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A detailed analysis of the Sydney Morning Herald's reportage of the Lucas Heights controversy reveals significant omissions in the cover-age. In particular, I draw attention to the existence of two competing rationalities within the controversy, that is, the instrumental rationality used by the Australian Nuclear Science and Technology Organisation (ANSTO), the Australian Federal Government, and the SMH editorial to publicly justify the building of a new reactor, and the ecological rationality advocated by the Sutherland Shire Council's scientific consultants and some individuals within the environmental lobby. I further argue that the full ramifications of the SMH's reportage of this controversy cannot be understood without reference to a number of international trade and diplomacy issues which have not been raised in the context of that reportage. I suggest that, because the SMH editorial shares the same instrumental approach to social and political issues as the Federal Government and ANSTO, the power relations at work within the Lucas Heights controversy have remained obscured by the positivistic belief in the social and political neutrality of technical evidence. Inasmuch as such a critique can be extended to the rest of the Australian media, the likelihood of implementing a more ecological approach to the reportage of scientific and technological development in Australia appears remote.

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Lucas Heights revisited: The framing of a major scientific controversy by the *Sydney Morning Herald*

Adam Lucas

Abstract

A detailed analysis of the *Sydney Morning Herald's* reportage of the Lucas Heights controversy reveals significant omissions in that coverage. In particular, I draw attention to the existence of two competing rationalities within the controversy, that is, the instrumental rationality used by the Australian Nuclear Science and Technology Organisation (ANSTO), the Australian Federal Government, and the *SMH* editorial to publicly justify the building of a new reactor, and the ecological rationality advocated by the Sutherland Shire Council's scientific consultants and some individuals within the environmental lobby. I further argue that the full ramifications of the *SMH's* reportage of this controversy cannot be understood without reference to a number of international trade and diplomacy issues which have not been raised in the context of that reportage. I suggest that, because the *SMH* editorial shares the same instrumental approach to social and political issues as the Federal Government and ANSTO, the power relations at work within the Lucas Heights controversy have remained obscured by the positivistic belief in the social and political neutrality of technical evidence. Inasmuch as such a critique can be extended to the rest of the Australian media, the likelihood of implementing a more ecological approach to the reportage of scientific and technological development in Australia appears remote.

Introduction

The following discussion focuses upon the continuing controversy surrounding the High Flux Australian Reactor (HIFAR) nuclear research reactor at Lucas Heights in the south-west of Sydney and, in

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particular, the manner in which this controversy has been handled by one of Australia's major daily newspapers, the *Sydney Morning Herald*, now owned by Conrad Black, Malcolm Turnbull, and Kerry Packer's Fairfax Group. My discussion concentrates on the *SMH's* reportage of some of the most recent developments in the controversy, particularly between June and November 1993.

The substantive claim made in this paper is that the HIFAR reactor at Lucas Heights is simply one element in a much larger matrix of conflicting but interrelated social, political, and economic interests which have remained largely concealed from public scrutiny. An unfolding of the *SMH's* coverage of Lucas Heights, together with an articulation of the issues revealed, throws considerable light on those conflicting interests. The intention of this analysis is to identify general patterns of reporting, and the extent to which individual articles have incorporated the discursive methodologies and underlying rationalities represented by the different interests involved.

Certainty and optimism versus incredulity and pessimism: Conflicting rhetorics or conflicting rationalities?

Gissing (1993) recently identified two rhetorics as operative in the Lucas Heights controversy: the rhetoric of certainty and optimism used by the Australian Nuclear Science and Technology Organisation (ANSTO) in its attempts to justify the building of a new research reactor, and the rhetoric of incredulity and pessimism used by the Sutherland Shire Council and the environmental lobby, which oppose both a new reactor and ANSTO's radioactive storage and safety procedures. However, while there is some truth to Gissing's observations, it would appear on closer examination that the rhetoric underscoring the conflict is motivated by two incommensurable scientific rationalities, each of which constructs the notion of scientific and technical evidence in a totally different fashion, and each of which promotes apparently opposite social objectives.

The (positivistic) instrumental rationality advocated by ANSTO and its public representatives in the government and the media contrast with the (process-oriented) ecological rationality advocated by the Sutherland Shire Council's scientific consultants and some individuals within the environmental lobby. To the best of my knowledge, this difference in scientific rationalities has not been identified in any of the contemporary analyses of scientific controversies in the media, although it is an empirically demonstrable difference.

The term 'instrumental rationality', or 'instrumental reason', derives from the work of the Frankfurt School (Adorno, 1960; Adorno & Horkheimer, 1972; Habermas, 1979, 1980). It is identified with a form of rationality known as positivism, which has gradually expanded its influence throughout the nineteenth and twentieth centuries so that it

now provides a theoretical basis for the majority of what Habermas has called the empirical-analytical sciences, as well as many of the modern approaches to social theory (McCarthy, 1978). Its central assumption is that the social sciences should model themselves on the natural sciences, whose *modus operandi* is the only one thought capable of producing certifiable and therefore valid knowledge.

Developing a critique of reason derived from Kant and Weber, the Frankfurt School made a sharp distinction between 'instrumental reason' and what they called 'practical reason'. Practical reason is the form of rationality developed by ordinary people in the practical application of shared knowledge in everyday life, and is oriented towards the ideals of freedom, justice, and happiness. Instrumental reason, on the other hand, derives mainly from the mechanistic worldview of the natural sciences. Its systematic aim is the technical control and domination of nature (including human nature), expressed by capitalism in the ubiquity of commodity exchange, and 'a continually refined administration of human beings and their relations to each other by means of social organization' (Habermas, 1973, p. 254).

Whereas Adorno and Horkheimer saw instrumental rationality as a distorted form of reason, a 'negative dialectic', that could/should be replaced by a 'new science' which acknowledges the equal status of practical reason and other forms of rationality (Adorno, 1982, p.48 ff; Horkheimer, 1972), Habermas has chosen to preserve the hermeneutic distinction between what he calls the 'critical sciences' and the (positivistic) social and natural sciences, but points to the different interests implicit in each of the forms of rationality that are considered appropriate to them (Habermas, 1975). Accordingly, the notion of a 'new science' and a new form of rationality which could bridge the divide is precluded as a possibility by Habermas (McCarthy, 1978). Thus, Habermas argues that instrumental, or what he calls system rationality is applied appropriately within the empirical-analytical sciences, but that it should remain within that domain of 'communicative action', rather than 'colonising' the other domains which constitute the 'lifeworld'. We can thus get some idea of how different members of the Frankfurt School have regarded the notion that instrumental rationality constitutes the legitimating ideology of the advanced industrialised nations (Dunn, 1979, p. 343).

Although postmodernists such as Lyotard and the poststructuralist Foucault have attempted to problematise such a description, it is not difficult to demonstrate that the globalisation of instrumental rationality has proceeded without interruption since the late 1970s (Debord, 1990; Guattari & Negri, 1990). Lyotard's assertion in 1979 that 'the Trilateral Commission is not a popular pole of attraction' (Lyotard, 1987, p.14) now appears somewhat premature, given the ever-expanding

influence of monetarist policies and economic rationalism as populist ideologies. The instrumental goals promised by such an approach have been embraced by government after government in the positivistic belief that the prescriptions of neo-classical quantitative economics are the only solution for our social and economic ills. Those postmodernists who point to the disunity of this Spectacle have fallen victim to its deceptive representations (Debord, 1990).

While the positivistic social and natural sciences represent themselves as the only means of acquiring 'true' or 'objective' knowledge, there is a stark contrast between this ideal self-image and the way in which such knowledge is actually accumulated and applied in the practicalities of the workplace (Collingridge & Reeve, 1986; Gilbert & Mulkay, 1984; Rip, 1985; Wynne, 1987). Wynne argues that science and technology operating within the positivist framework do so through a process of rule-construction and rule-following, 'where previous experience of rule-operation is extended to new situations by the *ad hoc* addition of new rules or sub-rules, in an ever-accumulating practical "craft" tradition' (Wynne, 1988, p. 154). Wynne points out that although positivist methodologies routinely incorporate notions of acceptable risk and uncertainty through the application of rules of thumb and other soft models (that is, non-quantitative, or a mixture of qualitative and quantitative models), more often than not, the representation of these methodologies to the public is through the filtering lens of a certainty based on supposedly indisputable technical criteria.

Nevertheless, science is not monolithic. Although there is a long history of opposition to positivistic approaches in social theory, and to mechanism within the 'natural' sciences, it is only over the last 30 years that this has translated into a popular movement of opposition to positivistic approaches amongst scientists and technologists from a broad range of disciplines. Habermas (1980) makes the observation that

responsible scientists, disregarding their professional or official roles, cross the boundaries of their inner scientific world and address themselves directly to public opinion when they want either to avert practical consequences connected with the choice of specific technologies or to criticize specific research investments in terms of their social effects (p. 79).

From these 'small beginnings', the process of broadening the dialogue between scientific and technical consultants, government agencies, and the general public has progressed considerably. What has not been well-recognised, however, is that there is no consensus within the scientific community about the superiority of instrumental approaches to science and technology. Consequently, we see a clash of competing scientific and technical claims made, on the one hand, by those 'responsible' scientists and engineers motivated by an interest in expanding the resources and methodologies open to science, and on the other, by

those primarily motivated by the desire to preserve the authority and ideological legitimacy of positivistic forms of science in the face of increasing calls for democratic participation in the direction of scientific and technological development.

Through this conflict of competing scientific and technical claims within scientific and environmental controversies, it is possible to locate ecological rationality as an emergent form of scientific rationality, and even to assert that the emergent ecological rationality is coextensive with the efforts of certain 'responsible' scientists to identify a 'new science'. Certain ideas and approaches which would be fundamental to such a 'new science' can also be seen as constituting this emergent ecological rationality, that is:

- (a) Scientific activity conforms to heterogeneous paradigms of theory and methodology which are collectively maintained and transformed (Feyerabend, 1986; Kuhn, 1970). Whether we subject these paradigms to a logical, historical, empirical, or hermeneutic analysis, it can be demonstrated that each paradigm has a domain of applicability, which means that there are, of necessity, limits to any particular scientific approach. Scientific knowledge can therefore be seen as context-dependent, provisional, and open to varying degrees of uncertainty. The conception of an *ecology* of 'regional', intersecting, complementary, and/or competing rationalities, of which any given paradigm is a subset, is more consistent with this multidisciplinary perspective than is the conception of one universal rationality (see Hayles, 1991; Luhmann, 1989 for two different theoretical perspectives on this issue).
- (b) The collective process of constituting scientific knowledge necessarily involves scientists in an ongoing process of education, peer negotiation, experimentation, and interpretation, which in turn involves the application of value-judgements based on metaphysical, ethical, and/or technical criteria (Collingridge & Reeve, 1986; Edge, 1985; Jasanoff, 1987; Wynne, 1988). Whether or not they are made explicit, social and political objectives are always embodied within these criteria (Albury, 1988). Those who make claims for the social and political neutrality of science are therefore misguided (Bloor, 1981; Latour, 1986).
- (c) The empirical-analytical sciences are thus neither asocial nor apolitical. Nor are they reducible to a logically self-consistent body of knowledge, or a single, rational methodology. The classical models of natural and social order cherished by positivism should remain restricted to the most simple and predictable natural phenomena to which they were initially applied. More complex natural and social phenomena require the evolution of more flexible and sophisticated mathematical tools, scientific

theories, and methodologies, and can usefully incorporate local and/or indigenous knowledge of the problem at issue (Feyerebend, 1988; Latour, 1986; Lucas, 1993; Wynne, 1988, 1989).

A critique of the instrumental and ecological rationalities employed by some of the dominant players in the Lucas Heights controversy underpins my analysis of articles in the *SMH*. Before conducting this analysis, however, it is necessary to describe how a number of instrumental goals pursued by the Australian Federal Government have played an important, though hitherto largely neglected, role in the Lucas Heights controversy. An explication of these issues reveals that the strategic manoeuvring required to achieve these goals is directly related to international trade and diplomacy issues, and that the Lucas Heights controversy cannot be understood without taking these matters into consideration.

Nuclear development in Asia and the Pacific region

According to some contemporary political theorists, the long-term strategy of capitalism and/or socialism is to replace a recalcitrant and 'overpaid' manufacturing workforce in the developed nations with non-unionised, cheap manufacturing labour in Asia and Latin America; hence the need to build more factories and boost the production base as quickly as possible in those regions (Giddens, 1986; Guattari & Negri, 1990).

Within this expansion of the world's manufacturing sector into Asia in particular, part of the expected pay-off for the industrialised nations is, firstly, the sale of technical know-how to Asia, and, secondly, for those governments and corporations with access to the raw materials for energy production, export contracts for the supply of oil, coal, natural gas, and uranium for the expanding energy needs of Asia's newly industrialised nations.

The Australian Federal Government has not been slow to perceive this 'window of opportunity'. Whilst it has downplayed the regular transgression of human rights by some Asian states (N-waste is negative, 1993, June 29), it has simultaneously attempted to expand its trade with those countries. Hence, Prime Minister Paul Keating's visit to Indonesia shortly after the last federal election in 1993, which was aimed at strengthening economic ties between the two nations, and, according to television reports at the time, included discussions between Keating and Indonesian officials about plans for a dozen new nuclear power reactors in the region. Although Keating's visit was given some attention on the television and radio news at the time, it was not reported in the *SMH*, nor was it reported in *The Australian*. Nor was Keating's visit to Indonesia mentioned in any of the three subsequent laudatory articles about Indonesia which appeared in the *SMH* in the

following fortnight after that visit (Australia's success in Indonesia, 1993, March 14; Soeharto takes new tack, 1993, March 22; Indonesia: taking the long view, 1993, March 24), a fact which suggests that the *SMH* editorial may intentionally not have published anything about that visit. If the suppression of information surrounding the Keating visit was a deliberate strategy, it raises extremely serious questions about the independence of the *SMH*'s news coverage of such an important and controversial issue. It is perhaps no accident that the *SMH*'s sudden enthusiasm for Indonesia followed on directly from both the 1993 Federal Election, and the highly controversial 'deal' struck between Keating and Conrad Black over the latter's access to a larger share percentage of the Fairfax Group. Was a softer editorial line on Indonesia also part of that deal?

An article from four months before the election helps shed some more light on this perplexing issue. On 18 November 1992, in an article entitled 'Indonesia puts off Canberra N-deal', it was revealed by the *SMH*'s Indonesian correspondent, Lindsay Murdoch, that the Indonesian Government had just refused to sign 'a nuclear co-operation agreement [with Australia] which foreshadowed the sale of uranium for planned nuclear power reactors on Java'. It was revealed in the report that Indonesia's Minister for Research and Development, Dr B. J. Habibie, had 'declined to sign the proposed Australia-Indonesia Nuclear Science and Technology Co-operation Agreement during a meeting with the Minister for Industry, Technology and Commerce, Senator Button' (Murdoch, 1992). Habibie's refusal to sign was reportedly due to the fact that he was unaware that the agreement 'which officials from both countries had been preparing for almost two years, was one of several to be signed by the two countries at the first Australia-Indonesia Ministerial Forum' (Murdoch, 1992). Button said that Habibie had refused to sign because he 'wanted to put nuclear co-operation under the broader umbrella of a joint agreement on science and technology', and that Button 'hoped it could be approved by early next year' (Murdoch, 1992). 'Early next year' was precisely the time that Keating was in Indonesia.

My earlier contention – that the HIFAR reactor at Lucas Heights is merely one element in a much larger matrix of conflicting but interrelated interests – is further supported by the fact that the proposed nuclear co-operation agreement between Australia and Indonesia would allow personnel and technical exchanges between ANSTO and Indonesia's nuclear agency, Batan. It would cover 'the running of research reactors, radiation technology in medicine and industry, the management of radioactive waste and radiation safety' (Murdoch, 1992). It was also reported that 'the agreement signalled future sales of Australian uranium to Indonesia' (Murdoch, 1992).

Another article by Dr Clive Hamilton, former Research Director for the Resource Assessment Commission, published in the *SMH* on the 30 August 1993, confirms that Indonesia's plans for the first of twelve reactors, to be built close to an 'extinct' volcano in one of the most seismically active places on earth, were going ahead; the final decision being whether or not to contract Mitsubishi or Westinghouse for the job. Hamilton also confirmed that '[t]he Australian Government, lured by the prospect of uranium sales, is due to sign a nuclear co-operation agreement with Indonesia that will give unequivocal endorsement to Indonesia's plans' (Hamilton, 1993).

These two articles, together with another by Armitage (1992), are the only articles over the last four years to even allude to the fact that these secret negotiations have been taking place. It would therefore appear that those *SMH* journalists who could have made more of this story have so effectively internalised the value system of their organisation that they have no difficulty in ignoring potentially explosive news items. It would seem that it is largely unnecessary for today's media managers to suppress this kind of information when they have such compliant journalistic staff. Although this story has been reported (while Keating's Indonesian visit was not), it is the number of times the story has been reported, and how much attention it is given, that determines whether or not the issue in question enters the public consciousness at a sufficient order of magnitude to effect a public (and therefore, a political) response.

ANSTO and the 'national interest' argument

For some years now, ANSTO has been lobbying the Federal Government for the building of a replacement of the research reactor HIFAR, built in the late 1950s and operational from 1958. The cost of a new reactor has been quoted at anything from \$150-600 million (Catalano, 1993; Cook, 1992; Macey, 1993a; Phelan, Plibersek, & Dodd, 1991; Pockley, 1993a). Opposition to the building of a new reactor from local residents, the Sutherland Shire Council, environmental groups, and State and Federal Members of Parliament has resulted in a temporary suspension of these plans. The Federal Government's Research Reactor Review, which was formally constituted sometime around 22 December 1992 (Pockley, 1992), recommended that the decision to build a new reactor should be postponed for another five years when it handed down its findings on 5 August 1993, thus 'allowing time for the technical and commercial arguments to become clearer' (Macey, 1993b). On the 9 November 1993, Parliament voted to support this finding.

While ANSTO argued its case to the Federal Government on the basis that a new reactor and extended nuclear program would further

Australia's 'national interest', it sought to justify its case to the public on the grounds that it would be economically advantageous for Australia because of the increased production of radioisotopes for nuclear medicine, and other research efforts (ANSTO, 1993).

Indeed, the only occasions on which the national interest argument has been raised publicly, at least with respect to the *SMH's* reporting of it, was in a series of three editorials written by Hickie dated 11 June, 22 July, and 6 August 1993 (Hickie, 1993a, 1993b, 1993c). The only time this argument was made explicit by Hickie, however, was on the day that the Research Reactor Review's findings were made public on 6 August, 1993. It is worth quoting the final two paragraphs of Hickie's editorial, titled 'Maybe is not an answer', which continues the line taken in his earlier two editorials, supporting ANSTO's call for the building of a new reactor.

Although Hickie does not dispute the committee's finding that any new reactor could not be financially self-supporting, he believes that the medical and research uses of such a reactor, combined with the national interest argument, do in fact justify the building of a new reactor:

We live in a region where the rapidly increasing demand for power is being met in large part by new nuclear power stations. Virtually every sizeable country in South-East Asia is planning them. (Indonesia, for example, has plans for twelve.) This will involve potential problems with which everyone is familiar: the handling of intractable waste, pollution, the possible spread of nuclear weapons. If our voice is to be heard clearly overseas, if we are to be informed effectively of current developments, and if we are to have expertise readily available to deal with the problems which arise, a nuclear installation is necessary to keep Australian nuclear science alive, and maintain our membership of the International Atomic Energy Agency.

That alone does not justify spending \$250 million [*sic*], but together with the medical and research uses of a reactor, it does (Hickie, 1993c).

Thus, we can see that Hickie does not question the validity of any of the arguments put forward by ANSTO to support the building of a new reactor. In fact, he is merely reiterating the line taken by the Minister for Foreign Affairs, Senator Gareth Evans, who claims that Australia needs a nuclear reactor if it is to continue to have a say on international nuclear policies (Lagan, 1993), which is simply fallacious (Greenpeace, 1993; Sutherland Shire Council, 1993b, pp. 50-51). Hickie's reasoning is therefore problematic. Rather than asserting Australia's role in questioning the proliferation of nuclear technology within the Asian region, he merely acknowledges that such proliferation is occurring, and that Australia, if it is to have any voice in this debate, must continue its own nuclear reactor program. Any possible alternatives have been foreclosed from his discussion. Hickie's editorial is therefore ideologically constrained by his unquestioning acceptance of the terms of the debate set by ANSTO, which he assures us is sufficiently expert and

professional to put forward an unbiased assessment of its own needs. Such unquestioning faith in scientific expertise (and government 'wisdom') raises an important issue with regard to the legitimacy of the scientific claims made by professional (and often government-sponsored) scientific research organisations when protecting or furthering their own (generally positivistic) research interests through the media.

The *SMH*, Lucas Heights, and scientific claims

Of the twenty-five articles published in the *SMH* between 1 June and 31 July 1993 which dealt with the controversy surrounding a possible new reactor, only a third of them deal in any way with the actual scientific claims made by ANSTO and/or the Sutherland Shire Council. Of these nine articles, only five actually deal with such scientific claims in any detail, and only four of them with any critical sense brought to bear. Four of the other five articles merely report the claims of ANSTO and the 'scientific' information which it has supplied journalists (N-waste test is negative, 1993, June 29; Browne, 1993; Hickie, 1993a; Zuel & Connell, 1993). These four articles reinforce the instrumental view of scientific activity which ANSTO has sought to maintain. The other article, by Pockley, is constructed in the manner of a balanced report, but obfuscates certain criticisms which have been levelled at ANSTO (Pockley, 1993b).

The only four articles from this period that deal with the scientific claims regarding Lucas Heights with anything approaching journalistic objectivity were written by Danielle Cook, the *SMH*'s local government and, formerly, environmental, reporter. Three of these articles actually put forward the alternative scientific claims being made by the Sutherland Shire Council. Significantly, this is the first and only time that the *SMH* has reported the controversy in this way, although it is not the first and only time that scientific research commissioned by the Sutherland Shire Council has been brought to bear within the debate (Robertson & Chambers, 1993; Sutherland Shire Council, 1993a, 1993b).

The Sutherland Shire Council's scientific claims, as reported in two of Cook's articles, can be summarised as follows:

Article 1

The risk of a major accident at Lucas Heights has been underestimated by ANSTO by up to 1000 times compared with estimates for two similar reactors in the United States, according to information supplied by the Californian-based energy and environmental consultants MHB Technical Associates (Cook, 1993a).

ANSTO's safety procedures are severely lacking, that is, with regard to ANSTO's emergency plan:

evacuation of residents would not occur until they had been exposed to 100 times the maximum permissible dose of radiation . . . ANSTO does not propose to advise the evacuation of residents until it is almost certain that 15 in every 1000 people exposed to a cloud of radioactive particles will eventually die of cancer from that exposure . . . This is based on the conclusion that 90 per cent of the people exposed to radioactivity will be inside at the time, and that only 1 per cent of the radioactive material in the reactor core will be released (Cook, 1993a).

Article 2

Radioactive waste discharges from Lucas Heights are 'extraordinarily high' – especially those discharges that are made into the air. These claims were made by Mr John Large, senior partner and nuclear engineer with the London-based consultancy Large and Associates, who stated in his submission to the Research Reactor Review that,

[t]he ANSTO environmental monitoring program is poorly planned and of an *ad hoc* nature . . . In some instances crucial radioactive pathways have not been monitored since the early 1980s . . . and there is the overriding and quite erroneous assumption that a 'research' nuclear facility . . . could not possibly create environmental and health concerns (Cook, 1993b).

Cook reports that Large's submission to the Research Reactor Review stated that a comparison of information supplied by ANSTO with that of overseas nuclear facilities reveals that 'Lucas Heights discharges far more radioactive waste to the air and water than larger, more powerful reactors and nuclear plants overseas' (Cook, 1993b). Cook reports that Large also stated that 'the liquid and gaseous discharges authorised for discharge from Lucas Heights were set in the 1960s and were now "many, many times over the levels of radioactivity which is actually required to be discharged"' (Cook, 1993b). Furthermore, Cook notes, 'the permitted emission levels would not be approved today with the improved understanding of safety and management since the 1960's' (1993b).

Although Cook is apparently sympathetic to the Sutherland Shire Council's case, her apparent lack of familiarity with contemporary debates about the status of scientific knowledge and how these relate to issues of public health and safety mean that she is ill-equipped to report the extent and range of the Council's critique of ANSTO's procedures. These two articles could therefore give the impression that the Council's critique was similarly informed by an instrumental approach to ANSTO and its activities, an impression which is not supported by a close reading of the Council's submissions to the Research Reactor Review (Robertson & Chambers, 1993; Sutherland Shire Council, 1993a, 1993b).

My earlier contention that the submissions prepared by the Sutherland Shire Council's scientific consultants are informed by an ecological rationality is supported by the Council's advocacy of the following procedures within those submissions:

1. Public participation and community right-to-know with regard to ANSTO's activities (Sutherland Shire Council, 1993a, pp. 8-10).
2. Independent reviews of ANSTO's occupational health and safety, risk analysis, and environmental pollution (1993a, pp. 3, 5).
3. Incorporation of local and worker knowledge of problems related to the reactor (1993a, p. 4).
4. Comparative assessments of ANSTO's activities with similar facilities overseas (1993a, pp. 1-3).
5. Peer review by independent consultants in an ongoing process (1993a, p. 8).
6. Public accountability for ANSTO and the Federal Government with regard to the Lucas Heights facility (1993a, p. 8).
7. A division of authority between regulators and operators/managers, which does not currently exist (1993a, p. 9).
8. Regular monitoring of emissions by a range of different government departments (1993a, p. 11).
9. Sampling locations should be properly identified, taking into account activities of residents and the habits of other so-called 'critical groups' (1993a, p. 17).
10. New research on radiation safety should be regularly reviewed and safety standards adjusted accordingly (1993a, pp. 20-21).
11. A precautionary approach to safety standards should be maintained due to the uncertainties of assessing risks to the public and ANSTO workers (1993a, p. 21).

Details of these recommendations are included in the Council's submissions.

Although Cook's sympathetic reportage of the Council's submissions is consistent with her role as environmental reporter, and therefore acceptable as part of her professional practice, we can see from the above list that she has failed to adequately cover the range of the Council's critique of ANSTO's activities. This would appear to have a great deal to do with the fact that the Sutherland Shire Council is the only Australian government body to have undertaken an independently-commissioned scientific report on Lucas Heights. Like most Australian journalists, Cook is not sufficiently knowledgeable to understand the full ramifications of such a report, and is therefore unable to present the Council's critique in a coherent way.

In response to the Council's claims, ANSTO's deputy executive director, Professor Helen Garnett was reported to have claimed that 'safety procedures at Lucas Heights were high and independent scientists in

Australia and overseas had reviewed the practices' (Cook, 1993a). Garnett is also said to have claimed that '[d]ischarges of radioactive waste . . . were well below the set limits and the nuclear facility posed no risk to public health'. With regard to the Council's claims that ANSTO's evacuation procedures were inadequate, Garnett is said to have responded that she 'could not confirm the accuracy of the council's claims . . . because she had not had time to undertake a full appraisal of the submission'. Garnett was never called upon again to answer these accusations.

It is instructive to analyse Cook's reportage of Garnett's claims in the light of the counter-arguments levelled at ANSTO by the Sutherland Shire Council in response to ANSTO's claims. The protocols of journalistic objectivity which have been implemented by Cook within these reports preclude the possibility of her analysing Garnett's claims in this way. Because of these constraints, the article does not tell us that:

- (a) some of the independent scientists who conducted reviews of ANSTO's safety procedures had recommended that ANSTO improve its safety procedures (Quiddington, 1990);
- (b) ANSTO's 'set limits' for radioactive waste discharge were 'set' in the early 1960s by the then Atomic Energy Commission, and nothing appears to have been done to review them since that time (Cook, 1993b);
- (c) monitoring and testing of some discharge outlets had not been undertaken for more than ten years (N-waste test is negative, 1993, June 29); and
- (d) there is insufficient medical data available in the Sutherland Shire to establish whether or not there have been any adverse effects on public health from the reactor, which means that Garnett had no scientific basis for making that claim (Robinson, 1993).

The only way that *SMH* readers would be aware of these contradictions is if they had been carefully following the newspaper's reportage over the last few years.

In the third of Cook's articles dealing with the Sutherland Shire Council's scientific claims, 'Nuclear reactor risk negligible, ANSTO says', ANSTO is given virtual *carte blanche* to answer its critics. Claiming that '[t]here was less than a one-in-five-million-year [*sic*] chance of an accident occurring at the Lucas Heights nuclear reactor that was severe enough to cause injury or death to people living nearby' (Cook, 1993c), ANSTO assures us that 'even if such an accident did occur, there would be no immediate public injuries or death. Rather, it would increase the risk of cancer in a person's lifetime. This risk, however, was one in 500 million' (Cook, 1993c). Thus, we are expected to take ANSTO's 'expert' risk assessments at face value and to ignore those of

the overseas consultants, presumably because ANSTO does not recognise their status as 'experts'.

That ANSTO is still permitted to regulate itself and publicly represent government policy on nuclear safety at Lucas Heights is indicative of the gross conflict of interests first publicly alluded to by the then Leader of the Opposition, Bill Hayden, in the wake of the Three Mile Island disaster in 1979 (New body urged, 1979, April 3; O'Reilly, 1993). ANSTO's 'risk assessments' are, of course, based on sound scientific data, whereas those of the Council's consultants are merely 'guesstimates', which, according to ANSTO, used terminology 'typical of the pseudo-technical mumbo-jumbo' (Cook, 1993c). The simple explanation for these 'guesstimates' is that ANSTO refused to make details of its safety procedures and monitoring available for public scrutiny either before, during, or after the time that the Research Reactor Review required them to make this information available (Robertson & Chambers, 1993; Sutherland Shire Council, 1993a, 1993b). It is thus clearly evident that ANSTO has total contempt not only for alternative scientific assessments of its operations, but for the public at large, and appears more than willing to resort to blatant propaganda moves in order to discredit those who would question its authority.

ANSTO also claimed in Cook's report that it achieved a performance level '25 times better than the Sellafield facility' (Cook, 1993c), because people living at the buffer zone of Lucas Heights only received a 'potential effective dose' of 0.01 millisieverts, as opposed to 0.25 millisieverts for people living close to Sellafield. However, Cook's article does not explain that:

- (a) the HIFAR reactor is only a 20 megawatt facility, whereas Sellafield has four 50 megawatt reactors (that is, it is one-tenth the size of Sellafield);
- (b) Sellafield is a reprocessing plant, whereas Lucas Heights is a research reactor;
- (c) the buffer zone surrounding Sellafield is somewhat less than that surrounding Lucas Heights; and
- (d) there is still a raging controversy over 'acceptable' levels of radiation exposure.

Thus, we can see that even according to its own criteria of technical evidence, ANSTO has grossly misrepresented itself to the public, 'massaging' the figures to put itself in the most favourable light. This article also demonstrates that ANSTO has no qualms about resorting to its own form of 'pseudo-technical mumbo-jumbo' whenever it feels that the situation warrants it. Because of the constraints and protocols surrounding such reportage, Cook is only able to present the information provided by ANSTO without criticising it. Such constraints do, however, highlight the difficulties of providing balanced reporting of

scientific controversies when the conflict is constructed around the contentious technical claims made by scientific experts representing different scientific rationalities.

Conclusion

In the *SMH's* framing of the Lucas Heights controversy, a number of formative influences stand out. Firstly, most of the *SMH* journalists who have covered the controversy do not have an adequate grasp of the wider political situation surrounding nuclear technology, nor do they understand the competing rationalities and the various scientific approaches adopted by the different disputants to buttress their respective positions. However, this is not surprising in a political and economic climate which actively discourages such a critical attitude in the mainstream media.

The fact that more than thirty different *SMH* journalists have contributed articles on different aspects of the Lucas Heights controversy over the last six years compounds these inadequacies, and gives some idea of the fragmented nature of the *SMH's* reporting. The way in which the *SMH* has handled the controversy is symptomatic of the usual on-again, off-again, nature of mainstream media coverage of controversial public health issues. The attention span of most of the journalists involved does not seem to last more than six months and, in many cases, articles on the controversy were simply 'one-offs'. Most of the reports were simply responding to press releases from ANSTO, the Sutherland Shire Council, or State or Federal Governments. A few were in response to leaked government documents; some others were initiated as 'fact-finding' 'vox-pop' articles. Only a very small number of the journalists involved, including Cook (and occasionally the *SMH's* science reporter Richard Macey), seem to have had the patience and fortitude to regularly 'do the rounds' by staying in touch with key players in the controversy. Indeed, it is only amongst this relatively small number of journalists that anything approaching the norm of journalistic objectivity has been in evidence.

The second formative influence on the reporting of the controversy is the powerfully persuasive instrumental rationality that serves as the basis of legitimacy for the *SMH*, the Federal Government, and ANSTO. Because the 'logic' which serves these three institutions is essentially in harmony, questions of legitimacy directed against the government and ANSTO eventually find some form of defence from the *SMH*. The consistently positive press that the *SMH* has been giving Indonesia since March, combined with the lack of reporting about the Federal Government's recent nuclear activities in that country, suggests that some kind of editorial intervention has been occurring. This observation

is further supported by the uncritical stance taken by the *SMH's* editor, D.J. Hickie, on Lucas Heights and the expansion of Australia's uranium exports. However, as always, such intervention is difficult to establish conclusively.

According to Jones, Connell, and Meadows (1971), science is usually only reported in the newspapers when it touches on issues of general social interest. Usually these reports focus on the moral and ethical questions raised by such issues, with a fair degree of suspicion and criticism brought to bear. While the mainstream media does have a tendency to present scientific issues in a fairly ambivalent manner when it comes to their ethical and social implications, it should be acknowledged that the instrumental aspects of science, that is, 'the curative powers of medicine and the use of technology in both industry and government' (Jones et al. p. 6), are frequently called upon within scientific controversies to reinforce the ultimate authority and impartiality of science as the 'deliverer of the goods', that is, as the practical saviour of humanity through technological progress. Of the seventy or more articles on Lucas Heights which have been published in the *SMH* over the last six years, at least eighteen of them have fulfilled this instrumental role (see Appendix). They have always appeared at strategic moments within the controversy, thus serving to buttress the legitimacy of the government and its scientific authorities when it appeared that 'the bad press' may be getting out of hand and undermining public confidence in science.

The third formative influence on the *SMH's* reporting of the controversy is the Sutherland Shire Council's campaign against a new reactor, in concert with the environmental lobby. Although the Council has so far been successful at stalling HIFAR's replacement, they have not been successful at forcing a reorganisation of ANSTO's safety procedures. Nor have they managed to draw the public's attention to the Federal Government's duplicity with regard to international nuclear issues. It could even be argued that Councillor Genevieve Rankin's calls for Lucas Heights to be closed down are unrealistic, especially given the 'international diplomacy' role that the government has planned for ANSTO. It could also be argued that such a strategy has actually diverted attention from the far more important tasks of setting up a genuinely independent scientific and administrative body to oversee nuclear safety procedures within Australia, and ensuring that the Federal Government withdraws its support for nuclear power technology for our Asian neighbours.

Finally, many of the problems associated with dealing with scientific controversies in the media derive from the perpetuation of inappropriate and antiquated myths about the nature of science in modern society. Most of the notions of certainty, objectivity, and rationality subscribed

to by the media and the legal and political systems actually stem from these inappropriate and antiquated myths about science. To quote Edge (1985):

... [this situation] only compounds the *difficulty* of the task ahead of us, for to attempt to displace these conventional ideologies and myths ... is to tamper with the legitimization of powerful vested interests, not only in science, but in society at large. Ideas about the nature of science are but one aspect of modern political rhetoric, and changes in the structure and exercise of power and authority in society – in other words, *political changes* – are a necessary precondition for their effective reform (p. 17).

It is hoped that studies such as this, as well as a growing body of research in the sociology of science (Shapin & Schaffer, 1986; Latour, 1986, 1987, 1990; Latour, Mauguin, & Teil, 1992), are able to demonstrate that despite postmodern and popular misconceptions, it is, after all, not the force of the better argument which wins out in the end, but rather, that the 'better' argument wins by force – a truism which, if we are to believe Latour, applies as much to science as it does to politics.

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Appendix

The following articles were published in the *SMH* at strategic moments within the Lucas Heights controversy, and appear to have served the instrumental purpose of 'damage control' for ANSTO and the Federal Government. It would also appear to be no coincidence that half of these articles appeared after the Research Reactor Review was announced, and most of those in two clusters: one in the immediate lead up to the March 1993 federal election, and the other in the lead up to the announcement of the Research Reactor Review's findings on 5 August 1993. A more detailed graphic plot of these articles within the *SMH*'s overall reportage of the controversy is available from the author.

- 09.1.88 Lucas Heights high-tech estate planned. *Sydney Morning Herald*, p. 5.
- 11.8.89 Beale, B. Supercomputer gets nod. *Sydney Morning Herald*.
- 15.2.90 Work starts on Lucas Heights business (and technology) park. *Sydney Morning Herald*, p. 7.
- 12.7.91 Reactor operating. *Sydney Morning Herald*, p. 9.
- 22.9.91 Pockley, P. Chance comment nets \$5m bargain. *Sydney Morning Herald*, p. 44.
- 15.6.92 Mostyn, S. Public welcome to visit, says Lucas Heights. *Sydney Morning Herald*, p. 4.
- 18.8.92 Lucas Heights safe. *Sydney Morning Herald*, p. 1.
- 06.9.92 Boffin opens lab doors. *Sydney Morning Herald*, p. 4.
- 1.10.92 New reactor is not definite. *Sydney Morning Herald*, p. 11.
- 27.12.92 Pockley, P. New reactor's doubtful future. *Sydney Morning Herald*, p. 5.
- 24.2.93 Macey, R. Scientists put case for new nuclear reactor. *Sydney Morning Herald*, pp. 1, 16.
- 28.2.93 Catalano, A. Doctor's plea for reactor. *Sydney Morning Herald*, p. 25.
- 07.3.93 Pockley, P. Most in favour of nuclear reactor. *Sydney Morning Herald*, p. 7.
- 09.6.93 Browne, S. Isotopes save thousands of lives: Specialist. *Sydney Morning Herald*, p. 4.
- 10.6.93 Fitzgerald, B. Uranium market starts to hum. *Sydney Morning Herald*, p. 37.
- 29.6.93 N-waste test is negative. *Sydney Morning Herald*, p. 6.
- 18.7.93 Pockley, P. Professor fighting for a cause. *Sydney Morning Herald*, p. 41.
- 18.7.93 Wynhausen, E. Lucas Heights: the local verdict. *Sydney Morning Herald*, p. 39.