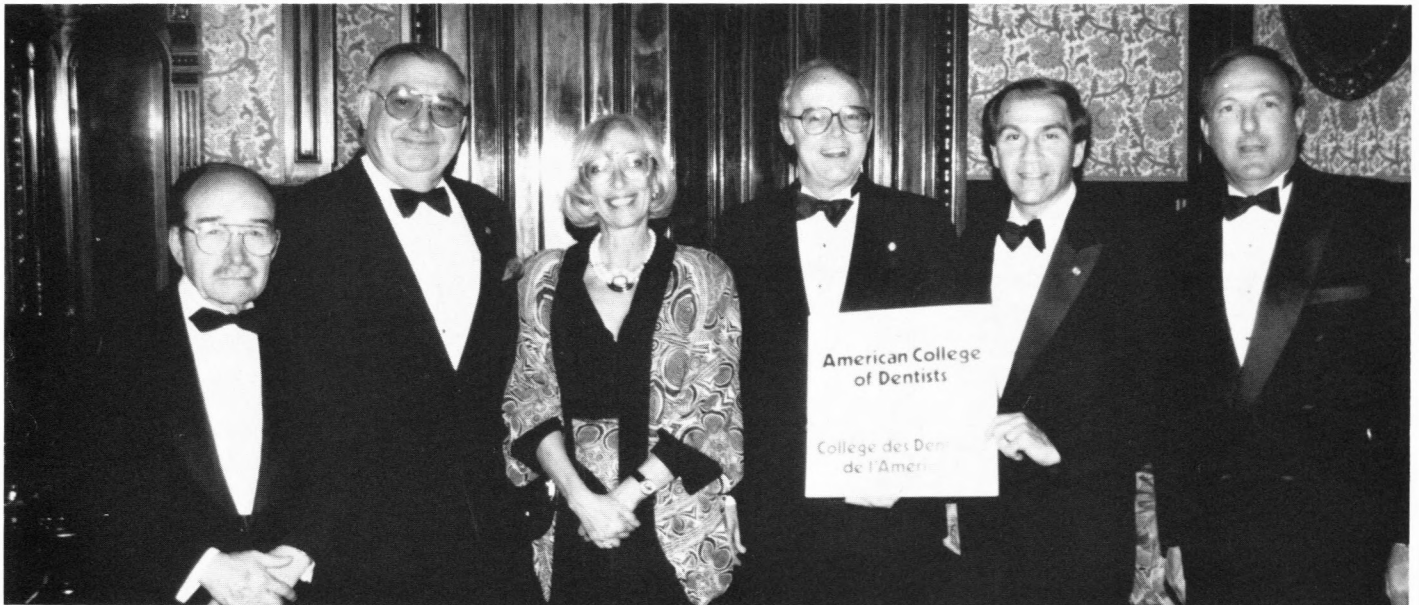
Pictured at the Washington Section's Annual Dinner are, left to right, Section Chairman Stan W. Sapkos, Mrs. Rosemarie Sapkos, student award recipient Ted Pilot, Mrs. Darlyne Bales and Immediate Past Section Chairman David J. Bales.

Quebec

The Quebec Section held its first closing dinner at the end of May. Our honored guest for the occasion was Regent Edward C. McNulty of ACD Regency 1, who delivered a most informative and inspiring message. Presiding commendably was Chairman Earl M. Hershenfield, while the speaker was thanked by Vice-Chairman Ralph Y. Barolet, Dean of the Faculty of Dentistry at McGill University.



Regent Edward C. McNulty, left, concludes his presentation of a twenty-year ACD lapel pin to Herbert Caplan, right at the Quebec Section meeting.



Pictured, left to right, at the Quebec Section meeting are Dean Emeritus of the Faculty of Dental Medicine at the University of Montreal Jean-Paul Lussier, Section Vice-Chairman Ralph Y. Barolet, Stephanie Schwartz, Regent Edward C. McNulty, Chairman Earl M. Hershenfield and Secretary-Treasurer Stephen Miller.

NOMINATION FORM REQUEST

Name _____ F.A.C.D.

Address _____

City _____ State _____ Zip _____

Signature

A nomination portfolio to be used in nominating to Fellowship is obtained from the Executive Office upon the signed request of any Fellow in good standing.

February 1, — Closing Date for Nominations. Send the form to the American College of Dentists, 839 Quince Orchard Blvd., Suite J, Gaithersburg, MD 20878-1603

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1. Smith, J.M., Perspectives on Dental Education, *Journal of Dental Education*, 45:741-5, November 1981.
2. White, E.M., Sometimes an A is Really an F. *The Chronicle of Higher Education*, 9:24, February 3, 1975.

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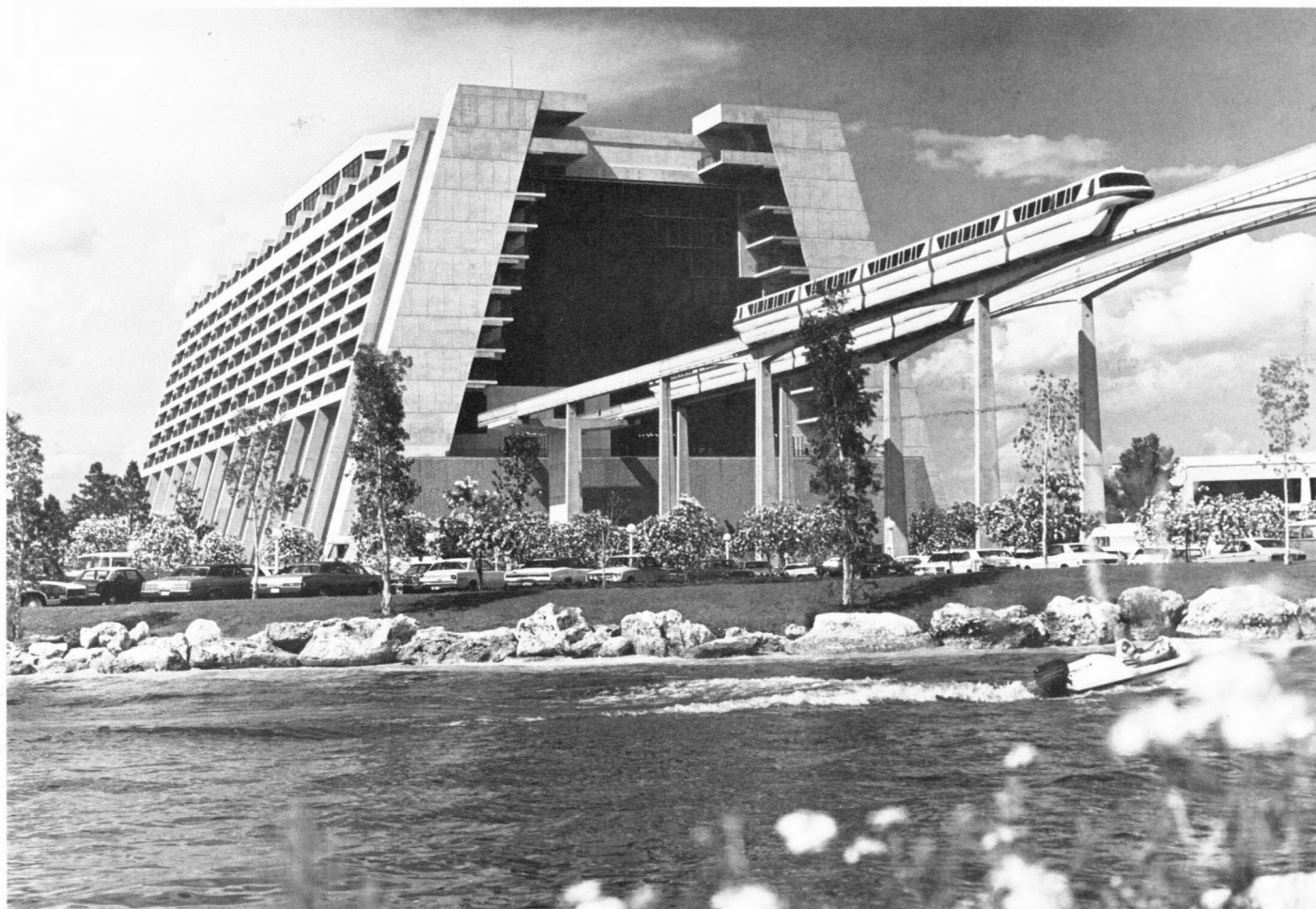
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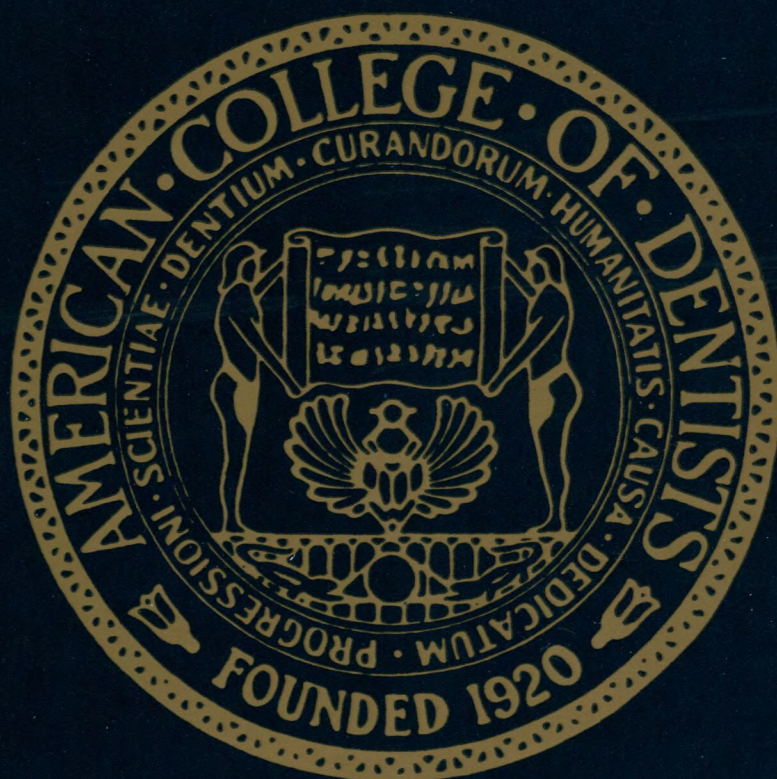
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