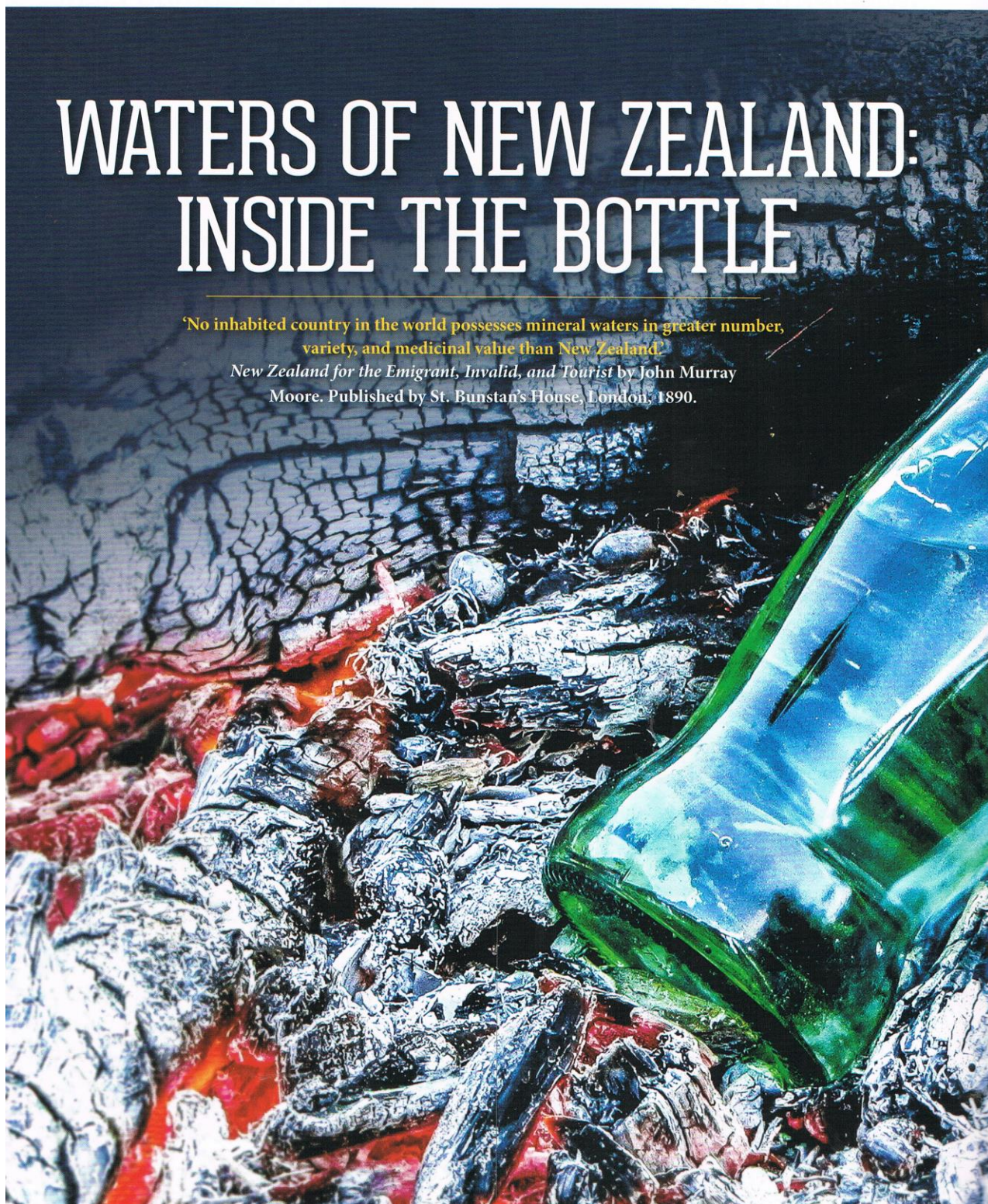


WATERS OF NEW ZEALAND: INSIDE THE BOTTLE

'No inhabited country in the world possesses mineral waters in greater number, variety, and medicinal value than New Zealand.'

New Zealand for the Emigrant, Invalid, and Tourist by John Murray Moore. Published by St. Bunstan's House, London, 1890.





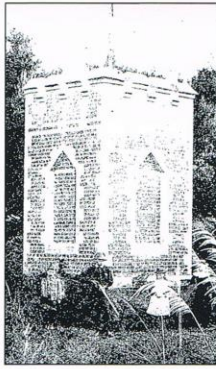
facebook.com/nztoday nztoday.co.nz

Some time ago, I was buying mineral water at a supermarket in Wellington. Next to me, a woman was choosing water to buy, and I asked her to what she paid the most attention when making a purchase. She said first of all, it was the price, and also its appearance. After this conversation, I thought to myself: what do consumers really know about bottled water, and how to make the best choice when selecting one?

Waters from underground sources are attributed with having miraculous power. Extracted from underground, mineral water is rich in minerals and trace elements, as well as providing energy that the body receives as a result of its consumption. Dr Linus Pauling, the two-time Nobel Laureate, once said: "Every sickness, every disease, every ailment can be traced to a mineral deficiency."

An international study carried out in 2002 spanning 122 countries, found that New Zealand's water quality was amongst the three best in the world. The country's annual water stock is more than 80,000 cubic metres per person, which is several times higher than the average world level. New Zealand has abundant water resources in snowfields, glaciers, rivers, lakes, and underground aquifers. The national groundwater resources are extremely valuable and are estimated by experts to be about \$NZ8 billion in value. The uniqueness of our groundwater is not only based on a specific set of components in its natural mineral form, but also because of the unique geological structure of the major aquifers – the birth place of the major brands of New Zealand bottled water. It is estimated that 80 per cent of New Zealand's total water is stored as groundwater in aquifers containing a great deal of water (about 615 billion cubic metres). These aquifers are the source of drinking water for about 40 per cent of New Zealand's population, and of irrigation water for about 200,000 hectares of land.

Historical records report that the countries first aerated waters started to be produced at Alexander Wilkie's plant in Auckland in 1845. But the bottled water industry in New Zealand really began with the establishment of factories by the colonists in the Otago region at the beginning of the 1860s. The pioneers were Jacob Levien, John Brown Binley, Lane & Co, Reeves & Co, Thomson & Co, and several others. The industry developed rapidly, and by the early 1870s, factories for the production of bottled mineral water were established in many parts of the country. For example, the Thomson factory that was developed in 1862 quickly expanded its business throughout New Zealand. It had branches in Napier, Invercargill and Wellington. During its 20 years of business, Thomson mineral water won 27 gold medals at prestigious international competitions which were held all over the world, including Australia, the USA, England and New Zealand.



The tower over the principal spring. *Otago Witness*, 12 December 1900. By kind permission of the Alexander Turnbull Library, Wellington

Bottlers of water were competing with each other on who had better factories and production technology. For example, the Hartley & Co plant in Auckland was a building made with red bricks, giving it a unique character. The most modern equipment, which was brought from London (bottling machines with advanced filters, corks, steam pumps), allowed them to produce 50 bottles an hour with water from a spring in the yard of the plant.

Towers were erected above the water sources to protect the waters from pollution, like the one which was set over the North Taieri mineral springs near Dunedin by Thomson & Co. The main well was enclosed with a red brick tower and a particularly attractive castellated roof, the architecture of which was the

same as during the Tudor period.

The small factories had the capacity to produce no more than 40-60 bottles per hour, but on the plus side, the bottles were corked and wired, and water quality was assessed in company laboratories. It is evident that right at the start of this business, producers really fought for the quality of their production and carried out experiments with ingredients to create different types of mineral water.



View of Thomson & Co building used for processing mineral spring water, their specialty Wai-Rongoa mineral water at North Taieri. Photograph taken by Albert Percy Godber in 1926. By kind permission of the Alexander Turnbull Library, Wellington

To carry out this work, companies employed highly skilled specialists. The famous New Zealand Mineral Springs company at Whangarei employed two chemists with good qualifications from England, to work in the science branch of the company.

Production expanded and technology was continuously improved to meet the high demands

of the market. During the 1870s mineral water started to increase in popularity not only in the colony, but also in the mother country. To meet the demand, producers imported from London production machines for bottling water, which had the capacity to produce up to 12,000 bottles a day. Two examples of such companies were Foster's Water Factory in Whanganui and Dixon's factory in Wellington. The range of types of water also increased to include sparkling and still water of various flavours.

Unique domestic brands appeared which became very popular and famous, for example Wai-Rongoa, Waiwera Seltzer, Puriri, and Te Aroha.

The very-well known brand Wai-Rongoa (translated as 'medicine water' from Māori) was a trade mark of a perfectly natural mineral water, which was 'charged' with its own gas at Taieri mineral springs in Dunedin to become sparkling. It continued in production for 80 years (from 1860s to 1939). For many years, Wai-Rongoa was sold as medicine.

Its producer, Alexander Thomson, organised its trade through druggists and supplied them with mineral water in siphons as well as in ordinary bottles.

In the 1890s, the New Zealand Medical Journal reported that Wai-Rongoa water was medically approved and "as an antacid and diuretic it would be beneficial in certain cases of dyspepsia and in gouty or rheumatic manifestations, and it should prove of value to those suffering from anaemia and debility." Public health authorities officially recognised the medical qualities of this water and wrote in 1916 that Wai-Rongoa can lead to lessening "constipation and kidney troubles, and will keep you fit and well. The glass of water is very important, as it clears the system and prevents the contents of the bowels from becoming hard and brick-like. Not only is Wai-Rongoa a delicious drink in itself, but it possesses highly beneficial qualities in a natural state."

Public and expert opinion was so high that Wai-Rongoa water was recognised as the finest table water in Australasia in the early 1900s. "Its purity, delicacy, and fresh clean taste make Wai-Rongoa the finest table water ever discovered in Australasia" – wrote one newspaper at the time.

Another well-known brand – Waiwera Seltzer began to be produced in the small village of Waiwera, in 1875. Highly mineralised Waiwera water was taken right from a gushing water source found underground, and was named as Te Rata, meaning 'doctor' in Māori. Te Rata was poured into heavy bottles, which were made by hand from green glass and had an original 'torpedo' design. Waiwera water is one of the 'pre-historic' waters of New Zealand; its age, as shown by modern laboratory tests, is around 15,000 years old. Te Rata originally appeared in deep geothermal underground aquifers, formed by geological processes about 25 million years ago. 'The Elixir of Life' was this water's first trademark, given for its extraordinary qualities. The unique properties of this water were known well outside of New Zealand. And despite the significant time it took for its transportation – about three or more months for cargo shipments – the water was regularly exported to Europe.



Waiwera Seltzer bottle and Waiwera bottle today



Campbell & Ehrenfried Company Ltd. Puriri natural mineral water [1902]. By kind permission of the Alexander Turnbull Library, Wellington

Puriri natural mineral water was sourced from mineral springs on a farm in Puriri. The name means 'mountain range' in Māori. It was found near Thames and was produced by Campbell & Ehrenfried from the 1870s. One of the company owners was Sir John Logan Campbell, who immigrated to New Zealand in 1840. He was only 24 years old when he started creating the company's business empire. The Government's annual reports (in 1879) wrote the following about the Puriri natural mineral waters: "This is a very interesting water, and is shown to be similar to several of the famous Continental mineral

waters, for example, that from Vichy in France, and Fachingen in Nassau, both of which are largely used in medicine.”

The Puriri Springs were found to be practically inexhaustible by the Government which spoke very highly on these mineral waters, and the *New Zealand Official Year Book* for 1894 described them thus: “A cold effervescent water, having valuable properties and are coming into repute as an antilithic aperient, and would probably be useful in cases of acid dyspepsia and in disorders of the kidney and bladder.”

The bottles containing Puriri water were of three types – Puriri emerald green seltzer, Puriri mineral water clay bottles, and 10oz and 20oz olive green cork top Puriri natural mineral water. Over a quarter of a million bottles were sold every year prior to the start of the 20th century in New Zealand, and the increasing demand both in the country and in the Australian colonies showed that Puriri was appreciated by the public. For many years, the results of the water analysis carried out by a government analyst, were printed on the label of every bottle. In 1872, an annual National Bottle Show Best Bottle competition was started. It is interesting to note that in the history of this competition, only Puriri mineral water stoneware bottle was twice recognized as the best.

Another well-known brand was Te Aroha, which was produced in a steam mineral water factory from 1883, in Te Aroha, – the name which translates as ‘place of love’. After a few years, it was already being exhibited at the Colonial & Indian Exhibition in London and in 1887 it won a commemorative medal. The mineral and curative spring waters of Te Aroha were recommended to everyone who suffered indigestion, liver problems and other organic diseases. The Te Aroha waters were shipped in large quantities to different parts of New Zealand until the mid 1960s. The bottles were small and large, and each had its very own pretty label.

The government sought to disseminate knowledge about the sources of mineral water and bottled water among the public. National guidelines were developed for testing the quality of water produced and regulations required that manufacturers regularly forward water samples for analysis to the government bacteriologist at the Department of Agriculture, who wrote

reports on the quality of bottled water production, which were regularly published in the *Annual Report on the Colonial Museum and Laboratory*. The reports also mentioned the water’s benefits for certain blood ailments, diseases in blood-forming organs and certain constitutional diseases.

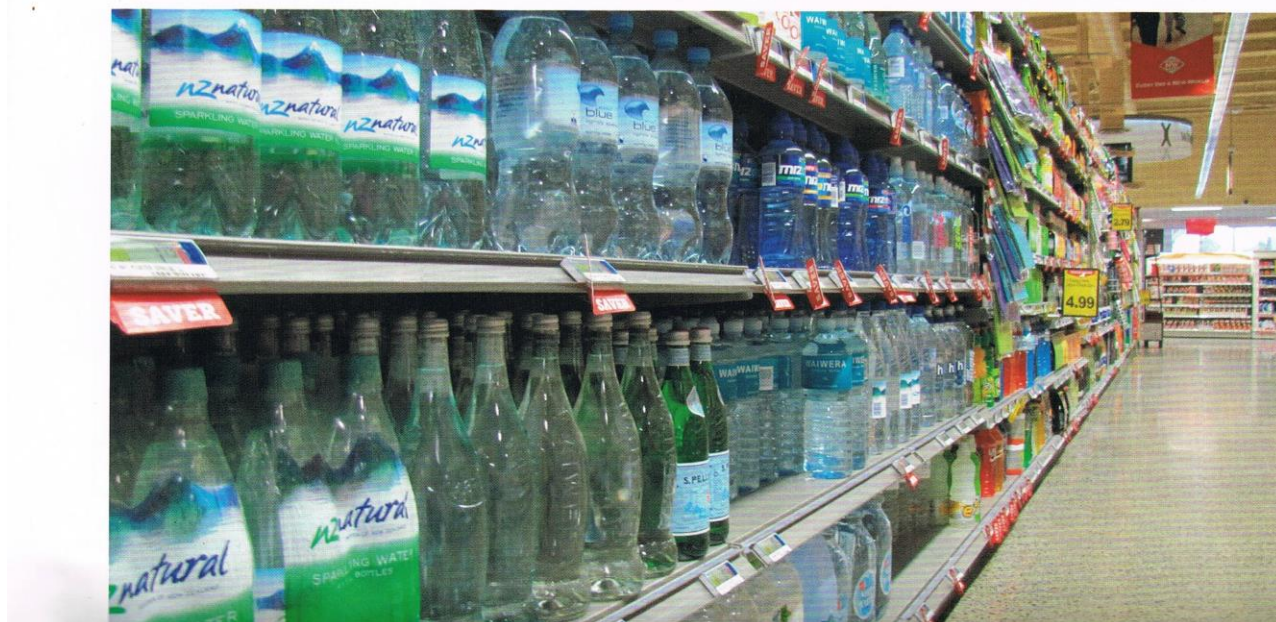
During the 1870s and 1880s, the lack of bottles became a serious matter in New Zealand, as the country didn’t have a big glassworks until 1899. Glass bottles were imported from Australia and even far away England. Because of the constant shortage of bottles there were some ‘glass wars’ until the end of the 19th century. This matter even reached court proceedings, where producers of mineral water demanded the return of “their” empty glass bottles from others, considering them as their own property and claiming rights to them.

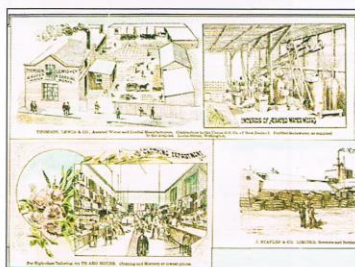
In a case before a Stipendiary Magistrate in Wellington in 1900, a judgement was made in which a mineral water manufacturing firm claimed the return of bottles, which were in possession of a storekeeper. The court held that “the bottles were the property of the issuers, and could not honestly be acquired by another person, except with their consent.” There were many cases like this, and the used-up bottles were long considered to be the property of their manufacturers.

Fortunately by the end of 1880s the most brilliant crystallized sand was discovered in inexhaustible quantities at Exhibition Bay near Auckland, and in Island Bay and Scorching Bay in Wellington. It was analysed and found to be very suitable for producing the finest table water bottles and for making light green and dispensable bottles. This sand helped to create the Colony’s own glass industry.



Campbell & Ehrenfried Co Ltd. A merry Christmas & a happy New Year to us all. Puriri natural mineral water. [1903]. By kind permission of the Alexander Turnbull Library, Wellington





Thomson, Lewis & Co Aerated Water and Cordial Manufacturers. [Thomson, Lewis & Co., Te Aro House. 1895]. In the late 1800s most New Zealand towns had an aerated water factory. By kind permission of the Alexander Turnbull Library, Wellington

When the Colonial Glassware Company founded a factory in Wellington at the end of the 1890s, the industry completely absorbed its glass bottle production.

At the end of the 19th century, the Aerated Water Employee's Union was established for the purpose of allowing the producers to merge together for a more effective production of water. At the start of the

20th century, the country already had 164 aerated water factories, with about 115,000 employees. At this time, New Zealand's mineral water was becoming popular in many countries of the world. In 1913, premium Wai-Rongoa water won 25 gold medals and was awarded 31 first-class certificates in open competition between all the countries in the world, as judged by the British. The water brand was so popular in New Zealand, that it was available at every hotel and shop in the country.

Mineral water was valued extremely highly on the world market. In 1903, New Zealand newspapers reported the price of one bottled water sold at auction in London: "Twenty-five guineas and a half for a bottle of soda-water is surely a unique price in the history of mineral water, and should make every manufacturer feel proud." At today's currency, this would be about \$NZ60.

In the following decades, until the mid-20th century, water businesses were amalgamated and many plants were closed. Industry development ceased and the production and consumption of bottled water decreased. One of the reasons for this, it seems, is that people became more reliant on town-supplied tap water, and stopped paying attention to nature's mineral water and its

health qualities.

This 'vacuum' however was filled with foreign products. In the 1970s imported products such as Evian, San Pellegrino, Perrier and several other well-known world brands came into the country, which were advertised as premium healthy waters, and were often served at dinners in restaurants to win public popularity.

It took several decades for the New Zealand industry to recover. Today, a little over 20 brands of bottled water are being produced in New Zealand.

Northland is a source of several of the finest mineral water brands in New Zealand today, such as New Zealand Spring Water, Thunder Mountain, Kauri Springs and Waiwera Infinity. Kauri Springs, which originates from a pristine aquifer at Kaiwaka, is appealing to customers domestically and overseas, and is becoming a very popular brand in Japan and Malaysia.

Artesian waters from the Otakiri aquifer in the Bay of Plenty, is the exclusive source of

premium water for a few good brands of mineral water, such as Otakiri Springs, UNZ Water, 1907 Water, and Antipodes. It is probably the deepest, highest-quality water source in New Zealand, being about 300 metres (1000 feet) deep.

The UNZ Water and 1907 Water are bottled in Paeroa where there is a source of 'prehistoric' mineral waters. These are about 50,000 years old, which is hundreds of times older than the most exclusive Cognac in the world!

In the same place at the start of the last century another fine New Zealand premier brand Paeroa was developed by the Grey & Menzies Company.

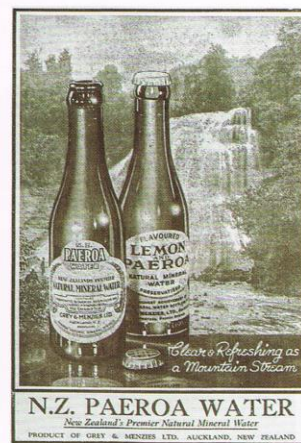
The world-known Antipodes has received numerous international water-testing awards and medals for the water's overall quality, including appearance, aroma, taste, mouth



Grey & Menzies Ltd. Known for the famous 'Lemon & Paeroa' drink. Thames NZ: Genealogy & History Resources



Natural mineral water is gashing from a geothermal underground source



Poster: N.Z. Paeroa Water New Zealand's Premier Natural Mineral Water. Product of Grey & Menzies Ltd. By kind permission of the 'Sir George Grey Special Collections, Auckland Libraries'

feel and aftertaste, and now is distributed in several continents. This brand became one of the symbols of modern New Zealand.

The Blue Spring at Putaruru in the Waikato is another unique aquifer, and is one of the sources for many mineral-water bottled brands, such as SOH2O – Blue Spring, Te Waihou (means ‘new water’ in Māori), Kiwaii, and several others.

The Blue Spring is an abundant (i.e. renewable) source of water, averaging more than 700 litres per second, or more than 60 million litres every day, all year round. The water gushes from the aquifer which is about 300 metres beneath a forest in a protected natural reserve. The crystal water is one of the purest springs in the world, and its crystal blue appearance is a result of that purity. The water is naturally filtered through layers of sand and volcanic rock. Putaruru, with a population of about 3700 people, is the unofficial capital of the bottled water industry in New Zealand – about 65 per cent of bottled water products are produced there.

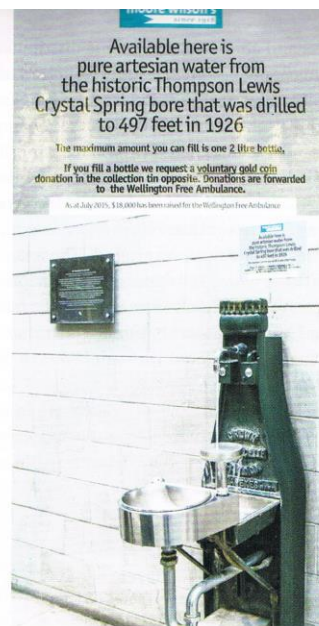
The Southern Alps are the origin of the most remarkable bottled-

water brands, such as Waimak (meaning ‘cold water’ in Māori), 420 Volcanic and several others – it is difficult to even count them all! 420 Volcanic has been sourced from over 200 meters below the ground from the Tai Pau spring through an extinct volcano at the foothills of Bank Peninsula, and has already gained prominent international attention. The brand has won numerous prestigious awards internationally.

The bottled water industry is the most dynamic beverage industry in the world and has literally created its own water culture. Bottled water sales have rocketed since the 1990s with annual growth of eight to nine per cent – about twice as fast as other beverages. The global bottled water market reached a volume of about 230 billion litres (valued at \$US180 billion), an increase of about 60 per cent since 2000, and is expected to be worth \$US220 billion by 2020.

There are more than 500 worldwide bottled water brands today. The top five global exporting countries are France, Italy, Belgium, USA and Germany, which produce about 350 brands of bottled





The historic Thomson Lewis Crystal Spring at Moore Wilson's, Wellington

NEW ZEALAND'S SHARE OF WORLD EXPORTS OF BOTTLED WATER IS 30 BILLION LITRES, REPRESENTING ABOUT 0.06 PER CENT OF THE GLOBAL MARKET. DOMESTICALLY WE CONSUME 50-60 MILLION LITRES OF BOTTLED WATER PER YEAR, WORTH AROUND \$US80 MILLION ANNUALLY

water – about 70 per cent of the produced bottled water in the world. New Zealand's share of world exports of bottled water is 30 billion litres, representing about 0.06 per cent of the global market. Domestically we consume 50-60 million litres of bottled water per year, worth around \$US80 million annually.

Virtually all countries that produce and import bottled water have their own regulations for natural mineral water, spring water and bottled drinking water. Others have adopted international quality standards for bottled water, such as the World Health Organisation/Food and Agriculture Organisation CODEX Alimentarius regulations for natural mineral waters, and the standards for bottled/packaged drinking water jointly developed by WHO and the UN's Food and Agricultural Organisation (FAO).

In New Zealand we don't have our own regulations for bottled water. We do have a microbiological quality compliance criteria for bottled water sold in retail stores, the Ministry of Health's Microbiological Reference Criteria for Food (the water is also defined as 'food') which came into being in 1995, and the Australia-New Zealand Food Standards Code 2002 for bottled water manufacture. But, it is important to know that there are other key criteria such as chemical, physical and radiological. The full analysis of the drinking water's quality is based on more than 100 odd elements (or determinands) found in the water, 50 of which have critical health-significant impacts. Apart from microbiological determinants – which by the way are just two (*E.coli* and pathogenic protozoa) – there are others such as heavy metals, pesticides, toxins and several other hazardous substances.

Standards for municipal tap water do exist in New Zealand but using them for bottled water products is not a correct procedure.

I made a comparative analysis of the standards and requirements for imported bottled drinking water for over twenty countries, and found that our New Zealand municipal tap water standards are considerably 'softer' in comparison with the WHO/FAO CODEX regulations, and the requirements for imported bottled water of these countries.

So, what is better: to assess the quality of our own and imported bottled water products on the basis of our 'soft' standards for municipal drinking water, or to make the assessment on the basis of 'hard' international standards, such as the requirements of the WHO/FAO CODEX?

If the assessment of water imported into our country is made using New Zealand's 'soft' tap water standards, then for our producers, this is most likely not beneficial, because import requirements for foreign water will be less severe than the requirements of more 'hard' international standards (the CODEX Alimentarius international standards). As a result, because of these 'soft' standards, it will be easier for foreign water to gain access to our domestic market.

If our producers of bottled water want to sell their products overseas – and conquer the international markets – then they need to apply considerable means to bring the quality of their products up to the 'hard' international standards and requirements of those markets. Understandably, this kind of 'polishing' and 'perfection' of our water requires a lot of extra money and energy, which in turn raises the price of the finished product. But all this extra work will actually pay off, because more and more countries are looking for clean water spring sources, and the demand for premium quality water is rising.

The key factors influencing the bottled water market these days

are exclusivity, health and wellness. The current major trend in bottled water is premiumisation – that is, brand exclusivity. Experts predict an increasing demand for premium quality bottled water from trusted sources.

Once it was considered quite a disadvantage to freight bottled water over long distances but this is no longer the case. Buyers are ready to buy water from the furthest regions of the world, if it is top quality.

The world's top bottled water companies with their famous brands consider these factors in their marketing campaigns, and market their products as those which come from unspoiled and untouched pure exotic springs found at the edge of the world.

For example, Kona Niagari water – which is sold in Japan at \$NZ500 per 750 ml – is actually collected from 600 metres below the surface of the Pacific Ocean just off Hawaii. Or the AquaDeco brand, which was a gold medal winner in 2007 as the world's best non-carbonated spring water, is sourced from unspoiled and untouched springs in Canada. Another example is Lauquen Artes Mineral Water, which is sourced from an aquifer with a depth of 500 metres located in a remote part of the Andes Mountains.

Most drinking water sources today have been damaged by pollution or human intervention, and clean water on the planet is becoming increasingly a problem. In today's world, with its growing demand for clean natural water, it's very relevant to access clean water sources that are not contaminated by the destructive activities of civilization. New Zealand artesian waters provide just such access and guarantees.

The country's major aquifers in both the North and South Islands belong to a 'deep system' and originate from depths of up to 300 metres, which have been protected from all risks of human pollution. In some places in New Zealand, mineral springs are the sole remains of past subterranean energy, while in others they exist side by side with tremendously active volcanic forces. Waters contain varied and unique concentrations of minerals and trace elements of therapeutic value.

New Zealand is one of the lowest density populated countries in the world. The population of our country is 110 times smaller than Western Europe (which constitutes 510 million people) and our population density is 17 people per square kilometre. This is 10 to 20 times less than in Western European countries, which



Since 1839 Te Puna Wai Ora – Spring of Life in Lower Hutt, Wellington, has provided a supply of artesian water to the inhabitants of the region

produce the most prestigious bottled water brands.

We are not yet aware of the treasures that our natural mineral waters possess. There are many mineral springs in New Zealand where water is of undoubted therapeutic value. These springs are running to waste while vast quantities of foreign mineral waters (bearing fancy names) are imported from countries far from us! In New Zealand, we find perennial springs yielding supply of waters which chemical analysis shows to be similar to or even of higher quality, than the most celebrated foreign waters.

Even in 1894 the *New Zealand Medical Journal* wrote that: "New Zealand is signally rich in mineral waters, far higher in medicinal value than the great majority of the European waters we see imported into the colony."

This statement was supported by the many international awards won, by our producers, over the span of one hundred years – it is the reality! However, in order to have more success in marketing our water products, their unique qualities and positive health effects need to have some scientific research behind them.

There is a great variety of bottles on the shelves to choose from. They are all great, but if you care about your health – read the label! Ideally, there should be some information about the source of the water, its mineral composition and the health impacts of the water.

An important indicator of water's quality is where the water was bottled. If the water was bottled directly from its source, this means it still contains its original minerals, salts and biological matter – contents that are very important for one's health.

Cheers! ☺

