



# Technoscience

## The Politics of Interventions

Kristin Asdal, Brita Brenna and Ingunn Moser (eds.)

Unipub  
2007



© Unipub AS 2007

ISBN 978-82-7477-300-4

Contact info Unipub:

T: + 47 22 85 33 00

F: + 47 22 85 30 39

E-mail: [post@unipub.no](mailto:post@unipub.no)

[www.unipub.no](http://www.unipub.no)

Publisher: Oslo Academic Press, Unipub Norway

Printed in Norway: AIT e-dit AS, Oslo 2007

This book has been produced with financial support from  
Centre for Technology, Innovation and Culture (TIK) at the University  
of Oslo and The Research Council of Norway

The introduction has been translated by Connie Stultz

All rights reserved. No part of this publication may be reproduced or  
transmitted, in any form or by any means, without permission

# Contents

## Introduction

|   |   |
|---|---|
| Kristin Asdal, Brita Brenna, Ingunn Moser |   |
| The Politics of Interventions             |   |
| A History of STS.....                     | 7 |

## Part 1: Networks and Critiques

|   |     |
|---|-----|
| Michel Callon   |     |
| Some Elements of a Sociology of Translation                                     |     |
| Domestication of the Scallops and the Fishermen of St. Brieuc Bay .....         | 57  |
| Susan Leigh Star  |     |
| Power, Technology and the Phenomenology of Conventions                          |     |
| On Being Allergic to Onions .....   | 79  |
| Donna Haraway   |     |
| Situated Knowledges   |     |
| The Science Question in Feminism and The Privilege of Partial Perspective ..... | 109 |

## Part 2: Modest Interventions

|  |     |
|--|-----|
| Deborah Heath                                      |     |
| Bodies, Antibodies, and Modest Interventions ..... | 135 |
| Ingunn Moser and John Law                          |     |
| Good Passages, Bad Passages .....                  | 157 |
| Marianne de Laet and Annemarie Mol                 |     |
| The Zimbabwe Bush Pump                             |     |
| Mechanics of a Fluid Technology .....              | 179 |
| Vicky Singleton                                    |     |
| Training and Resuscitating Healthy Citizens in the |     |
| English New Public Health                          |     |
| – Normativities in Process .....                   | 221 |

### Part 3: From the Laboratory to Politics and Economics

|   |     |
|---|-----|
| Bruno Latour  |     |
| To Modernize or to Ecologise? That is the Question.....   | 249 |
| Michel Callon   |     |
| Actor-Network Theory  |     |
| – The Market Test .....   | 273 |
| Andrew Barry  |     |
| Political Invention .....   | 287 |
| Kristin Asdal   |     |
| Re-Inventing Politics of the State  |     |
| Science and the Politics of Contestation.....   | 309 |
| Epilogue .....  | 327 |
| Ingunn Moser  |     |
| Interventions in History  |     |
| Maureen McNeil and John Law in Conversation on the Emergence, Trajectories and<br>Interferences of Science and Technology Studies (STS) ..... | 329 |
| List of contributors.....   | 351 |

Susan Leigh Star

# Power, Technology and the Phenomenology of Conventions

## On Being Allergic to Onions\*

### Introduction

Today I was reading about Marie Curie:  
she must have known she suffered from radiation sickness  
her body bombarded for years by the element  
she had purified  
It seems she denied to the end  
the source of the cataracts on her eyes...  
She died a famous woman denying  
her wounds  
denying  
her wounds came from the same source as her power  
(Rich, "Power", 1978)

I guess what I am saying is that in the university and in science the boundary between insider and outsider for me is permeable. In most respects, I am not one or the other. Almost always I am both and can use both to develop material, intellectual, and political resources and construct insider enclaves in which I can live, love, work, and be as responsible as I know how to be. So, once more I am back to the dynamic between insider and outsider and the strengths that we can gain from their simultaneous coexistence and that surprises and interests me a lot. (Hubbard, in Hubbard and Randall 1988: 127)

---

\* From John Law (ed.) *A Sociology of Monsters. Essays on Power, Technology and Domination* © *Sociological Review Monograph* 38, 1991. Reproduced with the kind permission of *Sociological Review Monograph*.

It is not peculiar that the very thing being deconstructed – creation – does not in its intact form have a moral claim on us that is as high as the others' [war, torture] is low, that the action of creating is not, for example, held to be bound up with justice in the way those other events are bound up with injustice, that it (the mental, verbal, or material process of making the world) is not held to be centrally entailed in the elimination of pain as the unmaking of the world is held to be entailed in pain's infliction? (Scarry 1985: 22)

This is an essay about power.

Contrast the following three images of multiple selves or "split personalities":

1. *An executive of a major company presents different faces.* The executive is a middle-aged man, personable, educated, successful. To tour the manufacturing division of the plant, he dons a hard hat and walks the floor, speaking the lingo of the people who work there. In a board meeting he employs metaphors and statistics, projects a vision of the future of the company. On weekends he rolls up his sleeves and strips old furniture, plays lovingly with his children that he has not seen all week.
2. *A self splits under torture.* The adolescent girl sits on the therapist's couch, dressed as a prostitute would dress, acting coyly. Last week she wore the clothes of a matronly, rather sombre secretary, and called herself by a different name. Her diagnosis is multiple personality disorder. Most cases of this once-thought-rare disorder arise from severe abuse, sexual or physical torture.
3. *A Chicana lesbian writes of her white father.* The words are painful, halting, since they are written for an audience finding its identities in being brown, or lesbian, or feminist. As in all political movements, it is easier to seek purity than impurity. Cher'rie Moraga (1983) writes of the betrayal that paradoxically leads to integration of the self, La Chingara, the Mexican Indian woman who sleeps with the white man, betrays her people, mothers her people. Which self is the "real" self here?

Bruno Latour's powerful aphorism, "science is politics by other means", coined in the context of his discussion of Pasteur's empire-building and fact-creating enterprises has been taken up by most of the research in the new sociology of science, in one form or another (1987). The sentral image of Pasteur is that of the executive with many faces: to farmers, he brings healing, to statisticians, a way of accounting for data, to public health workers, a theory of disease and pollution that joins them with medical research. He is stage-manager, public relations person, behind-the-scenes planner. It is through a series of translations that Pasteur is able to link very heterogeneous interests into a mini-empire, thus, in Latour's words, "raising the world" (1983).

The multiplicity of selves which Pasteur is able to unite is an exercise of power of great importance. And from Latour's work, and that exploring related themes, we also understand that the enrolment does not just involve armies of people, but also of nature and technologies. Explanations and explorations, *intéressement*, extends to the non-human world of microbes, cows, and machines. A new frontier of sociological explanation is found through links between traditional interests and politics, and those usually ignored by such analysis, of nature and technique.

The multiplicity of Pasteur's identities or selves is critical to the kind of power of the network of which he is so central a part. Yet this is only one kind of multiplicity, and one kind of power, and one kind of network. Its power rests, as Latour, Callon and others who have written about this sort of power in networks themselves attest, upon processes of delegation and discipline (Callon 1986). This may be delegation to machines, or to other allies – often humans from allied worlds who will join forces with the actor and attribute the fruits of their action back to him, her or them. And the discipline means convincing or forcing those delegated to confirm to patterns of action and representation. This has important political consequences; as Fujimura has written:

While Callon and Latour might be philosophically correct about the constructed nature of the science-society dichotomy (who represents nonhumans versus who represents humans), the consequences of that construction are important... I want to examine the practices, activities, concerns and trajectories of *all the different participants* – including nonhumans – in scientific work. In contrast to Latour, I am still sociologically interested in understanding why and how some human perspectives win over others in the construction of technologies and truths, why and how some human actors will go along with the will of other actors, and why and how some human actors resist being enrolled... I want to take sides, to take stands. (1991a)

The two other kinds of multiplicity I mention above – multiple personality and marginality – are the point of departure for feminist and interactionist analyses of power and technology. **We become multiple for many reasons. These include the multiple personalities that arise as a response to extreme violence and torture and extend to the multiplicity of participating in many social worlds – the experience of being marginal.** By experience and by affinity, some of us begin not with Pasteur, but with the monster, the outcast.<sup>1</sup> Our multiplicity has not been the multiple personality of the executive, but that of the abused child, the half-breed. We are the ones who have done the invisible work of creating a unity of action in the face of a multiplicity of selves, *as well as*, and at the same time, the *invisible work* of lending unity to the face

of the torturer or of the executive. We have usually been the delegated *to*, the disciplined.<sup>2</sup> Our selves are thus in two senses monstrous selves, cyborgs, impure, first in the sense of uniting split selves and secondly in the sense of being that which goes unrepresented in encounters with technology. This experience is about multivocality or heterogeneity, but not only that. We are at once heterogeneous, split apart, multiple – and through living in multiple worlds *without* delegation, **we have experience of a self unified only through action, work and the patchwork of collective biography** (see Fujimura 1991a and Strauss 1969 for discussions of this latter point).

**We gain access to these selves in several ways:**

1. **by refusing those images of the executive in the network which screen out the work that is delegated. That is, in the case of Pasteur or any executive, much of the work is attributed back to the central figure, erasing the work of secretaries, wives, laboratory technicians, and all sorts of associates. When this invisible work (Star 1991; Shapin 1989; Daniels 1988) is recovered, a very different network is discovered as well;**
2. **by refusing to discard any of our selves in an ontological sense – refusing to “pass” or to become pure, and this means in turn,**
3. **acknowledging the primacy of *multiple membership* in many worlds at once for each actor in a network. This *multiple marginality* is a source not only of monstrosity and impurity, but of a power that once resist violence and encompasses heterogeneity. This is at its most powerful a collective resistance, based on the premise that the personal is political.**

**All of these ways of gaining access imply listening, rather than talking on behalf of. This often means *refusing* translation – resting uncomfortably but content with that which is wild to us.**

## The background in science studies

A number of recent conversations in the sociology of technology concern the nature of this relationship between people and machines, human and non-human (see e.g. Latour 1988; Callon 1986). Some focus on the divide between them: where should it be placed? There is a fierce battle, for instance, between several British and French sociologists of science on precisely this question. The British sociologists involved argue that there is, and should be, a moral divide between people and machines, and attempts to subvert it are dehumanizing ones. They return us to a primitive realism of the sort we had before science studies. The French, on the other hand, focus against “great divides”, and seek a heuristic flattening



of the differences between people and machines in order to understand the way things work together. These often break conventional boundaries. A third strand, which I shall loosely call American feminist, argues that people and machines are coextensive, but in a densely stratified space, and that the voices of those suffering from abuses of technological power are among the most powerful analytically. A fourth strand, European and American phenomenology or ethnomethodology, argues that technology is an occasion to understand the way understanding itself – social order, meaning, routines – is constituted and reconstituted dynamically and that reflexive analysis of technology is thus paramount. (Several of these essays appear in Pickering 1992)

In the midst of these conversations, I have found myself asking, “what *is* technology?” or sometimes, “what *is* a human being?”. As a result of the discussion I mentioned above, we walk in a very interesting landscape these days in science and technology studies. There are cyborgs, near-animate doors, bicycles and computers, “conversations” with animals and objects, talk that sounds quite ecological and Green, if not downright pagan, about the continuum of life and knowledge; talk that opens doors on topics like subjectivity, reflexivity, multivocality, nonrational ways of knowing. In the policy field, things are scarcely less lively. On the one hand, critics of technology (Kling, Dreyfus) are labelled Luddities and scathingly attacked by those developing state-of-the art technology. On the other, utopian advocates of new systems envision global peace through information technology, genetic maps, or cyberspace simulations. A third side invokes visions of technoeological disaster, accidents out of control, a world of increasingly alienated work where computers are servants of a management class. At the same time, people from all sides of the fray are blurring genres (fiction and science, for example), disciplines, or familiar boundaries.

Sociologists of science have helped<sup>3</sup> create this landscape through a heretical challenging of the biggest sacred cow of our times: the truthfulness of science as given from nature, the inevitability of scientific findings, their monolithic voices. Even in severely criticizing science for biases of gender, race or militarism, science critics had not previously ventured far into this territory. Although often implicit, an early message from science criticism had been that science done right would not be biased. The message from sociology of science has consistently been: the “doing right” part *is* the contested territory. There are a few people asking the question about whether doing science at *all* can constitute doing right, or whether the entire enterprise is not necessarily flawed, but these are relatively rare: Restivo (1988) and Merchant (1980) are among them.

There is much disagreement in science studies about the nature of the politics by other means in science, both descriptively and prescriptively. We are recognizing

that in talking of the central modern institutions of science and technology, we are talking of moral and political order (see Clarke 1990a). But do we have a fundamentally *new* analysis of that order (or those orders)? Are science and technology different? Or are they just new, interesting targets for social science?

Since few of us are interested in merely adding a variable to an extant analysis, most sociologists of science would hold that there *is* something unique about science and technology (but see Woolgar 1991 for a critique of this notion in the recent “turn to technology” in science studies). These include the ideas that:

- science is the most naturalized of phenomena, helping form our deepest assumptions about the taken-for-granted;
- technology freezes inscriptions, knowledge, information, alliances and actions inside black boxes, where they become invisible, transportable, and powerful in hitherto unknown ways as part of socio-technical networks;
- most previous social science has focused exclusively on humans, thus ignoring the powerful presence, effects and heuristic value of technologies in problem-solving and the moral order;
- science as an ideology legitimates many other activities in a meta sense, thus becoming a complex, embedded authority for rationalization, sexism, racism, economic competitiveness, classification and quantification;
- technology is a kind of social glue, a repository for memory, communication, inscription, actants and thus has a special position in the net of actions constituting social order.

There is as well a persistent sense in science studies that technology in particular is *terra incognita* for social scientists, perhaps because of the myth of “two cultures” of those who work on machines vs. those who study or work with people.

### Power in the current problems of sociology of technology

This sense of a new territory, and a unique set of problems has prompted a number of historical reconstructions, where the participation of scientists, technologies, various devices and instruments are included in the narrative. Many sociologists of science claim that taking these new actors into account gives a new, more complete analysis of action. “Politics by other means” is underscored by looking at how traditional power tactics, such as entrepreneurship or recruitment, are supported by new activities, such as building black boxes, or translating the terms of a problem from scientific language to some other language or set of concerns.

In the terms of Latour and Callon, this latter is the power of *intéressement* – the process of translating the images and concerns of one world into that of another, and then disciplining or maintaining that translation in order to stabilize a powerful network. The networks include people, the built environment, animals and plants, signs and symbols, inscriptions, and all manner of other things. They purposely eschew divides such as human/nonhuman and technology/society.

Another discourse about “politics by other means” concerns groups traditionally dispossessed or oppressed in some fashion: ethnic minorities, women of all colours, the old, the physically disabled, the poor. Here the discourse has traditionally been about access to the technology, or the effects of technology (often differential) upon a particular group. Some examples include the sexist design and impact of reproductive technologies; the lack of access to advanced information technologies by the poor, further deepening class differences; the racist and sexist employment practices of computer chip manufacturers; and issues of deskilling and automation to labour.

Some writers in the science studies area have begun to bring these two concerns together, although others have begun to drive them apart in acrimonious battle (see e.g. Scott 1991). From one point of view, discussions of racism and sexism use reified concepts to manipulate tired old social theory to no good ends except guilt and boredom. From another, the political order described in actor network theory, or in descriptions of the creation of scientific facts, they describe an order which is warlike, competitive, and biased toward the point of view of the victors (or the management). Yet both agree that there are important joint issues in opening the black boxes of science and technology, in examining previously invisible work, and, especially, in attempting to represent more than one point of view within a network. We know how to discuss the process of translation from the point of view of the scientist, but much less from that of the laboratory technician, still less from that of the lab’s janitor, much as we agree in principle that all points of view are important. There is a suspicion from one side that such omissions are not accidental; from the other, that they reflect the adequacy of the available material, but are not in principle analytic barriers.

The purpose of this essay is to attempt to provide some tools hopefully useful for several of the discourses, and perhaps as well as show some ways in which technology re-illuminates some of the oldest problems in social science. I can see two leverage points for doing this. These are 1) the problem of standards, and their relationship with invisible work; and 2) the problem of identity, and its relationship to marginality.

There are many challenges associated with adopting the stance that each perspective is important in a network analysis. One is simply to find the resources to

do more work on traditionally underrepresented perspectives (see e.g. Shapin 1989; Star 1991; Clarke and Fujimura, 1992). Another is using multiplicity as the point of departure for *all* analysis, instead of adding perspectives to an essentially monolithic model. Yet another is methodological: how to model (never mind translate or try to find a universal language for) the deep heterogeneities that occur in any juxtaposition, any network? (Star and Griesemer 1989; Star 1988; Callon 1986, 1990) This methodological issue is a state-of-the-art one in many disciplines, including science studies, but also including organization studies, computer science (especially distributed artificial intelligence and federated databases), and literary theory.

This essay speaks to the second point: how to make multiplicity primary for some of the concerns about power appearing now in science studies. The following example illustrates some common aspects of the problems of standards and invisible work.

## On being allergic to onions

I am allergic to onions that are raw or partially cooked. When I eat even a small amount, I suffer stomach pain and nausea that can last for several hours. In the grand scheme of things this is a very minor disability. However, precisely because it is so minor and yet so pervasive in my life, it is a good vehicle for understanding some of the small, distributed costs and overheads associated with the ways in which individuals, organizations and standardized technologies meet.

### The case of McDonald's

Participation in McDonald's rituals involves temporary subordination of individual differences in a social and cultural collectivity. By eating at McDonald's, not only do we communicate that we are hungry, enjoy hamburgers, and have inexpensive tastes but also that we are willing to adhere to a value system and a series of behaviours dictated by an exterior entity. In a land of tremendous ethnic, social, economic, and religious diversity, we proclaim that we share something with millions of other Americans. (Kottak 1978: 82)

One afternoon several years ago I was very late to a meeting. Spying a McDonald's hamburger stand near the meeting, I dashed in and ordered a hamburger, remembering at the last minute to add "with no onions". (I hadn't eaten at McDonald's since developing the onion allergy.) Forty-five minutes later I walked out with my

meal, while all around me people were being served at lightning speed. Desperately late now and fuming, I didn't think about the situation, but merely felt annoyed. Some months later, I was again with a group, and we decided to stop to get some hamburgers at another McDonald's. I had forgotten about my former experience there. They all ordered their various combinations of things, and when it came to my turn, I repeated my usual, "hamburger with no onions". Again, half an hour later, my companions had finished their lunches, and mine was being delivered up by a very apologetic counter server. This time the situation became clear to me.

"Oh", I said to myself, "I get it. They simply can't deal with anything out of the ordinary." And indeed, that was the case. The next time I went to a fast-food restaurant I ordered along with everyone else, omitted the codicil about onions, took an extra plastic knife from the counter, and scraped off the offending onions. This greatly expedited the whole process.

### **The curious robustness of disbelief on the part of waiters**

I travel a lot. I also eat out at restaurants a lot. I can state with some certainty that one of the more robust cross-cultural, indeed cross-class, cross-national phenomena I have ever encountered is a curious reluctance by waiters to believe that I am allergic to onions. Unless I go to the extreme of stating firmly that "I don't want an onion on the plate, near the plate in the plate or even hovering *around* the food", I will get an onion where I have requested none (approximately 4 times out of 5), at restaurants of all types, and all levels of quality, all over the world.

### **The cost of surveillance**

In my case, the cost of surveillance about onions is borne entirely by me (or occasionally by an understanding dinner partner or host). Unlike people on salt-free, kosher or vegetarian regimes, there exists no recognizable consumer demand for people allergic to onions. So I often spend half my meal picking little slivers out of the food or closely examining the plate – a state of affairs that would probably be embarrassing if I were not so used to doing it by now.

Anyone with an invisible, uncommon or stigmatized disorder requiring special attention will hopefully recognize themselves in these anecdotes. If half the population were allergic to onions, no doubt some institutionalized processes would have developed to signal, make optional, or eliminate them from public eating places. As things stand, of course, such measures would be silly. But the visible presence of coronary patients, elders, vegetarians, orthodox Jews, and so on, has led

many restaurants, airlines, and institutional food suppliers to label, regulate and serve food based on the needs of these important constituencies.

When an artifact or event moves from being presumed neutral to being a marked object – whether in the form of a gradual market shift or a stronger one such as barrier-free architecture for those in wheelchairs or deaf-signing for the evening news – the nature of human encounters with the technologies embedded in them may be changed. This is one form where politics arise in connection with technology and technological networks. These are politics which come to bear a label: “handicapped access”, “reproductive technologies”, “special education”, even “participant-centered design”.

But the signs which bear labels are deceptive. They make it seem as if the matter of technology were a matter of expanding the exhaustive search for “special needs” until they are all tailored or customized; the chimera of infinite flexibility, especially in knowledge-based technologies, is a powerful one.

There are two ways in which this illusion can be dangerous. The first is in the case of things like onions: there are always misfits between *standardized* or *conventional* technological systems and the needs of individuals (Star 1990 discusses this with the respect to high technology development). In the case of McDonald’s, a highly standardized and franchised firm, changes can be made only when market niches or consumer groups arise that are large enough to affect the vast economies of scale practised by the firm. Thus, when dieters and Californians appear to command sufficient market share to make a difference, salad bars appear in McDonald’s; non-onion entrees are far less likely. Even where there are no highly standardized production technologies (in most restaurants, for instance), a similar phenomenon may appear in the case of highly conventionalized activities – thus chefs and waiters automatically add onions to the plate, because most people eat them. It is easier to negotiate individually with non-standardized producers, but not guaranteed. The lure of flexibility becomes dangerous when claims of universality are made about any phenomenon. McDonald’s appears to be an ordinary, universal, ubiquitous restaurant chain. *Unless* you are: vegetarian, on a saltfree diet, keep kosher, eat organic foods, have diverticulosis (where the sesame seeds on the buns may be dangerous for your digestion), housebound, too poor to eat out at all – or allergic to onions.

The second illusion about perfect flexibility is a bit more abstract, and concerns not so much exclusion from a standardized form, but the ways in which membership in multiple social worlds can interact with standard forms. Let’s say for the sake of argument that McDonald’s develops a technology which includes vegetarian offerings, makes salt optional, has a kosher kitchen attached to every franchise, runs their own organic farms for supplies, includes a meals-on-wheels programme

and free lunches for the poor, and all sorts of modular choices about what condiments to add or subtract. But that morning I have joined the League to Protect Small Family-Owned Businesses, and, immune to their blandishments, walk down the street and bypass all their efforts. I have added a self to which they are blind, but which affects my interaction with them.

We have some choices in the sociology of technology about how to conceptualize these phenomena, which are obviously exemplary of many forms of technological change. First is a choice about what is to be explained. It is true that McDonald's appear in an astonishing number of places; they are even more successful than Pasteur at politics by other means, if extension and visible presence are good measures. Is that the phenomenon to be explained – the enrolment and *intéressement* of eating patterns, franchise marketing, labour pool politics, standardization and its economics? It is also true that McDonald's screens out a number of clients in the act of standardizing its empire, as we have just discussed. Should *that* be the phenomenon we examine – the experience of being a McDonald's non-user, a McDonald's resister or even castaway? In the words of John Law, sociologist of the technology and of McDonald's:

In particular, the McDonald's marketing operation surveys its customers in order to obtain their reaction to the adequacy of their experience in the restaurant on a number of criteria: convenience, value, quality, cleanliness and service ... these criteria are in no way "natural" or inevitable. Rather they must be seen as cultural constructs. The idea that food should be fast, cheap, or convenient would be anathema, for instance, to certain sections of the French middle class ... These reasons for eating at McDonald's might equally well be reasons for *not* eating there in another culture. (1984: 184)

There are two kinds of phenomena going on here, and both miss another aspect of the transformation of the sort captured very well by semioticians in discussions of rhizomatic metaphors, or that which is outside of both the market and unmarked categories, which resists analysis from inside *or* outside. In this case, this means living with the *fact* of McDonald's no matter where you fall on the scale of participation, since you live in a landscape with its presence, in a city altered by it, or out in the country, where you, at least, drive by it and see the red and the gold against the green of the trees, hear the radio advertising it, or have children who can hum its jingle.

The power of feminist analysis is to move from the experience of being a non-user, an outcast or a castaway, to the analysis of the fact of McDonald's (and by extension, many other technologies) – and implicitly to the fact that "it might have

been otherwise<sup>4</sup> – there is nothing necessary or inevitable about the presence of such franchises. We can bring a stranger’s eye to such experiences. Similarly, the power of actor network theory is to move from the experience of the building of the empire of McDonald’s (and by extension, many other technologies) and from the enormous amount of enrolment, translation and *intéressement* involved – to the fact that “it might have been otherwise” – there is nothing necessary or inevitable about any such science or technology, all constructions are historically contingent, no matter how stabilized.

One powerful way these two approaches may be joined is in linking the “non-user” point of departure with the translation model, returning to the point of view of that which cannot be translated: the monstrous, the Other, the wild. Returning again to John Law’s observation about the way McDonald’s enrolls customers:

It creates classes of customers, theorizes that they have certain interests, and builds upon or slightly diverts these interests in order to enlist members of that group for a few minutes each day or each week. It does this, group by group and interest by interest, in very particular ways ... Action is accordingly induced not by the abstract power of words and images in advertising, but rather in the way that these words and images are put into practice by the corporation, and then *interpreted* in the light of the (presumed) interests of the hearer. Advertising and enrolment work if the advertiser’s theory of (practical) interests is workable. (1984: 189)

He goes on to discuss the ways in which McDonald’s shares sovereignty with other enterprises which seek to order lives, and of coexisting principles of order which in fact stratify human life.

But let our point of departure be not that which McDonald’s stratifies, nor even the temporally brief but geographically extensive scope it enjoys and shares with other institutions, nor the market niches which it does not (yet?) occupy. Let it be the work of scraping off the onions, the self which has *just* joined the small business preservation group, the *as-yet unlabelled*. This is not the disenfranchised, which may at some point be “targeted”; not the residual category not covered in present marketing taxonomies. This is that which is permanently escaping, subverting, but nevertheless in relationship with the standardized. It is not nonconfirmation, but heterogeneity. In the words of Donna Haraway, this is the cyborg self:

The cyborg is resolutely committed to partiality, irony, intimacy, and perversity. It is oppositional, utopian, and completely without innocence. No longer structured by the polarity of public and private, the cyborg defines a technological



polis based partly on a revolution of social relations in the *oikos*, the household. Nature and culture are reworked; the one can no longer be the resource for appropriation or incorporation by the other. (1991: 151)

In a sense, a cyborg is the relationship between standardized technologies and local experience; that which is between the categories, yet in relationship to them.

### Standards/conventions and their relationship with invisible work: heterogeneous “externalities”

To speak to others is to first silence those in whose name we speak.  
(Callon 1986: 216)

One problem in network theory is that of trying to understand how networks come to be stabilized over a long period of time. Michel Callon has tackled this problem in his essay, “Techno-Economic Networks and Irreversibility” (1991). There are some changes which occur in large networks which are irreversible, no matter what their ontological status. The initial choice of red as a colour in traffic lights that means, “stop” for example, is now a widespread convention that would be functionally impossible to change, yet it was initially arbitrary. The level of diffuse investment, the links with the other networks and symbol systems, and the sheer degree of interpenetration of “red as stop” renders it irreversible. We are surrounded by these networks: of telephones, computer links, road systems, subways, the post, all sorts of integrated bureaucratic record-keeping devices.

Irreversibility is clearly important for an analysis of power and of robustness in networks in science studies. A fact is born in a laboratory, becomes stripped of its contingency and the process of its production to appear in its facticity as Truth. Some Truths and technologies, joined in networks of translation, become enormously stable features of our landscape, shaping action and inhibiting certain kinds of change. Economically, those who invest with the winners in this stabilization process may themselves win big as standard setters. Later, others sign on to the standardized technologies in order to gain from the already-established structures, and benefit from these *network externalities*. Just as city-dwellers benefit from the ongoing positive externalities of theatres, transportation systems, and a density of retail stores, network-dwellers benefit from externalities of structure, density of communications populations, and already-established maintenance. Any growing network evidences this, such as the community of electronic mail users in academia.

One can now sign on and (more or less) reliably communicate with friends, benefiting from a network externality that didn't exist just a few years ago.

Understanding how, and when, and whether one can benefit from network externalities is an essentially sociological art: how does the individual join with the aggregate, and to whose benefit? Once arrangements become standard in a community, creating alternative standards may be expensive or impossible, unless an alternative community develops for some reason. Sometimes the expense is possible and warranted, and may in fact lead to the development of another community, as in Becker's analysis of maverick artists (1982).

Becker raises the question of the connection between work, communities and conventions in creating aesthetics and schools of thought. He begins with a series of simple, pragmatic questions: why are concerts two hours long? Why are paintings the size that they are (in general)? By examining the worlds which intersect to create a piece of art, *and valuing each one in his analysis*, he restores some of the normally hidden aspects of network externalities. There are contingencies for musicians' unions in prescribing hours of work, but also for those parking the cars of symphony-goers, those cleaning the buildings after hours, and these contingencies, as much as considerations of more publicly-acknowledged traditions, are equally important in forming aesthetic traditions.

So most composers write for concerts that are about two hours long, most playwrights plays of similar length; most sculptures fit in museums and the backs of transport vans, and so forth. Those artists who are mavericks play with these conventions, opposing one or more. Occasionally, a naïve artist – with little knowledge of any of the conventions – will be picked up and accepted into the art world – and for that reason is especially sociologically interesting for illuminating the usually taken-for-granted.

The phenomenon Becker is pointing to in art is equally true in science and technology, if not more so, because there are so few instances of solitary or naïve scientists (inventors are possibly a counterexample). Scientists and technologists move in communities of practice (Wenger 1990; Lave and Wenger, 1991) or social worlds (Clarke 1990b) which have conventions of use about materials, goods, standards, measurements, and so forth. It is expensive to work within a world and practise outside this set of standards; for many disciplines (high energy physics, advanced electronics research, nuclear medicine), nearly impossible.

Yet these sets of conventions are not always stable. At the beginning of a technological regime; when two or more worlds first come together; when a regime is crumbling – these are all periods of change and upheaval in worlds of science. As well, *the sets of conventions are never stable for non-members*. McDonald's may provide sameness and stability for many people – in John Law's words, it may order

five minutes of their world each day – but for me and for others excluded from their world, it is distinctly not ordered. Rather, it is a source of chaos and trouble.

### **Network or networks; that is the question**

There is thus a critical difference between stabilization within a network or community of practice, and stabilization between networks, and again critical differences between those for whom networks are stable and those for whom they are not, where those are putatively the “same” network. Again we have a choice for a point of departure: does McDonald’s represent a stable network, a source of chaos, or a third thing altogether?

### **Politics by other means or by the same old means?**

Bruno Latour explicates some of the features of actor network theory, and the mix between humans and nonhumans involved in socio-technical systems, in his article on “The Sociology of a Door-Closer”. He advocates an ecological analysis of people-and-objects, looking at the links between them, the shifts with respect to action, and the ways that duties, morality and actions are shifted between humans and nonhumans: “The label ‘inhuman’ applied to techniques simply overlooks translation mechanisms and the many choices that exist for figuring or de-figuring, personifying or abstracting, embodying or disembodying actors”(1988: 303).

The analytic freedom accorded by this heuristic is considerable; in fact Latour and Callon’s work has opened up a whole new way of analysing technology. However, the problem remains with respect to humans and the question of power that such mixes may seem to sidestep traditional questions of distribution and access: “As a technologist, I could claim that, provided you put aside maintenance and the few sectors of population that are discriminated against, the groom does its job well, closing the door behind you constantly firmly and slowly” (p. 302).

There is no analytic reason to put aside maintenance and the few sectors of population that are discriminated against, in fact, every reason not to. As Latour himself notes in response to criticism of the actor network theory for the political implications of its “levelling” of human/nonhuman differences, heuristic flattening does not mean the same thing as empirical ignoring of differences in access or experience. Rather, it is a way of breaking down reified boundaries that prevent us from seeing the ways in which humans and machines are intermingled.

However, one of the features of the intermingling that occurs may be that of exclusion (technology as barrier) or violence, as well as of extension and empowerment. I think it is both more analytically interesting and more politically just to

begin with the question, *cui bono*? than to begin with a celebration of the fact of human/nonhuman mingling.

### Network externalities and barriers to entry: physical and cultural

One of the interesting analytic features of such networks is the question of the *distribution of the conventional*. How many people can get in and out of doors, and how many cannot? What is the phenomenology of encounters with conventions and standardized forms, as well as with new technologies? And here an opportunity for new ground in science studies arises: given that we are multiply marginal, given that we may interweave several selves with our technologies, both in design and use, where and what is the meeting place between “externalities” and “internalities”? I say this not to invoke another “great divide”, but to close one. A stabilized network is only stable for some, and that is for those who are members of the community of practice who form/use/maintain it. And part of the public stability of a standardized network often involves the private suffering of those who are not standard – who must use the standard network, but who are also non-members of the community of practice.

One example of this is the standardized use of the pseudo-generic “he” and “him” in English to refer to all human beings, a practice now changing in many places due to feminist influence. Social psychologists found that women who heard this language form understood its meaning, but were unable to project a concrete example, and unable to place themselves within the example, whereas men could hear themselves in the example (Martyna 1978). Women thus both used and did not use the technology of this expression, and, with the advent of feminist analysis of language, were able to bring that experience to public scrutiny.

When standards change, it is easier to see the invisible work and the invisible memberships that have anchored them in place. But until then it may be difficult, at least from the managerial perspective. A recent article by Paul David, an economist of standards, looks at a familiar problem for economists of information technology, called “the productivity paradox” (1989). For many firms, and even at the level of national economies, the introduction of (often very expensive) information technology has resulted in a decline in productivity, contrary to the perceived productivity benefits promised by the technology. David makes a comparison with the introduction of the general purpose electric dynamo engine at the beginning of the century, which saw a similar decline in productivity. He refers to the work of several economists on the “transition regime hypothesis” – basically, that large scale

technological change means a change in economic regime, which carries its own – often invisible to standard analysis – costs.

### The transition regime hypothesis: whose regime? whose transition?

From the viewpoint of the analysis put forth here, the productivity paradox is no paradox at all. If much work, practice, and membership goes unrepresented in analysis of technology and socio-technical networks, then the invisible work that keeps many of them stabilized will go unaccounted for, but appear as a decline in productivity. Just as feminist theory has tried to valorize housework and domestic labour as intrinsic to large scale economics, the invisible work of practice, balancing membership and the politics of identity is critical for the economics of networks.

Who carries the cost of distribution, and what is the nature of the personal in network theory? I believe that the answers to these questions begin with a sense of the multiplicity of human beings and of objects, and of a commitment to understanding all the work which keeps a network standardized for some. No networks are stabilized or standardized for everyone. Not even McDonald's.

### Cyborgs and multiple marginalities: power and the zero point

In torture, it is in part the obsessive display of agency that permits one person's body to be translated into another person's voice, that allows real human pain to be converted into a regime's fiction of power. (Scarry 1985: 18)

It is through the use of standardized packages that scientists constrain work practices and define, describe and contain representations of nature and reality. The same tool that constrains representations of nature can simultaneously be a flexible dynamic construction with different faces in other research and clinical/applied worlds. Standardized packages are used as a dynamic interface to translate interests between social worlds. (Fujimura 1992)

To translate is to displace ... But to translate is also to express in one's own language what others say and want, why they act in the way they do and how they associate with each other; it is to establish oneself as a spokesman. At

the end of the process, if it is successful, only voices speaking in unison will be heard. (Callon 1986: 223)

Several years ago I taught a graduate class in feminist theory at a large university in California. The first day of class eight women and one other person showed up. I couldn't tell whether the ninth person was male or female. S/he gave his/her name as "Jan", an ambiguous name. In the course of our class discussions, it turned out that Jan was considering transsexual surgery. S/he'd taken some hormone shots, and thus begun to grow breasts, and was dressing in a gender-neutral way, in plain slacks and short-sleeved shirt. S/he said that s/he wasn't sure if s/he wanted to go ahead with the surgery: that s/he was enjoying the experience of being ambiguous gender-wise. "It's like being in a very high tension zone, as if something's about to explode", she said one day. "People can't handle me this way – they want me to be one thing or another. But it's also really great, I'm learning so much about what it means to be neither one nor the other. When I pass a woman, I begin to understand what feminism is all about. But this is different somehow."

I was deeply moved by Jan's description of the "high tension zone", though I didn't really know what to make of it at the time. A few weeks into the class we became friends, and she told me more about the process she was going through. She worked for one of the high technology firms in Silicon Valley, one which offered very good health insurance. But the health insurance company, Blue Cross, was unsure about paying for the extremely expensive process of transsexual surgery. Furthermore, the "gender identity clinic" where Jan was receiving psychotherapy and the hormone shots was demanding that s/he dress more like a conventionally feminine woman to "prove" that s/he was serious in her desire for the surgery. She told me that they required you to live for 2 years passing as a woman.

Around the Christmas holidays we fell out of touch. I was amazed to receive a phone call from Jan in February. "Well, congratulate me. I've done it", she exclaimed into the phone. "What?" I said, puzzled. "I've had the surgery, I'm at home right this minute", she said. I asked her how she was feeling, and also how it had happened. "Did (the company) decide to pay for it?" I questioned. "No", she replied. "Blue Cross decided to pay for the whole thing. And then the doctor just said 'better do it now before they change their minds.' So I did!"

In the years that followed I saw Jan's (now Janice) name once in a while in local feminist club announcements; she became an active leader in the women in business groups in the area. I never saw her again after that February, but continued to be haunted by the juxtaposition of the delicate "high tension zone", the greed and hypocrisy of the insurance companies and physicians involved, and her own desperation.

Another friend has told me of a similar phenomenon within the gender clinics which require candidates for transsexual surgery to dress and act *as stereotyped females*, and deny them surgery if they do not: “They go from being unambiguous men, albeit unhappy men, to unambiguous women” (Stone 1989: 5 of MS). She goes on to recommend that the transsexual experience become an icon for the twin experiences of the high tension zone and the gender stereotype/violence:

Here on the gender borders at the close of the twentieth century ... we find the epistemologies of white male medical practice, the rage of radical feminist theories and the chaos of lived gendered experience meeting on the battlefield of cultural inscription that is the transsexual body: a meaning machine for the production of ideal type ... Given this circumstance a counterdiscourse is critical, but it is difficult to generate a discourse if one is programmed to disappear. The highest purpose of the transsexual is to erase his/herself, to fade into the “normal” population as soon as possible. What is lost is the ability to authentically represent personal experience. (Stone 1989)

Here is a socio-technical network, an exercise of power – and a certain kind of loss. What would it have taken to preserve the “high tension” of Jan’s non-membership, the impurity of being neither male nor female? This high tension zone is a kind of zero point between dichotomies (see Latour 1987; in *Irreductions*, in Pickering 1991) or between great divides: male/female, society/technology, either/or.

Elaine Scarry’s extraordinary *The Body in Pain: The Making and Unmaking of the World* (1985) is a book about torture and war. Her argument is that during torture (and in similar ways during war) the world is created and uncreated. The torturer shrinks the world of the tortured, by taking the uncertainty of experienced pain and focussing it on material objects and on the verbal interchange between them. Old identities are erased, made immaterial.<sup>5</sup> We never really know about the pain someone else experiences, argues Scarry, and this uncertainty has certain political attributes that are explored during torture and war as the private becomes made public and monovocal. The visible signs of violence are transported to the public, and through a series of testaments, modifications, and translations become belief.

There are striking similarities between the making of the world Scarry describes and the making of the world by Pasteur described by Latour, or the successful process of translation Callon analyses, although there seems to be no violence in these latter. A set of uncertainties are translated into certainties: old identities discarded, and the focus of the world narrowed into a set of facts.

The unity and closedness of the world of the torturer/tortured are seen as aberrant and outside the normal world by most people – far outside our normal realm.

But Scarry argues that it is precisely this distancing that is one of the factors that makes torture possible, *because* it makes invisible to us what are in fact the pedestrian ingredients of making the world outside the extreme of torture. Simone de Beauvoir (1948) and Hannah Arendt (1977) have made similar arguments about anaesthetization to violence and the banality of evil. We always have elements of uncertainty about the personal world of another, especially about pain and suffering; we often leave one world for another, or narrow our experience without betrayal or permanent change – for example, in the dentist’s chair, when we can think only of the immanent pain.

If we shift our gaze from the extremes: torture, or the enormous success of Pasteur, to something as simple and almost silly as an allergy to onions, it becomes clear that similarly quotidian events form part of a pattern. Stabilized networks seem to insist on annihilating our personal experience, and there is suffering. One source of the suffering is denial of the co-causality of multiple selves and standards, when claims are made that the standardized network is the only reality that there is. The uncertainties of our selves and our biographies fall to the monovocal exercise of power, of making the world. My small pains with onions are on a continuum with the much more serious and total suffering of someone in a wheelchair barred from activity, or those whose bodies in other ways are “non-standard”. And the work I do: of surveillance, of scraping off the onions, if not of organizing non-onion-eaters, is all prior to giving voice to the experience of the encounters. How much more difficult for those encounters which carry heavier moral freight?

Networks which encompass both standards and multiple selves are difficult to see or understand except in terms of deviance or “other” as long as they are seen in terms of the executive mode of power relations. Then we will have doors that let in some people, and not others, and our analysis of the “not others” can’t be very important, certainly not central. The torture elicited by technology, especially, because it is distributed over time and space, because it is often very small in scope (five minutes of each day), or because it is out of sight, is difficult to see as world making. Instead it is the executive functions, having enrolled others, which are said to raise the world.

The vision of the cyborg, who has membership in multiple worlds, is a different way of viewing the relationship between standards and multiple selves. And this involves weaving in a conception of multiple membership, of a cyborg vision of nature, along with the radical epistemological democracy between humans and nonhumans. In the words of Donna Haraway:

There’s also the problem, of course, of having inherited a particular set of descriptive technologies as a Eurocentric and Euro-American person. How do



I then act the bricoleur that we've all learned to be in various ways, without being a colonizer... How do you keep foregrounded the ironic and iffy things you're doing and still do them seriously. Folks get mad because you can't be pinned down, folks get mad at me for not finally saying what the bottom line is on these things: they say, well do you or don't you believe that non-human actors are in some sense social agents? One reply that makes sense to me is, the subjects are cyborg, nature is coyote, and the geography is elsewhere. (in Penley and Ross 1990/91: 10)

But there is a problem with this conception, and that has to do with the simultaneous poverty of our analyses of human/nonhuman, and of multiple membership for humans between human groups:

You can't work without a conception of splitting and deferring and substituting. But I'm suspicious of the fact that in our account of both race and sex, each has to proceed one at a time... there is no compelling account of race and sex *at the same time*. There is no account of any set of differences that work other than by twos simultaneously. Our images of splitting are too impoverished ... we don't actually have the analytical technologies for making the connections. (In Penley and Ross 1990/91: 15-16)

What would a richer theory of splitting involve, bringing together the following elements:

- multiple membership
- maintaining the "high tension" zone while acknowledging the cost of maintaining it
- the cost of membership in multiple arenas
- multivocality and translation?

## Multiple memberships, multiple marginalities

Every enrolment entails both a failure to enrol and a destruction of the world of the non-enrolled. Pasteur's success meant simultaneously failure for those working in similar areas, and a loss and world-destruction for those outside the germ theory altogether. We are only now beginning to recover the elements of that knowledge: immunology, herbal wisdom, acupuncture, the relationship between ecology and health. This had not to do with Pasteur vs. Pochet, but the ecological effects of Pasteurism and its enrolment.

One of Haraway's suggestions is that the destruction of the world of the non-enrolled is rarely total. While torture, or the total institution, is one end of a continuum, the responses to enrolment are far more varied along a much richer continuum. The basic responses, outside of signing on, have to do with a multiplicity of selves, partial signings-on, partial commitments. Rut Linden's courageous and moving study of survivors of the Nazi holocaust, interwoven with her own biography as an American Jew, testifies to this rich complexity (1989). Adele Clarke's study of the different communities of practice which joined together in creating modern reproductive science shows how multiple memberships, partial commitments, and meetings across concerns in fact constitute science (1990a, 1991).

Becker's analysis of commitments and "side bets" is apposite here. In his decoupling of commitment from consistency, there is a metaphor for decoupling translation and enrolment. How can we explain consistent human behaviour? he asks. Ruling out mentalist explanations, functionalist explanations of social control, or purely behaviourist explanations, he instead offers that commitments are a complex of *side-bets* woven by the individual, ways of involving his or her action in a stream of "valuable actions" taken up by others. Following Dewey's theory of action, he notes that we involve ourselves in many potential actions; these become meaningful in light of collective consequences, jointly negotiated (Becker 1960).

Similarly, our experiences of enrolment and our encounters with standards are complexly woven and indeterminate. We grow and negotiate new selves, some labelled and some not. Some are unproblematic in their multiplicity; some cause great anguish and the felt need for unification, especially those that claim sovereignty over the entire self.

One of the great lessons of feminism has been about the power of collective multiplicity. We began with the experience of being *simultaneously* outsiders and insiders (Hubbard and Randall 1990). In the end, it is the simultaneity that has emerged as the most powerful aspect of feminism, rather than the outsiderhood. The civil liberties/equal rights part of feminism would not have fundamentally extended political theory; but the double vision, and its combination of intimacy, ubiquity and collectivity has done so (Smith 1987). It's not so much that women have been left out, but that we were both in and out at the same time.

Sociology and anthropology have long traditions of studying the marginal person – the one who both belongs and does not belong, either by being a stranger (this is especially strong in the work of Simmel and Schutz) or by being simultaneously a member of more than one community. The person who is half black and half white, androgynous, of unknown parentage, the clairvoyant (who has access to another, unknown world) – all are either venerated or reviled in many cultures. The concept of the stranger, or strangeness to our own culture, as a window into

understanding culture, is fundamental to many branches of anthropology and to ethnomethodology and its fruitful investigations into the taken-for-granted (see e.g. Garfinkel 1967 and its many references to Schutz).

Sociologist Everett Hughes extended Simmel's concern with the stranger, drawing on the work of his teacher Robert Park. He considered the anthropological strangeness of encounters between members of different ethnic groups who worked and lived together and developed an analysis of some of the ways in which multiple membership plays itself out in the ecology of human relations. In "Dilemma and Contradictions of Status" for example, he explores what happens when a person working in an organization belongs to two worlds simultaneously, and the prescriptions for action and membership are different (1970: 141-50 [1945]). He used the example of a female physician, or a Black chemist. Later sociologists used a related concept, "role strain", but that is one which fails to convey the sense of "high tension zone" or the complexity of the relationships involved in simultaneous multiple membership.

Another student of Park's, Everett Stonequist, reviewed various forms of marginality in his monograph, *The Marginal Man: A Study in Personality and Culture Conflict* (1961 [1937]). He discussed the stories of various racial and cultural hybrids: in Hawaii, in Brazil, in the United States and South Africa, as well as the phenomenon of cultural hybridism, as among immigrants and denationalized peoples, and the Jews. What is interesting about his work is that he places marginality at the centre of *all* sociology:

It is the fact of cultural duality which is the determining influence in the life of the marginal man. His is not a clash between inborn temperament and social expectation, between congenital personality tendency and the patterns of a given culture. His is not a problem of adjusting a single looking-glass self, but two or more such selves. And his adjustment pattern seldom secures complete cultural guidance and support, for his problem arises out of the shifting social order itself. (p. 217)

But we are all implicated in this changing social order, Stonequist goes on to say – through technology, through shifts in the meaning of race and nationality, and through the diffusion of peoples across lands.

Because, in analysing power and technology, we are involved in understanding precisely such shifts and precisely such shifting social orders, we could take a similar mandate. We know that the objects we are now including in the sociology of science and technology belong to many worlds at once. One person's scrap paper can be another's priceless formula; one person's career-building technological

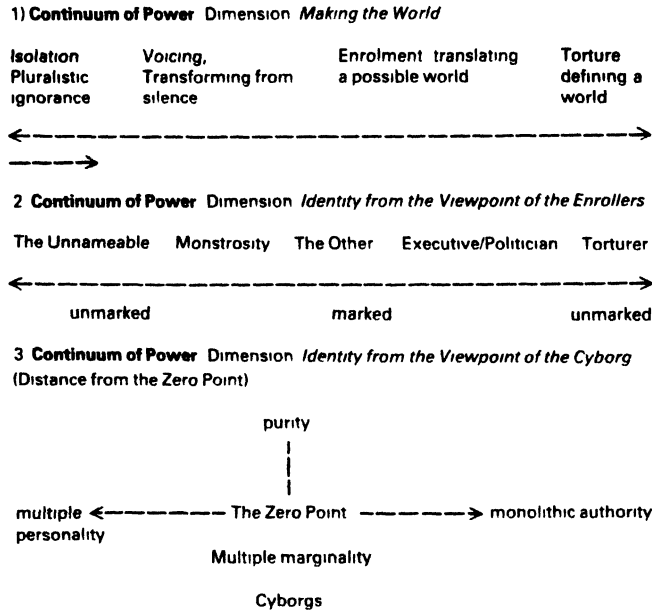
breakthrough can be another's means of destruction. Elsewhere I have analysed the ways different social worlds construe the objects which inhabit more than one shared domain between scientists and others involved in the science-making enterprise, such as amateur collectors (Star and Griesemer 1989; Star 1988). People inhabit many different domains at once, as well, and the negotiation of identities, within and across groups, is an extraordinarily complex and delicate task. It's important not to presume either unity or single membership, either in the mingling of humans and nonhumans or amongst humans. Marginality is a powerful experience. And we are all marginal in some regard, as members of more than one community of practice (social world).

### Conclusion: metaphors and heterogeneity

Because we are all members of more than one community of practice and thus of many networks, at the moment of action we draw together repertoires mixed from different worlds. Among other things, we create metaphors – bridges between those different worlds.

Power is about *whose* metaphor brings worlds together, and holds them there. It may be a power of the zero-point or a power of discipline; of enrolment or affinity; it may be the collective power of non-splitting. Metaphors may heal or create, erase or violate, impose a voice or embody more than one voice. Figure 1 sketches some of the possible configurations of this sort of power:

This essay is about a point of departure for the analysis of power. I do not recommend enfranchising or creating a market niche for those suffering from onion-allergy; nor a special needs assessment that would try to find infinitely flexible technologies for all such cases. Nor am I trying to say that conventions or standards are useless, or can be done without. But there is a question about where to begin and where to be based in our analyses of standards and technologies. If we begin with the zero point, like my friend Jan, we enter a high tension zone which may illuminate the properties of the more conventionalized, standardized aspects of those networks which are stabilized for many. Those who have no doors, or who resist delegation – those in wheelchairs, as well as door-makers and keepers, are good points of departure for our analysis, because they remind us that, indeed, it might have been otherwise.<sup>6</sup>



*Figure 1. Dimensions of power*

## Acknowledgements

Geof Bowker and John Law made many helpful comments on this manuscript. A conversation with Bruno Latour illuminated the importance of the executive metaphor in understanding multiple personality. Conversations with Allan Regenstreif about the relationship between severe child abuse and multiple personality were extremely helpful. Their work and friendship, and that of Adele Clarke, Joan Fujimura and Anselm Strauss is gratefully acknowledged.

## Notes

- 1 Monsters are the embodiment of that which is exiled from the self. Some feminist writers have argued that monsters often represent the wildness which is exiled from women under patriarchal domination, perhaps the lesbian self, and that apparently dichotomous pairs such as Beauty and the Beast, Godzilla and Fay Wray are actually intuitions of a healthy female self.

- 2 There are many courses for managers whose speciality is teaching executives how to delegate things to their secretaries and others below them in the formal hierarchy. Traditionally, of course, and still for the most part, this is male-to-female delegation.
- 3 Along with antiracist theorists, Third World writers on de-centring, deconstructionists, literary theorists, feminist activists and theorists, and critical anthropologists, among others.
- 4 A methodological dictum of Everett Hughes (1970).
- 5 This has striking resonances with the creation of the world in the “total institution” described by Goffman in his classic book *Asylums* (1961). Fagerhaugh and Strauss (1979) as well describe a similar shrinkage of identity and of the world in their *Politics of Pain Management*.
- 6 This is one place where ethnomethodology and symbolic interactionism richly complement each other in exploring the taken-for-granted. See Becker 1967.

## References

- Arendt, H (1977) [1965], *Eichmann in Jerusalem: A Report on the Banality of Evil*, 2<sup>nd</sup> edition, Harmondsworth: Penguin (reprinted).
- Becker, H (1960), “Notes on the Concept of Commitment”, *American Journal of Sociology*, 66: 32–40.
- Becker, H (1967), “Whose Side Are We On?”, *Social Problems*, 14: 239–47.
- Becker, H (1982), *Art Worlds*, Berkeley, CA: University of California Press.
- Callon, M (1986), “Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay”, pp. 196–233 in John Law, (ed.), *Power, Action and Belief*, London: Routledge & Kegan Paul and this volume.
- Callon, M (1991), “Techno-Economic Networks and Irreversibility”, paper delivered to conference on “Programmes”, Centre de Sociologie de l’Innovation, École Nationale Supérieure des Mines, Paris.
- Clarke, A (1990a), “A Social Worlds Research Adventure: The Case of Reproductive Science”, pp. 15–42 in Susan Cozzens and Thomas Gieryn, (eds.), *Theories of Science in Society*, Bloomington: Indiana University Press.
- Clarke, A (1990b), “Controversy and the Development of Reproductive Sciences”, *Social Problems*, s. 37: 18–37.
- Clarke, A (1991), “Social Worlds/Arenas Theory as Organizational Theory”, in David Maines, (ed.), *Social Organization and Social Processes: Essays in Honor of Anselm L. Strauss*, Hawthorne, NY: Aldine de Gruyter.

- Clarke, A and Joan Fujimura (eds.), (1992) *The Right Tool for the Job in Twentieth Century Life Sciences: Materials, Techniques, Instruments, Models and Work Organization*, Princeton: Princeton University Press.
- Daniels, A. K (1988), *Invisible Careers: Women Civic Leaders from the Volunteer World*, Chicago: University of Chicago Press.
- David, P (1989), "Computer and Dynamo: The Modern Productivity Paradox in a Not-Too-Distant Mirror", Center for Economic Policy Research Publication 172, Stanford University.
- De Beauvoir, S (1948), *The Ethics of Ambiguity*, New York: Philosophical Library.
- Fujimura, J (1991), "On Methods, Ontologies and Representation in the Sociology of Science: Where Do We Stand?", in David Maines (ed.), *Social Organization and Social Processes: Essays in Honor of Anselm L. Strauss*, Hawthorne, NY: Aldine de Gruyter.
- Fujimura, J (1992), "Crafting Science: Standardized Packages, Boundary Objects, and "Translation", A Pickering (ed.), *Science as Practice and Culture*, Chicago: University of Chicago Press.
- Garfinkel, H (1967), *Studies in Ethnomethodology*, Englewood Cliffs, NJ: Prentice-Hall.
- Goffman, E (1961), *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates*, New York: Anchor Books.
- Haraway, D (1991), *Simians, Cyborgs and Women: The Reinvention of Nature*, New York: Routledge.
- Hubbard, R and Randall, M (1988), *The Shape of Red: Insider/outsider Reflections*, San Francisco: Cleis Press.
- Hughes, E (1970), *The Sociological Eye*, Chicago: Aldine.
- Kottak, C (1978), "Rituals at McDonald's", *Natural History*, 87: 75-82.
- Latour, B (1983), "Give Me a Laboratory and I Will Raise the World", pp. 141-70 in K. Knorr-Cetina and M. Mulkay (eds.), *Science Observed: Perspectives on the Social Study of Science*, Beverly Hills, CA: Sage.
- Latour, B (1988a), *The Pasteurization of France*, Cambridge, MA: Harvard University Press.
- Latour, B (1988b), "Mixing Humans and Non-Humans Together: The Sociology of a Door-Closer" *Social Problems*, 35: 298-310.
- Lave, J and Wenger, E (1991), *Situated Learning: Legitimate Peripheral Participation*, Cambridge: Cambridge University Press.

- Law, J (1984), "How Much of Society Can the Sociologist Digest at One Sitting? The "Macro" and the "Micro" Revisited for the Case of Fast Food", *Studies in Symbolic Interaction*, 5: 171-96.
- Linden, R (1989), "Making Stories, Making Selves: The Holocaust, Identity and Memory", Ph.D. Dissertation, Department of Sociology, Brandeis University.
- Martyna, W (1978), "What Does "He" Mean? Use of the Generic Masculine", *Journal of Communication*, 28: 131-8.
- Merchant, C (1980), *The Death of Nature: Women, Ecology and the Scientific Revolution*, San Francisco: Harper & Row.
- Moraga, C (1983), *Loving in the War Zone: Lo Que Nunca Pasó por sus Labios*, Boston: South End Press.
- Penley, C and Ross, A (1990/91), "Cyborgs at Large: Interview with Donna Haraway", *Theory/Culture/Ideology*, 25/26:8-23.
- Pickering, A (ed.) (1991), *Science as Practice and Culture*, Chicago: University of Chicago Press.
- Restivo, S (1988), "Modern Science as a Social Problem", *Social Problems*, 33: 206-25.
- Rich, A (1978), "Power", from *The Dream of a Common Language, Poems 1974-1977*, New York: Norton.
- Scarry, E (1985), *The Body in Pain: The Making and Unmaking of the World*, Oxford University Press.
- Scott, P (1991), "Levers and Counterweights: A Laboratory that Failed to Raise the World", *Social Studies of Science*, 21: 7-35.
- Shapin, S (1989), "The Invisible Technician", *American Scientist*, 77: 554-63.
- Smith, D. E (1987), *The Everyday World As Problematic: A Feminist Sociology*, Boston: Northeastern University Press.
- Star, S. L (1988), "The Structure of Ill-Structured Solutions: Heterogeneous Problem-Solving, Boundary Objects and Distributed Artificial Intelligence", in M. Huhns and L. Gasser (eds.), *Distributed Artificial Intelligence 3*, Menlo Park: Morgan Kaufmann.
- Star, S. L (1989), *Regions of the Mind: Brain Research and the Quest for Scientific Certainty*, Stanford, CA: Stanford University Press.
- Star, S. L (1990), "Layered Space, Formal Representations and Long-Distance Control: The Politics of Information", *Fundamenta Scientiae*, 10: 125-55.



- Star, S. L (1991), "The Sociology of the Invisible: The Primacy of Work in the Writings of Anselm Strauss", in D Maines (ed.), *Social Organization and Social Processes: Essays in Honor of Anselm L. Strauss*, Hawthorne, NY: Aldine de Gruyter.
- Star, S. L and Griesemer, James, (1989), "Institutional Ecology, "Translations", and Coherence: Amateurs and Professionals in Berkley's Museum of Vertebrate Zoology, 1907-1939", *Social Studies of Science*, 19: 387-420.
- Stone, A. R (1989), "The *Empire* Strikes Back: A Posttranssexual Manifesto", in Kristina Stroub and Julia Epstein, (eds.), *Body Guards: The Cultural Politics of Sexual Ambiguity*, London: Routledge.
- Sagerhaugh, S and Strauss, A (1977) *Politics of Pain Management; Staff-Patient Interaction*, Addison-Wesley, Menlow Park, California.
- Stonequist, E. V (1961) [1937], *The Marginal Man: A Study in Personality and Culture Conflict*, New York: Russell & Russel.
- Strauss, A (1969), *Mirrors and Masks: The Search for Identity*, San Francisco: The Sociology Press.
- Wenger, E (1990), "Toward a Theory of Cultural Transparency: Elements of a Social Discourse of the Visible and the Invisible", Ph.D Dissertation, Department of Information and Computer Science, University of California, Irvine.
- Woolgar, S (1991), "The Turn to Technology in Science Studies", *Science, Technology and Human Values*, 16: 20-50.