

Speaker Summary – 15th March 2021

Nuclear Free (?) New Zealand

"In the beginning there was nothing and on the first day God created light. And there was still nothing, but you could see it much more clearly now."

Old Testament chemistry.

"Great fleas have little fleas upon their backs to bite'm. And little fleas have lesser fleas and so ad infinitum." ~ Augustus Morgan

Our speaker was Dr Gavin Wallace, QSM. Born in Scotland Gavin came early to NZ and has had a distinguished career as a scientist and a stellar career as a volunteer bush firefighter. He has worked in industry and at GNS and is about to receive a Double Gold Star for 50 years for volunteer Bush Fire service. He is also responsible for creating the Bush Fire Historical Museum. Our club was privileged to meet him on an earlier club visit to the Wainui Bush Fire Station.

Gavin's thesis was that to talk of a "nuclear free New Zealand" is simplistic and wrong. To justify this he gave a brief history of the discovery and use of nuclear forces, mentioning;

- How x-rays are electro-magnetic waves - little photons of energy streaming forth
- Rontgen's very first use of nuclear radiation when he x-rayed his wife's hand in 1895
- The demonstration of radio-activity in uranium 1896
- How Madame Curie gave us the term x-ray and won two Nobel Prizes before her death from radioactive poisoning
- How by 1898 several NZ hospitals had x-ray equipment by 1898
- How radiation was used extensively and excessively, leading to the death of many women painting the luminous dials on wrist watches, including in shoe shops until regulations were introduced to control it.

Gavin then explained how the science behind radiation developed. He mentioned how J.J Thompson discovered the electron which led to the discovery of the structure of the atom. How our own Ernest Rutherford "split" the atom, and as a result of his work won a Nobel Prize and is the only NZer to be buried in Westminster Abbey.

Gavin then entered more abstruse territory as he explained atomic theory. All matter is composed of atoms, which comprise a nucleus made up of neutrons and protons surrounded by electrons in orbit around it. All this is on a microscopic scale, but if you think of an atom as the size of a cathedral the nucleus is the size of a tennis ball in the middle.

Gavin then explained atomic numbers, the table of the (90) naturally occurring elements, isotopes stable and radio-active, and DNA. He moved on to consider the practical applications of such knowledge such as nuclear reactors, the promise of nuclear energy to offset global warming (France generates 87% of its electricity by nuclear means and exports its surplus to UK.) He left unstated the issue of global warming and whether NZ should use nuclear reactors to generate electricity with no pollution.

If you have read this far, well done. It is of considerable concern that our bulletin editor suspects that fewer than half our members actually open it, let alone read the Bulletins. If therefore you have read this far, please contact david g – I am avoiding capitals so as not to attract undue attention - asap and you will receive a free glass of wine.

If you would like to read a fuller but simpler explanation of the discovery of nuclear science and present knowledge, read the relevant chapter in Bill Bryson's, "*A Short History of Nearly Everything*" - I can lend you a copy.