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Judgment 37 1964

In the Privy Council

No. 25 of 1964

ON APPEAL FROM THE COURT OF APPEAL OF NEW ZEALAND

BETWEEN

Her Majesty's Attorney-General for New Zealand On the relation of Robert Richard Lewis of Lower Hutt, Printer and Eric Bernard Elliott of Lower Hutt, Warehouseman. .... Appellant

AND

The Mayor, Councillors and Citizens of the City of Lower Hutt a municipal corporation duly incorporated under the Municipal Corporations Act 1954. .... Respondent

RECORD OF PROCEEDINGS

INDEX OF REFERENCE

PART I

78644

PART I (continued)

PART II

LIST OF DOCUMENTS OMITTED FROM RECORD (BEING THE EXHIBITS OF BOTH PARTIES)

Exhibit Mark	Description of Document	Date
A	Letter from Duncan Matthews & Taylor addressed to the Lower Hutt City Council	5th May 1960
1	Balance of the Report of the Commission of Enquiry on the Fluoridation of Public Water Supplies	10th July 1957
2	Table 1 - List of fluoride contents of various foods. Table 2 - Effect of air contamination on fluoride levels of food. Table 3 - Fluoride contents of various waters. Table 4 - Upper or lower desirable or permissable limits of concentrations of substances present in piped water supplies. Table 5 - Typical analysis of Lower Hutt water, before lime treatments.	
3	Table of special typical analyses of water supplies prepared by the Dominion Laboratory.	
4	Tables 1 & 2 - Dental caries prevalence in Lower Hutt children in 1959 and 1963. Table 3 - Comparison of dental caries prevalence in Lower Hutt and Hastings in 1959 and 1963.	

LIST OF DOCUMENTS OMITTED FROM RECORD
(continued)

Exhibit Mark	Description of Document	Date
4	Table "A" - School Dental Service report on children's teeth in 1950, 1955 and 1961. Table "B" - Dental caries prevalence in Lower Hutt children in 1955 and 1963.	
5	Tables 1 - 6 - Comparisons of the prevalence of dental caries in Hastings children in 1954 and 1963.	
6	Tables 1 - 12 - Comparisons of the prevalence of dental caries in Lower Hutt children in 1959 and 1961.	

In the Privy Council

ON APPEAL FROM THE COURT OF APPEAL OF NEW ZEALAND

BETWEEN

HER MAJESTY'S ATTORNEY-GENERAL FOR NEW ZEALAND on the relation of ROBERT RICHARD LEWIS of Lower Hutt, Printer and ERIC BERNARD ELLIOTT of Lower Hutt, Warehouseman .... Appellant

AND

THE MAYOR, COUNCILLORS AND CITIZENS OF THE CITY OF LOWER HUTT a municipal corporation duly incorporated under the Municipal Corporations Act 1954 .... Respondent

RECORD OF PROCEEDINGS

No. 1

STATEMENT OF CLAIM

IN THE SUPREME COURT OF NEW ZEALAND
WELLINGTON DISTRICT.
WELLINGTON REGISTRY.

IN THE SUPREME COURT OF NEW ZEALAND
No. 1
STATEMENT OF CLAIM

22ND APRIL, 1963.

BETWEEN

HER MAJESTY'S ATTORNEY-GENERAL FOR NEW ZEALAND on the relation of ROBERT RICHARD LEWIS of Lower Hutt, Printer and ERIC BERNARD ELLIOTT of Lower Hutt, Warehouseman .... Plaintiffs

AND

THE MAYOR, COUNCILLORS AND CITIZENS OF THE CITY OF LOWER HUTT a municipal corporation duly incorporated under the Municipal Corporations Act 1954 .... Defendant

IN THE SUPREME COURT OF NEW ZEALAND
No. 1
STATEMENT OF CLAIM

22ND APRIL, 1963.

(CONTINUED)

The Plaintiffs by their solicitor say:-

1. That the plaintiffs are residents and ratepayers of the City of Lower Hutt.

2. That the plaintiffs draw their supply of domestic water from the Defendant and have no other source of supply of drinking water or water for domestic purposes.

3. That on or about the 27th day of July 1959 the defendant acquired and installed equipment for the purpose of adding sodium silico-fluoride to the domestic water supplied to the plaintiffs and other residents of the said City of Lower Hutt.

4. That from the said 27th day of July 1959 down to the present time the defendant has maintained operated and used such equipment and has employed labour in connection with the operation and use of the same and has added sodium silico-fluoride to the domestic water supplied as aforesaid.

5. That the addition by the defendant of sodium silico-fluoride to the said domestic water supply as aforesaid is for the purpose of medication only and not of purifying the said domestic water supply.

6. That the acts of the Defendant described in the foregoing paragraph 4 hereof are not within the powers conferred upon or vested in the Defendant.

7. That the Defendant has failed and refused to comply with a request made by the Plaintiffs that it should desist from adding such sodium silico-fluoride as aforesaid.

8. That the notice required by Section 23 of the Limitation Act 1950 has been duly given by the Plaintiffs to the Defendant.

WHEREFORE the Plaintiffs Claim:-

(a) An order restraining the Defendant from adding sodium silico-fluoride or any similar substance to the domestic water supplied by the Defendant to the Plaintiffs.
(b) The costs of this action.

IN THE SUPREME COURT OF NEW ZEALAND
No. 1
STATEMENT OF CLAIM
22ND APRIL, 1963.
(CONTINUED)

This Statement of Claim is filed by Michael Hardie Boys, Solicitor for the Plaintiffs, whose address for service is at the offices of Messrs Scott, Hardie Boys & Morrison, 118 T. & G. Building, Grey Street, Wellington.

I HEREBY CONSENT to the commencement of an action the Statement of Claim in which is to be in the foregoing terms.

DATED at Wellington this 4th day of April 1963.

J. R. Hanan
Attorney-General.

No. 2

NO. 2
NOTICE OF MOTION FOR INJUNCTION
22ND APRIL, 1963.

10 NOTICE OF MOTION FOR INJUNCTION

TAKE NOTICE that on Monday the 6th day of May 1963 at 10 o'clock in the forenoon or so soon thereafter as Counsel can be heard Counsel for the abovenamed Plaintiffs WILL MOVE this Honourable Court at Wellington FOR AN ORDER that a Writ of Injunction do issue to the Defendant to perpetually restrain it, its servants or agents from adding sodium silico-fluoride to the domestic water supplied to the Plaintiffs and other residents of the City of Lower Hutt and directing that the costs of the Plaintiffs of and incidental to this application and any order thereon be
20 fixed and be paid by the Defendant UPON THE GROUNDS appearing by the Statement of Claim and the Affirmation of Robert Richard Lewis filed herein.

DATED this 22nd day of April 1963.

M. Hardie Boys
Counsel for the abovenamed Plaintiffs

No. 3

AFFIRMATION OF ROBERT RICHARD LEWIS IN SUPPORT OF NOTICE OF MOTION FOR INJUNCTION

NO. 3
AFFIRMATION OF ROBERT RICHARD LEWIS IN SUPPORT OF NOTICE OF MOTION FOR INJUNCTION

11TH APRIL, 1963.

I, ROBERT RICHARD LEWIS of Lower Hutt, Printer solemnly and sincerely affirm as follows:-

1. That I am one of the abovenamed Plaintiffs.

2. That I am a resident and ratepayer of the City of Lower Hutt.

3. That I draw my supply of domestic water from the abovenamed Defendant and have no other supply of drinking water or water for domestic purposes.

4. That on or about the 27th day of July 1959 the Defendant acquired and installed equipment for the purpose of adding sodium silico-fluoride to the domestic water supplied to me as aforesaid.

5. That from the said 27th day of July 1959 down to the present time the Defendant has maintained, operated and used such equipment and has employed labour in connection with the operation and use of the same and has added sodium silico-fluoride to the domestic water supplied to me as aforesaid.

6. That the addition by the Defendant of sodium silico-fluoride to my domestic water supply as aforesaid is for the purpose of medication only and not for purifying the said supply.

7. That the Defendant has been requested to desist from adding such sodium silico-fluoride as aforesaid but has failed and refused to comply with this request.

AFFIRMED at Wellington; this 11th day of April 1963, before me:-

R. R. Lewis

A. M. Cousins
A Solicitor of the Supreme Court of New Zealand

No. 4

IN THE SUPREME COURT OF NEW ZEALAND
No. 4
STATEMENT OF DEFENCE
20TH MAY, 1963.

STATEMENT OF DEFENCE

The Defendant by its Solicitor says:-

1. It admits the allegations contained in paragraph (1) of the Statement of Claim.

2. It admits the allegations contained in paragraph (2) of the Statement of Claim.

3. It acquired the equipment referred to in paragraph (3) of the Statement of Claim a considerable period prior to the 27th day of July 1959 and completed the installation thereof prior to the said 27th day of July 1959, but otherwise it admits the allegations contained in paragraph (3) of the Statement of Claim.

4. It admits the allegations contained in paragraph (4) of the Statement of Claim.

5. It denies the allegations contained in paragraph (5) of the Statement of Claim.

6. It denies the allegations contained in paragraph (6) of the Statement of Claim.

7. It denies the allegations contained in paragraph (7) of the Statement of Claim.

8. It admits the allegations contained in paragraph (8) of the Statement of Claim.

This Statement of Defence is filed by Neill Thomas Gillespie the Solicitor for the Defendant whose address for service is at the offices of Messrs Hogg, Gillespie, Carter & Oakley, Solicitors, T. & G. Building, Grey Street, Wellington.

IN THE SUPREME COURT OF NEW ZEALAND
PLAINTIFFS' EVIDENCE
NO. 5
C.A. PEIRARD

EXAMINATION

No. 5

NOTES OF EVIDENCE TAKEN BEFORE THE HON. MR. JUSTICE McGREGOR

4th September, 1963:

CHARLES ATHOL PEIRARD:

I am a research technologist and bacteriologist. I have practised in that capacity for the last 30 years. I specialise in general analytical work - general work involving examination of water, many analytical procedures. Prior to private practice I was bacteriologist and bid-chemist at Wellington Hospital for 17 years.

I visited the Lower Hutt City Fluoridation plant on 23rd August this year. This is an artesian supply, so I am told by the engineers of the defendant corporation. It consists of a series of bores in the vicinity of the plant. Would you describe what you saw of the fluoridation plant? It is an elaborate plant. Very well kept and most elaborate pumps and motors and in one section apart from the pump room was the section for dealing with the addition of sodium silico-fluoride and lime in controlled proportions to water. This section of the plant was very elaborate and operated as far as I could see automatically - the powdered substances were fed into the water, the volume of which was automatically controlled. Fed into the waters as powders. The powder was fed from a hopper into a certain controlled volume of water. The flow of powder was automatically regulated and apparently so was the volume of water into which it was fed. The powder was fed into a by-pass. Water from main system was by-passed and then the by-pass returned to the main supply. And then that involved the problem of mixing a very concentrated suspension of these chemicals into a very large volume of water and in order to ensure uniformity in the mixture this water carrying sediment passed three points of turbulence which is considered gave an even mixture. I understand that this plant is today standard equipment in America, for the purpose of fluoridation. And it is used in other industries as well.

A definition of waterworks sub. 239(1) - did what you saw fall within the terms of this definition? Did the equipment feeding fluoride into the water come within that definition? Does this equipment collect or convey water? No. The water from the

artesian supply is diverted and some of that water is taken - goes through the medication - the by-pass. That portion of the water is medicated and then returns to the general flow.

BENCH: But isn't - aren't all these pipes conveying water to the district? Water is taken from the main supply, a small quantity is taken and medicated with special plant, and then medicated water returns into the main supply.

COUNSEL: I couldn't follow the pipe lines. I was informed by the engineer that that is what happens. Water comes from wells to pump house. It is I think the main distribution point for water from wells.

I took samples of water from the plant - I supervised the collection of samples. One was taken from a sump well and there was a pipe from which this water was allowed to flow directly into a container. I took it from a pipe from the sump. That was stated to be unmedicated water directly from the artesians. I took another sample from another place - from the pump room - a by-pass going through a sink in the pump room. That was stated to be treated water. That was after it had been through the three places where there was turbulence.

I subsequently analysed those samples. Untreated sample 40 parts per million of calcium, 3.8 parts per million magnesium, 15.4 parts per million sodium, .3 parts per million potassium. in the analysis I did not detect any fluoride. Detection of fluorine in doing analysis for fluorine one distills - it is collected as a gas and the actual test is done by comparison with standards. Amounts of fluorine are extremely small, very minute. I made a test for fluorine and in the untreated water I could not demonstrate it. But that might be due to the fact that the amount of sample was not sufficiently large for demonstrating the minute amount of fluorine which I believe would be present in artesian water. It would have required another series of tests. I was instructed not to undertake that further series of tests on that sample, by the solicitors.

The potability of that first untreated sample - I was not able to find anything other than the fairly high calcium, fairly large amount of sulphate and chloride, which are but high chloride and calcium and sulphate are common in artesian waters. I found nothing else which would render the water unpotable. As a matter of interest I made cultures from this sample - bacteriological cultures, and found colon bacilli were not present in 100 cubic centimetres and

IN THE SUPREME COURT OF NEW ZEALAND
PLAINTIFFS' EVIDENCE
NO. 5
C.A. PEIRARD

EXAMINATION (CONTINUED)

the average bacterial count was only 28 organisms per cubic centimetre. That means it is suitable -within the limits of potability. I might mention that the sample was not collected for a bacteriological examination.

Analysis of the treated sample - -

In the other one I did not mention the hydrogen - ion content. It was 6.67 which is slightly acid.

The treated sample showed hydrogen - ion concentration - of 8.48, 138 parts per million calcium, 4 parts per million magnesium, 15.9 parts per million sodium, 0.28 parts per million potassium, and 0.96 parts per million fluorine. Where does that calcium come from? That is the added lime. That has increased the calcium content a little more than threefold. It is very hard water. The presence of lime with water collected at that point which is very near the point where it was mixed, the water was decidedly opalescent the treated water. A bit cloudy, due I think to suspended lime.

Has the effect of adding fluorine been to remove any impurities? Not that I know of. You are adding to the water. Has it from a chemical point of view affected the purity of the water? Definitely not. Has it had effect on potability of the water? It certainly wouldn't improve it. Would it be within the limits of potability? That is a matter of opinion.

BENCH: If there is any effect on potability, would it be would it result from the addition of lime or from the fluorine? Lime makes it much harder water. Some people might object to drinking hard water. Has fluorine affected potability? It might take 50 years to find that out. It has not improved it. Fluorine added in that manner wouldn't behave in the same manner as chlorine. You chlorinate waters and they usually taste. But chlorine is added to destroy micro organisms, whereas fluorine - combined fluorine, present as a fluoride, in the quantity used, would have practically no effect on micro organisms. Would chlorides in this minute quantity have any effect? Yes it could. One part per million of chlorine would have effect. But ordinary chlorinated waters would have much more than one part per million? Yes, about 10 parts per million.

COUNSEL: The treatment has made the water very alkaline, the lime. Has the fluorine been added for any purpose concerned with

chemical composition? No I think it is added as a medicament. I think that is the purpose behind it. Did your analysis show that any other purpose had been achieved? No.

Turning your mind to pure water pure H_2O - that is rather unpalatable. It is not practical to produce it for domestic consumption. You have to use a lot of heat to produce it.

CROSS-EXAMINED: What are your technical qualifications? I have no academic degrees. I trained in bacteriology in clinical laboratory in Auckland, a private laboratory. In the First World War, I was taken on the staff of Wellington Hospital. Have you any technical qualifications? No diplomas. Are you a member of Institute of Chemistry? No. I was invited to in 1930. I have no dental or medical qualifications.

You agree in scientific matters definition of terms is important, Yes. You used the word fluorine - that is the element? Yes. We are dealing with not fluorine at all? No. We are dealing with fluoride? Yes. You agree that pure water would be so unpalatable as to be unacceptable to the population? Yes, I agree. Apart altogether from the cost of its production? Yes. By pure water scientists and laymen think of water that is fit for human consumption? Yes. Has addition of fluoride to Lower Hutt water made any difference in the water to its fitness for human consumption? That is a controversial point. I am unable to express any view as to whether introduction of fluoride affects water from the point of view of fitness for human consumption. To-day there is great interest in trace elements in agriculture &c. They add them but sometimes with disastrous effects.

When we talk of one part per million those little packets of 5 grams of sugar served on an aircraft - assuming that was sodium silico-fluoride, in order to produce the level of one part per million you would need thirty 44-gallon drums to do it. One part per million is one milligram per litre 1000 milli-litres. You are working down to micrograms and they are 1000th part of a milligram.

Referring to potability did you taste the two samples of water? Yes. Did you detect any difference between the treated and untreated? Yes I thought the treated was harder. And in thinking that you were right? I might be biased, I knew. What is the purpose of introducing the lime? I think it is the effect on solubility of sodium silicate fluoride, to keep the concentration in a safe

level by forming calcium fluoride which has a very low solubility. It is much more likely that lime was introduced to ensure less corrosion of pipes? That would be the same reason, yes. It would prevent liberation of any free fluorine from - free fluorine is very reactive chemically - in the presence of any acid fluorine would be liberated. By forming calcium fluoride it would prevent that. On the other hand the calcium would affect boilers by forming a calcium scale. What would be the alternative if lime were not added? Would there not be corrosion of pipes and contamination of water because of acidity? Yes there could be, theoretically. Water of acidity of 6.7 would affect the pipes? Yes. Then you refer to very high alkalinity? Yes. What was your figure? 8.40. What is the standard? Wellington City Council water is 7.2 hydrogen ion concentration. 7 is neutral.

BENCH: What is North Otago? I don't know.

COUNSEL: Is 7 the standard? You very rarely get natural water with that. To have a water above 7 renders it much safer for piping, for transportation through pipes. So at 8 or 8.48 there is a beneficial effect as far as pipes are concerned? Yes. But you might get a deposit of lime, in boilers or possibly electric hot water elements. That would be better than having acidity of water eating the pipes so that public might be consuming some small trace of metals? Yes, definitely. 8.48 is high. Has it any danger from the point of view of public health? Not that I know of. What is the solubility of calcium fluoride? About .0016, somewhere about that. It is almost insoluble. If another expert witness says it is 4 parts per million you would disagree? I have not considered that. Can you put it into parts per million? I am quoting from a standard text book.

What effect does silicon have? You may get precipitate of calcium silicate also in water, with the calcium carbonate. It is only ordinary silicic acid? It would form silicic acid and then you would get a calcium silicate which is virtually inert. Silicic acid is present in practically all water except distilled. Has it any physiological effect? I don't know. It is found in many prescriptions and tablets? Yes.

What is fluorine? It is the element itself, the gaseous element. One of the most reactive of all.

Does fluorine occur in a free state in nature? No. Naturally it is obtained from calcium fluoride. But it has no relevance

to the fluoridation process of which we are speaking? Fluorine as such, no. The term fluorine is used - We are concerned here with fluorides. But fluorine compounds are in a different category from fluorides? What is the chemical formula for sodium silico-fluoride? NASI F_1. I am not quite sure. NA_2SIF_6. The fluorine compounds are or can be poisonous? If taken in large quantities, yes. Fluoro-acitates - you wouldn't want to take much of that? No. None of these fluorine compounds have anything to do with fluoridation?

BENCH: In water with these other salts that are in this water is there anything with which it could combine that could produce a dangerous compound? Not in that water but if put into water of hydrogen ion content of below 7 it could liberate fluoride.

COUNSEL: You put lime in to ensure it does not. At what stage is lime added? From what I could see of this process, I think silico fluoride is added and then the lime. It was hard to follow the exact sequence of a complicated piece of equipment. If you were told that the Council for many years added lime to the water long before fluoride, would you still adhere that sole purpose of addition of lime was to counteract the possible liberation of fluorine? No I wouldn't say that. You have an acid water and lime is probably the safest and cheapest method of making it alkaline.

You speak of untreated water and then treated water? I meant water straight from artesian supply by untreated water. Could you describe the tests you made? On untreated water? I used ASTM test - testing method of American Associated Agricultural chemists. It is standard procedure. Did it involve machines? No, very careful work. Of what general nature? Distillation, steam distillation, careful preparation beforehand, and a very special method of checking your distillate, for the amount of fluorine - no silico fluoride. You distil the fluoride as silicon fluoride. It comes off as fluorine and then is formed into silico fluoride, which is volatile. It is distilled from a mixture of perfluoric acid with added silver sulphate, to prevent interference from any chloride which might be present in samples. Are there any other chemicals used in this test? Yes. All chemicals have to be of known purity and the apparatus also has to be checked very carefully. In fact one has to be - it needs a good deal of practice to perform the test and many so-called blank runs have to be made to ensure that there is no interference from fluorine in any of the apparatus or in any of the chemicals. You have to distil with the thermometer dipping into perfluoric acid and some thermometers

IN THE SUPREME COURT OF NEW ZEALAND
PLAINTIFFS' EVIDENCE
No. 5
C.A. PEIRARD
CROSS-EXAMINATION (CONTINUED)

have fluoride in the composition that is used in the scale, in the markings. And that can cause error. Did you use a spectro photometer? No. I don't know of any spectro photometric (method) that is applicable to determining fluorine in water. But you didn't use it? No.

Are there any aspects of that analysis you would dispute? I would have to study them. With bacteriological check these are very elaborate analyses, nitrogen and various things. Purpose is to show whether water would support growth. I did a test. I did not report. I was quite satisfied with the soundness of the water. 10

RE-EXAMINATION

RE-EXAMINED: The Dominion Analyst has a figure for the fluorine or fluoride on his report? No. You were asked about the effect of fitness of water for human consumption of addition of fluoride - does it increase the fitness of the water for human consumption - can you say? No. I cannot express an opinion. It might take 20 or 50 years before people know. I don't think it increases fitness in any way. I don't think it improves the water.

(Conclusion of evidence for Plaintiffs)

No. 6

IN THE SUPREME COURT OF NEW ZEALAND
DEFENDANT'S EVIDENCE
No. 6
K.E. SWAN

EXAMINATION

KENNETH EDMUND SWAN:

I am a State Servant. I am the Secretary of the Fluoridation Committee of the Board of Health. A section of the Department of Health. An advisory Board to the Minister of Health. I was (the) Assistant (Secretary of the Royal Commission). I produce the original report signed on the 10th July 1957 and endorsed by the Governor-General. I produce copies of the printed report. That report is readily available. It is on sale by Government Printer at a cost of 8/-. It has been widely distributed by the Department to people who have an interest in fluoridation - to local authorities in New Zealand, and to Librarians.

(Mr. Barton objects to production of report, but accepts copies as copies).

NO CROSS-EXAMINATION.

No. 7

DEFENDANT'S EVIDENCE
No. 7
R. TRUSCOE

EXAMINATION

RICHARD TRUSCOE:

Associate Professor of Bio-Chemistry at Victoria University. These are my qualifications - M. Sc. Chemistry University College London: Ph. D. University of Warsaw; also Practitioner's degree University of Warsaw. Pure water in chemical terms is H_2O. It is not found pure in nature. Purest is rain water but that would immediately dissolve gases and particles from the atmosphere so that by the time it reached the vicinity of earth's surface it would be a saturated solution of oxygen nitrogen, carbon dioxide and any effluent gases that might be around.

If pure H_2O could be produced for consumption, would it be pure when the public consumed it? Possibly not because it has to be put in containers - pass through pipes and they are made of metal. Pure water is aggressive. It attacks materials with which it is in contact. In particular materials of domestic pipes, iron or galvanised iron, copper or lead. And if pure water were to be in contact with these materials a certain amount of heavy metal

would be leashed out by chemical action and this could have an adverse effect on the consumer. Heavy metals tend to accumulate animal organisms. Therefore such pure water would be not only impure by the time it left the outlet, but could also be definitely toxic therefore if any authority were to provide water from some source that represents a source of danger to the consumer at the outlet. Are you referring to pure in chemical terms? Yes. Can you tell us what impurities there are in ordinary water supplies? In New Zealand - usual ones are calcium carbonate, to which is due the hardness of water and the content depends on the nature of the soil formulations through which the water percolates. If no calcarious deposits there it becomes necessary to add calcium to render the water less aggressive. The other impurities are in trace amounts; small amounts which cannot be collected by appearance, taste or smell. Does typical water supply contain dissolved substances? Yes, salts of calcium, sodium magnesium, carbonic acid and hydrochloric acid, sulphuric acid, and in very small amounts other inorganic materials which are in amounts which cannot really be (detected) on which one cannot generalise - depends on nature of local strata. You can divide them into cathions and anions which are counterparts of the cathions together they form salts. The salts are what is dissolved in water. Can you classify them? A convenient classification is four groups -

(1) toxic and which ought not to be present in water supplies above some very low figure which varies;

(2) not really hazardous to health but giving undesirable symptoms at high concentrations. Magnesium sulphate and sodium sulphate. Desert brackish water is not hazardous to health but causes undesirable symptoms such as diarrhoea;

(3) substances having no effect on health and giving no symptoms but undesirable for other reasons - ammonia interferes with chlorination. You do not smell it in that amount;

(4) substances which are desirable and these would be dissolved oxygen and calcium in the form of lime which is always added where it is deficient.

Exhibit 2 - turning to Table 4 - That shows
In the case of one of upper limits if that were exceeded by a small amount would there be an appreciable hazard to health? There are figures for parts of the world where fluoride content of water is naturally 3 to 4 times higher than the 1.5 in the table. Between 5

and 6 or even 8. And there has been no record of any particular hazard to health in those regions of people who have lived there all their lives. Therefore the upper permissible limit of 1.5 parts per million is leaning over backwards to a very considerable extent. Could be exceeded therefore by up to 3 parts without appreciable effect. Reason is that the fluoride content of urine of animals and humans living in those parts or fed artificially with water of high fluoride content is of same level as that of the water drunk, and therefore it is evident that animal organisms are readily able to eliminate fluoride at a concentration of 5 parts per million in the water drunk.

Group 2 - Undesirable symptoms at concentrations higher than those stated in the table. What substances within Group 2 would occur naturally in ordinary municipal water supply? Nitrate in most parts of the world fluoride, magnesium, and sulphate chloride. There is a slight uncertainty - do you mean supply at reservoir or outlet according to type of pipes used in that locality, you could expect copper iron or zinc which the aggressive water has taken from the pipes.

Turning to Calcium carbonate Groups 3 and 5 of the Table why is that needed? One reason is that calcium is essential part - essential element for building bone - hence all animals must have it. But it is added chiefly because - to prevent corrosion of pipes and to prevent inclusion in the water of toxic elements. Another point is if boilers are fed with aggressive water there is pitting and corrosion of tubes. For both industrial and domestic reasons it seems reasonable to remove aggressiveness of water by adding lime. Lime combines with dissolved carbon dioxide.

Water with a fluoride content of one part a million - could the lime have any effect on concentration? No. As Mr. Pierard said, solubility is 16 parts per million of calcium fluoride and whether or not lime is present is quite immaterial. No fluoride would be precipitated by addition of lime.

You received from the Dominion Laboratory an Analysis of Lower Hutt water supply? Yes. I produce that. (Exhibit 3)

What does sodium silico fluoride consist of? NA_2SIF_6 - it is sodium silicon and fluorine. What happens to sodium silico fluoride in dilute solution? It very swiftly within seconds breaks down to sodium fluoride, hydrofluoric acid and silico. At that concentration all of these would remain in solution.

IN THE SUPREME COURT OF NEW ZEALAND
DEFENDANT'S EVIDENCE
No. 7
R. TRUSCOE

EXAMINATION (CONTINUED)

The Council adds sodium silico - what about the silicon? It is of no importance - added for convenience and also for sodium silico fluoride is much easier to handle than sodium fluoride. What is relation of silicon to silicic acid? Silicon is an element - when oxidised it gives silica and this can re-act with water to give silicic acid. Would silicic acid have any physiological effects? Silicic acid or silica is present in all foods in many parts of body and animal and plant cells. It has no known physiological effect in any amount. If sodium silico fluoride is added to water does it do anything? Nothing but raise the fluoride content. Amount of sodium silico fluoride is it dissolved on addition? If added as a solid it would dissolve and the solution is then according to Mr. Pierard mixed with the whole supply. I don't think it matters whether you add it as a solid or as a solution. To what extent is fluoride found in ordinary food? Table 1 gives an indication - it should be realised that these are values which were taken from an American publication and values refer to foods produced in America with some exceptions. Wine maximum of 18 parts per million is shown and that is for wine from grapes grown on the slopes of Mount Vesuvius. Would Table 1 be misleading as regards New Zealand foods? I think so. In parts of New Zealand where the fluoride content of water is low, then the plants and produce would have less fluoride content.

Table 2 - Can the acidity of water after sodium fluoride is added cause fluorine to be liberated? Under no possible conditions - even if you add quite concentrate acid to sodium fluoride - under no circumstances would fluorine be liberated. Has the element fluorine got anything to do with fluoridation process? None whatever. Is it correct that there are some fluorine compounds that are dangerous to health? Certain organic compounds are very toxic - Substance 1080 used for extermination of vermin in New Zealand. In fact sodium fluoro acitate. CH_2 F COOH. It is used to exterminate rabbits, rats and deer. What would you use to produce a satisfactory analysis of fluoride? That would depend on what was analysed. If water, fairly simple equipment. Calorimeter or a spectrophotometer to measure intensity of colour together with zerconium salts and various dyes. Would you regard analysis without those as satisfactory or reliable? I wouldn't agree with using anything different for water.

Would you refer to Water Report page 150 paragraph 544, sub-paragraphs 1 and 2 of paragraph 544. Would you express an opinion about the conclusions reached by the Commission? I agree with all - water is normal vehicle. If food is rich in fluoride then the amount in food would compensate for deficiency in water. Para-

graph 539 page 149, would you comment on that? I would agree with every proposition contained in it. 541(3), what is your comment? I agree with that. And sub-paragraph (6)? I entirely endorse that.

CROSS-EXAMINED: You suggest that a well balanced diet could provide all fluoride needed? Yes. So fluoride has no relevance in fluoridation process except it is a sine qua non - You say fluorine has no relevance - but fluorine itself is the basic substance involved? Fluoridation is to raise fluoride content of water.

You were asked about methods of detecting fluorine in water? Analysis you have produced from Dominion Analyst does not show any fluorine having been detected in that? Yes these are the standard analyses. It is not usual in any standard analysis to include fluorine or other trace elements. Covering note from the Analyst says that fluoride content of Lower Hutt water was below 0.05 per million and the same applies to most New Zealand waters. Fluorine in some measure is found in all New Zealand waters? Yes that would be correct - except compared with many other countries the level seems to be very low.

In Table 5 of series of tables you produced - would you show where these figures came from? They are the figures before lime treatment. Must it not be before treatment with fluoride? Fluoride is not in it. Analysis of artesian water. Done by Dominion Analyst. It should be the first column.

Does this analysis in Table 5 show that the untreated Hutt water contains any of the substances in Groups 1, 2 and 3 of Table 4? In an undesirable quantity? Yes it shows that the calcium carbonate content is below desirable amount. And the free carbon dioxide content is too high. Where have you free carbon dioxide in Table 4? It is there - it speaks of upper and lower limits of calcium carbonate - free carbon dioxide is removed by addition of lime to the water. Hence as it arrives at the consumer this excess of CO_2 is compensated. So these two defects in untreated water are rectified by addition of lime? Yes. Anything else in that that is undesirable? No. PH is the acidity. If it is 7 it means the water is neutral PH_7, above is alkaline, below acid. And addition of sodium silico fluoride makes no difference to any tables except the fluoride? Correct. It removes no impurities from the water? No. And its only effect is to increase the natural content of fluoride in the water? Yes.

RE-EXAMINED: (No questions)

IN THE SUPREME COURT OF NEW ZEALAND
DEFENDANT'S EVIDENCE
NO. 8
D.J. BECK

EXAMINATION

No. 8

DONALD JAMES BECK:

Principal Dental Research Officer in Department of Health. I hold degree of Bachelor of Dental Surgery of University of New Zealand and Master of Science in Dental Science in University of Rochester N. Y. I have general supervision of activities and reports of Dental Officers of University. Between June and December 1959 - In those months 1954 children of Lower Hutt aged 5 to 13 years were given a dental examination by an officer of Division of Dental Health. Similar examination was made in 1961 - 21 to 27 months after previous examination 2529 children of same age groups drawn from same Lower Hutt Schools were examined. I produce tables showing those. Table 1 sets out dental caries prevalence in Lower Hutt in 1959 and 1961. (Mimeographed copy). Tables 2 and 3 give a break down into finer detail of information in Table 1. Two sets of initials are used in my summaries D. M. F. and d. e. f. D. M. F. employs capital letters and is nomenclature used for Decayed, Missing due to dental caries or filled. And it is an index of the prevalence of dental caries in permanent teeth and may be applied to an individual as D. M. F. of 6 teeth - which implies that 6 of that individual's teeth are decayed, missing or filled or may apply to averaging of population. d. e. f. (lower case letters) (Tables 7 onwards) - decayed, extracted due to dental caries or filled. Same as D. M. F., but applies to deciduous teeth not permanent teeth. From those figures - children between 5 to 13 years it reveals that in a pooled group aged 6 to 8 male and female, there was a reduction in permanent teeth of D. M. F. from 2. 72 in 1959 to 2. 38 in 1961 which represents a 12. 5 per cent. decrease. In permanent teeth of 9 to 13 year old children and in deciduous teeth of 5 to 8 years olds, no significant change was noted over this 2 year period.

Further survey was made about a month ago. Tables cover this. This survey was on a smaller scale, more in the nature of a spot check. Again they are numbered 1 and 2. Table 1 is headed Dental Caries prevalence in Deciduous teeth of Lower Hutt children. Looking at a mimeographed table - 1959 and 1963 after 45 to 50 months of water fluoridation. Table 1 is D. M. F. permanent teeth. The last line of this table gives overall picture. This includes just 6 and 7 year old children male and female. And shows that in this 4 year period the average number of D. M. F. teeth per child in Lower Hutt of this group has been reduced from 1. 99 to 1. 35 representing a 32. 2 per cent. reduction.

Table 2 gives the picture for deciduous teeth in these same children aged 6 and 7 and we find over the 4 year period prevalence of caries has been reduced from 8.49 d.e.f. teeth per child in 1959 to 7.17 d.e.f. teeth per child in 1963 representing 15.5 per cent. reduction. Can you indicate where the children came from? They were all of European extraction. All life-long Lower Hutt residents and were drawn from schools in Lower Hutt City.

National - to gain idea of the national picture is difficult. In order to get a true idea it would necessitate an extremely large scale dental survey involving a great deal of work. We get some indication of the national picture - covered in Tables A and B.

Table A gives some indication of national picture. Not a very adequate one. It is based on records maintained by school dental nurses in all clinics throughout New Zealand and these returns are for 1950, 1955 and 1961. The figures are those for average number of d.e.f. deciduous teeth per child in children presented for their first routine dental examination in a dental clinic. Children who normally first visit the clinic between $2\frac{1}{2}$ and 5 and these - this table covers those years. The number of d.e.f. teeth increases with age. In 1950 the 2 year olds had average of 1.76 d.e.f. etc.

By comparing the years 1950, 1955 and 1961 you see there is apparently some improvement in the dental condition of these children. Improvement is not terribly great but the trend appears to be in the right direction. I attribute that reduction in caries to activities of dental health educational nature conducted by Department of Health and dental profession. They have made the public more dentally conscious or aware of preventive measures and maintenance etc., and this has been reflected in a slight but definite improvement.

Table B gives similar figures for Lower Hutt. These are figures of dental condition stressed as average numbers of d.e.f. per child of children presented for their first dental examination in Lower Hutt for the year 1955, the last Lower Hutt pre-fluoride year, and for months January to June 1963. Approximately 4 years after introduction of fluoride. Comparing 1963 Lower Hutt figures with national figures age to age? In every case 2, 3 and 5 year olds Lower Hutt figures are very much lower than national figures. At 2 years national figure is 1.12 d.e.f. teeth per child, Lower Hutt figure is 0.52 and similarly in other ages.

BENCH: A tremendous reduction in 4 year olds in Lower Hutt

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CROSS-EXAMINATION

compared with whole of New Zealand but not as much in 5 years? That can be explained by fact that 1963 5-year olds were alive when fluoride was introduced. To what do you attribute Lower Hutt figures? Only one major factor which differentiates Lower Hutt from national picture and that is fluoridation of water supply. We must assume it is that that has cause and effect relationship.

CROSS-EXAMINED: The Lower Hutt average d. e. f. teeth in 1955 is higher than the national average? Not significantly higher, somewhat perhaps. This stage of fluoridation - the effect has been to postpone onslaught of dental caries by 18 months to 2 years? I would disagree. Benefits bestowed by fluoridation on a child who has access to fluoridated water during formative years will carry those benefits throughout life.

Up till what age does fluoridation have significant benefit? It will be life-long for those who have had fluoride from childhood. They will carry those benefits with them throughout life. But if a child has fluoride up to 16 years of age - will it last him all his life? Maximum benefit will have accrued by the age of 16. Some small benefit is derived from flushing tooth surface after tooth has erupted. This builds in fluoride ion into the enamel. Main benefit is ingestion of fluoride while teeth are forming? Yes. Dental caries is not an infectious disease? There has been some evidence that there is some infectious nature but it is of no significance. Infectious it is animal studies -

BENCH: But is it from tooth to tooth in one person or from person to person? Rat to rat.

COUNSEL: Not a disease classified in the Health Act? No. Lower Hutt is one of the two municipalities where fluoride is added to water? No one of the four major. Hastings, Lower Hutt, Palmerston North and Invercargill. There is one minor one - somewhere near Rotorua. Invercargill has begun within the last three weeks. Do you you are not a member of the Board of Health? No. Have you any knowledge of functioning of that Board? A little. Do you know whether the Board has ever directed a Municipality to add fluoride to water supply? No. I would think the Board did not have power to direct. Your Department does not do any of this addition of fluoride to water? No. Can you indicate the proportion of the population in Hutt Valley which would derive direct benefits from fluoridation? I don't have precise figures. Estimate would be those who are deriving maximum benefit, are those 14 years and under.

RE-EXAMINED: (No questions).

No. 9

IN THE SUPREME COURT OF NEW ZEALAND
DEFENDANT'S EVIDENCE
No. 9
T.G. LUDWIG

EXAMINATION

THOMAS GEORGE LUDWIG:

Director of Dental Research Office of Medical Research Council. My qualifications B. D. S. Sydney, M. Sc. Rochester.

Examinations of Hastings children taken during 1954. I undertook base line dental examinations for Hastings Fluoridation Study in September-November 1954. That was a study purely a study of fluoridation in Hastings. Fluoridation commenced in Hastings in March 1953. It was discontinued for some time, and re-commenced at the level of one part per million early in September 1954. Since that 1954 examination there has been a further examination. I have carried out further examinations at two year intervals and the most recent series of examinations was undertaken in March-April this year. I used the same methods in these series. I have examined all of the children myself and I have interpreted all the dental X-rays myself. All the diagnosis of caries has been made by me. 1869 children were involved in the 1954 examination. 1963 examination involved 2231. I have constructed certain tables. (Exhibit 5). Tables 2 and 3 Table 2 shows the prevalence of dental decay amongst Hastings children in 1954 and in 1963. That is permanent teeth. Table 2 shows the prevalence rates on basis of the number of teeth affected and Table 3 shows the prevalence rates on the basis of the percentage of permanent tooth surfaces affected. Significance of calculating that way is it has been suggested that due to the high prevalence of dental decay in New Zealand it would be more desirable to assess caries prevalence on the basis of tooth surfaces rather than teeth. Have you drawn any conclusion? Table 2 shows that the number of teeth permanent teeth affected in the Hastings children ranged from 1. 41 at the age of 6 years, to 16. 61 in children aged 16 years. That is for 1954. Prevalence rates in 1963 ranged from 0.31 teeth affected per child, at the age of 6 years to 13.33 teeth affected in children aged 16 years so that comparing these two sets of results we find that 6 year olds have had a 78% reduction in the number of permanent teeth affected, and 7 year olds etc. They fall to 50% at 7 to 20% at 16.

Table 3 - D. M. F. surfaces table. The results follow much the same pattern except that working on the basis of tooth surfaces Table 3, the percentage reductions appear to be a little greater.

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(CONTINUED)

Table 4 - this shows the percentage of - Table 5 shows comparison of caries rates in deciduous teeth. Reduction is shown by that Table too. Have you drawn any conclusion about the percentage of children completely immune from caries? There has been a considerable increase in the percentage of children immune completely from caries, shown in Table 6. 5 year olds have been about sixfold increase. 6 year olds about fourfold increase. And in 7 year olds about tenfold increase. I attribute these reductions - I feel quite sure it is a result of fluoridation.

BENCH: Does Hastings add additional lime to its water? Untreated for extra lime as far as I know. Nothing except fluoride.

DEFENDANT'S EVIDENCE
No. 10
SIR J.P. WALSH
EXAMINATION

No. 10

JOHN PATRICK WALSH:

I am Dean of Dental Faculty of University of Otago. I am Doctor of Dental - I am consultant surgeon of Dunedin Hospital. I am Member of expert Committee on Dental World Dental Health Organisation. Also National Dental Federation. I am Chairman of Dental Clinic of New Zealand. Talking of fluoride level of 1 part per million. What is main effect of fluoridated water? It reduces dental decay by half. It has no other harmful dental effects. Is there a chemical difference between fluoride added to water and that naturally present? None. Fluoride ion is the same. What is length of the benefit received by a child by fluoride? That point was asked before - if a child takes fluoride in water from birth the benefit would extend throughout its life. If it takes it until teeth are fully formed. After that the effect is only superficial. While teeth are being formed particularly in early years, fluoride is built into the structure. If a person has drunk fluoride water all his life would that affect rate of dental decay? He would have about half the decay he otherwise would have had. Any age at which there is prevalence of decay? Yes in children about 6 to 8 years the deciduous teeth decay is at its maximum, for baby teeth. For permanent teeth the age is steadily increasing as the child goes through adolescence. Ability to ingest fluoride other than by means of water? Fluoride could be obtained from diet, it was said earlier. But an infant does not live on fluoride rich foods such as tea and oysters. Has there been any marked reduction in prevalence rate of caries in 6 to 8 year olds? About 40% in deciduous teeth - that is reduction of decay as a result of fluoridation

of water - in baby teeth. Children born after fluoridation commenced effect is worse. Child must have taken fluoride from birth or shortly before to get maximum effect. In respect of unborn child - in later months of pregnancy there is an effect from fluoride in the water.

Medical effect of a diseased mouth? Oral sepsis is I believe a major cause of general ill health. And masticatory inefficiency is a second great dental cause. The two ways in which this works. I have seen many practical examples. I have seen many cases of putrid lung abscess from inhaling debris under anaesthetics. Gastric ulcer - I saw a young Maori boy die recently from extraction of 3 septic teeth.

Report of Commission of 1957 page 148, paragraph 536. I support those statements. Paragraph 537? I am familiar with this report. I fully support these statements. Paragraph 540(2) - what do you say of fluorine water as the vehicle for ingestion? Water is the natural vehicle. Paragraph 3 of 540 - I support that. All sub-paragraphs of paragraph 540 I fully support.

CROSS-EXAMINED: You have given examples of diseased mouth effects, is that more than that caries has serious ? If caries is treated successfully. These cases are people who had not proper dental treatment? The second man had dental extraction treatment too long delayed. I am a member of Dental Committee of the Board of Health. Can you say whether the Board of Health has a power to require a local authority to carry out its duties? No I am not aware of that. I have no knowledge of a local authority being required by the Board to carry out fluoridation.

CROSS-EXAMINATION

The effective dosage of fluoride is 1 milligram per day? Yes. One part in a million requires about 1-3/4 pints? I think it is 2.2 pints per litre. Effectiveness of fluoridation depends on water consumption? Yes it is a physiological need. But it would have to be consumption of water per day? Yes. What if some water was used for boiling cabbage would child get additional fluorides that way? Very little. The quantity would have to be drunk in some liquid containing fluoridated water. Efficacy of the scheme depends on the child drinking that amount. Efficacy of the scheme stands on the figures presented in Court. The ones who have improved must have consumed a reasonable quantity of water. It is also possible to obtain two varieties of proprietary fluoride pills? Yes. 50% of children between 12 and 18 months of age are taking pills. This is a statistical figure. If taking of pills is done

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CROSS-EXAMINATION
(CONTINUED)

according to instruction is the same result achieved? No the result is not so good. From public health point they are far inferior but even from the individual they are not as good. This is statistically substantiated. Thousands of papers have been published on fluoridation. Have there been comparisons between the two? Yes the tablets are not as effective. One reason is that the fluoride has twofold action - bathing effect of the water on surface of the teeth and the other from ingestion. Local effect as well as one from ingestion. Local effect is relatively insignificant? Relatively. It has an appreciable effect. Fluoride has been used in a topical way. Health Department tried topical fluoride. That was a stronger solution of fluoride. 2000 times as strong? 2 per cent. Would you explain the way in which fluoride re-acts on teeth or assists teeth? Fluoride ion is incorporated into the atomic lattice. It is built into the intrinsic structure of the tooth. It is taken up also by the tooth's surface. This has been studied by radio active isotopes. The effect of this is to reduce solubility of enamel in acid. This really involves a change of structure of the tooth? Atomic structure, yes.

RE-EXAMINATION

RE-EXAMINED: You spoke of 50% of children being given pills. Where do they live? Statistical sample. They wouldn't be living at Lower Hutt because they don't need pills there? Quite. 2.2 pints per day - is that to get maximum results? Yes. An infant only needs half that dose. Up to what years? 2 or 3. Would you expect to find appreciably good effect below that optimum? Yes. You said it is borne out by figures produced? Yes.

BENCH: Why is Dunedin so decadent in not installing fluoridation? The City Council are prepared to act but they were influenced by a daily newspaper.

No. 11

IN THE SUPREME COURT OF NEW ZEALAND
DEFENDANT'S EVIDENCE
No. 11
J.M. WATT
EXAMINATION

JAMES MICHAEL WATT:

I am a duly qualified and registered medical practitioner, practising in Wellington. M. B., Ch. B., M. R. C. P., D. C. H. My special field is diseases of children. I am senior visiting physician at Children's Hospital Wellington. Also Karitane Hospital. Natural diets contain fluoride in small amounts. Natural water supplies also in very small amounts in New Zealand. Fluoride from diet or water when it enters the body is absorbed and stored in bones and particularly in the teeth. Teeth contain fluoride - all teeth. That would be before absorption of diet or water? No as a result of absorption. Would you comment on whether there is a desirable amount of fluoride? There is no doubt that a reasonable concentration of fluoride in teeth does strengthen enamel. Too much can cause mottling of the enamel. But too little does diminish enamel's resistance to acid. It makes the teeth harder. Storage of fluoride in teeth commences at the time of calcification of the teeth which with milk teeth is about 4 months before birth and it continues for term of with permanent teeth up to about the age of 12. Calcification is the laying down of calcium in the teeth and fluoride is laid down at about the same time.

Does the taking of fluoride by a pregnant mother affect the unborn child? Yes it increases absorption of fluoride by the child and it is important this should happen in last 3 or 4 months of pregnancy. Calcification ceases when? Main calcification of teeth finishes about the age of 12, - permanent teeth. Is it - what is your opinion about desirability of adequate fluoride? There is no doubt that adequate fluoride intake improves dental health and increases resistance of the teeth to caries. I think we can say it is far more important in the first 12 years of life. Is there any daily dietary requirement which you would consider necessary? Daily intake is considered -necessary daily intake is considered to be 1 milligram in older children and adults and about half a milligram in children up to 3. Necessary for effective fluoridation of enamel. Does much fluorine come from food? Very little - it depends on diet but only a small proportion of the requirement comes from food. It should come from water - both drinking and cooking water. The drinking water commonly available in New Zealand is very small in fluoride content. Much less than the ideal level of about 1 part in a million. Can you express an opinion as to sufficiency of fluoride intake in case of older children in New Zealand? In natural conditions in New Zealand it is inadequate for dental health.

BENCH: Is there any locality in New Zealand where water is sufficient in fluoride? Not that I know of.

COUNSEL: Can the deficit be corrected? Yes. How? The alternatives are as additions to diet or as pills or as additions to water supply. If addition to water supply, what type of addition? The experimental evidence from many parts of the world proves conclusively that about 1 part per million is adequate and satisfactory. Do you say that the addition brings the fluoride content up to one part? Yes. Speaking of pills, pills are available to parents - would you express an opinion on the usefulness of taking pills? The desirability is certainly present. The usefulness is very doubtful. Most parents would prove incapable of giving a fluoride pill to every one of their children every day from the time of birth to the age of 12. There might be exceptional parents. I have tried it and it proved I was not an excepticnal parent. Would you tell us a general comparison of fluoride pills and fluoridated water? I think there is no comparison. Fluoridated water is effective and depends not at all on the parents' ability or child's goodwill. It is and has proved effective where tablets have never been proved effective in any large number of children.

Might fluoride have any harmful effect on children? There is no evidence of any effect on its growth or development. Even in places where there is a very high natural fluoride in the water. In one or two cases in the United States children have been followed for about ten years and in one series they were examined clinically by X-ray, blood tests and urine tests, and no evidence of any ill-effects was found. That was McAuley and McClewer, Public Health Report, Washington, 1954, Volume 69, page 671. It was a very thorough study of many children. They were studied regularly and for longer periods than an average child is likely to be. No evidence of any ill-effects. Two groups were compared with each other? Yes. These tests were applied to both groups. No difference between children on water with a high fluoride content and those on a water with low fluoride content as regards their general health and development. A further study in the United States was a study of more particularly bone development and formation and it was a similar study of children in a low fluoride water area compared with children receiving high fluoride water. This level was something about 6 parts per million - well over the one part regarded as sufficient. But they were being rather over-dosed. The low was about .2 parts per million. About 2,000 children were involved. These children had serial X-ray examinations to study the texture of the bone and the time at which ossification occurred, and there

was found to be no difference in texture or rate of development of bone in the two groups. In either of these studies were any ill-effects on the children discovered? No.

The Report of the Commission of Enquiry, paragraph 544, page 150, what is your opinion? I would agree with all those conclusions. Referring to paragraph (4) of 544, would you accept that? Yes. Paragraph 546? I would agree with those conclusions also.

CROSS-EXAMINED

CROSS-EXAMINED: Looking at page 151, paragraph (3) - consumption of water is limited. Efficacy of this treatment depends on the amount of water required to produce the one milligram per day? Yes. Isn't that as variable as the responsibility of parents and children taking a pill a day? Not over a period of some time. Particularly with children the water intake in certain age groups is remarkably constant. There are variations, but the constancy is quite surprising.

Have you evidence to suggest that taking of pills is not effective? No. It is effective. Your only fear is the prescription might not be observed? Yes.

Have you paragraph 544 of the Report - you agree with that - "slight changes of concentration of fluoride" - it increases it in Lower Hutt? I will accept that. Increases it 20 times? Yes. You described the way in which fluoride becomes embodied in structure of the tooth? Yes. And you agreed it amounts to a change in the nature of the tooth itself - in the composition? Yes, just as calcification is a change in the nature of the tooth. It changes the chemical composition of its structure? Yes. It is that change that produces the resistance? Yes. You are a member of the Board of Health? Yes. You are aware that the Board has power to require local authorities to fulfil its duties? So I believe. Can you say whether the Board has required an authority to fluoridate its water? Not as far as I know. I am not on the fluoridation sub-committee.

IN THE SUPREME COURT OF NEW ZEALAND
DEFENDANT'S EVIDENCE NO. 12
P.P. LYNCH EXAMINATION

PATRICK PHILIP LYNCH:

I am a pathologist. I am a doctor of medicine. I am F. R. A. C. S. I practice as a pathologist in Wellington, and have practised for over 30 years. I have been a member of the Medical Research Council for 10 or 12 years. I am also a member of the Board of Health. There is a dental research committee of the Medical Research Council. The Council has a number of special ad hoc committees of which the Dental Research Council is one under the Chairmanship of Sir John Walsh. Its function was to concern itself with problems of research in relation to dental health, and one of the matters to which that Committee through its research officers directed its attention while I was a member of the Council was to the problem of the very high incidence of dental caries in children of New Zealand. I took no personal part in the investigation. But I was aware from my own reading of the nature of this problem and I felt satisfied that it was somehow related to the curious deficiency of fluorides in the soils and in consequence in the water supply in this country. I know of no part of New Zealand in which the fluoride concentration of water supplies is adequate for the normal needs of the growing child. I think this is a deficiency which is related to the geological origin of the country. The glacial action on the surface of the land in past centuries has stripped the surface of the country of substances like fluorides and a notable example and its consequences are well-known is the shortage of iodine in the soil. A number of other substances which normally occur only in traces. But those traces are necessary for either healthy bodily development of animals and man, or of healthy growth of pasture. I mention these related subjects because I believe that the shortage of fluoride in the water supply is a basic and fundamental shortage in New Zealand and because I believe that fluoride clearly plays an important part in healthy tooth growth and development. There is an obligation on those who have responsibility for health of the community, as I felt I had when I was a member of the Council, to see if some method could not be arrived at of making up the deficiency. In the case of the iodine deficiency, that was made up and I think successfully by the addition of iodine to ordinary table salt. I believe the deficiency in fluoride cannot satisfactorily be made up unless by the means that were originally recommended by the Dental Research Committee of the Medical Research Council and such as are at the moment being employed by the local bodies that we know of. Why was iodine added to table salt? To ensure that all persons in the community were able to get iodine in sufficient concentration to maintain normal health, and to keep them free from goitre.

Here we have water with a fluoride content of one part to a million, would that have any toxic effect? The work of a pathologist from time to time brings him into a position where a study has to be made of toxic or poisonous effects of a great variety of substances. From what I know of the toxic effects of fluoride I believe that no possible harm could come to a child or a man from the concentration of sodium fluoride in water such as is contemplated by these measures. That remark applies to fluoride in whatever form it is added to water. It finishes up the same in the end in solution as fluoride. I know of no disease or disorder which would either be caused or be worsened by fluoride even in a concentration many times that which is commonly used for this purpose. I knew of the studies made and which were referred to by Doctor Watt where there were concentrations up to 6 or 7 times - parts per million, present naturally in water supplies, and no harm was seen to have come from that. That does not surprise me. I wouldn't expect or believe that harm could come even with concentrations higher than that. Some substances which when ingested become fixed in the body? Yes. Professor Truscoe spoke of some of the harmful ingredients that may from time to time get into water supplies. Such as lead, copper, and to some extent zinc. Of these lead in particular is likely to be taken up within the body and may even have a cumulative effect because it tends to be stored in bones and is only very slowly eliminated. Fluoride has no such similar effect. It is readily enough soluble. It does not tend to accumulate in the body and even if it is taken say in water supplies or in food in excess of what the natural and normal requirements of the body are, the surplus is very quickly excreted in the urine. There is no accumulation of fluoride in the body although of course some of the tissues such as tooth and bones have their proper and normal concentration of it. Assuming a man had taken fluoridated water? His tissues may show presence of fluoride but not excess.

BENCH: Suppose a person was a terrific consumer of beer made with fluoridated water and got perhaps ten times or more normal consumption of fluid, would the fluoride in the water have any effect on that person? No because the amount he took in excess of natural requirements of the body would be excreted.

COUNSEL: Can you speak of relationship between a healthy set of teeth and general health? The healthy person is a person who is healthy in all his parts. It is known that dental caries leads to general sepsis in the mouth. It leads to sepsis in the gums.

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(CONTINUED)

It leads to the general condition of oral sepsis to which Sir John Walsh referred. I agree with him that a great many bodily ailments do derive from oral sepsis. I believe it is an important part of the duty of maintaining normal health to maintain a good state of dental health. Natural teeth, have they an advantage over false teeth? Quite apart from dental sepsis, a person who has natural teeth masticates his food better and more thoroughly; he is freer from indigestion and his sense of bodily well-being is at its maximum. Mouth cancer? My experience of cancer of tongue and mouth is that in a high proportion of cases of this disorder the condition is found to be related or associated with a marked condition of neglected caries jagged and broken teeth and an unhealthy condition of the gums. I think that oral sepsis in the wider sense is an important cause of cancer of the mouth. Can there be toxic absorption? I referred to that under oral sepsis. There is toxic absorption with all sorts of vague and sometimes unpleasant consequences. Is there a connection between taking fluoride in childhood and health in adulthood? I think an important condition for good health in adult life is the proper care and conservation of the teeth of the child. Is fluoridation of one part to a million pure water? If it is pure otherwise. Do you mean pure in a chemical sense? When the word pure is related to a water supply it is used in the vaguest possible way. Aqua pura whatever that means. Nothing could be purer than the triple distilled water we inject into patients. That is pure water. Because there are no other ingredients than those that make water. No gas, no salts, no taste.

CROSS-EXAMINATION

CROSS-EXAMINED: Is it correct that in U. S. A. fluoridation is extensive? I believe so. Have you examined comparative figures between U. S. A and New Zealand as to the incidence of cancer of the tongue and mouth? No. Except that I know cancer of the tongue and mouth is not confined to New Zealand. Is it any more or less extensive in the United States than here? I don't know. All I know is that it is universally accepted by doctors that cancer of the tongue occurs in patients who have dirty mouths. Is the condition of oral sepsis due to the lack of care of the mouth? Yes indeed. Is the direct cause the lack of care rather than the lack of fluoride? I would not say that lack of fluoride is a cause of oral sepsis. If a child had fluoridated water but never cleaned its teeth that child would have more dental sepsis than the child that had no fluoridated water but cleaned its teeth. All I would claim is this - that oral sepsis is more likely to occur where there is extensive dental caries than otherwise. All this discussion

of oral sepsis and cancer is that one can lead to the other? Yes. Iodised salt, is this iodine put in salt by manufacturers? There is legislation, got most painfully and slowly. All salt sold for table purposes must have added to it a proportion of iodine in the form of potassium iodine. If you or I for some reason wanted salt free from iodine, you would have to make a special request and demand for it. Do physicians ever prescribe non-iodised salt? Not that I know of. Demands for non-iodised salt largely come I believe from manufacturers of pickles. Is it procurable? Yes, if a person had some reason for believing they shouldn't have iodine, non-iodised salt is available.

You discussed the deficiency of fluoride in New Zealand soil - you are familiar with the Report of the Medical Research Council last year? No. There are other substances being found which have the same effect on dental caries? Molibdenum.

RE-EXAMINED: Looking at this copy of the report - Royal Commision Report - paragraph 540 page 149, sub-paragraph (4) - do you agree with that? That relates to the easy absorption and free elimination of fluoride? I agree. 541 (4)? I agree with that. I have already said that in effect. Sub-paragraph (5)? I believe that to be correct. Paragraph 542? Yes - all the matters in paragraph 541 relate to toxicity of fluoride. In this connection it has none. Paragraph 542? That states in a different way what I said before. I agree with that.

(CASE FOR THE CORPORATION)

IN THE SUPREME COURT OF NEW ZEALAND
NO. 13
REASONS FOR JUDGMENT OF McGREGOR J.
20TH SEPTEMBER, 1963.

No. 13

REASONS FOR JUDGMENT OF McGREGOR J.

The relators are residents and ratepayers of the City of Lower Hutt, and their water supply is drawn from the defendant City's waterworks. There is no other public source of supply of water for drinking or for domestic purposes within the City. Some time prior to July 1959 the defendant Corporation acquired and installed equipment for the purpose of fluoridation of the water supply by adding sodium silico fluoride to the water, and from July 1959 until the present time this substance has been added, and the defendant has operated the equipment in connection with fluoridation. The substance is added in such a quantity that, together with the fluoride naturally in the water, a proportion is obtained of fluoride to the natural water of one to one million parts. The fluoride is added to the water used both for domestic and general commercial consumption in the City. The relators on the 5th May 1960 called on the Council to discontinue adding the fluoride to the water, but the Council has not discontinued this addition. The relators now come to the Court asking for an order restraining the defendant from adding sodium silico fluoride or any similar substance to the domestic water supplied by the defendant, on the general ground that the fluoridation of the water is ultra vires the defendant Corporation.

I have heard considerable evidence in the matter, and I must say at the outset that I have never hitherto experienced evidence more impressive and cogent than that of the defendant establishing that it is, to use a neutral expression, most desirable that fluoride should be added to the water.

In nature, water free from impurities is never found. Absolutely pure water can be supplied only by means of a complicated distillation process, and would not be palatable or acceptable to the ordinary user. All natural waters contain something in the nature of impurities. Lower Hutt City water supply is an artesian one, and an analysis of an untreated sample of Lower Hutt water shows that it contains 40 parts per million of calcium, 3.8 parts per million of magnesium, 15.4 parts per million of sodium and .3 parts per million of potassium. The fluoride content is so minute that it cannot be demonstrated, and the natural water is slightly acid in reaction. For a double purpose the Corporation has installed a treatment plant adding lime and fluoride to the water. As a result of this treatment the water supplied to the consumers contains 138 parts per million of calcium, rendering it slightly alkaline, and

.96 parts per million of fluoride. Apart from the fluoridation result, the addition of lime and the consequent alkalinity obviates the acid reaction on the pipes through which the water is supplied, and achieves in this respect a desirable result. There is no significant difference in the other contents of the water, comparing the natural water with the treated water.

The evidence of the desirability of fluoridation is most impressive. The Hastings City Council was the first local body in New Zealand to install a fluoridation plant for the treatment of its water. This plant was installed in 1954. New Zealand waters are naturally deficient in fluorides, and as a result there is a high incidence of dental caries or decay in New Zealand, more especially in regard to the teeth of children up to the ages of twelve or fourteen. Investigations by officers of the Dental Division of the Department of Health have definitely proved that in Hastings the fluoridation of the water has had a very marked result in the reduction of dental caries. I do not need to discuss fully the results of the extensive examinations conducted on school children in Hastings in 1954, and the comparison of the results thereby established with the results of similar examinations in 1963. It is sufficient to say that a comparison in respect of six year old children shows a 78% reduction in dental caries on the statistics resulting from the two surveys carried out. The figures show a reduction in the percentage improvement up to the age of sixteen years, where there is still a reduction of 19.7%. The reason for the great reduction in the six year olds as compared with children of sixteen is that it is essential that children should have the benefit of fluorides from the pre-natal state until at least the age of twelve, for the strengthening of the structure of both the deciduous teeth and the permanent teeth. In Hastings, therefore, the children who had attained sixteen in 1963 would have had the benefit of fluorides only from the age of seven onwards, and one cannot expect the full result of the treatment. The children aged from six to eight, if they had been residents of Hastings all their lives, had had the benefit over this whole period, and the reduction of decay in the six to eight year old group in my view establishes beyond any shadow of doubt the benefit of fluoridation.

Similar surveys have been carried out in Lower Hutt in 1959, and in 1961, covering a period of 21 to 27 months water fluoridation. The period in Lower Hutt is obviously too short for results similar to those in Hastings to have been attained, but the tables show a substantial reduction in dental caries in Lower Hutt, the six year old males having received a benefit of 36.9%.

Apart altogether from the results of these surveys, the scientific evidence is conclusive as to the general effect of fluoridation as a benefit not only to dental caries but also to general health. Sir John Walsh, Dean of the Dental School of the University of Otago, expresses the opinion that the effect of fluoridated water at the level of one part per million is to reduce dental decay by half, and that there are no harmful dental effects from fluoridated water. While teeth are being formed, particularly in early years, fluoride is built into the structure, and a person who has drunk fluoridated water all his life would have about half the decay he otherwise would have had. It is difficult to ingest fluoride by means other than water, as the diet of an infant does not contain fluoridated foods such as tea and oysters. It is true that fluoride can be given to children in the form of tablets, but comparatively few parents would persist in this means of medication. Both Sir John Walsh and Dr. Lynch, the eminent pathologist, also emphasise the lessening of bodily disorders by the reduction of caries in teeth and again their evidence is most impressive in this respect, and Dr. Watt, a pediatrician, has also given evidence to a like effect which is most convincing to my mind. All the expert witnesses adopt the opinions in the report of the Commission of Enquiry on the Fluoridation of Public Water Supplies of 1957. I agree that this report is not in itself admissible evidence, but certain portions are accepted by the expert witnesses as a summary of their own opinions. I refer to para. 539 of the Report, that the process is aimed at increasing the concentration of fluoride ions in water supplies, and those ions do not possess the properties of fluorine in its free elementary state. Paragraph 540, fluoride is a normal constituent of human diet, and the principal source of fluoride is water in all normal circumstances. Fluoride is a normal constituent of the boney structure of the body and of teeth. Paragraph 541, it is beneficial in proper amount and the optimum level in drinking water can be established with certainty. Acute poisoning could be produced only by such a great excess that the possibility becomes irrelevant in relation to the fluoridation of water. Paragraph 544, the process of fluoridation does not add a substance that is foreign to the water, but merely brings about a slight change in the concentration of the fluoride already present naturally in the water. Paragraph 546, the efficacy of fluoridation as a public health measure is proven, and no alternative suggested would be effective as a public health measure.

I would emphasise that the evidence establishes that no toxic effects result from the fluoridation of water. The proportion of fluoride added, one part to a million, is very low, but on the other

hand sufficient to improve the structure of the teeth and attain the desired result of reducing dental caries, with the consequent improvement of general health throughout life. In some countries natural water contains up to six parts per million of fluorides without any harmful effects.

My conclusion on the facts is, therefore, that fluoridation, more especially in New Zealand owing to the deficiency in the natural water supplies, is highly beneficial to the population in general, and to children in particular, and it is in the highest degree desirable that fluoridation of water should be developed. There is no alternative to produce the same results. But the question I have to decide in the present case is not the desirability of fluoridation, but as to whether it is within the powers of the defendant Corporation to maintain its fluoridation scheme. This must depend on the powers conferred on the defendant as a local authority by the legislature.

At this stage I should describe as far as I am able, and in general but not scientific terms, the fluoridation process adopted by the defendant. The defendant's water supply is an artesian supply. Adjacent to the pump room is the fluoridation plant. A certain proportion of the water of the main supply is led into a by-pass. Into the water flowing through the by-pass there is fed from a hopper the necessary calcium addition, and the fluoride in powder form. The water in the by-pass then containing a concentrated suspension of the added chemicals in a very large volume of water, is returned to the main supply. To ensure uniformity of the mixuture the main supply then passes through three points of turbulence ensuring that the whole supply contains an even mixture with the proportion of fluoride to water one part per million. The whole supply then passes in the ordinary manner to consumers. It is accepted that the plant is a standard equipment for fluoridation, and is similar to other plants in various overseas countries.

The powers of a municipal authority are contained in the Municipal Corporations Act 1954, and in this case the defendant relies on the power to construct and maintain waterworks contained in s. 240 of the Act, and more emphatically on the general powers of the Council with respect to the preservation of public health contained in s. 288. It is accepted that the defendant in the exercise of its operations is limited to the authorities conferred or reasonably implied by or from the provisions of the enabling legislation. The principal is stated by Lord Selbourne in Attorney-General v. Great Eastern Railway Co. (1879) 5 A. C. 473, 478:-

"I assume that your Lordships will not now recede from anything that was determined in The Ashbury Railway Company v. Riche. It appears to me to be important that the doctrine of ultra vires, as it was explained in that case, should be maintained. But I agree with Lord Justice James that this doctrine ought to be reasonably, and not unreasonably, understood and applied, and that whatever may fairly be regarded as incidental to, or consequential upon, those things which the Legislature has authorized, ought not (unless expressly prohibited) to be held, by judicial construction, to be ultra vires." 10

and again by Lord Parmoor in Trustees of the Harbour of Dundee v. D. & J. Nicol (1915) A. C. 550, 570:-

"It is settled law that a body such as the Appellants, constituted by statute, have no authority except such as Parliament has conferred upon them, and that they must find a sanction for any powers which they claim to possess in their incorporating statute or statutes. These powers may be expressly authorized or implied as fairly incidental to what is expressly authorized."

To the same effect is the statement of Viscount Haldane L. C. in the latter case at p. 556. 20

Further, I agree with the submissions of counsel for the defendant that the object in entrusting authority to a public body such as the defendant is to enable it to provide services to the public, and that the statute should receive a fair, large and liberal construction in accordance with its objects. In the case of powers conferred by the Act the Court should be liberal in deciding what matters are fairly incidental to or consequential upon the express authority conferred. When authorities are given general powers to effect certain specified purposes, the powers will ordinarily be construed to cover any proper method of effecting those purposes, although 30 the method may not have been known, nor have been in existence at the time when the powers were originally granted: (Halsbury 3rd Edit. Vol. XXX 689; Attorney-General v. Cambridge Consumers Gas Co. (1868) L. R. 6 Eq. 282). I propose to endeavour to apply these principles in the construction of the relevant sections of the Act.

Now in regard to s. 240 of the Act the Council may construct waterworks for the supply of pure water for the use of the inhabitants of the district, and may keep the same in good repair and may from time to time do all things necessary thereto. By virtue 40

of subs. (2) the powers granted in respect of the construction of waterworks shall be deemed to include the power of extending or enlarging any such waterworks.

Mr. Barton submits that this provision confers no authority to add fluorides to the natural water supply of the defendant, and he questions whether the plant of the defendant is a plant for the supply of pure water. I accept the meaning that pure water is equivalent to wholesome water. I am prepared to hold that the natural artesian water of the defendant is pure water, and that the water after fluoridation is pure water in the sense that it is wholesome water or potable water. No water except distilled water is pure water in the narrow sense, but natural water in so far as it is free from noxious impurities can still, in my view, be described as aqua pura, so long as it is reasonably potable and wholesome, or in most cases even as "the nectar of the Gods". From the evidence I have heard the fluoridated water, even although there is the slight percentage of chemicals added thereto, is still pure water. It is no more and no less pure than the natural supply.

There is, however, a further difficulty. The waterworks of the defendant prior to the installation of the fluoridation plant gave a supply of pure water to the inhabitants of the city. "Waterworks" by s. 239 of the Act is defined as including "all . . . pipes and all buildings machinery and appliances of every kind acquired or constructed by the Council under the authority of the Act for collecting or conveying water for or to the district or any part thereof or beyond the district". As I have already said, s. 240 gives power to construct waterworks (a power already exercised prior to the installation of the fluoridation plant) and from time to time to do all things necessary thereto. A question therefore arises as to whether the addition of the fluoridation plant was necessary for collecting or conveying pure water to any part of the district. I do not think such an addition was necessary. It is certainly in my opinion expedient and highly desirable, but the Council had already installed all pipes, machinery and appliances for collecting and conveying water to the district. What it has now done is not an addition to the supply, or something necessary to collect or convey the water, but most worthily it has improved the health quality of the existing supply. A chlorinated plant might well be authorised for the reason an impure or dangerous supply may be converted into a pure supply, and such a plant would be necessary to give a supply of pure water. But here the inhabitants already have a supply of pure water. The fluoridation plant is for the purpose of a supply of what might be termed medicated pure water. This

seems to be in accord with the view accepted by the Court of Appeal of Ontario in The Village of Forest Hill v. The Municipality of Metropolitan Toronto (1956) O. R. 367 and by the New Brunswick Supreme Court Appeal Division in R. v. Fredericton (1956) 2 D. L. R. (2nd) 551. In the former the municipality had "a power and obligation to provide a continued and abundant supply of pure and wholesome water". It was held that although the word "wholesome" may properly be interpreted as meaning "beneficial to health" and although a municipality may be entitled to do something to make its water more beneficial to health as water, it enters a different field, and one it is not entitled to enter, when it proposes to add something for medicinal purposes to pure and wholesome water, and its real purpose is not to make the water pure and wholesome, but to improve the general health of the community. At p. 376 Pickup C. J. O. says:-

"This brings me back to consideration of the provisions of s. 41 of the Metropolitan Toronto Act and the question whether, in purported exercise of a power and duty to provide pure and wholesome water, the Respondent can add some chemical substance to it for a medicinal purpose, where the water, without the addition of that substance, is already pure and wholesome. It is not suggested that the addition of fluoride to the water makes the water any purer, and I think the evidence establishes that such addition does not make it less pure in the sense of a 'pure water supply' for domestic use. The Respondent contends that the word 'wholesome', as used in this section and in s. 12 of The Public Utilities Act, means 'beneficial to health', and I am prepared to accept that definition for the purposes of this appeal. All counsel agree that the word 'wholesome' is a relative term. Water can be wholesome. Other waters may be more wholesome or less wholesome. I do not want to be understood as saying that a municipality entrusted with the duty of supplying wholesome water could not do something to make the water more wholesome in the sense of being more beneficial to health as water but I think a municipality enters a different field when it proposes to add to pure and wholesome water something for medicinal purposes and the real purpose is not to make the water pure and wholesome. I do not think the Legislature intended that a municipality should be given power to prescribe medicinally for the health of its inhabitants by adding to the water-supply anything such as fluoride for the purpose of improving the general health of the community. On the contrary, I think the Legislature in this Province has left matters relating to the general public health of the community in the Department of Health with provin-

cial regulations as to health and limited powers reposed in local boards of health and medical officers of health. To hold that this by-law is valid because the water is still pure and wholesome after the addition of fluoride would be to sanction an indirect invasion by a municipality of a field of Legislation not entrusted to it by the Legislature, or to sanction a municipality's exercise of a power which it does not possess under the guise of exercising a power which it does possess."

It seems to me that what is necessary for the supply of pure water is at least in part a question of fact, but that it would be straining the language of the Act to hold that by implication the Legislature has empowered the Defendant to add fluoride to its water supply. Such an act seems to me neither incidental nor consequential to the supply of pure water, where the water is already pure.

Mr. Barton further refers to s.254 of the Municipal Corporations Act in regard to pollution of water, and the definition of "pollutant" in s. 2 of the Act. These sections, in my opinion, do not assist, as the addition of fluoride does not, in my view, make the water unclean, noxious or impure so as to be detrimental to the health, safety or welfare of persons using the water. I am prepared to hold that in fact the contrary is the case.

It is true that assuming a thing to be within the discretion of the local authority no Court has power to interfere with the mode of exercise of such discretion reasonably and bona fide: (Westminster Corporation v. London and North Western Railway (1905) A. C. 427). But it seems to me that in the present case the discretion given by s. 240 is limited to what is necessary for the supply of pure water. I therefore conclude that s. 240 does not give the necessary power to fluoridate the water, although I consider there is the necessary authority to add calcium to overcome what has been described as the "aggressiveness" of the water, the result of such "aggressiveness" being to corrode the pipes and cause what can be regarded as an impurity.

The Defendant also relies on the powers conferred by s. 288 of the Municipal Corporations Act 1954. This section reads as follows:-

"The Council may do all things necessary from time to time for the preservation of the public health and convenience, and for carrying into effect the provisions of the Health Act 1956 so far as they apply to the district."

In my view this section should be read as conferring separate powers to do all things necessary from time to time (1) for the preservation of the public health and convenience and (2) for carrying into effect the provisions of the Health Act 1956 so far as they apply to the district. In my opinion the conjunction "and" should be read in the distributive sense ut res magis valeat quam pereat, as there may be matters being comprised in the first limb of the section. On the other hand there may be matters, as for example, matters of administration or for public services, for which provision is made in the Health Act which might not be necessary for the preservation of the public health and convenience, such matters coming within the second limb. It seems to me it was the intention of the Legislature to authorise matters in either of these categories.

In the present case I am satisfied on the evidence (1) that there is a high incidence of dental caries in New Zealand generally (2) that there is an almost complete absence or at least a high deficiency in the fluoride content in the natural artesian water supply of Lower Hutt (3) that the absorption of fluoride has a substantial effect in reducing the incidence of dental caries, especially in young children (4) that there are no deleterious or toxic effects on the human body from the absorption of fluoride, more emphatically in the minute proportion of one part to a million (5) that any surplus fluoride taken into the body is excreted without harmful effects and (6) that tablets or other vehicles for the taking of fluoride are unsatisfactory, in that the required regularity with children would not be achieved, and that natural water is the only really satisfactory vehicle.

I therefore come to consider whether fluoride in a water supply is necessary for the preservation of public health. The recognised meaning of "preservation" is "the action of preserving or keeping from injury or destruction". To "preserve" is "to keep safe from harm or injury" or "to take care of" "to guard": (Shorter Oxford English Dictionary 2nd Edit. 1575). The question is partly one of fact. In my opinion the addition of fluoride to a water supply, and the taking of such medicinal water, has the effect of guarding teeth from decay or destruction, and a consequence is the improvement of bodily health in later life, or the guarding thereof from many diseases or ailments which are a consequence of dental caries. This seems to me to amount to the preservation of health, and as it may affect a considerable proportion of the public it is a preservation of the public health. Furthermore, fluoridation treatment seems to me to be necessary or needful owing to the deficiency in the natural water, the high incidence of dental caries, the need

for the prevention or reduction thereof in the interests of public health, and the absence of any other satisfactory method of administering fluoride. Although I may be adopting a liberal construction, I consider that in the interests of the general public the Legislature intended a liberal construction to be applied to an Act empowering a local authority to exercise public services for the public benefit. In my opinion, therefore, fluoridation of water supply is necessary for the preservation of the public health.

Mr. Barton suggests that a distinction should be drawn between "health" and "public health" and points out the use of both such terms in, for instance, s. 7(a) (b) and (d) of the Health Act 1956. I doubt if there is any real distinction in the use of the alternative terms, but in any case I consider a matter which affects the health of a substantial proportion or a class of the public is a matter of public health.

He also draws attention to the use of the phrase "from time to time" and suggests that that is something that should be done at more or less regular intervals, as distinct from a continuous process. I agree that a recognised meaning of the phrase is "at regular intervals" but equally in the present connotation I consider a meaning of de die in diem or continuously can be attributed in the light of divers matters which may affect public health or public convenience. Either sense seems to me to harmonise with the context and promotes in the fullest manner the policy and object of the Legislature, to advance the remedy.

It is further suggested that if I were to give a liberal construction to s. 288 of the Municipal Corporations Act, such construction would by virtue of s. 23 of the Health Act 1956 impose on all local authorities a duty to install fluoridation schemes in respect of water supply. I do not think this is so. It can be accepted that when s. 288 of the Municipal Corporations Act was enacted the Legislature was aware of the provisons of s. 20 of the Health Act 1920, the predecessor of s. 23 of the Health Act 1956, and there should be no repugnancy between the two sections. Under s. 23 the local authority is empowered and directed to do certain specific things. The second limb of s. 288 of the Municipal Corporations Act empowers the local authority to carry into effect the provisions of the Health Act, and to this extent the two sections may well be in pari materia. But in any case I do not think that the first limb of s. 288 of the Municipal Corporations Act embraces exactly the same territory as the duty under s. 23 of the Health Act, to promote and conserve the public health within the district. In some respects s. 23 of the Health Act

may be more far-reaching than s. 288 of the Municipal Corporations Act, as promotion of public health may cover a wider field than preservation of public health. In other respects s. 288 of the Municipal Corporations Act may cover the wider field, as it empowers the local authority to do all things necessary for the preservation of the public health and convenience. Recognised meanings of "convenience" comprise "suitability, material advantage or comfort" (Shorter Oxford Dictionary 2nd Edit. Vol. 1, 386). It may well be that some matters are necessary for the preservation of public health and convenience which are beyond the ambit of the promotion and conservation of the Public Health. It seems to me that in the present case I am not directly concerned with s. 23 of the Health Act and that section should not deter me from giving to s. 288 of the Municipal Corporations Act that fair, large and liberal construction which the Legislature intended in light of the public good and the benefit conferred by the establishment of services within the district for the benefit of the public generally.

Furthermore, it seems to me that a discretion is conferred on the local authority. It has acted bona fide and reasonably, and on sound advice, and the Court should be loath to restrict such an exercise of a discretionary power: Westminster Corporation v. London & North Western Railway (supra).

I have been referred to the authority of a United States court in Readey v. St. Louis County Water Co., 352 S. W. 2nd 622 (1961). In this action it appears that the Court of Appeal of Missouri held that a local authority was empowered to fluoridate its water. The same result seems to have been reached in a number of other United States jurisdictions, namely de Aryan v. Butler 119 Cal. App. 2nd 674 (1953), Krause v. City of Cleveland 163 Ohio St. 559, 351 U. S. 935 (1955), Dowell v. City of Tulsa Okla. 273 P. 2nd 959 (1954), Chapman v. City of Shreveport 225 La. 849, 348 U. S. 892 (1954), Froneck v. City of Milwaukee 69 N. W. 2nd 242 (1955), Baer v. City of Bend 292 P. (2nd) 134 (1955), Kaul v. City of Chehalis 247 P. 2nd 352 (1954), McGurren v. City of Gargo 66 N. W. 2nd (1955), Wilson v. City of Council Bluffs 110 N. W. 2nd 569 (1961). As no recognised reports are available to me I have not considered these authorities. I apprehend that the empowering legislation in each case may be fundamentally different from the legislation with which I am concerned, and I merely mention them by way of reference for the future, if need be.

For the reasons I have endeavoured to state, in my opinion the fluoridation of the Lower Hutt City water is within the powers of

the local authority under s.288 of the Municipal Corporations Act as something necessary from time to time for the preservation of the public health and convenience. The order requested by the Relators is therefore refused. The Defendant will have costs, which include junior counsel and second day in the sum of 70 guineas and disbursements.

IN THE SUPREME COURT OF NEW ZEALAND
No. 13
REASONS FOR JUDGMENT OF McGREGOR J.
20TH SEPTEMBER, 1963.
(CONTINUED)

IN THE SUPREME COURT OF NEW ZEALAND
No. 14
FORMAL JUDGMENT OF SUPREME COURT
20TH SEPTEMBER, 1963.

No. 14

FORMAL JUDGMENT OF SUPREME COURT

BEFORE:

THE HONOURABLE MR. JUSTICE McGREGOR

Friday the 20th day of September, 1963

UPON READING the Statement of Claim the Notice of Motion for an injunction and the Affirmation of Robert Richard Lewis filed herein on behalf of the Plaintiff AND UPON READING the Statement of Defence filed herein by the Defendant AND AFTER HEARING Mr. Barton and Mr. Hardie Boys of Counsel for the Plaintiff and Mr. Gillespie and Mr. Mathieson of Counsel for the Defendant and the evidence adduced on behalf of the Plaintiff and the Defendant IT IS ADJUDGED that the injunctions sought by the Plaintiff be refused AND IT IS ORDERED that the Plaintiff pay to the Defendant the sum of £73. 10. 0 as costs together with the sum of £34. 12. 3 for disbursements and witnesses expenses making a total of £108. 2. 3. 10

By the Court

L. S.

"M. J. Hawkins"
Deputy Registrar.

No. 15

NOTICE OF MOTION ON APPEAL TO COURT OF APPEAL

IN THE COURT OF APPEAL OF NEW ZEALAND

IN THE COURT OF APPEAL OF NEW ZEALAND
No. 15
NOTICE OF MOTION ON APPEAL
18TH OCTOBER, 1963.

BETWEEN HER MAJESTY'S ATTORNEY-GENERAL FOR NEW ZEALAND on the relation of ROBERT RICHARD LEWIS and ERIC BERNARD ELLIOTT

Appellant

AND THE MAYOR, COUNCILLORS AND CITIZENS OF THE CITY OF LOWER HUTT

Respondent

TAKE NOTICE that this Honourable Court will be moved on Monday the 4th day of November 1963 at 10 o'clock in the forenoon or so soon thereafter as counsel can be heard ON APPEAL from the Judgment of the Supreme Court of New Zealand at Wellington delivered on the 20th day of September 1963 by the Honourable Mr. Justice McGregor in an action No. 88/63 in which the Apellant is Plaintiff and the Respondent is Defendant UPON THE GROUND that the said Judgment is erroneous in fact and law.

DATED at Wellington this 18th day of October 1963.

M. Hardie Boys

Solicitor for Appellant

No. 16

IN THE COURT OF APPEAL OF NEW ZEALAND
No. 16
REASONS FOR JUDGMENT OF NORTH P.
13TH DECEMBER, 1963.

REASONS FOR JUDGMENT OF NORTH P.

The question we are asked to determine is a finely balanced one. The Appellant challenges the right of the Respondent to add a small quantity of sodium silico-fluoride to the water supply of the city.

The facts are fully set out in the judgment under appeal and I do not think it necessary to say anything more about them than this - the Lower Hutt City water supply is an artesian one and an analysis of an untreated sample of the water shows that it contains 40 parts per million of calcium, 3. 8 parts per million of magnesium, 15. 4 parts per million of sodium and . 3 parts per million of potassium. All or nearly all New Zealand waters are deficient in fluoride ions. This it seems is related to the geological origin of the country, but in Lower Hutt the fluoride content is abnormally low even by New Zealand standards, and indeed, is so minute that it cannot readily be demonstrated. The natural water is slightly acid in reaction. For a double purpose the Respondent has installed a treatment plant adding, in controlled proportions, lime and fluoride to the water. As a result of this treatment, the water supply to consumers now contains 138 parts per million of calcium rendering it slightly alkaline, and . 96 parts per million of fluoride. It is not in dispute that all or nearly all of the natural waters used by waterworks authorities throughout the world contain a trace of fluoride, the quantity however varying very markedly from place to place. In some places an excessive quantity is found. The evidence called in the present case overwhelmingly supports the view that the presence of a sufficient quantity of fluoride in domestic water assists in the preservation of the teeth of young children by preventing decay. It may therefore confidently be said that the addition of a small quantity of fluoride to domestic water which is lacking in that respect is beneficial and assists in promoting the health of the community. This the Appellant does not seriously challenge but the submission is made that until Parliament has spoken and given local authorities the right to act in the way the Respondent has acted, no local authority is lawfully entitled to place any substance in drinking water so that it enters the body and there effects a change

no matter how minute in the body. The fact that the change may be beneficial to the health of the community it is claimed is immaterial.

Counsel were agreed that the necessary statutory authority - if it exists - must be found in one or other of three provisions - first, in s.240 of the Municipal Corporations Act 1954, which authorises the council to "construct waterworks for the supply of pure water for the use of the inhabitants of the district" or secondly, in s.288 which provides that "the council may do all things necessary from time to time for the preservation of the public health and convenience, and for carrying into effect the provisions of the Health Act 1956 so far as they apply to the district," or thirdly in s.23 of the Health Act which imposes on every local authority a duty "to promote and conserve the public health within its district." In the Court below, McGregor J. came to the conclusion that s. 240 did not empower the corporation to add fluoride to the natural water supply, but he held that the first part of s. 288 could be invoked to provide the necessary statutory authority. The appeal is from that learned Judge's judgment.

Section 240(1) of the Municipal Corporations Act 1954 has clothed local authorities with the power to construct waterworks for the supply of pure water. In determining the ambit of this section it will be convenient to begin by deciding what meaning should be given to the word "pure" in the context in which it appears in the section. No attempt was made in the statute to define what is meant by the word "pure" or to prescribe a standard of purity. Obviously the Legislature did not select the word with the object of encouraging local bodies to construct expensive plant for the purpose of supplying to their inhabitants chemically pure water. This, if I have correctly understood the evidence, is seldom if ever found in nature and in any case its manufacture - if practicable on a large scale - would serve no useful purpose. The statute plainly is concerned with the practical affairs of life and the Legislature must have been aware that even the most bright clear and refreshing water contains mineral constituents in solution, so in a strict sense natural water is never "pure". As Lord Blackburn said in Milnes v. Mayor etc. of Huddersfield (1886) 11 A. C. 511, 527:

> "I take it to be a matter of general knowledge that water collected from the fall of rain in a particular district derives its character from the nature of the strata over which it flows when collected on the surface or through which it filters when flowing out of springs."

It is well known that some waters are "hard" and others are commonly called "soft" - the nature of the strata with which the latter come in contact being such as to contain but little of those minerals the absorption of which gives water the character of hardness. In the Huddersfield case the district contained iron pyrites which when exposed to air and water undergoes a chemical change resulting in the production of sulphuric acid, which however, was in such small quantities that the water in the mains was still considered to be "pure and wholesome". On the whole then, I am disposed to accept the view of both counsel that the word "pure" was used in a very general sense as meaning something like "wholesome" or "potable" water. It is true that "wholesome" is not a synonym of "pure", but I think it is clear that on this occasion the Legislature did have in mind a supply of water that would be beneficial to the health of the community. But whatever expression is preferred in my opinion it is clear enough that the Legislature did aim at the supply of water of good quality containing no foreign or vitiating material.

It is next necessary to determine the limits of the powers conferred on local bodies in connection with the supply of pure water. In the Court below McGregor J. appears to have been a little troubled by the definition of "waterworks" contained in s. 239(1). With respect, I do not think the definition clause causes any difficulty. It has been included to enlarge, and not to restrict, the natural meaning of the word. The word "includes" as Lord Watson pointed out in Dilworth v. the Commissioner of Stamp Duties (1899) A. C. 99, 105, "is very generally used in interpretation clauses in order to enlarge the meaning of words or phrases occurring in the body of the statute; and when it is so used these words or phrases must be construed as comprehending, not only such things as they signify according to their natural import, but also those things which the interpretation clause declares that they shall include."

In my opinion the word "waterworks" when used in s. 240 retains as well its natural meaning, and will cover all machinery buildings and engineering construction and the like which are used for the purpose of supplying water which is conveyed or distributed through pipes. It will be observed that the section is purely an enabling provision; there is no obligation imposed on local bodies; they may construct waterworks or not as they choose; but if they do decide to exercise the power, it must be exercised bona fide for the purpose of supplying "pure" water to the inhabitants. But once again it is to be noticed that no attempt has been made by the

Legislature to prescribe or define what waterworks may consist of. The Act was intended to apply alike to large and small boroughs and just as no standard of purity has been laid down so too, the nature and extent of the waterworks are left to the discretion of individual local bodies. Thus a large city may construct an expensive filtration plant, whereas a small borough may have to be content to collect rainwater in a reservoir and supply the inhabitants with water in its natural state. Likewise I see no reason to doubt that the term "waterworks" is wide enough to include plant installed for the purpose of improving the quality of the natural water available in any area if that step is thought desirable in the interests of the inhabitants of the district. Sometimes it may be necessary to extract some element in the water which is there to excess, even although the quantity is so small that the natural waters could be regarded as "pure" in the sense in which I think that word is to be understood. On other occasions it may be found that some useful element in the available water supply is lacking and if so, I can see nothing in the section which would prohibit a local body constructing plant to supply that need. On still other occasions it may be considered desirable to treat the water for the purpose of rendering acid water slightly alkaline. In my opinion, in any of these cases, if the necessary authority is not to be found in the express words of the section, at least it may be fairly regarded as being incidental to or consequential upon those things which the Legislature has authorised. Attorney-General v. Great Eastern Railway Co. (1880) 5 A. C. 473, 478. But if, on the other hand, the local body in the interests of the health of the inhabitants sought to introduce foreign substances into the water supply, then I agree with Mr. Barton that the language of s. 240 certainly would not justify such a course for this would be a step in the direction of adulterating the water supply and thus rendering it impure.

The question then which we are called upon to decide is on which side of the line does the introduction of this small quantity of fluoride lie? This is the rock on which judicial opinion is likely to split, as is well illustrated by the Canadian case of The Village of Forest Hill v. Metropolitan Toronto (1955) O. R. 889 (1956) O. R. 367 (1957) 9 D. L. R. (2nd Ser.) 113. This case seems to have taken a rather curious turn as it proceeded from Court to Court. At first instance, MacKay J. A. appears to have had little difficulty in concluding that a statute which made provision for the supply of "pure and wholesome" water when read with the provisions of a section in the Public Health Act conferred on the municipality the power to pass a by-law which provided for the fluoridation of the metropolitan water supply. He thought it was for the council

acting in good faith to determine what treatment (if any) should be given to the water. On appeal to the Court of Appeal of Ontario, however, a Bench of five judges were all agreed that the by-law was invalid and should be quashed. In reaching this conclusion the Court appears to have been very largely influenced by a concession made by counsel for the municipality that the water was "pure and wholesome" before treatment with fluoride. The following passage from the judgment of Pickup C. J. O. will indicate the line of reasoning:

> "I do not want to be understood as saying that a municipality entrusted with the duty of supplying wholesome water could not do something to make the water more wholesome in the sense of being more beneficial to health as water but I think a municipality enters a different field when it proposes to add to pure and wholesome water something for medicinal purposes and the real purpose is not to make the water pure and wholesome. I do not think the Legislature intended that a municipality should be given power to prescribe medicinally for the health of its inhabitants by adding to the water-supply anything such as fluoride for the purpose of improving the general health of the community".

The case was then carried to the Supreme Court of Canada where the Court was divided, the majority being in favour of the appeal being dismissed.

As I read the judgments, the majority view seems to have been determined by the view the Judges took of the motive for the introduction of fluoride. It seems to have been felt that this was a misuse of the power, in that it was an attempt to enforce on the inhabitants a compulsory form of mass medication. Thus Rand J., who gave the leading judgment for the majority, said: (p118):-

> "If its object was to obtain the ordinary or natural composition of substances in solution so as to furnish what the body has become adapted to receive as water there would be grounds for justifying such a measure;..... But it is not to promote the ordinary use of water as a physical requisite for the body that fluoridation is proposed. That process has a distinct and different purpose; it is not a means to an end of wholesome water for water's function but to an end of a special health purpose for which a water supply is made use of as a means".

Likewise Cartwright J., who was one of the majority, said: (p. 123):

"If, on the evidence in the record, it could properly be regarded as action by the council to provide a supply of pure and wholesome water or to render more pure and wholesome a supply of water already possessing those characteristics I would hold it to be valid. But, in my opinion, it cannot be so regarded. Its purpose and effect are to cause the inhabitants of the metropolitan area, whether or not they wish to do so, to ingest daily small quantities of fluoride ..... The water supply is made use of as a convenient means of effecting this purpose. In pith and substance the by-law relates not to the provision of a water supply but to the compulsory preventive medication of the inhabitants of the area".

On the other hand, both the Chief Justice of Canada and Locke J. were of the opposite opinion. The Chief Justice said that he considered the whole question turned on whether the council was acting in good faith and that so long as it was, he could not read the relevant section in the Act in such a way as to declare that the council in enacting the by-law was exceeding its authority. I take the liberty of citing the following passage from the dissenting judgment of Locke J. because I think it throws into relief the opposing points of view. Having first referred to the fact that MacKay J. A. in the Court of first instance found in favour of the municipality, he continued - (p. 120):-

"The unanimous judgment of the Court of Appeal delivered by the Chief Justice of Ontario, reversed this order and directed that the by-law be quashed. In the reasons it is stated that it had been admitted in the Court of Appeal that the water, without the addition of fluoride, was pure and wholesome. Accepting the admission as establishing that fact, it was said that nothing in the (Acts) conferred upon any of the area municipalities power to add some chemical to a pure and wholesome water supply and that the question to be decided was as to whether the Respondent had power to do so 'for a medicinal purpose'. With great respect, I disagree and think the judgment appealed from is based upon a false premise. In deciding the question whether the by-law was intra vires of the council, it was, of course, necessary to determine the exact nature of the action which the by-law assumed to authorise. The uncontradicted evidence is that 'a physically or chemically pure water does not occur in nature and has defied all efforts to obtain it'. This is the opinion of Joslyn Rogers, a chemical engineer of long experience whose affidavit was filed on the application. Mr. Rogers further said that it cannot be produced artificially, except in small quantities and with considerable difficulty. The admission that the water was pure

if intended as an admission of fact - was, therefore, inaccurate. If intended as meaning that it was 'pure' within the meaning of the Appellant's Act of incorporation, that was a question of law for the decision of the Court and not to be decided upon the admission of counsel. It should be said that no such admission was made in this Court. In the extracts from the work of E. V. Suckling, M. B., to whose opinions in this respect Joslyn Rogers subscribes, it is said that wholesomeness is purely a medical question while purity must be physical and chemical. Apart from such evidence, the accuracy of the statement seems obvious. In view of the evidence to the contrary, I would decline in the matter of such moment to act on an admission of counsel in the Court of Appeal that the water supply was, without any addition, either pure or wholesome. That question, which, in my view, is only relevant to the issue as to whether the members of the council have acted in good faith in the exercise of their statutory duties, is to be decided on the evidence adduced upon the application ..... It is, in my opinion, a necessary inference from the evidence that the water supply in the metropolitan district of Toronto whatever it may be, is in its natural state lacking in the element fluoride and thus less wholesome than it would be if that were added, to the extent mentioned. If the supply in its natural state contained fluoride to the extent of 2.5 parts to a million, as does the water obtained from the Boone River by the Municipality of Essex, and if, in the opinion of the council acting in good faith, it was considered advisable to reduce the fluoride content to one part in a million, I think it would be within the power of the municipality to do so. Indeed, I find it hard to understand why it can be fairly contended that this would be beyond the municipal powers any more than to add chlorine to render the water more wholesome by rendering sterile and harmless some existing constituent in it. If the argument which succeeded in the Court of Appeal is carried to its logical conclusion, it would be ultra vires of the Appellant to use water of the character used by the Municipality of Essex or the 64 other municipalities referred to by Dr. Chute since such waters, in their natural state, contain fluoride in varying proportions".

With great respect for the views which found favour with the majority of the members of the Supreme Court of Canada and also for that matter with the Court of Appeal of Ontario, I feel bound to say that I have found the judgment of MacKay J. A. at first instance and the dissenting judgments of the Chief Justice of Canada and Locke J. the more convincing. In view of the wider wording of the Canadian statute, I should have thought there was little room

for doubt that the action of the municipality in adding a controlled quantity of fluoride to its water supply was well within the statutory powers conferred on it, and the only question was whether, in exercising that power, the municipality had acted in good faith and reasonably; neither of these possible objections was ever in issue. The Judges in the Court of Appeal of Ontario and the majority of the Judges in the Supreme Court of Canada seem to have been impressed with the view that the municipality in the guise of improving the quality of its water supply was engaged in what counsel had described as "a form of compulsory mass medication for a particular ailment", and in this respect I cannot help feeling that they were inclined to attach too much importance to an incautious admission made by counsel in the Court of Appeal of Ontario that the water supply was "pure and wholesome" before treatment. I am disposed then to agree with Locke J. that the judgment under appeal was based upon a wrong premise.

The judgment of the majority seems to proceed on the assumption that "pure and wholesome" are absolute terms and therefore if a water supply is already "pure and wholesome" the addition of any chemical, however desirable, can never be justified. But if, as I think the position to be, the word "pure" in the context in which it appears in our statute is a relative term, and does not refer to the water being chemically pure, then I see no reason why a local body, so long as it acts in good faith, should not be entitled to take any reasonable step it may think proper to improve the quality of its available water supply as water. I agree that it must not attempt to introduce a substance which is foreign to the nature of water, for medicinal or other purposes, for this would render the water "impure". But short of anything like that, in my opinion a local body is entitled to change the concentration of the various elements which are in solution in the water available to it if it is advised that that course is desirable. Local authorities are public bodies entrusted with powers and duties for public purposes and the election of their members is in the hands of the inhabitants of the district. This being the position, in my opinion the power contained in s. 240 should not be narrowly construed. (See Attorney-General v. the Crayford Urban District Council (1962) 1 Ch. 575, where it was held that in considering what was fairly incidental to or consequential on the "general management" of houses provided by the housing authority, the relevant standard of management was not that of a private landowner but that appropriate to a local authority). We are told that New Zealand soils owing to the accident of the geological origin of the country are deficient in fluoride: it is not in dispute that fluoride is a natural constituent of most waters used for drinking and domestic purposes; and finally the evidence in

this case shows that the water supply available to the Respondent is particularly low in fluoride content - so low, indeed, that its presence cannot even be demonstrated.

In these circumstances, in my opinion the Respondent was lawfully entitled to instal a treatment plant for the purpose of adding in controlled proportions fluoride to its water supply. In taking this step the Respondent was doing no more that rectifying a deficiency in the water which was available to it and was acting reasonably on expert advice which had satisfied it that this step was desirable in the public interest. It is not without interest that in New Zealand the practice of adding calcium to render artesian water slightly alkaline is common, and indeed counsel were not prepared to dispute the right of the Respondent to change the character of water from acid to alkaline. Moreover, I do not consider that it is a valid objection to the course which has been followed by the Respondent that it was actuated by a desire to assist in the preservation of the teeth of the young children of the district. It would, I think, not be unusual to find that most efforts to improve the quality of a water supply stem from health considerations.

In coming to this conclusion I have not found it useful to place reliance on the provisions of s. 288 of the Municipal Corporations Act 1954 or S. 23 of the Health Act 1956. It may be that these provisions could have been invoked had the good faith of the Respondent been impugned - which was not the case - for local bodies are expected to take an interest in the health of the inhabitants. But for my part, I find a difficulty in the way of reaching the conclusion which found favour with McGregor J., for if the view expressed by him be right then these very general provisions would entitle a local body to medicate its water supply by the introduction of foreign substances. I cannot bring myself to the view that these general sections enlarge a specific power enabling local bodies to supply the inhabitants with "pure water".

For these reasons I would dismiss the appeal.

The majority of the members of the Court being of that opinion, the appeal is dismissed accordingly with costs to the Respondent on the highest scale together with an allowance of 20 guineas for one extra day, and an allowance of 10 guineas for each of two days for second counsel.

No. 17

REASONS FOR JUDGMENT OF TURNER J.

IN THE COURT OF APPEAL OF NEW ZEALAND
No. 17
REASONS FOR JUDGMENT OF TURNER J.
13TH DECEMBER, 1963.

Three statutory provisions, and only three, were cited, both in this Court and in the Court below, as possible authority for the action of Respondent in fluoridising the Lower Hutt water supply. They were (a) Section 240 of the Municipal Corporations Act 1954, (b) Section 288 of the same Act, (c) Section 23 of the Health Act 1956.

Section 240 of the Municipal Corporations Act 1954 empowers a municipality to construct and operate waterworks

> ". . . . for the supply of pure water for the use of the inhabitants of the district."

In the Court below McGregor J. found it impossible to decide the matter on this section, because he thought that the fluoridation plant, not being necessary for the collection or conveyance of the water supply, could not be a "waterworks" within the meaning of s. 239. For myself I respectfully think that his interpretation of the term "waterworks" was rather too narrow a one, and that it must include, as Mr. Mathieson argued, not only plant strictly necessary for the collection and conveyance of water, but all plant reasonably ancillary thereto. For this reason I think that the question before us, so far as it turns on this section, is not to be solved by asking whether a fluoridation plant is a part of a waterworks, but rather whether the supply of fluoridised water furnished by the Defendant Council can be described as the supply of "pure water". If it can, then the fluoridation plant, being ancillary to this supply, is part of a waterworks; if not, then the plant is not one reasonably ancillary to the supply of pure water.

It is common ground that the Defendant Council's fluoridation plant is used to supply the fluoridised water to the inhabitants of the district; the only question, therefore, which remains is whether the supply of the fluoridised water is "the supply of pure water". If the words "pure water" are strictly used in their primary senses, then fluoridised water is not "pure water". Water is the compound of oxygen and hydrogen having the chemical formula H_2O. This is a substance rarely and only momentarily found in nature - its

nearest approximation will be fresh rainwater, though even this is not chemically pure, containing some proportion of dissolved gases, besides small quantities of solids and liquids taken into solution while the raindrops pass through a more or less dusty atmosphere. It is not possible therefore, for any borough to supply "pure water" if the words are used strictly in their chemical sense. Nor is it possible for any borough in this country even to use rainwater as a major source of its municipal water supply; for climatic and other reasons the source is invariably ground-waters of some kind - either lake or river or spring or well-water - and in each case water with an appreciable quantity of mineral constituents in solution, besides, of course, the proportion of dissolved oxygen, nitrogen, carbon dioxide, and other gaseous constituents which are always present in solution in agitated water. With this background I readily conclude that the term "pure water" in s. 240 refers not to chemically pure H_2O, but to ground waters which have been subjected to a reasonable degree of purification.

The supply is not one merely of "water" "pure water" must be supplied. For the reasons which have already been indicated, "pure water" cannot mean water absolutely free of any adulteration. Some degree of impurity is always present in nature, and it is unreasonable to contend that the supply of "pure water" to the consumer must involve the complete removal of all such impurities. Where it is unreasonable to require their removal, they may, in my opinion, be allowed to remain in the natural water, and this does not prevent the supply being a supply of "pure" water for the purpose of the Statute. It is not, in my opinion, a reasonable construction, moreover, to read the words "pure water" as meaning "natural water without anything whatever added to it"; for, once resort is to be made to ground waters, certain processes of purification become inevitable, which themselves necessarily involve the addition to the original fluid of other substances. I can myself see no reason why the addition, for instance, of chlorine, to eliminate bacterial contamination, or of lime, to neutralise acid constituents, should not be permissible, for the residue which remains in solution after the operation is only incidental upon the removal of deleterious matter previously contaminating the water, which its addition has eliminated - but of course I do not expressly so decide, as the addition of these substances was not a matter of formal argument before us. But it is quite another thing to attempt to justify the addition (as here) of more of some substance already present in the natural water, solely on the ground that such an addition will be beneficial to the diet of the consumer. This is a step in the reasoning which has given me much cause for thought.

I must make it plain that my reflection has in no wise been due to any doubt as to the beneficial results accruing from the addition of the fluoride in the proportions used at Lower Hutt. The medical and scientific evidence - and voluminous evidence of the very first quality was presented to the Court - unanimously supported the procedure which has been adopted, and it is impossible, upon the evidence, for the relators to contend that any harm will result to consumers drinking the Hutt water; rather it is demonstrated conclusively that consumers will benefit, in greater or less degree according to their age and dental condition, by the fluoridation of the supply. Considering the matter with this basic conclusion firmly in mind, however, I still have to ask myself - Is the process of fluoridation employed by the Lower Hutt Council one which can reasonably be said to be a part of the supply of "pure water"? - for if it is not, no considerations of community benefit can bring me, by straining the construction of s. 240, to decide this case "on the merits". Statutes are not so to be interpreted. When matters of statutory construction come before the Court, the decision which strains the provisions of the section, so as to decide the matter on the merits, may serve to form the foundation for a different kind of result when another Court has to follow the same construction in very different circumstances.

In my opinion what the section authorises is the collection of ground water reasonably suitable for drinking purposes, and its purification by removing from it deleterious and contaminating substances which it naturally contains. If the removal of these substances involves incidentally the addition of some other harmless or beneficial substance necessarily added in the course of the process of purification, this incidental addition will not invalidate the procedure, which is still one essentially of purification. The use of chlorine and of lime, as I have already indicated, may perhaps be justified by this reasoning. But, in my opinion, water can never be purified, using any reasonable interpretation of that word, by adding to it a substance not there before, simply by way of additive for the purpose of compulsorily improving the diet of the consumer.

It can make no difference, in my opinion, that the additive is conclusively shown - as it is shown here - to be wholesome or beneficial in the proportions used. If one substance can be added on this ground, so can another; and it is impossible to see where such a construction of the section could stop, short of authorising any amount of compulsory medication which the Council might reasonably consider beneficial to the inhabitants of its district.

Nor, in my view, can the addition of fluoride be justified as a step in purification on the ground that some proportion of the substance is found in all ground waters in nature, but in only minute proportions in the Lower Hutt artesian supply, and that the addition practised at Lower Hutt does no more than "correct a deficiency". As soon as any attempt is made to give some exact meaning to such a phrase, the necessity at once appears for the postulation of some "normal" drinking water, to which other drinking waters are to be compared and made to approximate; But the Act is completely silent on such a topic, and it is not too much to say that this conception is not even remotely hinted at in any part of the Statute. Without a norm or standard it seems to me meaningless to speak of "excess" or "deficiency"; the essence of the meaning of these words lies in the quantitative comparison of one state of affairs with another. In this case no standard is perceptible. It certainly does not appear from the Act; and if the standard is to be simply what is beneficial to health, the argument again reverts to that which has been considered in the preceding paragraph. The plain fact is that the standard prescribed by the Act is "pure" water, and I find myself driven back to my basic consideration - that one cannot increase the purity of water by adding an impurity to it, however beneficial that impurity may be to the diet of the consumer.

At one stage in the argument I think it was contended that if water of the composition of the Lower Hutt supply (as it now reaches the consumer) were found in nature it would undoubtedly be regarded as "pure water" for the purposes of the Act. How then (it was said) shall that which would ex hypothesi be acceptable as pure water in these circumstances, be other than pure water simply because it has been artificially treated? To this it may be replied; if such water were found in nature, its properties, having regard to purity and wholesomeness, would make it unreasonable to subject it to any further process of purification, for it would be unreasonable to insist on the removal (for instance) of fluoride naturally present in an amount actually beneficial to the consumer. But though it would be unreasonable to insist on its removal, and though for this reason the water containing it would be regarded as pure water for the purposes of the section, it must also be accepted that if the fluoride were removed the water would thereby be rendered purer than before. Conversely, it is less pure after the fluoridation treatment than before; and the process by which the fluoride is added can never be "purification" on any usual meaning being given to the word.

It is important to observe that the English and Canadian cases,

some of which were cited to us, are all decided on provisions containing the words "pure and wholesome water" - see for instance in Britain Barnes v. Irwell Valley Water Board (1938) 2 All. E. R. 650 or Reid v. Croydon Corporation (1938) 4 All. E. R. 631, or, in Canada, Metropolitan Toronto v. Forest Hill 9 D. L. R. 2nd Series 113. The introduction of the words "and wholesome", in my opinion, prevents them from being of use in the construction of the New Zealand section; if section 240 of the Municipal Corporations Act had contained these words I might easily, for myself, have been brought to the view that the supply of "wholesome" water could authorise the addition of fluoride. But these words are not in our Statute, and cannot be implied into it by any judicial process without some danger of usurping the functions of the Legislature.

Before leaving the topic of wholesome water I must not omit to recall that, at one stage of the argument before us, Mr. Barton was disposed to admit that "pure" could be regarded as equivalent, or nearly equivalent, to "wholesome". I do not forget this; but the construction of a public Statute, affecting all the citizens of this country, cannot be determined, or even influenced, by any concession which Counsel representing only a few persons may feel disposed to make. For this reason I put Mr. Barton's concession on one side.

Some reference has already been made to cases decided in Britain and Canada. There were also American decisions cited. I have been unable to gain assistance from the American cases, which seem to me to have been decided for the most part on questions dependent on the provisions of the United States Constitution. As regards Village of Forest Hill v. Metropolitan Toronto I have two comments to make. First, it must be remembered that the majority in the Supreme Court of Canada decided as did also the Judges in the Court of Appeal - against fluoridation; the contentions which have been made for Respondents upon this decision rest upon dissenting judgments. Second, it seems to me that my own conclusions as to the correct meaning of the word "pure" is the same as that to which Rand J. came, delivering the first judgment of the majority in the Supreme Court of Canada in the Metropolitan Toronto case (9D. L. R. 2nd Series 113 at p. 117). Referring to purification he said:

> "... purify it, that is reduce objectionable foreign matter in it by means harmless to its consumers."

I respectfully agree with this definition of the process of purification.

The next provision to be considered is Section 288 of the Municipal Corporations Act 1954. This provides that:

> "The Council may do all things necessary from time to time for the preservation of the public health and convenience, and for carrying into effect the provisions of the Health Act 1956 so far as they apply to the district."

It is not seriously contended that the latter half of this provision could provide the necessary authority for the council's actions, but McGregor J. decided that the process of fluoridation could be justified by the first part of the section. But this provision cannot properly be applicable to the permanent or continuous treatment of a water supply - it empowers a council only to do things necessary from time to time. In my opinion these words are applicable only to ad hoc action dictated by emergencies or temporary or recurring expediencies. Moreover the evidence cannot, in my opinion, be said to justify the conclusion that fluoridation of the Lower Hutt water supply is necessary for the preservation of the public health. It is shown certainly that it is desirable for the improvement of the health of the inhabitants of the district, but this is not enough to justify the invocation of the section. Further, the words of the section are, in my opinion, too general to be of use to the council in this case. If they are to be used to authorise fluoridation, I am unable to see where the use of the section could stop, short of an authority for any form of compulsory medication which a council might reasonably think necessary for the preservation of the public health. I am unwilling so to read the section, and think that a much more specific provision would be necessary to authorise such a consequence. For these reasons I find myself in disagreement with McGregor J. on this point.

And having held that the provisions of Section 288 cannot, taken by themselves, authorise the fluoridation of a water supply without at the same time opening the door wide to other forms of compulsory medication - a construction to which I for my part will not give my approval - I am unwilling to follow the course suggested at one stage of the argument, and to hold that while Section 240 and Section 288, each taken by itself and separately, might be insufficient to authorise fluoridation, nevertheless the sections can and should be read together so as to do so. I see no reason to read the sections as intended by the Legislature so to affect each other. Section 240

is the opening section in Part XVII - "Waterworks". Section 288 is in a different Part of the Act - Part XX - "Public Health and Convenience", and between these two Parts two other parts on separate though related topics are interposed. It is not as if the two sections closely succeeded each other or were even found in the same Part of the Act. In the circumstances which I have described I can see no sound justification for reading each as intended by the Legislature to extend the meaning of the other.

For similar reasons to those which I have set out as applicable to Section 288, but a fortiori, I find it impossible to read into Section 23 of the Health Act 1956 any sufficient authority to empower a municipality to add fluoride to its water supply.

Finally, I am unwilling to approach the question before the Court, which it must be remembered is one purely of the construction of Statutes, by asking what Parliament would be likely to do if the matter were now brought before it. The question is not what Parliament would be likely to do, or even what Parliament might have done had the question been specifically raised earlier, but rather what the words of the enactment mean in their plain and ordinary signification.

Nor can the construction of the Statute be influenced by the consideration that municipalities have expended much money on fluoridising plant; or even by the argument that statistical programmes of importance to medical science could be interrupted or rendered useless by the suspension of the practice of fluoridising at Lower Hutt. Statutes are not to be interpreted according to the expediencies raised by such arguments; and if the majority of the Court were of the same opinion on the question of construction as myself these objections could be satisfactorily met by some period of delay, during which any writ of injunction would lie in the Court so as to enable the Legislature to give its deliberate consideration to the desirability of amending the Statute.

For the reasons which I have endeavoured to express I do not think that any of the statutory provisions invoked are sufficient to authorise the fluoridation of the supply, and I would allow the appeal.

IN THE COURT OF APPEAL OF NEW ZEALAND
No. 18
REASONS FOR JUDGMENT OF McCARTHY J.
13TH DECEMBER, 1963.

No. 18

REASONS FOR JUDGMENT OF McCARTHY J.

The Appellant, the Attorney-General, on the relation of two residents and ratepayers of the city of Lower Hutt, sought in the Court below an injunction restraining the Respondent Corporation from adding sodium silico-fluoride to the Lower Hutt water supply, complaining that the Respondent was acting beyond its powers in doing so. McGregor J., before whom the action came, refused the injunction. He held that the Respondent did have the necessary power. The Appellant has appealed to this Court.

As the issue is one of the extent of the powers of a local authority incorporated under the Municipal Corporations Act 1954, it is desirable to state at the outset how such powers arise and how they should be interpreted. A municipal corporation is a creation of statute. It has no powers at all except those conferred by the Act which creates it or by some other statute which brings specific additional powers. But in determining what powers actually are conferred by Legislation, the Courts will consider the corporation as having, not only the powers expressly stated, but also "whatever may fairly be regarded as incidental to, or consequential upon, those things which the Legislature has authorised." Lord Selbourne in Attorney-General v. Great Eastern Railway Co. (1880) 5 App. Cas. 473, 478; Dundee Harbour Trustees v. D. & J. Nicol (1915) A. C. 550, 570. Further, in deciding what can fairly be regarded as incidental to express powers, the Courts do not think narrowly. They bear in mind the public nature of the obligations of a local body and the requirements of its community, and they take a liberal view of the power under consideration: Attorney-General v. Crayford Urban District Council (1962) 1 Ch. 575. Finally if the act done is within a discretionary power of the corporation, the Courts will not interfere if the discretion has been exercised reasonably and bona fide. Westminster Corporation v. London and North Western Railway (1905) A. C. 426.

It is important to bear these directions in mind, for the conclusion one reaches in this case depends largely, it seems to me, on the spirit in which one approaches the interpretation of the statutory provisions on which the Respondent relies for power to

enable it to add fluoride to its water supply. Those provisions are: first, s. 240 of the Municipal Corporations Act 1954 which authorises a corporation to "construct waterworks for the supply of pure water for the use of the inhabitants of the district"; second, s. 288 of the same Act which enables a corporation to "do all things necessary from time to time for the preservation of the public health and convenience, and for carrying into effect the provisions of the Health Act 1956 (previously the Health Act 1920) so far as they apply to the district"; and third, s. 23 of the Health Act 1956 which casts a duty on every local authority "to promote and conserve the public health within its district". It was in the second of these sections, and in particular in the words "may do all things necessary from time to time for the preservation of the public health and convenience", that McGregor J. found the authority which, in his view, entitled the Respondent to add the chemical, sodium silicofluoride, to its water supply. However, I will commence by considering the first of the statutory authorities called in aid by the Respondent, s. 240 of the Municipal Corporations Act.

It will be seen immediately from what I have already said that there is no express statutory power to operate a water supply. However, the supply of water is a service with which all city corporations, and indeed most local authorities, are in one way or another associated, and the words of s. 240 by implication clearly confer a power to undertake that service. The Relators accept that. However, they insist that, as that section provides the only statutory recognition, the power is necessarily restricted by the wording of the section to the supply of "pure water". I am prepared to accept that that is so; and I move now to a consideration of the true limits of the power so implied and limited.

The judgments of other members of the Court have explained what, in precise scientific terms, is meant by the expression "pure water"; that such water is rarely, if ever, found in nature; and that a supply of it for purposes of normal city consumption would be impossible and unwelcome. The description which is most commonly found in English and Commonwealth Legislation relating to water supplies is "pure and wholesome"; but, for some reason, the New Zealand statute, as far back as 1876 uses only the single adjective "pure". In a yet earlier statute, the Municipal Corporations Act 1867, the word "water" appears simpliciter. Clearly "pure water" in s. 240 must have some meaning other than chemically pure. Both parties agree that that meaning must be rejected and some other found. This brings difficulty for once a literal interpretation is rejected, the question becomes much more open, and more subject to the influences of one's approach. The

Relators suggest as alternative adjectives "wholesome" or "potable", but I cannot accept that either of those words is really a synonym or a suitable alternative. I am not prepared to interpret "pure" in any sense which ties it either to physical or chemical purity, or to benefit to health. It is a word of wide use: it is used in the sciences, the arts and to a certain extent, in philosophy; but, wherever it is used, it denotes that the thing specified is free from everything that is foreign to its true nature or essential character. It suggests freedom from intermixture. Websters Dictionary of Synonyms. The Oxford Dictionary lists as the first amongst the meanings carried by the word, "not mixed with anything". When it is applied to concrete things, it usually implies a lack of contamination, adulteration or pollution; such as, for example, a pure breed, pure milk. But it does not necessarily follow that an article becomes impure if something is added which is not foreign to the true nature or the essential character of the thing specified, and especially is that so, when the word is used in relation to a commodity commonly used in trade; see, for example, Roose v. Perry and Co. (1900) 44 Sol. Jo. 503. Moreover, it should be remembered that on the various occasions when the section has been re-enacted, the Legislature was not speaking in a scientific context, but was dealing with a practical matter touching the everyday life of the people. It knew that, in New Zealand, water supplies are mostly, if not always, obtained from natural ground waters which invariably contain mineral salts and other substances in solution. It accepted, obviously, that it was necessary for local authorities to obtain from such sources supplies of water for those domestic and commercial purposes for which water is commonly used in advanced communities. Therefore I think it reasonable to conclude that by inserting the word "pure" the Legislature intended no more than to ensure that it was the supply of water alone, not water and something more, which was being authorised. If that is correct, as I think it is, then two questions arise: (1) whether the addition of fluoride results, in fact, in a supply of water plus something else, for if it does, that is the end of the matter, and (2) even if it does not, whether the act of fluoridation can reasonably be regarded as incidental to the supply of water by a local body to its residents. Before those questions can be answered, I must consider briefly what it is that the Respondent actually does in the course of fluoridating its water supply and why that is done.

Fluoridation, it would appear, is a subject which is apt to engender emotion. Its advocates and its opponents hold their views strongly. Various commissions of inquiry, including one in New

Zealand, have heard volumes of evidence, expert and otherwise, pertaining to its claims. But we must take this case, at least in those areas which are in dispute, as calling for decision on the evidence given in the Court below, and it is in the light of that evidence that we must examine the actions of this Respondent Corporation.

The element fluorine is to be found almost everywhere in the earth's crust. Small amounts of it occur in most natural waters in the form of soluble fluoride ions. They are derived from the solution of a wide range of minerals. Small quantities are present, too, in nearly all foods and in the human body, particularly in the bones and the teeth. It plays an important role in tooth structure. During the development of a tooth, small amounts of fluoride are incorporated into the crystaline structure of the mineral salts deposited throughout the hard substance of the tooth. Before young teeth erupt, the soluble fluoride present in food and drinking water is conveyed to the site of development by the blood stream. After the teeth have erupted, fluoride is added to the surface layers of the enamel by direct contact in food and drinking water. The presence of fluorine is particularly important in the early years of a person's life to harden the teeth and make them more resistant to dissolution by acids. Unless it is incorporated into the teeth in sufficient quantities, tooth decay and, very often, consequent deterioration of health follow. All this is not in the contest. Nor is the fact that New Zealand ground waters, generally speaking, have a particularly low fluoride content when compared with very many overseas waters, and especially when compared with what experts consider to be an optimum fluoride level The object of fluoridation, as carried out by the Respondent, is to bring the level of the fluoride content up to a figure which the experts consider to be desirable. That is achieved by adding sodium silico-fluoride in minute quantities to the water before distribution to consumers

The Lower Hutt water supply is an artesian one. An analysis of an untreated sample shows that it contains 40 parts per million of calcium, 3.8 parts per million of magnesium, 15.4 parts per million of sodium and .3 parts per million of potassium The fluoride content is so small that it cannot be demonstrated, but it is there. The water is slightly acid in reaction. In 1959, or thereabouts, the Respondent installed a treatment plant for the purposes of adding lime and fluoride to the water. The water is by-passed through the plant, the chemicals are added and the

water is returned to the main supply system. It is then slightly alkaline (as a consequence of the addition of lime) and has a fluoride rating of .96 parts per million (as a consequence of the addition of sodium silico-fluoride.)

The evidence called for the Respondent in the Supreme Court established, beyond any question, that in areas having natural waters like those in the Hutt Valley, fluoridation is highly beneficial in improving the quality of the teeth and, as a result, the general health of a community. This evidence, not challenged by the Relators, came from experts of the highest qualifications. Consequently - though I am aware that some people hold contrary views concerning the desirability of this process and say that, if parents wish their children to have an increased fluoride intake, there are better ways of ensuring that - I must proceed upon the basis that it is established that a higher concentration of fluoride than is in the Lower Hutt water supply as it comes from the bores is highly desirable in the interests of a substantial portion of the community, and, for so the evidence also establishes, that no other method of increasing the fluoride intake is as efficacious. I underline these matters. We are not called upon, as other tribunals have been, to decide between rival viewpoints as to the merits of fluoridation. Here the merits are not disputed. We can only concern ourselves with the legality of the Respondent's action.

It is at this point that the issues emerge rather more clearly. The Relators while accepting that the evidence establishes that fluoridation should be followed by substantial benefits to dental health, contend that it is ultra vires the Respondent Corporation. They submit that it is not a step in the obtaining or supplying of pure water; it adds to the water a substance which in due course passes into and forms part of the human body; the fluoride is added not for the purposes of purifying the water but with the object of administering, as it were, a medicine; citizens should not be subjected to such "mass medication" except pursuant to express statutory authority given in clear terms, and none of the statutory provisions relied upon by the Respondent give express or implied authority. These submissions are weighty, but I must say immediately that such terms as "mass medication" seem to me to obscure the issue. Particularly do they veil the distinction between the extent of a power, on the one hand, and the motives behind its use, on the other, a distinction which is of particular importance in this present case, for it is not contended by the Relators that there was an improper exercise of an existing power; it is the existence of a sufficiently wide power which is challenged. The former question will usually be determined on considerations of good

faith, considerations which do not bear on the latter. Of course no one disputes that the objective is an improvement in health and that that improvement is sought to be effected by a means by which medicine is often introduced into the human body, that is by adding it to drinking water. Therefore, no doubt some people see fluoridation simply as a medication, but I think it better not to do so; rather one should bear in mind that fluoride is normally present in New Zealand waters and that all that is done, in Lower Hutt at any rate, is to increase the quantity. This distinction seems to me to be basic when one is concerned with the extent of the power Fluoridation does not add a substance that is foreign to the nature or the essence of natural waters: it brings about a change in the concentration of fluoride, but it still leaves that concentration at an extremely low figure. The amount added, as I have said, is minute. True, according to the evidence, the water is wholesome and potable before the addition of the fluoride; but after the fluoride is added it is still wholesome and potable, and, what is the important feature, it is still pure water in the sense in which I have interpreted that term. Nothing which has been done to it has rendered it impure. It is not water plus some foreign substance in material quantity; it can reasonably be said to be water alone, readjusted, no doubt, but still water. Incidentally, it is better water, for it then discharges in a better manner the purposes for which water is commonly used in communities such as Lower Hutt. From all this it seems to me to follow - if one adopts the liberal approach which the cases show must be adopted - that the power to fluoridate is one which can reasonably be said to be incidental to the power to supply a water which is suitable to discharge the tasks which water usually discharges in the human body. "Those things which are incident to, and may reasonably and properly be done under the main purpose, though they may not be literally within it, would not be prohibited." Lord Blackburn in Attorney-General v. Great Eastern Railway Company (supra) 481. Taking a liberal view, then, I think it is possible to say that though fluoridation may not be literally authorised by the words of the section, yet because it results in a water which brings to the inhabitants of the district a required element which is normally and best conveyed to humans through a water supply, it can be seen as an act reasonably and properly performed in the prosecution of the main purpose.

As I have already pointed out, sodium silico-fluoride is not the only chemical added to the water by the Respondent Corporation. Chlorine and lime are also added, the former to combat bacterial contamination and the latter to neutralise acid action.

This is quite frequently done in New Zealand water supply systems. These additions are said by the Relators to be justifiable as acts of purification, whereas the addition of sodium silico-fluoride is characterised as a step making the water less pure because it adds a substance to it. This explanation does not convince me; first because it implies that purification is the sole test of what can be done, when I think it is not; and secondly because I am not satisfied that the facts sufficiently clearly establish the distinction sought to be drawn. I would agree that if "pure water" meant chemically pure, then the test to be applied to any form of treatment would be whether that treatment is a step in purification; but that, it is accepted, cannot be the meaning. If the meaning is what I have suggested it to be, then the test is whether the action of the council promotes the supply of water suitable for the purposes for which water is normally supplied in like communities. That is a very different test. Now as to the addition of chlorine, the only evidence relating to the bacterial condition of the water is that of Mr. Pierard, the Relators' own witness, whose investigations told him that, when taken from the bores, it was free from colon bacilli and was within the limits of potability. That being so, whether chlorination can correctly be termed a step in purification, I have not sufficient technical knowledge to say, and it may be that some distinction requires to be made between chlorination for the purpose of eliminating impurities and chlorination as a preventative against possible later contamination. However, as far as the addition of lime is concerned, the situation is much clearer. Lime is added to counteract acids, and the two important purposes for that are to make the water softer, and therefore more suitable for household use, and, then, more importantly perhaps, to prevent corrosion of the iron pipes through which the water is conveyed in the Lower Hutt area, corrosion which destroys the pipes and leads to contamination of the water. Now, I have grave doubts whether the addition of lime can strictly be said to be a step in purification. In any event - and in this respect it is similar to fluoride - it does add a foreign substance, some of which at least remains in the water and passes into the body of the consumer; it is incorporated into the bone structure. But, be all this as it may, I think that these distinctions between the use of the various chemicals are all rather strained and unreal. I see all three as being added for the same general purpose, namely, the improvement of the quality of the water, or to put it another way, enabling it the better to achieve the purposes of normal domestic water.

Another argument advanced against the view which I have taken, is that if the Respondent is permitted to add fluoride, it can then

add any other substance which it honestly considers beneficial. That does not follow at all. I have been at pains to point out that fluoride is normally found present in water, and that the increasing of the concentration does not really amount to adding something foreign. Whether some other substance can be added must be determined separately in each case In Attorney-General v. Crayford Urban District Council (supra) the Court was concerned with a challenge to the power of a corporation to enter into an arrangement with an insurance company for the collective insurance of its tenants household goods, personal effects, fixtures and fittings. To the submission that, if the council could do that there could be no reasonable limits to what it could do in the way of insurance, Donovan L. J. said, at p. 592:

> "It is objected, however, that this is an intrusion into the private lives of the tenants, and it is said that if the local authority can do this, why should it not also encourage and assist its tenants in the same way to insure against every vicissitude of life which might affect a tenant's financial stability? Whatever answer one returns to that question would not, in my view, be decisive of this case, where on the evidence the risk insured against closely affects the productiveness of the houses. There may be other cases where the possible effect on rent is too remote. Any such case must be left to be dealt with if and when it arises."

We should, I think, take the same attitude in relation to the parallel argument of the Relators in this case. Here we are concerned with the addition of one particular chemical. There may be other cases where the addition of a chemical cannot fairly be said to fall within a corporation's powers; but any such case must be left to be dealt with if and when it arises.

I am not overlooking that in the Municipality of Metropolitan Toronto v. Forest Hill (1957) 9 D. L. R. (2d) 113 the Supreme Court of Canada, by a majority of three to two, took the view that fluoridation was, in effect, a medication and was not authorised by a statute which obliged the Municipality of Toronto to provide "a continued and abundant supply of pure and wholesome water". Nor do I seek to minimise the authority of that decision by stressing the difference in language between our s. 240 and the section there under review. Indeed, I think that if I were to accept the same approach to interpretation as did the majority in that Court, I would in all probability reach a conclusion on s. 240 adverse to fluoridation. But I confess frankly that, like the learned President

of this Court, I prefer the approach of the two Canadian Judges who dissented. Much the same viewpoint as they and I favour seems to have influenced a great number of decisions of superior State Courts in the United States of America in which the right to fluoridate has been supported against a variety of attacks on constitutional, religious and other grounds. A number of these decisions are referred to in the judgment appealed from. In those cases, too, the language is often different from that employed in our statute and the decisions are complicated by issues of a constitutional character. Nevertheless, it does seem that widely in the United States the interpretation brought to the language of powers of local bodies is a liberal one. See in particular Dowell v. City of Tulsa (1954) 273 P. 2d 859, 43 ALR2d 445, and Wilson v. Council Bluffs (Iowa) 110 NW2d 567, and Readey v. St. Louis County Water Co. (Mo) 252 SW2d 622. However, though such Canadian and United States decisions are persuasive of one view or the other, they do not, of course, bind us. We are concerned with a New Zealand statute, which must be applied in the light of conditions and ways of life current in this country.

As, in my view, the proper interpretation to put upon s. 240 is that it impliedly authorises the fluoridation of the water supply, I have no need to go on to enquire whether s. 288 of the same Act, or s. 23 of the Health Act, also avail the Respondent.

I would dismiss the appeal with the usual consequences.

No. 19

IN THE COURT OF APPEAL OF NEW ZEALAND
No. 19
FORMAL JUDGMENT OF COURT OF APPEAL

13TH DECEMBER, 1963.

FORMAL JUDGMENT OF COURT OF APPEAL

BEFORE:

THE HONOURABLE MR. JUSTICE NORTH, PRESIDENT

THE HONOURABLE MR. JUSTICE TURNER

THE HONOURABLE MR. JUSTICE McCARTHY

FRIDAY THE 13TH DAY OF DECEMBER, 1963.

THIS Appeal coming on for hearing on the 4th and 5th days of November 1963 AND UPON HEARING Mr. G. P. Barton and Mr. M. Hardie Boys of Counsel for the Appellant and Mr. R. K. Davison Q. C. and Mr. D. L. Mathieson of Counsel for the Respondent THIS COURT DOTH ORDER that the Appeal be and the same is hereby dismissed with costs to the Respondent on the highest scale together with an allowance of twenty guineas for one extra day, and an allowance of ten guineas for each of two days for second counsel, being in all the sum of £117. 0. 0 together with Respondent's disbursements £7.7.0, making a total of £124. 7. 0.

By the Court,

"G. J. Grace"
DEPUTY REGISTRAR.

No. 20

IN THE COURT OF APPEAL OF NEW ZEALAND
No. 20
ORDER OF COURT OF APPEAL GIVING FINAL LEAVE TO APPEAL TO HER MAJESTY IN COUNCIL
- 4 MAY 1964

ORDER OF COURT OF APPEAL GIVING FINAL LEAVE TO APPEAL TO HER MAJESTY IN COUNCIL

BEFORE

THE HONOURABLE MR. JUSTICE NORTH, PRESIDENT.
THE HONOURABLE MR. JUSTICE TURNER.
THE HONOURABLE MR. JUSTICE HUTCHISON.

UPON READING the Notice of Motion filed herein and the Affidavit of John Oswald Upton sworn and filed in support thereof AND UPON HEARING Mr. Hardie Boys of Counsel for the Appellant and Mr. Mathieson of Counsel for the Respondent THIS COURT DOTH ORDER that the Appellant do have final leave to appeal to Her Majesty in Council from the Judgment of this Honourable Court pronounced herein on the 13th day of December 1963.

By the Court,
G. J. GRACE
Deputy Registrar

L. S.

EXHIBIT
REPORT OF THE COMMISSION OF ENQUIRY ON THE FLUORIDATION OF PUBLIC WATER SUPPLIES (1957)
EXTRACTS REFERRED TO BY DEFENDANT'S WITNESSES

PART II

REPORT OF THE COMMISSION OF ENQUIRY ON THE FLUORIDATION OF PUBLIC WATER SUPPLIES (1957)

EXTRACTS REFERRED TO BY DEFENDANT'S WITNESSES

Page 148, paragraph 536:

"THE DENTAL HEALTH PROBLEM IN NEW ZEALAND -

(1) Virtually every child born in New Zealand experiences dental decay and, in consequence, an unduly high proportion of the population over the age of 21 years uses some form of denture.

(2) Sustained efforts over many years by both the Department of Health and the dental profession to introduce improved dietary habits have been ineffective. At the present time there is no hope of any programme of dental health education achieving a significant beneficial effect.

(3) The problem of controlling the rate of dental decay is beyond the resources of the dental services in this country.

(4) The filling of teeth is not a preventive measure, but merely a means of treating decay.

(5) The incidence of dental decay in New Zealand is so widespread and severe that it constitutes a major problem in public health and is a matter for grave concern."

Page 148, paragraph 537:

"THE RELATION OF FLUORIDE TO DENTAL HEALTH -

(1) Fluoride is a natural component of all teeth and by hardening their mineral structure it makes them more resistant to dissolution by acids.

(2) In New Zealand the fluoride content of potable waters is considerably below 1 ppm.

(3) In areas where there is fluoride in drinking waters at optimum concentrations, whether naturally present or artificially added, the prevalence of dental decay in children is at least 50 per cent lower than in areas where the fluoride content is 0.2 ppm or less. In the higher fluoride areas about one-third of all children escape dental decay entirely and the beneficial effects continue into adult life.

(4) There is no evidence that the consumption of fluoridated water would do harm to the pulp of the teeth or to the tissues which surround and support them.

(5) The regular ingestion of a substantial excess of fluoride (more than 1.9 ppm) in the drinking water may cause dental fluorosis. This in only one type of mottled enamel. Other

EXHIBIT

REPORT OF THE COMMISSION OF ENQUIRY ON THE FLUORIDATION OF PUBLIC WATER SUPPLIES

EXTRACTS REFERRED TO BY DEFENDANT'S WITNESSES

(CONTINUED)

enamel defects unrelated to fluoride are common. Enamel defects can develop only during the years of childhood.

(6) When the drinking water contains 1 ppm fluoride, or slightly more, the incidence of dental fluorosis has no significance.

(7) As the result of painstaking and thorough scientific observations conducted over a period of at least 40 years, there is a rational basis for the proposal to add fluoride to public water supplies in which this trace element may be deficient."

Page 149, paragraph 539:

"THE NATURE OF FLUORINE - (1) The element fluorine does not occur in a free state in nature and has no relevance to the fluoridation process.

(2) The process is aimed at increasing the concentration of fluoride ions in water supplies, and those ions do not possess the properties of fluorine in its free elementary state.

(3) Excepting radioactive fluoride, which is not relevant, all fluoride ions are alike and, irrespective of their source, do exactly the same things in both a chemical and a biochemical sense.

(4) Organic compounds of fluorine are extremely stable and do not dissociate to give fluoride ions in aqueous solution.

(5) No distinction can be drawn between the fluoride naturally in water and the fluoride proposed to be added to it by the fluoridation process."

Page 149, paragraph 540:

"THE INGESTION OF FLUORIDE - (1) Fluoride is a normal constituent of human diet and, in fact, no diet is completely devoid of this element.

(2) The principal source of fluoride is water in all normal circumstances.

(3) Fluoride is a normal constituent of the bony structure of the body and of teeth.

(4) It is absorbed easily but, since most of the fluoride absorbed is readily excreted by the kidney, and the residue deposited in bones, it does not accumulate in soft tissues or impair the activity of enzyme systems.

(5) Storage in the bones is a reversible process, although it is likely that some retention occurs at all levels of intake."

Page 149, paragraph 541:

"THE TOXICITY OF FLUORIDE - (1) Fluoride is beneficial

in proper amounts and the optimum level in drinking water can be established with certainty.

(2) In common with all foods, including pure water, it can become harmful in substantial excess.

(3) Acute poisoning could be produced only by such a great excess that the possibility becomes irrelevant in relation to the fluoridation of water.

(4) In the proposal to fluoridate water there is no risk of chronic fluoride poisoning.

(5) The suggestion that fluoride is an enzyme poison has no relevance to fluoridated water.

(6) The implication contained in certain anti-fluoridation literature that fluoridation involves the use of a substance with properties similar to certain deadly organic compounds of fluorine is absurd and entirely misleading."

Page 149, paragraph 542:

"Fluoridated water does not cause or aggravate any of the following disorders:

(1) Disorders of the brain and nervous system, disorders of the special senses, and disorders of the mind.
(2) Disorders of the heart and blood vessels.
(3) Disorders of the kidney and urinary tract.
(4) Cancer.
(5) Diabetes or disorders of the thyroid gland.
(6) Disorders of the gastro-entestinal tract and the liver.
(7) Disorders of pregnancy and labour or developmental defects in children.
(8) Disorders of bones, joints, and the bone marrow.
(9) Irritation of the eyes or irritation of mucous membranes."

Page 150, paragraph 544:

"GENERAL CONCLUSIONS CONCERNING THE RELATION OF FLUORIDE TO HEALTH - (1) The process of fluoridation does not add a substance that is foreign to the water but merely brings about a slight change in the concentration of the fluoride already present naturally in that water.

(2) No diet is devoid of fluoride, and water is the normal vehicle for conveying this substance to the body.

(3) Flouride is a normal constituent of bones and teeth.

(4) Fluouride is a nutrient and is beneficial in proper amounts. In common with many other foodstuffs it has adverse effects on the body when ingested in excess.

(5) In the proposal to fluoridate public water supplies there

EXHIBIT

REPORT OF THE COMMISSION OF ENQUIRY ON THE FLUORIDATION OF PUBLIC WATER SUPPLIES

EXTRACTS REFERRED TO BY DEFENDANT'S WITNESSES (CONTINUED)

is no risk of excessive ingestion; there is no risk of chronic fluoride poisoning; and the possibility of acute poisoning can be disregarded entirely.

(6) No harmful effects on health will follow the fluoridation of water supplies whether in respect of the complaints specifically made before us or otherwise."

Page 151, paragraph 546:

"(1) The food alternatives suggested are not practicable as vehicles for fluoride as they do not permit a low optimum concentration of the substance.

(2) Humans naturally obtain the greater part of their dietary fluoride in water which is universally consumed.

(3) Because the consumption of water is regulated by physiological need the ingestion of fluoride by this means is self-limiting.

(4) The efficacy of fluoridation as a public health measure is proven.

(5) No alternative suggested would be effective as a public health measure.

(6) There is no practicable method of adjusting the daily intake of fluoride other than by addition of that substance to public water supplies."

CERTIFICATE OF REGISTRAR OF COURT OF APPEAL AS TO ACCURACY OF RECORD

I, GERALD RONALD HOLDER, Registrar of the Court of Appeal of New Zealand, DO HEREBY CERTIFY that the foregoing 76 pages of printed matter contain true and correct copies of all the proceedings, evidence, judgments, decrees and orders had or made in the above matter, so far as the same have relation to the matters of appeal, and also correct copies of the reasons given by the Judges of the Court of Appeal of New Zealand in delivering judgment therein, such reasons having been given in writing: AND I DO FURTHER CERTIFY that the Appellant has taken all the necessary steps for the purpose of procuring the preparation of the record, and the despatch thereof to England, and has done all other acts, matters and things entitling the said Appellant to prosecute this Appeal.

AS WITNESS my hand and Seal of the Court of Appeal of New Zealand this - 5 day of May 1964.

L.S.

G. R. HOLDER
REGISTRAR.

In the Privy Council.

No. 25 of 1964

ON APPEAL FROM THE COURT OF APPEAL OF NEW ZEALAND

BETWEEN

HER MAJESTY'S ATTORNEY-GENERAL FOR NEW ZEALAND on the relation of ROBERT RICHARD LEWIS and ERIC BERNARD ELLIOTT — Appellant

AND

THE MAYOR, COUNCILLORS AND CITIZENS of THE CITY of LOWER HUTT — Respondent

RECORD OF PROCEEDINGS

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PRINTED BY EVERARD PRESS, WELLINGTON, NEW ZEALAND.