

Climate Change - A Personal View

By Dr John Butler, Armagh Observatory



“Maple Leaf with Rain”

Photograph taken by Karl Jordan



“A Taste of Summer”

Photograph taken by Ciara Stephens



“Summer Lily”

Photograph taken by Linda Nolan

Few people in the western world, or indeed further afield, can now be unaware of the concern expressed in the media about the possible effects of climate change and, in particular, of global warming. The last, much trumpeted, IPCC report received the ultimate accolade of a Nobel Prize for its thorough assessment of the current state of climate science. But, as always in science, this is not the end of the story for we are dealing with a constantly evolving planet that changes according to processes we are only beginning to understand. High performance computers are used to model what we think should happen, but it is the Earth itself, not the climate models, that defines reality. The computer climate models are essential in refining our understanding of the physi-

cal processes involved but observations of the Earth and its atmosphere are paramount.

So where are we now after a decade when there was so much discussion, hype and media attention given to global warming and its cause? Almost every climate scientist agrees that the world is warmer now than it was in the late 19th century; however, is this really all that remarkable in view of the historical and geological evidence for climate change over past millennia? If you think it is, then you are naturally drawn to the enhanced greenhouse interpretation but, if not, a multitude of natural processes which may modulate the Earth's climate, come into view. It is these poorly understood natural processes which are now in need of

major research effort. Even the Royal Society, a strong advocate for the anthropogenic origin of global warming, now concedes that there are significant uncertainties in the contributions of feedback processes and natural variability. Several recent highly publicised "scandals" may have helped to push the venerable society in this direction.

First there was the so-called "hockey stick" furore in which a selection of data (much of it from tree-rings) had been used to suggest that there was a prolonged period (from 1000AD) of unchanging global temperatures followed by a rapid rise in the 20th century. This tended to exaggerate changes in the last century when man's influence would be apparent compared to previous centuries.



“Fire and Ice” Photograph taken by Robert Riddell

More recently, the media highlighted large errors in the timescale for the melting of Himalayan glaciers contained in the IPCC report. The third scandal, "climate-gate", centred on the disclosure of emails from the University of East Anglia which implied that scientists were not being as open with their data as good practice would normally require. Though the individuals concerned were exonerated, the result has been to raise questions in the minds of both scientists and the general public on the reality and causes of global warming and to break the apparent monopoly of the Domsday protagonists. Now it appears there is a greater awareness that other mechanisms than greenhouse may also be involved.



"High and Dry" - Photograph taken by Kevin Murphy.

Another development in this story is that global warming, so apparent in the last two decades of the 20th century, has faltered in the first decade of the 21st. Global temperatures reached their peak in 1998 and since that time have remained roughly constant. In recent years, there has even been a slight fall and this has occurred in spite of a roughly 5% rise in atmospheric CO₂ concentration. Many people have noticed that the pause in the global temperature curve has coincided with a drop in the amplitude of the sunspot cycle and this behaviour would be consistent with former studies which

linked the Earth's temperature to solar activity. However, although there has been a flattening of the global temperature curve in the first decade of the 21st century, the fall towards the end of the decade is still rather minor compared to the rise since 1980 and other explanations involving global climate oscillations could be responsible.



"Back Strand" - photograph taken by Thomas Quilty.

Where does all this leave us in the ongoing discussion of the causes of global warming and the strategy to reduce greenhouse gases which has become such a major rallying call for environmentalists in recent years? Firstly, in spite of the newly recognised uncertainties about the root causes of global warming, the ever increasing concentration of carbon dioxide and methane in our atmosphere remains a cause for concern and is not to be encouraged. For although other processes may be involved, the anthropogenic greenhouse contribution to global warming could be substantial. Therefore, we should continue to develop ways in which our energy requirements can be met by sustainable, non-polluting, methods such as wind and wave power. The huge potential of such currently under-utilised energy resources is nowhere clearer than in the massive water-driven linen mills that once dotted the Ulster countryside and which powered the first Irish

industrial revolution there in the late 18th century. But will renewable energy sources be enough to save the world from the worst case scenarios of the IPCC, as it is not just the cars, aircraft etc relevant to our modern lifestyle that are the problem but the number of people who wish to use them? As the much larger populations of the new industrial nations of China, India, Brazil etc aspire to living standards which emulate those in the West, there will be ever increasing demands on our planet's resources. Ultimately, it seems it could be a battle between Mankind's insatiable desire for more of everything and the Earth's ability to supply it. Eventually, governments will have to grasp the problem of the world's rapidly rising population - something many governments don't even seem to recognise, let alone confront. Only China, with its "one child" policy has made serious efforts to control its population; many more countries may need to do so in future.



"Carraroe" - photograph taken by Conor Ledwith.