THE CASE AGAINST FLUORIDE: how hazardous waste ended up in our drinking water and the bad science and powerful politics that keep it there*

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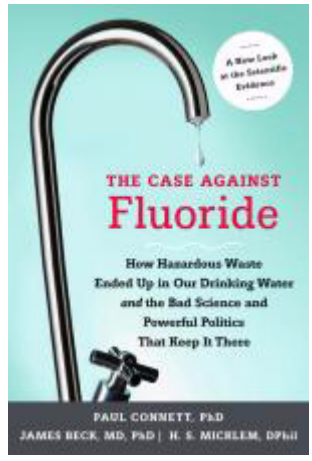
SUMMARY: A review of *The case against fluoride: how hazardous waste ended up in our drinking water and the bad science and powerful politics that keep it there* by Connett P, Beck J, and Micklem HS summarises the historical, political, ethical, toxicological, and epidemiological scientific data behind drinking water fluoridation. The book concludes that, if proposed today, fluoridation of drinking water to prevent tooth decay would stand virtually no chance of being adopted, given the current status of scientific knowledge



Keywords: Book review: *The case against fluoride*; Fluoridation of water.

If you are interested in the fluoride debate you should read this book. However, more importantly, if

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you are disinterested in the fluoridation of drinking water or are strongly pro-fluoridation, you must also read this book. The authors have produced a well-researched, cogently argued, and very readable text that summarises historical, political, ethical, toxicological, and epidemiological scientific data behind drinking water fluoridation. For the historical aspects of fluoridation, the three scientific authors were greatly assisted by Peter Meiers of Saarbrüken, Germany.


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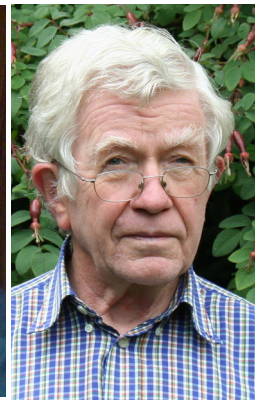
Dr H Spedding Micklem

The authors stress that they are not arguing about the use of fluoride, for example in dentifrices, mouthwashes, etc., but about the intentional addition of fluoride to the drinking water supplies of populations. The book is divided into six sections, which are addressed below. The text is approachable by non-scientists and specialists, although an extensive technical bibliography is provided for those who wish to delve deeper.

CONTENTS

Part 1: The Ethical and General Arguments Against Fluoridation: The requirement for the informed consent of the patient before administration of a medication is a basic human right. Yet with fluoride, which is added to drinking water as a therapeutic intervention, no such permission is sought or given. The process is enforced on every member of the population. The authors explore this fact in the context of medical ethics. Another aspect is the efficacy of fluoridation as a therapy, which, the authors argue, is marginal at best and deleterious at worst. The fluoride used for water fluoridation is not of pharmaceutical grade, but is in fact a chemical waste by-product. The lack of any rigorous studies as to the efficacy of fluoridation programs, the authors contend, means that the whole process is experimental. There is no control of 'dose' nor how much fluoride anyone receives from the water.

Part 2: The Evidence of Ineffectiveness: In this section the authors present a detailed examination of the literature on the efficacy (or rather lack of efficacy) of water fluoridation. Their findings, which include International data on dental caries over a number of years from various countries, both fluoridated and non-fluoridated, are mirrored by the September 2000 York Report, *A Systematic Review of Water Fluoridation*.[1] It is clear that the improvement in dental health

preceded the introduction of water fluoridation and has continued in those countries that have not fluoridated. Graphical evidence shows the lack of correlation between dental health and fluoridation status. In addition, a very important confounder not addressed in many dental studies is the positive correlation between average income and dental health. Older and more recent studies (since 1980) are discussed in detail, and the overall conclusion is that the claims for the effectiveness of fluoridation in protecting against tooth decay are greatly overstated.

Part 3: The Great Fluoridation Gamble: This section of the book is divided into two chronological periods, 1930–1950 and post-1950. A chronology is presented of the dates of knowledge of various aspects of fluoride gleaned from the dental, medical, and industrial literature leading up to the endorsement of water fluoridation by the US Public Health Service (PHS) in 1950. Discussion includes the use of fluoride as a therapy for thyrotoxicosis, reports of bone damage and fluoride, the fact that the PHS endorsed the use of fluoride before key studies had been reported and the possible intervention in the whole debate of big industry. The post-1950 part of this section outlines how the PHS decision was 'cemented in place' with the backing of false statements by Harold Hodge and the ignoring of a number of outcomes of critical longitudinal studies.

Part 4: The Evidence of Harm: This section constitutes a major part of the book (98 pages) and reviews the wide-ranging toxicological literature of fluoride. The topics addressed include: dental fluorosis, fluoride chemistry, physiology and biochemistry, neurotoxicity, endocrine disruption, bone fractures, osteosarcoma (a malignant tumour of bone), and renal toxicity. Also reviewed is the important 2006 US National Research Council Report, *Fluoride in Drinking Water.*[2]

Part 5: Margin of Safety and the Precautionary Principle: This short section discusses the assumptions that have been made in arriving at the margin of safety for fluoride. Various mistakes are pointed out. These include: adoption of an unrealistic end-point of concern, namely crippling skeletal fluorosis, and then using that to set a LOAEL (Lowest observable adverse effect level); use of an inadequate safety factor (the normal one for human safety was not used); and assuming that people only drink 2 L of water per day; not taking into account other sources of fluoride contributing to daily intake. It is widely accepted that too much fluoride damages health. The authors contend, convincingly, that the margin of safety of fluoride consumption is exceedingly low, when the evidence in Part 4 is considered.

Part 6: The Promoters and the Techniques of Promotion: The final section of the book visits some of the standard arguments deployed by the pro-fluoride lobby and then goes on to refute them in a series of 40 statements.

COMMENTARY

A complete discussion of water fluoridation requires knowledge of its history, the political pressures during that period of history, the toxicology of fluoride, and the epidemiological impact on exposed populations. This undertaking requires a

great deal of effort on behalf of the non-expert. In this respect, the authors have done an excellent job in analysing the current knowledge base and presenting it in a fairly non-technical manner.

If we were to accept that those responsible for the introduction water fluoridation were acting in the genuine belief they were contributing positively to public health and wellbeing, what should we think now, over 50 years later, in the light of the evidence in this book? There are several aspects to any response. The ethical basis for exposing a whole population to a therapeutic agent without informed consent has to be called into question in the 21st century. We live in a far less paternalistic society now. The idea that a 'one dose fits all' can be applied to a whole population makes a mockery of all that is currently happening in medicine, where tailoring therapies to the individual is a major thrust of research. The admission that infants being fed formula milk made up with fluoridated tap water are being overdosed is a key example of the failure of the approach. We now know that fluoride acts topically on dental enamel, not systemically, which is another good reason for not administering it by ingestion. The margin of safety of fluoride is much lower than was originally envisaged. If any of the toxicological sequelae highlighted in the book—lowering of IQ in children, increased incidence of bone cancer in teenage boys, increased incidence of bone fractures, and thyroid gland dysfunction—are likely, then the argument for adopting a precautionary stance becomes overwhelming.

After reading this book, one is left with the strong impression that water fluoridation is an idea that is well past its 'sell by date' and that it should be rapidly phased out. What is now clear is that, if proposed today, fluoridation of drinking water to prevent tooth decay would stand virtually no chance of being adopted, given the current status of scientific knowledge The good news is that, unlike many other forms of pollution, fluoride will leave no persistent legacy if adding fluoride to drinking water is stopped. Nobody will die, nobody can really complain, and, if only a portion of the evidence presented in this book were to be sustained in the long term, then many thousands would benefit.

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