

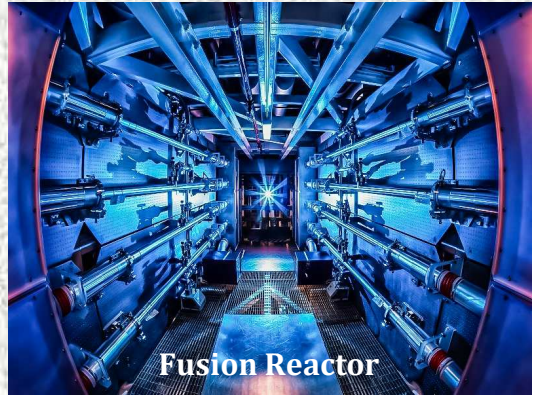
NUCLEAR FUSION

By Neville Barlow

About 40 years ago I used to visit an uncle. Every time he would isolate me from my family and escort me into his office. He was a man of many interests and had been an electrician in his daily work. He really did know his 'sparks and arcs'. He always sent me home with some of his treasured books, including the life of Leonardo da Vinci's machines and many about ancient philosophers. We talked about many things but especially about what he fore saw happening in the future. He predicted that the world would have a much different source of power from that which we had in his day. He called it Fusion. Every house would have a window in its roof that could be opened and closed to let this power source in. It would be so abundant it would be free.

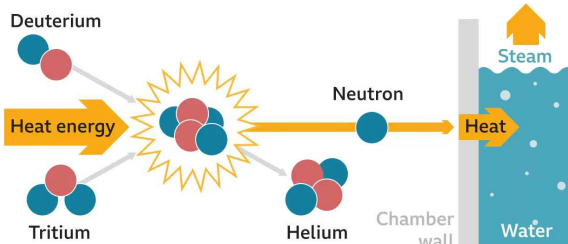
He was equally adamant that I would have a dramatic change in my lifestyle and that I would need to protect, especially, two of my family. This was something I took with a 'grain of salt' but sort of remembered it. Within 3 years my whole life seemed to disappear, and my uncle certainly got that right.

What has this got to do with Nuclear Fusion? Well, a couple of years ago I was in a Hobby shop talking to the proprietor, about electric cars, hydrogen fuels etc and trying to predict the future. I brought up the subject of Fusion and he said, "that's something I do know a little about". Apparently, he has a relative in Germany that is fully involved in experiments with Fusion. He says it will be many years before, perhaps as many as 20 years, that Fusion will be available and perhaps many more before it will be accepted.



How nuclear fusion works

1	2	3	4
Hydrogen atoms are heated	Fusion reaction	Helium, neutron and energy released	Neutron energy heats water



To me it seems my uncle was on to something I had no idea of. This could be the Nuclear Fusion we talk about today. What is Nuclear Fusion? It has been described as the 'holy grail' of energy production. It is the process that powers the Sun and other stars. It works by taking pairs of light atoms and forcing them together. This fusion releases a lot of energy. It is the opposite of nuclear fission, where heavy atoms are split apart.

Fission is the technology that is currently used in nuclear power stations. This process also produces waste radiation which must be stored safely for many many years.

Nuclear fusion produces far more energy, and only small amounts of short-lived radioactive waste. I have read it is nearly 8,000 times more efficient at producing energy than traditional fossil fuels. It has no gas emissions and does not contribute to climate change. Scientist's have been working for many years to harness this process and it has only been

recently that they have been able to produce a small amount of energy, but the vital thing was they had more energy coming out than going in. Across the scientific World this has been heralded as a massive break through.



Fusion Plant

It shows that nuclear fusion can work but it must be scaled up millions of times. There is a long way to go. These experiments have cost billions of dollars but the promise of a source of clean energy will certainly be a big incentive for overcoming these challenges.

I have spent many hours trying to understand all the scientific data and the mathematical theories. It is endless and defeats me totally. Here in this magazine is not the place to try to understand these things but to be aware that processes are being explored that have real promise. Always the caution must be that nuclear fusion is coming but many of us may never see it.

Neville