Just think about it. The first time that a human being looked through a telescope was Galileo's peeks at Jupiter in 1610 when the as yet undiscovered Uranus was only four Moon widths away from Jupiter. Uranus remained undiscovered. Three years later, Jupiter occulted Neptune, an event so unusual that it would only happen twice more in the next 1,800 years and Galileo missed it!

The last opportunity we who are alive now had to see Neptune within one Moon width of Jupiter was in 2009. The next opportunity will be in 2085. Here's hoping that someone who reads these lines will live to see that event.

What Might Have Been

Lets do a thought experiment. How might history have been different had Galileo discovered Neptune in 1613 – 168 years before Herschel discovered Uranus and 223 years before Neptune was discovered?

The heavens were then still regarded by conventional society as being Earth-centric – everything out there revolved around the Earth and had been doing so since creation. The stars and the planets were fixed in perfectly round crystal spheres, fitting within one another so that the stars moved together at one pace and the planets and the Moon at their own speeds. Copernicus and Kepler had been discovering from their painstaking observations that the heavenly ordained status quo might not be as it appeared nor as perfect. Kepler had determined that the orbits were not perfect circles but ellipses.

The understanding of the world was so ingrained and imposed by authority that when Galileo also started to say – very carefully – that the Earth was not the centre of creation, he was very nearly burned at the stake when close to 70 years old. Were it not for friends in high places and prudently standing back from his assertions, a fiery death would have been his destiny. This was tantamount to sentencing Einstein to death for challenging the accepted wisdom. Can you imagine that?

If Galileo had noticed that Neptune was not moving with the stars but was another planet, how would this have been received by the authorities? The discovery might have led to the discovery of Uranus early in the 17th century instead of in 1781. Might these events and the flood of evidence subsequently generated by men of learning not have hastened the acceptance of the real world and a scientific approach to knowledge? Might not the role of authority and the church (who mostly was the authority) have been eroded and saved millions of people who continued to be burned at the stake for holding heretical views? Those who were cruelly executed would often have been the gifted minds open to understanding the new ideas. Might there not have been a Michael Faraday to discover electro-magnetism or a James Clerk Maxwell to understand that phenomenon, or a Luigi Marconi to implement it and give to the world radio communication with its multifarious benefits that we use daily without giving the science underpinning the technology a thought. Just imagine if the person born in 1750 with the brain of an 'Einstein' had not been burned at the stake for holding heretical views! Then consider how very different the civilisation we share today might have been.

Neptune, Newton and Einstein

The prediction of Neptune's existence and whereabouts was the first experimental proof of the validity of Newton's laws of gravitation. The mathematics derived from the laws had been used to calculate where cannon balls would land and to understand motion on Earth, but the ultimate test of a theory is to use it to predict an outcome. Le Verrier was in effect saying that the theory says there should be a new planet out there. How could he test the theory? By doing an experiment. By looking to see if the planet is there! There could be no disputing that anyone had prior knowledge of Neptune and had doctored the calculations to suit a desired end result. This was a perfect scientific experiment. The predictions worked perfectly and unequivocally – unlike those of astrology.

More than a century later, Einstein did the same thing that Newton had done – he provided civilisation with a significantly advanced comprehension of the universe and derived mathemati-