THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH:

THE PAST 49 YEARS AND THE FUTURE

Bruce Spittle,[a]

Dunedin, New Zealand

The International Society for Fluoride Research (ISFR) was founded in 1966 at a meeting in Detroit of the American Society for Fluoride Research to promote the sharing of scientific information on all aspects of inorganic and organic fluorides. This is done by the publication of the peer-reviewed quarterly journal *Fluoride*, now in its 47th year of publication, and sponsoring of international conferences, with our meeting here in Chiang Mai being the 32nd such conference. The first ISFR conference was held in Frankfurt am Main, Germany in 1967 and subsequent conferences have been held in Spain, Austria, the Netherlands, England, the United States of America, Switzerland, India, Japan, Hungary, China, Poland, New Zealand, Canada, and Iran.

Dr George Waldbott, MD, of Warren, Michigan, was the driving force behind the formation of the Society and was the editor of *Fluoride* for 15 years before his death in 1982. He was born in Speyer, Germany, in 1898 and graduated in medicine at the University of Heidelberg in 1921 before emigrating to the USA where he specialized in allergic and respiratory disease. In the 1950s he turned his attention to environmental pollutants. Fluoride was repeatedly brought to his attention in 1953 by his wife Edith leading him to review the literature, including the pioneering 1937 book on *Fluorine intoxication* by Kaj Roholm of Copenhagen, Denmark, and to appreciate that fluoride could affect enzymes and many cell functions. He wrote an article, *Medical evidence against fluoridation of public water systems*, but found that neither the *Journal of the American Medical Association* nor the *New England Journal of Medicine*was interested in publishing it. After printing it privately, he circulated the article to the members of his medical society and some Detroit dentists. Subsequently the *Australian Journal of Dentistry* requested the privilege of publishing his paper and it appeared in February 1955. Investigations of his own patients, including double-blind testing, convinced him that fluoride, as used in water fluoridation, could cause significant illness and further publications followed.

By 1960, many physicians and scientists, including those in the USA and in Europe, recognized the need for meetings and free discussion on fluoride research and a meeting was held in Bern, Switzerland, in 1962. Most of the 60 persons attending had carried out original research on fluoride and they all expressed great satisfaction for an unfettered opportunity to exchange information and views with other leaders in the field. The success of the Bern meeting led to the founding of the International Society for Fluoride Research at a meeting in Detroit, Michigan, in 1966 of the American Society for Fluoride Research with participants from Europe and Asia as well as North America. The first meeting of the new society was in Frankfurt am Main, Germany in 1967.

In a guest editorial in 2002, Richard Foulkes reviewed 35 years of the Society's publication *Fluoride* noting, "Many years have passed since Roholm's book first appeared, but most of the data that he presented are as new to most scientists today as they were then." Following Waldbott's death in 1982, his widow Edith Waldbott served as interim editor until 1991, when John Colquhoun, Auckland, New Zealand, was appointed editor. He was a most able editor until shortly before his death in 1998 after which Albert Burgstahler, Lawrence, Kansas, USA, became editor until his death in 2013. Professor Emeritus Burgstahler first made contact with Dr Waldbott when he requested reprints of his fluoride research in 1964 and met him personally in 1965. Burgstahler helped with corrections for Waldbott's 1965 book, *A struggle with titans*, and subsequently, for the rest of his life, was associated with each issue of *Fluoride*, and, as his health permitted, the conferences of the Society. He attended the conference in Szczecin in 2012 but his health did not allow him to come to Tehran in 2013. He was hopeful that he would improve and expressed the intention to come to Chiang Mai, but sadly died six days before the Tehran conference.

At the Szczecin conference Albert became Editor-in-Chief with a new editorial structure involving a number of regional editors being appointed with nominations for these positions coming from the Members at Large for the regions and with voting on the appointments being done by the members of the ISFR Advisory Board. The Editor-in-Chief is now ably assisted by the Regional Editor for Africa: Professor Eli Dahi; the Regional Editor for Eastern Europe:Professor Dariusz Chlubek; the Associate

The biological effects on fluoride in plants, animals, and humans, which include cellular level actions in many organs on energy production in mitochondria and the expression of RNA, continue to have significant health and economic effects resulting in the continued production of important and original research. Although more journals are now available for the publication of this research, the Society continues to play an important educational role by holding conferences and publishing *Fluoride* while abstaining from being involved in the politics of fluoridation. In 1978, Waldbott, Burgstahler, and McKinney noted in *Fluoridation: the great dilemma*that most scientists and laymen remain ignorant of the dangers of fluoridation. Since then, the situation has improved but a recent publication from New Zealandsuggests that understanding the effects of fluoride on health is still incomplete.

In August 2014, *Health effects of water fluoridation: a review of the scientific evidence* was published on behalf of the Royal Society of New Zealand and the Office of the Prime Minister's Chief Science Advisor. In a covering letter, dated 20 August 2014, to Dr Roger Blakeley, Chief Planning Officer, Auckland Council, the commissioners of the report, Sir Peter Gluckman, the New Zealand Prime Minister's Chief Science Advisor, and Sir David Skegg, the President of the Royal Society of New Zealand noted, "Given the caveat that science can never be absolute, the panel is unanimous in its conclusion that there are no adverse effects of fluoride of any significance arising from fluoridation at the levels used in New Zealand (the deliberate adjustment upwards of fluoride concentrations in drinking water from their naturally low levels of approximately 0.1–0.2 mg/L in most parts of New Zealand to between 0.7 and 1.0 mg/L). In particular, no effects on brain development, cancer risk or cardiovascular or metabolic risk have been substantiated, and the safety margins are such that no subset of the population is at risk because of fluoridation. All of the panel members and ourselves conclude that the efficacy and safety of fluoridation of public water supplies, within the range of concentrations currently recommended by the Ministry of Health, is assured. We conclude that the scientific issues raised by those opposed to fluoridation are not supported by the evidence. Our assessment suggests that it is appropriate from the scientific perspective, that fluoridation be expanded to assist those New Zealand communities that currently do not benefit from this public health measure — particularly those with a high prevalence of dental caries."

In the executive summary of the report, in the section on *Effects on IQ* it is noted, with reference to the 2012 study by Choi, Sun, Zhang, and Grandjean, "Further, the claimed shift of less than one IQ point suggests that this is likely to be a measurement or statistical artefact of no functional significance." In the body of the report it is noted, "Choi et al. determined that the standardised weighted mean (SWM) difference in IQ scores between "exposed" and reference populations was only –0.45" Choi et al. subsequently, in 2013, elaborated on the relationship between the SWM and IQ points, "Sabour and Ghorbani's comments about the reported mean difference in IQ (intelligence quotient) scores reported in our article (Choi et al. 2012) suggest a misunderstanding of the scale unit we used and the public

health significance of even a small decrease in the average IQ associated with exposure. We appreciate this opportunity to clarify the factual information about the reported IQ measure.The standardized weighted mean difference (SMD) in IQ score between exposed and reference populations was –0.45 (95% confidence interval: –0.56, –0.35) using a random-effects model (Choi et al. 2012). We used the SMD because the studies we included used different scales to measure the general intelligence. The SMD is a weighted mean difference standardized across studies, giving the average difference in standard deviations for the measure of that outcome. For commonly used IQ scores with a mean of 100 and an SD of 15, 0.45 SDs is equivalent to 6.75 points (rounded to 7 points). As research on other neurotoxicants has shown, a shift to the left of IQ distributions in a population will have substantial impacts, especially among those in the high and low ranges of the IQ distribution (Bellinger 2007)."
Thus, in the area of the effects of fluoride on IQ, the science cannot be seen as settled and this is reflected in the ongoing research being published.

The model on which the ISFR was established of presenting, discussing, and publishing research on all aspects of fluoride, while avoiding involvement in the politics of fluoridation,has served the Society well for 47 years and provides a sound basis for the future.

Key words:History of the ISFR; ISFR; Waldbott GL.

[a]For correspondence: 727 Brighton Road, Ocean View, Dunedin 9035, New Zealand;E-mail: spittle@es.co.nz.