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FORECASTING THE FUTURE

"Forecasting is difficult: particularly about the future" This piece of wisdom is attributed to Yogi Berra. But it does not apply to the Intergovernmental Panel on Climate Change, since they do not make "forecasts" at all, only "projections". As they make clear, "projections" are dependent on the correctness of the assumptions made by the computer models and the futures scenarios from which they are made.

This has not always been so. In the first IPCC Report (1990). on the first page of the "Executive Summary" there was nearly a whole page headed " Based on current model results, we predict" with no less than ten actual "predictions".They used the phrase "models predict" several times throughout, but they did, at least admit that there were "uncertainties".

Chapter 4 was entitled "Validation of Climate Models". Paragraph 4,12 "Methods and Problems of Model Validation" showed that such validation is quite a problem, and it seemed to show that, so far, no model has been truly validated.

Chapter 8 "Detection of the Greenhouse Effect in the Observations" had the answer when it said (paragraph 8.4) "the fact that we have not yet detected the enhanced greenhouse effect leads to the question: when is this likely to occur"

The next Report (1995) had, in its first draft, another Chapter 4 "Validation of Climate Models". I commented (with, perhaps, others), that since no model had ever been validated, according to their own opinions, the title was inappropriate. So in the next draft they changed the word "validation" to "evaluation" no less that fifty times, and that report and all subsequent ones have not used the terms "predict", "forecast", or "validate". Also there has been no further discussion on how validation might be made. This is true of all of the four parts of the Fourth Report.

I frequently quote this example from their "Frequently Asked Question 1.2"

"A common confusion between weather and climate arises when scientists are asked how they can predict climate 50 years from now when they cannot predict the weather a few weeks from now. The chaotic nature of weather makes it unpredictable beyond a few days. Projecting changes in climate (i.e. long-term average weather) due to changes in atmospheric composition or other factors is a very different and much more manageable issue".

Note that they insist that all they do is "project". They are admitting that "scientists cannot "predict climate 50 years from now". No wonder there is "A common confusion", the claim that their "projections" are "very different" and "much more manageable" does not include a claim that they can provide successful predictions.

And yet, the politicians, activists and many ordinary people seem to be under the delusion that the IPCC "projections" actually can be regarded as "forecasts" to the extent of promoting all manner of economically damaging measures in the belief of countering them.

The above statement seems also to agree that the only scientists capable of actually predicting are the weather forecasters and it might be worth while to examine how this has been achieved, however imperfect it may seem.

It may not be generally known that one of the first people to make weather forecasts was Admiral Robert Fitzroy, the first Head of the British Meteorological Office.appointed in 1854. His story is worth the telling.

Robert Fitzroy had an extremely colourful career. He was born 5th July 1805, the second son of the Duke of Grafton, descended from the illegitimate son of Barbara Villiers and King Charles II. "Fitzroy" means "royal bastard", He trained at the Royal Naval College, Greenwich, went straight into the British Navy, and was appointed captain of HM sloop "Beagle" in 1828, aged 23, after Captain Stokes had shot himself from depression during a British expedition to South America, During Fitzroy's return he financed an expedition on the "Beagle" to promote a mission in Tierra del Fuego after he had trained three children he had taken hostage to bring British culture to the savages. Eventually he persuaded the British Government to convert the voyage into a round-the-world trip, so he recruited a "gentleman companion" who turned out to be Charles Darwin, to restrain him from following the example of the late Captain Stokes. This voyage of the "Beagle" led not only to Darwin's outstanding scientific work but it played an important part in the colonization of New Zealand. The Captain became the second Governor. and several members of the crew were prominent early settlers. The master, Edward Chaffers, was captain of the "Tory" which sailed into Wellington harbour with the Wakefields in 1839. He became the first harbourmaster and founded the first public park, which Wellington City Council recently renamed, to show their contempt for local history,

Fitzroy and Darwin visited New Zealand on 21st December 1835 and left on the 30th, not very impressed. On their return to Britain, Fitzroy became a member of Parliament and a specialist in colonies. When his friend William Hobson, the first Lieutenant Governor and then Governor of New Zealand, died suddenly in September 1842, Fitzroy became the second Governor. He lasted from 26th December 1843 to November 1845, ejected by settler pressure who disliked his belief in the British Government policy, intended by the Treaty of Waitangi, to retain most of Maori land under their own control and merely supervise.them.

After a number of odd jobs, promotion to Admiral, and membership of the Royal Society, he started the Meteorological Office. His first task was to tackle what was at that time the most urgent issue, the prediction of storms at sea. Maritime life on sailing ships was extremely hazardous to life, limb and economics.

Fitzroy wrote to all his friends in the navy for information about storms. He operated the first definition of wind intensity, the Beaufort Scale, invented by Francis Beaufort, hydrographer for the navy. This scale was routinely presented by the Chinese weather forecasters when I was in China, and it seemed to me to be much more sensible than the system used by the New Zealand forecasters, where the winds seem always to be "freshening".

Fitzroy set up measurements of climate properties. He invented an improved barometer. An example turned up in a recent "Antiques Roadshow" He did his best to classify the factors leading to storms at sea and issued regular forecasts which were much appreciated by the seamen. However, the general public and some of the press picked on examples that were wrong and criticized his work. It preyed on his mind to the extent that he cut his own throat with a razor in April 1865, only 59 years old, following the example not only of the previous captain of the Beagle, but also his uncle Lord Castlereagh, former British Foreign Secretary.

Since his day, the meteorological services have used every device that scientific research and knowledge can supply, to improve the art of forecasting the weather. Essentially, they use the same procedures as Fitzroy, the assembly of information and observations from every possible source, its classification and analysis and testing. Now they have an array of observations, theories of winds and temperatures and computers. The observations are now very diverse. They measure pressures, humidities, wind patterns, isobars, isotherms, sunshine, rain, hail snow, fog and hurricanes. They check the forecasts against actual weather events so they are continually improving them. The one thing they do not measure, because it does not help forecasts, is greenhouse gas concentrations.

Chaos, which the IPCC seems to think that it has evaded, is still a feature of the weather system. In some ways it is a feature of all forecasting, to a greater or lesser degree, The particular problem of weather is that it is much concerned with the behaviour of fluids, of ocean currents, of the atmosphere. The 19th century scientists thought they could predict anything from Newton's Laws, but these apply only to solids. They work for solids very well, even after modified by Einstein, but there is no satisfactory theory for predicting the behaviour of fluids. Scientists have to resort to all manner of approximations, parameterizations and assumptions, repeatedly checked from observations. which inhibit successful weather prediction. The climate scientists are simply wrong to claim that they can overcome these barriers by their utterly oversimplified models of "climate".

Despite all this, the public, the media and the politicians seem to think that the IPCC "projections" are "forecasts" even when the IPCC denies it. It is therefore useful to see whether these projections show any success as forecasts

The following table shows a comparison between the "projections" of the IPCC and the observed figures, extrapolated to 2010 from the latest available information. It shows that

the IPCC are within range of prediction for population, coal production, CO2 emissions and CO2 concentrations, but they are completely wrong on methane concentrations, global temperature change and sea level change. It might be mentioned that the "projections" for global GDP are also all wrong, but I have been unable to find figures that make adequate allowance for the changes in the US dollar

IPCC PROJECTIONS COMPARED WITH OBSERVATIONS

Feature	2000 observed	2010 projected	2010 observed (extrapolated)
World Population (billions)	**5.29**	**6.6-7.6**	**6.9**
Coal Production(EJ)	**100**	**91-190**	**183**
CO2 Emissions GtC/yr	**6.1**	**8.0-9.7**	**10.0**
CO2 Concentrations (ppmv)	**369**	**380-398**	**389**
CH4 Concentrations (ppbv)	**1753**	**1827-1995**	**1780**
Global Mean Temperature rise (ºC)	**0**	**0.1-0.6ºC**	**0.0ºC**
Sea Level Rise (mm)	**0**	**18-59**	**(Pacific Islands) 0.0**

Cheers

Vincent Gray
Wellington, New Zealand

"To kill an error is as good a service as, and sometimes better than, the establishing of a new truth or fact"
Charles Darwin