

## IN MEMORIAM

### ALBERT W BURGSTAHLER, PhD: A TITAN IN FLUORIDE RESEARCH 1928–2013

“The seeds of great discoveries are constantly floating around us, but they only take root in minds well prepared to receive them.”

American physicist Joseph Henry (1797–1878)

Dr Albert William Burgstahler, Professor Emeritus at the University of Kansas, Lawrence, KS, USA, passed away peacefully at his home with his family present on October 12, 2013, at the age of 85, after experiencing declining health for some months with adenocarcinoma of the gallbladder region for which no effective treatment was available. At the time of his death Dr Burgstahler was the Editor-in-Chief of *Fluoride* with his association with fluoride research and the International Society for Fluoride Research (ISFR) going back many decades. In 1964 he requested reprints on fluoride research from Dr George L Waldbott and met him in person the following year at a meeting in Detroit of the American Chemical Society.<sup>1</sup> A lasting friendship began at that time with Dr Waldbott and his wife Edith. Dr Burgstahler was able to read and help correct the galley proofs of Dr Waldbott's new book *A struggle with Titans*.<sup>2</sup> This gave him an insight into the enormity of the problems making it difficult for the toxicity of fluoride to be better known. Dr Waldbott had organized the first international symposium on the toxicology of fluorine compounds in Bern, Switzerland, October 15–17, 1962, which was attended by over 30 researchers from 11 countries. A similar conference was held in Detroit in 1966 sponsored by the newly formed American Society for Fluoride Research which then became, in 1966, the ISFR. The Society held its first meeting in Frankfurt am Main, Germany, in October 1967. Dr Burgstahler was a regular attender at the conferences of the Society and participated, at the age of 84, in the XXXth conference in Szczecin, Poland, September 5–8, 2012. Although, because of his ill health he was unable to register for the XXXIst conference in Tehran, Iran, October 18–21, 2013, he was hoping that his health would recover and that he would be able to attend the XXXIInd conference this year in Chiang Mai, Thailand.



Albert William Burgstahler at the Great Wall  
of China, October 2007  
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Following meeting Dr and Mrs Waldbott in 1965, Dr Burgstahler began to assist with editing and revising papers for the ISFR journal which first appeared in July

1968 under the title *Fluoride Quarterly Reports*, with Dr Waldbott as Editor and Dr Burgstahler as Co-Editor.<sup>1</sup> In the introduction to the first issue, it was noted that the Society and the journal were established because there was a lack of communication between fluoride researchers, even with those in the same or a nearby university.<sup>3</sup> It was planned that the journal would feature, in particular, research from non-English speaking countries which were generally not accessible to the scientific community in the USA. Accomplishing this goal required overcoming difficulties such as translating papers into English. No advertising was contemplated to finance the journal and the Society indicated that it would not engage, at any time, in political activities concerned with fluoridation or air pollution. The journal would feature original research except for occasional review articles, editorials, and an abstract section featuring current research. Dr Burgstahler worked with devotion on the journal from 1968 until the end of his life. He was a Co-Editor from 1968 until Dr Waldbott's death on July 17, 1982, when he assumed the reins as Acting Editor, in which role he continued until Dr John Colquhoun became Editor in 1991. Dr Burgstahler then continued to assist again as a Co-Editor or Scientific Editor until Dr Colquhoun's death on March 23, 1999, after which Dr Burgstahler became Editor. His role changed to Editor-in-Chief at the Szczecin, Poland, conference in 2012 when positions of Regional Editors were created. Dr Burgstahler was diligent in his editorial work, striving for perfection, in his copy editing, being particular about the finer points of English, such as the placement of commas, and generally adhering to the guidance of William Strunk Jr. and EB White in their informative book *Elements of style*.<sup>4</sup>

A background in chemistry enabled Dr Burgstahler to collaborate with Dr Waldbott and H Lewis McKinney in writing *Fluoridation: the great dilemma*, an enduring and scholarly 423-page book on fluoridation, published in 1978.<sup>5</sup>

Dr Burgstahler received his BS degree in chemistry (Magna com Laude) from the University of Notre Dame in 1949, and his MA and PhD in organic chemistry from Harvard University in 1950 and 1953 respectively. After post-doctoral studies at the University of London, England, a year as an instructor at Notre Dame, and further post-doctoral research at the University of



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Wisconsin, Madison, he joined the faculty at the University of Kansas, Lawrence, as an Associate Professor of Chemistry in 1956, became a full Professor of Chemistry in 1965, and Professor Emeritus of Chemistry on his retirement in

1998. His teaching and research were primarily in general and organic chemistry, and the synthesis and chemistry of natural products. He had an interest in the toxic effects of environmental pollutants and his involvement in fluoride research began in the early 1960s with work on the synthesis and biological properties of fluorinated amino acids. He then enlarged this focus to the overall literature of fluoridation and took a particular interest in the connection of fluoride with Down's syndrome and the toxicity of fluoride in both humans and animals. From 1961 to 1964 he was an Alfred P Sloan Research Fellow and in 1965 received a Notre Dame Centennial of Science Award.<sup>5</sup> In 2006 he was awarded the Fluoride Action Network's inaugural Albert Burgstahler Scientific Integrity Award, awarded annually to scientists upholding the highest standards of scientific integrity in the effort to end fluoridation worldwide.

In addition to his editorial work, Dr Burgstahler served on the ISFR Advisory Board, helped with the organization of the conferences, and held various positions in the Society including being President from 1971 to 1974.

Dr Burgstahler personally experienced symptoms of the chronic fluoride toxicity syndrome and had no doubt about its reality. He described his experiences on May 16, 2005 in an article which has not been previously published.

#### **REVERSIBLE TOXICITY FROM FLUORIDATED DRINKING WATER – CLINICAL CASE OF AWB**

“Born on July 10, 1928 in Grand Rapids, MI, where he lived until going to college in 1945, AWB had no regular contact with fluoridated water until becoming a post-doctoral research associate at the University of Wisconsin, Madison, WI in 1955. The following year he accepted a chemistry faculty appointment at the University of Kansas in Lawrence, KS (fluoridated since 1953 with sodium silicofluoride). Up to that time he enjoyed generally good health. After a few years in Lawrence he began



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noticing that he was waking up feeling tired, even after 7–8 hours of uninterrupted sleep. He also noticed that he had aching shoulder, elbow, and knee joints on arising, which gradually subsided. In addition, he felt increasing thirstiness, even though he was drinking at

least two or three quarts of water per day. In the morning, before drinking some water, his throat felt very dry and rough. He also had a bloated gastrointestinal feeling and occasional headaches and temporary blurring of vision. Often, while writing, he felt his fingers move in a jumpy involuntary fashion, and he frequently felt “pins and needles” sensations in his legs. Except for the feeling of extreme fatigue on arising, none of these symptoms seemed particularly bothersome. His diet, overall, was quite good.

“Around 1961, after residing in Lawrence for five years, he consulted the family physician, Glenn Lessenden, MD, who evidently suspected low thyroid function and recommended a basal metabolism rate (BMR) test. The results revealed a  $-22$  BMR, clearly indicated a substantial hypothyroid condition. Treatment with thyroid extract was initiated, but no appreciable improvement in any of the above symptoms was noted, including the excessive morning fatigue. During this period, he and his family also began experiencing mouth ulcerations of unknown origin.

“In 1964, during the course of research on the synthesis of cis- and trans-4-fluoroproline in collaboration with Professor Seymour Bakerman at the University of Kansas Medical Center in Kansas City, AWB became aware through reading of the clinical reports by GL Waldbott, MD, of reversible ill effects



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from fluoridated drinking water. Early in 1965 he switched to distilled water for all drinking and cooking and very quickly noticed the clearing up and disappearance of the various symptoms mentioned above. The first to go was the drying morning throat and excessive thirst. Then the bloated stomach feeling disappeared. Within a few more days he noticed that he was waking up more refreshed without aching elbow and knee joints. The headaches, pins and needles sensations, and other symptoms also disappeared. He stopped taking the thyroid extract, and three months after switching to distilled water, he made an appointment for another thyroid test. This time the thyroid function appeared normal ( $BMR = 0$ ). By changing to nonfluoridated toothpaste the mouth sores also ceased.

“Since 1965, AWB has not had any recurrence of the aforementioned symptoms, although on visits to certain fluoridated cities like San Francisco, he noticed some recurrence of gastrointestinal discomfort.”

Dr Burgstahler fitted a tap in the kitchen of his house in Lawrence which supplied distilled water.

Dr Burgstahler wrote in 2007:<sup>6</sup>

“Although dental public health officials in countries promoting water fluoridation adamantly deny the existence of illness caused by fluoride in drinking water, undeniable medical ill effects from fluoride added to drinking water have been known and reported since the start of water fluoridation over 50 years ago. Even today, those who experience these adverse effects, whether from fluoride in their drinking water or from other sources, know only too well how insidious these ailments can be, what a relief it is to find out what is causing them, and how easily they can often be overcome simply by reducing excessive intake of fluoride. Those who deny reality and persist in discounting sensitivity to fluoride in drinking water are like ostriches with their heads in the sand. They would do well to ...stop continuing to promote and be misled by scientifically indefensible claims that do not hold up under scrutiny.”

Although the Society was not involved in the politics of fluoridation and Dr Burgstahler never expressed a view on fluoridation on behalf of the Society, he expressed his personal views on fluoridation in a number of fora and was prepared to vigorously defend his position if the scientific basis of his views was challenged.

Dr Burgstahler began to study the Shakespeare authorship problem in 1997 and made various presentations of his work from 1999 onwards including a presentation in 2007 at the Shanxi Agricultural University, Taigu, PR China, on *Encrypted testimony of Ben Jonson and his contemporaries for who “William Shakespeare” really was.*<sup>7</sup> He was meticulous in his work in this area seeking out facsimiles of the first publications of literary works, reading extensively before expressing his opinions, and generously sharing his knowledge with colleagues working in the field, particularly with David L Roper, Truro, Cornwall, England. At the time of his death he had two articles being considered for publication.

Dr Burgstahler was a renaissance man willing to think for himself and basing his opinions of the evidence he found rather than absorbing uncritically the accepted wisdom of authorities. In his *In Memoriam* for his colleague Dr Waldbott, Dr Burgstahler began by quoting from Henry about the seeds of great discoveries only taking root in minds well prepared to receive them.<sup>1</sup> Dr Burgstahler had such a mind and his unrelenting personal criticism of the practice of fluoridation reflected his being prepared to examine critically the claims made for the practice and his discovery that it was neither safe nor effective. His steadfast opposition,

based in science rather than rhetoric, made him a Titan able to take on the Titans with whom Dr Waldbott struggled.

Dr Burgstahler epitomized in his life taking up the challenge of President John F Kennedy, given in the epigraph in *Fluoridation: the great dilemma*:<sup>5</sup>

“As every past generation has had to disenthral itself from an inheritance of truisms and stereotypes, so in our time we must move on from reassuring repetition of stale phrases to a new, difficult, but essential confrontation with reality.

For the great enemy of truth is very often not the lie—deliberate, contrived, and dishonest—but the myth, persistent, persuasive, and unrealistic. Too often we hold fast to the clichés of our forbears. We subject all facts to a prefabricated set of interpretations. We enjoy the comfort of opinion with the discomfort of thought.”

President John F Kennedy  
Commencement Address, Yale University, June 11, 1962

A need still exists for the International Society for Fluoride Research, to which Dr Burgstahler devoted much of his life, with its international conferences and its journal *Fluoride*. Although more journals now publish research on fluoride and are indexed by MEDLINE than was the situation in 1966, e.g., *Biological trace element research*, other journals containing important research are not currently indexed by MEDLINE, e.g., *Zhonghua difangbingxue zazhi*, *Chinese journal of endemiology*. Similarly, *Fluoride* continues to be excluded from MEDLINE indexing although it has long been and still is the only international scientific journal devoted to uncensored publication of legitimate research concerning all aspects of the biological effects of fluoride.<sup>1</sup> In the 2006 National Research Council publication, *Fluoride in drinking water: a scientific review of EPA’s standards*, *Fluoride* was the journal most referenced with 57 of the 1077 references being from it.<sup>6</sup> By publishing abstracts of fluoride research of particular importance, including of work not readily available through not being indexed in MEDLINE, *Fluoride* assists with the sharing of information in the research community.

As noted by Dr Burgstahler, the result of excluding *Fluoride* from MEDLINE “has been not only to marginalize much of that research but also to impede the free flow and exchange of information about such investigations that are crucial not only to the success of science but also to the vital needs and interests of everyone in society.”<sup>1</sup> Although it was stated that *Fluoride* was rejected for inclusion in MEDLINE in 2009 because of professional shortcomings and insufficient scientific quality, the rejection really appeared to stem from the fact that peer-reviewed reports in *Fluoride* by well-qualified researchers dealt with toxic effects of fluoride that called into question the credibility of the unwavering endorsement of water fluoridation and dental fluoride use as completely safe by the US Department of Health & Human Services.<sup>8</sup> A further review by the Literature Selection Technical Review Committee, National Center for Biotechnology

Information, US National Library of Medicine, on October 24, 2013, produced the same result with *Fluoride* being again excluded. It received a score of 1.5 out of 5, with 3.75 being the threshold for inclusion in MEDLINE.

A Titan in fluoride research has passed away. However the struggle for the emergence of an informed understanding of the biological effects of fluoride continues. Professor Emeritus Albert Burgstahler will be missed but our memories of him and his philosophy will remain and inspire us to cultivate our minds to nourish the seeds of discovery that come our way.

A large and diverse assemblage of Dr Burgstahler's papers, ca. 1956–2007, comprising 75 boxes (120 linear feet) has been deposited with the Special Collections & University Archives, UMass Amherst.<sup>9</sup> Spanning nearly five decades, the correspondence, publications, and research offer a perspective on Dr Burgstahler's activism in science and public policy and documents his association with other anti-fluoridation activists, including Dr Waldbott and Professor Emeritus Paul Connett.

Dr Burgstahler was preceded in death by his wife Patricia, on April 17, 2010 after 53 years of marriage, and by his two sisters Helen Boss and Margaret Hiemstra. He is survived by his three daughters, Maria Bokor, Janet Anderson, and Jennifer Burgstahler, his two sons Albert and David, ten grandchildren, and five great grandchildren.

Bruce Spittle, Editor-in-Chief

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