

EDITORIAL

Introducing Women in Science

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Through all of its history, what is called 'science' has been dominated by men. Almost all of the most famous, powerful and well-paid scientists have been men. Most women in the area have been in junior, supporting positions. Nevertheless, a number of women have forged careers as scientists, often in the face of enormous difficulties.

The male face of science was treated as unremarkable until the 1970s in Western countries. Since then, an increasing number of critics and challengers have been examining education, employment and ideology in science and demanding changes. Three major factors have contributed to this challenge.

To begin with, the second wave of the feminist movement, which developed in the 1960s, eventually got around to looking at science. The initial concerns of the movement were with issues such as rape, abortion, direct discrimination and the gender division of labour. Science was first introduced into the discussion via the role that some scientists took in justifying sexual inequality, such as through alleged differences in intelligence. Science as an occupation was criticised because of the very low representation of women, especially in prestige fields such as physics and molecular biology.

This criticism of the 'abuses' of scientific knowledge and of discrimination in career structures helped focus attention on science as a social institution. Some critics began examining 'science' itself, namely the body of scientific knowledge and the human and material practices which go on to produce and validate that knowledge. Beyond the abuse and discrimination, they began to suggest, perhaps science as a social institution is inherently masculine. This led to early attempts to develop a feminist epistemology of science.

The second factor in the equation was the complementary effect of the radical science movement. In the late 1960s and early 1970s, groups of scientists and students, outraged by the use of the science and technology in the Vietnam War and aware of the role of science in producing military weapons and environmental problems, began what was called the 'social responsibility in science' movement. Initially involving many mainstream scientists, the movements in several countries quickly moved in a radical

direction, developing critiques of the use of science and technology for profit and social control.

The radical science movement has played only a marginal role in relation to mainstream science. It continues to attract people on the fringe of science, especially students, though there are a number of prominent scientists who take an active role. But whatever its institutional weaknesses, the radical science movement has provided a fairly sympathetic arena for feminist critiques of science, especially those critiques which challenge the nature of scientific knowledge and practice rather than just the participation of women in science.

A third factor in the rise of concern about male domination in science has been the grassroots social movements, including the environmental movement, the peace movement, the animal liberation movement and the people's health movement. In these and other movements, challenges to the status quo are commonly countered by appeal to the scientific experts. This has necessitated a concerted attack on particular experts and often on the ideology of expertise.

A good example here is the movement against nuclear power. The proponents of nuclear power included governments, corporations, and nuclear scientists and engineers. All of them vouched for the safety, cheapness and necessity of nuclear power. In opposing nuclear power, the statements of the establishment nuclear experts had to be attacked. This was done both by bringing forth counter-experts—a minority of scientists and engineers who were willing to voice criticism of the nuclear industry—and by questioning the validity of 'nuclear expertise' itself. The critics argued that decisions about nuclear power were not only technical but involved social, political and ethical dimensions. The establishment nuclear experts were submerging these dimensions behind a facade of objectivity; what was needed was popular involvement in decision-making.

Within the women's movement, birth control and abortion were early key concerns, and feminists focussed on women's health issues. On the practical side, the early 1960s and 1970s saw the flourishing of many women's health groups, and much experimentation with self-help and alternative medicine. This brought feminism into conflict with medical expertise and led to efforts to record the experiences of women as recipients of such 'male' expertise and question its efficacy, status, and gender neutrality. The women's health movement thus generated the earliest attempts by feminists to develop a gender analysis and politics around a body of scientific knowledge. It produced a number of popular books and pamphlets which directly confronted medical expertise and promoted the view that not only the practice but also the theory—the knowledge—of modern scientific medicine was gender-laden. At the same time, these early activists asserted the value of women's own experiences of childbirth, sexuality and those areas of medical knowledge peculiar to or having a particular relevance to women, and demanded their involvement in decision-making in such areas. The popular

scepticism of medical expertise engendered by the women's health movement spilled over into other publicly contested areas of scientific and technical expertise and probably did more to undermine the belief in the neutrality and objectivity of science than the more theoretically focussed efforts from the radical science movement and feminist epistemology.

Since the 1970s, a rich and diverse literature embodying analyses of women and science has emerged from the development and interweaving of these three streams. This ranges across the whole spectrum of feminist concerns, and includes the original and still important concern with gender-linked achievement in science, the ways in which science functions to legitimate the social inequality of the sexes, the use of science for profit and social control (such as military research or the proliferation of questionable drugs and medical technologies), and more radical calls for a transformation of the very foundations of scientific knowledge. The solutions offered are as diverse as the analyses. One prevalent response, which merges nicely with existing programmes for equal employment opportunity and affirmative action in many western countries, has been to push to get more girls into science. This approach offers valuable support to women in or planning to enter scientific careers, but it does not tackle the problem of the unattractiveness to most girls and women of becoming a scientist. Conceptions of science start early; educationists have turned their attention on science education in schools, where girls begin to drop away and boys persist even though there are no particular differences in ability.

The trouble with such approaches is that they assume the problem is one of women adapting themselves to get into science; science itself is left unexamined. If organisational structures, research programmes and assumptions about knowledge in science embody masculine values in some way, getting women into science is a flawed approach. What will happen is that some women will be alienated by the masculine dynamics of scientific research and the scientific community and will leave, while others will adapt to the masculine scientific culture and become no different from male scientists. One analogy here is to the military: is it really useful to get more women into the army, or is it more important to challenge the nature of organised warfare?

'Feminist science' has been posed as an alternative to conventional science incorporating masculine values. The idea of feminist science opens many possibilities. It might mean scientific knowledge developed without assumptions about male superiority, as in the biological sciences. It might mean knowledge built on assumptions about the unity and interconnectivity of nature, rather than domination of nature. It might mean scientific research organised in an egalitarian fashion rather than through the usual hierarchies which are linked to male domination. What feminist science means or will mean remains hazy so far, because formulations of the theory and practice of such a science have been unclear and inconsistent. It is even possible to argue that feminist science is a contradiction in terms, and that

what is required is 'feminist anti-science'.

In terms of political practice, it is important that initiatives continue in a range of areas. Getting more women into science may not, in principle, challenge the nature of science, but in many areas the struggle itself can upset male preconceptions and masculine routines more effectively than can a separatist effort to do feminist science. Nevertheless, it is important to continue the deeper critiques of the masculine nature of scientific knowledge and practice so that successful women scientists, and men too, do not settle into complacency about the validity of their activities. Finally, it is essential for connections to be maintained between scientists and members of social movements, in order to counter the routine connections between scientific elites and dominant social groups.

In this issue of *Philosophy and Social Action*, each contribution can be interpreted as showing some aspect of the challenge to science by women. Susan Niven's coolly sarcastic account of her experiences as a mathematician shows how incredibly threatening a single woman researcher can be to many male scientists. Thomas Simon argues that the political theory of participatory democracy is an effective way to confront male-centred science and help move towards feminist science.

Jacqueline Feldman aims to develop a feminist critique of science which goes beyond a patriarchal analysis and beyond the reassertion of traditional feminine values, to a degendered analysis which takes account of the essential marginality of women. Ann Dugdale's paper offers a critique of the writings of Evelyn Fox Keller (particularly Keller's attempt to frame the epistemological assumptions or preconditions of a feminist science) which have become very influential in the literature on women and science.

Merrelyn Emery tells about a workshop which provided stimulus for specific actions towards the goal of feminist science and outlines a framework for such a science. Together, these papers illustrate some of the variety of approaches to feminist analysis of science.

We also wanted to have a Third World contribution (as well as a Second World contribution) to the women in science issue, but perhaps it has not worked out because the issue of women in science has, so far, mainly been raised in the countries of First World. It has, however, been decided to bring out a separate special issue of *PHILOSOPHY & SOCIAL ACTION* on "Women in Third World". □

चन्द कोयले ही अगर जल उठें,
तो बाकी गीले कोयले भी
आग पकड़ लेते हैं।

—सर्वेश्वर दयाल सक्सेना

WHEN A FEW IGNITE
EVEN WET-COAL CATCHES FIRE.

—SARVESHVAR DAYAL SAXENA