


Search the Site

By Article

go

[Archive Search](#)

Registered User

User Email Id

Password

[Change Password](#)

New User

[Register Here](#)
[Home](#)
[This Issue](#)
[Last Issue](#)
[Archives](#)
[Forthcoming](#)
[Subscribe Now](#)
[Advertise in EPW](#)
[Submissions](#)
[The Site](#)
[Sameeksha Trust](#)
[Research](#)
[Foundation](#)
**Resources**
[Books](#)
[Announcements](#)
[Appointments](#)
**EPW Special Articles**
**November 20, 2004**

## Scientists, Nuclear Weapons, and the Peace Movement

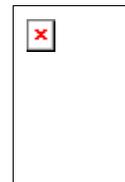
*The greatest challenge any scientist interested in advancing nuclear disarmament in south Asia is to sensitise the public at large to nuclear perils. Technically trained people are especially crucial in spreading such awareness because within the existing structures of society, professional credentials largely determine how a person's opinion is perceived and received. Flashing professional credentials is a double-edged sword. The establishment can and does field large numbers of scientists to support their policies. Their prominence is why many people believe in profoundly wrong ideas about nuclear issues at times. Some examples of such mistaken ideas are nuclear weapons preserve peace and nuclear reactors generate cheap electricity. Many of these claims have been disproved by other scientists. But because scientists from powerful institutions like the DAE have much greater access to the media and are sometimes the only scientists that most people ever hear about, anti-establishment scientists face an uphill battle. One way to fight this unequal battle is for scientists to not limit themselves to nuclear weapons issues but also challenge the power of the establishment that manufactures and peddles these weapons in a variety of ways, including on ethical, moral, economic, environmental, and public health grounds.*

**M V Ramana**

[The] way in which technical experts make their services available to society can significantly affect the distribution of political power [Primack and von Hippel 1974].

Modern societies, where sophisticated technologies are routinely used widely, and where economic and political power require the constant invention and deployment of new technologies, impose a particular ethical responsibility on scientists.<sup>1</sup> Technologies that underlie mass production, mass consumption, and mass destruction are constantly being created, transformed, and exploited. Scientists, as people capable of creating such technologies, and who have exclusive knowledge of the workings of such technologies and the potential impacts thereof, are privileged in such a setting.<sup>2</sup> And privilege, as Noam Chomsky has reminded us, confers responsibility. Meaningful democratisation of societies where science and technology are such dominant forces necessarily requires that people with expertise on these subjects, scientists among others, intervene actively in the public interest, speaking truth to power as it were.

For those scientists who do take this responsibility to society seriously, nuclear weapons, arguably the greatest threat to all life on this planet, offer a particularly compelling requirement for intervention, aimed at bringing about the elimination of these horrendous weapons. Historically one reason that has been advanced for this intervention has been that nuclear weapons were designed and manufactured by scientists, who also made

**Special  
Subscription  
OFFER**

**CURRENT  
STATISTICS**
[Macroeconomic Indicators  
\(20 November 2004\)](#)
[Money Market Rates of  
Interest](#)
**BOOK REVIEWS**
[Re-examining Democracy](#)
[Leaders and Their Struggles](#)
[Women's Health in India](#)
[Click Here](#) for Weekly  
Email Content Alert


## Fellowships

the plans that resulted in the wholesale destruction of Hiroshima and Nagasaki. Since then the complexities involved in analysing nuclear weapons and the policy issues surrounding them have grown tremendously. These issues have technical aspects that have to be addressed through technical means [Feiveson 1982]. Whether there can be early warning of nuclear attack, what kinds of events could trigger an accidental nuclear explosion, or whether any kind of 'civil defence' measures will protect significant sections of the populace from the destruction wreaked by a nuclear explosion, are just a few questions that require detailed technical knowledge to answer. Similarly, technical knowledge is needed to put forward possible transparency and arms control measures that India and Pakistan could adopt to lower the danger of nuclear war.<sup>3</sup>

When it comes to actually influencing nuclear policy, two broad avenues for the participation of scientists are available to those interested - the inside and the outside routes. Simply put, the term inside refers to people who work within the formal system of decision-making - the various branches of the government and its advisory bodies. Working outside refers to addressing oneself primarily to the public, with the hope that public pressure will force the government into policy change. We first look at the some of the structures that limit effective advancement of nuclear disarmament through the inside route in India.

Indian nuclear policy-making at the official level has generally been dominated by a small coterie of advisors surrounding the prime minister (PM). Unlike most policy matters, nuclear affairs come under the direct charge of the PM and the cabinet is essentially bypassed. Scientific input into this process has largely come from the Department of Atomic Energy (DAE) and the Defence Research and Development Organisation (DRDO), usually through their heads or other top leaders or retired senior personnel. The part played by these organisations in advocating nuclear weapons and moving Indian nuclear policy in a hawkish direction has been extensively documented [Abraham 1998; Perkovich 1999; Ramana 2003]. Since the 1998 nuclear tests, these organisations have also been rewarded through copious budgetary increases. Given this history and incentive structure, it makes little sense to expect someone within these organisations to effectively further nuclear disarmament.

The government also receives advice on security issues, including on nuclear weapons issues, from the National Security Advisory Board (NSAB), which has usually included one or more scientists. There seems to be no specific criterion required to being inducted as a member of the NSAB, especially with respect to expertise, but agreement with the broad lineaments of official nuclear policy appears to be an implicit prerequisite. The NSAB's recommendations have typically been even more aggressive than official policy. For example, in early 2003 it recommended abandoning the No First Use agreement, usually touted as proof of the moderate nature of India's nuclear policy [Anonymous 2003].

An informal scientific network that has been active through the cold war in advancing nuclear arms control and disarmament between the US and the Soviet Union is the Pugwash network.

### EPW Index

A comprehensive subject and author index to *EPW* for January-June 2003 and January-June and July-December 2002 is under print. Each half-yearly edition of the index is priced Rs. 25 and may be ordered from Circulation Manager, *Economic and Political Weekly*, Hitkari House, 284 Shahid Bhagat Singh Road, Mumbai-400001.

Though this is a non-governmental network it operates partially on the 'inside' due to the prestige of its members and the access to government leaders that they enjoy. In both India and Pakistan, Pugwash has been dominated by scientists and strategists who toe their government's line, and Pugwash meetings in south Asia have largely stayed at the level of platitudes about the dangers of nuclear weapons around the globe and the perfidy of nuclear weapon states in not pursuing nuclear disarmament, but carefully avoided criticising, even mildly, the nuclear activities of their own countries.<sup>4</sup> Last year, an attempt by some newer Pugwash members to change focus was thwarted because the Indian government refused visas to foreign invitees to a proposed meeting in Goa [Malhotra 2003].

Another set of scientific groupings that has played a role in shaping nuclear policy-making elsewhere, partly through activities on the 'inside', are national professional societies of scientists. Such societies in the US, UK, France, and the Soviet Union have on occasion mobilised the research and analytical capabilities of their members to inform either policy-makers or the public about nuclear questions. An example is the US National Academy of Sciences study on the technical issues related to the Comprehensive Test Ban Treaty (CTBT) [National Academy of Sciences 2002].<sup>5</sup> Governments have also turned to them for advice or for populating various official scientific committees. However, no such society of scientists in India has attempted to intervene in nuclear policy-making, nor has the government turned to them, even as a counter-balance to the parochial advice offered by the DAE or the DRDO.

One can speculate about why official scientific organisations have not tried to promote independent studies of nuclear weapons issues.<sup>6</sup> For decades the 'strategic enclave', namely, the laboratories and institutions involved in defence research and nuclear science and engineering [Abraham 1992], has received the bulk of government research funds.<sup>7</sup> As a consequence they have tremendous financial influence over researchers, especially in the physical sciences. This has been a major constraint on independent criticism of nuclear policies, certainly at an organised and official level.

This phenomenon has only become more acute since the 1998 nuclear tests, which increased the economic and political power of the strategic enclave. The enclave has also been engaged in developing an indigenous military industrial complex involving defence laboratories, technical institutions, universities and public and private sector firms. As was the case in the US with its much older and larger military industrial complex, this phenomenon is beginning to implicate larger numbers of scientists and shape their thinking on nuclear and security issues.

More generally, most scientists in India are dependent on the government for their funding. Though they might resent being so termed, in effect this dependence on the state makes scientists into government servants, which in turn has led to progressive bureaucratisation. Like bureaucrats everywhere, there is therefore a tendency to follow the dictates of the government. Some evidence for this can be found in a 1996 elite poll, which

showed that 54 per cent of the scientists and other academics polled supported the official policy then which called for neither forswearing nor acquiring nuclear weapons [Cortright and Mattoo 1996: 117]. Once the official policy changed with the 1998 nuclear tests, many scientists switched to supporting overt acquisition of nuclear weapons.

The last few years have also seen the emergence of a few think tanks focusing on strategic and security issues. Many of these have played a role in shaping nuclear policies. But they have generally been populated by retired defence personnel, bureaucrats and strategists; none have concentrated on scientific and technical issues. This is unlike, for example, the case of environmental issues where there are at least a few illustrious non-governmental organisations that have done significant technical work of high quality.

Thus the existing structures offer little hope of advancing nuclear disarmament through 'inside' routes.<sup>8</sup> The only choice for the concerned scientist then is to participate in efforts at changing nuclear policy through the 'outside' route.

Before we discuss the 'outside' route, it is worth mentioning that it can sometimes be a stepping stone to an 'inside' role. However, for this to be the case there should be significant pressure from popular social movements. In south Asia the peace movement is not yet at this stage. If it does become strong enough, then one may see the government inviting the more moderate elements of the movement into advisory bodies and policy-making circles as a way of marginalising the more radical elements of the movement. This has been the case with respect to other social movements as well. An example is the transformation of environmental movement in the US into a much more mainstream direction by selective incorporation [Gottlieb 1993; Stauber 2002]. A similar strategy of 'the soft embrace' was adopted in the late 19th and early 20th centuries by the ruling classes to split the growing and militant labour movement and isolate the radical elements [Hobsbawm 1989: 101-03]. The purpose of the strategy is to maintain business as usual, with at best cosmetic changes, while marginalising the radical members of the movement that call for systemic and fundamental change. As long as the peace movement is not strong enough, to offer oneself as an inside advisor would only force one to make compromises and simultaneously weaken the movement.

There is a long and honourable precedent for scientists trying to influence nuclear policy through 'outside' means. Ever since the dawn of the nuclear age, scientists have played a leading role in educating the public about the horrors of nuclear war. In many nuclear weapon states, the US and the UK in particular, scientists have also offered public criticisms of various nuclear policy matters, for example, ballistic missile defence. One significant feature of such participation is that many of them were unlikely to have worked in a professional capacity on any of the technical details in the policy matter that they were debating. In other words, they developed expertise on the policy matter due to the importance of the issue and contributed to the debate. The same conditions are likely to prevail in India since the strategic enclave has tried to monopolise technical knowledge on nuclear and

other security issues.

The greatest challenge any scientist interested in advancing nuclear disarmament in south Asia is to sensitise the public at large to nuclear perils. With the many concerns that people have, nuclear weapons are not seen as 'a clear and present danger'. Indeed, the majority may not be even aware of them, as illustrated by an exit poll conducted during the 1999 national elections. Despite the massive official propaganda effort extolling the tests, 54 per cent of those polled had not even heard of the nuclear tests conducted the previous year [Yadav, Heath, and Saha 1999]. Even among those cognisant of nuclear issues, few feel they have adequate information about the nuclear programme. The 1996 poll mentioned earlier found that only 13 per cent thought that information on nuclear issues was easily available [Cortright and Mattoo 1996: 119]. Spreading awareness about nuclear issues from a pro-disarmament perspective is clearly necessary.

Technically trained people are especially crucial in spreading such awareness because within the existing structures of society professional credentials largely determine how a person's opinion is perceived and received. Thus, a scientist, who is perceived as knowing how the bomb works or what level of radiation doses are fatal, is automatically authorised to pronounce opinions on nuclear policy. This is especially true of the media, which looks for professional credentials before quoting someone and which is a primary vehicle for spreading awareness of nuclear dangers.

Flashing professional credentials is a double edged sword. The establishment can and does field large numbers of scientists to support their policies. Their prominence is why many people believe in profoundly wrong ideas at times. Some examples of such mistaken ideas are nuclear weapons preserve peace; the command and control of nuclear arsenals is an easy task; nuclear reactors generate cheap electricity; and dealing with nuclear waste is not a problem. Many of these claims have been disproved by other scientists.<sup>9</sup> But because scientists from powerful institutions like the DAE have much greater access to the media and are sometimes the only scientists that most people ever hear about, anti-establishment scientists face an uphill battle.

One way to fight this unequal battle is for scientists to not limit themselves to nuclear weapons issues but also challenge the power of the establishment that manufactures and peddles these weapons in a variety of ways, including on ethical, moral, economic, environmental, and public health grounds. This includes, for example, critiquing the nuclear energy programme and its failure to provide cheap and plentiful electricity as promised, or exposing the adverse health consequences due to uranium mining and milling on the inhabitants of the Jaduguda area. This may not be easy for an individual scientist and may require collective effort.

Fortunately this is no longer so hard a task. One result of the 1998 nuclear tests is the emergence of a vibrant peace

movement working for nuclear disarmament. Both Pakistan and India now have national coalitions with hundreds of citizens groups publicly opposed to the acquisition and continued build-up of nuclear weapons. Scientists have been prominent in their activities.

These movements also require technical expertise. For example, the Indian Coalition for Nuclear Disarmament and Peace charter includes demands for complete transparency and independent monitoring of governmental activity on nuclear development and energy matters, and compensation and reparation to all victims and their families for damages to health and local environment by activities related to all aspects (from uranium mining to reactor operation to waste disposal) of the nuclear fuel cycle. Both of these demands have significant technical components.

The peace movement is, however, not just focused on nuclear weapons, but sees this as a manifestation of the larger social and political malaise that grips the country. Many of the citizens groups that have joined the movement are also involved in a variety of democratic issues ? women?s issues, education, human rights, environmental issues, and so on.<sup>10</sup> Their opposition to nuclear weapons and nuclear energy is therefore situated within a larger social, economic, and political framework.

Within such a movement, the involvement of scientists and engineers in opposing to nuclear weapons or energy must be part of developing alternative sources of technical expertise, grounded in local realities and reflecting the aspirations of the vast majority of people. The emphasis then would be on a just peace, i.e, systemic change and not simply the control or elimination of nuclear weapons while leaving everything else unchanged [Ramana 1999].

*Address for correspondence:*  
ramana@isec.ac.in

### Notes

[I would like to thank Andrew Lichterman, Zia Mian, Satyajit Rath, Achin Vanaik, and my colleagues at the Centre for Interdisciplinary Studies in Environment and Development, Bangalore for useful discussions.]

1 I use the term scientists to denote both people involved in the creation and practice of science in particular, and technically trained people in general. This is both for convenience and because even if scientists, in the narrower and more precise sense of the term, are not themselves directly involved in developing or deploying technologies, they are technically trained and therefore have the skills required to intervene in the kinds of ways that I describe in this essay.

2 The involvement of scientists in organising and abetting the power structures and perpetrating dominance of the weaker sections in society is the subject of a vast literature. However, that is somewhat outside the scope of this article.

3 These are, of course, the kinds of issues that scientists interested in advancing nuclear disarmament, the only route to ensure that nuclear war does not occur, could grapple with. Those who are, for one reason or the other, interested in aiding states to develop the quantitative and qualitative enhancement of nuclear destructive capability could and do get involved in a different basket of technical issues.

4 The early history of Indian scientists with regard to Pugwash is even worse. In the 1950s, prime minister Jawaharlal Nehru supported Bertrand Russell?s initiative to foster contact between American and Soviet scientists and for a time, it seemed that the Indian government would sponsor what eventually became the Pugwash conferences. New Delhi was in fact chosen as the first conference site and in June 1956 Russell dispatched invitations for a conference there in January 1957. But Homi Bhabha, the physicist and founder of the Indian nuclear programme, made sure that

this was not to be. As Russell lamented: '[Nehru] had been exceedingly friendly. But when I met Dr Bhabha, India's leading official scientist, I received a cold douche. He had profound doubts about any such manifesto, let alone any such conference as I had in mind for the future (Pugwash). It became evident that I should receive no encouragement from Indian official scientific quarters.' Not a single Indian nuclear scientist signed the famous Russell Einstein manifesto. See [Wittner 1997: 100, 34]; as cited in [Sharma 1988].

5 The study argued, inter alia, that the test ban treaty was verifiable, in direct contrast to the position advanced by some nuclear weapons laboratory officials and many republican politicians.

6 This is despite a small but significant genealogy of anti-nuclear and anti-military thinking among prominent scientific figures, such as Meghnath Saha and C V Raman [Murthy et al 1998].

7 In the late 1950s, over a quarter of all resources devoted to research and development in science and technology went to the DAE. Though it was subsequently overtaken by the Department of Space, the total amount spent on the DAE, the DRDO, and the Department of Space as a fraction of all government research and development budgets remains at over 60 per cent [Abraham 1993: 177].

8 Even in the US where the structures are more conducive to insider influence, George Kistiakowsky, a senior Manhattan project scientist and science advisor to US president Eisenhower from 1959 to 1961, in other words someone who had tried the highest of the inside channels, stated towards the end of his life: 'Forget the channels. There simply is not enough time left before the world explodes. Concentrate instead on organising, with so many others who are of like mind, a mass movement for peace such as there has not been before' [Kistiakowsky 1982].

9 For example in the late 1980s Amulya Reddy analysed the costs of nuclear power, showing that it is more expensive than the alternatives [Reddy 1990].

10 For more on these 'New Social Movements' see for example [Bonner 1990] and [Omvedt 1993].

## References

- Abraham, Itty (1992): 'India's 'Strategic Enclave': Civilian Scientists and Military Technologies?', *Armed Forces and Society* 18 (2): pp 231-52.
- (1993): 'Security, Technology and Ideology: 'Strategic Enclaves' in Brazil and India, 1945-1989?', University of Illinois at Urbana Champaign, Urbana Champaign.
- (1998): *The Making of the Indian Atomic Bomb: Science, Secrecy and the Post-colonial State*, Zed Books, London and New York.
- Anonymous (2003): 'Abandon No-First Use Policy, Security Board Tells Government?', *India Abroad*, January 3.
- Bonner, Arthur (1990): *Averting the Apocalypse: Social Movements in India Today*, Duke University Press, Durham.
- Cortright, David and Amitabh Mattoo (eds) (1996): *India and the Bomb: Public Opinion and Nuclear Options*, University of Notre Dame Press, Notre Dame.
- Feiveson, H A (1982): 'Thinking about Nuclear Weapons?', *Dissent*, pp 183-94.
- Gottlieb, Robert (1993): *Forcing the Spring: The Transformation of the American Environmental Movement*, Island Press, Washington, DC.
- Hobsbawm, Eric (1989) *The Age of Empire, 1875-1914*, Vintage Books, New York.
- Kistiakowsky, George B (1982): 'The Four Anniversaries?', *Bulletin of the Atomic Scientists*, December, 2-3.
- Malhotra, Jyoti (2003): 'Track One May Be Frozen with Pak, MEA Says No to Even Track Two?', *The Indian Express*, October 21.
- Murthy, M V N, Madan Rao R Shankar, J Samuel and A Sitaram (1998): 'Voices against the Militarisation of Science?', *Current Science* 75 (11): pp 1110-11.
- National Academy of Sciences (ed) (2002): *Technical Issues Related to the Comprehensive Nuclear Test Ban Treaty*, National Academy Press, Washington, DC.
- Omvedt, Gail (1993): *Reinventing Revolution: New Social Movements and the Socialist Tradition in India*, M E Sharpe, Armonk.
- Perkovich, George (1999): *India's Nuclear Bomb: The Impact on Global Proliferation*, University of California Press, Vols Berkeley.
- Primack, Joel and Frank von Hippel (1974): *Advice and Dissent: Scientists in the Political Arena*, Basic Books, New York.
- Ramana, M V (1999): 'For a Just Peace ? The Anti-Nuclear Movement in India?', *Social Science Research Council Newsletter* 12.
- (2003): 'La Trahison Des Clercs: Scientists and India's Nuclear Bomb?' in *Prisoners of the Nuclear Dream*, edited by M V Ramana and C R Reddy, Orient Longman, New Delhi.
- Reddy, Amulya Kumar N (1990): 'Nuclear Power: Is It Necessary or Economical??' *Seminar*, pp 18-26.
- Sharma, Dharendra (1988): 'Science and Control: How Indian Atomic Energy Policy Thwarted Indigenous Scientific Development?' in *The Revenge of Athena: Science, Exploitation and the Third World*, edited by Z Sardar, Mansell Publishing, London.
- Stauber, John (2002): 'Managing Activism: PR Advice for 'Neutralising' Democracy?' (Book review), *PR Watch* 9 (2).
- Wittner, Lawrence (1997): *Resisting the Bomb*, Vol 2, *The Struggle against the Bomb*, Stanford University Press, Stanford.
- Yadav, Yogendra, Oliver Heath, and Anindya Saha (1999): 'Issues and the Verdict?', *Frontline*, November 13.

---

[EDITORIALS](#)

[CURRENT STATISTICS](#)

[COMPANIES](#)

[MONEY MARKET](#)

[COMMENTARY](#)

[BOOK REVIEWS](#)

[SPECIAL ARTICLES](#)

[DISCUSSION](#)

[LETTER](#)

---

Hitkari House, 284 Shahid Bhagatsingh Road, Mumbai 400 001  
Phones: 2269 6072, 2269 6073 Fax: 2269 6072 E-mail: [epw@vsnl.com](mailto:epw@vsnl.com)

This site is hosted by and in technical consultation with Investment Research and Information Services Limited

---

© Copyright 2001 The Economic and Political Weekly. All rights reserved.