Performative Articulations of STS:
On Representation, Materiality and Politics

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A Portrait of the Field of Science and Technology Studies

A Portrait of the Artist as a Young Man is a classic case of a text that exemplifies itself. Stephen Daedalus undertakes a quest for a new form of novel and the resultant novel is written in the new form which he discovers (Joyce and Egoist Press. 1917). Before James Joyce wrote this book he completed his first novel, *Stephen Hero*, in which the protagonist undertakes a quest for a new form of novel, but the novel itself does not instantiate the temporality and materiality proposed therein (Joyce and Spencer 1944).

Joyce viewed the fact that the representational style in his first novel did not match the complexities it described as an acute dissonance. In this paper we explore what has been perceived as a similar incongruence in science studies literature. Contingent, heterogeneous, and relative histories of everyone and everything are written, yet when the transformations of our own field is considered, the stories that are told tend to be relatively smooth, linear and progressive.

To Joyce, an adequate rendering of his protagonists' quest required a new form of writing. Both the problem he perceived and the solution he posed bears similarities to issues, which, in STS, have been raised by reflexivism. Thus, the discrepancy between analysis and mode of writing can be viewed as a variant of "ontological gerrymandering" (Woolgar and Pawluch, 1985) – and new modes of writing have been proposed for STS (e.g. Ashmore, 1989; Woolgar 1988).

Yet, as Latour (1988) and Pickering (1995) have pointed out this solution is based on a specifically representational understanding of the relationship between text and world (see also Lynch 2000). Reflexivists, Latour argued, severed the link between word and world, but never questioned the received representational view according to which the two were separated in such a way as to require this link in the first place. This is the view according to which the job of the scientific text, first and foremost, is to adequately *represent* the world. With a performative approach, however, the scientific world is not seen to be concerned primarily with representing. Rather, it is concerned with operating on the world, conceived as a field of heterogeneous agencies. But this would then be the case not just for the science that STS studies, but also for STS itself. Consequently, the field and its practitioners would also have to be conceived as performative entities operating in the world, rather than as striving to represent what is going on in it (Deleuze

1996, Pickering 1995). Following this basic idea, the paper works through some possible implications of this approach for the ways in which STS researchers understand their analytical tasks and their political and practical relations to other practices.

Although the paper is conceptually oriented, we believe that there are significant practical stakes[i] in this discussion, since at present the social sciences are more and more often required to justify its usefulness. Consider, for example, the analysis of Mode 2 knowledge production promoted by Nowotny, Gibbons and colleagues. In a recent discussion, these authors argue that

> The first attribute of Mode-2 is the fact that contemporary research is increasingly carried out in the context of application, that is, problems are formulated from the very beginning within a dialogue among a large number of different actors and their perspectives. The context is set by a process of communication between various stakeholders.[ii]

Mode-2 discussions are predicated on shaky historical grounds: it is pretty unclear when science was ever 'pure', research 'basic' and the tower 'ivory'. No doubt the explicit reference to social purpose – included now in all applications to the National Science Foundation for example – does provide an opening for STS scholars to become more active in policy and politics, two arenas where as a field (with notable exceptions) we have not been engaged. But although it generates possibility, becoming enrolled in this construction of science and society relations poses problems as well. Especially noteworthy and troublesome is the increasing tendency to require that social science explain its usefulness to project "stakeholders", in terms of outcome measures, which make little sense in terms of the empirical, historical, and theoretical analyses that actually constitute this research. Here we speculate that a re-articulation of what STS is, does, and could do, might enable us to respond innovatively, both in theory and practice, to such changing configurations of research and policy. We might, in other words, take a largely regressive, ill-thought through push from funding authorities as an opportunity to articulate our politics in new ways.

As Barbara Herrnstein Smith has argued, calls for academic utility have often evoked something of a standard response. In her "The Critiques of Utility," she shows

that that this kind of debate typically involves what appear to be two radically opposed discourses:

> On the one hand there is the discourse of economic theory: money, commerce, technology, industry, production and consumption, workers and consumers; on the other hand, there is the discourse of aesthetic axiology: culture, art, genius, creation and appreciation, artists and connoisseurs (Smith, 1988: 127).

But, she suggests, we are in practice never dealing with dualism. Rather, we are dealing with kinds of action and evaluation, which

> could [] be seen as parallel and complementary, the categories and considerations with which they deal and the operations they perform being only *relatively* and *locally distinguishable*. Viewed merely as calculative processes, in other words, the two kinds are not absolutely or essentially distinguishable from each other (Smith, 1988: 133).

Following this analysis, the point would not be to show that STS is not useful and certainly not that it should not aspire to be. On the contrary, our aim is to both point to the multiple of uses of STS research; and to generate new ideas about what its social and political relevance might be in the future (Jensen 2007). We suggest then, that STS, which, after all, have turned upside down and inside out many other common sense terms, could do a similar service for notions such as utility and relevance, policy and politics. And we propose, in particular, that the concepts, images and practices generated with reference to these terms, might be interestingly reconfigured and expanded *as a consequence* of a performative turn in STS.

In what follows, we explore this topic by working through a series of related themes. We start out by identifying some features of the curiously intellectualist stories, which STS scholars offer to each other about the merits of the field. We argue that they operate with a representational view of the field and contrast this with a performative approach. We then exemplify what difference this distinction implies for STS with respect to three interrelated themes: the continuity or discontinuity of ideas, the relationship between performativity and materiality and the implications for constructivist politics. We wrap up the discussion by briefly indicating our view on the relationship between these articulations and possible futures for STS.

Intellectualist Histories in the STS Literature

Science and Technology Studies (STS) have shown that the theoretical and methodological espoused by scientists in various fields and their actual behaviour is often at significant variance. By briefly examining the introductions to some key works in STS we illustrate that this is also the case in our own field. The point of these illustrations is not just the irony. Rather, they suggests an analysis of some ways in which the representational idiom has had continued influence in constructivist STS. We go on to explore some consequences of this situation.

Consider one of the foundation volumes of the SCOT (Social Construction of Technology) tradition: *The Social Construction of Technological Systems* (Bijker, Hughes, and Pinch, 1987). In this multiply re-printed volume from 1987 the editors introduced the SCOT-programme through an historical narrative. According to the introduction to this volume, science and technology have been more or less endemically separated in "science studies." Three bodies of literature have nevertheless tried to come to terms with their interrelationships. The first is sociology of science. Since the 70's, the sociology of scientific knowledge (SSK) has been of particular importance for developing realistic understandings of scientific production. It has not, however, concentrated specifically on technology. The second body of work is referred to as the 'literature on the relationship between science and technology' (Bijker and Pinch, 1987: 19) and is viewed as constituted by a conglomerate of work in philosophy of technology, on which the editors 'prefer to suspend judgment … until philosophers propose more realistic models of both science and technology' (19), and recent innovation research, in which it has been realized that simple models assuming that 'science discovers and technology applies – will no longer suffice' (20).

For Bijker and Pinch, the third relevant body of work was technology studies. This term is taken to cover assorted research in 'innovation studies [again], history of technology, and sociology of technology' (21). Innovation studies were carried out by economists who included in their models 'everything that might be expected to influence innovation, except any discussion of the technology itself' (21). The history of technology, while good on the details, suffered from generalization anxiety; an

unwillingness to make grand theoretical gestures out of their histories, just as it had been asymmetrical in its focus on technological success stories. Likewise sociology of technology, up to the time when Bijker and Pinch were writing, had left out the most radical insights one could gain from viewing technology as socially constructed. Thus, we are led to EPOR (Empirical Programme of Relativism) and SCOT (Social Construction of Technology), models which are viewed as drawing on the strengths of earlier approaches, as exemplified by Bijker and Pinch's canonical case study of the development of the bicycle, but going beyond them in the ways outlined above. But the 'sociology of technology is still underdeveloped compared with the sociology of scientific knowledge", and the authors feel that 'it would be a shame if the advances made in the latter could not be used to throw light on the study of technology' (47) The social construction of technology was intended to accomplish this advance.

Similar gestures are found in another key volume, *Shaping Technology/Building Society*. The volume is enfolded in a bold and perspicacious introduction and postscript by Bijker and Law (Bijker and Law, 1992). Although organized around the trope of mirror-like representation[iii], the authors consistently refer to contingency and complexity: 'Our technologies mirror our societies. They reproduce and embody the complex interplay of professional, technical, economic, and political factors … *all* technologies are shaped by and mirror the complex trade-offs that make up our societies' (Bijker and Law 1992a: 3). In this transformational process, objects get instantiated through the complex interaction of the social, the technical and the natural. Technologies, by this view, do not: 'evolve under the impetus of some necessary inner technological or scientific logic. They are not possessed of an inherent momentum'(3). The central actors of this story are the architects of heterogeneous theories who are leading us towards insight. As Law and Bijker explain in the postscript we are: 'witnessing the birth of a new capacity to understand, in a matter-of-fact way, how it is that people and machines work together, how they shape one another, how they hold one another in place' (Law and Bijker, 1992: 306).

These stories are told in distinctly progressivist terms: 'the social constructivist approach to technology … is an attempt to apply recent work in the sociology of scientific knowledge to the case of technology' (Bijker and Law 1992a: 13). So first the

quest took our sociologists to scientific knowledge and then to the new territory of technology – in a progression towards increased matter-of-factness. In this world, there is a smooth cut and thrust of intellectual inquiry:

> We mentioned Bloor's (1976) principle of symmetry … On the other hand, we also mentioned Callon's radical (1986a) extension of this principle – his controversial view that the social, the technical, and indeed objects in the natural world should be analyzed in the same terms. Many, perhaps most, English-speaking students of sociotechnology reject this view because it is incompatible with the Wittgensteinian and Winchian (1958) tradition of studying cultures as forms of life… Callon and Latour (1991) counter by arguing…" (Law and Bijker 1992: 290-291)

In this narrative concepts float between intellects, unhindered by precisely the kinds of material and institutional exigencies through which STS view concepts as being transformed in other practices. The world of representation and knowledge is completely removed from the world of practice and action.

Moving from technology to science studies, we turn to Andrew Pickering's classic 1992 collection: *Science as Practice and Culture* (Pickering, 1992). In the 1970's, Pickering tells us, the sociology of scientific knowledge (SSK) emerged as a field of study distinguished from other models in the sociology and philosophy of science, but during that decade the conceptual and geographic map of SSK remained simple and readily surveyed (Pickering, 1992a: 1). The situation changed in the 1980s, where a number of new approaches became discernable (laboratory studies, ethnomethodology, new approaches in the philosophy of science, symbolic interactionism, discourse analysis, the reflexive programme and so forth).

> But the time is past when one could entertain the idea of a comprehensive survey of SSK and its younger relatives, and this book aims instead to foreground what I take to be the key advance made by science studies in the 1980s. This is the move toward studying scientific practice, what scientists actually do, and the associated move towards studying scientific culture, meaning the field of resources that practice operates in and on (2).

This, so it is said, is a key advance in comparison with philosophy of science both in its orthodox analytical formulations and in 'many of the philosophers who have opposed mainstream thought, Paul Feyerabend…and Norwood Russell Hanson, for example' (3). However, the openness of practice as established by numerous case studies also poses a problem for SSK, 'why doesn't scientific culture continually disintegrate as scientific actors develop it in the myriad different ways that are conceivable in practice?' (4). While EPOR and SSK explain this by invoking sociological concepts such as closure and interest, Pickering suggests that 'SSK simply does not offer us the conceptual apparatus needed to catch up to the richness of the doing of science, the dense work of building instruments, planning, running, and interpreting experiments…and so on' (5). So 'SSK's account is thin, idealized, and reductive' (5). *Science as Practice and Culture* thus comes to figure as the natural development of science studies, by offering us thick, realistic, and non-reductive analyses of science. We end up with a Whiggish tale of methodological advances. It is predicated on a vision of the past as simple and the present and complex so familiar in these narratives – one need only think of the tired accusations of technological determinism in the past contra current enlightenment, or indeed (to be duly reflexive) Whiggishness in the past contra current sophistication. We need a simple past to get that momentum going.

Performative Articulations

These observations indicate some classically problematic themes in STS. But rather than reflexively interrogating these stories, perhaps in order to deconstruct them, we want simply to argue that progressive histories of the kinds we have just presented bear witness to the strength of the representational idiom in STS. This strength does not appear to have significantly diminished since these early publications. But what happens if one moves towards performative articulation? Because the problems to which STS texts attempt to respond look different with this approach, the solutions it becomes possible to imagine also take on different shapes.

In relation to the illustrations offered above, three points are worth noting. First, they present concepts as units with a fixed content. Progress is ensured as older concepts are exchanged with newer and more adequate ideas. Reflexivist analyses accentuated the

instability of ideas and possible reversals of meaning to show that the notion of intellectual progression is flawed. But because they retained the representational premise, their way of handling the problem became one of developing increasingly sophisticated techniques for writing reflexively. The disjunction between the description of change in other fields and the description of transformation within our own is also interesting in the performative idiom. Yet, this interest does not automatically guide one towards attention to textual reflexivity. Instead of moving further *into texts* it may instead may instead lead us *out of writing* so as to consider the extra-textual consequences and possibilities enabled by recognition of the discontinuity, non-linearity and historicity of ideas.[iv]

This leads to our second point. All excerpts in the analysis above rely on a deeply embedded distinction between idea and materiality. According to this distinction concepts are what scholars work with, whereas others, engineers, say, work with material things. This dualism between the ideal and the material is also part of the representational idiom. Performatively, however, this distinction breaks down and both ideas and things appear as part of fields, in which the material and the semiotic is thoroughly intertwined (Haraway 1997, Jensen and Lauritsen 2005). In actor-network theory terms an idea is a black box, which enfolds an actor-network: it is always already material and organizational.

These representational views are also importantly related to conceptions of the relationship between constructivism and politics. The assertion of representational validity is often implicitly a normative, political claim: indeed the desire to police our discipline underwrites the otherwise paradoxical assertion of representational validity in our own accounts. As Bruno Latour (Latour 2004) has argued, this police action through privileged access to historical, material truth is a feature of much scientific boundary work. The argument goes that the constructivist denial of a representational fit between description and reality denies the possibility of politics altogether.

Thus, the constructivist manner of bringing attention to multiple meanings and perspectives is often seen as leading to a "*dangerous* relativism" argument, according to which all arguments are equal and none can be preferred (Star 1995a).[v] Alternatively, it may be seen as *inconsequential* because, it is said, constructivism has nothing to say about how the world is *really* structured, irrespective of the constructivist preference.[vi]

These objections are not surprising as such. However, when constructivist STS researchers themselves take such views to heart things become more peculiar. This is the case, for example, when constructivist analyses at certain points – for example when directed at skeptical colleagues or policy makers -- are presented in the language of unmediated realism and clearly defined application in the attempt to demonstrate the importance of such studies. In such situations realist rhetoric is deployed because it is felt that it is only possible to be "practically relevant" by stressing "the real world." Often enough this is a pragmatic consideration seen to be of little analytical consequence. We argue, however, that the strategic retreat to realism constitutes a significant hollowing out of constructivism, because it accepts that one can only be a constructivist *until* the serious business of making real change occurs. From a performative vantage point, however, this is not the case. Constructivists do not have to be strategic realists in order to do practical work because the efforts of constructivism is no longer seen to be directed at unpacking the representational instability of dominant categories. To be sure our theories and categories do not simply represent "real world practices" correctly, but that is because they *extend* those practices rather than simply *describe* them more or less adequately. This raises the question whether there are possibilities for using STS research to extend some of those practices in interestingly *different ways*.

We may agree with Lynch, who concludes his "constructivist genealogy of social constructivism" by arguing that "Constructivism is benign enough, but [] it provides no guarantee of originality, correctness or deep metaphysical understanding" (Lynch, 1998: 29). However, although constructivism in a performative guise comes with no guarantees, it does enable one to maintain a flexible openness towards the surprises of practice. In the following sections, we discuss some consequences of this view in relation to the three themes identified– the discontinuity of ideas, the performances of materiality, and the politics of constructivism.

Discontinuous Ideas

As Paul Veyne points out, a principle of the discontinuity of ideas is central to the historiography of Michel Foucault (Veyne 1971). Foucault argued, for example, that concepts such as the 'state', 'democracy' or the 'the citizen' did not develop continuously

over time, but was rather transformed in leaps and bounds. But although Foucault has been an important inspiration in STS, the notion that ideas are stable entities often appears as an indispensable argumentative resource. This is particularly the case if one wishes to construct an argument, according to which new ideas surpass older ones.

Anne-Marie Mol is a prominent example of the performative turn in STS. But consider how she describes functionalism in *The Body Multiple*: 'The work of Talcott Parsons is outdated. It is functionalist in character' (2002: 8). The argument is prefaced with an introductory qualification: "Just as it is possible to write about the multiplicity of the objects of medicine, this could be done about other disciplines. I won't attempt to do so here" (7). These statements are written on the lower half of the page of her book, which is dedicated to 'relating to the literature'. The upper half is dedicated to analyzing the enactment of atherosclerosis in Dutch medical practice. This dual organization enacts an uneasy division between theory and practice (which could be characterized as functional in its own way).

Mol chooses to take on Parsons' functionalism because it has been crucial: 'he invented medical sociology' (9). Functionalism, she suggests, was strong in the fifties, but since then it has been 'thoroughly undermined' (8) by diverse (incongruent) research programs, such as Marxism, quantitative studies, and microsociology.

In describing the theoretical challenges to functionalism, Mol in effect makes our point. She shows, for example, how the term 'sickness' changed dramatically as it moved between theories and practices. It changed from 'a kind of excuse or justification into a form of condemnation' (9); and old understandings became outdated in the process. But functionalism does not get such detailed transformational treatment. According to Mol, the reason is that it is too important. In medical sociology it set the original agenda, and although later developments disagreed: 'they all occupied [the] newly created space' (11) defined by functional concerns. Mol stabilizes functionalism and she repeatedly characterizes it as outdated, because it seems to her like the black hole of medical sociology; the center towards which all work gravitates, and therefore 'the place from which this book …tries to escape' (13).

It is without question that functionalism is out of fashion – Mary Douglas is one of the few to unflinchingly (and with great sophistication) avow the soubriquet (Douglas,

1986). For a science studies graduate student, the very invocation of the word tends to evoke a hasty 'get thee behind me' or other banishing rite of choice. However, this does not mean that the *practice* of functionalism has gone away. To the contrary, it is alive and well in repeated formulations like 'What work does this concept/object do?' The point is not that the formulation is flawed but that its development is often theoretically indistinguishable from what used to be called functionalist positions. (One can make a very similar argument about structuralism and post-structuralism – which naming convention elides the fact that many 'post structuralists' are structuralist in all but name). So what is being banished when we deride functionalism? In part it is the past – it saves us from having to read a whole lot of stuff that would take an enormous time to wade through: we can dismiss it out of hand. It is doubly easy to do this because in the process of blackboxing we create a simple past and a complex present: what a powerful narrative that is (Bowker 2006)!

When we banish it, we ignore its many redefinitions and adoptions in current theoretical practice; leaving behind only our projection of what it was (as the dark side of what we are). The functionalism we banish never really existed, but the act of denigration is what enables us – ever so often -- to remain functionalist, without recognizing our own acts of "historical pruning".[vii]

Performativity and Materiality

What would it mean to write a history of ideas, which was not organized around self-identical and free-floating concepts? Many scholars inside and outside STS have attempted to deal with this question by focusing on the materiality of practices. Ian Hunter, for example, wrote an article called 'Setting Limits to Culture' in which he argued that the academic field of cultural studies has tended to fall into an aesthetic-ethical reading of culture, even when it was avowedly materialist (Hunter 1988). He noted that administrative change of the type carried out by Kay-Shuttleworth in the mid-nineteenth century (he was a poor law commissioner turned architect of England's national education system) tends to get written out of cultural histories – although his work arguably had a lot more to do with the founding of the state, say, than the arguments propounded by political economists. Hunter asks:

> Why then are we predisposed to ascribe thinkers like Engels and his more famous partner – or, for that matter, prophets of culture like William Morris or Matthew Arnold – central roles in the process of cultural development, and to consign administrative intellectuals like Kay-Shuttleworth to the relative obscurity of educational history? (Hunter 1988: 105)

His response is that on the whole, academic attempts to look at the forging of organizations and the framing of cultural attributes are carried out: "in the shadow of a single general process of contradiction, mediation and overcoming at whose end lies the 'fully developed' human being" (Hunter 1988: 106). Hunter instead calls for detailed attention to administrative practice. In his version materiality is thus highlighted in the form of infrastructure. However, while infrastructures are obviously important objects of study (e.g. Bowker and Star 1999), they comprise only a subset of the materialities of interest to STS.

Manuel de Landa's *A Thousand Years of Non-Linear History* offers a wide-ranging attempt to do performative history (de Landa, 1998). In particular it is much more long-term and 'macro' as de Landa attempts to systematically analyze a thousand years of history of geological, biological, and linguistic systems.

His approach does not bear great similarities with classical historical scholarship, although it draws on Ferdinand Braudel and the Annalists; de Landa qualifies his history as philosophical. In his exposition, the three systems identified 'will *not* be viewed as the progressively more sophisticated stages of an evolution that culminates in humanity as its crowning achievement' (de Landa, 1998: 21), for with a strong materialist inclination, history is viewed as a matter of dynamic transformation of energies, rather than the carrying out of plans and intentions:

> in a very real sense…a *single matter-energy* undergoing phase transitions of various kinds, with each new layer of accumulated "stuff" simply enriching the reservoir of nonlinear dynamics and nonlinear combinatorics available for the generation of novel structures and processes (21).

Rather than being a 'chronicle of man' this history will be one in which 'materials will all be allowed to "have their say"' (22).

De Landa develops his three histories separately, 'starting roughly in the year 1000 and culminating in our own time, a thousand years later'. Given its non-linear theme, this organization of the book may seem odd, as the author recognizes:

> But doesn't this approach contradict my stated goal? Isn't the very idea of following a *line of development*, century by century, inherently linear? My answer is that a nonlinear conception of history has absolutely nothing to do with a style of representation, as if one could truly capture the nonequlibrium dynamics of human historical processes by jumping back and forth in the centuries. On the contrary what is needed here is not a textual but a physical operation: much as history has infiltrated physics, we must now allow physics to infiltrate human history (14-5).[viii]

By relying on ideas from the natural sciences, which have acquired a strong temporal dimension as they came to view systems as open-ended, de Landa thus formulates a performative answer to Joyce's reflexive concern: historical writing does not necessarily become more adequate to the non-linearities of real events by attempting to mimic them on the level of representation.

With this strategy, de Landa hopes to participate in developing an enhanced historical materialism, 'liberated from the dogmas of the past' (13). The shape and format of this claim sound strange to historians and theorists within STS, who, far from being used to rely on certain theories of physics to liberate them from disciplinary dogmas, have spent considerable amounts of energy challenging the sometimes dogmatic certainties of the natural sciences.

Yet, de Landa's suggestions may also provide a breath of fresh air into debates on materiality and representationalism. Who, there, would venture to claim that:

> Changing our way of thinking about the world is a necessary first step, but it is by no means sufficient: we will need to *destratify reality itself*, and we must do so without the guarantee of a golden age ahead, knowing full well the dangers and possible restratifications we may face (274).

In this conception, there is no promise of a golden age, because no intervention, no transformational process, can guarantee a beneficial outcome (*pace* Lynch's argument):

> As we observed of communities on the internet: they are undoubtedly more destratified than those subjected to massification by one-to-many media, but since everyone of all political stripes – even fascists – can benefit from this destratification, the mere existence of a computer meshwork is no guarantee that a better world will develop (272).

The best one can do, therefore, is to approach the world with a more experimental attitude, which, in a Spinozist conclusion may generate 'a positive, and even joyful conception of reality' (274). De Landas provocative ideas responds to our (and Pickering's (1995)) call for a performative and material history. Yet, one element in his history remains curiously representational: the idea that a certain kind of conceptual operation informed by biology and physics guarantees the objectivity of the approach. On the one hand, this approach sees the entire world as constituted by transformational flows. Yet, on the other hand certain theories about this flow are used as if they were located on the outside: simply and precisely describing the world without participating in it in any consequential manner.

Hunter views material history as dealing in institutions and infrastructure while de Landa is concerned with histories of naturally occurring objects. Both, however, remain representational, by relying on a dualism between the (material) aspects of the world with which they deal and the discursive (representational) aspects they find inconsequential. Materiality thereby comes to figure as just about everything but culture and language. Would it not be possible to learn from such approaches to pay attention to the performances of materiality without buying into their dichotomy between the ideal and the real; the conceptual and the material?

This appealing possibility encourages further consideration of how one might construct strong arguments and propound their consequences, while retaining a constructivist disposition. As we shall now argue, we also think it could shed new light on the politics of constructivism.

Constructivism and Politics

Political theorist Wendy Brown points out that: 'while many have lost confidence in a historiography bound to a notion of progress or to any other purpose, we have coined

no political substitute for progressive understanding of where we have come from or where we are going' (Brown, 2001: 3). As a consequence,

> we continue to operate politically as if these premises still held, and as if the political-cultural narratives based on them were still intact. Our attachments to these fundamental modernist precepts – progress, right, sovereignty, free will, moral truth, reason – would seem to resemble the epistemological structure of the fetish as Freud described it: 'I know, but still…' (4).

Although Brown discusses historiography in relation to political theory, her analysis is valuable also to STS and, as we know, charged debates concerning the political and/or normative orientations that are, or are not, made possible by STS studies, are rather common.[ix] 'I know, but still…', seems precisely to identify not just strategic essentialism but, closer to home, 'meta-alternation' (Collins and Yearley 1992), as a mode of intellectual behavior placing the researcher in a double bind: the constructedness of one's own constructions cannot be admitted as similar to those one so clearly identifies everywhere else (Jensen 2004, 2006).

As Brown points out, the implications of constructivism often appear particularly worrisome, if studies are approached with a specifically political sensibility, a hope of documenting injustices, so that the current state of affairs can be transformed. For where is the basis, and how does one gain a direction, if classical ideas such as 'progress, right, sovereignty, free will, moral truth, and reason' are left behind?

We explore these issues through looking at Adele Clarke's historical sociology of the American 'disciplines of reproduction' in the 20th century (Clarke, 1998). This study, as Clarke states, comes out of just the combination of intellectual curiosity and political interest, which tend to lead to the worries about politics identified by Brown. Yet, Clarke elegantly navigates this territory. She references the 'flexible' life of one central article, which formed the background of her study. In the hands of later users, this article provided argumentative resources for those Clarke views as progressive feminists, no less than for those she identifies as conservative Christian fundamentalists. Clarke therefore characterizes her own project as more than the staple 'chronicle of transformations' (Clarke, 1998: xii). Although she believes that 'good scholarship informs social change' she is also aware that this scholarship is not by itself capable of controlling the shapes

such change will take. Her stance is thus explicitly that 'representing *is* intervening' (xiv). She can therefore offer her work to a range of audiences, including relevant scientists, feminists, cultural students of science, health activists, demographers and sexologists as a tool for building 'bridges and translations' between their various worlds. The Christian groups identified above are not mentioned, as part of the bridge-building efforts, but undoubtedly the missing invitation will not prevent them from using (or, as Clarke sees it, abusing) the material as it is made available.

Clarke's argument is largely even-handed and symmetrical. That is precisely why it can easily cut both ways. It is unable to promise or even advocate a specific course of action as the solution to present problems. Rather, than offering blueprints for action it bears witness to complicated historical processes, which can be evaluated as beneficial or harmful only in their details. Clarke insists that this is heterogeneous history:

> Controlling life was and is to be achieved in part by rationalizing and industrializing reproductive processes. Multiple heterogeneous and contradictory groups have had an interest in such control – from elites seeking to control others to individuals, especially women, trying to get a grip on their own lives…from eugenicists…to neo-Malthusians…from philanthropists and foundation executives to reproductive scientists trying to do their research. I emphasize heterogeneity again here specifically to disrupt in advance a simplistic reading of the next paragraphs, where I take up the question of control, specifically: Whose control over whose reproduction? And under what conditions? (274)

The reason why the warning is formulated at this particular point is that her concluding considerations are much less symmetrical than the analyses from which they result. This streamlining of the otherwise heterogeneous history happens through a reconfiguration of the case as *primarily* about control, which is claimed to be due to the development of a general modern "economic ethic of fertility" (McCann, 1994). As a consequence of this simplification of the concluding argument it becomes possible to argue that *Disciplining Reproduction* has 'pulled back the veil not from nature but from the reproductive sciences…' (276). The invocation of Francis Bacon's trope is undoubtedly ironic.[x] Yet, it leaves the reader with an ambiguous feeling that perhaps Clarke's preceding analysis, in the end, might also be squeezed into the secure intellectual frame of representing the

facts; while only the specifics of these facts need change. As we have noted, Clarke explicitly warns about the simplifying move she is going to perform; yet she does perform it, and in doing so, she instances the 'Brownian motion' of constructivist politics: I know…but still.[xi]

Performative STS-Studies

Where does this leave us? Michel Serres has proposed a performative alternative to representational and progressive history. Objects and concepts, he says, can always be characterized by their "terminal moraine": "the moraine, where the liquid mass stops, on a given date" (Serres, 1977: 18**,** cited in Lyngså, 1994: 185). In this metaphor, materialities, actions, and events from different times and places are presented as co-existing in the present: temporalities are mixed up as the sedimentations of pebbles and clay where the moraine stopped (Lyngså, 1994: 185). The contemporary field of STS can also be described in such terms of mixed temporalities.

We have discussed a diverse set of scholars' varying ways of attending to and dealing with the fraught relationships between representation, materiality, and politics, in STS and neighboring areas. A performative approach to these questions, we argue, give us a vantage point for considering the merits, possibilities and dangers of constructivist STS-studies, which is quite different from that made available from a representational point of view. It accepts that concepts, our own as well as others, are always undergoing transformation, so that representational adequacy is an insufficient criterion with which to evaluate the usefulness and relevance of research. Engagement with material practice may then be seen as an alternative focal point of STS intervention. Yet, it is uncertain where "the material" really resides; it is unclear, for example, whether writing texts is less material, less real and less consequential than doing physics experiments, building bridges, or participating in demonstrations. A performative approach makes us appreciate that we are always already operating in and through multiple materialities, which generate specific fields of intervention: educational, technical, political, theoretical and so on.

It is precisely because of the acknowledgment of this contingency and variability that STS researchers often cease to be constructivists when they aim to make real

differences. Our argument, though, is that the retreat to realism does disservice to STS. We propose to accept that uncertainty and negotiation are inevitable components in policy-making, as in research practice and social existence at large. We suggest that accepting the performative condition, taking it to heart and experimenting with its implications might do STS good. Indeed, it is possible that some energy would be freed to imagine new ways of performing the links between STS and other practices if less effort had to be spent turning constructivist analysis into realist rhetoric, simple guidelines, projections and recommendations, as soon as we "leave STS" and enter "the real world."

What then should we do? It is clear that the answer cannot take the form of clear-cut methodological or political guidelines. Indeed, the answer is bound to be that we are required to do *nothing specific*. But, then, we might do many things. In fact, we might argue that the single performative obligation for the field as a whole is to develop an ethos encouraging exploration of new theories, alternative methods, and different kinds of relationships with practices. Only by doing so, after all, is STS likely to stay *as attuned* to social and political changes as those practices. And only by participating in ongoing experiments with its own concepts and methods, is STS likely to retain the intellectual agility necessary to understand and engage our constantly changing sociotechnical world, which have made the field so exciting over the last decades.

For example, performative STS might be a vehicle enabling one to cross disciplinary borders. Recent work at the intersection of STS and art, as exemplified by the work of Lucy Kimbell[xii] and Natalie Jeremijenko,[xiii] or between STS and design as illustrated by Phoebe Sengers[xiv] and Nina Wakeford[xv] indicates the depth and range of such possibilities. Or, to move in a quite different direction, the work of Helen Verran, on an African logic (2001), and on aboriginal databasing in the Northern Territory[xvi] offers vivid illustration of what STS might do in a post-colonial setting. But a performative disposition might also facilitate our capacity for drawing other practices, their ideas and methods *into our field*. Thus, we might find that there is yet more to learn from, for example, cybernetics, social anthropology, chaos theory, post-colonial theory, or poststructuralism, than STS has hitherto imagined (e.g. Jensen and Rödje 2007). Drawing upon, and learning from such divergent constellations of ideas and practices is one

important way of ensuring a continual development of our own analytical tools, and one way of keeping our 'canon' open for and responsible to change. Indeed, one might argue that a performative science studies encourages us to *always* think of more things to do: theoretically, methodically, practically, and politically. We think that is what is required for a field to remain sensitive to the many things going on in the world around it. In turn, this is what enables us both to make theoretical innovation and to bring our understandings, concepts and analyses to bear on the world in new ways.

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[i] As we argue below, the categorization into "conceptual" and "practical" is itself an unsustainable dualism, the terms of which needs to be reconfigured.
[ii] Available at http://www.interdisciplines.org/interdisciplinarity/papers/5 (accessed March 3rd, 2006).
[iii] The classical critique of this trope is found in Richard Rorty's *Philosophy and The Mirror of Nature* (Rorty, 1979).
[iv] This raises the undeniable objection that we are still writing. Yet, the reformulation of writing as an activity on level with others means that we can pay new attention to the ways in which written accounts performatively and dynamically interact with their supposed referents, including in ways that change the latter.
[v] See Smith (1988 and 1997) for a thorough analysis of such worries.
[vi] A well-known example of this flawed understanding is physicist Alan Sokal's remark that those who believe that physical laws are social conventions are welcome to try to transgress these conventions from his window on the 21st floor.
[vii] This notion is due to Andrew Pickering.
[viii] See also Serres (1980)
[ix] See e.g. debate between Singleton (1996, 1998) and Radder (1998).
[x] See Bacon's *New Organon and Related Writings* (1960), and Daston (1994) for analysis.
[xi] An altogether less sophisticated version of this move is exemplified by qualitative researchers Yvonne Lincoln and Norman Denzin (1998), who claim that that field has developed in linear and progressive phases. Thus, the 'traditional period' lasted from 1900-50, the 'modern' phase goes from 1950-70, while 'blurred genres', 'the crisis of representation', and the 'postmodern challenge' rapidly succeeded each other. Denzin (2001) adds to this a 'post-experimental phase' since 1996, and argues that it will be followed by a 'seventh moment' undetermined at the time of writing. See Atkinson and Coffey (1999) and Jensen and Lauritsen (2005a) for further discussion
[xii] Available at http://www.lucykimbell.com/ (accessed March 3rd, 2006)
[xiii] Available at http://xdesign.ucsd.edu/(accessed March 3rd, 2006)
[xiv] Available at http://cemcom.infosci.cornell.edu/ (accessed March 3rd, 2006)
[xv] Available at http://incite.surrey.ac.uk/people/nina.html (accessed March 3rd, 2006)
[xvi] Available at http://www.cdu.edu.au/centres/ik/ (accessed March 3rd, 2006)