

Crosscurrents: Social Movements and the Anthropology of Science and Technology

By David J. Hess

Citation: Hess, David J. 2007 "Crosscurrents: Social Movements and the Anthropology of Science and Technology." *American Anthropologist* 109(3): 463-472.

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Abstract. Along with growth and acceptance of the anthropology of science and technology has come a narrowing of focus both topically and methodologically. An alternative topic of inquiry (social movements) and an alternative method (a limited return to nomothetic inquiry) offer potential for research that is relevant to both social change actors and social scientists such as sociologists and political scientists. A comparative analysis of existing anthropological research on science, technology, and social movements provides the basis for limited generalizations regarding the types and circumstances of charged cultural repertoires that both social movements and elites invoke. [Keywords: social movements, science, technology, cultural repertoires, theory]

Since the late 1980s, the anthropology of science and technology has developed from a small group of researchers who faced difficulties of recognition to a subdiscipline with representation and acceptance in major departments. However, along with growth and acceptance has come a narrowing of focus. To some degree the field has undergone disciplinarization around cultural analyses of the changes in nature–culture relations associated with emergent biosciences and biotechnologies. In this article, I explore an alternative approach to science and technology that emphasizes the potential of social and cultural anthropology to contribute to interdisciplinary conversations in the social sciences as well as to

broader political conversations regarding enhanced democratic participation in the choice of future research agendas and technologies.

BACKGROUND

In the late 1980s, the anthropology of science was defined largely against the backdrop of laboratory studies, which used ethnographic methods but were theoretically oriented to the sociology of scientific knowledge and the philosophy of science (e.g., Knorr-Cetina 1981; Latour and Woolgar 1986; cf. Hess 2001). An exception was Sharon Traweek's early work (1988), which focused largely on the laboratory but was conceptually oriented to anthropology. Anthropologists soon began pushing ethnography out of the laboratory to study a range of broader issues (e.g., Downey and Dumit 1997; Hess and Layne 1992), and as the number of anthropologists reached a critical mass, the ethnography of science and technology became more historical and cultural. A large proportion of the subsequent studies examined the changes in fundamental cultural categories that have occurred as nature has become increasingly manufactured, commodified, digitized, and, in general, socially shaped by new research fields and associated technologies. Ethnographic studies explored that historical and cultural proposition regarding modernity and science for a wide variety of biocultural categories, such as death (Lock 2002), life (Franklin and Lock 2003; Franklin et al. 2000; Haraway 1997; Helmreich 2000), blood (Rabinow 1999), kinship (Franklin and Ragoné 1998; Strathern 1992), pregnancy (Layne 2003), the body (Martin 1994), body parts (Hogle 1999), the self (Dumit 2004), microbes (Helmreich in press), and plants (Hayden 2003).

The focus on new definitions of nature and culture was able to bring the anthropology of science and technology into conversation with issues that have been important historically in the four-field approach of U.S. anthropology. The network of research and researchers drew on and critiqued theories of nature, culture, and kinship that had been developed in mid-20th-century structuralism and functionalism and revised later by feminist anthropologists (e.g., Franklin and Lock 2003; Goodman et al.

2003). Although the focus on nature, culture, and life compellingly made the case that the anthropology of science and technology could offer significant critical reappraisals of central concepts in the history of anthropology, the parallel focus on the biosciences tended to preclude ongoing conversations with ethnographic research on scientific and technical fields that were located outside the triangle of nature, culture, and life. Examples of such work include anthropological studies of engineering (Downey 1998), information (Forsythe 2001; Hakken 2003; Kelty 2004; Suchman 2007), mathematics (Eglash 1999), nuclear power expertise (Perin 2005), religious movements (Toumey 1994), science museums (Weinstein 1998), and weapons research (Gusterson 2004).

A second persistent area of attention, the study of cultural diversity and difference with respect to modern science and technology, has been more comprehensive topically. Questions of cultural difference permeate the literature in the anthropology of science and technology, including Diana Forsythe (2001) on gender and artificial intelligence, Emily Martin (2000) on mania and new valuations of psychological difference, Rayna Rapp (1999) on amniocentesis and social difference, and Michael M. J. Fischer (2003) on “emergent forms of life.” Some studies contribute to the long-standing discussions in anthropology on postcolonialism, marginalization, and lay knowledges (Biehl 2004, 2005; Eglash 1999; Harding 1998; Hayden 2003; Hess 1995; McNeil and Castaneda 2005; Nader 1996; Redfield 2000), and comparative projects are underway on engineering (Downey 2005) and free or libre open-source software (Hakken 2005; Kelty 2004). Another cluster of interest tracks questions of nationality and national difference, such as how being a Japanese physicist (Traweek 1992) or Japanese genome researcher (Fujimura 2000) affects the way a scientist thinks about science and research problems. More generally, research on postcolonialism and cultural difference explores how (or if) differences in social categories and identities play themselves out in the definition of research agendas, methods, and technological designs.

In this article, I explore a third lens from which the anthropology of science and technology may

be viewed. The issue of social movements and science connects the anthropology of science with broader currents in science and technology studies (STS) and well as with the anthropology of social movements. One enduring topic of STS research has been the problem of how technological innovation and scientific expertise can be made more publicly accountable and more amenable to democratic participation (e.g., Fischer 2000; Kleinman 2001; Woodhouse and Nieuwma 2001; Woodhouse et al. 2002). Given the lack of responsiveness of governments, global financial institutions, and multinational corporations to calls for greater accountability and public participation, attention has focused on the role of social movements as crucial actors in the development of a democratic politics of science and technology (e.g., Brown and Zavestoski 2004; Epstein in press; Frickel and Gross 2005; Hess 2004; Hess et al. in press; Jamison 2001; Lanzelius and Dumit 2006; Moore 2006). In recent years, the study of social movements has also received increasing attention from anthropologists (e.g., Casas-Cortés et al. n.d.; Edelman 2001, 2005; Escobar 2005; Hodgson 2002; Holland et al. n.d.; Nash 2005; Price et al. n.d.). Social movements oriented toward scientific and technological issues have been particularly prominent in countries such as the United States, where, for many scientific and technological issues, opportunities are relatively open for protest but closed for participation in decision making.

By paying closer attention to science, technology, and social movements, it is not necessary to ignore the rich body of ethnographic work that has accumulated in a relatively short period of time around the reconfiguration of fundamental biocultural categories or the roles of cultural differences and colonialism in science and technology. There is no need to define the choice of problem areas in a zero-sum relationship. Instead, anthropologists of science and technology can, and in some cases already do, contribute to all three areas of inquiry. However, the anthropology of science and social movements presents some unique challenges that are less evident in other approaches to the anthropology of science and technology. For research in the anthropology of science and technology (and perhaps social and cultural anthropology in general) to play a significant role in interdisciplinary social science

conversations, it is necessary to rethink the methodological question of generalization.

SCIENCE, SOCIAL MOVEMENTS, AND GENERALIZATION

Both STS and social movement studies have a well-developed literature of social science research and theory. For sociologists, political scientists, and other social scientists who have been studying the field, a question emerges: can an anthropological approach to science, technology, and social movements provide a unique and valuable perspective? To anthropologists the answer may seem to be an obvious affirmative, but for one's interdisciplinary colleagues the answer may not be so self-evident. One of the primary differences between sociology and anthropology in the study of both science and social movements is the understanding of what counts as theory. In an interdisciplinary social science context, the work of anthropologists may appear to be descriptive and atheoretical in the sense that it does not contribute to a body of generalizations. Like historians, anthropologists use theoretical concepts as a means for the elaboration of the specifics of a case, whereas sociologists tend to use the case as the grounds for developing generalizations. Within anthropology, the closest articulation of the difference in theory cultures is A. R. Radcliffe-Brown's distinction (1952) between idiographic and nomothetic inquiry, which was influenced by his use of French sociology. For Radcliffe-Brown, nomothetic inquiry was possible at the broadest scale: "generalizations about the nature of human society, i.e., about the universal characteristics of all societies, past, present, and future" (1952:86). More or less the same distinction appears in a contemporary essay by Claude Lévi-Strauss (1963:ch. 15; orig. 1953), who contrasted the empirical observation of history and ethnography with the model building of sociology and ethnology. The generalizing projects of mid-20th-century British and French social anthropology—and even some articulations of mid-20th-century U.S. cultural anthropology (e.g., Aberle 1966; McEwen 1963)—are largely marginalized today.

Of course, the distinction that is more well-known, and in fact is widely quoted even by scholars

who have never taken an anthropology course, is the one articulated by Clifford Geertz, who famously described the project of anthropology as “not an experimental science in search of law but an interpretive one in search of meaning” (1973:5). In the essay “Thick Description” (1973), Geertz provided a fairly lengthy articulation of what counted to him as “theory,” a discussion that, notwithstanding all the subsequent deconstructions of his essay on the Balinese cockfight, has stood the test of time well: a “repertoire of concepts” that ethnographers draw on to make ethnographic description thick. Although the list of concepts that he provided shows some signs of age, the idea of cultural theory (at least when contrasted with an ideal typical sociologist’s understanding of theory as a quest for generalization, or even the nomothetic inquiry of mid-20th-century social anthropology) does not.

In the historicist tradition of U.S. cultural anthropology, Geertz rejected the nomothetic approach to theory, particularly versions of it that involved a quest for cultural universals. In his essay on Lévi-Strauss, Geertz voiced a suspicion about generalization that one hears echoed today: “What is presented as High Science may really be an ingenious and somewhat roundabout attempt to defend a metaphysical position, advance an ideological argument, and serve a moral cause” (1973:347). The equations are familiar even if they are not entirely explicit: generalization equals universalization equals ethnocentrism equals colonialism. However, Geertz also took his argument to an extreme, eschewing not only a universalizing form of generalization but also arguing that the role of theory is “not to generalize across cases but to generalize within them” (1973:26). In this tradition, discussions of “theory” have tended to become largely metamethodological.

Three decades later, in an academy that has become much more interdisciplinary, the taboo on nomothetic inquiry does not travel well in the conversations that anthropologists are having and will have with sociologists, political scientists, and other social scientists. In fact, it can lead to a condition of intellectual involution for anthropologists. One might argue “so what?” and reject the value of cultural

anthropology as, at least in part, a social science, but when anthropologists take themselves out of the interdisciplinary social science theoretical debates, both anthropologists and the interdisciplinary theories lose. There should be a way of preserving the sensitive powers of cultural interpretation and critique for which anthropologists have become known across the disciplines while also continuing a general conversation with the social sciences that was more prominent in the early and middle decades of the 20th century.

The alternative to ethnographic particularism does not require a return to the universalizing aspirations of mid-20th-century nomothetic inquiry in anthropology. Rather, there is an alternative somewhere between the Geertzian reduction of social and cultural anthropology to ethnography—that is, a task akin to writing history—and a universalizing form of generalization—specifically, a “law” stated as a relationship between independent and dependent variables, which, for example, would apply to all social movements everywhere, or at least some more specific universe of cases, such as all interactions between social movements and scientific communities during the 20th century. Somewhere in between is a rich but self-disciplined and limited comparative analysis that might find its social theory source less in Franz Boas or Emile Durkheim and more in the Max Weber of *The City* (e.g., 1978:1323–1324). Weber’s use of generalization does not sweep historical differences under the rug of a single template but instead establishes a framework for finding limited regularities amid a sea of comparative differences. There is a tradition of such work in anthropology, both in archaeology and in social and cultural anthropology; the point here is not to claim that limited generalization would be methodologically new for anthropology as much as it is to suggest that it deserves more attention. Furthermore, as research fields become more interdisciplinary, the historical transformations of the 21st-century academy may create opportunities for the reconsideration of limited generalization and conditions for its return.

To provide an example of what the research repertoire of limited nomothetic inquiry in the

anthropology of science and technology might entail, I focus in this article on the study of meaning in social movement studies. Because work by anthropologists on social movements generally attends to meaning, sociologists may, at least on first pass, translate such work as a version of frame analysis (Benford and Snow 2000). The argument is superficially compelling, particularly because occasional references to frames and framing appear in the ethnographic work of anthropologists, and in fact anthropologists may legitimately claim to have invented frame analysis.¹ However, a close comparison of, for example, a frame analysis of the nuclear disarmament movement by a sociologist (e.g., Benford 1993) and a cultural interpretation by an anthropologist (e.g., Gusterson 1996) suggests fundamental differences. The anthropologist pays much greater attention to the detailed meaning of texts, statements, and their significance with respect to broader cultural contexts. Although the equation of the ethnographic interpretation of anthropologists with frame analysis is ultimately misleading, there are some more convincing points of overlap between the work of sociologists and anthropologists in a small portion of the sociological literature on the cultural dimensions of social movements, such as research on the cultural resonance of frames and the use of symbolic repertoires by social movements (e.g., Johnston and Klandermans 1995; Polletta 2004; Williams 2002). Specifically, the anthropological study of social movements is well positioned to contribute to understanding the place of charged cultural repertoires—that is, meaningful historical events and narratives that are invoked to interpret new political struggles and to provide maps for future action.

In the remainder of this article, I will demonstrate what is intended by the method of limited generalization by presenting a comparative or “meta-”analysis of cultural repertoires in the existing U.S. anthropological literature on social movements and modern science and technology. Although the issue is not always the central focus of the studies that will be reviewed below, the value of good ethnography is that it can be reread for insights that were not the primary focus of the ethnographer. The method is based on a comprehensive familiarity with the entire literature on science, technology, and social

movements (for an entry point, see Hess et al. in press). Within that literature, I have selected work by anthropologists who pay attention to social movements and include some analysis, either explicit or implicit, of cultural repertoires. Furthermore, given limitations of accessibility and space and the publication venue, the analysis is restricted to work in U.S. anthropology.

The analysis that follows will also be limited to social movements understood as collective action rather than as the activism or acts of resistance of individuals. Social movements can be distinguished from related forms of social action by their goal of fundamental social change (in contrast with interest groups), broad scope (in contrast with smaller activist networks and short-term campaigns), and extrainstitutional action such as protest and civil disobedience (in contrast with the institutionalized advocacy work of reform movements). Although typological distinctions can be made between social movements and related forms of social action, in practice the boundaries are fluid, and in some cases other terms may be more appropriate (Hess 2007). For example, in the case of disease-based advocacy movements, which Phil Brown and Stephen Zavestoski (2004) describe as one type of “health social movement,” often the action does not involve protest, and there may only be one advocacy organization. However, for the present purposes, patient-advocacy groups and movements will be considered under the broader rubric of social movements.

With those limitations in mind, nine examples in the existing U.S. anthropological literature on science, technology, and social movements provided enough detail to identify cultural repertoires. In those nine examples, three types of cultural repertoires were identified: anticolonialism, opposition to genocide and mass extinction, and enactment of sacred action. Although the movements may use other repertoires, those three were the most prominent in the existing literature (see Table 1). In addition, a corresponding rational, secular, progress narrative of elites was also identified and will be examined.

Table 1. Movements and Cultural Repertoires

<i>Author</i>	<i>Movement</i>	<i>Location</i>	<i>Cultural Repertoires</i>
Downey	antinuclear	New Mexico	anticolonial
Masco	antinuclear	New Mexico	antigenocide, sacred action
Hayden	antibiopiracy	Mexico	anticolonial
Harper	anti-GM food	Hungary	anticolonial
Gusterson	antinuclear weapons	California	antigenocide, sacred action
Rabinow	muscular dystrophy patients	France	antigenocide
Hess	alternative cancer therapies	United States	antigenocide, sacred action
Redfield	Doctors without Borders	Global	antigenocide
Taussig, Rapp, and Heath	“Little People”	United States	antigenocide

ANTICOLONIAL REPERTOIRES

Probably the first anthropological study of social movements and modern science and technology was Gary Downey’s work (1986, 1988) on the antinuclear movement in New Mexico.² Activists who opposed the Waste Isolation Pilot Plant linked their position to a common New Mexican identity, whereas they associated the Waste Isolation Pilot Plant with the nonlocal nuclear industry and federal government. Activists noted that the state of New Mexico was ranked 46th in per capita income and was “politically weak and disorganized,” a condition that resulted in the people being “exploited in the form of cheap labor in dangerous, poorly regulated jobs” by “out-of-state corporations from California, Pennsylvania,

and Massachusetts” (Downey 1988:29). Although the term *colonialism* was not explicit in the passages that Downey examined, Joseph Masco’s subsequent ethnographic study of popular representations of and opposition to the nuclear industry in New Mexico noted a billboard produced by activists that described the state as “America’s nuclear weapons colony” (2006:218). Activists also formed “citizen verification teams” and drew explicit parallels with the colonization of Iraq by the United States; they even suggested that New Mexico was a good place to find weapons of mass destruction (Masco 2006:215–219). However, because New Mexico is characterized by a layered colonial history (indigenous First Peoples who had been colonized by Spanish settlers and both, in turn, by the United States and an Anglo population), colonialist repertoires pointed to a history that divided as much as united a local “New Mexican” identity. For example, Nuevomexicanos were often supportive of the state’s nuclear industry because of the jobs that it provided, whereas First Peoples utilized a post–Cold War opening of political opportunities to leverage recognition of nationhood rather than an end to nuclear weapons research (Masco 2006:chs. 3–4).

In the example of ethnobotanical research in Mexico studied by Cori Hayden (2003), anticolonialist repertoires faced a complication similar to that encountered in New Mexico: layers of colonialism, whereby indigenous groups and the Mexican government both claimed some property rights for local ethnobotanical knowledge. However, unlike in New Mexico, the outside actors—Mexican and North American ethnobotanical researchers—shared a similar anticolonial repertoire by arguing that intellectual property agreements between local communities and the pharmaceutical industry could strengthen local economies, enhance environmental sustainability, and reverse the colonialist pattern of biopiracy. Within indigenous groups a range of positions emerged, from a hard line that advocated a complete moratorium on bioprospecting to a probioprospecting position advocated by Zapotec and Chinanteca communities, which viewed resource extraction agreements as a right of indigenous communities. In addition to the differences among indigenous communities and groups,

NGOs and journalists in both Mexico and the United States played a role in articulating opposition. Claims to local intellectual property were difficult to ground because of a century of Mexican ethnobotanical research that had interacted with local knowledge, not to mention centuries of trading of plants among indigenous societies and between them and the Spanish colonizers. As a result, the anticolonialist repertoires could be applied both to local groups and the Mexican nation, with the result of increased division rather than unification.

In Hungary, environmental activists were more successful at making anticolonial repertoires compelling to the country. According to Krista Harper (2004), the environmental movement faced various internal divisions, such as between the capital city and the provinces and between the preservationist and industrial-pollution sides of the movement. However, Hungarian environmentalists could draw on the relatively fresh memories of Soviet domination, a unifying experience that cut across social divisions, to build on concerns with new forms of colonialism. Specifically, environmentalists argued that their campaign against genetically modified (GM) food supported the small nation against “ecocolonialism” and “corporate colonialism” in the new historical situation of membership in the European Union. Activists also noted that a biotechnology company in Germany decided to move its research to Poland, where the anti-GM movement was weaker, and they suggested that the dumping of GM research on Eastern Europe was similar to the expansion of the nuclear power industry in the region.

ANTIGENOCIDE AND RELATED REPERTOIRES

Although charged cultural repertoires of opposition to genocide and mass extinction can, like the histories that they draw on, overlap with anticolonialist repertoires, the two are analytically distinct and may appear under different conditions. One example of overlap occurs among antinuclear weapons activists in New Mexico, who utilized anticolonialist repertoires but also described the state as a

“national nuclear sacrifice zone” (Masco 2006:223). Although the two types of repertoires overlap in this case, the antigenocide–extinction repertoires can also be less place-based than the repertoires of colonial resistance. One example in the antinuclear weapons movement that involved a repertoire of mass extinction was the frequent use of BBs to demonstrate the potential for annihilation. As Hugh Gusterson described (1996:199–201), to symbolize the power of all weapons used in WWII, activists began with one BB and dropped it into a metal bucket. Then they slowly poured in 5,000 more pellets to provide an increasingly loud and overwhelming demonstration of the firepower of the international effects of a full thermonuclear war. The deafening sound provided some sense of the potential for mass annihilation and extinction in the event of full or even widespread use of the world’s nuclear arsenal. Another example of the repertoire of genocide and mass extinction in the antinuclear weapons movement is the “die-in,” where activists lie on the ground to mimic the effects of a nuclear attack (Gusterson 1996:198; Masco 2006:235).³ In both cases the cultural repertoire is not necessarily place based, nor is it necessarily linked to the anticolonialist repertoire discussed above..

Repertoires of resistance to genocide are also prominent in health-related social movements, which generally rely on the mobilization of non-place-based identities such as disease or physical condition. For example, under the leadership of Bernard Barataud, a parent who had become outraged at the mistreatment of his son, the Association Française contre les Myopathies (AFM) developed a general critique of French medical research, initiated a Téléthon, and raised money for genetic research in its Généthon laboratory. Paul Rabinow notes that the group’s opposition to the medical establishment was framed in military metaphors, with Barataud even calling one doctor a “Vichy collaborator of health” (1999:38). Although the AFM was not a central focus of Rabinow’s research and the point is not developed, the comparison with the Nazi collaborators suggests a highly charged repertoire with associations of genocide.

A comparison with Nazism was also invoked during the 1970s by a leader of the U.S. alternative

cancer therapy movement. The doctor, who had been put on trial for using laetrile, referred to the Nuremberg Principles as part of his defense strategy: “When the laws of one’s government require a man to condemn innocent people to death, he must reject those laws and stand with his conscience. If he does not, then he is no different from the Nazis, who were hanged for war crimes” (Richardson and Griffin 1977:103).⁴ By invoking the Nuremberg Principles, the doctor was able to reframe his own action as a form of civil disobedience and establish a parallel between the genocidal policies of the Nazis and the massive deaths of cancer patients who were not being permitted access to alternative therapies. (The point also deflected attention away from his own right-wing politics.) As a result, his trial invoked the cultural repertoire of resistance to Nazi persecution and offered the jurors an opportunity to reenact the Nuremberg Principles.

The Nazi experience and repertoire of opposition to genocide has also been central for Doctors Without Borders (Redfield 2006). The organization distinguishes itself from the Red Cross, which remained silent on the Holocaust, and it has actively publicized human suffering worldwide as well as specific instances of genocide, including in Biafra, Rwanda, and Kurdistan. The organization also defines its work as more than a medical-humanitarian assistance project. Unlike the Red Cross, the organization engages in “witnessing” or “advocacy” (*témoignage*), that is, acts of public denunciation against injustice and genocide.

Repertoires of opposition to genocide can also be mobilized with some ambivalence. Karen-Sue Taussig and colleagues (2003) note that advocates for Little People carefully negotiate research within a framework of individualism and choice that would allow them to select some genetic interventions but limit others. The organization Little People of America is concerned that advances in genetic knowledge could be combined with prenatal screening to generate eugenic practices. Although the information on the meaning of eugenics is not detailed, the discussion suggests how a genetically defined population could simultaneously welcome medical assistance in the form of new research and technology while

also fearing that advances in science and technology could lead to their extinction.

SACRED ACTION REPERTOIRES

One would not necessarily expect religious traditions to provide an important source of repertoires of action in social movements oriented toward science and technology, but religious repertoires have been prominent in other social movements (such as the civil rights movement), and the ethnographies of science and technology also suggest at least a few examples of the enactment of religious repertoires. For example, Gusterson describes how antinuclear activists developed the “bombing run,” a speech in which a doctor or other credible expert describes in detail the effects of nuclear warfare, as an enactment of repertoires of religious damnation: “Similar in some ways to fire-and-brimstone preachers’ evocation of hell, the aim is to terrify the audience and make them seek salvation, in this case through political action” (1996:199). Masco (2006:chs. 3–4) also explores how traditional cultural repertoires of the sacred, such as First People’s rituals of sacred land stewardship and Nuevomexicano Catholic pilgrimages, have been mobilized to raise questions about the effects of nuclear weapons research and testing. However, given the differences of religious traditions between the two groups, religious repertoires can, like anticolonialist repertoires, potentially weaken opportunities for coalition building across ethnic divisions.

Disease-based opposition to conventional cancer therapies can also draw on religious traditions. For example, some of the leading alternative cancer therapy clinics in Tijuana have roots in evangelical Christianity, and even secular advocates of alternative cancer therapies talk about the value of healing body, mind, and spirit (Hess 1999). Some patient-activists also view their healing trajectories as simultaneously acts of political resistance and spiritual awakening, in which they confront the disease itself, conventional cancer therapies of limited efficacy, and the spiritual emptiness and toxicity of their precancer lifestyles (Wooddell and Hess 1998). For some patients, immersion into the world of

complementary and alternative cancer therapies, as well as the associated politics of resistance to conventional treatments, enacts a repertoire of spiritual development (Wooddell and Hess 1998).⁵

SECULAR PROGRESS REPERTOIRES

Although religious repertoires can provide powerful maps for the performance of social movement action, industrial and political elites can also draw on powerful secular counterrepertoires of rationality and progress. The dominant repertoires tend to emphasize scientific neutrality as a source of objective assessment of health and environmental risk, and they also emphasize broader programs of economic progress and security over local concerns. For example, Gusterson noted that the nightmare scenarios of annihilation seemed to have less purchase for nuclear weapons scientists. As one scientist commented, “It’s not rational to have nightmares about nuclear weapons” (Gusterson 1996:197). For the nuclear industry and government, nuclear weapons ensure world peace and domestic security, and nuclear energy also serves a broader national interest by reducing dependence on foreign oil (Downey 1988). Laboratories such as Los Alamos can also enact repertoires of progress for local populations, such as for the Neuvomexicanos who believe that they have benefited from the industry (Masco 2006:ch. 4). Likewise, as Harper (2004) explored in the case of anti-GM campaigns in Hungary, the activists contended with cultural associations among Hungarian scientists, policymakers, and journalists that linked biotechnology to repertoires of progress in the form of “Euro-readiness,” whereas the movement against GM food could be framed as antiprogress.

Given the way that governments and industries draw on repertoires of economic and scientific progress, it is not surprising that social movements will attempt to recruit some scientists to their side. For example, the anti-GM movement in Hungary received a boost when a prominent Hungarian scientist was suspended from a research institute in Scotland because he made statements on television against GM food. As he toured Hungary, he noted that he had fled the country during the 1950s to escape

Stalinism, but the problem of censorship in science also occurred in the West via the economic domination of science (Harper 2004). More generally, as Downey (1988) noted in his analysis of counterexpertise, social movements can break the neutrality of scientific expertise by recruiting dissident scientists to their side (Downey 1988). There are many examples of counterexpertise in the antinuclear energy and weapons movements, as well as examples of scientists who have risked their careers to question the health and environmental benefits of GM food and alternative cancer therapies.⁶

Counterexperts may stick to scientific discourse by restricting their interventions to critiques of existing evidence and the development of new counterevidence, but in some cases they also shift into a social scientific diagnosis of the devolution of science—that is, an analysis of how science has become corrupted by economic and political interests. Such critiques of mainstream medical research are widespread in the movement for complementary and alternative cancer care (Hess 2005). By portraying the suppression of alternative therapies as the enactment of a long-standing repertoire of profiteering and self-interest, advocates of complementary and alternative therapies counter the dominant repertoires of paternalistic progressivism and neutral rationality. They also transfer the repertoire of progress and rationality to their own efforts to fund alternative research agendas and make alternative therapies more widely accessible.

A somewhat different type of counterexpertise appears in the case of Doctors Without Borders, an organization that views itself as “resolutely secular” in contrast with the religiously oriented Red Cross. For Doctors Without Borders, the practice of *témoignage* is more than an act of denunciation against genocidal practices; it also includes reporting on local conditions that, somewhat akin to ethnography and investigative journalism, can contradict official government declarations (Redfield 2006). Although not necessarily “counterexpertise” in a scientific sense, the practice has a similar effect of undermining official repertoires of secular progress and politically neutral rationality, especially

where government interventions in episodes of genocide have been inadequate if not deceptive.

In the case of antinuclear weapons activism, Gusterson shows that the critique of dominant scientific rationality can also shift from the gender-neutral terrain of contested facts and economic corruption to cultural critiques of science (1996:209–214). He charts out a range of feminist critiques of militarism and nuclear weapons research developed by feminist peace and antinuclear organizations. They counter the repertoires of rational progress based on a balance of terror with a range of counterimages, such as masculine fantasies of “missile envy” and “toys for boys” as well as the threat that nuclear warfare poses to the social categories that it claims to protect: children, mothers, grandmothers, and the home.

CONCLUSIONS

To date, the existing ethnographic literature in U.S. anthropology that discusses social movements, science, and technology is largely limited to the exploration of cultural meanings associated with the discourses and practices of activists and their opponents. As a result, anthropological inquiry is not well positioned to contribute to broader interdisciplinary discussions of structural and related approaches in science studies, such as the new political sociology of science (e.g., Frickel and Moore 2006), and social movement studies, such as the contentious politics-research program (e.g., McAdam et al. 2001). However, the anthropological literature on science, technology, and social movements has become developed enough to permit some limited generalizations that could advance a broader interdisciplinary literature on theories of culture, meaning, and social movements.

One generalization that emerges from the foregoing analysis is that in addition to articulating frames for current events and actions, social movements enact cultural repertoires that often draw on charged historical events and cultural traditions to provide templates for future action. In the small body of existing ethnographic work by U.S. anthropologists on science, technology, and social movements,

the repertoires include resistance to colonialism, opposition to genocide and mass extinction, and the enactment of sacred action. Further research might reveal other cultural repertoires, but the ones identified in the comparative analysis above are the most prominent in the existing literature. One might further generalize (or hypothesize) that repertoires of anticolonialism and sacred traditions may be undercut by layered colonial histories and multicultural identities, and that the repertoires may be more successfully deployed where place-based identities are less divided. Repertoires of opposition to genocide and mass extinction may be more prominent in the less place-based movements of the health field. To counter the cultural repertoires of movement groups, political and industrial elites will mobilize their own repertoires, which in the cases examined involved scientific and societal progress. In turn, movements sometimes recruit counterexperts to break down the dominant repertoires, and they mobilize their own counterrepertoires of scientific devolution and corruption.

The outline of a theory of cultural repertoires for science, technology, and social movements is also a proposal for an alternative research repertoire for the anthropology of science and technology and perhaps more generally for social and cultural anthropology. The search for limited generalizations could guide future ethnographic research and also be integrated into interdisciplinary social science conversations. In the case of social movement studies, theorizing on cultural repertoires could become part of general social theories of mobilization that take into account political opportunities, strategy, organization, and resources. The middle ground between the resolutely idiographic method of ethnographic particularism and the overstated nomothetic method of universalizing theory promises to make the anthropology of science and social movements—and many other forms of cultural anthropology, for that matter—more relevant both inside and outside the academy. Inside the academy, anthropologists could contribute to interdisciplinary social science conversations by opening up new topics of inquiry that may not have been previously visible and by bringing a form of generalization that is rooted in the comparative knowledge of cultural and historical difference. Outside

the academy, activists and advocates may find the kind of generalization that I am suggesting to be more useful than either quantitative analysis, which is often too abstract to translate into strategic insight, or detailed histories and ethnographies, which are generally not relevant to current campaigns without further analysis and comparative insight. One might argue that a politically sensitive, critical, humanistic ethnographic text is more valuable to a world troubled by nuclear weapons, biocolonialism, and orphaned patients, but I would counterargue that understanding the complex interplay of general patterns and historical specificities is a more valuable starting point for activists and advocates who wish to plot a strategy and anticipate possible moves of their opponents. For those who wish to discipline such work as “not anthropology,” I would reply that the field might benefit by becoming a little more undisciplined.

DAVID J. HESS Department of Science and Technology Studies, Rensselaer Polytechnic Institute, Troy, NY
12180-3590

NOTES

Acknowledgments. An earlier draft of this article was presented as the annual joint anthropology lecture of Duke University and the University of North Carolina at Chapel Hill. I appreciate the comments given after the lecture as well as specific suggestions from Arturo Escobar, Hugh Gusterson, and Krista Harper on drafts of the article, as well as the comments from the AA reviewers and editor Benjamin Blount.

1. As Oliver and Johnston (2000) have noted, the history of frame analysis extends beyond Goffman to an essay by Bateson (1972:177–193).
2. Of the half-dozen studies that Downey produced at this time on environmental activism, each of which is carefully crafted for a specific journal audience, I have chosen Downey 1988 because it was written for an anthropology journal and is thematically continuous with later work

discussed below. Also of relevance is Downey 1986, which contrasts the progress frame with those that emphasize the pollution of nature and either an unbalanced collectivity or domination.

3. The discussion draws on Gusterson's first book (1996); his second book (2004) is less focused on the relationship between weapons scientists and activists. One would also expect to find repertoires of genocide in social movement responses to disasters such as Chernobyl (Petryna 2002) and Bhopal (Fortun 2001). Those two ethnographies are not discussed here because the former does not focus on social movements and the latter focuses more on remediation through the legal system. Although imagery of genocide appears in some of the documents cited for the Bhopal case, the primary repertoire for activists appears to be compensation, a topic that could also be explored comparatively but is beyond the scope of this article.

4. Laetrile is a nontoxic chemotherapy that can be derived from a variety of foods. During the 1970s, a huge controversy erupted over the politics of its evaluation and its lack of availability in the United States.

5. Complementary therapies are used alongside conventional therapies, whereas alternative therapies are used in place of them.

6. Gusterson (2005) also explores the utilization of expertise by both activists and GM-food advocates.

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