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Chapter 50: After Climategate … Never the Same

Three years on, what have been the consequences of Climategate for climate science, for policy development and for public understandings of climate change?

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Science controversy or political conspiracy?

The iconography of climate change is replete with dramatic images of the imprints of weather extremes and the effects of climate warming on physical systems. Calving icebergs are amongst the most common and images of river flooding, cyclone damage and sweltering heat are also frequently used as signifiers of climate change. These images seek to capture moments of disruption to the physical world or to the social order, thereby representing the material reality of climate change. But there are other moments of disruption which offer representations of the social reality of climate change. These could be dramatic events in the world of human discourse and political performance which also leave audiences with a sense of disorientation and disturbance. One of the most powerful of these disruptions occurred in late 2009 through the events that have commonly been dubbed 'Climategate'.

A simple account of this rupture in the discourse of climate change might read thus. Several thousand professional emails extending over a period of 13 years between a small group of influential climate scientists were 'stolen' and made public. On the basis of these emails a range of criticisms were made about the professional integrity of these scientists. In particular, had they engaged in practices which compromised key findings in climate science or, more generally, had they subverted scientific norms? A series of enquiries were conducted in the UK (and the USA) over the following nine months which largely exonerated the accused of the most serious allegations, but which also identified and criticised instances of poor communication, data management and statistical analysis. Climategate could thus be viewed as one in a rather large family of science controversies which have erupted over the years, including at the extremes Pons and Fleischmann's cold fusion, the BSE crisis and the Korean human cloning fraud.

There is, however, another way of framing Climategate. This would be to describe the publication of the emails as a criminal act by one or more individuals, motivated by a

desire to undermine public trust in climate science and to deliberately discredit the status of some of the scientists involved. Rather than being a controversy about the practices of science, Climategate would then have to be placed in an even larger family of sleazy political campaigns to influence a public policy dispute, in this case whether or not to adopt stringent regulation of greenhouse gas emissions through national and international legislation.

Neither of these simplified versions of events is really adequate. To begin to understand Climategate in its broader cultural context one would need to construct a much larger story of the emerging idea of climate change over the past quarter century (see Chapter 1). The purpose of this essay, written three years after the events described above, is not to offer my own detailed account of why and how Climategate happened (I have more things to say about this, but they are for another occasion). Rather its purpose is to reflect on the repercussions of Climategate for climate science and for the public status of climate change knowledge and how citizens engage with such knowledge .

As a former member of the Climatic Research Unit (CRU) in the School of Environmental Sciences from where the emails had been obtained, and an employee of the University of East Anglia (UEA), I was an 'interested party' to the events unfolding in November 2009. A number of the published emails had been copied to me or else were sent to me. Some of them were sent by me. I knew a number of the central characters in the story. In the days immediately after the emails were published, I was therefore in correspondence with many interested actors in the climate change debate seeking my perspective on the significance of the unfolding events. Amongst these were scholars and scientists, members of the public, a variety of journalists and representatives of various organisations.

One of my correspondents was a senior advisor in an international NGO. In an exchange of views with him over the weekend of 5-6 December 2009, he remarked that after first learning of the emails' release two weeks earlier he had "appreciated immediately that this would be the defining moment of the climate debate in the last five years. My initial reaction was that in terms of public perception and the 'balance of legitimacy' in editorial meetings at media offices, the [CRU] emails would put us back two or three years." In response, I offered my own view that after seeing "the first print media story about [Climategate], I knew immediately that the climate change story will never be the same again. It's not just about a 2-3 year set-back; it is that the whole story has taken a different turn."

So from the perspective of late 2012 I am interested to explore what has been merely 'set back' two or three years by Climategate or whether, and in what ways, 'the whole story [has] taken a different turn'? Have the consequences of Climategate been good or bad; and for whom? How has climate science changed as a result? And how has the imaginative force of climate change as an idea changed over this period?

Waiting to happen

Wildfires in the American west have become more widespread and severe in recent years. Rather than finding a cause in the changing climate, ecologists have argued that forest management practices have been substantially to blame. Through modern fire suppression techniques practiced over decades, substantial amounts of dry brushwood have built up in these dryland forests which would under natural regimes have combusted through a series of small fires. When fire now is triggered through a lightning strike or a power cable spark the risk of an uncontrollable conflagration is now much greater than in the past.

I think this is a helpful analogy to explain what happened with Climategate. Over a period of 25 years or so, climate science – or at least some aspects of climate science - had slowly begun to operate in ways which was building up, so-to-speak, tinder dry brushwood. As the public policy debates around climate change grew and multiplied in scale and complexity, so the cultural and political contexts in which climate science was practiced became more febrile. If one understands science as a process sensitive to social and political context, then this inevitably began to affect how climate science was practiced. The polarising of political positions around climate change responses began to be reflected in a polarising of opinions amongst practicising climate scientists about other climate scientists: they were either 'on our side' or 'against us'. This is what Judith Curry immediately after Climategate referred to as the warring tribes of climate science . So, things began to change, subtly, oh so subtly. Access to certain data became a victim of this mentality; 'friends' could access the data, but not 'enemies'. Peer review processes and judgements became exposed to similar group loyalties; papers were judged on their authorship rather than on content. The IPCC exerted an increasingly important influence over what science was deemed to be 'useful'; research was designed to fill gaps identified by the IPCC and papers were prepared to meet IPCC deadlines. And for the sake of a good cause, some climate scientists temporarily lost sight of their role to produce critical, sceptical and qualified scientific claims.

All of these practices – or variants of them -- are recognisable in published ethnographies of science. In its ceaseless work of establishing and stabilising public facts, science is not immune from such influences and strategies, and never can be. But in the case of climate science in the years leading up to Climategate these influences had become magnified, as shown by Ryghaug and Skjølsvold (2010) in their analysis of the CRU emails. The CRU emails were only a shock if commentators did not realise that "… scientific facts are made and not just discovered, that they emerge as products of deliberation and persuasion, that methodological doubts may be resilient, and that scientists' trustworthiness is important" (Ryghaug and Skjølsvold, 2010: 304). And of course most did not. So these scientific 'impurities' (cf. Shapin, 2010) offered a heady mix of brushwood awaiting its lightning strike. Climategate was a wildfire waiting to happen.

Human geographer Sarah Whatmore has studied science controversies and the effects they have on science, policy and public trust and understanding. She, along with other scholars, see such events as moments of learning when "… what we think we know or, more usually, what 'experts' claim to know about something [becomes] the subject of intense public interrogation" (Whatmore, 2009: 588). Controversies create opportunities for re-thinking how problems are structured, how science governs and undertakes its work and how new forms of public accountability can be exercised. From this perspective then, it is necessary to reflect on the learning that took place after Climategate. What has changed as a result of the 'intense public interrogation' which occurred during the winter of 2009/10? I am going to focus on three areas of notable impact: on scientific practice; on public opinion; and on understanding the nature of climate change scepticism.

Scientific practice

Data policy. One of the criticisms of CRU which emerged from the various inquiries into Climategate was that their data curation and data access policies were deficient. The most thorough of these reviews found "a consistent pattern of failing to display the proper degree of openness" and that "there was unhelpfulness is responding to requests [for data]" . For these reasons, Climategate gave huge rhetorical impetus to an already emerging open-access movement, a movement which advocated the public sharing of scientific data based on two arguments: the scientific norm of communalism and the publicly-funded nature of much science. These arguments were well illustrated through the events leading into Climategate: if CRU's thermometer and tree-ring data were so central to the argument that humans are influencing climate, then surely the data should be open for public scrutiny and re-analysis by any interested party? The obstructive gate-keeping role that many saw CRU adopting in this matter gave rise to suspicions of elitism and self-serving at best, and collusion and manipulation at worst.

In the last three years this drive for greater openness with scientific data has found expression in many new initiatives, both inside climate science and across science more broadly: for example journals requiring all data supporting an analysis to be accessible on-line and research funding bodies requiring all grant proposals to come with a data management and access plan. Following Climategate, CRU for the first time in its history secured external funds dedicated solely to the curation of some of its data and then in 2011 it was finally required by the UK's Information Commissioner to release all of the temperature data it had previously refused to release. As the journal Nature Climate Change editorialised in October 2012, "After some false starts, and hard lessons learned, climate change researchers have woken up to the need for transparency … and the sharing of information through public data repositories" (Anon, 2012: 703).

There are of course broader cultural and technological currents of change at work here than merely the events of Climategate; calls for 'openness' and 'transparency' now have resonance across many different social and political institutions and practices. Yet there is no doubt that Climategate functioned as a rallying point for those both inside and outside science who were arguing for much greater attention to be paid to questions of data policy and public accountability in the scientific enterprise. And it was undoubtedly one factor prompting the UK's Royal Society report on 'Science as an Open Enterprise' (Royal Society, 2012). The significance of these concerns for public trust in science was later put starkly by the Chair of the report, Geoffrey Boulton :

"Science has been sleep walking into a new era … We now have many citizens who are simply not prepared to accept the authoritative word of the scientist. They want to verify for themselves that the evidence actually justifies [the] conclusion … [published research] conclusions [are] an opinion and unless we see the data in such a way that we can replicate it, validate it, check it, then frankly there's no reason why we should accept what they say as having any greater validity than a myth. These are not trivial issues. They are absolutely vital to the progress and delivery of science and its trustworthiness in the public domain."

Attention to uncertainty. Another of the criticisms of CRU that was upheld in the Reviews was their poor communication of uncertainty in the infamous 1999 World Meteorological Organisation (WMO) graph which was designed using a data splicing 'trick' to 'hide the decline' in one of the tree-ring chronologies. One of the unsettling effects of the Climategate controversy on climate science has therefore been to encourage much more careful articulation of uncertainties concerning climate change. This is evident in communications by scientists themselves, as well as by some media commentators and reporters. After 2009 there have been more frequent reports of new scientific studies suggesting climate change may be 'less serious than previously thought', balancing the previous dominance of the tag-line 'worse than previously thought'.

Some examples of this include findings that the natural variability of stratospheric water vapour is much greater than previously thought (Solomon et al., 2010), that the thermohaline circulation is more complicated than previously thought (Lozier, 2010), that soil respiration of carbon dioxide is less sensitive to temperature than assumed by climate models (Beer et al., 2010), that new observations of outlet glacier velocities indicates that sea level rise from Greenland may fall well below proposed upper bounds (Moon et al., 2012) and that there is no evidence for worldwide increases in drought in recent decades (Sheffield et al., 2012). It is also noteworthy that in the IPCC's Special Report of Weather Extremes published in 2011 (IPCC, 2012), the language about attributing weather extreme trends to human influences was much more cautious than in the IPCC's 2007 Report.

The above are only isolated and cherry-picked examples, so what evidence is there for a more systematic adjustment in scientific practice? Using the Scopus database I searched all peer-review journal articles dealing with 'climate change' in the physical sciences for the 13 years prior to Climategate (1996-2009) and for the three years subsequent (2010-2012). The overall number of such articles continues to rise (about 6,500 in 2012 compared to about 2,000 a decade earlier), but I was interested in what proportion of these articles dealt with uncertainties. I therefore searched amongst this population for those articles which included the words 'uncertainty' or 'uncertainties' in their title, keywords or abstract. After remaining stable at around 6 per cent from 1996 to 2005, the proportion rose slightly to around 6.5 percent between 2006 and 2008. But by 2012 the percentage had risen to 9.1 . If one compares the two years immediately before and after Climategate (2008-2009 with 2011-2012), then the total number of 'climate change' articles increased by about 30 percent (from 10,047 articles to 13,111). But the number of these articles dealing with 'uncertainty' or 'uncertainties' increased by about 73 per cent (from 692 articles to 1,197). This is clear evidence of a reflexive reaction by climate scientists following Climategate to engage more directly with uncertainties in their research and to communicate this in their professional publications.

Science-public dialogues. The practice of blogging dates back to the final years of last century and large numbers of scientists now either run their own blogs or contribute to group or institutional blogs. And it was through blogs such as Climate Audit and Bishop Hill that the coalescing of an on-line community of climate critics was enabled in the years leading up to Climategate, becoming an example of Jerry Ravetz's 'extended peer community' (Funtowicz and Ravetz, 1993). Many of these critical blog sites played a dominant role in shaping the early versions of the Climategate narrative.

One of the consequences of Climategate has been the increased numbers of climate scientists who are now active bloggers, either on their own bespoke sites or as visible and frequent commentators on other blogs. This trend is itself a response to my two previous observations: a new commitment from climate scientists to be open, not just about their data but even more importantly about their reasoning processes and, second, the refreshed concern with how uncertainties in climate science should be represented and interpreted in public debates.

One of the highest profile of these new bloggers is Judith Curry from Georgia Institute of Technology. She started her blog Climate etc. in September 2010 with the aim of providing: "… a forum for climate researchers, academics and technical experts from other fields, citizen scientists, and the interested public to engage in a discussion on topics related to climate science and the science-policy interface". Another example is from Tamsin Edwards, a climate modeller at the University of Bristol whose blog All Models Are Wrong… but some are useful launched in January 2012 to offer "A grown-up discussion

about how to quantify uncertainties in modelling climate change and its impacts, past and future." A third example is Die Klimazwiebel ('the climate onion') which is unusual amongst climate change blogs for two reasons: its main bloggers are drawn from both social and natural science and it is multilingual, mainly German and English. Die Klimazwiebel tries to occupy a middle ground between the two warring tribes and attracts fire from both.

This trend may well have developed independently of Climategate, but it is certain that the acute controversy gave a new impetus and incentive for climate scientists to 'open-up' and explain their practices and deliberations in more public fora. The quality of some of the discussions of climate science hosted by some of these blogs has also improved, as has the range of perspectives offered. Senior climate scientists, such as Richard Betts from the UK Met Office , are now frequent commentators on a range of climate blogs and on-line dialogues, bringing 'institutional' climate scientists and their expertise into these new media. Important and enlightening exchanges about various aspects of climate science can now be accessed, for example about the value of the climate sensitivity on Bishop Hill or about the reasons for the Arctic sea-ice decline on the Dutch Met Office site Climate Dialogue . The old in/out boundaries of climate science have been re-drawn.

The IPCC. One of the clearest repercussions of Climategate was the unprecedented challenge to the authority, accuracy and reputation of the UN's Intergovernmental Panel on Climate Change (IPCC). This was triggered early in 2010 by a story written by Fred Pearce in the 11 January issue of New Scientist magazine and which quickly gained global attention. This concerned a claim in the 2007 IPCC Report that the likelihood of Himalayan glaciers "disappearing by the year 2035 and perhaps sooner is very high if the Earth keeps warming at the current rate" (IPCC, 2007: 493). Such a claim was rapidly dismissed by all experts as false and so this error rapidly prompted another investigation by the extended peer community into the veracity of other IPCC knowledge claims. A few errors and many ambiguities and poorly evidenced claims were found in the IPCC's 2007 Report, especially in its Working Group on impacts and adaptation.

Notable was the reaction in the Netherlands to an erroneously high percentage of land in that country which was claimed to lie below sea-level. Within a week the Dutch Parliament had debated the trustworthiness of the IPCC reports and voted for an independent line-by-line review of the entire Working Group 2 report. And then on 10 March, just seven weeks after the New Scientist article, the UN Secretary-General Ban Ki-Moon and the IPCC's parent body, the UN Environment Programme, commissioned the Inter-Academy Council (IAC) to conduct a detailed review of all of the IPCC's processes and procedures. In more than 20 years of operation, through four full Assessment Reports and winning (jointly) the award of the 2007 Nobel Peace Prize, the IPCC had never been subject to this level of scrutiny.

Yet the initial error about the Himalayan glaciers had been published by the IPCC nearly three years earlier, in April 2007, and critical journalistic attention to the claim had already been aired publicly on Indian TV in early November 2009 following a report from the Indian Government questioning the claim. The IPCC's chairman Dr Pachauri dismissed this report as 'voodoo science'. Yet this occurred ten days before the CRU emails were published and the criticism of the IPCC gained no traction. It was only after public confidence in climate science had been unsettled by Climategate that such criticism of the IPCC could 'stick'.

The repercussions of Climategate for the IPCC should therefore be seen as a good thing. The IPCC has rather helpfully been removed from its pedestal of infallibility and more plausible accounts of the knowledge-making practices of the IPCC have been established. In recent years critical scholarship has shown how the knowledge claims of the IPCC emerge from complex and contingent processes of inclusion and exclusion, where framing, personality and politics shape the resulting knowledge (e.g. O'Reilly et al., 2012, on sea-level rise estimates; Mahony and Hulme, 2012, on dangerous climate change; and Suk, 2012, on climate change and malaria). Although the IAC's recommendations have not been implemented in full, its Review brought to heel an organisation and its leadership which had become high-handed, above criticism and largely unaccountable to public interests. It fully illustrated and justified the concern of scholars like Clark Miller who have drawn attention to the weak accountability of international knowledge assessment institutions.

Public opinion

One of the consequences of a public science controversy is to unsettle previously held convictions and certainties, beliefs which had been assumed but perhaps unexamined for some time. In the days immediately after the emails' release I remember a professorial colleague in the School of Environmental Sciences at UEA came to see me in my office. Knowing that I used to work in the Climatic Research Unit he wanted my candid opinion about whether our colleagues working over the bridge in CRU could indeed be trusted. Had they been manipulating data? Was the empirical evidence for global warming sound? He was being challenged to re-examine his assumed certainties; and this from someone who had worked for over 15 years in the same School as the scientists under suspicion.

This unsettling extended much more widely, although significantly it seems only to have affected certain Anglophone – UK, USA, Australia – and some northern European nations. Neighbours and friends of mine in Norwich started asking me questions about the validity of the criticisms being made. Assumed truths and certainties were being questioned. The UK environmentalist columnist George Monbiot was an example of a high profile public

commentator whose beliefs were clearly challenged by the emails and subsequent allegations. "No one has been as badly let down by the revelations in these emails as those of us who have championed the science", Monbiot wrote the week following . "I have seldom felt so alone."

In the weeks after Climategate evidence of the impact of the controversy on public beliefs emerged from public opinion polls on both sides of the Atlantic. For example, in the USA a poll taken six weeks after the emails' release suggested that amongst those who had followed the story – just over half those surveyed – 47 per cent said it had made then more certain that 'global warming was not happening'. (A slightly larger proportion said that they had 'less trust in climate scientists' as a result). Scaled up, this amounted to about 58 million Americans who had been influenced in this way by the controversy (Maibach et al., 2012).

Some have claimed that these effects on public beliefs about climate change would be relatively short-lived, but a large-scale survey in the UK conducted in March 2011 – 16 months after Climategate – suggests this may not be so (Shuckburgh et al., 2012). The overall levels of concern about climate change amongst the British public had decreased over five years, almost half the population felt that the 'seriousness of climate change had been exaggerated' and one-third of the public did not trust climate scientists to tell the truth about climate change.

I don't think Climategate itself can explain all of these results and trends. Other factors such as the economy have intervened and trust across many UK public institutions and professionals has fallen, not just climate scientists. And yet what these results show is a changing and volatile public culture within which climate science is undertaken. Scientific knowledge is not created solely in the laboratory and therefore neither can it enter into public circulation simply stamped with the label 'truth'. To claim, "I am a scientist, trust me" is no longer sufficient, even if it ever once was. For scientific knowledge to earn credibility as public knowledge scientists have to work as hard outside the laboratory as they do inside, through repeated demonstrations of their integrity, accessibility and trustworthiness. Only then will they be judged as reliable witnesses and their knowledge deemed credible (Shapin, 2010). This is not easy to do, as the events surrounding Climategate showed. What may be adequate in one culture at one moment, may not count as an adequate performance in a different context. Science is made in public as much as it is made in the laboratory or in other arcane spaces of expert deliberation.

Understanding scepticism

One of the interesting responses from the academic community since Climategate has been a new interest in studying and understanding the various manifestations of climate change

scepticism . One obvious reason for this interest is the evidence that voices sceptical of the standard climate change 'plan' (cf. Sarewitz, 2011) multiplied in the months following Climategate. This has been shown in the work of Painter and Ashe (2012) and Grundmann and Scott (2013) who followed media reporting of climate change around the world in the months following Climategate. Taking climate change scepticism as an object of study has engaged new scholarly communities – such as social psychologists, rhetoricians and anthropologists – and a wider range of academics than the select few sociologists who had been working in this field before. By paying attention to the political and cultural values which shape the production, circulation and reception of climate change knowledge a much richer and more helpful picture emerges. The populist notion that all climate sceptics are either in the pay of oil barons or are right-wing ideologues, as is suggested for example by studies such as Oreskes and Conway (2011), cannot be sustained.

There are many different reasons why citizens may be sceptical of aspects of climate science, certainly why they may be sceptical of knowledge claims which get exaggerated by media and lobbyists (see Chapter 38). This may be because of innate suspicion of 'big science' (which climate science has become, with powerful patrons in government and UN and international institutions) or because of a commitment to forms of data and knowledge libertarianism, as in the Wikileaks movement. Some of the individuals who pursued CRU scientists for access to data in the months leading up to Climategate may be seen in this light; they had no connections with the oil industry or conservative think-tanks. Other expressions of scepticism may result from issue fatigue, cynicism about a media who seek to sensationalise (as quoted above in the 2011 UK opinion survey quoted above) or the experience of cognitive dissonance. This latter idea captures the feeling of discomfort when someone holds two or more conflicting beliefs and Kari Marie Norgaard explores this in her ethnography of climate scepticism in a small town in Norway (Norgaard, 2011). Norgaard exposes the psychologies of climate change belief, doubt and unbelief embedded in local histories, cultures and community social practice.

But beyond these reasons for climate change scepticism, in the years following Climategate it has become more important to distinguish between at least four different aspects of the conventional climate change narrative where scepticism may emerge. Trend scepticism would be disbelieving of evidence that suggested a change in climate was occurring, whereas attribution scepticism would be doubtful that such trends were predominantly caused by human agency. Impact scepticism would question whether the melodrama of the discourse of future climate catastrophe is credible and policy scepticism would query dominant climate change policy frameworks and instruments. When this more nuanced analysis of climate change scepticism is combined with a valorisation of the scientific norm of scepticism and the democratic virtue of scrutinising and interrogating vested interests, there becomes room for more respectful arguments about what climate change signifies and what responses may be appropriate. My contention is that the events

surrounding Climategate in late 2009 have opened up new spaces for such agonistic democratic virtues to be exercised.

The evolution of science

There were a number of specific circumstances and broader cultural trends which enabled the phenomenon of Climategate to erupt in November 2009 and which also shaped the competing interpretative stories in the days and weeks following. The proximate circumstances were the refusal (later deemed illegal) by CRU scientists to release climate data and the imminent COP15 climate negotiating meeting in Copenhagen. But the wider cultural trends included the growing use and visibility of social media, the Wikileaks movement, the intensification of American partisan politics and the intractability of climate change negotiations.

Scientific controversies not only reveal intellectual arguments, struggles for power and human limitations within the practices and institutions of science, they also reflect the dynamics of these exact same phenomena in the wider culture within which science takes place. And they also nearly always lead to changes in the way in which science is done as it seeks to retain its cultural authority. The nature and practice of science – how it makes authoritative knowledge about the physical world – is not defined in textbooks, least of all textbooks which are treated as timeless and universal. People have tried to define science in this way and failed. Science is like other human cultural institutions: it evolves to survive. And science controversies often become the necessary disturbances to provoke adjustment and innovation; the genetic mutations upon which processes of natural selection can operate. Whatmore observes that scientific controversies are "generative events in their potential to foster the disordering conditions in which reasoning is forced to 'slow down', creating opportunities to arouse 'a different awareness of the problems and situations that mobilize us'" (Whatmore, 2009: 588).

This is certainly true of Climategate. Climate scientists, their institutions and their sponsors – i.e., climate science as an enterprise - were forced to stop and reflect on how they organised their interactions with the outside world, from data policies to language, modes of communication and forms of public engagement. The unthinking assumption that having gained broad public trust (after all the IPCC had been awarded a Nobel Prize!) this would automatically be retained, was sharply challenged. And more widely, outside science, there have been adjustments in media reporting of climate change and in the entrainment of climate science in policy deliberations, and a greater boldness from critics to challenge scientific claims and practices.

Has Climategate been a good thing? Probably not for some of scientists caught in the conflagration. There has been some reputational damage both to individuals and

institutions. The real answer though depends on one's beliefs about the nature of science and its place in public life. If one thinks of science as a pure disinterested pursuit of knowledge whose truths can then coerce social actors, whether individual or collective, into value adjustments and behavioural change, then one probably sees Climategate as a set-back. If however one understands that science only 'works' because it continually evolves norms and practices which can be rhetorically defended in public and its knowledge therefore becomes powerful through beliefs and behaviours, then Climategate should be seen as a creative episode. The lesson for scientists would then be this: "In the long run, scientists may be better served by greater openness with respect to the actual practice of science, rather than upholding the conventional image of cool, restricted display of instrumental rationality" (Ryghaug and Skjølsvold (2010: 304).