REVIEW ESSAY

Constructing Nature: On Salmon, Mushrooms, and Epistemic Cultures

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MOREL TALES: THE CULTURE OF MUSHROOMING, Gary Alan Fine, Cambridge, MA: Harvard University Press, 1998, 336pp., $40.00 (cloth), $19.95 (paper).

EPISTEMIC CULTURES: HOW THE SCIENCES MAKE KNOWLEDGE, Karin Knorr Cetina, Cambridge, MA: Harvard University Press, 1999, 320pp., $50.00 (cloth), $24.50 (paper).

FISHY BUSINESS: SALMON, BIOLOGY AND THE SOCIAL CONSTRUCTION OF NATURE, Rik Scarce, Philadelphia: Temple University Press, 2000, 272 pp., $61.50 (cloth), $21.95 (paper).

Although at first sight *Morel Tales* (1998), *Epistemic Cultures* (1999), and *Fishy Business* (2000) appear to be focused on very diverging domains, one of the common denominators of these three books is their assertion that there is not one "nature." "Nature" is a social construction, differently conceptualized in different social, political, or "epistemic" settings. In *What Is Nature?* Soper also explored the "politics" of the idea of nature, the social and cultural demarcations which have been drawn through the concept, and the ways it is both defended and contested in contemporary social movements. She considered three general ways in which the term "nature" is applied. First, and in its most commonsense way, the term is used to refer to an order opposed to that of humanity: "that part of the environment which we had no hand in creating" (Soper 1995, 16). Although this corresponds most closely to intuitive promptings about the meaning of "nature," its empirical application is hard to fulfill: does this not leave us with the confounded assessment that nothing (or extremely little) on planet earth corresponds to this definition? In this regard, Beck's statement seems precisely articulate: "In nature, we are concerned today with a highly synthetic product everywhere, an artificial 'nature'. Not a hair or a crumb of it is still 'natural,' if 'natural' means nature being left to itself" (Beck 1992, 81). Second, Soper remarked that the concept of "nature" is used to refer to the "totality" which comprises both "nonhuman" and human orders (for example, in the past conceived as "the Great Chain of Being"): in this way we conceive ourselves as forming a part of Nature. Third, it is considered to refer to the nature of humanity

itself, on the one hand stressing our elevated difference from so-called natural species; on the other, claiming humanity's sameness with the animal world and our rootedness within the order of nature (Soper 1995, 15-36). Of course, these conceptions of nature are in many ways incompatible, although they are often used as simple alternatives in scientific, political, or everyday discourse. In a similar vein, MacNaghten and Urry stated "there is no pure 'nature' as such, only natures. And such natures are historically, geographically and culturally constituted," and further: "there is no simple and sustainable distinction between nature and society. They are ineluctably intertwined" (MacNaghten and Urry 1995, 207; 1998, 29). The nature-society antithesis can thus be perceived as a false dichotomy. Even more, the socially constructed meanings of nature are much more diversified than the three general delineations sketched by Soper. One could extend this argument so far in stating that conceptions of nature are idiosyncratically informed and impossible to classify under common nominators. What is denoted by one as a sublime example of "being in nature"—for example, a walk along a towpath with rows of pollard willows along a canal's banks—is a scenery decried by another as a cultural scare in a historical and ecological valuable heath landscape.

Notwithstanding the idiosyncracies in the formation of all these conceptions of nature, it is, however, not impossible to map common interpretations of what nature "is," along different organizational or institutionalized lines, for example, specific leisure organizations, professional groups, or scientific maps. This becomes abundantly clear in the readings of *Epistemic Cultures*, *Morel Tales*, and *Fishy Business*, with the latter two more explicitly focused on the cultural construction(s) of nature. Each of these three books in fact presents the results of ethnographic research into the construction of "nature" in a specific organizational setting. Or, at least, they each focus on a certain "part" of nature, with Fine (*Morel Tales*) analyzing the meanings given to fungi by mushroomers (amateur mycologists) operating in the United States, Scarce (*Fishy Business*) reconstructing the place and nature of salmon among American and Canadian salmon biologists, and Knorr Cetina (*Epistemic Cultures*) focusing on the ways of knowledge creation in the field of high energy physics and molecular biology, particularly focused on some laboratory settings in Europe.

Scarce's "salmon study" is based on an analysis of biologists dealing with Pacific Salmon in the Northwest of the United States and in the

West of Canada. He conducted semischeduled interviews with more than twenty salmon biologists and attended two salmon biology conferences and numerous public hearings on salmon-related topics where biologists were present. Furthermore, he gathered information from speaking with several others in noninterview encounters and observed biologists at work in fish hatcheries and in a laboratory that conducted DNA research on salmon. Guided by a thoroughly qualitative approach of grounded theory, Scarce round up his project after nearly three years of research and analysis in the salmon biology "business." In *Fishy Business*, he shows how social psychological, institutional, and technological forces play a part in salmon biologists' constructions of salmon, and he explores the impact of those resulting meanings. Do biologists as a professional group have a single meaning of salmon? If not, how do new meanings emerge and how are they negotiated within the discipline? Which social forces (institutions and organizations) appear best situated to influence meaning-creating processes? What interests are served by doing so? How do less powerful social actors effect changes in meaning in the face of dominant, hegemonic forces (Scarce 2000, 8)? Answering these questions, Scarce maps in detail how hatcheries salmon biologists have the power and control to enforce the meaning of salmon as "resources," and can—and in fact—impose this discourse as the dominant one, for example, as opposed to the discourse of conservation biologists. In this respect, many passages in *Fishy Business*—especially the fourth chapter: "Thinking and Making Salmon" (pp. 83-120)—also serve as a revelation distorting the idyllic(?) picture of the salmon business being one of some fishermen catching free migrating "wild" salmon. Salmon fisheries have indeed become a *fishy business*, applying many of the same technologies as used in the agricultural industry (introducing genetic modifications to the salmon, monitoring and controlling their food intake, spatially and temporally controlling their lives, etc.). It thus becomes apparent that the salmon hatchery operates along the same lines as a modern factory and fits into the agrarian model of production, having become a marine version of agriculture. The fisheries approach to salmon is driven by control as framed by economic and political contingencies, with fisheries biology stressing an anthropocentric, human-focused approach to salmon. This sharply contrasts with—the suppressed and minority positioned—conservation biology's perspective of salmon that embraces ecocentrism, in which what is right or good is judged by its effects on ecosystems. The

conservationist perspective on salmon argues for the intrinsic worth of all species (instead of treating salmon as a mere "resource"), and its proponents are advocating the protection of "natural salmon," seeking a paradigm shift in the species' study and control. In chapter 6 (pp. 147-76), Scarce argues (maybe too optimistically so) that this conservation biology perspective can substantially revise salmon biology's dominant, use- and control-oriented perspective, not only allowing the salmon more freedom, but also the biologists who have taken this species as their research topic, in their pursuit of self-determination.

A similar "peopled sociology" as to the one used by Scarce in *Fishy Business*—in Fine's terms "an analysis of what people actually do and say" (Fine 1998, 12)—can also be found in *Morel Tales*. During several years, Fine talked to, observed, and joined members of the Minnesota Mycological Society in their hunt for mushrooms. He attended local and national forays, conducted interviews with more than twenty members, and analyzed several mushroom documents and two surveys. His focus was primarily on those people who search for, collect, and/or consume mushrooms as a leisure activity, although not altogether leaving professional mycologists out of the picture. As in *Fishy Business*, *Morel Tales* also presents an analysis of the social construction of "nature": the book unravels how mushrooms are given meaning by pickers and how these individuals and leisure groups understand, experience, and interact with the natural environment. Fine has labeled this process "naturework," which he explains as being "how individuals define the meanings of the environment in light of cultural images and then define their relationship to that environment. . . . Naturework is a rhetorical resource by which social actors individually and collectively make sense of their relationship to the environment. As ideological work conveys the process by which individuals transform the here-and-now into broader moral concerns, naturework conveys how natural objects are given cultural meaning" (p. 2). Fungi are thus made meaningful through processes of naturework, for example, by naming them. In this respect, Fine presents an insightful analysis of the controversy between common or folk names and scientific names for fungi (for example, "a daffodil on steak" standing for Psathyrella species, or an "inky cap" being labeled as a "fairy castle" in folk terminology; pp. 65, 228-45), and the place of sexual metaphors in this process (pp. 65-6). Naturework with respect to fungi also includes valuing them along a hierarchy of edibility, rarity, and/or scientific interest (and accordingly, how, for

example, "LBMs"—being "little brown mushrooms"—are denigrated), or by the attribution of character, gender (pp. 80-3), or personification. As such, the Morel (*Morchella*) is valued as the Cadillac of mushrooms, an "elite mushroom," and has the greatest cultural resonance, reflected in Morel festivals and the greater emotional weight of morel hunting than other mushrooming.

Fine not only deals with the individual processes of naturework but also with the social features of searching for, identifying, and consuming mushrooms by mushroomers, portrayed as being "a community in the woods." This is, for example, spelled out in being together at forays, the analysis of mushroom consumption as a social enterprise, and the practice of mushroomers sharing personal experience stories (war stories, sad tales, treasure tales, and jokes as a way of dealing with the—maybe deadly—risks involved with consuming poisonous mushrooms). In this respect, Fine aptly links the role of leisure-mushrooming organizations with provisioning theory, explaining how these groups provide what the mushroomers expect in return for being a member of the leisure organization. As such, these organizations need to provide sufficient rewards for their members to continue their affiliation. In a very clear-cut way, Fine is able to establish how trust and confidence, secrecy and competition (although positioned on oppositionary scales) are necessary for the group's cohesion and help smear the social order. The latter then also finds outing in specific identity symbols, for example, items that enhance one's sense of self (see, for example, the bumper sticker "I Brake for Fungi," p. 177). On the other hand, Fine also pays attention to the differentiation in this leisure group of mushroomers (for example, between pot hunters, whose primary concern is for edible mushrooms and amateur mycologists, with a more explicit scientific orientation) and to how amateur mushroomers perceive and interact with the general public, commercial mushroom collectors, and professional mycologists. In so doing, it becomes apparent that these groups' different "natureworks" can lead to tense relationships between them, especially between amateur mushroom collectors and professional mycologists. Fine further links the naturework of mushroomers to a threefold classification of general ideological perspectives of nature: an organic, a protectionist, and a humanist orientation toward nature. In his analysis, he finds that these mushrooming naturalists most closely correspond to an organic vision of nature, a view that humans are part of nature, part of an organic whole. In this perspective, there is a kind of

"pastoral and harmonic link between man [*sic*] and nature, while underlining the authenticity of the natural environment" (p. 10). On the other hand, they are not totally devoid of holding humanist visions of nature, in seeing nature as a well of resources for human consumption, evidenced of course in hunting mushrooms for consumption.

Although Knorr Cetina's work (1999) indirectly also deals with cultural meanings of nature in a specific social setting (for example, she shows how in molecular biology, living organisms are seen as "machines," similar to industrial production systems and production sites, with the central dogma that DNA contains the building blocks of life), the prime focus of *Epistemic Cultures* is not so much on *what kind* of knowledge is produced, but on the "construction of the machineries of knowledge," more specifically in the domains of High Energy Physics (HEP) and Molecular Biology (MB). Knorr Cetina gathered data through the work of several field ethnographers, involving the unmediated observation of scientific procedure, gathering researchers' notes, written correspondence, audiotapes of interviews, and other interactions. The research arena for the study into experimental HEP was situated at the European Particle Physics Laboratory, and a molecular cell biology research group was the focus of research into the epistemic culture of MB (beginning in Heidelberg and later at the Max Planck Institute). As such, this research involved the collaboration of three analysts, one inquirer for each field (HEP and MB), with the comparison between the two fields being conducted by Knorr Cetina herself.

The book then presents a comparative laboratory study of HEP and MB, more focused on the *differences* between these two domains than on the essential features of each field, showing their different working cultures and organizational structures. As to the latter, it is meticulously documented how HEP is concentrated in only a few laboratories around the world, with hundreds of scientists working in team on the same project, and how, on the other hand, the scientific research done in the field of MB is structured in several smaller-size pyramid-hierarchy organized labs, also explaining why competition is more a feature of MB and cooperation one of HEP. Since the objects of study and scientific aims are totally different in these two domains, it is further no surprise that their respective "knowledge cultures" are also totally differently organized. While HEP focuses on turning "negative knowledge" (trying to eliminate all the things that can go wrong in a HEP experiment) into positive knowledge, MB is characterized by a positive epistemics

through experiential knowledge (experimenting with different variations of "problematic factors").

As stated, the outcome of *Epistemic Cultures* is not so much a focus on the kind of scientific knowledge being socially constructed, but more a comparison and juxtaposition of how HEP and MB are organized and their means of knowledge acquisition. Knorr Cetina labels this as the comparison of two "epistemic cultures," defined as "those amalgams of arrangements and mechanisms—bonded through affinity, necessity, and historical coincidence—which, in a given field, make up *how we know what we know.* Epistemic cultures are cultures that create and warrant knowledge, and the premier knowledge institution around the world is, still, science" (Knorr Cetina 1999, 1). As she states herself, the research was aimed at being an amplification of "the knowledge machineries of contemporary sciences until they display the smear of technical, social, symbolic dimensions of intricate expert systems" (p. 3). By this analysis, Knorr Cetina wants to underpin her proposition that there is more than a simple bifurcation between the natural and the human sciences with respect to their ontological difference and methodological divergence, but that there is also a divergence among the natural sciences themselves. Her work can thus be seen as one of the first attempts to address the epistemic disunity of contemporary natural sciences in their machineries of knowing (pp. 4-5).

As to the mapping of different epistemic cultures of different scientific fields, Scarce's *Fishy Business* could as such be read as an addition to Knorr Cetina's work, documenting the "epistemic culture" of salmon biologists. To a certain degree, this analysis could also be extended to Fine's research into the world of mushroomers, albeit his research in *Morel Tales* reveals more of the "leisure culture" of nature, than—as is the case with Scarce's *Fishy Business* and Knorr Cetina's *Epistemic Cultures*—the knowledge creation of nature. Nonetheless, in seeing how these three researchers all aimed at a sociological analysis of the epistemic or leisure culture of certain specific groups (acted out through similar ethnographic-based methodologies), it is interesting to see how the concept of "interchangeability" mentioned by Scarce (2000, 71-4 and 157-9) could be applied to their respective works. Scarce deals with three senses of the concept of interchangeability (the interchangeability of salmon, the interchangeability of biologists' abilities, and the interchangeability of species) and sees these as a form of control that salmon biologists exert over salmon. In his explanation of this latter

aspect—the interchangeability of species—he documents how salmon are construed by salmon biologists as only one of any number of organisms that they might study. As one Canadian interviewee stated, "It doesn't really matter whether you're working on insects or moles or fish—the basic principles are the same. You can take a course in ecology, and if you've got a good grasp of the principles, you can apply them to any animal" (Scarce 2000, 72). In this respect, it is noticeable to remark that a similar Cartesian view on animals persists in the discourse of the hatcheries salmon biologists studied by Scarce and the molecular biologists examined by Knorr Cetina (laboratory mice as "animal machines," see above). In Scarce's words: "The norm is that of objective science, which conceptualizes the workings of organisms as machinelike and directs that those workings are all that matters" (p. 73). Although Fine's work only marginally touches upon the epistemics of professional mycologists (as a conflicting culture to that of amateur mycologists), it is interesting that their discourse also reveals a similar "machinized" view on nature, for example, when the reality of a fungi species (the whole) is made up through the use of scanning electronic microscopes and/or chemical analysis (analysis of their parts). Although—in Knorr Cetina's words—the "machineries of knowledge construction" may indeed be dissimilar among the different natural sciences, it seems a lacuna that she did not seize the opportunity to elaborate on the underlying positivistic Cartesian logic tying them together at a more abstract theoretical and empirical echelon.

The interchangeability concept introduced by Scarce could be taken a step further. As a detailed ethnographic analysis of different social groups, it is no surprise then that concepts such as group cohesion, competition, conflict, control, group hierarchy, and so forth, and the ways by which these practices are effected, are recurring themes throughout the three books. On a more tangible level, we, for example, read of "mushroom wars" (the conflicts with commercial mushroom picking and the problem of overpick—Fine 1998, 212-12) and "salmon wars" (conflicts between the United States and Canada regarding the salmon fisheries business—Scarce 2000, 177-89), or of "fish stories told by mushroomers" ("The one that got away," Fine 1998, 145). In Fine's statement, his analysis of cultural meanings found among mushroom collectors is equally applicable to birders, butterfly collectors, rock hounds, and other naturalists, serving as a paradigm of the customs of naturalists in general. Taking this line a step further, it is highly

interesting to compare how similar conflicting discourses (e.g., the anthropocentric attitude of hatcheries biologists versus the ecocentric attitude of conservation biologists; the organic view of nature among amateur mushroomers versus the humanistic paradigm of commercial pickers) dome the domains of salmon biology, mushrooming, and even molecular biology.

Fishy Business—as Scarce mentions himself (pp. 17-18)—has a foot in two intellectual camps: the tradition of environmental sociology (the social construction of Nature) and the sociology of science (the social construction of science and technology). A hard constructivist position in which nature were only to be seen as a cultural construction not only poses serious headaches for environmental philosophy but hence also leads to the pointlessness of environmental advocacy (see Dombrowski 2002). However, both Scarce and Fine show that our choices have real impact. Scarce's position is not a "hard constructivist" approach, which would imply the untenable position that nature holds no ontological reality, that there is no "real," "tangible" nature. He argues that "constructivism does seek to demonstrate that the control and power to make Nature is within our hands and that the Nature that is being made is a product of society, not of the thing itself" (p. 210). In a similar vein, Fine admits that although "nature" is a cultural category, it is, however, constructed from real, essential objects, a position he exemplifies by the hypothetic extreme case of uprooting all green plants and trees and hence learning the real and dire consequences (p. 260). Although convincingly having demonstrated that there is indeed no nature without culture, a core environmental message emanating in their works is best reflected in the last sentence of Scarce's work: "Environmental sociology needs to problematize its core concepts—Environment and Nature—if it is to act with authority in rectifying the abuse being heaped on the planet by industrial society" (p. 211). Or in Fine's closing words: "To recognize that nature is culture is to accept our responsibility as beings whose impact on the world will be great, whatever choices we make" (p. 261).

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