

“THE ONLY GREEN SOLUTION”: SCIENCE, MASS MEDIA & THE UK ENERGY DEBATE

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Abstract

We examine the contention that sufficiently well-informed mass media coverage of scientific and technological issues contributes toward the democratic process by enhancing citizens' ability to debate and make informed decisions about such issues. Influences upon media science communication which call this model into question are addressed. Miller's model of the circuit of mass communication frames our analysis of a single news story: Scientist and environmentalist, James Lovelock's 2004 newspaper article which started a new phase of discussion on UK energy policy by suggesting that citizens accept the increased use of nuclear power now to mitigate worsening global warming in the future. Several factors which affect the quality of scientific information appearing in the article are examined: the use of media 'news values' in structuring the text; the 'mediation' of salient facts by Lovelock; recognition that a direct influence on political policy making is possible; and the effect of Lovelock's scientific authority. We conclude that media demand for news value in its science reporting coupled with the various agendas of experts engaged in interpreting the issues make it impossible for citizens to form balanced judgements on scientific and technical issues based on the quality of information received from the mass media.

Keywords: Science communication, News value, Public engagement, Democratic process

1. Introduction

It may appear that sufficiently well-informed mass media coverage of scientific and technological issues can contribute towards the democratic process by enhancing citizens' ability to debate and make informed decisions about such issues. After all, Collins and Pinch [1] observe that political policy making is increasingly affected by scientific and technological issues – demonstrating the need for citizens of a participatory democracy to possess a certain level of scientific understanding in order to engage with these issues. Whilst Nelkin [2] comments that mass media reporting is often the only explanation the public have of the scientific issues that affect their lives. Therefore, improving the quality of scientific information in the only channel of communication accessed by most of the public would seem to provide a solution. Indeed the media have been continually criticised for 'dumbing down' their science reporting, implying that some solution may be found if this trend was reversed.

But to propose such a solution is to misunderstand the complexities underlying the situation. As Collins and Pinch observe “the information needed [by citizens] is not about the content of science; it is about the relationship of experts to politicians to the media, and to the rest of us.” [1, p. 142] In this paper, Miller's model of the circuit of mass communication [3] which provides a concise illustration of these relationships, will be applied to the analysis of a single news story – scientist and environmentalist, James Lovelock's March 2004 article [4] suggesting that citizens should accept the increased use of nuclear power in the short term as the only effective way of insuring against worsening global warming in the future. Which appeared in *The Independent*, a UK, daily, centrist, broadsheet newspaper.

Lovelock's article kick-started a new phase of discussion on UK energy policy, our aim is to explore the implications of the way in which this debate has been managed for the further development of civically engaged science communication.

The newspaper article and its author have been chosen to enable an examination of two things. The different criteria applied by scientists as opposed to the media when selecting the 'newsworthy' elements of a scientific issue. Secondly to demonstrate the ability of a media-savvy scientist, like Lovelock, to exploit these media 'news values' in structuring his text to achieve his own ends – in this case, a wider political impact. By 'news values' we mean stylistic attributes such as continuity, personalisation, unexpectedness and sensationalism [5]. The process being described here is referred to by Miller [3], as the mediation of science – the communicating of science shaped by a particular motive. Miller claims that all science communication undergoes 'mediation'.

The authority of the author reporting the science will also be examined. Again, Lovelock is an interesting case in point since he has distinct and somewhat contrasting profiles within the scientific establishment and the sphere of the mass media. He is, at once, the media's maverick Gaia theorist and Science's award winning environmental scientist.

We will examine Lovelock's newspaper article and others relating to it. Our aim is to emphasise the skewed information which the public receive about science and technology from the media. Our contention being that it is impossible for the public to form balanced judgements based on this quality of information.

2. Science and Media Culture Clash

Any analysis of science reporting in the media must address the fact that the language and structure of a news story are different from those of a scientific paper. In general, Gregory and Miller observe, "News language is immediate, positive and active, unlike the measured, passive prose of science...Science is supposed to be generalised and generalisable...but news is specific, so the words must be specific...To be concise, journalists may remove the qualifications in scientific language...This has the effect of exaggerating...it also makes the information look more certain than the scientists might think it actually is." [5, p. 116] So, for instance, the conclusion of a scientific report becomes the headline of a news story. In our case, "Nuclear power is the only green solution. We have no time to experiment with visionary energy sources; Civilisation is in imminent danger" [4]. News values favour short-term and dramatic issues over longer-term stories [3]. With this headline Lovelock has cleverly imposed a concrete, short term time frame on an issue that, to the public at least, is long term and amorphous. This practice is continued throughout the article, "The floating ice of the Arctic Ocean is even more vulnerable to warming; in 30 years, its white reflecting ice, the area of the US, may become dark sea...there is no chance that the renewables, wind, tide and water power can provide enough energy and in time. If we had 50 years or more we might make these our main sources. But we do not have 50 years." [4]

It could be argued that the structure of the article is a recognition by Lovelock that in order to communicate science in the media, one must conform to its tropes and deliver print-ready copy to the Editor. Further it could be said that Lovelock is attempting to shock his audience, with his sensationalist style, into re-evaluating their mistrust of nuclear power in the light of his claims of the far worse effects of climate change if the nuclear option is not embraced. But is there another reason for the structuring and placing of this story in the mass media?

3. Mediation of Science

Miller defines the mediation of science; "By mediation we mean that to describe any single piece of science or a body of scientific theory, a selection of what to say or write must be made. The account to be given must of necessity be 'selective'...mediation implies agency. Someone does the mediating and does it for particular reasons." [3, p. 206] Lovelock wants the readership to take note of the story, so that they will debate the issue and come (we infer) to support his proposal. But newspaper readerships are small compared to the size of the population at large, "quality newspapers have relatively small readerships (of the order of half a million in Britain compared to five million for a tabloid)," [5, p. 105] so Lovelock is also aiming to excite wider critical and political reaction. An examination of news stories in the days following publication show that the desired reaction was forthcoming. For example this report in *The Independent*, a UK, daily, centrist, broadsheet newspaper,

"A FORMER Labour energy minister and the nuclear industry both welcomed the call by the scientist James Lovelock yesterday for a massive expansion of the nuclear industry to combat global warming. They also forecast that Professor Lovelock's dramatic call, in yesterday's *Independent*, would force more environmentalists to consider whether nuclear power really posed a greater threat to humanity than climate change - and that they too would eventually agree with the celebrated scientist. Professor Lovelock's radical suggestion provoked widespread debate yesterday, with both Friends of the Earth and Greenpeace rejecting his claims." [6]

This kind of reaction is advantageous to Lovelock's cause but also serves a journalistic end, a news value that Gregory & Miller term 'Continuity' - "for just how long will a story run?... journalists who work hard to understand the latest science and establish contacts with the relevant scientists may only get one story out of their efforts, compared with the dozens that will appear during [say] an election campaign." [5] The initial continuity of this story was boosted over several days by immediate reaction in the form of 'letters to the editor'.

Neither is it a coincidence that on the day the story was published *The Independent* also ran an interview with James Lovelock at his home. This demonstrates the news value of 'personalisation', "The tendency of the media to personalise stories is a mixed blessing for science. Science is usually done by somebody - there is the 'who' already. But according to scientific tradition, it is the 'what' and the 'how' that are supposed to be more important." [5, p. 121]

The above are examples of Lovelock, using his media knowledge to add news values to the article. The last value relevant to this article is 'Unexpectedness' - 'Science may not usually run to schedule, but scientists can take the public by surprise' [5, p. 127] as in the comment,

"SCIENTISTS sometimes come out with statements so astonishing you wonder if you heard them correctly. Can it be true that Britain's Professor James Lovelock, guru of the environmental movement, has called for an immediate and massive investment in nuclear power?" [7]

Thus science can be communicated in the newspaper media - under certain journalistic constraints - and this, we suggest, can also have a political effect. In order to better understand the nature of these inter-related influences we must return to the concept of The Mediation of Science and examine its use in the wider political sphere.

4. Circuit of Mass Communication

“The mediation of science is a complex phenomenon which involves a large number of contending and co-operating social factors and groups. These include institutions and corporations, media organisations, a range of publics, and policy, cultural and political outcomes.” [3, p. 208] These interactions are shown graphically below. The intention is demonstrate that all interested parties can affect and be affected by all others:

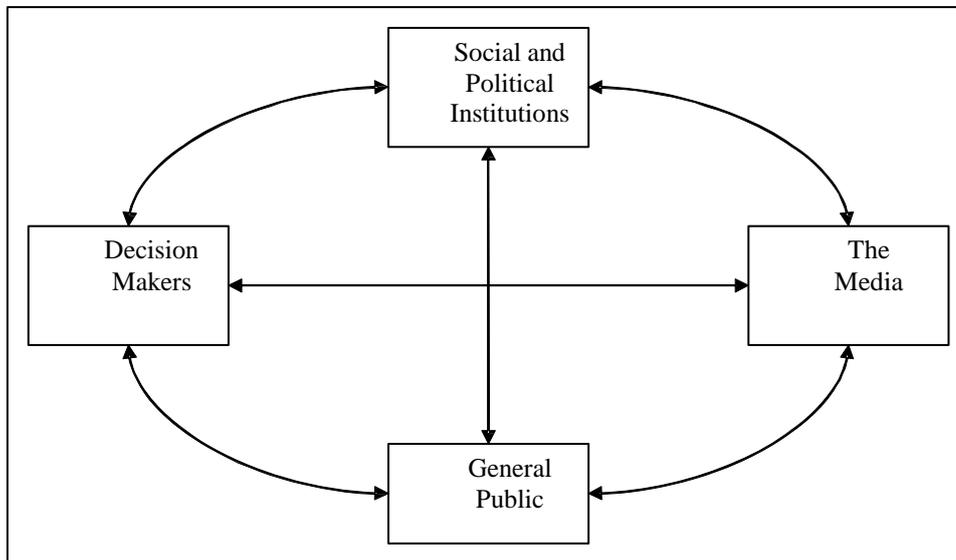


Figure1. The Circuit of mass communication

“However, the communication of science is often examined from the vantage point of only one part of the ‘circuit of communication’. Thus we find discussions of the coverage of particular issues, examinations of ‘lay perspectives’ or public opinion, or attempts to evaluate the communication strategies of particular organisations. But we cannot properly understand the actual behaviour of ‘experts’, the media or the public in isolation. Instead they need to be examined in the context of their interactions with each other.” [3, p. 208]

5. Management of the Debate

The above discussion provides a fresh perspective from which to examine our opening contention; that the mass media could provide sufficiently well informed science reporting to enable citizens to engage in participatory democracy. In essence, Lovelock’s article asks readers to perform a risk analysis comparing increased use of nuclear power to the projected impact of climate change. But we would now argue that, the demands of journalistic news values coupled with the author’s mediation reflecting his own perspective, and the pressures of political policy making mean that the mass media can never be a channel that provides information in a complete enough form to educate the public about the scientific and technological issues with which they must engage.

In the case of Lovelock’s article the most obvious omission is any discussion of the problem of nuclear waste. Since the siting of a nuclear waste storage facility is hugely unpopular with the public, it is a decision that has been put off by successive UK Governments ever since the 1950s. Those responsible for generating the waste, such as British Nuclear Fuels also ignore the issue of its storage, preferring instead to concentrate on the Green credentials of nuclear power and attempt to position it along side renewable energy sources,

“Nuclear power and renewables – such as solar cells and wind turbines – produce electricity with almost no greenhouse gas emissions. There are some low level greenhouse gas emissions, for example during construction. But these emissions are tens or even hundreds of times lower than the emissions from burning fossil fuels such as coal, oil and gas. In short, to help reduce greenhouse gas emissions we need to generate more of our electricity from nuclear and renewable sources.” [8] Such tactics have been referred to as a cynical attempt to “Green-wash” nuclear power.

And so, once again, public opinion on the issue of nuclear waste is largely informed by media reporting and, as we have seen, news values dictate that this reporting will be basically sensationalist in tone – since sensationalism sells newspapers,

“Ninety-eight percent of Britain’s most deadly radioactive waste is still sitting at the Sellafield nuclear site in Cumbria, much of it left over from the early nuclear power and weapons programmes. A permanent fix could still be decades away and with the threat of terrorism adding to the danger, the problem is pressing. Some of the Sellafield waste stores, such as the B30 and the B38, fall well short of modern standards. On my trip to the site I was prevented from entering the B30 itself. It is an open pond containing radioactive waste and is so dangerous that access is strictly limited. Some areas of the facility workers are allowed in for just minutes per day.” [9]

An examination of newspaper coverage shows that in the 2004 round of the UK energy debate the political possibility of legislating for the building of new nuclear power stations was effectively blocked by reporting of the nuclear waste issue. Forcing the government to announce that energy efficiency measures and renewables would be their focus instead. The power of the media to influence public opinion and political policy making is not at issue here. The ability of the media, by its very nature, to deliver well informed science coverage to a politically engaged citizenry, is.

Table 1. The Nuclear Debate in the Newspapers (summary 2004 - 05)

<i>Date</i>	<i>Newspaper</i>	<i>Story</i>
24.05.04	The Independent	<i>Headline:</i> Nuclear Power Is The Only Green Solution; We Have No Time To Experiment With Visionary Energy Sources; Civilisation Is In Imminent Danger.
25.05.04	The Independent	<i>Headline:</i> Scientist's Plea To Use Nuclear Energy Starts New Climate Change Debate By Green Groups
30.01.05	Sunday Telegraph	Publication of Government's Energy white paper delayed until after general election because issue is a 'vote loser'
08.05.05	The Observer	The government's strategy to kick-start a huge nuclear power station building programme is revealed today in confidential Whitehall documents seen by The Observer
09.05.05	Guardian	Huge radioactive leak closes Thorp nuclear plant (Sellafield)
10.05.05	The Independent	Britain may need one more generation of nuclear power stations in the fight against climate change, Sir David King, the Government's chief scientific adviser, says.
11.05.05	Guardian	Rapid return to nuclear power ruled out by Sir David King instead to focus on energy efficiency and renewables
14.05.05	Guardian	Waste warning sounded in clamour for nuclear stations A new generation of nuclear stations will hamper attempts to find a solution to the nuclear waste problem, the government has been told.

6. Authority

We have seen that a scientist requires good communication skills and a knowledge of the media. Many commentators observe that the final attribute required is authority and that, in some respects, this is more crucial and yet more difficult to gain in the media sphere than in the scientific. James Lovelock is an interesting case in point since he manages to maintain 'dual identities' across these two spheres.

Science aspires to the values of "rationality, universalism and disinterestedness," but the structure of the scientific establishment is hierarchic with influence depending on seniority, Kuhn called science 'dogmatic' and Sardar & Van Loon highlight, "in-built gender and racial biases in the process of science" and accuse science of being 'powered by' a "mono-cultural matrix." [10, p. 5, p. 31]

As far as publishing of scientific work goes, Gregory and Miller explain, "one of the traditional rules of science popularisation [is to] have published in a peer-reviewed journal first and gone public second." but, "the scientific culture and journalistic culture do not match up: it can take anything from a few months to... years to get an academic paper into the peer reviewed literature, but if it is news it has got to be in the newspaper tomorrow." finally, "When scientists do go to the newspapers before their peer-reviewed work has been published, they can jeopardise their social and professional relationships within the scientific community." [5, p. 108]

James Lovelock is an interesting case in point because he has what could be seen as a dual identity split between the media and the scientific spheres. Described most often in the media as an 'independent scientist and inventor' and known to be the originator of the Gaia hypothesis¹ we are lead to expect some kind of maverick mad-scientist,

"But that will not worry 84-year-old James Lovelock, CBE, FRS, who all his life has been a maverick, Fellow of the Royal Society or not." – for instance [6].

We can speculate that this is a deliberate action on the part of newspaper journalists – again adding news value to a scientific story. In this case satisfying the public's "fascination with unorthodox science" and by "pitting an unorthodox scientist against the scientific establishment in a news article [they] have excited public sympathy for the lone outsider." [5, p. 126]

¹Described by Dick & Strick, "the controversial Gaia hypothesis. First published in a developed form in 1974...claim[ed] that all living things on Earth, along with the lithosphere, oceans and atmosphere, act as a unified, synergistic system analogous to the body of a single organism which homeostatically controls environmental conditions in the oceans, the atmosphere, and so on, so that they remain within the range needed to support life." [11, p. 49]

But an examination of Lovelock's scientific work will show that he is neither a maverick nor a loner – in fact he commands great respect in certain scientific quarters:

There is nothing 'maverick' about the fact that he is an inventor, as he himself comments, "In those days [1948] it was customary to build, not buy, instruments. Indeed scientists were expected to invent." [12, p. 182]

In any case, Lovelock's invention of the Electron Capture Detector (a gas chromatograph) can be seen as the source of his 'independent means', he is not 'independent' due to 'banishment' from the scientific establishment. His skill as an inventor and the discoveries made with the help of his invention are sources of the scientific respect he commands especially within the environmental sciences,

"This simple device [the ECD] that fits easily into the palm of my hand was without doubt the midwife to the infant environmental movement. Without it we would not have discovered that chlorinated pesticides like DDT... had spread everywhere in the world...it soon found...other pollutants PCBs and CFCs. It made us aware for the first time of the global extent of pollution." [12, p. 181]

The unparalleled sensitivity of the ECD in the 1970s – able to detect atmospheric pollutants at parts per trillion levels – made Lovelock the main authority on CFC pollution after a monitoring voyage to the Antarctic in 1971 – 72. Lovelock received recognition for his invention in the 1990s with the awarding of three environmental prizes: The Amsterdam, Volvo and Blue Planet awards in 1991, 96 and 97 respectively. Lovelock also worked for NASA between 1961 and 1963 adapting the ECD gas chromatograph for use on their Lunar Surveyor mission.

The authority that Lovelock holds in both scientific and media spheres means that he is well able to publish his article in The Independent newspaper rather than a peer reviewed journal without the risk to his reputation within the scientific community of which Gregory and Miller warned [5]. Partly due to the fact that he is also widely published in those peer reviewed journals – 16 articles and reviews over a 30 year period in the journal 'Nature' alone. Again, hardly the act of a maverick.

We have established the basis of Lovelock's credibility in the scientific sphere and the influences shaping his media profile. We contend that Lovelock's experience communicating in both of these spheres enabled him to craft his May 2004 newspaper article with a specific political end in mind. Lovelock's reputation also makes him a figure whose scientific authority is readily recognisable to newspaper readers.

7. Recent Developments

Two years have passed since the publication of Lovelock's article and it is instructive to examine developments in the intervening period which illustrate conflicts of scientific authority plaid out in the media and provide further support for our contention that the media, by its very nature, cannot provide well informed science coverage.

Lovelock has not been idle during this time, publishing a book in February 2006, entitled "The Revenge of Gaia: Why the Earth Is Fighting Back - and How We Can Still Save Humanity" in which he continues to expound his message of drastic measures needed in the next decade – including the large scale use of nuclear power – to mitigate the worst effects of climate change thereafter.

The UK government's commitment to publish the results of its latest energy review in summer 2006 has set another cycle of debate in progress. The perceived government position is that it still favours the nuclear option but recently the government's own Sustainable Development Commission, chaired by Jonathon Porritt, has claimed that, "if the UK's existing nuclear capacity was doubled, it would only lead to an 8 per cent reduction in carbon emissions from 1990 levels. By contrast, renewable energy sources such as wind, wave, solar and biomass, which are zero-carbon sources of energy, could supply 68-87 per cent of the country's electricity needs if fully exploited." This claim undermines Lovelock's main argument and presents a fascinating authority issue for the public readership to interpret; Lovelock and Porritt both have media profiles as committed environmentalists, however, Lovelock, the media's maverick scientist, supports the establishment view, whilst Porritt, who is working for the government, disputes it. Tellingly Porritt refers to Lovelock's perceived authority saying, "No one person should be accorded that overarching credibility in the face of the evidence before us." [13]

Other authority figures have presented the public with concrete examples of non-nuclear energy solutions, which minimise greenhouse gas emissions. Mayor of London, Ken Livingstone proposes the use of decentralised power generation in the city, citing the town of Woking which experienced a 77.4 per cent drop in CO2 emissions between 1991 and 2004 after instigating such a scheme [14].

So, what now will be the public's reaction? Lewis observes that there are links, "between the public's knowledge, their opinions and science in the news media. The media are an important source of information about contemporary issues, and what people know influences what they think...people do tend to absorb oft-repeated associations they hear in the media, such as the association between global warming and other environmental problems." [15]

A very often repeated association in the media is that between nuclear power generation and danger, Markham observes,

"After 40 years of production of nuclear waste, it is little wonder that there is 'considerable public anxiety' over nuclear power. Of course the near melt-down at Three Mile Island, slow pollution of the North Sea by Sellafield (i.e. Windscale) and the terrifying explosion at Chernobyl haven't done much to lessen public anxiety." [16]

We use the above examples to emphasise the skewed information which the public receive about science and technology from the media. The media tend to personalise the debate by associating each point of view with a particular authority figure so Lovelock represents the pronuclear argument while Porritt is associated with renewables. In the absence of informed science and technology reporting the public are left to form their opinions based on associations repeated in the media, such as the association between global warming and other environmental problems, and their judgement of which authority figure they feel to be pre-eminent.

8. Conclusion

We have seen that, although attractive, the notion that mass media reporting could inform a politically engaged citizenry in issues of science and technology is based on an over simplistic reading of the situation. In our study we have seen that it is possible for figures such as Lovelock to establish their scientific authority in both the scientific and media spheres and to become skilled in adding news value to their public science communication. But a wider view reveals that such communication has other motives than pure public education. Again in our study it was shown that Lovelock desired a wider political effect – an influence on policy making. We are forced to conclude that the demands of news value and the mediation of salient facts make it impossible for citizens to form balanced judgements on scientific and technical issues based on the quality of information received from the mass media.

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