Chapter 6

Notes on the Traffic between Cultural Studies and Science and Technology Studies

Marianne de Laet

1 Representation: On the Nature of the Universal

> When someone talks to me about a universal, I always ask what size it is, and who is projecting it onto what screen. I also ask how many people maintain it and how much it costs to pay them. I know this is in bad taste, but the king is naked and seems to be clothed only because we believe in the universal. (Bruno Latour 1988: 4.4.5.1)

Universality and representation

We tend to believe in the universal; we believe in the universality of scientific facts and technological artifacts, of surveys and overviews and of scholarly practices. Universals furnish our cultural space.

In this chapter I introduce the academic field of science and technology studies (STS), which has made it its business to learn about the social, material, and cultural conditions that make and maintain the universal. While the object of the scientific enterprise is to *produce* universals – and it is notorious for its success in generating quite a few of them – STS, the field that engages in the (social) study of science and technology, can be cast as tracing *how*, exactly, particulars become universals in this arena of scientific and technical knowledge. Put another way: STS is – among other things – interested to trace the strategies of representation that form the trajectory from local theory or vision to universal (arti)fact.

This is an unorthodox way to frame STS. As the name of the field implies, STS has science and technology as its objects of study. An alternative name by which the field is referred to, social studies of science and technology, points to the attention to science and technology's relationship with society and culture; their nature as social (or human) accomplishments; and/or the social structure of their enterprises. In the 30 years of its existence the field has made "culture" a central, though problematic, analytical category. While it is acknowledged that culture needs to be part of any kind of understanding of the processes and

practices of technology and science (Pickering 1992), there is no consensus on how to conceptualize the role it plays. Does the world of science constitute a separate culture? Should the main concern be how science and technology shape culture and/or vice versa? Is it only a particular type of culture that can develop and sustain the scientific mode? If science and technology turn out to be culturally grounded, what does this imply for the universals they aspire to produce?

Inquiry into the universal may come with the STS territory. For in tracing the origins, the genesis, or the building of universals, one acquires a view of the social, cultural, and material particulars that go into their making. I suggest that this inquiry into the universal is at the heart of STS. It is a major source of difficulties between STS practitioners and their objects of study: those who engage in the practices of technology and science. For the quest for *universal* knowledge, which after all motivates the pursuit of science, seems at odds with the proposition, offered by STS, that the creation of such knowledge depends on culturally specific – and hence *particular* – routines. And while not *every*one who engages with the social or humanistic study of science and technology endorses such skepticism towards the universal (some philosophers and historians of science, especially, would not agree), I suggest that most of those who identify themselves with the field of STS, in some way or other, share this interest in how it – the universal – comes about.

Linkages of STS and cultural studies (from now on, CS) are obvious. Not only is there a joint interest in the relations of science, technology, and culture; like those who work in the field of STS, scholars in cultural studies are interested in how the universal grows out of particularities. Moreover, the skepticism towards the universal, the general, or the overview that can be found in STS, is even more apparent, for slightly different reasons, in CS. For even though general statements suggest universality, they are always partial – or so CS claims – and they are always made from a particular location or point of view. Surveying is not only a descriptive, but also a normative act: while reviewing, one reviews from the perspective of one's own intellectual and institutional alliances and thereby affirms the interests of those alliances. Or one surveys from one's geographical, ethnic, and/or political location, and thus is partial in another sense (Haraway 1997).

This skepticism towards the strategies of representation that need to be mobilized in order to produce a universal or an overview becomes even more urgent when one considers the *multicultural spaces* in which scientific knowledge and technical artifacts operate – which STS is increasingly requested to take into account. While in CS cultural difference has long been a central theme, in STS the relation between culture and science is a problematic issue and diversity, of cultures and so also of the cultures of science, has only recently begun to be seriously considered. Knowledge, especially scientific knowledge, and technology, especially "high" technology, despite their diffuse manufacture, their travel, and their use in a variety of heterogeneous locations, are still regarded as in, and

of, and carrying one, homogeneous (but mythical) culture – the "culture of the West."

Overview

While many scholars in STS trade in skepticism of the universals that science and technology generate, they equally suspect the knowledge that they produce themselves. Trained to be "reflexive," they are aware that the knowledge that is produced in the field *itself* can be problematic on account of precisely its suggestion of universal applicability (Ashmore 1989) – and that thus caution is called for. Annemarie Mol, a Dutch science studies scholar, puts it as follows: "I want to avoid the idea that I am – or am in – a knowing *center* from which the various *elsewheres* in this large world may be *overseen*. I don't think that the *overview* is a proper mode of knowledge in a complex world where, or so it seems to me, the crucial political and intellectual challenge is to find ways of living with difference" (Mol 2000).

Caution is required. For while Mol is talking here to a heterogeneous audience about her discomfort in portraying the unifying role of the intellectual, and in a development context at that, what about my present commission to provide a (homogeneous?) portrait of a field as mixed as science studies? Suspicion towards the ways in which one might represent STS itself is in order, too. For STS is a diverse, a complicated, and an international field, which is made out of at least four disciplines, a plethora of case studies, a number of explanatory models, serious intellectual debates, and a few major controversies. I do not wish to provide a summary overview of this field; of its place in a cultural studies environment and in a world fraught with differences in knowledges, technologies, and their uses. And yet, for a Blackwell Companion, the overview seems to be an apt mode of representation. It is an uncomfortable responsibility, the responsibility of having to represent. What to do?

Framing the chapter

Here is what I propose. I organize what follows not around *differences* between STS and CS, nor do I attempt to give an overview of what STS is *all* about. Rather, I focus on the common interest in CS and STS in the work of culture, in the work of representation, and in the work of making universals out of particulars – in order to bring into view the traffic across the two fields, their exchanges with the arenas of science and technology themselves, and the ways in which all learn from each other. And I do so in what I hope is an appropriate fashion. By telling you a small story about a particular case, in which a printing machine with its appending practice of and knowledge about printing – a machine that is thought to be a universal technological object – travels to Zimbabwe and turns out not to be quite so universal at all, I show how STS might be *done* rather that *summarizing* or *overviewing* what it consists of.

Before we turn to this story, let me organize some of the convergences and differences between STS and CS around the issues of universality, representation, and culture. For these themes, I suggest, provide insight in what the relations between STS, CS, and the practices of science and technology are all about.

2 Science and Technology Studies and Cultural Studies

Universality, representation, culture; those are the issues around which I frame this chapter. It seems fair to say that – counter to the practices of science – CS and STS are not about producing universals; they are about understanding how universals come to be.

STS

Unlike CS, which is after the interpretation of cultural signs, artifacts, and symbols, unearthing their deeper (but culturally specific or local) *meaning* and which, as Andrew Ross frames it, is out to "show how the powerful language of science exercises its daily cultural authority in our society" (Ross 1996: 10–11), a leading motif in STS is to deconstruct the universal by asking about its *materiality*, its workings, and its use. How does a universal come about? What is it made out of? What does it cost to make it stick? What are the mechanisms by which scientific language and technological artifacts are given such authority in our society? These are the kinds of questions that are asked in STS – not only of universals but, more specifically, about the scientific facts and technological artifacts that are often taken to universally apply.

The field of STS emerged in the late 1970s, out of what hitherto had been three separate disciplinary interests in the nature of science and, to a lesser degree, of technology: history, philosophy, and sociology of science. An influx of anthropological studies of the workings and practices of the scientific and technological enterprise sealed the orientation of the field towards empirical, detailed, case-based, studies of the innards of scientific and technological practice and culture (Pickering 1992; Latour & Woolgar 1986; Knorr Cetina 1981; Traweek 1988).

A social studies approach is thus assumed and an interest in culture implied; the (many) historians and (fewer) philosophers of science who identify with the field of STS have the "social" or the "cultural" (whatever the precise content of the terms) in mind, as factors that help explain (in the latter case), or that need to be taken into account in the understanding of (in the former), the workings of technology and science. However, it is not the case that STS is a homogeneous project, organized around culture – or that it has fully assimilated the separate disciplines of history, philosophy, sociology, and anthropology of science. Each

of these disciplinary tracks still flourishes in its own right, and not everyone who is active in them would identify him or herself with the STS field.

To apply a bit of STS analysis: there is a sociological explanation for this. The matter of disciplinary identity is still a major factor in the academic market for jobs, publications, and awards. One might give a historical explanation: each of these disciplines has developed a canon, a set of topics, and perhaps not a method but in any case a general approach to the subject-matter. A philosophical consideration: culture is a concept that is hard to approach with rigor and so for many philosophers this disenfranchises the enterprise of either pursuing a cultural approach to science, or to taking culture seriously as a factor to be considered in its development. Politically, STS has recently been identified, whether justified or not, with an insistence to not only recognize that the universal is partial, but to request that scientific methods learn to take such partiality seriously into account. And while anthropologists of science and cultural analysts usually subscribe to this project to democratize science as a political motivation for doing science studies work, this does not apply to everyone who works in the general area of studying technology and science. And so it has come to depend on the measure of comfort with this political and cultural orientation whether historians, philosophers, or sociologists associate themselves with STS – there is some apprehension about the current tendency to converge with cultural studies. For both the degree to which social and cultural factors are assumed to be responsible for the development of technology and science, and the political thrust of STS, remain divisive points (Ross 1996).

So STS is characterized by its object: technology and science. It distinguishes itself by its method: the empirical investigation of practices, workings, and materialities of technology and science. Also on the level of method, there is an ethnographic sensibility in sections of STS, bringing new challenges to the anthropological enterprise, such as that of studying one's "own" culture: the culture of science and technology of which the STS enterprise is an element (Ashmore 1989); and that of "studying up": studying powerful institutions (Fujimura 1991). Some unifying themes that run through all of STS will reemerge in what follows: the texture and materiality of scientific representation; the enabling constraints on innovation and technical development; the (political) use and ideological status of scientific facts and technical artifacts; the reconsideration of social, material, and cultural arrangements that ground, enable, and institutionalize knowledge.

CS and STS

Meanwhile, with the emergence of a consensus that contemporary (Western) society is dominated and shaped by scientific knowledge and technical in(ter)ventions (Knorr Cetina 1999: 5), technology and science have gained legitimacy, or even urgency, as objects of study in CS. The further acknowledgment that "technoscience" – a term which flags the merger of science and technology

(Haraway 1997) – and the hazards of advanced industrialized life are closely knitted forces that frame turn-of-the-century culture as what Ulrich Beck calls a "risk-society" (Beck 1992), defined not only by the presence of environmental and technoscientific risk but also the formation of institutions that are centered around its management, gives CS its political thrust. Add to this mix the matter of what we call globalization and its consequent insistence to absorb diversity, and the question of the relations of science, technology, and culture becomes even more pressing – as a conceptual as much as political issue that frames the connections between CS and STS.

Changes that have taken place in STS over the past decades (in focus, subject-matter, theoretical stakes) are to some extent a response to its exposure to CS. Or, if not a response, then at least these changes coincide with theorizing in CS. The traffic between the fields is mediated by their objects, which flow back and forth: CS takes on science while STS takes on culture and both are interested in the issue of an increasingly global but irremediably partial spread of technoscientific cultures. There is political convergence: both fields have incorporated and elaborated the ideology critique of the 1970s, and a call for democratization of technoscience motivates at least portions of CS as well as STS.

Methodologically, both fields have been influenced and changed by the influx of cultural anthropology and CS more overall, STS partially, have taken in semiotics (the study of how humans organize the systems and articulate the processes of meaning: Fabbri & Perron 1990: vii) as a way of reading, respectively, texts and objects. Conceptually, the leading rule in both fields seems to be to make strange the taken-for-granted, by interrogating the images and objects that frame our daily lives. The traffic with CS is embodied by the emergence of a flourishing and highly visible new "cultural" stream in STS. This stream has the material and conceptual connections between culture and science as its central theme. (Some examples: Alpers 1983; Biagoli 1993; Downey & Dumit 1996; Haraway 1989, 1991, 1997; Hartouni 1997; Helmreich 1998; Hess 1995; Knorr Cetina 1999; Lave 1988; Mol forthcoming; Traweek 1988.)

Universality and representation. Both CS and STS are concerned with the work of representation. But while one asks what does it mean to represent, the other asks what resources does representation require and what are its effects? Whereas CS is primarily interested in the ways in which science and technology inform and shape culture, in the ways in which they are represented in contemporary culture and how, through such representations, they shape the cultural imagination, STS is rather interested in the question of how culture shapes technology and science. So the latter takes apart the universal – and hence universality! – by looking at the materialities that are required in order to sustain it.

Of course the differences between the fields are forged. For STS is not homogeneous. Neither is CS. Their shared interest in the entanglements of culture, technology, and science makes the two fields converge in certain ways; many scholars in science and technology studies are cultural observers, too. And

of course in practice those who are interested in one question often find themselves dealing with the other as well, and so there is an area where CS and STS blend together and where both questions are addressed – as sides of the same coin. Nevertheless a disclaimer is in place here: convergence does not imply merger, and despite their shared interests CS and STS remain quite separate fields, with different perspectives, different methods, and a different set of questions that motivates them.

The point of my disclaimer is to stress that although culture has become an important analytic concept in STS, and although STS is increasingly (but inappropriately) identified with a cultural approach to technology and science, a generalized "cultural" take on technology and science is not representative of the field of STS as a whole. My treatment evokes *an* approach to studying science and culture in tandem; it does not "represent," or stand for, the whole of STS. But it does provide a glimpse of what STS and CS may do for each other.

3 Science and Culture: Fusions?

> Resisting the separation of science and technology, the word *technoscience* itself makes clear that category fusions are in play. There is one other category separation, in particular, that seems ill fitted to do much useful work in representing technoscience: that between science and politics, science and society, or science and culture. (Haraway 1997: 62)

This is, in a nutshell, where science studies and cultural studies merge: in finding its object taken up by cultural studies, science studies is pushed to reconsider the ways in which culture and technoscience matter to each other.

It is appropriate to say that STS *re*considers the relation between science and culture. For the field has struggled with the relations of science, technology, and culture from its inception in the late 1970s. Coming out of a critical movement that wanted to assess how science and society (or culture) influence each other, the matter of how to frame those relations – what kind of model to propose for them – has issued in heated debate. Roughly four positions can be distinguished.

In the first place there is the nineteenth-century tradition in which science is considered the equivalent of art and treated as its counterpart in constituting high culture. Art and Science are the sophisticated accomplishments of Western civilization, by which it distinguishes itself from other locations – where primitivity reigns. In this view science and technology are kept separate, one taken as a part of "high" culture, the other as "low." While this position on science and culture has been criticized and discarded by sociologists and historians (of science) throughout the most part of the twentieth century, some early work in the field of STS has taken explicit position against the remnants of this view. So in early STS one finds the argument that the great (hierarchical) divide between the cultured and the primitive that is inscribed in this view is not so much an

articulation of how matters stand between cultural realms, but rather an artifact of how culture, science, and knowledge are defined. This way of parsing things, it argues, is itself a cultural idiosyncrasy: by positioning science as an exclusively Western European enterprise it becomes unthinkable to include Chinese, Babylonian, or Bushman accomplishments in what might count as knowledge (Foucault 1970; Latour 1993).

In the second place there is the position that science and technology develop according to a dynamic entirely their own, and without reference to culture. In this frame the development of science is usually the prime focus (given primacy over the consideration of technology, that is) and this development is mostly rather unreflectively understood as progressing, unencumbered by cultural or societal constraints. It is in early history and philosophy of science – precisely the targets of science studies critique in the late 1970s – that this position can be found. *Boundaries* are strict, and are strenuously policed, in this approach, not only as a matter of fact (science and technology *are* separate, and they *are* strictly demarcated from culture and society, for the adherents to this approach), but also as a matter of intellectual policy: the act of separation guarantees analytical rigor. To add a reflective note on this practice of investigating science and technology, borrowed from early STS critiques: it might be the case that it is this very policy of strict analytical separation which leads to the recognition of strict separations in the reality to which the analysis is applied.

In the third place there is the position that considers culture the ambience for the development of technology and science; culture (or society) provides *context* and enabling constraints which mold the shape that technology and science can assume. (Staudenmaier 1985: 1–2). Pushed further, this position assumes a constructivist view, where science and technology are thought to be fully *determined* by such cultural and societal constraints. While much present history of science (and technology) falls into the former category, the second is more frequently adopted by sociologists of science. The emergence of STS as a trans- (or inter-) discipline, encompassing contributions from the history, the sociology, the philosophy and, a bit later, from the anthropology of science (and, to a lesser extent of technology), marked the transition to this more contextual or constructivist approach. One of the motives of the new orientation towards technology and science was, to find an alternative to the "progress" talk of the previous generation; one of its results, that the science–technology–culture relationship came to be understood as intrinsically mutual. A reflective note: culture, in this framework, is considered to be a known entity; more often than not science and technology are treated as its dependent variables.

Finally there is the position where STS and CS converge – a take on the matter that has come out of developments within STS, as well as in response to conversations with (for instance) cultural studies. Here, while the frame of mutual and intrinsic relationships is maintained, neither culture, nor technology, nor science are taken to be fixed, certain, known entities; or, for that matter as an ultimate determining factor in explaining developments in either realm (Latour

1987). Science and technology are treated as emergent effects, brought about by those who engage in them in conjunction with the (cultural) institutions that enable them. Likewise, culture is considered an emergent effect of the forces that operate on it – of which technoscience is (a significant) one. Rather than insisting on separating the realms of science and technology, many of those who operate in this mode prefer to use the term "technoscience" to indicate that science studies has become sensitized to the ways in which technology and science blend into each other. And rather than assuming that relations between technoscience and culture act according to a set model, those who operate in this mode are interested to (1) sort out the variety of models that may be, and that have been, applied to understand these relations, and (2) to map out the variety of ways in which they hold together. This attention to what might be called the *fluidity* of both technoscience and culture is – in these or in other terms, such as blurring boundaries, reflexivity, heterogeneity, hybridity, implosion, simultaneous production of the technical and the social – a feature of much recent work in or around STS (Beck 1992; Latour 1996, 1999; Haraway 1989, 1991, 1997; Bowker & Star 1999; De Laet & Mol 2000).

In this latter approach, a suspension of judgment about what constitutes (and separates) culture and technoscience is held in balance by an insistence on investigating the *materials* of which they are made up. Entities, even seemingly abstract ones such as culture, are held together by material objects. Their relations are mediated by concrete things – rather than by abstractions such as structures, institutions, or policies. This is not to say that structures, institutions, or policies do not exist; it is to say that they can only be understood by sorting out the materials that constitute them. Research in STS of the past 30 years – with its focus on case studies, laboratory studies, empirical research of scientific practices – has brought this materiality of relations – consisting of paper traces, spatial arrangements, laboratory rats, experimental assays, techniques to test for anemia to name a few – squarely into view (Latour & Woolgar 1986; Callon 1998; Mol & Law 1994). Materiality, then, stands out as another crucial feature in contemporary STS. And so in this fourth approach, as culture and technoscience move and modulate in tandem, so do they need to be followed – that is, investigated – as fluid but tangible categories that mutually shape one another. Obviously, my own reluctance to represent STS in terms of overviews and universals, and my choice to, in what follows, present some stories and possible ways of taking a cut at things, comes out of this approach.

Learning to Print in Zimbabwe: Universals, Representation, Culture

Universals

It is June 1997. I am looking at a photographic, electronic printer in a polytechnical school in Harare; it is about 6 months old, a state-of-the-art printing

device. "Looking at it" is as much as one can currently do with this machine – and that without learning much about it – since it has been out of order almost from the day it arrived. This printer has cost what in Zimbabwe is a fortune. Luckily it didn't have to be paid for with a Zimbabwean fortune; it was donated by a Danish aid organization and cost what in Denmark constitutes much less than a fortune. The teacher, who was donated by a Dutch aid organization – but who will have to leave Zimbabwe short after my visit because even so she costs the Zimbabwean government too much – shows me around.

When a Danish aid organization sends a state-of-the-art printing machine to Zimbabwe it assumes that the technology is universal: that it will work elsewhere, no matter where this elsewhere is. Good machines are supposed to hold their own, whatever the circumstances in which they operate. For such a printing machine to be universal, does its size matter? Does it count who is bringing it where? How many people are needed to maintain it, and how much it costs to pay them? In other words, what is needed for it to be a universal? What are the costs and benefits to the expectation that this technological object is universally applicable? What are its materiality, its workings, and its use? How does a universal come about? What is it made out of? What does it cost to make it stick?

Universals. The machine does things: it prints. But in Zimbabwe it doesn't. Material issues count for this. In the case of the printing machine in Zimbabwe – as is the case with many machines that end up, with the best of intentions, in other worlds – the assumption of universality turns out to be wrong. In new, intractable environments, machines often break down. Such breakdowns can be "technical" (in which I include "mechanical": a wire breaks, a lamp gets displaced); it can be social (it is not used, or it is used for other purposes than it was intended for; as a footstool, for instance); it can be something in between. This in-between is the interesting space: what might be located there? Culture, perhaps?

Representation

The words that represent this printer – its operation manual – have disappeared. They have been lost. Perhaps they are stolen. They never meant much, anyway: they didn't really instruct the Zimbabwean polytechnical printing students on how to operate this machine. For they tell about switches and buttons, but not about hows and whys. So (and this "so" deliberately forges a causal link) even while the words were still around, the machine was out of operation. One of its lamps has been out of whack almost from the day the printer arrived. It may have been used as a footstool, or something. This is rather a typical state of affairs, according to the teacher; in and to Zimbabwe, things do not always travel well. The school's other state-of-the-art printing machine fell off a truck, the other day, on the way back from a trade fair demonstration. "*Aju paraplu*," she says in laconic Dutch vernacular. Which means so much as: "oh, well . . ."

Representation. The manual "represents" the printing machine in multiple ways: it *holds* its knowledge and it *stands* for it, hidden behind lock and key in the closet of the principal's office. Command over the manual means command over the machine. In order for the printing machine to be a universal the manual for the printing machine has to be a universal as well. The knowledge about the machine that is represented in the manual should be transparent, and should be as transportable as the machine itself. But like the machine, the manual is not. In new, intractable environments, like a polytechnical school in Harare, knowledge often breaks down. It breaks down because the carrier of knowledge fails to carry it effectively to these places. Such failure can be "technical" (it is not readable, for instance, because manuals are notoriously dense); it can be "social" (the manual ends up behind lock and key in the principal's office because that is where written text goes); or it can be somewhere in between. Again: the in-between is interesting. What might be happening with the manual, there? Might it perhaps arrange its own cultural space around it?

Culture

Usually words are kept behind closed doors, in this place in Zimbabwe. For they do get stolen. They mean much in that respect: they are sufficiently desirable to be unlawfully appropriated. Such appropriation happens on a regular basis. Even a useless manual to a useless printing device is a much sought-after collection of words. As a consequence (or is it the reason?) the principal keeps most words under lock and key. It is quite possible that these particular words – the ones that might make the printer work, the ones that describe and operate the apparatus – are in the principal's office as well. To all purposes that would be the same as if they were stolen. For, once in the principal's closet they are not accessible to anyone else. Here is another way in which facts – and things – break down. The words that capture them disappear into someone's private domain.

Culture. The machine moves through cultures: from Denmark to Zimbabwe; from high-tech laboratory to low-tech educational environment; from designer to user; from material space to world of representations. We are used to thinking of "culture" as the thing that is outside: it is nationality, it is context, it is environment; it is what sets the stage. "Culture," then, might explain what happens to the printing machine in Zimbabwe: we are quick to assume that worship sanctifies the written word and places it behind bars. That in certain cultures (cultures much like ours in this respect), status and collections of texts go together. That there is a culture that doesn't know – doesn't care to know? – about this particular machine. But maybe, maybe, culture is "inside." A "culture" that places high stakes on the written word may *result* from the realization that without the written word the printing machine will never work. A particular cultural arrangement may result from the way in which technologies travel – and from the ways in which they break down.

So the teacher, who is responsible for the education of the public domain, decides to do without the words. "Let 'em stick their heads in a machine," she says. "That's much better for them, anyway. Go into the machine, look at it, take it apart, draw it. See what is made up of." The machine they stick their heads in is another one, an older one, though; and it won't ever work again, that much is for sure. "Sticking your head in" is not something that can be done with just any machine, and it is not done without consequence. It can not be done with little machines, nor with machines that consist mainly of chips – like the Danish Multi-Million-Zim-Dollar one. And you don't do it easily with a brand-new, freshly delivered one. But in the case of the older machine, or with the one-that-fell-off-the-truck, it is possible: these machines are out of use anyway, for one reason or another. So they offer students a chance to do without words, now, and in the future, when they – the students – will be printers, "originators" as they will be called, themselves. Maybe there is even a chance that, through sticking their heads into these machines, the students will learn some things about the Danish thing as well. That its lamps are not footstools, perhaps, because a print is as good as the angle of its light.

An STS approach has its eye on practices. It asks, for instance, how a machine that is not working can teach about printing; how in a new environment a machine – a printer for instance – assumes different tasks than the ones for which it was sent elsewhere – to Zimbabwe for instance. It has an eye on materialities: it is small, material things that decide whether the machine will work or not. Maybe our printer has to go to a trade show because it is the only machine in Zimbabwe. Maybe it falls off a truck on the way back. Maybe its manual stays with it so that someone can try to learn how to operate it. Maybe the manual disappears on day one. Maybe it is the culture of respect for written words that forces them to be placed behind lock and key and that so decides that this machine does not turn out to be a universal; or maybe, maybe it *is* a cultural idiosyncrasy that it works here and not there. And an STS approach has an eye on effects: maybe other things than learning to print emerge from sending a printer to Zimbabwe. Maybe it is a new cultural arrangement; a cultural arrangement that is sociotechnical in nature, that emerges from the travel of this machine. Perhaps culture is context but content; perhaps it is not already there but an emergent effect of the travel of technologies into new space.

5 Musings at the End

I would have been happy to give only particulars about STS and its differences and convergences with CS. But of course I have done a bit more. After all, the format of a chapter on STS and CS in the Blackwell Companion to Cultural

Studies requires that it *represent* universals, generalities, an overview; it is supposed to be a presentation of dependable matters of fact. You have been reading this because you wanted to know what STS is "all" about. So I have told you one of various versions of the history of the field, of its roots and developments, of its achievements and battles, of its findings and established facts; all this organized around a series of efforts in STS, in the course of its existence, to *grapple with the matter of culture*, around the issues of representation about the practice of making universals.

But you should keep in mind that a chapter written in this way should also be viewed as a way to *build* universals. For if I have given you a particular overview of what STS is all about, you now carry this overview with you, take part in its diffusion – and in the process its particularity disappears from view and the overview becomes more of a universal than it was before. My *partial* view may have gained more *general* viewing and thereby it has perhaps become – an *overview*. A tricky proposition, to write such a chapter, you will now understand. The writing of a universal is a performative act, that contributes to its making.

There are costs and benefits to the making of such a universal. I have been interested here to sort out what such costs and benefits, in a particular case, of certain universals – namely of the mission of STS and the travel of a printing device – might entail. I have wanted to keep in mind the costs and benefits of writing a story about STS in a volume like this. So here is how to read what I have written. I have organized what came before not around *differences* between STS and CS, nor have I attempted to give an overview of what STS is *all* about.

Rather, I have focused on the common interest in CS and STS in the work of culture, in the work of representation, and in the work of making universals out of particulars – in order to bring into view the traffic between the two fields and the ways in which they learn from each other. And I have done so in what is hopefully an appropriate fashion: by telling you a small story about a particular case, in which what is thought to be a universal technological object travels and turns out not to be quite so universal at all. In this story I have sorted out the cost and benefits to the expectation that a technological object is universally applicable. And so by following this object I have pursued the classic anthropological project of tracing the materiality of culture, which becomes a fresh pursuit when we try to understand what happens when the facts of science and the artifacts of technology travel into other worlds.

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