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PERSPECTIVE

Climate change: seeking balance in media reports

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Boykoff and Mansfield (2008), in a recent paper in this journal, provide a detailed analysis of the representation of climate change in the UK tabloid newspapers. They conclude that the representation of this issue in these papers 'diverged from the scientific consensus that humans contribute to climate change'. That is, portrayal of climate change in tabloid newspapers contradicts the conclusions of the fourth Intergovernmental Panel on Climate Change (IPCC) assessment (IPCC 2007). Is it healthy to have the scientific consensus challenged so frequently? But should we worry about systematic misrepresentation of scientific consensus? We believe the answer to both of these questions is yes. To present regular updates on climate change issues in the popular press is important because the changes in behaviour needed to achieve substantial reductions in greenhouse gas emissions require a broad understanding of the basic facts. However, if the majority of readers receive misleading information, it will be difficult to achieve the level of public understanding necessary to make such reductions needed to avoid dangerous climate change (Schellnhuber *et al* 2006 and references therein).

Boykoff and Mansfield (2008) identify a gulf in presentation of the scientific facts and their interpretation on the subject of 'global warming' in tabloid newspapers, when compared to the scientific consensus. What is really sobering is the huge circulation of these papers (see table 1 of Boykoff and Mansfield—many millions per day); even the most important 'landmark' research papers very rarely achieve five hundred plus citations. We find it heartening, therefore, that the area of climate change research does at least have the umbrella of the IPCC. This provides an additional channel through which current research associated with the effects of burning fossil fuels can be presented, and in our personal experience at least, we have found the non-tabloid UK newspapers to report accurately any IPCC statements. As this perspective article is being written, the UK (and worldwide) is facing almost unprecedented increases in the cost of petrol and diesel, and with the transport sector lobbying hard for tax incentives/rebates to reduce fuel costs. In the middle of this, some government ministers are suggesting that from the climate change angle, lower dependence on fossil fuels (forced on the population by such higher prices) might be a good thing. But their voices are drowned by other ministers saying that such an approach is deeply unpopular with the electorate—to what extent, therefore, is the tabloid press responsible for the lack of urgency related to potential future damage to the planet?

How else are people informed about the climate change debate? Aside from TV and radio, popular science books are usually a good source of information. However a viewing of the environmental sciences department in any bookshop at present will reveal how remarkably polarized the climate change debate is becoming. Some books have very alarming titles; for instance Pearce (2007) is titled 'The Last Generation: How Nature will take her Revenge for Climate Change'. Meanwhile other books are appearing with titles suggesting that the entire issue is given far too much emphasis, is used as a means for politicians to keep society fearful (and presumably, therefore, more controllable), or present a view that the IPCC system is scientifically deeply flawed. Examples of these include Spencer (2008) titled 'Climate Confusion: How Global Warming Hysteria Leads to Bad Science, Pandering Politicians and Misguided Policies that

Hurt the Poor', Booker and North (2007) titled 'Scared to Death: From BSE to Global Warming: Why Scares are Costing us the Earth' and two books by Michaels—Michaels (2004) 'Meltdown: The Predictable Distortion of Global Warming by Scientists, Politicians, and the Media' and Michaels (2005) 'Shattered Consensus: The True state of Global Warming'. Both polarized views could be argued as detrimental to addressing possible dangerous climate change. The first argument (i.e. 'we are doomed') gives the impression that climate change is so serious, and possibly unstoppable in the immediate future, that this could lead readers to decide there is nothing that can be achieved on an individual basis—and yet any measure to stabilize atmospheric greenhouse concentrations will require changed behaviour regarding fossil fuel usage at the individual level. On the other hand, simply to ignore the effects of increasing levels of atmospheric greenhouse gas concentrations on the climate system could lead the planet in to a highly undesirable 'dangerous' state, and one that is potentially difficult or impossible to reverse in reasonable timescales. Fortunately there are some books on the subject of climate change that do present the science without bias, such as 'Global Warming' by Houghton (2004).

One new book of particular interest is that of Nigel Lawson, former Chancellor, whose recent publication on climate change (Lawson 2008) is titled 'An Appeal to Reason: A Cool Look at Global Warming'. Lawson (2008) contains a range of very interesting and interlinked strands regarding the climate change debate. As with many books discussing technical matters, it is always of interest to first check the citations, and here it is comprehensive, up-to-date and certainly does not initially appear to be selective (this is also true of the two books by Michaels). This therefore creates what seems like a paradox. Given that so many of the key papers cited by Lawson (2008) form the backbone of current understanding of climate change, and many researchers quote these as reasons for concern regarding global warming, how is it that this book instead, concludes (see the dust cover) '... the conventional wisdom on the subject is suspect on a number of grounds; ... global warming is not the devastating threat to the planet it is widely alleged to be'?

What is the overall feeling after reading some of Lawson (2008)? Well first and foremost, we believe that although the use of literature is impressive, there appears to be a deliberate search for the remaining scientific uncertainty (i.e. issues freely acknowledged by climate change scientists as requiring refinement, but used in this book as a reason to doubt the entire scientific debate about global warming). On this basis, it is tempting therefore to just ignore this contribution to the debate, but a more positive approach is to re-address these uncertainties, and in the process generate more concise scientific understanding and presentation. Top of this list would be Lawson's key argument that global warming has stalled between the year 2001 and 2007—'there has been no further global warming since the turn of the century ... which has occurred at a time when global CO_2 emissions have been rising faster than ever'. Lawson then cites, correctly, Smith *et al* (2007) but who in fact point out that this is almost certainly due to internal variability and we may expect more warming from year 2009 onwards. Lawson concludes that such a 'resumption of warming' may or may not occur. In our view the climate modelling community should work hard to revisit and extend the work of Smith *et al* (2007), possibly applying their technique to multiple climate models. In parallel there is a desperate need for better explanation by researchers that, even against a background warming trend, natural variability will mean that on a year-to-year basis, warming will not necessarily be monotonic. Some of Lawson's other arguments can be more readily rebutted. Two issues he presents are that trends in global temperature could be a function of varying sunspot activity, and that the global warming measured during the second half of the 20th Century could be a consequence of urbanization around measurement stations (the 'heat island' effect). Sloan and Wolfendale (2008) and Parker (2006) provide

highly detailed and convincing reasons why, respectively, these two arguments cannot explain the warming trend seen in measurements during the last fifty years—these two papers require more extensive circulation. Lawson attacks the IPCC panel as changing from a 'fact-finding and analytical exercise' in to 'something more like a politically correct alarmist pressure group'. This is particularly unfortunate and is not consistent with the facts. For example Stott *et al* (2000), using statistical 'detection and attribution' analyses, utilized the spatial patterns observable in the temperature record to tease apart natural oscillations from those caused by human adjustments to atmospheric composition. This underpinned in part the statement in the 3rd IPCC Assessment (IPCC 2001) that 'There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities'. It should be noted that all such analyses require disproving of the null hypthoesis (i.e. humans have no influence), and to a very high level of statistical confidence. In other words, the IPCC report depends heavily on research scientists whose starting point is actually that higher levels of greenhouse gas concentrations (most notably CO_2) have had no effect on surface temperatures, unless there is significant evidence to the contrary.

At some points, Lawson cannot be taken seriously. He points out (correctly) that CO_2 is one of the greenhouse gases without which life would be unable to survive. However, this is then used to state that 'to describe the carbon dioxide in the atmosphere as pollution is as absurd as it would be to describe the clouds as pollution'. In fact most pollutants of the atmosphere are emitted from anthropogenic activity and through natural processes. The gases become pollutants by exceeding thresholds above which damage occurs—these basic principles are widely accepted in the scientific community. Hence there is still the requirement to explain in very general terms the role of near-stable (at century timescales) pre-industrial atmospheric CO_2 concentrations in sustaining life (along with the other greenhouse gas concentrations), but how much higher values of CO_2 could cause dangerous perturbation to the climate system.

Boykoff and Mansfield (2008) provide a valuable insight in to how climate change is presented in the media. As the general consensus among climate research scientists is that to avoid 'dangerous' climate change there is a requirement to make very large reductions in emissions and soon, then this will be politically difficult to achieve against such a backdrop of such press reporting denying the IPCC message. We have also used this perspective article to consider how the debate over climate change (as induced through anthropogenic emissions) is presented through popular science books. In some ways this is equally worrying—how is it that such polarized views can be presented in books frequently citing the same research papers? With significant public funds placed in climate change research, it might be expected that the public deserve more definitive answers. So the main question here is whether (a) there remains massive uncertainty in how raised atmospheric greenhouse gas concentrations will manifest themselves through changes to future climates, or, (b) is there selective interpretation of key research papers (and indeed the IPCC report). If the answer is (b)—and that is consistent with the evidence—then each scientific issue raised by the sceptics should be addressed. There are important steps in this direction. For example the Royal Society has on its web site specific answers to several of the commonly used misleading arguments. See http://royalsociety.org/downloaddoc.asp?id=1630 a web page entitled 'Facts and fictions about climate change'.

As governments struggle to balance issues of economic development, the ubiquitous use of fossil fuels, and the need for very large reductions in emissions to ultimately stabilise the climate at safe levels, then it is essential that those involved in climate change research keep a careful note of the portrayal of their research in the media. Boykoff and Mansfield (2008) (and citations therein) make an important contribution to this process. Ultimately, of course, (for predictions corresponding to different prescribed emissions scenarios) we are working with

an issue embedded in fundamental science. If newspapers and books take a sceptical angle, and through this force further reductions in uncertainty bounds surrounding available scientific understanding, then such reporting will have played a useful role, even if ultimately shown to be incorrect. But such refinement has to happen quickly-—if a global consensus emerges, unchallenged, that climate change issues are being vastly overplayed (or worse are almost some form of hoax) then we could be 'sleep walking' towards eventual climatic disaster as a consequence of a 'business as usual' attitude to emissions.

We believe the current debate to be vital. But ultimately, society requires a balanced presentation of the facts. It is unreasonable to expect the tabloid media to avoid oversimplification and sensational comments, but it is reasonable and necessary in support of the political process to present a balanced view, and to avoid systematic misrepresentation of the science in either direction. We believe the IPCC goes a long way towards achieving this—but there is still much to do.

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