THE ADSTOCK SCIENCE CLUB

This year The Adstock Science Club has so far had three meetings, the first two of which were focussed on biology, specifically biology of the human cell. In January we watched a video "The Hidden Life of the Cell", which through the use of some pretty amazing CGI (Computer Generated Imagery) graphics allowed us to view the workings of some of the internal structures of the human cell and how it responds to the threat of a cold virus attack. This film was so incredible in its imagery it was like watching a Sci-Fi movie made by George Lucas.

In February we took a look at another video "Playing God". This showed the development of a relatively new science, Synthetic Biology, where researchers are able to tweak DNA, the actual code of life, by using readily available pre-coded DNA fragments, also called Bio-bricks. These are manufactured by a number of companies and can be bought quite freely over the Internet. Just like Lego, bio-bricks can be fitted together to build different structures of varying complexity. In the case of bio-bricks these are DNA code sequences. They can then be inserted into living organism, where they can perform new functions totally alien to that organism. Bio-bricks can be viewed as circuit elements capable of being combined into larger and more complex bio-circuits and, in fact, these can be designed on a computer in exactly the same way that a programmer would design computer code. Towards the end, the program visited a small warehouse in America where non-scientists, and even children, were being shown how to use these building blocks for their own experiments. Scary stuff!

Following the video we took a look at a number of different types of cell through a USB microscope. With the cells having previously been stained it wasn't too difficult to see their individual nuclei. I then demonstrated how strands of DNA could be separated out and made visible to the naked eye from the nuclei of cells contained in human saliva.

In March we were able to get Mr John Foggitt to give our members a talk "The Ubiquitous Chip". This was about the development of the integrated computer chip from its beginnings up to the present day. After explaining some basic stuff about NAND, NOR and XOR logic gates, and how these could be built using standard transistor technology, John discussed the pros and cons of the latest breed of CISC (Complex Instruction Set Computing) processors, such as the 64 bit Intel Pentium range, and how they compare with Advanced RISC Machines' RISC (Reduced Instruction Set Computing) processors which are used in most smartphones and also in many tablet computers. These were originally developed by Acorn Computing for the development of the BBC Micro. Though quite involved, in parts, John did a brilliant job of making the subject accessible to the least technical of us.

Coming up shortly, TASC will be hosting a talk "Crystal World" by Mike Glazer Emeritus Professor of Physics at Oxford University about the development of Crystallography.

Crystals have been objects of mystery and fascination for the last two millennia. The importance of crystals lies not just in their beauty and their intrinsic value as gem-stones, but in their practical applications that are at the centre of today's technological society. The study of crystals, known as "crystallography", has had a major impact throughout all the sciences. This talk celebrates the 100th anniversary of the discovery of the technique of X-ray diffraction, which has enabled modern scientists to determine crystal structures from experiment. We shall see how the science has advanced over the last 100 years from the first very simple crystal structures, such as in common salt, to today's complicated molecular crystals, such as proteins and viruses that can contain 10's of thousands of different atoms. With today's computing power and sophisticated instrumentation, even these complex crystal structures can be solved almost routinely.

The "Crystal World" is a free talk and will be held in the Adstock Village hall starting at 7:30pm on Thursday 18th April.

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