Postscript

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Ontography: Investigating the production of things, deflating ontology

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Abstract

In this postscript to the special issue of *Social Studies of Science* on the 'turn to ontology' in science and technology studies, I discuss a tension that runs through many of the articles in the issue. This is a tension between adopting a general philosophical ontology and pursuing empirical studies of particular historical and contemporary practices. The general ontology highlights multiplicity and difference and rejects the idea that, for example, an identical disease entity underlies different practical enactments of that disease in different clinical and research circumstances. The empirical approach investigates how particular identities and differences are negotiated and instantiated in specific circumstances. The two approaches are not necessarily incompatible, but the first settles questions of identity and difference through a 'pre-theoretical decision', while the second remains open to distinct resolutions of *what counts as* identity and difference in the practical settings studied. In this postscript, I argue that a commitment to a general philosophical ontology confuses investigations of specific practical ontologies. To avoid such confusion, I recommend 'ontography': historical and ethnographic investigations of particular world-making and world-sustaining practices that do not begin by assuming a general picture of the world. Such investigations avoid making sharp distinctions between epistemology and ontology and take a symmetrical approach to concerns about identity and difference.

Keywords

Atlantic salmon, epistemology, ethnomethodology, labeling genetically modified foods, science and technology studies, the turn to ontology

One of the advantages of growing older with a field is that it becomes possible to map current enthusiasms onto earlier waves of enthusiasm. In the decades following the launch of the 'new' sociology of scientific knowledge (SSK) in the 1970s, Science and

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Technology Studies (also known as Science, Technology and Society, and in either case identified with the acronym STS) became a corporate individual. It is now common for those of us who write about the field to present 'it' as a unified, internally coherent, entity and actor – as though STS *is* and STS *acts as* a coherent subject. Of course, we know that disciplinary histories are literary fictions and that STS is riven with partial affiliations, fractious tendencies, and professional rivalries, but treating the field as an 'it' can be irresistible. In the 1970s, when I first became interested in studying science, there was no STS: the sociology of science and sociology of knowledge were minor subfields of the parent discipline, and history of science and philosophy of science were fairly well established but just beginning to make some tentative moves toward treating the sciences as social productions. In the decades that followed, STS coalesced as a named and acronymized field, with links to several other fields but with at least nominal independence from any single 'parent' discipline. The field's history is frequently recounted as though it consisted of a series of turns: the social turn, the turn to technology, the feminist turn, the practice turn, and the normative turn, among others. Some of these turns have been met with skepticism as well as enthusiasm (see, for example, Woolgar's (1991) questioning of the 'turn to technology'), and given their frequency, one may wonder if 'spin' might not be a better way to describe these revolutions. This special issue allows us to reflect on one such turn – the so-called turn to ontology in STS and neighboring fields. Taken together, the introduction and constituent articles in the special issue exhibit a tension between announcing a new turn and questioning that very turn; a tension that enables us to guard against the twin perils of overenthusiasm for the not-so-new and curmudgeonly resistance to what may indeed be novel and promising.

At the very start of their introductory essay, Steve Woolgar and Javier Lezaun (2013) express a noncommittal and even ambivalent posture toward the turn to ontology. They observe that there has been 'a perceptible new interest in matters of "ontology" in the field of science and technology studies' (p. 321). For some contributors to the issue, particularly John Law and Marianne Lien (2013), this increased use of the word 'ontology' is emblematic of an epochal shift with roots in philosophy going back at least to the 19th century. Other contributors take more qualified, or even skeptical, positions. Noortje Marres (2013: 418) notes that 'work in STS has rendered ontology empirical' but that this is 'a very particular understanding of ontology'. Annemarie Mol (2013: 380) criticizes the 'turn to ontology' that she attributes to the 'new materialists' – a turn that, in her view, is more of a nostalgic reversion to a notion of 'stable and singular' matter – and distinguishes it from a turn that she prefers toward a 'relational materialism' characterized by heterogeneity and fluidity. Charlotte Brives (2013: 398) embraces a turn that she attributes to Mol but calls a 'praxiological turn': a mirror image of the 'ontological turn' proposing an ontology in which multiple practices enact multiple objects in multiple worlds. In their article, Bas van Heur, Loet Leydesdorff and Sally Wyatt (2013) present bibliometric evidence that the word 'ontology' is indeed more commonly used in recent STS literature than in the past and that such usage is consistent with trends in several neighboring literatures. However, they question whether this trend represents a coherent and dramatic turn and suggest instead that it is more of an incremental change that reflects no single theoretical – let alone metaphysical – shift. Their view is closer to my own impression from reading the contributions to this special issue. While I agree with

the contributors who propose that an empirical approach to topics associated with ontology holds promise for STS research, I do not see a profound break from previous STS treatments of epistemological and other classical philosophical themes. More importantly, as I shall argue, an empirical treatment of *topics* associated with ontology should not be confused with the adoption or advocacy of a philosophical theory of objects.

Near-to-natural kinds

Recently, I encountered at the seafood counter of a neighborhood supermarket a kind of salmon I had not noticed before: European Union (EU) Organic Salmon. This category supplemented the established kinds of 'wild-caught' and 'farmed' fish, which were helpfully marked with color-coded labels and priced accordingly. An online search located a press release that gave a brief account of how this new kind of salmon had been sourced. It began by asking and answering an ontological question, 'What do you do when customers ask for something that doesn't exist? You broaden your horizons and look harder' (Wegmans, 2011). After noting that the 'United States Department of Agriculture has not yet established a definition of organic seafood', the press release described how the company's vice president of seafood, the aptly named Carl Salamone, searched far and wide in an effort to satisfy customer demand for 'organic options' before locating a salmon farm in Ireland 'that carries European Union Organic Certification':

> At Murphy's Irish Seafood, Salamone found a small family-run farm using the deep waters of Bantry Bay, Ireland. The pens are fully exposed to the strong currents and natural elements of the Atlantic Ocean. 'This supplier controls its product from day one. They raise their own juvenile stock on the Comhola River using a diet of sustainable natural and organic ingredients', says Salamone. 'The smolts are then moved to the pens in the Bantry Bay where their number is strictly limited in each pen for a near-to-natural growing environment with massive water movement; this is great for the fish and less stressful on the environment'. The salmon are fed sustainably sourced organic feeds and are grown to 12 pounds in 14 months. The fish are harvested, cleaned, and flown to Wegmans' processor in Rochester, NY, all within 24 hours.
>
> Another benefit to these farm-raised salmon is they are fully traceable from hatchery to customer – from farm to fork – which is a vital requirement of the EU Organic Certification process. Each fish is tagged to guarantee authenticity and origin. 'For customers who are concerned about the environment and want to know exactly where their salmon come from, this product is for them', smiles Salamone. (Wegmans, 2011)

Clearly, the category 'EU Organic Salmon' does not fit a standard philosophical definition of a 'natural kind' that 'corresponds to a grouping or ordering that does not depend on humans' (Bird and Tobin, 2010). It would be more conventional to say that 'EU Organic Salmon' is a socially constructed kind and also an economic kind or brand: as the press release notes, the price (US$17.99/lb) is intermediate between those of 'traditional farm-raised and wild-caught salmon'. Moreover, it is clearly a legal kind, given the references to a certification process and a tag designating 'authenticity' that supports the claim of full traceability (see Lezaun, 2006). But is it not also sensible (if not philosophically respectable) to say that EU Organic Salmon constitutes a *natural kind* in the sense

that such salmon can be included in the vernacular category *natural foods*? Surely, EU Organic Salmon is no arbitrary construction: according to the press release, the fillets in the seafood counter gain their natural status and higher price by reference to 'natural elements' such as ocean currents, which flow through their cages, and the 'natural ingredients' the fish are fed.[1] In a slight concession to artificial conditions, the press release mentions the 'near-to-natural' environment provided by the cages. I think it would be fair to say, with apologies to Robert K. Merton (1973), that EU Organic Salmon is a (near-to) natural kind that depends upon 'a set of characteristic methods by means of which knowledge is certified' (p. 268).

Consider another near-to-natural alternative to conventionally farmed salmon that has yet to show up at the seafood counter: AquaAdvantage® Salmon (AAS). This is a kind of genetically engineered salmon in which genes from Pacific Chinook salmon and ocean pout are inserted into Atlantic salmon eggs, to produce a fast-growing salmon with obvious commercial advantages for fish farms. According to the company's 'Mission Statement', AquaBounty (2012b) aims to 'play a significant role in "The Blue Revolution" – bringing together biological sciences and molecular technology to enable an aquaculture industry capable of large-scale, efficient, and environmentally sustainable production of high quality seafood'. The company assures us that these salmon would be raised as 'sterile, all-female populations in land-based facilities with redundant biological and physical containment', adding that:

> AAS raised in land-based facilities reduce the environmental impact on coastal areas, eliminate the threat of disease transfer from farms to wild fish and grow more fish with less feed. Additionally, facilities located near major consumer markets reduce the environmental impact associated with air and ocean freight. (AquaBounty, 2012a)

Not surprisingly, these salmon have been the subject of controversy. Opponents dubbed them 'Frankensalmon' and questioned the company's claims about complete sterility and environmental friendliness. Despite such opposition, in September 2010, an advisory committee of the US Food and Drug Administration's (FDA) Center for Veterinary Medicine tentatively concluded that 'Triploid ABT salmon are not materially different from other Atlantic salmon based on their composition or allergenicity' (VMAC, 2010: 108). The committee added that the company had provided adequate assurances against the risk that the salmon would escape and breed in the wild. However, opponents were not persuaded, and state and federal legislation thus far has delayed approval for raising and marketing AAS for human consumption.

Once again, we have claims about a novel kind of salmon, including claims that the new kind is certifiably *natural*. Following Law and Lien's contribution to this special issue, it makes sense to say that 'practices generate orders' of salmon (Law and Lien, 2013: 364), and in line with Woolgar and Lezaun (2013: 321), we also can say that AAS and EU Organic Salmon exhibit an 'enacted' ontology. And, with Noortje Marres (2013), we can add that EU Organic Salmon and AAS enact *experimental* ontologies and are '*deliberately* invested with moral and political capacities' (p. 417, emphasis in original). Accordingly, natural kinds and distinctions between them are not simply nominal claims;

they testify to an economy that organizes a food chain, secures official certification, and penetrates the very flesh of the salmon.

Staying with salmon, we can locate other ontological enactments. One highly significant and contentious set of concerns has to do with a threefold distinction between 'hatchery', 'wild', and 'native' Pacific salmon in the Northwest USA. Hatchery salmon, like the farmed salmon in Law and Lien's account, are propagated by stripping eggs from gravid females and mixing them with the milt stripped from males and then raising the progeny in crowded tanks in which they are fed pellets dispensed at regular intervals. But, whereas farmed salmon are raised for their entire lives in pens, hatchery salmon are released into rivers as smolts, where they head downstream through a gauntlet of predators, reservoirs, and dam turbines to reach the sea, before returning 2 or 3 years later to their natal streams, running a gauntlet of sea lions, commercial fishers and recreational anglers, dams, and oxygen-poor reservoirs before spawning or being captured and stripped of eggs and milt to supply a hatchery.

'Wild' salmon are the fortunate few that hatch from eggs deposited by their progenitors in the gravel of a tributary. They then grow for a year or two in the river system before heading to sea, maturing, and then returning to their natal streams. 'Native' salmon are wild salmon that (arguably) are identical to the salmon that historically inhabited a particular domain (river system, series of river systems, or political unit such as the rivers of a state or province). Genetic 'fingerprinting' has become a primary means for determining identity, though genetic markers, species categories, and legal distinctions and jurisdictions are deeply intertwined. According to some federal and state court decisions, a species of salmon in an eco-political district (e.g. sockeye salmon that spawn in tributaries of the Snake River in Idaho) is not endangered as long as there are ample numbers of hatchery-propagated salmon of that species returning to rivers in the same district. Other court decisions have drawn a bright line between hatchery and native salmon – a distinction that is materially enacted through the systematic marking of hatchery salmon by clipping each smolt's adipose fin before releasing it for its seaward journey. Fishing regulations then require commercial and recreational anglers to release unharmed all unmarked fish. Genetic markers also are used to make the case for there being a natural difference between salmon that spawn in a particular river system and the hatchery stock released into that system. Courts and legislatures sometimes do, and sometimes do not, define hatchery-raised salmon as 'the same' as native salmon. Under the Endangered Species Act, the fate of a series of large hydroelectric dams on the Snake River hinges on such decisions: if the relevant courts and legislatures agree that 'hatchery' salmon do not mitigate the losses of 'native' salmon due to the dams, the dams will have to go.[2]

The ontologically fatal insight

These examples, together with those in Law and Lien's account (such as their descriptions of the vernacular category *Daufisk*, denoting 'dead' fish that are to be culled during routine labor at a salmon farm), should be enough to demonstrate that kinds of salmon are bound up with practical judgments of identity and difference. A familiar way to understand such variability is in terms of an objective phenomenon (*Salmo salar* in this case) that is subject to endlessly many conceptual framings, depending upon pragmatic,

political, economic, and other interests and perspectives. Law and Lien (2013) propose a more radical way to understand these kinds of salmon, which is to 'do without the assumption that there are salmon out there with a definite form, in existence outside the practices in which they are being done' (p. 366). They add that 'it follows that since those practices aren't the same, different and multiple salmon subsist in different and multiple worlds' (p. 366). This radical move is a variant of what Melvin Pollner (1987) once called 'the ontologically fatal insight' (p. 88) – an insight sometimes arrived at in a moment of heady delight, but often as a horrifying realization – that the world we take for granted as an independent environment of our actions is not what it seems; instead, it is a product of our own constitutive practices and it could be otherwise. This insight echoes a venerable, albeit still radical, move in social theory. In an article first circulated more than 50 years ago, Harold Garfinkel (1972 [1960]) contrasted the 'pre-theoretical decisions' of Talcott Parsons and Alfred Schutz. One of the 'decisions' that Garfinkel's essay discussed had to do with 'the theory of objects'. Parsons' 'theory' was a variant of the neo-Kantian position that, at the time, was so widely held that it enjoyed the status of educated common sense among social scientists. This is the idea that there is a deep and coherent unity to the world that underlies variations in cultural and individual perspectives: that the cake of the universe can be cut in many different ways but that in the final analysis a cake is there for the cutting. The contrasting 'decision', as Garfinkel (1972 [1960]) characterized Schutz's phenomenological position, is that '[r]ather than there being a world of concrete objects which a theory cuts this way and that, … the cake is constituted in the very act of cutting' (p. 5). However, even if we apply this radical 'theory of objects' to *Daufisk*, EU Organic Salmon, or AAS, I am not sure that we would want to conclude that 'different and multiple salmon subsist in different and multiple worlds'. It is easy enough to grant that different vernacular categories of salmon are made relevant by practices on the farm, in the seafood market, or in court rulings, but to assign ontological priority to difference and multiplicity seems to resolve particular empirical questions and political disputes with an a priori theoretical 'decision' about *any* object. Would it not make sense instead to *investigate* how questions of identity and difference are worked out in specific cases – such as in disputes about whether hatchery salmon are genetically (or otherwise) the same as native salmon or whether triploid ABT salmon are materially the same as wild or 'traditionally farmed' Atlantic salmon – rather than proposing to resolve such questions with a general theory of objects?

Another axis of symmetry: identity and difference

We may want to consider the possibility of maintaining *impartiality* toward claims of inherent identity and difference. Treating identity and difference in this way is merely one more expansion of a well-established STS posture toward claims and counterclaims about 'truth or falsity, rationality or irrationality, success or failure' (Bloor, 1976: 7). David Bloor famously proposed, for the sake of sociological explanation, to treat historical *uses* of these dichotomies without prejudice, so that, for example, controversies could be studied as such rather than resolved in advance by adopting the versions told by the victors. Bruno Latour (1993) later complicated Bloor's epistemic stance with his proposal to treat human and nonhuman agency 'symmetrically', so that our accounts of how

arcane disputes about novel and marvelously intricate matters would not always be resolved with off-the-shelf sociological theories of human interest, ideology, and socialization. My modest proposal is to add yet another axis of symmetry: to address questions of identity and difference *in and through* the disputes STS investigates, rather than to entertain the theoretical hope of resolving them through a general ontological preference. In this instance, maintaining symmetry may not be so difficult, as we are dealing with petty distinctions between categories of fish and not grand ontological commitments that are so all-encompassing that they leave no place in the world for a noncommittal stance.

Ontology and epistemology

Woolgar and Lezaun (2013) note that the 'turn to ontology' often is billed as an attempt to 'circumvent epistemology and its attendant language of representation in favour of an approach that addresses itself more directly to the composition of the world' (p. 322).

However, with terms reminiscent of Pollner's ontologically fatal insight, they suggest that 'the turn to ontology in STS can be better understood as another attempt to apply its long standing core slogan – "it could be otherwise" – this time to the realm of the ontological' (p. 322). The phrase 'it could be otherwise' – or in historical terms 'it could have been otherwise' – recalls the themes of contingency and counterfactual possibility so central to the social constructionism of an earlier STS era (Hacking, 1999: 111). As Woolgar and Lezaun suggest, this core slogan was established when it was more common to speak of epistemology than ontology; it is a traceable thread that runs through the series of so-called turns going back to the 1970s. Moreover, 'the ontologically fatal insight' is fatal for any proposal that would have us turn toward 'the composition of the world' as though we could forget how 'composition' describes both the activity and results of *composing* through material assembly and writing.

There is good reason at this point in the history of STS for confusion on what it means to talk of epistemology and ontology. A trend has been underway for some time now to target a particular set of what Ian Hacking (1999: 22) calls 'elevator words' – words such as *fact, truth, reality*, and *knowledge*. Rather than continuing ancient philosophical debates on the essential meaning and significance of these terms, STS research places them in specific historical and pragmatic circumstances. Such a treatment follows from Bloor's (1983: 182) appropriation of Wittgenstein's (1958: 28) line, to propose that the sociology of knowledge would be among 'the heirs of the subject that used to be called philosophy'. Since knowledge is the subject of epistemology, it seemed consistent with Bloor's ambitions to appropriate epistemology for sociological and sociohistorical research.[3] However, what Bloor and others who took up his initiative developed was *not* a program in philosophical epistemology – it was something else.

There is an apparent kinship between the SSK and epistemology. SSK initially developed as a program in the sociology of knowledge. However, despite the strong orientation to *epistēmē* – knowledge, understanding – SSK never was epistemology as usually conceived. As Steven Shapin (2001) summarizes, '[t]he sociology of scientific knowledge that emerged from the early 1970s purposely set aside epistemological evaluation and took as its primary task understanding scientific credibility. How is it that scientific claims succeed, or fail, in being believed?' (p. 15926). To underline this point, he adds,

'[i]ndeed, the founding gesture of modern sociology of scientific knowledge was the rejection of epistemological evaluation as the proper basis for sociological accounting' (p. 15928).

Shapin does not say that SSK failed to delve into epistemological matters, but that it did not take on the job of epistemological *evaluation*. Rather than securing a context-free conception of true or robust knowledge that would enable evaluation of specific instances of (claimed) knowledge, SSK delved into sources of credibility – what counts as knowledge in specific historical circumstances ('historical' including the circumstances in which we currently live as well as those characteristic of various pasts). Accordingly, when treated as empirical subject matter, knowledge (later pluralized to knowledges) becomes located in history and culture, and the sociologist of knowledge tries to give disinterested explanations for why particular beliefs and systems of belief arise and are accepted in particular historical circumstances, how they are sustained under relevant social conditions, and how they reflect political and economic interests.

Currently in STS, moves to pluralize 'epistemologies' in social, historical, and cultural studies of science and technology are more ubiquitous than any single worked-out epistemological program. For quite some time, 'epistemologies' have been identified with distinct standpoints in history and society (Haraway, 1988). Understood as an STS research program, epistemology – and, by extension, ontology, ethics, or aesthetics – does not make up a distinct field of metaphysics, but instead, it reverts to diverse social, historical, political, and cultural conditions under which 'knowledges' are established, objectified, moralized, communicated, or dismantled.

Mundane epistemology and ontology

STS research tends to pluralize, 'mundanize', and *merge* epistemology, ontology, ethics, and aesthetics. By this, I mean that the central concepts become historicized and situated. Instead of construing them as a part of larger, abstract fields, empirical research posits them as discontinuous local epistemologies, petty ontologies, and so forth. Inventorying the furniture of the world and outlining how we may come to know about it are no longer the privileges of philosophical reflection, as epistemology and ontology become embedded in diverse practices in many fields within and beyond the sciences. However, while dissolving the metaphysical aura surrounding these classic terms, STS research nevertheless preserves the terms, often with confusing results. This last point is what I want to address in connection with the turn to ontology.

The turn to ontology in STS has an uneasy relationship with the antimetaphysical thrust of much research in the field and with the associated tendency to disrespect traditional boundaries between fields. One indication of the antimetaphysical thrust can be found in STS critiques of normative frameworks that either explained (as in Merton, 1973) or provided criteria for justifying (as in Popper, 1965) the exceptional nature of scientific knowledge. Although their programmatic arguments relied upon philosophical sources, Collins (1983) and Bloor (1976) explicitly stressed that they were not assuming a general philosophical position, such as *philosophical* relativism, but instead were setting the table for empirical case studies. Such case studies were a correlate of the dismantling of general normative and methodological visions. The historians and ethnographers

who developed such studies stressed the necessity to explicate the distinctive knowledge of historical or contemporary actors – agents and agencies whose actions and sensibilities were bound up with specific contexts – and as much as possible they aimed to explicate such knowledge without presuming which beliefs were true or rational and which were false and irrational.

Another, more recent, polemical tendency in anthropological, discourse-analytic and cultural studies approaches to science, technology, and medicine is to stress that knowledge systems are discontinuous and disunified. Studies that express this tendency usually are more respectful of, and even enthusiastic about, metaphysics than are Anglo-American proponents of SSK, but they also stress a philosophy that rejects programmatic distinctions between language and world and between constructed and natural kinds. It is common throughout the STS literature, regardless of lineage, to treat demarcation criteria as rhetoric used flexibly to establish and contest moveable boundaries between science and religion, science and common sense, and science and technology (Gieryn, 1999). If STS has anything to say about a reality that precedes the slicing and dicing operation produced through historical discourses, it is that this reality does not come packaged with clearly marked-off boundaries between subjective and objective domains. In line with the programmatic dissolution of the subject/object dichotomy and other traditional concepts and distinctions, epistemology and ontology are no longer clearly distinguishable from each other. Investigations of detailed practices tend to emphasize the primordial inseparability of ontic and epistemic properties (e.g. Rheinberger's (1997) 'epistemic things', Latour's (1993) 'hybrids', or Barad's (2007) 'onto-epistemology', which also takes in ethics and aesthetics). Consequently, the turn to ontology may seem like a lecturer's gesture toward the smudged and faded outlines of a figure that had earlier been erased from the blackboard.

From resources to topics

The move that situates metaphysical themes in history and society is sometimes said to be deflationary.[4] Fundamental concepts – 'elevator words' – are recognized for being ordinary words. Investigations no longer take themselves to be building or unearthing the rational foundations of justified true belief, the ontological grounds of objective reality, or the ethical basis of right conduct. Instead, capital 'K' Knowledge, capital 'N' Nature, capital 'E' Epistemology, and capital 'O' Ontology are demoted to lowercase, pluralized counterparts: knowledges, natures, epistemologies, and ontologies. The sense of flattening produced by this literary device is not, in my view, a summons calling for a new synthesis that re-capitalizes the devalued currency for another system of academic exchange. Instead, it raises (or perhaps begs) questions that are no longer raised very often in STS; questions about what, if anything, pluralized 'knowledges' have to do with the traditional conception of Knowledge as justified true belief or about what pluralized 'ontologies' have to do with philosophical 'Theories of Everything' (TOEs).

A problem with excited talk about epistemology, ontology, ethics, and aesthetics is that it generates confusion about the kinds of investigation that are being envisioned and promoted. The retention of the classical categories can seem to inflate mundane practical action and reasoning with the grandness of philosophical systems. To move from

proposals that would have us investigate the local production of *things* to proposals to inaugurate a new *ontology* seems akin to a familiar move in secular philosophies to replace a crossed-out God with an abstract Nature or Society that performs a similar role in a systematic philosophy (see, for example, Dawkins' (2006: 40) admission that his anti-philosophical anti-theology is an expression of an 'Einsteinian religion'). A more circumscribed inflation of currency seems to occur when particular analytical metaphors (e.g. Mol and Law's (1994) 'fluids') are upgraded into pervasive ontologies.

Pluralized and hybridized ontologies may seem difficult to distinguish from what used to be called worldviews. But, clearly, proponents of the ontological turn in STS do not want to revert to the old sociology of knowledge, with its talk of *Weltanschauungen* and its privileging of a *Generalized Language of Social Science* (GLOSS); they want to grapple with *things* rather than to run things through a GLOSS. Pluralization also rests uneasily with the explicit ambitions expressed by some STS theorists to develop what Pickering (1995: 246ff.) forthrightly calls a 'theory of everything' (TOE). Actor-network theory (ANT), which in its grandest form might better be dubbed actant-network ontology (ANO) – a semiotic materialism that, unlike the more familiar naturalistic materialism, treats humans and nonhumans alike as relational nodes situated in networks that endow them with agency and voice – is the best-known TOE in STS. With ANO, as with other TOEs, the theorist's monism frames the heterogeneous ontologies attributed to actors within the frame. Accordingly, if we assume that any empirical description reverts to a prior theory, and that ontology is the most comprehensive of theories, then any attempt to describe 'ontologies' *in* the world must revert to an ontology *of* the world – a comprehensive picture of the world's constitution. Any incongruity with a described ontology either will not be registered or will be resolved in favor of the ontology through which it is described. However, what if we begin by acknowledging that *we do not know* if our descriptive language reverts to anything so simple, centered, and coherent as a 'theory' and further that *we do not know* what such an all-encompassing theory would look like even if it existed? I should add that *we would not know* of this theory, not because we have not yet learned it, but because it would require a god-like perspicacity even to learn *of* it. When taking such an agnostic position, what we do know (or at least should know) is that the TOEs on offer are, to put it mildly, rather thin. And yet, amazingly, it seems that particular descriptions – including descriptions of ontologies – *can* make sense, apparently even to others who do not share our grand theories. For example, in this special issue, Brives' (2013) vivid, highly realistic descriptions of a series of encounters at a Burkina Faso clinic do not seem deeply indebted to the 'praxiological turn' that she attributes to Mol and proposes to exemplify with her study. What comes through is Brives' facility with language, her knowledge of the daily routines at the clinic, and her understanding of clinical trials and about how mothers and infants are shaped as subjects. These virtues of her study seem largely independent of any novel (or not-so-novel) ontology it may be used to exemplify.

From ology to ography

A change in vocabulary might be helpful to keep the elevator at the ground floor and to signal a reorientation. As mentioned earlier, the turn to ontology is said to succeed an

earlier turn to epistemology in the sociology of knowledge and history of ideas. The topic–resource distinction (Garfinkel and Sacks, 1970; Gilbert and Mulkay, 1984; Zimmerman and Pollner, 1970) is a familiar way to articulate a reorientation to basic methodological themes as historically and interactionally situated phenomena, so that methods and their associated concepts (truth, objectivity, testing, replication, experiment) become topics of investigation for studies of their historical and situated conditions – conditions of *production* rather than conditions of *possibility*. Conditions of possibility become circumstances of relevance. I once suggested that we should use the word 'epistopics' to respecify familiar topics of epistemology (Lynch, 1993: 275ff.). When I first tried out the word in a public talk, a prominent colleague denounced it as 'vulgar', but the point is that 'epistopics' *are* vulgar – down to earth, local, mundane – phenomena. An even more monstrous neologism 'ontopics' enjoys the additional advantage of punningly signaling topical relevancy – of being on topic.

Peter Dear (2001) suggested a more dignified name for studies that would investigate epistemology's topics: epistemography. His historical study of conceptions of 'experience' in 16th- and 17th-century natural philosophies (Dear, 1995) exemplified such an effort to historically situate a fundamental epistemological theme and to trace its development. Epistemography readily lends itself to ethnographic approaches as well. Both historians and ethnographers attempt to avoid imposing their own epistemic sensibilities on the situated agents whose practical actions they study. Epistemography is not social epistemology or ethno-epistemology. It is not social epistemology because it does not simply expand the field of relevance to include 'the social' within a general theory of knowledge. It is closer to the idea of ethno-epistemology (or, of course, ethnomethodology) because it treats social life as giving rise to indefinitely many vantage points on traditional subthemes of epistemology (truth, reason, etc.). This differs from including 'the social' in a broader philosophical conception of the possibility of knowing anything at all. However, epistemology usually is construed as 'theory of knowledge' and so ethno-epistemology might suggest the study of 'folk theories of knowledge' – a definition compatible with a cognitivist orientation. However, epistemography does not limit itself to *theories* of knowledge; it investigates practices in specific cultural and historical circumstances. It includes genealogies in Foucault's (1979) sense: descriptions of an open variety of mundane architectures and economies that set up and order how things and people can be known, counted, measured, classified, and administered. However, as I view it, epistemography is more open to the possibility that a given era will host many 'epistemes', some of which would seem incommensurable with others if one were to compare them abstractly (Lynch, 1991).

A similar verbal maneuver can be used to respecify 'ethics' as 'ethigraphy' (Lynch, 2001). Again, the word signals a different orientation from that of a normative program of ethics or any other academic approach that offers general answers to the question, 'How shall we live?' To appreciate what this involves, take the example of embryonic stem cell research in the United States. In his 9 August 2001 presidential address on the subject, G.W. Bush spoke of stem cell research as involving 'profound ethical questions'.[5] He took for granted that it *was* an ethical matter, and while he marked it as a difficult one, he did not invite discussion of *whether* it was ethical or not. An ethigraphy would ask what are, in my view, very apt questions about stem cell research: How, for

whom, and under what circumstances did embryonic stem cells and stem cell research *become* matters of ethical concern? Blastocysts were not until recently cherished as ethical subjects, and are not regarded as ethical subjects everywhere in the same way, or even at all (Prainsack, 2006; Sperling, 2004). This is not to suggest that blastocysts are inherently pre-ethical or nonethical objects – indeed, rather than use the seemingly neutral technical term, others prefer to speak of 'nascent human life' or 'an unborn child'. An ethigraphic investigation would make an issue of when and how such terms are deployed to raise or lower the salience of ethical concern.

Ontography would involve the same sort of mundane, deflationary transformation as suggested by epistemography and ethigraphy.[6] Indeed, ontographic investigations – whether of vernacular categories of salmon, bin bags, or disease configurations – would also be epistemographic and ethigraphic investigations. To put it in practical terms, the first step for such an investigation is to establish the salience of ontology (and/or epistemology and/or ethics) for some case under study. This step presupposes that talk of ontology is not always and everywhere salient and that when it is salient, it remains to be determined just how it is salient. As suggested earlier, close study of examples is likely to make it difficult to delineate ontological concerns, as such, or to separate them from ethical or epistemological concerns. Can a particular category, estimate, or measure of what is in the world be separated from the practical, conceptual, and political means through which it is implemented? Think of such cases as estimates of civilian casualties following the 2003 US invasion of Iraq, estimates of numbers of persons in India infected with HIV (Mahajan, 2008), estimates of the age of the earth and of the life forms on it, or the regimens for counting calories as discussed in Mol's (2013) contribution to this special issue.

Garfinkel's (1991, 2002) account of 'perspicuous phenomena' addresses the problem of relevance by suggesting that there are some (indeed, countless) nonacademic practices that routinely address recognizable methodological themes and distinctions. There are also established institutions, such as the courts, and many established arts and sciences that conduct systematic investigations, often circumscribed by overriding pragmatic agendas and with limited use for academic scholarship and debate. There are times when 'big' questions are raised in such contexts; questions such as 'What is science?', 'How does scientific expertise compare with other forms of knowledge and expertise?', 'How do the sciences differ from religious beliefs?', or 'What counts as objective knowledge?' Such questions need not be raised in so many words to establish the salience of 'ontography' (or any of its cousins), but an argument is necessary to establish such salience.

Matters of fact/matters of concern as topics for ontography

One central point for ethnomethodology that is abundantly illustrated in STS is that knowledge of what is in the world is bound up with the methods for generating such knowledge. As Shapin and Schaffer (1985) made canonical for STS, *matters of fact* are simultaneously ontological, epistemological, practical, rhetorical, and political – they are integral to a 'form of life'. Aside from recent tendencies in STS, there is reason to wonder where to place 'fact' in a table of metaphysical possibilities: Is a (scientific) fact like

a rock in the field that one can stumble over (thus verifying the unforeseen, unhoped-for, but unmistakable existence of the thing)? Or, as Wittgenstein proposes in the *Tractatus* (1961), is a fact the worldly counterpart of a proposition – a logical relation rather than a simple thing? Or, as Latour and Woolgar (1979) propose, is a fact an unqualified statement? Or, as Latour (2004) suggests (borrowing etymology if not philosophy from Heidegger), is a fact a 'gathering' – an assemblage or heterogeneous network? Let us consider this last possibility. Latour points out that many of his contemporaries (and he includes himself among them) have acquired an almost reflexive (in the 'knee-jerk' sense of the word) tendency to deconstruct facts (whether construed as things, statements, or the correspondence between the two) by raising questions about their pragmatic conditions of possibility. He proposes that such critiques have gotten out of hand, in part because they retain a rigid conception of 'matters of fact', if only as a straw position, even while they disavow that very notion of 'fact'. He suggests that an alternative ontology built around 'matters of concern' would avoid the fragile conception of 'fact' that invites incessant critique.

Following Latour's suggestions, an investigation of 'matters of concern' would delve into a field that is not already compartmentalized into domains corresponding to the traditional concerns of politics, ethics, epistemology, and ontology. However, based on what I said earlier, we would want to treat 'matters of concern' not as a master category with which to frame an ontology but as a topic for ontography. We would look for instances in which 'matters of concern' are locally relevanced and locally contested. To illustrate such a move, allow me to give a very brief and rather formal example – a judicial ruling in a 1996 US Federal appeal case (92 F. 3d 67) *International Dairy Foods Association v. Amestoy*.[7]

The case is salient because members of the three-judge panel that ruled on it wrote opposing opinions on whether certain 'concerns' expressed in legislation passed by the state of Vermont mattered sufficiently to override corporate 'free-speech' rights under the First Amendment of the US Constitution (a 19th-century judicial decision granted corporations some of the individual rights specified in the First Amendment). The Vermont legislation mandated that retail groceries that sold milk and milk products must label products that were derived from cows that had been given genetically engineered bovine growth hormone (rBGH – also known as recombinant bovine somatotropin (rBST)). A consortium of milk producers sued the government for encroaching upon their right not to engage in 'speech' that would 'irreparably harm' their commercial interests. The crux of the dispute was whether the legislation represented an overriding public concern. A matter of fact (which was not disputed by either party to the litigation) was central to the court's determination. The Vermont statute specified that retailers would state this fact explicitly in conjunction with a sign indicating which milk products were from rBGH-treated cows: 'The United States Food and Drug Administration has determined that there is no significant difference between milk from treated and untreated cows'. The stated rationale for labeling these products was not health and safety but 'to help consumers make informed shopping decisions'.

The two-judge majority acknowledged that consumers might have reasons for wanting to know whether the milk they purchased was derived from rBGH-treated cattle: the FDA tests were short term rather than long term (and there had been some controversy

about other aspects of the test conditions); concerns had been raised about the health of treated cattle (a reason given for banning rBGH in Canada and parts of Europe); and concerns also had been raised that Vermont's traditional small family-run dairies would not be able to compete with agribusinesses that raised production through the use of the hormone treatment. However, the court majority defined such concerns as matters of 'consumer curiosity' and reversed the lower (federal district) court, which had ruled that Vermont citizens' interests were sufficient to override the free-speech rights of the milk producers. The majority of the appeal court argued:

> As the district court made clear, Vermont 'does not claim that health or safety concerns prompted the passage of the Vermont Labeling Law', but instead defends the statute on the basis of 'strong consumer interest and the public's "right to know" ...' 898 F. Supp. at 249. These interests are insufficient to justify compromising protected constitutional rights.

However, one of the three appeal court judges dissented. In his dissenting opinion, Justice Pierre Leval objected to the majority's narrow definition of 'public concern'. Citing a survey conducted by the Vermont state legislature, he noted:

> The state offered survey evidence which demonstrated similar public concern. Comments by Vermont citizens who had heard or read about rBST were overwhelmingly negative. The most prevalent responses to rBST use included: 'Not natural', 'More research needs to be done/ Long-term effects not clear', 'Against additives added to my milk', 'Worried about adverse health effects', 'Unhealthy for the cow', 'Don't need more chemicals', 'It's a hormone/Against hormones added to my milk', 'Hurts the small dairy farmer', 'Producing enough milk already'.

The discrepant judicial opinions turned on whether a matter of fact (the FDA determination) about health and safety should define the limits of legitimate 'public concern' about the product in question or whether such concern should also include a broader gathering. This broader assemblage would include concerns with the political economy of milk production and the welfare of nonhuman animals, as well as unsubstantiated (arguably irrational) fears about unnatural products and their effects on health.

This dispute is rich with themes of interest for STS discussions of public engagement in technical decision making. However, I want to make only the simple point that *International Dairy v. Amestoy* is an apt case for an ontography focused on *what counts as* 'a matter of concern'. For Latour, 'matters of concern' are a cornerstone of an alternative ontological frame for STS studies – alternative to the relentless critique of matters of fact that he argues has 'run out of steam' (a loss of steam, because the critical tropes have been appropriated so widely, even by climate change skeptics and corporate-funded bloggers who debunk the 'junk science' associated with environmental and safety regulations). However, does an alternative *ontology* built around 'matters of concern' provide more appropriate guidance for STS research than one built around 'matters of fact'? Just as 'matters of fact' shift back into the gatherings that make up the 'things' that STS studies, so do 'matters of concern' no less easily shift back into quotidian gatherings of interest. What we have is a dispute about what should or should not be part of a legitimate gathering of public concerns; whether a scientifico-bureaucratic fact (results of FDA tests) should be accepted at face value as a singular measure of legitimate public

concern; whether corporations should count as individuals with free-speech rights; whether nonhuman animals should count as legitimate subjects of public health concerns; and whether 'process' as well as 'product' concerns should have legal standing (Kysar, 2004).

Like epistemography, ontography is a descriptive alternative to its grand theoretical counterpart. 'Mere description' is unlikely to satisfy many in STS who would like the field to gather itself under one or another overarching normative agenda or ontology. With regard to the *International Dairy* case, I can imagine that many STS scholars would want to align with Justice Leval's minority position to criticize the majority for drawing epistemic boundaries on narrow, technocratic grounds. However, while I also would align that way, it is unclear to me that STS provides a general ontology (or epistemology or ethics) that supports such alignment. Instead, the distinctive moves toward symmetry and impartiality – about matters of fact, social or natural kinds, identities and differences, and matters of concern – immediately shift normative and ontological commitments into the disputatious fields that STS scholars investigate. STS may provide analogies and argumentative lines that *occasionally* appear compatible with those that are (or can be) brought into play by one or the other party in a dispute, but as soon as they are *in play* as contingent, relational, empirical constituents of a mundane world, they no longer stand as stable onto-epistemologies through which to analyze that world.

Ontography may require agnosticism toward particular positions in disputes about matters of concern, but it can provide an orientation to how matters of concern, as well as matters of fact and questions of identity and difference, are composed and invoked by participants. Committed partisans are unlikely to have much interest in ontography, except when a description it produces seems to align with a position they already support. When we cannot stay out of the fray, then it may be wise to consider the possibility that our rationales for joining it and the knowledge and interests we bring to it may have no intrinsic relation to STS theories or polemical postures.

Conclusion

I have argued that the contributions to this special issue on 'the turn to ontology' exhibit a tension between two tendencies. One is to proclaim a novel ontology that presents a picture of multiple entities enacted on separate occasions in accordance with distinct practices. This theory of objects contrasts itself to a traditional ontology that posits an underlying and coherent unity beneath circumstantial variations. The other tendency is to investigate mundane, contingent enactments of particular orderings of similarity and difference, without supposing from the outset that the world (or the specific matter of concern) is either unitary or fragmentary. Both tendencies persist in the STS field, and both can be found in the movement from polemics to cases in the several articles that make up this special issue.

Annemarie Mol and other contributors to this special issue recommend versions of what Mol calls 'empirical philosophy'. This is not an empiricist philosophy, though we may be left wondering how, and in what sense, it is empirical. The question that it raises for me is whether or not it should fancy itself as a *philosophy* or as a different kind of investigation. In the case of empirical ontology, the question is whether to propose a general 'theory of

objects' or to do as Noortje Marres (2013: 423) suggests: conduct empirical studies of specific instances in which ontological questions are 'in actuality decided through specific, historical, cultural, technological, scientific interventions', and then, if one so chooses, to go further with experimental interventions. As I have argued, an alternative to devising a 'theory of objects' is to take up topics that have familiar association with ontology but to subject them to historical or ethnographic investigations. To an extent, the articles in this special issue do this: they present insights from empirical case studies. In some cases, the descriptions take the form of vignettes illustrating one or another general theory of objects, whereas in others, the descriptions exhibit a richness that does not need the theory that frames them. In my view, the particular merits of the articles that make up this special issue do not derive from their taking part in a 'turn to ontology'; instead, they have more to do with the depth of insight derived from the research they present.

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Notes

1. In this case, ocean currents have been domesticated and are now allied with the effort to promote the natural qualities of the seafood. Alert readers may notice that such docile currents run contrary to the situation portrayed in Michel Callon's (1986) allegory of a failed effort to farm scallops in Normandy. We should also note that there is little need to subject this press release to analysis using actor-network theory – the anonymous author already seems to have anticipated such analysis.
2. I am indebted to Charis Thompson for an unpublished paper she wrote for a graduate seminar in Science Studies at the University of California, San Diego, in 1992, in which she discussed how species classification interacted with endangered species legislation in legal disputes about Northwest US salmon.
3. Peter Winch's (1958) *Idea of a Social Science* often was recruited in this effort to socialize epistemology, especially by Harry Collins (1985), even though Winch (1958: 43) recommends the opposite: that sociology's efforts to devise general empirical explanations of social phenomena might best be viewed as a 'misbegotten' exercise in epistemology, where epistemology for Winch involves the explication and elucidation of the meaning of concepts.
4. My use of the term 'deflationary' has some affinity with more general philosophical usage: it attempts to bypass essentialist and other loadings of extraordinary metaphysical weight on to an open-ended but short list of words. However, this is not meant as a way to support realism, except in the sense that it advises us to place words that shimmer with an aura of grandness on the same plane as the words and actions that surround their practical use. See Sismondo and Chrisman (2001) for a helpful (and also deflationary) discussion of deflationary philosophy.
5. The text of the speech is available at: http://georgewbush-whitehouse.archives.gov/news/releases/2001/08/20010809-2.html (accessed 22 December 2012).
6. When I first used the term 'ontography' in 2008, for a presentation of an earlier version of this article at the Oxford Ontologies Workshop at the Saïd Business School (25 June), I thought

that I had coined a neologism. Later, I discovered many websites that use this neologism independently, often as a name for the very sort of metaphysical position I had hoped to distinguish it from.

7. A case summary is available at: http://www.publichealthlaw.net/Reader/docs/IDFA_Amestoy.pdf (accessed 20 December 2012).

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