

The 50th Anniversary of Water Fluoridation in Grand Rapids, Michigan

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The Grand Rapids Committee for the 50th Anniversary of Water Fluoridation and the University of Michigan School of Dentistry are pleased to publish the proceedings of the symposium commemorating the 50th anniversary of water fluoridation in Grand Rapids, Michigan, in this issue of the *Journal of Public Health Dentistry*. These proceedings were made available by a generous lead gift from Delta Dental Fund of Michigan.

In these proceedings, we celebrate the single most important clinical event in the history of dentistry, an event of such profound impact that the pandemic of dental decay, which spread throughout the world after the introduction of sugar in the diet, has ended. Today, as we prepare to enter the 21st century, we in dentistry can be in control of our clinical destiny. No longer do people expect to lose all their teeth. We have had successive generations of children who have never experienced the excruciating pain of a toothache. More than 50 percent of our youth are free of dental decay. The majority of senior citizens have most of their own teeth. This multigenerational improvement in oral health can be attributed primarily to fluoride; and the use of fluoride in drinking water began with the classic studies performed here in Grand Rapids.

In these proceedings we celebrate this magnificent achievement by looking at the past, the present, and the future. Drs. David Scott and Ray Stevens, in their essays, provide a unique historic perspective, as they were both in Grand Rapids at the dawn of this new era in dentistry. Dr. Scott was a member of the US Public Health Service team, headed by H. Trendley Dean and Francis Arnold, that initiated water fluoridation in the Grand Rapids water system at the request of the dental community of Grand Rapids. Dr. Scott recounts the



The Fluoridation Commemorative Monument was dedicated in September 1995 in Grand Rapids, Michigan.

events leading to fluoridation and the magnificent role of the Grand Rapids Dental Society, led by their spokesperson, Dr. Russell Klinesteker, in the public meetings leading to the decision to fluoridate the water supply. Dr. Stevens has practiced dentistry in Grand Rapids for almost 50 years. He has looked within his patients' records and documented the changing DMF score between parents and children when they both were the same age. He provides ample testimony to the vision and of the compassion of the Grand Rapids dental community.

Water fluoridation is among the finest achievements of the United States Public Health Service. However, water fluoridation is not universally implemented in the United States, and Tom Reeves of the Centers for Disease Control and Prevention (CDC), describes the CDC's strategic plan to "in-

crease to at least 75 percent the proportion of people served by community water systems providing optimal levels of fluoride." This plan is detailed, comprehensive, and a must-read for individuals interested in public health policy and operation. He notes the emotional challenges to water fluoridation by a small group of individuals espousing political or personal reasons.

Dr. Ernest Newbrun describes the nature of this challenge, the religious-like zeal of their spokespersons, and the nature of their techniques. He reviews the opportunism of their arguments and their "scare rhetoric." He describes how their vocal opposition, devoid of scientific credibility, has appealed to the media, a fact borne out by the local newspaper and television coverage of the symposium, which gave equal time to this small number

of anti-fluoridationists who protested at the dedication of the fluoride memorial.

The scientific evidence for the efficacy of water fluoridation is overwhelming. Dr. Herschel Horowitz documents the success story of water fluoridation in community after community in the United States. He stresses the safety of fluoride and its lifelong benefits. He discusses the dilution effects of fluoride from other sources and the platform that this has provided for the arguments of the anti-fluoridationists. He warns against complacency on the part of the dental community and reminds us that water fluoridation remains our most cost-effective measure against the ravages of dental decay.

Dr. Thomas Marthaler provides insights into the difficulty of establishing community-based water fluoridation in Europe, especially in Switzerland. The lack of single large reservoirs and the exchange of water supplies between adjacent communities discouraged the implementation of water fluoridation. However, water fluoridation was started in the canton and city of Basel in 1962 and has provided the expected benefit. Cross-sectional data found that 15-year-old children averaged 14.7 DMFT in 1967, but only 2.1 DMFT in 1992. Despite this success, continued efforts by the small anti-fluoridation community have had to be refuted.

Water fluoridation in Ireland has taken a different path. Dr. Denis O'Mullane describes the legal controversy surrounding the Health Act of 1960, which empowered the Minister for Health to direct the fluoridation of all public piped water supplies. As a result, Ireland is the only country in the world that has approved fluoridation at the national level. Dr. O'Mullane documents the health benefits of this law, which has given Ireland the lowest DMFT figures in Europe.

The success of water fluoridation has profoundly changed the practice of dentistry. This was noted by Dr. Stevens in his daily practice and by Dr. Marthaler and others in the number and type of dental procedures that are performed. This change necessitates

that the dental community must evaluate its prevailing paradigms and adjust to the new reality in which individuals will be retaining most, if not all, of their teeth for a lifetime.

Dr. Bo Krasse addresses this changing scenario as observed by him over a lifetime in clinical research. He notes that when he graduated from dental school "dental caries was one of our greatest sociomedical problems"; now, almost 50 years later, "too many dentists is a social problem." He describes his journey down the winding road of the science of prevention and describes the new treatment strategies inherent in the new paradigm that dental decay is a transmissible and treatable infection. He foresees some resurgence in the caries rate, but an eventual further decline in caries.

What, then, is the profession to do? The proceedings contain several examples of opportunities available to the clinician of the future. One opportunity, which truly is 21st century in concept, is the application of molecular biology to dental and oral problems. Dr. Harold Slavkin, the director of the National Institute for Dental Research, enthusiastically projects the many avenues of research and treatment that recombinant DNA technology will engender for oral medicine. Clinical entities such as congenital malformations involving cleft lips and palates so far have been given only symptomatic relief. But the isolation of numerous genes responsible for the formation of craniofacial-oral-dental tissues raises the distinct possibility that in the future, some, and possibly many, congenital malformations will be diagnosed and prevented. He foresees a future where genetically based therapeutics will suppress oral cancers and successfully treat difficult condition, such as trigeminal neuralgia.

But before these wondrous new concepts and therapeutics can be introduced, the existing framework for dental education has to be changed. The 19th century dental curriculum based upon the insightful observations of G. V. Black and W. D. Miller cannot productively serve us any longer. Dr. Bruce Baum, in a careful

and somber assessment, concludes that today's dental educational system is inadequate to produce a dentist who can compete successfully in the brave new world of the 21st century. He envisions that dentists of the 21st century will need to "function in a health care system in which oral health is truly integrated with total health." He refers to the recent Institute of Medicine's report on "Dental Education at the Crossroads," and its recommendation that dentistry needs to return to its medical origins. He does not prescribe any specific changes, but documents the areas in which change will be essential.

The necessity for change is the theme of Dr. David Nash's presentation. Dr. Nash draws lessons from nature and illustrates how certain overarching principles—i.e., natural selection, environmental change, form follows function, symbiosis and entropy—provides instructions for the profession of dentistry. He draws particular attention to the observation that change in nature might not be gradual, but can be "dramatic, rapid, and cataclysmal." There should be no doubt, as dentistry enters the 21st century, that cataclysmic events are shaping our destiny. Dr. Nash speaks of the notion of "enlightened self-interest" in terms of dentistry's reaching out to or, more appropriately, returning to its biological basis. And he reminds us that biological evolution teaches that cooperation is a more likely determinant of survival than is competition.

These proceedings provide a brief synopsis of the progress of the profession of dentistry in the 20th century. In this regard, dentistry has come full circle. In the late 19th century, the medical community's answer to the caries pandemic was to create dentistry as a free-standing health specialty. As we stand now, a century later, this mission has, because of fluoride, been essentially completed. We can now address, in the 21st century, neglected oral problems and reassert our full societal role in the betterment of human health. But to do so, we must change, or at the very least modify, our *modus operandi*.