Visions of STS

Counterpoints in Science, Technology, and Society Studies

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STS on Other Planets

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In a democratic society the STS perspective has the potential to contribute in myriad ways to better science and technology decision-making, as has already been suggested by several of the authors in this collection. Recently, however, much of the scholarly STS literature has focused on the "social construction" of scientific knowledge and technological change, sometimes to the exclusion of concern for the "social consequences" of science and technology. Richard Sclove is particularly concerned that STS not lose sight of its sociopolitical roots. He thus argues for "socially engaged STS research," by which he means that STS professional institutions, teachers, and even students should work to make science and technology responsive to democratically decided social concerns.

Sclove's plea is more than idle academic rhetoric, since he is the founder and research director of the nonprofit Loka Institute, which has as its mission the promotion of a democratic politics of science and technology decision-making that includes a strong grassroots, worker, and public-interest voice. To that end he is also the author of *Democracy and Technology* (1995), which not only argues for this position, but also offers "design criteria for democratic technologies."

In the essay that follows, Sclove "fantasizes" about an imaginary planet where there is active democratic participation in the processes of scientific and technological decision-making. Shifting out of this rhetorical reverie, he notes that this image is, in fact, a very real one, even if limited in scope, and that it can be found in

the realization of Dutch "science shops" and Danish "consensus conferences." Although differing in approach, in both cases the intent is to provide expanded knowledge and to allow greater participation for the general public with regard to scientific and technological issues.

In concluding his essay, Sclove invites professors and students alike to become more actively engaged in socially responsive programs and institutions. In reading this essay, we may want to compare Sclove's approach to the question of science and technology policy- and decision-making with those of Lars Fuglsang and Albert Teich earlier in this collection. It would also be a useful exercise to identify those institutions and opportunities available locally where such active participation is possible or, barring such opportunities, to consider how to create just such possibilities.

Knowledge from Nonexperts

The practice of science and engineering occurs preeminently in laboratories, so it is fitting that those of us concerned with the social aspects of science and technology preoccupy ourselves with those haunts. Yet periodically, when suffering snow blindness from staring at men in dazzling white coats, I close my eyes and fantasize about another planet: Planet XI. Like Earth, Planet XI is a place in which knowledge and technical artifacts are socially contrived, but in other respects it is utterly bizarre and exotic.

For example, on Planet XI a startling amount of knowledge about how the world works is produced by social groups comprising nonexperts—that is, ordinary women and men. Sometimes they are organized according to their occupations (a little bit like our trade unions), sometimes according to their social concerns (like our environmental or women's groups), and sometimes according to where they live (like our community and grassroots organizations).

Some of these groups produce knowledge entirely by themselves. For instance, if they fear that they have been poisoned by polluted water, they conduct their own surveys and empirical examinations to find out whether, how, and why. Farfetched as this sounds, they are able to do this without the benefit of university educations, research grants, or laboratory facilities.

But in other cases they produce knowledge in close collaboration with professionally trained researchers. Yes, it is hard to

believe that there could be a place where men and women with professional credentials would even talk, much less cooperate actively, with others less educated. But on Planet XI, I insist, it is so.

For instance, in one nation on Planet XI, most universities have established a set of research centers whose sole purpose is to facilitate studies conducted with or for popular organizations. Thus, on Planet XI, understanding how knowledge is socially produced sometimes entails studying laboratories, but it also means spending time with all kinds of women and men in all kinds of social settings. On Planet XI, knowledge creation knows no sharp geographic, class, or other social boundaries.

Even on Earth, science and technology are not, of course, self-contained or insular enterprises; they are strongly influenced, for example, by government policies. But since the only kinds of people who significantly influence those policies are the same people who otherwise wear white coats and busy themselves with laboratory equipment, studying science policy-making on Earth hardly requires shifting one's gaze from the laboratory's customary denizens. Thus, it is both a relief from tedium—and yet also a bit shocking—that on Planet XI many other kinds of people influence science and technology policy-making.

For instance, there is another nation on Planet XI that, realizing that knowledge and know-how are not only socially constructed but also have profound social repercussions, convenes panels of laypeople—that's right, everyday folks from all walks of life, including school teachers, homemakers, and street sweepers—to publicly interrogate men and women in white coats and then reach their own policy conclusions. These lay panelists' judgments have influenced popular political deliberations, business decisions, and government policies.

You might well imagine that this process is not only costly but leads to ludicrously ill-informed judgments. But a broad cross section of the nation's members—including its political and business leaders—claim that these irrational participatory methods actually result in greater social justice and even in real economies. This occurs, according to them, because there is relatively little costly opposition to innovation, insofar as a wide range of social concerns are reasonably well reflected in prior research and development (R&D) and government policy decisions.

In several nations on Planet XI, programs have begun to be established through which workers and consumers can even participate directly in designing alternative technologies better

adapted to their life circumstances and aspirations. Workers, for instance, have consistently demonstrated both an interest and impressive capabilities in helping to devise production technologies that are not only efficient but also maintain safe, high wage/high skill jobs, protect the environment, and result in high quality products or services.

Many university students on Planet XI pursue educations and careers no different from the conventional student trajectories familiar on planet Earth, but others choose to become actively engaged in the preceding participatory activities as an integral aspect of their studies. For instance, one Planet XI university has a community research center located *within* its academic technology and society program. The center is staffed by professors of science, technology and society (STS), who also teach courses on participatory research and on participatory approaches to technological design.[1]

Students who take these courses receive credit for conducting participatory community research projects. Their projects, in turn, influence the university to adopt new courses that reflect community concerns (such as sustainable economic development) and to establish new, socially oriented, interdisciplinary research programs that include faculty from many different departments and programs throughout the university. This university's STS professors themselves hold graduate degrees in either natural science, engineering, or social science. Disciplinary credentials turn out to be of secondary importance, however, because over time all the professors have become generally familiar with one another's disciplines.

Expert and Nonexpert Criticism

To read the mainstream STS literature currently being produced back home on Earth, one would have to conclude that Planet XI exists only in my fevered imagination. But actually, Planet XI is a real place. In fact, it is the third planet out from the center of our own solar system. For instance, in 1995 I made a brief tour of two of the nations on Planet XI; they are named "Denmark" and "the Netherlands."

During this trip I was privileged to deliver a plenary address to the national meeting of the Dutch "science shops." The meeting was attended by staff from the Netherlands' thirty-eight university-based community research centers, which together produce more than a thousand studies each year in response to requests from community groups, trade unions, public-interest organizations, and local governments.[2]

Other science shops, or related community research centers (not always based in universities), now exist in many other nations, including Denmark, Austria, Germany, England, Ireland, Norway, the Czech Republic, Canada, and the U.S., although the Dutch system is the oldest and mostly highly evolved. In the developing world there is a somewhat analogous international network of indigenous knowledge resource centers; its newsletter is published in The Hague.[3]

I also met with staff from Teknologi-Rädet (the Danish Board of Technology), who since 1987 have conducted about twenty "consensus conferences" in which panels of everyday citizens become intensively informed on selected topics in science and technology policy and then, after participating in a public forum, announce their judgments at national press conferences that are attended by members of Parliament (Sclove, 1996; Joss and Durant, 1995).[4]

I spent a day with several professors at Aarhus University, who are among the world's leading practitioners in designing new technologies collaboratively with workers (*Computers in Context*, 1995). I was hosted for another day at the Danish Technological University in Lyngby, where indeed there is a thirteen-year-old science shop located within an STS program and staffed by Professors Michael Søgaard Jørgensen and Børge Lorentzen.

One comes naturally to the question of why these, as well as other real-life examples that seemingly represent an important thrust toward democratizing science and technology, are so little considered within the conventional STS literature. The first Danish consensus conference was held in 1987, but the leading academic STS journals—such as *Science, Technology & Human Values* and *Social Studies of Science*—have not discussed these procedures.[5] How do the reports produced by Danish lay panels compare substantively with those produced by conventional technocratic approaches to technology assessment? Is their social and political impact typically greater or less? The bulk of the STS community has apparently not found such questions of interest.

During the mid-1980s Professor Loet Leydesdorff and colleagues published several illuminating studies of the main science shop at the University of Amsterdam (Leydesdorff and Van den Besselaar, 1987; Zaal and Leydesdorff, 1987). But at the time there

were already about a dozen other science shops scattered throughout the Netherlands. What of them? Indeed, since that time the number of Dutch science shops has tripled, but apparently no one in the STS community has found this vibrant effort to democratize university research capabilities worthy of serious attention. In fact, when the very shop that Leydesdorff and his colleagues studied was recently shut down owing to university budget constraints, did a single person from the STS community know, care, or do anything to try to help?

How do the several dozen remaining Dutch science shops vary from one another? How are participating students' career decisions affected? Do the shops appreciably influence faculty research programs? What is the social impact of the shops' research? How does their social utility and cost efficacy compare with that of conventional research systems? How do science shops in various countries reflect the different circumstances of their origin? Could science shops and the popular constituencies they serve evolve into a grassroots foundation for challenging other, nondemocratic science and technology institutions? Is the Internet permitting transnational collaborations among science shops to emerge?

No one knows the answer to these and a hundred other such questions, for the simple reason that no one has asked them. The answers would not merely be of academic interest; they could help provide a basis for maintaining and greatly extending the practice of community-based research (Sclove et al., 1998, esp. chap. 3, finding 18).

The pioneering anthologies on participatory research have all been published by Third World activists or by social change-oriented sociologists, not by members of the STS community (Fals-Borda and Rahman, 1991; Park et al., 1993; Nyden et al., 1997). Likewise, the pioneering anthologies on participatory design in the workplace were compiled by Computer Professionals for Social Responsibility—an activist group, not an STS organization (e.g., Schuler and Namioka, 1993; Chatfield et al., 1998). The latter anthologies are extremely useful, but other questions remain to be asked. For instance, if workers and users should participate in technological design, what about affected *non*-users? What are the cultural, institutional, and legal barriers to participatory design, and what types of political strategies might be used to soften them? (Sclove, 1995; Sandberg et al., 1992)

Every year in the United States a majority of new STS graduate students, and many undergraduates, arrive on campus motivated primarily by awareness of some particular deep social problem involving science or technology. They want to study that problem, and to contribute constructively and actively toward addressing one or another real social ill. Do our current STS programs nurture that eminently worthy desire?

For the most part, no. These admirably motivated students are coopted into courses and research programs whose inadvertent (?) thrust is to remake their social commitment into a commitment to largely idle scholarship instead. This is good for academic careers, perhaps, but not for society. STS—as a codified profession, field, or discipline—is now near-perfectly accomplishing just what the late social theorist Michel Foucault claimed disciplines normally do: producing docilely functional bodies.

Similarly, the academic STS community's recent, intense preoccupation with establishing that technologies are contingent social *products* (a theoretical point that was actually pretty well established in the 1970s by social historians of technology and by appropriate technology practitioners) has meant that few in the STS community are studying the other half of the coin: the social *consequences* specific to particular technologies and technological complexes. The relative inattention to consequences has been noted, for instance, by sociologist Claude Fischer (1987), technological change theorist Everett Rogers (1983), and urban historian Christine Rosen (1989).

The embarrassing truth is that when I want to learn about the social consequences of emerging technologies, I do better canvassing human interest stories by *New York Times* reporters than reading anything in the leading STS journals. Recently in the U.S., the most influential scholarly claims about the social and political implications of technology have been made by Harvard University political scientist Robert Putnam (1996), who never cites any STS literature and has never published in STS journals.

A few others in the academic STS community have called attention to various expressions of depoliticization within our field—famously symbolized by the recent the shift in meaning of "STS" from "science, technology and society" to "science and technology studies"—but little has yet changed as a result of these critiques.[6]

So, why is STS relegating overt attention to democratizing science and technology to a back burner? One obvious hypothesis is that such attention would directly challenge current social power relations and so risk currying disfavor within the corridors of

power, including those that provide funding. Servants of power are rewarded in our societies; challengers are frequently punished.

This hypothesis is unfashionably straightforward and simple, but there is also some evidence to support it. For example, two of the most gifted and inspiring STS professors with whom I studied as a beginning graduate student in the 1970s were David Noble and Langdon Winner. Both were politically engaged, and both were, not coincidentally, denied tenure by MIT. Did these spectacularly unjust and irrational decisions function as early warning shots across the bow, teaching other aspiring STS scholars the career risks they might run if they did not depoliticize their research and teaching programs?

Perhaps one way to start reversing this socially damaging, climatic chilling within our field would be for socially concerned STS professors—or, better yet, the leading STS professional societies—to establish standby mechanisms for quickly mobilizing external support to colleagues whose political commitments are jeopardizing their careers. We could also establish prizes to recognize and reward socially engaged research and teaching. Meanwhile, university students interested in becoming involved with socially engaged STS research, or in helping directly to make science and technology more responsive to democratically decided social and environmental concerns, can do so by applying to volunteer or intern with such nonprofit organizations as the Loka Institute, Council for Responsible Genetics, or Computer Professionals for Social Responsibility.[7]

Notes

1. As noted later in this essay, "STS" is a contested acronym. It originally meant "science, technology and society," but in some circles it now denotes "science and technology studies."

2. Sclove (1995, pp. B1–B3) (this essay is available at <http://www.Loka.org/alerts/loka.2.5a.txt>); or Sclove, Scammell, and Holland (1998, esp. sect. 2.13) (this report is available at <http://www.loka.org/crn/pubs/comreprt.htm> or it may be ordered directly from the Loka Institute, P.O. Box 355, Amherst, MA 01004 USA; tel. [413] 559–5860; e-mail <Loka@Loka.org>).

3. Directories of science shops and related community research centers worldwide are available via the Community Research Network Database at <http://www.loka.org/crn/index.htm> and via Delft Technical University at <http://www.bu.tudelft.nl/wetensch/lsw/ehome.htm#start>. Information about indigenous knowledge resource centers is available from the Center for International Research and Advisory Networks (CIRAN), P.O. Box 29777, 2502 LT The Hague, The Netherlands, e-mail <ikdm@nuffic.nl.> or <http://www.nuffic.nl/ciran/ik.html>.

4. Sclove (1996) is also available at <http://www.loka.org/pubs/techrev.htm>; and Joss and Durant (1995). Information about the first consensus conference in the United States, organized in April 1997, is available at <http://www.loka.org/pages/panel.htm>.

5. Guston (1999) represents a recent, welcome exception.

6. See, for example, three articles in *Science, Technology & Human Values*: Martin (1993), Cozzens (1993), and Winner (1993), and also Carl Mitcham's review of *The Handbook of Science and Technology Studies* (1995) and Chubin (1992).

7. Contact information for the Loka Institute appears in note 2 above. The Council for Responsible Genetics' website is: <http://www.genewatch.org> and that of the Computer Professionals for Social Responsibility is: <http://www.cpsr.org>.

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