To ask 'How is water made' is to ask a simple question, yet the answer is quite complex. To answer it, it is necessary to go deep into the forms that surround us, and travel from the reality we all experience and see, into the dynamic world of atoms, sub atomic particles, the Big Bang and electron interaction. An overview of how water is made leads to an interesting conjunction of indigenous views on water and those of the West. This article begins with the scientific view of water.

H2O is an equation even more well known than Einstein's famous e=mc2. Water is indeed the molecule of life. Water is formed by hydrogen – in fact 'hydro gen' means water generator – and Oxygen. Hydrogen is the most abundant element in the universe. Hydrogen accounts for 75% of the mass of the universe, helium comes next with 23% and Oxygen is 1%; all up the three elements account for 99%. That also means water is produced by the atomic mixing of two of the three most abundant elements in the universe.

In the very early moments of the universe, there was basically a molten soup consisting of protons (positively charged particles) and neutrons (whose charge is neutral). The heavy elements of helium, lithium and boron were formed out of the clumping together of protons and neutrons under intense heat pressures. Helium4 has two protons and two neutrons, lithium has three protons and three or four neutrons, and boron11 has five protons and six neutrons. These elements do not have electrons, whereas hydrogen does.

Hydrogen was formed when the universe 'cooled' to a mere 4000C. At that temperature, protons can catch electrons via electro-weak interaction and from that the dance of electrons occurs. This eventually gives rise to the entire table of elements, but in the meantime and importantly for water, hydrogen is created. Hydrogen has a proton and an electron buzzing like bees around a hive: the orbits are actually probabilities of being in a particular location, or travelling with a specific momentum. Some forms of hydrogen have neutrons and these form isotopes of hydrogen. This applies to many elements: Helium4 is an isotope of helium, for example.

So how about water? At the centre of stars four time massive than our sun, at intense temperatures a small amount of carbon will convert Hydrogen to Helium. But in this process inside stars, something special happens: there is a chain reaction in the Hydrogen to Helium process that results in the Carbon-Nitrogen-Oxygen cycle. Stars repeat this process, which results in creating resources of Carbon, Nitrogen and Oxygen for the star. At really high temperatures, the isotopes Oxygen16 and 17 occur which are two of the forms of Oxygen most seen in nature.

Once Oxygen is in the system is it a matter of time for the collision of particles to occur that creates the molecule that is water. This occurs via the electrical interaction of electrons in the outer orbits of the elements. This might seem strange, but then this process is how the entire table of elements is created. In the case of water, the Oxygen connects to the two Hydrogen atoms, and the remaining two pairs of electrons in the orbit of Oxygen give the molecule the shape of a tetrahedron.

H2O is a very special molecule as it has three forms: solid, liquid and gas. As Phillip Ball (the source of much of the preceding information) pointed out, you can fly a Jumbo aircraft through clouds, but you need an icebreaker ship to pass through ice.

Beyond our planet there are vast fields of ice on Neptune, and most comets are chunks of ice compacted with minerals. On our planet, the fact of the matter is that 71% of the surface of Earth is

water. We should perhaps be calling this place Planet Water as that name is closer to the actual state of affairs.

Then within the human body, between 50 and 65% of humans is water. The range is due to the fat content of the body. There is a strong relationship between blood – the main fluid in humans – and the great oceans: they are chemically identical. This explains why in hospitals people are sustained by a saline drip: salt water can be directly fed into the bloodstream. The only difference between sea water and blood is that blood contains red and white corpuscles.

So there you have it: water from the beginning of the universe to the human body. Rather than being some odd exception to a universe set about on other duties, humans are intimately, chemically and atomically part of it. This perhaps explains the importance given to water by indigenous peoples and contrasts, as it happens to the current Western view. The latter is mainly one of thrash (exploit for resources) and trash (dump waste and runoff in it).

This is so predominantly, but not exclusively. For we live in a world where some dairy farmers care about their landscape and use natural methods to ensure the health of water ways. There are consultants in water usage that save millions of litres of water every year, through the wise use of water. Here in Taranaki Aotearoa New Zealand, there is an over supply of water, but through careful use, participation in the abundance of nature is granted. The wise use of water is something that indigenous peoples and Westerners can agree on, as part of the way forward in our relationship with the environment.