

# A Fair Share of the Research Pie or Re-Engendering Scientific and Technological Europe?

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Karl Marx once observed that the past hangs like a nightmare on the brain of the living. Nowhere are those historical constraints more evident than in European Union research policy. In consequence, though feminists are increasingly interested in either a modest but fair share of the research pie, or less modestly, the re-engendering of scientific and technological Europe, we are better situated to secure more of these related aims if we understand the past.

Historically, the Treaty of Rome setting up the European Economic Community (EEC) made no provision for research and development (R&D). Nonetheless the idea of a European 'Technological Community' had been part of Jean Monet's vision for a United States of Europe. Within this vision Euratom (later the European Atomic Energy Agency) was seen as the flagship of future European scientific collaboration. Thus it was understood as appropriate that the Treaty of Rome and that for Euratom were signed in the same year, 1957. Scientific and technological research was seen as the cultural glue to hold this new Europe together (Ashby, 1978).

Euratom embodied the belief passionately held by physicists in the postwar period that the future of energy was nuclear. It was the physicists who successfully persuaded key players in the formation of the new Europe that this was the technology winner to pick; nuclear energy would power the new Common Market. In their turn the 'founding fathers of the EC adopted a functionalist theory that, by obliging the development of

this technology between EC member states, political integration would surely follow' (Ford and Lake, 1991: 39). In the event these founding fathers (and the language is both metaphorically and empirically appropriate) were wrong on almost every score. The energy which was to dominate the postwar world was not nuclear but oil, and far from Europe being important in orchestrating the development of this new source of energy, it was largely managed by the market together with those nation-states fortunate enough to have oil in their offshore waters.

How are we to understand the success of the physicists in persuading the politicians to support this extremely expensive failure to pick the energy technology winner? The answer surely lies in the immense cultural capital secured by the physicists for their part in the 1939–45 war. In the postwar context of a devastated Europe, this new cultural and political elite saw themselves, and the nuclear energy over which they had secured mastery, at the heart of the reconstruction project. Science policy, 'historically the child of war and not of peace' (Salomon, 1973: 51), served to justify the continuation of a vastly expanded state expenditure on science. At the same time the physicists' rhetorical move, claiming 'atoms for peace', solved two issues. First, it purified physics, after the horror – even war crime many felt – of the atomic bomb. Second, it technically guaranteed that the physicists would play a continuing important political role in peace. Some time ago Rose and Rose (1969) called 1939–45 'the Physicists' War'; the postwar years could equally have been named 'the Physicists' Peace'.

As the pioneers of 'Big Science', in which the advance of nuclear science and technology required a new relationship between capital investment and the scientific workforce, the physicists were the first to recognize that future developments in their field would require international collaboration, as the capital costs were too great for a single European state. Thus the founding fathers of Europe seeking to bind Germany into Europe and the founding fathers of post-bomb physics were agreed in their Europeanism. Physics, as Euratom, was the symbol of the new cultural glue for Europe.

#### EPISTEMOLOGICAL INTERROGATIONS OF THE CLAIM OF 'CULTURAL GLUE'

Intense debates concerning the epistemological status of the natural sciences, and hence the nature of this cultural glue, have marked this century three times: in the 1930s and 1940s as part of both the Marxist and the Nazi projects; during the Vietnam War with the formation of the radical science movement; and, currently, as part of the new social movements and currents of feminism, environmentalism and postcolonialist struggles. Although research policy formation has fought long and

hard to ignore this interrogation, the questioning is at last beginning to penetrate the policy agenda, and forms a crucial strand to my account.

As part of the New Left the radical science movement was also the breeding ground of feminist critics of science enraged by the movement's sexism. Others came directly from within the new women's liberation movement. By the mid-1960s the issue of the overrepresentation of men in the research system had been put on to the agenda. During the 1970s the links between the overrepresentation of men and the patriarchal culture of science as both an institution and as a system of thought was under scrutiny. By the 1980s, the work of science feminists such as Birke (1986), Bleier (1984), Fausto-Sterling (1985), Harding (1991), Haraway (1989), Hubbard (1990), Keller (1985), Martin (1987), Merchant (1980), Rose (1986), Rossof and Tobach (1977), Shiva (1989), Traweek (1988) and so on had constructed alternative interpretations of science. In the 1990s, the plurality of the feminist approaches to science has become so numerous as to make a key listing impossible. Fundamentally the claim of science that it was a culture of no culture was seen by feminist theorists as little more than a smokescreen to mask its profound androcentricity. Not that patriarchal biology which had long represented women's nature as inferior and the male as superior was going to relinquish its ideological account easily. Biological determinist texts such as *The Inevitability of Patriarchy* (Goldberg, 1975) and *On Human Nature* (Wilson, 1978) came into existence as a masculinist backlash to the burgeoning women's movement.

In parallel, the environmentalist movement also questioned the relationship of modern science to nature. The convenient continuity between modern science and the Judeo-Christian assumption that because Man is made in the image of God, he has the right to dominate the beasts and indeed the whole of green nature, is increasingly rejected. Pollution, environmental degradation, patenting life, genetically manipulated food, new infectious diseases and the proliferation of cancer cast into question 'our' relationship to nature. More positively, post-colonial social movements both resist the deadlier biotechnologies and seek to reclaim the less violent relations of people and nature of premodern cultures, reinterpreting them in today's context. While the concerns of these movements do not map on to those of feminism in any one-to-one way, there are theoreticians and activists making common links.<sup>1</sup>

These movements and their theoreticians have unquestionably shifted the cultural understanding of the social status of science. The debate is not resolved; the powerful ideology of science as a culture of no culture continues to hold sway but everywhere is being subtly eroded by the critical view that science is socially shaped and can thus be reshaped. This idea of social shaping, in principle favourable to feminist demands, is

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evident not least within the history of EU research policy, to which I now return.

### JOBS FOR THE BOYS?

The founding fathers in their postwar nuclear European enthusiasms had failed to reckon with the equally masculine forces of the nation-state. These successfully invoked the principle of subsidiarity which underlies the formation of Europe as a supranational structure. First France, swiftly followed by other nation-state members, challenged the agreement between the European political visionaries and the physicists for a necessarily European nuclear development. This left Euratom, or rather the European Joint Nuclear Research Centre (JNRC), which was scattered over a number of sites across Europe, high and dry. Few policy analysts (Williams, 1973; Harrop, 1989; Peterson, 1991) probe this expensive failure other than Holdsworth and Lake (1988) and Ford and Lake (1991); and none draw attention to the success of physicists in securing immense resources, not least through the European Centre for Nuclear Research (CERN), irrespective of whether the supranational or the national model of nuclear research won out.

In Europe this command over resources secured the physicists' construction of reality over rather more than just the physical world. For with the loss of political legitimacy for its nuclear role, the JNRC dropped the 'N' becoming JRC. Nonetheless, for 30 years nuclear was the single largest item in the EC research budget and physicists proliferated in its research divisions. Meanwhile the European Parliament did not get anything other than a courtesy look at Euratom's research brief, and until Maastricht, had little more than a commentator's status over the JRCs.

As a result of this lack of accountability, centres could become what was most politely referred to as a long-standing crisis or more bluntly, a scandal. One reading of this story is as an immense programme, tacitly agreed by a profoundly masculine political and scientific culture, of positive discrimination towards the employment of physicists. Nor has this gendered point been entirely missed by research policy analysts. Hans Skoie, describing the physicist Vannevar Bush's (1945) influential report *Science: The Endless Frontier*, spoke of it as a programme for 'making jobs for the boys coming back from the desert'.<sup>2</sup> Having secured such immense cultural capital in time of war, the physicists were turning it to good advantage in time of peace. They not only commanded the new research institutions of Big Science but also framed, led and managed the new realm of research policy across the industrialized world.

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## CLOSING THE EUROPEAN TECHNOLOGY GAP – OR SUBSIDIZING CORPORATE WELFARE?

After this less than auspicious beginning for a European science and technology policy – almost certainly a factor in the reluctance of member states to support an enhanced role for the European Commission in research – by the 1980s strong claims were coming from industry of a ‘technology gap’. The new consensus was that Europe had to strengthen its investment in research so as to compete on world markets, above all with the USA and Japan. European producers of information technology (IT), for example, were rapidly losing their European, let alone their global market share. Innovation became once more the focus of industrial policy (Peterson, 1991). Whether Europeans in general, let alone European women, actually wanted to live in societies organized like those of the USA or Japan was rather less frequently discussed; techno-economism was in the driving seat.

By way of a response to the growing market hegemony of the USA and Japan, the 12 largest IT firms and the Commission developed a joint initiative which Europe was to underwrite financially. When the first IT programme, ESPRIT (European Strategic Programme for Information Technology), was launched as a pilot programme in 1983, 80 percent of the contracts were awarded to the same ‘Big 12’ firms who had helped devise the programme. Physics push (which offered women rather little) had begun to yield to big industry pull (and IT has not been exactly a cornucopia for women either). But even this did not save the Big 12 from mergers or protect their ability to compete.

The success of large-scale IT firms, at least in terms of securing European subsidies for research and development during the mid-1980s, encouraged the car industry to seek assistance from Europe, this time in the name of the competitively desired ‘level playing field’. Other programmes such as BRITE (Basic Research in Industrial Technologies for Europe) and RACE (Research in Advanced Communications for Europe) followed. Fundamentally, these programmes were set within a particular techno-economist perspective shared by the Commission and Big Industry, namely that what was good for Europe’s big firms was good for Europe. The politicians, whether as the Parliament with its self-evidently weak powers or the Council of Ministers with rather more, were reduced to ratifying the annual budgets.

Currently, there is widespread research-based scepticism concerning the effectiveness of EU strategies for increasing competitiveness. Rather than continuing to subsidize industrial research, it is suggested that a Europe-wide sophisticated set of taxation and incentive policies might well stimulate industrial research and innovation more effectively. To date this criticism has made little evident impact, although research

policy has shifted away from giant corporate welfare towards strengthening small and medium-sized enterprises. However, both the programme and its evaluation have so far been solely directed towards the technoeconomic project.

#### MAASTRICHT: POST-ACRONYM RESEARCH POLICY

This period of growth in European research policy has been accompanied by a certain jostling for influence by the various divisions, while outside the Commission, the European Science Foundation offers its greater expertise in managing research. Thus the star of DGXII (the Directorate General for Science, Research and Training) rose as the Framework Programmes (FPs), which began in 1984, developed and brought together the bundle of acronyms (e.g. BRITE, ESPRIT and RACE) into an increasingly coherent research policy.<sup>3</sup> Not until the 1992 Treaty of the European Union, when Article 130 instructed the Commission to fund research 'to improve competitiveness whilst also underpinning other EU policy objectives' was this accompanied by the commitment that research should enhance the 'Quality of Life'. Yet neither this, nor its successor 'Citizens First' (both slogans expressing concern for the social and cultural dimensions of research), were given a place in the working through of this agenda.

While 'competitiveness' is relatively unambiguous, 'Quality of Life' is one of those well-sounding ambiguous expressions crucial to political rhetoric, since it can very easily mean different things to different people. Its history within the development of EU research and development policy is one of continuous reinterpretation, not least as the economy moves between more and less healthy phases. Thus in the documents surrounding the first FP, Quality of Life was restricted to biomedicine and the environment, but by FP4 (1994–8), following the Delors White Paper (1988), the meaning was cast rather wider, but I return to this later.

The EEC/EC/EU<sup>4</sup> research effort has primarily focused on technological innovation, with social science entering only to study 'the impact of innovation'. (These artefactual preoccupations mean that humanities are not seen as having any part to play in EU research, even in the context of the 'information society'.) The continuous invocation of the language of 'social impact' or 'social implications' picks up a social theory which haunts the first three FPs. This assumes an autonomous technology, which simply appears and then impacts on society, like a stone falling into a pond. This assumption works to erase the last two decades of scholarship in the history of technology, which have meticulously documented the social choices exercised at every stage along the path of technical development. With that erasure research policy fails to

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acknowledge the possibility that different and other technologies are possible. Autonomous technology inevitably views the social sciences as handmaiden disciplines, whose purpose is to help 'society' adjust to technological innovation.

## THE SOCIAL SHAPING OF SCIENCE AND TECHNOLOGY

The fourth FP broke new ground in that within the 10 billion ECU programme, a specific section, Targeted Socio Economic Research (TSER), directed 147 million ECU towards the social sciences – 48 percent of this aimed at the 'social shaping of scientific and technology policy'. The text's use of 'socially shaped' carries the clear if tacit message that science and technology can be shaped differently. Of course the theory of autonomous technology was not dead, and continued to inform the purposes of the remaining 9853 billion ECU.

Despite this modest conceptual advance, what was not put into play in either FP4 or its current successor, FP5, is how women and their interests might be part of that social shaping. This difficulty is echoed and constituted by mainstream social studies of science and technology (SSTS), which are coming to terms with the presence of feminist critiques of science and technology,<sup>5</sup> but only very slowly adopting the concept of gender within their own analyses.

## GENDER, TRUST AND QUALITY OF LIFE

Feminist research policy analysts in both Europe and the USA suggest that gender is central, and not some mere afterthought, to Quality of Life.<sup>6</sup> First there is a need to change the composition of the labour force which produces science and technology, so that the labour force better matches the society which pays for and uses the research. Second, feminist SSTS (in common with the mainstream) increasingly argue that it is time to use the gains from the theoretical and empirical achievements of the new scholarship and develop new social institutions to help close the trust gap between civil society and the scientific and technological culture.

Strengthening civil society and closing the trust gap puts the problem squarely into gender politics. In Europe, as elsewhere over the last quarter century, women have been slowly winning both access into the public, and also changing the definition of what constitutes that public, not least for science and technology as 'public knowledge'. Meanwhile EU research policy-makers have begun to grasp that they are in gender trouble. Mostly they see Europe as having a 'technological gap' which has not merely not been closed, but been made even more difficult by a 'trust gap'

between science and society. Trust is now seen as crucial for socially and environmentally acceptable technological innovation, but without seeing gender within that process.<sup>7</sup>

### THE ALMOST INVISIBLE GENDER

Despite the lively discussions of both academic and community feminists neither the Quality of Life nor the prioritization of the citizen has included tackling the masculine culture of science and technology. It is also rather obvious that women are in short supply as top officials within the Commission. While the political culture<sup>8</sup> continues to be seen as ungendered, the chances for changing the scientific culture are that much weaker.

Women are massively underrepresented in research policy-making as members of the three top EU advisory committees (Osborn, 1993, 1994). No women were nominated by the four large European countries who between them are responsible for 80 percent of all the research carried out within the EU. Thus where high expertise in scientific research carries most cultural capital, there women are most excluded from positions of power within the research system. Those women experts who are nominated are more likely to come either from Southern Europe where research is less developed and scientists have a rather weaker place within the political culture, or from the relatively small Nordic countries where the political commitment to gender equality can result in recognizing women experts even though women are not particularly well represented in the Nordic academic institutions at the senior levels.<sup>9</sup>

What is of course new in the current situation is that the Commissioner for DGXII is a woman, Mme Edith Cresson, sometime French premier and with a strong interest in industrial innovation. The other new factor, which I discuss later, is the Amsterdam Treaty of 1997: this commits Europe to mainstream gender. In Cresson's exchange with WISE (European Women's Studies Association) she claimed that FP4 financed research on gender issues, and that gender would increasingly have 'an impact on research'.<sup>10</sup>

Although it is more than three decades since Alice Rossi's (1965) classic paper in *Science*, 'Why So Few?', which marked the beginning of the struggle by the US women's movement to rectify women's – at that time diminishing – share of the research system, there are in Europe not even the statistical data to measure whether there are 'few'. It remains the case that even in that part of the research system funded by the EU itself, there have been no data collected. Thus, even though the first question on the form for research network proposals under FP3 asked the sex of the principal scientist, nothing visible seems to have happened with the data,



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either in terms of monitoring applications or outcomes. It is ironic that increased sensitivity to gender issues was offered as the explanation of why this question was no longer asked in FP4. Instead researchers were required to describe the implications of their research proposals for Quality of Life. Answering this question, researchers were advised, 'is not optional'.

This is not to say that there has been no pressure from women researchers for equal opportunities in research employment, or that the question of women's or feminist approaches to science have not been raised within Europe, but until Amsterdam the pressure had not been experienced as sufficient to force change. Where the social upheaval of 1968 led to the OECD Brook Report (1971) acknowledging demands for social relevance, the upheavals associated with feminism have so far been met only with gestures from the framers of European research policy. The lack of gender statistics is of particular significance when we reflect on the historic origin of the concept of statistics as numbers of importance to the state.<sup>11</sup> The absence speaks of the androcentric politics in command of the EU research system, not of the absence of a political and cultural problem.

Writing this article is thus something of a peculiar exercise, as matters of gender have been silenced both within scientific and technological policy in Europe and internationally.<sup>12</sup> What was begun by the physicists was endorsed by the economists as they joined the policy circle and accelerated the production of indicators. Political analysis of research policy has been similarly located in ungendered liberal and social democratic theory. And despite the deconstructions and interruptions of second wave feminism over the past two decades, the international discourses of research policy, not least in the statistical data sets, continue to transmit and construct scientists and technologists as universal ungendered abstract statistical entities. It is only recently that the unblushing category of 'manpower', initiated by the viriculture of 1960s labour market analysis, has been replaced by 'human resources'.<sup>13</sup> But, crucially, for an issue to become the subject of research policy discourse whose rhetorical strategies demand the evidence of numbers requires that there are adequate statistical data. No data, no discourse, no problem.

## THE OECD AS THE KEY FRAMER OF POLICY DISCOURSE

The rhetoric of research policy analysis works by drawing on statistical data to underpin its arguments, with the OECD as unquestionably the most influential source of international data sets and the key framer of research policy discourse. A child of the years of the postwar reconstruction, the OECD rapidly became understood as the club for the rich countries who were determined to stay that way. Although the OECD

began as exclusively focused on economic policy, by 1963 the Pigniol Report had put science policy on the agenda as a key mechanism through which national policies were to be achieved. The science push model – science makes technology makes economic growth makes the good society – held until the long boom ended in the mid-1970s.

Despite the changing definitions of the research labour market, the OECD retains an unreconstructed concept of the scientist as ungendered hence axiomatically male. This must remain hidden; in consequence the public message from science and its policy-makers goes something like this:

Of course we are not the bad old men of the past who gave Madame Curie a hard time for taking a lover, or like that Otto Hahn who thought it was alright for Lisa Meitner to research in the wood shed, and for him alone to receive the Nobel prize, we are new men. If we produce non gendered statistics this is simply a kind of pragmatism, which thinks that it is inevitable that most of the people who produce science and technology are men and will be so in the foreseeable future.

The OECD's gender silence of over 40 years precludes thinking about what part women might play in the research system. Given the long-standing commitment to gender equality in employment and the recent commitment of all three co-decision-makers of the EU to increase the representation of women in science and technology, Europe and the OECD have so far preferred to express good intentions rather than change their statistical practices which might monitor and accelerate policy change.

## STATISTICAL PRESSURES

So what pressures for adequate gender statistics have appeared in European research policy discussion? Two years after the OECD meeting in 1990, DGXII commissioned a report on the position of women in research in the EU; this was followed by a meeting of experts (unfortunately only one expert in research policy). A number of recommendations flowed from this, including the need to provide adequate statistical data through Eurostats and the need to improve the representation of women on key bodies (Logue and Talapassy, 1993). The proposals had the merit of being well focused, but the experts were largely derived from academic institutions, and consequently the data and debate were primarily concerned with academic research. The report led to a number of last minute amendments being proposed for FP4, including a version of contract compliance for EU contract holders which could have had significant potential for overcoming resistance to employing women researchers.

However, proposal and implementation were some way apart. When

FP4 arrived it showed almost zero impact. Nor have national governments moved to modify the gender composition of the top research policy advisory committees. Indeed, the one visible sign resulting from these pressures for equal opportunities was in a passage in FP4 relating to training and mobility. This modestly urges that 'it is essential to include equal opportunities for male and female researchers'. However, Europe's ideological commitment to mobility as sustaining the idea of science as the new cultural cement of Europe was pressed without reference to the lives of women. It is unsurprising that 75 percent of the researchers to be made mobile through EU resources are men.

The Commission's expert meeting made robust and well-founded recommendations, but it also produced a problem. Both inside and outside the committee, there was a debate concerning the inclusion or exclusion of women from the category the 'socially excluded', the other main focus of the TSER programme. In the event, the report echoed the final conclusion of the Commission that women should not be 'listed alongside in that list of people that are in some way or another deprived' (Logue and Talapassy, 1993: 20) because issues of 'full representation in science and technology' are somehow different (Logue and Talapassy, 1993: 142). Social exclusion is used here as a concept to put poor, sick, disabled and differently 'raced' Europeans, but not women, into research focus. Yet women in Europe may experience any or all of these other exclusions and indeed will be massively overrepresented among the poor, a matter far from disconnected to their limited access to well-paid occupations such as those within R&D. The disturbing suspicion must remain that the experts were unable to see the connections between the problems of well-qualified middle-class women such as themselves and those of the other Others.

The Commission's initiative on representation of women was followed in June 1993 by the Women's Rights Committee within the Parliament. The third group raising gender issues was the Parliamentary Committee for Research and Energy (CERT), which also made recommendations for gender to be included. These too had little impact in shaping the final research policy document. Indeed, Annemarie Goedmakers, a Member of the European Parliament and of CERT, reported anxiety within CERT lest 'measures to promote the participation of women are bad for men, will influence negatively the quality of research and would therefore be disastrous for the EC and the way it can compete with Japan and the United States' (Goedmakers, 1993: 141).

The political arithmetic of gender in academic research has been ably rehearsed by others (e.g. Collin (1993), Etkowitz et al. (1992), Fox (1995), Lie and O'Leary (1990), Osborn (1994), Ruizo (1987) and Stolte-Heiskanen (1991)). We all know that the figures, with a few exceptions, are by and large lamentable. Even in the life sciences, where more than half the

entrants are women, the pattern of promotion is distinctly bleak. However, in most industrial countries there is currently some effort being made to improve the situation in the public sector, particularly in academic research. But because we only have gender data in one part of the research system, these statistics push the focus on to academic research and away from the industrial sector. This neglects the international restructuring of research which is taking place and in which the state, having been the major funder of research, is now a large minority player (the rough proportions are one-third state to two-thirds industry). Thus feminist analysis is being carried out as if the context were constant, yet we are only arguing about what is a visibly shrinking tip of the iceberg.<sup>14</sup> It is not that we should not be concerned with the tip but that the large mass underneath contains the ignored questions of equal opportunities both in the expanding industrial research sector and in the new hybrid/post-academic forms of research (Gibbons et al., 1994; Ziman, 1996) which we see on every campus. Casualized employment for junior researchers is integral to these new forms, and what statistics we have suggest that women are overrepresented at these levels.

#### GENDER AND SCIENCE WATCH

My thesis is that although one gendered group has historically more or less successfully arrogated to itself the right to make new knowledges and new artefacts, as we approach the 21st century that exclusive right is increasingly being challenged. That past taken-for-granted androcentricity of science and technology is under intense cultural interrogation and the political rhetoric for gender change acknowledges this. What we lack in the EU (and in a number of member states, including Britain) are policies which systematically put these engendered reconstructions of the scientific and technological culture into place. Although such changes are struggling to take place albeit too slowly and unevenly, at the level of the EU, the pale androcentric organizational culture of 'Scientific and Technological Europe' has, until Amsterdam, continued to reproduce itself more or less unchallenged. At the DGXII meeting 'Women in Science' in April 1998, Mme Cresson announced a European Gender and Science Watch System, which would ensure a significant proportion of women in the advisory bodies, collect data on the participation of women in its projects and place emphasis on research areas of interest to women.

The new challenge is whether this timely initiative can break out of the tight cultural and political ghetto of the ungendered silences of research policy. Among Commission staff there is energy and commitment, but 'equal opportunities' gets just one line in the Commission's Working Paper for FP5 (COM 1997, 553, final: 54) and is not visible in the Council's

Decision (COM 1998: 8). There is no mention of gender in the latest report of the activities of the JRCs. Unless this continuing reluctance to grasp the gendered character of both science and the citizen is overcome, the crucial policy goals of the Quality of Life dimension in European research policy and of building 'trust' between 'society' and 'science' will inevitably be held back.

My concluding reflection turns to these interlinked questions. Even if policies to change the gender representation of the research labour are put in place and so enhance the Quality of Life and thereby the possibility of trust, as those producing knowledge become more representative of the society they produce it for, this still leaves the democratic deficit in the relationship between the scientific and technological culture and civil society to be addressed. How can women and men outside the research system influence the social shaping of science and technology? How can FP5's positive slogan 'Citizens First!' be put into practical effect? Defending European citizens, and the society and science relationship, is to be left to the European Parliament and the feminist, consumer and environmental lobbies which press them.

The regrettable decision of the Parliament in 1998 to support the patenting of life, exclusively responding to the demands of competitiveness, reminds us of the difficulty of democratic representatives in resisting the powerful demands of raw techno-economism and new style party management. That said, we should not ignore past, positive achievements of the Parliament, not least its success in blocking human genome research in its first guise as 'predictive medicine', and insisting on inserting consideration of the ethical, legal and social aspects as part of the research programme. The openness of the parliamentarians to the greens and the feminists was crucial in this.

It has become increasingly clear that we need in addition to representative democracy, new social institutions, consensus forums, constructive technology assessment and the like, to nourish the democratic reshaping of science and technology. Within mainstream SSTS circles, there is a renewed interest in taking the theoretical gains from research, ANT (actor network theory), SCOT (social construction of technology) and SSK (sociology of scientific knowledge), and using these as theoretical resources to reinfuse the struggle for democracy (Bijker, 1995; Van den Daele, 1994). While welcoming both the turn to democracy and also the increased interest in gender that mainstream SSTS are currently displaying, it remains important to insist that merely adding gender and stirring will be neither a theoretically nor politically adequate substitute for feminist approaches. While we should welcome the new interest in gender we can be reasonably sure that successful mainstream SSTS researchers will position themselves (rather like the physicists earlier) to secure their cultural capital. While I welcome such repositioning, I want

to insist on a certain healthy scepticism. We continue to need distinctively feminist approaches to science and technology if we are to go beyond merely asking for a fair share of the research resources towards the re-gendering of both scientific knowledge and technological artefacts.

The current cultural turbulence<sup>15</sup> around science and technology brings both problems and opportunities. What in EU research policy is spoken of as the problem of public acceptance of technological innovation, not least in the light of public anxieties over Mad Cow disease, genetically engineered soya, the FlavorSaver Tomato, chemical and biological weaponry, Dolly the sheep and much more besides, is formulated under the social and environmental banners of the 'Trust Gap', 'Quality of Life', 'Sustainable Development' and now 'Citizens First'. Inserted along these is the call for women to be better represented in the research system. This can be read as mere political rhetoric, a fashionable gloss to the old techno-economic project, or, more creatively, as offering political and cultural possibilities for feminist transformations of the scientific and technological culture itself. Struggling for such possibilities is central to the struggle for the quality of everyday life.

## NOTES

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1. Merchant (1980) and Shiva (1989) are classics in this coalition building.
2. Comment, 'Changing Trends in Science Policy: A Symposium on the Theory and Practice of Science Policy', Göteborg, November 1995.
3. DGXII is also however under steady criticism for its opaque review system and heavy administrative costs. These complaints aided the Council of Ministers' cuts to the proposed budget for FP5.
4. The shift from EEC to EC to EU reflects the widening structure and deepening agenda of 'Europe': beginning with the European Economic Community (Treaty of Rome 1957) to the treaty establishing the European Community (the unification of Euratom, the European Steel and Coal Community and the EEC itself, 1965) to the Maastricht Treaty (1991) establishing the European Union.
5. This can be traced in a long struggle by feminists to secure a feminist presence at the meetings of both the US Society for the Social Studies of Science (4S) and the European Association for the Social Study of Science and Technology (EASST). From the pioneering keynote talk by Keller, through which many men talked, to Haraway's recent rapturous reception

- at the 4S, there has been a tremendous advance. Similarly, the progress since the early attempt to have a feminist stream at Amsterdam, through the Göteborg and Budapest meetings, to the unequivocal feminist focus at Bielefeld of the EASST in 1996 has been equally encouraging.
6. Susan Cozzens (1994) makes a very similar argument concerning the potential contribution of gender in basic research to Quality of Life.
  7. The SET Policy Forum (1995) looks to new social institutions to generate socially and environmentally 'virtuous' cycles of innovation. See also Joss and Durant (1995).
  8. Pateman's (1988) influential book was a marker for the following deluge of feminist critique of political theory and culture.
  9. The Swedish government is currently tackling this imbalance, most marked at senior levels, by seeking to appoint 30 women chairs.
  10. See the correspondence between Mme Cresson and WISE in *News from NIKK* (No. 1, 1997: 8–9).
  11. Only UNESCO, with its wider cultural brief, has collected international gender statistics but for higher education alone. These are rather fragile but in broad brush terms echo the general picture.
  12. The UN has to be excepted from this criticism, as its World Report included a special section on gender ready in time for Beijing.
  13. In OECD (1995) the OECD finally accepts a less sexist term.
  14. Rita Foss Fridliziuz (1996) makes a parallel case for Sweden.
  15. In the USA this turbulence has been called the 'Science Wars' (Ross, 1996) but most researching countries are experiencing a version of it.

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