fluoridation (52). The New Zealand Medical Journal has also recently published comments critical of the paradigm (53). There has, however, been very little response from fluoridation proponents. It almost seems that, after 30 years of avoiding debate, they are out of practice.

Over the years, the New Zealand Dental Journal, organ of the Dental Association, has fulfilled its function of professional education. Its one-sided presentation of the fluoridation paradigm has been, of course, in line with the majority prevailing view within both the profession and the narrower dental scientific community. Although the present editor, Harvey Brown, for whom this author has respect, tries to be fair and open-minded, the journal's professional educational efforts in defence of the paradigm continue to be rather one-sided. For example, it was critical of presentation on national television of the findings of the Auckland dental fluorosis study, described in Chapter 6, before that study was published in a refereed journal (54). Yet later in the same year pre-publication newspaper and television publicity of research results which supported fluoridation (55) drew no such censure.

The journal's explanation to its professional readers of the high prevalences of dental fluorosis which were reported in a study in the journal (56), was quite ingenious (57). The journal's editorial stated that a "difference of 11 percent", reported in the study between the 19%

56. TW Cutress et al NZ Dent J 1985;81:12-9
prevalence of fluoride mottling in the fluoridated areas and the 8% prevalence in the non-fluoridated areas, "is within the range noted in the 1957 Report of the Commission of Inquiry on the Fluoridation of Public Water Supplies". The 1957 report had actually stated:

"Very mild dental fluorosis, characterised by small opaque white areas or faint scattered lines involving not more than a quarter of the surface area of a tooth, may be expected in 6 to 10 per cent of children when the water supply contains 0.9 ppm fluoride. The mottling is not detectable without close expert examination, and the front teeth are less affected than the back teeth. There is no disfigurement or aesthetically objectionable appearance." (58)

There is no suggestion in the 1957 Commission's report that the prevalence predicted referred to any difference. The editorial did not point out that the fluoridated 19% and non-fluoridated 8% prevalences from which it made its calculation were for children whose four upper front teeth only had been examined. The study from which the prevalences were cited had reported that the fluoridated prevalence when all teeth were examined was 29%. Also, the "non-fluoridated" front tooth prevalence of 8% was for children most of whom had ingested fluoride tablets. The prevalence for children who had consumed neither fluoridated water nor fluoride tablets was shown in the study to be 5%. The actual difference was thus much greater than the editorial's calculated 11%. The present author has suggested that the use of such arguments is a sign of crisis (59).

The kinds of pressures that are applied to dissidents within networks are usually unrecorded. The historian is left only with the suspicions or allegations of the victims and their friends. In the United states three prominent dental scientists who publicly disagreed

with the fluoridation paradigm lost their positions soon afterwards (60). No doubt reasons other than their rejection of the paradigm would be given by the authorities who dismissed them. In New Zealand the late R E T Hewat resigned from his position with the Medical Research Council in the same year that he revealed to his colleagues his doubts about the paradigm (p145). The author knows that he was fulfilling a long-held wish to go farming (61), but to what extent he was influenced by pressures to make his decision at that particular time, with the Hastings experiment just started, is not known. The minutes of the Dental Association show that some within the profession believed he resigned under pressure (62). The late Owen Hooton was a respected Auckland dentist, in private practice, who felt bound by conscience to write to the newspaper dissociating himself from support for fluoridation and agreeing with Sir Arthur Amies' assessment. He was visited by Evan Williams, an officer of the Dental Association, and told that he (Hooton) should desist from such public differences from his colleagues. Hooton promised to reconsider, but after doing so wrote explaining why, in the light of the evidence available to him, he could not change his stance (63). He added

"The majority of people are against fluoridation. I make that statement on the evidence of the ten referendums held in New Zealand. The methods being used by both the Health Department and the NZDA to force the issue are just repugnant to me."

Hooton resigned from the Association in 1968, and died soon after, saddened by the ostracism he had suffered from most of his

60. VO Hurme letter to author
61. Information to author from John Hewat, son of late RET Hewat
62. Executive Council Aug 8 1953: "Speaking for the Wellington Branch, Mr Rout stated that it was thought by certain members of his Branch that some pressure had been put on Dr Hewat and that, as a result of this, he had tendered his resignation..." JF Fuller assured the meeting "that the suspicions were quite unfounded."
63. Copy of letter Sept 28 1964
colleagues (64).

Pressures applied within the government bureaucracy were much more explicit. Shortly before his retirement the author warned parents in a newspaper article of the danger of pre-school children swallowing fluoride toothpaste. The use of such toothpaste by children under four years of age is banned in the Scandinavian countries. In New Zealand, however, Health department policy is to recommend such use by all "dentate" children – that is, from 2½ years of age. The author had therefore contradicted official policy. The letter of admonition from the Director-General of Health stated

"a staff member who is required to carry out instructions which are abhorrent to him should seek a transfer to another position where this conflict will not exist, or he should resign." (65)

A Department colleague who had, anonymously but identifying her occupation, given a similar newspaper warning about swallowing toothpaste, based on her experience with her own child who had marked dental fluorosis, was visited by a superior officer who had learned her identity and warned that she had committed "a dismissable offence" (66). Such pressures are hardly educational, but they do help to promote the belief that there is no dissent about fluoride safety by experts. They also help to explain why such dissent is rarely displayed.

In summary, the education both through formal training and through networks, which has led to such enthusiastic acceptance and support of the fluoridation paradigm by the great majority of the New Zealand dental and medical professions, seems to have conformed to Kuhn's description of scientific training for a paradigm. That is, the

64. Letters and information from Margaret Hooton, widow of OG Hooton
65. Nov 24 1983 in possession of author
66. Information from the officer concerned
education has been authoritarian and rigid rather than designed to promote scepticism and questioning of assumptions. That education did prepare professionals for the single-minded promotion of fluoridation in the earlier years of the paradigm. But that kind of education has not noticeably led to better quality research. Nor does it appear to have equipped professionals to flexibly undertake reassessments in the presence of unexpected new data. Rather, it has led to retreat into the rhetoric of pure science, harking back to classic discoveries.
Chapter 10
PUBLIC EDUCATION

The history of the various efforts to educate the New Zealand public about fluoridation falls into two periods: before and after the release of the 1957 report of the Commission of Inquiry into fluoridation (1). Both before and after that event "public education" was conceived in terms of winning the support of the public for the widespread fluoridation of water supplies. But publication of the report enabled professional and official agencies to develop their educational techniques in a new and effective way.

Early period of public education

Dr Muriel Bell, the nutrition scientist mentioned at the opening of the previous chapter as the initiator of professional education for fluoridation, also claims credit for the first public education on the subject (2). Three articles by her on "Fluorine and teeth" appeared in the journal New Zealand Listener in August 1944 (3). However, as also related in the last chapter, enthusiastic groups of members of the dental profession were active as well. As a result of such efforts the Council of Papakura, south of Auckland, wrote to the Minister of Health in 1947 seeking permission to add fluoride to the town's water. The Minister replied that it would be preferable to wait for the results of the United States experiments, and that Papakura was in any case too small a population for such a trial (4). By 1951, however, local

1. Report of the Commission of Inquiry on the fluoridation of public water supplies 1957
2. ME Bell Nutrition in New Zealand 1962 p9
3. ME Bell NZ Listener Aug 11-25 1944
4. ME Bell Nutrition in New Zealand 1962 p9
dentists had persuaded the Council of Hastings to introduce fluorida-
tion. On that occasion the Minister and the government, on the advice
of Health Department officers, gave approval. A Department committee
proceeded to plan a suitable controlled experiment, choosing the nearby
town of Napier, of the same size and using the same water, as the "ideal
control" community for comparison (5).

It was not until opposition to the procedure became evident, after
the commencement of Hastings fluoridation early in 1953, that organized
education of the public in support of fluoridation was begun. The local
dentists had already won the support of the Council and of the local
Junior Chamber of Commerce ("Jaycees"), an organization of young
businessmen. Early in 1954 Dr Derek Taylor, the Medical Officer of
Health in Palmerston North, in whose Health District Hastings was
situated, wrote to his Head Office requesting funds for "the campaign in
support of fluoridation" which the Jaycees had decided to initiate. In
response he received a grant of $50 (a considerable sum in those days,
equal to some thousands of dollars today), which he stated would
probably be used mostly on "advertising propaganda". He also mentioned
the suspicions of the Jaycees about the national organization called
"New Zealand Voters' Policy Association" which was supporting the local
opposition to fluoridation. It was this correspondence (6) which led to
the Director-General of Health asking the Commissioner of Police to
investigate the people opposing fluoridation (7, see Chapter 12). The
outcome of Taylor's efforts was a "Fluoridation Education Committee" in
Hastings, supported by the Jaycees and the local newspaper (8).

5. Secretary to Cabinet to Minister of Health Mar 3 1952. HD 125/299 NA
7. Head Office to CND Taylor Aug 2 1954. HD 125/299/1 NA