

Science Group Report of the Royal Institution Lectures

This month we attended the Royal Institution Lectures. The topics for the lectures had been chosen by U3A's throughout the country and ranged from the pollution of the oceans by plastic, a brief visit to our expanding universe and a warning about the way in which statistics can be manipulated.

A Plastic Ocean

Jo Ruxton worked for the BBC Natural History unit and whilst there was involved in the making of The Blue Planet during which time she became aware of the extent to which our oceans have become polluted by the almost indestructible material, plastic.

It is present in Antarctica, the Pacific and the Caribbean and it is not only polluting all our oceans but is also having a devastating effect on the marine population who mistake small pieces of floating plastic for food which they eat and then die of starvation. They may also become entangled with discarded fishing lines and drown. The chemicals that are used in the manufacture of plastic, some of which are carcinogenic, begin to leach out as the plastic breaks down into smaller and smaller particles that can be ingested by humans and recently micro plastics have been found in human faeces. We saw film of Albatross chicks whose stomachs contained nothing but plastic so that they starved to death.

Jo Ruxton told us about "The Great Pacific Garbage Patch" an area in the north Pacific where a whirlpool of ocean currents collects plastic debris. It is estimated to be twice the size of France and it will continue to increase unless we reduce our reliance on plastic.

Only a small amount of plastic litter present in the sea floats; the vast majority sinks down to the ocean bed polluting this currently pristine part of our planet. A single use plastic bag can take between 100 and 300 years to fragment. Plastic was an invention of the 20th century has many necessary uses, but we have been so profligate with its use that not only have we left future generations to clear up our mess but also we have unwittingly caused the destruction of some of the creatures that share our planet.

Judith Boniface

What made our universe?

Andrew Pontzen began by telling us that our most familiar astronomical body - the Moon, is four hundred thousand kilometres away from the earth. The actual planet Mars was probably more like Earth in its early history and may contain surviving life forms such as bacteria. It is forty trillion kilometres to the nearest star and the space probe Voyager 1 is only twenty-two billion kilometres away from Earth at present, so space travel to another suitable planet around a distant star is unlikely to say the least.

Knowledge of our universe depends on telescopes such as the Hubble space telescope to give us a clear view. This telescope looked at an apparently empty area of space for ten days and detected about 3000 galaxies in a photograph called the Hubble Deep Field. Later the Ultra Deep Field detected 10,000 galaxies. The present estimate of the number of galaxies in our

universe is two trillion!!!! Our nearest galaxy is Andromeda, which is twenty-two quintillion kilometres away.

The Kepler space telescope looks at particular stars for long periods of time, looking for new planets. When such a planet passes in front of a star it appears dimmer and then becomes brighter.

Galaxies are not randomly distributed and form a cosmic web. Light travels relatively slowly so that it takes a long time to reach Earth, which means that we are looking back in time. The universe is expanding at an accelerating rate and originated at a tiny point with the Big Bang.

The Plank satellite detects the cosmic microwave background, which is the leftover glow from the Big Bang and is the oldest light in the Universe. The early universe was very hot and some points are hotter than others. At this point our excellent speaker ran out of time after this fascinating account of our Universe.

Anthony Boniface

Living is a risky business

Jennifer Rogers is a statistician; no doubt you have heard the saying “there are lies, damn lies and statistics” Jennifer’s talk was aimed at helping us discover the truth or otherwise of this saying. How we weigh up the different options that we are given and how to choose the most suitable one.

This is not an easy task as some information will be biased and given in such a way as to persuade us to take the course of action that our informant wishes us to take. We were shown headlines regarding the cancer risk of eating bacon. Our risk of developing cancer would increase by 20% if we ate bacon sandwiches it said. It didn’t say how often we needed to eat them, once a week, every day, or only as a treat on high days and holidays, before this would happen but happen it would.

We were shown a slide with 400 little pink figures on it. Five turned grey, they represented those who would die of cancer whether they had eaten bacon or not, as statically 5 people in 400 would die from cancer. To most people an increased risk of 20% would seem quite high. In fact when the next slide was shown only one extra person had gone grey. Following this headline the sale of bacon decreased for a few weeks. I think that this is an example of how we can be manipulated by statistics, and the thing is we are really not aware of it being done.

Did Jennifer convince me? Well I think I may look more closely at similar claims in future and maybe not take things at what appears to be face value. Although you never know, there may be a statistician lurking in the background trying to persuade me otherwise!

Judith Boniface