

Radical Medicine: Embodiment and Contradiction of Scientific Literacy within Struggles for Social Justice

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Responses

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Introduction

This paper examines the structure of disciplinary knowledge in the service of social justice. Specifically it looks at forms of “science literacy” developed by medics organized to support protestors of militarization and corporate globalization. In doing so it problematizes school definitions of scientific literacy, especially as promoted in the current science standards. To do so, it contrasts the meanings of equity, social justice, and science in this community of medics with these same key works in the community of science educators. My purpose in doing so is to challenge school practices especially in the selection of knowledge and to begin to theorize new democratic forms of scientific literacy.

Theoretical streams feeding this river...

The most concrete target of this paper is the National Science Education Standards (NRC, 1996, abbreviated NSES), both in their selection of content and emphasis on inquiry as a medium for scientific literacy. My critique of the Standards draws on a wide variety of current social theorists, primarily associated with post-colonial/repatriated anthropology (Clifford, 1997). My general methodology can be characterized as “anthropology as cultural critique” (Marcus & Fischer, 1986). This involves challenging key concepts (in my case, science, science literacy, and its relationship to empowerment) by examining a case (the medics) that in its complexity challenges the assumptions embedded in such concepts. To understand the radical alternative that the medics embody, I will also draw on Bourdieu’s (1978/1972) concept of the habitus, i.e., culturally determined bodily dispositions. Such a concept is important to this study because school conceptions of literacy are tied closely with producing certain types of bodies both explicitly (in terms of dress and carriage) and internally (what Bourdieu calls the other senses: the sense of balance, aesthetics, justice, etc. 1984). I will also need to build upon a certain strand of postmodern thought that tries to challenge dichotomous thinking, to make sense of the complex and seemingly contradictory practices of the medics. This includes ideas of Thirdspace (Soja, 1996), cyborg discourse (Haraway, 1991), and heteroglossia (Bakhtin, 1990). Thirdspace refers to the crossing of imaginary and material space; cyborg theory challenges binaries of mechanical and natural; and heteroglossia, perhaps the most important analytic idea for this research, complicates understandings of language by seeing it as intrinsically polymorphous in regards to register, metaphor, voice, and linguistic origin.

This paper also draws heavily on earlier critiques of science literacy and science education by Roth and Barton (2004) and Helms (1995), and others who bring social justice perspectives to bear on in school science practices. My work differs from theirs in its focus on a specific social justice movement and the employment of science literacy practices within it. It challenges this year’s theme by focusing on what I call

“down stream” practices, i.e., the transformation (and rejection) of school knowledge after leaving sites of official disciplinary education. This project challenges the idea that the topography of knowledge is a “circle” rather than contesting networks; it rejects the relationship of research to school practice as some closed geometric figure encompassing only the denizen of schools and their researchers. Instead, I look outside that set of actors as a necessary part of a radical reconceptualization of institutional education.

This move of seeking outside the corpus of institutional schooling owes much to the double referents of STS: science technology studies (including the social anthropology of science) and science-technology-and-society, a curricular movement from the 1970s to teach science in the context of its socially networked relations. Early STS curricula emphasized examining ecological and ethical side effects of science (pollution, cloning, etc.). More recently, and better informed by the increasingly sophisticated social and cultural studies of science, STS curricula have tried to problematize science itself i.e., not just to question its effects, but to trouble the cosmological and epistemological practices that characterize science itself (Barton, 1998; Helms, 1995; Weinstein, 2002, 2008). Part of this move, following work like Traweek’s reflections on the science wars (1996), has been to pluralize science: view science itself as complex, multifaceted, imbedded in social lives, and contested (Roth & Barton, 2004).

This attempt to conceptualize science as a public engagement owes much to Hurd’s conception of “scientific literacy” (DeBoer, 1991). Originally, the phrase distinguished a curriculum geared towards citizenship rather than professional scientific training, which marked so much of post-Sputnik science education in the 1960s. In recent years the idea of science literacy has reversed, moving from an identification of the skills needed by citizens to be engaged in a scientific world to a more narrow idea of problem solving like a professional scientist. The use of the term scientific literacy as anchored in inquiry reinforces this inversion. Literacy can be seen as a form of producing a particular habitus. To read and to write is to have a certain bodily disposition, to carry oneself in certain ways, and emotionally to value certain things over others (writing over speech). In the National Science Standards equity has come to mean that such a habitus should be adopted (and implicitly imposed) on all students, regardless of gender, race, interest in science, etc. (Eisenhart, Finkel, & Marion, 1996; Rodriguez, 1997) Difference is rendered merely as a problem to be overcome in achieving uniform ends.

This vision of science literacy held by educators is incorporated in schools; a location I describe as upstream. In current models of education; values, skills, dispositions inculcated upstream are envisioned as being purposeful in downstream worlds where they are actualized in concrete activities. My attention for the bulk of this paper moves downstream, into people’s later lives to examine intersections between science and struggles for social justice and civic responsibility.

Methods and Modes of Inquiry

This paper is primarily anthropological in the sense of cultural critique as used by scholars such as Rosaldo (1989) and Marcus (1986), and is specifically within the anthropology of science portion of that literature (Dumit, 2006; Fortun, 2001; Martin, 1998). My method is a mix of discourse analysis, drawing on the long semiological tradition in the anthropological field, and ethnographic field work with a street medic collective. My fieldwork has consisted of approximately 15 hours of interviews with the members of what I pseudonymously call the Seaview Street Medic Collective (SSMC)¹ and participation in a 20 hour medic training.

¹ All names of those involved with and places associated with the SSMC have been changed. The only exception is Dr. Ron “Doc” Rosen who was a well known medic leader and activist in the Medical Committee for Human Rights and who passed away July 20, 2007. He was not a member of SSMC, but was their first trainer.

To move beyond the specific community I am studying, I draw on a wide variety of texts regarding street medics more generally. These include websites, zines, operations manuals, and other forms of communication that inform and document the activities of radical medics. These texts need to be read ethnographically, i.e., within community life. My larger project examines the forms of language in those texts, and how those languages work to create and further what Fish (1980) has called “interpretive communities.” The intention here is to understand the values and cosmology of the communities as well as their practices—i.e., what do they actually do to embody this cosmology? I also draw on others’ historical research as well as journalistic and first hand accounts of being street medics.

Medic! A Science of Love and Rage

Deep Roots; Hard Routes

This project began with a search for texts that embodied a counter-habitus to those I saw schools trying to produce. The character of this counter-embodiment I summarized in a slogan popular in anarchist political circles: “love and rage.” It is this dual quality that I searched for in zine archives, web sites, and other publications, and that seemed to me to be the habitus of critical practices in and out of education. If liberal or ameliorist approaches to education accepted flows of capital and bodies that mark current professional technoscientific practices, I sought alternatives that sought to re-root and re-route technoscience in directions that were explicitly democratic: i.e., perpetually worried about the dispossessed, the marginalized, and the excluded and continuously resisted the violences that accompany and produce such disenfranchisement (for a more detailed examination of what this politics means and how it differs from liberal practices vis-à-vis science see Elam & Bertilsson, 2003). Such alternatives needed to be deeply ambivalent: loving the utopian possibilities that technoscience offers and enraged at extant structures connected to science that produced marginalization, structural violence, and cultural, social, and economic poverty (Farmer, 2003). Models of this autre-scientific habitus included the guinea pig activists I’ve written about for many years now. It also included patient activists fighting cancer personally but also politically: identifying corporate practice with metastasized cellular biology. Finally, I have identified such a habitus in the community of medics, called street medics, organized to help protesters resist corporate globalization as advocated by groups like the G8 (now G20), WTO, and NAFTA, i.e., visions and versions of globalization that liberated capital from national borders while constraining and criminalizing the mobility of labor and restricting public engagement on its issues. This paper focuses exclusively on this last group of downstream medical practitioners.

The street medicine movement was in part a revival of an earlier movement of radical doctors and medical practitioners (nurses, EMTs, alternative medicine practitioners) from the civil rights movement of the 1950s and 1960s. This earlier movement centered around the Medical Committee for Human Rights (MCHR). The MCHR organized to provide medicine for the major civil rights demonstrations

Growing out of the Medical Committee for Civil Rights which organized the medical contingent of the March on Washington in 1963, the Medical Committee for Human Rights (MCHR) was formed in June of 1964 to support Freedom Summer. More than 100 northern doctors, nurses, psychologists, and other health professionals, — Black and white — came to Mississippi. Though MCHR volunteers were not licensed to practice professionally in Mississippi, they could offer emergency first-aid anywhere and anytime to civil rights workers, community activists, and summer volunteers. Working without pay, they cared for wounded protesters and victims of police and Klan violence, assisted the ill, visited jailed demonstrators, and provided a medical presence in Black communities, some of which had never seen a doctor. They established and staffed health information and pre-natal programs in many Black communities. Appalled at the separate and

unequal care provided to Blacks by Mississippi's segregated system, they soon involved themselves in political struggles to open up and improve Mississippi's health care system for all.

After Freedom Summer, MCHR continued working in Mississippi and expanded its operations into Alabama and Louisiana. Like battlefield medics, with their canvas medicine-bags marked with a red cross slung over their shoulder, they were easy to spot in Selma, on the March to Montgomery, and in the hellish violence of Bogalusa. They marched side by side with the protesters, set up their emergency clinics in Black churches, taught community health and pre-natal classes, and fought the white health system to end its segregationist policies. And just like the organizers in SNCC, SCLC, and CORE, the courageous sisters and brothers of the MCHR were targets for arrest and Klan violence. (CRMVET, 2004)

Practices that define current street medicine were largely established in this first wave of the medical movement: the adoption of battle field medicine protocols and logics of practice, the specific concern with the development of "chemical warfare" protocols (to treat tear gas and pepper spray), the interest and theorization of medicine both in the protest site and in a broader social context, and the eclectic training of its practitioners in both allopathic and other medical traditions.

While MCHR served to support protesters in the field of struggle, their vision was much broader. As Malika McCay notes in her history of the Boston chapter, "Whether it was in the realms of women's health, the official use of chemical weaponry such as mace, or insurance and hospital policies, Boston MCHR struggled with maintaining a principled and radical vision of health and the delivery of care, and simultaneously with keeping an eye on changes happening on the legislative level" (McCay, 2007). While the current street medic movement shares a "radical vision," their primary concern has been with the direct provision of care to protestors.

The MCHR ceased to function as a coherent organization in the early 1980s. Its leaders remained activists, however (Dittmer, 2009a). When police returned to using violent techniques in the late 1990s to quell demonstrations, medics from the MCHR were brought in to train a new generation. One medic in particular, Ron "Doc" Rosen, took on a prominent role as a trainer, especially after the Battle in Seattle. The "Battle," as it was described by the media, refers to the very confrontational encounters with police at the time of the 1999 WTO Ministerial Meeting in Seattle, Washington. The police violence, including renewed use of tear gas, lead medic support groups to increase their sophistication and in subsequent protests. Doc Rosen, a doctor of Chinese medicine, had served as a medic in signature struggles of the civil and anti-war movements of the 1960s including the March on Selma, The Chicago Democratic Convention of 1968, and the Occupation of Wounded Knee. He remained active in social struggles, served as a medic in Seattle 1999, and provided medical leadership in demonstrations at the 2003 Free Trade Area of the America's summit in Miami, FL, which is seen by the medics as a particularly bloody and repressive encounter between police and demonstrators:

While there have been injuries at nearly every protest, most medics single out the November 2003 Free Trade Area of the Americas summit in Miami as a particularly egregious example of police violence. Human rights groups condemned Miami police for what they regarded as excessive violence – including shooting protesters with rubber bullets at point-blank range and bludgeoning protesters with long batons as they tried to flee. According to Amnesty International, Miami police appear to have deliberately targeted the medics as they were treating the wounded. John Timoney, the Miami chief of police who coordinated security for the FTAA summit, served as a consultant for DNC security. (O'Carroll, 2004)

The red and black crosses worn by medics, have often identified by the medics themselves as serving as literal targets. Increasingly, medics have had to "run" (serve) "unmarked."

A second set of fronts of medical action has been the Republican and Democratic National Conventions, both in 2004 and 2008. Both were sites of mass protests, largely against the occupation of Iraq, and general Military-Industrial policies shared by both parties. Again, police over reaction characterized the demonstrations; medics were specifically targeted and arrested—the Republican conventions of both New York and St. Paul, MN were particularly challenging with medics facing mass arrest.

In their own historical narratives, collectives or local networks of medics appeared in a wide variety of cities at approximately the same time in the late 1990s as coordination of the demonstrations became more sophisticated around the resistance to globalized capital. Ultimately these local collectives of medical support personnel started networking internationally and creating explicit codes to help navigate differences in experience, skill, and paradigms at the protest sites.

The politics of the medic movement is complex in that there are issues of medical politics (e.g., over which protocols and which medical traditions to follow), of political economy, and of political tactics. There are also plural medical roles and social structures that medics act within, the two most salient being the roles of collective medics and affinity group medics. The community that I am ethnographically researching is the former; though many if not most of the people they have trained land up being the latter. Collective medics work together to create a medic community, and it means that their primary focus is on the delivery of medicine in the places where street medicine is necessary (see next section). Because their primary commitment, at least in theory, is to each other and the delivery of care, there is by necessity a trans-politics. The Seaview Street Medic Collective (SSMC) I have been studying state explicitly that they are “not political.” For a variety of historical reasons this embrace of “non political” is very important to them. The practical meaning of the phrase is that they will serve any protester, regardless of their politics; and many would also provide medical aid to the police if they needed it, even though one of their primary activities is helping people resist the police. In this latter sense they are extremely political. They came into being to enable radical politics in the broadest sense of the word (not just at protests but in a wide variety of venues). As the SSMC core group of medics explained in this interchange:

Bonnie: But if you look at like videos from the last Seaview protest you see the people who have the whites around their eyes and running down. You see multiple lines they're different colors. That's because they were eye washed multiple times from being pepper sprayed multiple times. And it's amazing when I watched the news after that how many people I saw. I cured that guy! I cured that guy! (laughs)

Amy: Yeah it had a lot to do with confidence mostly I mean. We had power as a group in the May of 2006 protest because we were both there that whole time. It was like a week and a half, we sat on a curb. You feel confident because you're all together but you know something starts happening and you kind of lose it. And in the Anchor City protests you can tell that people were more together.

Carin: It's a way of taking back the power that they take away from you by using that force. It's our way of trying to not let that... (Interview 9/18/2008b, time index: 1338.17)

It is against a certain level of state violence that street medicine acts as a counter measure. The value of the medics work in their own eyes (and this same memory of the protesters with multiple streaks from multiple pepper spraying came up in several interviews with the core group—it was a key measure of their success), is that they re-enabled protesters to enter the fray with police, to return to a blockade of roads and pathways between the ports where troops landed and the military base near by.

In contrast to collective medics are the affinity medics who serve specific affinity groups. Affinity groups are, according to ACT-UP:

self-sufficient support systems of about 5 to 15 people. A number of affinity groups may work together toward a common goal in a large action [protest], or one affinity group might conceive of

and carry out an action on its own. Sometimes, affinity groups remain together over a long period of time, existing as political support and/or study groups, and only occasionally participating in actions...

...Affinity groups serve as a source of support and solidarity for their members. Feelings of being isolated or alienated from the movement, the crowd, or the world in general can be alleviated through the familiarity and trust which develops when an affinity group works and acts together...

Affinity groups form the basic decision-making bodies of mass actions. As long as they remain within the nonviolence guidelines, affinity groups are generally encouraged to develop any form of participation they choose. (Alach, ND)

Joined together by a shared politics; rooted primarily in anarchist theory (the term affinity group dates back to 19th century Spanish anarchists), affinity groups represent a critical social structure in anarchist politics and culture. Anarchism refers here to various decentralized, collective/egalitarian social movements, often embracing a Do-It-Yourself ethos or anti-expert/authoritarian (though not necessarily anti-expertise) and decentralized forms of socialism (Guérin, 1970). Affinity medics share the politics of their affinity groups and serve their group primarily if not exclusively. They are, in essence, freed of a lot of the obligations that the collective medics feel, i.e., to serve whoever needs help regardless of role (police/demonstrator) or whether or not they endorse the actions that lead to the injury.

In general, the medics tend to share the politics of the protesters themselves (and they are distinguished from “protesters” when “running” as medics; as medics they do not see themselves as protesters), which has been inflected by a resurgent anarchist politics—a different politics from the New Left, Marxist oriented politics of the MCHR in the 1960s and 1970s. This may in fact mark some of the arenas of politics that the current street medics seem to be disengaged from. The MCHR were active in creating legislation, gaining proxy votes in corporations they saw as pernicious, fighting for Black inclusion in the AMA, i.e., a variety of more ameliorative steps to address injustice tied to medicine. Anarchist politics tends to be more skeptical or even critical of such reform politics. The differences, however, may be also a matter of different expertise. While doctors and nurses play critical roles in the current street medicine movement, my sense is that they are a smaller part, and not necessarily playing the leadership roles, in the current movement. In the SSMC none of the core members are doctors or nurses, though there is at least one doctor whose assistance they draw upon.

A Geography of Street Medicine

For the current generation of street medics, their expertise is called upon in very specific geographic/cultural/legal zones. Street medics are active in areas where the police (or other authorities) have declared a “civil emergency,” as Isaac, one of my trainers at a street medic workshop explained. Civil emergencies, or “states of exception” as political philosopher Giorio Agamben has called them (2005), have become more frequent and even permanent features of neo-liberal governmentality. In the state of legislative power is shelved, limited, or dispensed with, and military and police action becomes the primary structure of power (Giroux, 2009; Ong, 2006). The current state of exception in the United States involves gradations of state power. In Guantanamo and in the agonistic protest zones that surround the conventions for corporate globalization (G8, IMF, etc.) in which the medics serve, the exception is total. In such areas establishment medical actors: EMTs, Red Cross, etc., cannot enter except by permission of the police. As the core medics of the SSMC explained

Carin: There’s a rule that they don’t have to, uh, medical personnel. I don’t know if they don’t have to or if they’re not even allowed to—

Amy: They’re not allowed to.

Carin: They're not allowed to enter an area that's considered unsafe, so if you're in the middle of a protest area where they're shooting off gas. It's considered unsafe and they will not send an ambulance in there.

Bonnie: And that's the difference between EMTs and civilian medics--street medics. We don't operate underneath the Geneva Code. We're not protected. The cops can shoot us, they can arrest us. But the reason they can do—that is because we go into zones they [the police] say are unsafe. (Interview 9/18/2008a, time code: 222)

Communities shattered by natural disasters also fall into this same legal classification, and street medics have often been the first providers of medical care in these uncivil places (DeRose, 2005). It should be noted, however, that the United States as a whole has been in a technical state of exception since the attacks on New York and D.C. on September 11, 2001, through George Bush's proclamation 7463, which has been extended twice by Barack Obama.

The actual training of the medics varies widely. While a few are doctors or nurses, most of the committed medics in the SSMC have at least Wilderness First Responder (WFR) training. Many others, however, have little more than a weekend (20 hour) workshop training provided by more experienced medics. (Some members of the collective are also serving in support—e.g. fundraising, carrying medical goods at protest—roles while waiting for training.) The SSMC places great reliance on two elements of these weekend trainings: the length of the trainings and the trainers themselves. Given that street medic trainings end with no certification, it is the word of mouth—verbal license of the trainers—that provides legitimacy. Core medics at the SSMC talked of calling trainers they knew to find the story of people who were claiming to be medics at protests.

Bonnie: There's no certification or anything, but we yeah we were all trained by Doc initially, and we really follow that code a lot more.

Amy: It is kind of a code; there is kind of like this national code of, like, let's say some medic shows up at the DNC and we're like "Who is this guy? Like, we've never seen him before" You know, he's like "Well I was trained by [trainer name] on this day this month—"

Carin: It's a small community.

Amy: Then you call up [the trainer] or somebody who knows [the trainer] and you say, "Hey, do you happen to know this guy or did you hold a training on this day where this guy could have been there?" and they're like, "well, yeah, I actually remember that guy, he's a little iffy but he should be good." You know, or something. You get a response. And so, it's tight knit enough where everybody kind of knows the code and can respond accordingly." (Interview 9-18-2008a, time code: 2023)

Reputation matters enormously to the medics both because they want to know that people claiming to be medics have competence and because they see their own reputations as frail and affected by problems created by people "running as medics." When bad care is given by any street medic, it is seen as reflecting on all street medics.

Most medics are basically operating as good Samaritans, and it is the Good Samaritan laws that protects them from legal action.² If medics have higher levels of training, legal liability increases.

Good Samaritan statutes are laws enacted by the various states that protect healthcare providers and other rescuers from being sued when they are giving emergency help to a victim provided the person uses reasonable, prudent guidelines for care using the resources they have available at the

² This was also true of the medics of the MCHR, who were Northerners, when they worked in the South supporting civil rights demonstrators. (Dittmer, 2009b)

time of the accident. Most states have enacted some form of Good Samaritan or Volunteer Protection law prohibiting a victim from suing a physician or other health care professional for injuries from a Good Samaritan act. To trigger the protection of such an act, several conditions must be satisfied: it must be a volunteer act, the person receiving the help must not object to being helped, and the actions of the rescuer must be a good-faith effort to help. (Medi-Smart, 2006)

Such protections are variable by state, and are rarely absolute. There is no guarantee even that meeting the above criteria will prevent legal action, and recently the California Supreme Court declared that good Samaritans can be sued (Williams, 2008).

Given the limited legal framework in which street medics are allowed to operate, much of the training works towards operating within the conditions of the law. Much of the practice in trainings consists getting permission to proceed with care, for instance, one of the criteria listed above necessary for invocation of the statute.

The idea of a geography of civil disturbance does not just describe the circumscribed domain where the street medics practice. It also describes the historical situation of the Seaview Street Medic Collective who I have been studying. Their dilemma is one of specific geographies and civil distress. The SSMC are composed mostly of students and recent graduates of the explicitly progressive, liberal arts Oceanside College located in Seaview. Their activism was fostered in the context of the U.S. occupation of Iraq. A nearby army base, Fort Bush, has served as a major base for troops moving to Iraq. Supplies and materiel arriving at or leaving Fort Bush by sea have had to land either at Seaview or the industrial port of Anchor City to the south.

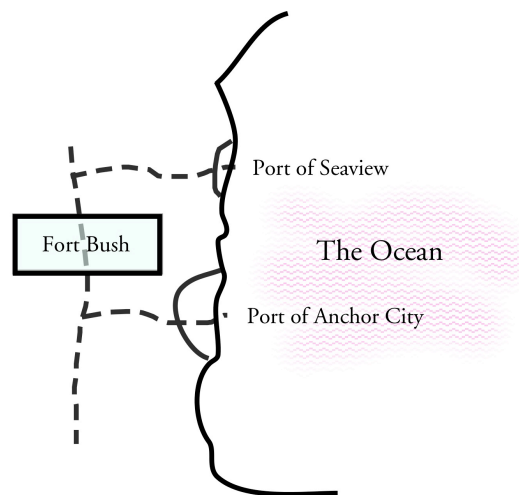


Figure 1: Map of Seaview Region

Students initially organized to stop the movement of military supplies through their city. In May, 2006, student protesters met violent response by the police including the use of chemical weapons when they tried to blockade the road out of the port. Amy, who later became a founding organizer of the SSMC, was in charge of organizing a “medic” affinity group within the larger group organizing the protests, Seaview Anti-military Action (SAMA)

Amy: So the Seaview Port protest in May 2006

Carin: From that SAMA formed and we were both a part of SAMA.

Amy: And I wasn't. I was in charge of the medic affinity group within that organization.

Carin: After the protest happened they formed an affinity group of people that were going basically—not be medics but they were going to focus on...

Amy: We were looking for places to put blankets and ways to get water quick and basically just trying to kind of

Me: Life support more than...

Amy: Very life support. The medicine that we saw at that protest in May 2006 was very limited I guess, you know the ambulance or fire trucks would come and they'd be like here's a bottle of water, like pour it on you. Like, we don't really know what to do. We're not going to really do much. (Interview 9/18/2008a, time index: 135.94)

It was this inadequacy in the face of police over reaction to students and town people blocking streets that lead to an intensive effort to bring Doc Rosen, who had been a leader in the Medical Committee for Human Rights, to train them to provide a higher level of care to protesters. Those months provided them with a painful lesson in the politics of coalitions. Eighth months after the protest and after three months of intensively working to arrange the training, the coalition that had organized food, location, and support for Doc Rosen, fell apart. In one week, a core group of five Oceanside College Students involved with SAMA and its medic group relocated the training site, organized food, and, critically, financial support for both Doc Rosen and other street medic leader/trainers.

Because both Seaview and Anchor City had marine landing sites, both became the locations of on going protests, with varying degrees of violent response from the civilian police. In essence, the location of Seaview near Fort Bush created a situation that required ongoing medical support for protesters. The SSMC ended up providing critical logistical and medical support continuously for protests in both ports.

Street Medic Practice

Street medics are called upon to treat a wide variety of medical issues in the field. First, they are called upon to deal with general problems such as dehydration, exhaustion, allergic reactions, cuts and burns, and hypothermia. Since most of the time protests are relatively peaceful, the medics are mostly there just to provide resources (blankets, water, shelter) for protesters in need. A second domain of care distinguishes street medics from other emergency responders, however; and that is expertise in dealing with various weapons that are used against the demonstrators by police or national guard, ranging from clubs, rubber bullets, tear gas and pepper spray, to newer sonic and electro-magnetic wave weapons. Expertise in dealing with gas and pepper spray, called collectively "chemical weapons" by the street medics, has been one of the defining skills of street medics. Treating chemical weapons is, in the words of anthropologist David Hess, a techno-totem, a form of technoscience that comes to be highly invested with meaning by a community and ultimately becomes symbolic of them. In my own training, more time was spent learning to treat chemical weapons than any other issue, with practice repeatedly giving and receiving eyewashes. As far back as the MCHR, the skill in treating chemical weapons defined street medics' expertise (Manriquez, ND).

In addition to providing medical care at protest sites to which they are invited (for the SSMC these have included protests over homeless encampments, anti-military protests—their original *raison d'être*, and protests over the arrest of immigrants), the medics provide trainings. There are two types of trainings that are offered by the members of the collective. The first are the trainings for new street medics. These consist of about 20 hours spread over 2-3 days and cover basic and standardized protocols and social scripts³ for delivering first responder care such as bandaging, dealing with burns, stress, and dehydration,

³ First response care consists of highly scripted ways of initiating care of patients, assessing hurt, and determining response. These scripts are boiled down to short acronyms for easy memorization: ABC (air, breathing, circulation), LOC (levels of consciousness), and CSM (circulation, sensation, motion). None of these scripts and protocols are peculiar to street medics; they are commonly shared among first responders.

communication with EMTs and other medical personnel, and importantly, treating tear gas and pepper spray (among many other medical traumas that can occur at protests). Typically 20-30 potential medics are trained by a team of several experienced medics. The second type of trainings are one evening workshops for protesters on how to avoid injuries in confrontations with police. At these, SSMC collective members explicitly tell protesters how to dress, what to bring, what not to bring, how to handle toxic materials, how to be conscious of their surroundings, and after care, i.e., how to deal with the toxicity of chemical exposure and stress in the long term. In taking on this role, the SSMC has moved beyond merely servicing the wounded at demonstrations, and in an anticipatory manor, have raised the capacity of the community to avoid medical incidents and resist police violence. These workshops have been in very high demand.

Perhaps most remarkable, given the meager resources of the street medics and the anarchist community as a whole, was that novel science emerged from the Street Medic community. A now disbanded collective of street medics from Portland Oregon, named the Black Cross, ran randomized clinical trials to find effective treatments of tear gas and pepper spray on both the skin and the eyes. Testing a long list of medications that medics had thought had worked against chemical weapons, the collective eliminated many folk remedies, and established a model for best care. As they explain on their website,

Just after we formed Black Cross, maybe our first or second meeting, someone brought up the fact that no one really knew what helped to make people feel better after they'd been pepper sprayed. It became our first of many large and over-ambitious projects-- to do some version of a clinical trial. We wanted to find out, in an evidence-based fashion, what, of the 100's of things that were flying around the rumor mill, worked to make people feel better, and what didn't.

We started by searching the medical literature, and polling ourselves and our demo-experienced friends in the US and abroad, to get a list of possible remedies. We then looked at the list and separated it into things that we wanted to try sometime, and things that seemed silly, impractical or possibly dangerous. We wanted something that was ideally cheap, easy to buy and use and totally non-toxic. We had a fair amount of debate about how scientific we'd be in designing the trial. Some of us are from traditional scientific backgrounds and wanted to follow a traditional model—others of us were wary of anything established and wanted to break away and create our own model. Since we began the trials, we've moved closer towards traditional scientific models. This move was made perhaps in part out of a lack of ingenuity. But also it was made because it became clear to us that if we were going to subject our friends to fairly serious levels of pain, we wanted the data that came from that pain to be as useful as possible. (Black Cross Health Collective, 2003b)

Local activists came and got fed and participated first in skin tests and then in eye tests over the course of about a year. Through their trials, they identified most “treatments” as ineffective, and were able to identify clearly effective treatments:

What's worked well and is still in the running is:

- liquid antacid (ie Maalox)- seems to work only on eyes - not on skin. Mineral oil followed by alcohol- only on skin- never in the eyes
- hairdryer -from the Scottish literature works quite well (though is obviously impractical)
- Chinese burn cream- has worked on skin for some not all—not for use in the eyes
(Black Cross Health Collective, 2003b)

One treatment at issue was a working protocol that had been pioneered by the MCHR and was later adopted by the military called MOFIBA (Mineral Oil followed immediately by Alcohol) (Wikipedia, 2008). However, as another medic website noted,

Unfortunately, MOFIBA can be difficult to do correctly in the chaos of a protest. It also necessitates carrying multiple bottles that can easily get mixed up (bottles should be well marked or color-coded).

People are always trying new remedies in the hope of coming up with something better.
(Bay Area Radical Health Collective, 2002)

Despite this, the Black Cross trials cautiously endorsed MOfibA noting “oil followed by alcohol was clearly superior to the rest of the combinations.” The Black Cross also confirmed the use of LAW (Liquid Antacid and Water) as a treatment for chemical exposure in the eyes. As BAHRC (Bay Area Radical Health Collective) website notes

The most effective remedy for eyes exposed to tear gas or pepper spray seems to be a mixture of liquid antacid and water. Street medics call this LAW. Use plain, unflavored Maalox, Mylanta, or a generic equivalent (some people report that flavored antacid stings). Make a 1:1 (50/50) mixture if using regular strength; use more water if using extra-strength. Shake the solution before you use it, since the antacid will settle at the bottom. LAW is cloudy and can temporarily cause blurred vision.
(Bay Area Radical Health Collective, 2002)

Many attendees at the training I observed (Fall 2008), asked about LAW. Our trainers were against LAW, the Black Cross’s recommended treatment, however, and explained in detail how different batches of the same supposedly useful antacid had been toxic. SSMC members also noted in later discussions that many medics simply prepared the LAW solution wrong. The trainers stressed the use of plain water eyewashes both to avoid confusion and the greater harm caused by the wrong treatments. While LAW remains widely used, the emphasis on plain water points to conflicts between clinical science and field experience that I will return to shortly.

The Black Cross’ clinical trials represent a particularly notable moment in the scientific literacy of the street medic movement. In its effort to master skills that distinguished—in their own narratives—the practice of street medicine from others, the medics moved from merely treating patients with established protocols, and sought to “traditionally scientifically” investigate the knowledge circulating within the community. In so many ways the street medics in this moment might be poster children for what downstream scientific literacy should/could look like: communities using orthodox (what the Black Cross called “traditional”) methods of research to solve the technical problems they face. In their design of the clinical trials, the medics embodied exactly those skills involving “inquiry” that the National Science Education Standards promote: measurement, controlled experimental design, replication, etc. (NRC, 1996) This is certainly a case of “science-for-the-people” in the tradition of scientists using their skills to solve community problems (Moore, 2008).

At the same time, there are hints within the Black Cross testimonial that point to other medical impulses within the street medic community. The idea that their turn towards orthodox science was an effect of their lack of “ingenuity” clearly indexes these “other” values that the community embraces. Science, in this narrative, requires justification of its legitimacy. A clearer picture of this counter value is made clear examining the Athens Manifesto, a working protocol for coordination of care by street medics. Crafted at a meeting of medics in Athens Greece, the manifesto lays out in various levels of generality how medics should work together. The document is laid out with sections on rights, responsibilities and proposals; under each are a number of bullet points. Some of the bullets urge medics to take responsibility for their own actions, ideologies and oppressive acts; others urge humility with non-medic activists; one proposal urges specific steps medics need to take to function effectively: “A backup clinic and set of supplies should exist for every major action. Location and decision to use these should be on a need-to-know basis among folks trusted by all sectors of the movement” (Athens Manifesto, 2001).

Challenging the “traditional” medical model is made explicit in the Manifesto in one of the “Rights” planks which states that “All disciplines (Herbalists, Witches, Allopathic, Homeopathic, Naturopathic, etc.) must be honored and respected” (Athens Manifesto, 2001). Here technomedicine (allopathic medicine) is one practice among many. Rather than being given a priority, the biomedical tradition, is explicitly leveled; equated with a wide variety of contradicting traditions.

Part of this leveling has to be seen as a prioritizing of effective collective action over technical knowledge. The problem is made explicit in the opening section of the Manifesto which states

Oppressive behavior has happened in trainings and on the streets and in the clinics coming from action medical/1st Aid people. We want to prevent it from happening again. You can be a neurosurgeon or the most experienced trainer around, but if you don't know how to facilitate or are oppressive in your behavior, you are doing more harm than good. (Athens Manifesto, 2001)

The ability to "facilitate" and be anti-oppressive trumps neurosurgery. Cooperation, consensus, and collective politics are more important than mere technical know-how in the value scheme of the medics.

In essence, and against the vision of scientific literacy embodied in the NSES, is vision of literacy that involves heterodoxy, or medical heteroglossia; the ability to speak compellingly in multiple medical tongues. Medical heteroglossia embodies an anarchist ideal of individual respect and rejection of hierarchy and impersonal authority. At the same time it deeply challenges the very cosmology that science education and science literacy is supposed to designate, in which technoscience represents a better, more secure form of knowledge than other treatments of biology, materiality, and nature.

The heresy in this was captured well by anthropologist Sharon Traweek in her meditation on the way that monotheistic logics underpin scientific imagination

The other singularities have gone... European arts no longer set the world standard... Some have just begun to notice that the same has happened with science... What is the name of that obsession for singularity and unity, for an order that does not divide, for a world of symbiotic union, for a world that begins and ends with an indissoluble ego? Is it like the rage that some felt against a heliocentric universe or the rage that others felt against a Darwinian world? Why should there be only one way to think well, only one way to have fun with our minds? Why is mental monogamy required? Are we still fighting about monotheism...? (Traweek, 1996, p. 137)

The medics paradigmatic polytheism is the context for the embarrassed/apologetic tone in Black Cross's narrative of the clinical trials. They, in essence, and against explicitly agreed upon codes, reasserted a higher status of allopathic medicine.

Medical heteroglossia has been very much evidenced in my own training with SSMC and my interviews with collective members. At one level the training embodied the whole history of allopathic care; do no harm, triage, testing levels of consciousness, analysis of circulation (bleeding), and a variety of bandages, splints, and swathes all would have been familiar to traditionally trained EMTs. There was also regular reassertion about the limits of care we could provide with our training compared to that of a doctor. Hierarchies of both experience, but also of credentialing, were repeatedly emphasized. At the same time, various herbal remedies were brought up (some endorsed, some rejected) and one of our trainers provided several Chinese medical protocols for different problems including burns and asthma. These were not just taught mechanically, but some of the chi based principles were explained to give causal legitimacy to the procedures. Doc Rosen had provided a similar training to the core group in 2006:

Amy: But then [Doc] also with his knowledge of like acupuncture

Carin: Yeah we did a lot of acupuncture [actually acupressure] and

Bonnie: Chinese herbs

Amy: We did a little thing like Saturday night. Chinese herbs. He went over a lot of that stuff like slightly outside the training, but it was still, some people went to that as well.

Carin: And then very specific like emergency stuff like, for example, he taught me the acupuncture point for asthma and for heat exhaustion

Bonnie: And then there was the anxiety one and--it was really great (Interview 9/18/2008b; time index: 62.05)

There are three possible reasons for the importance of Chinese and herbal medicine in street medic practice. First, such medicines are cheaper and therefore more accessible to the poor. Second, because Chinese medicine is unregulated it allows unlicensed medics to exercise a higher level of practice and authority than they would if only limited to allopathic practice, and finally, such medicines are oppositional to allopathic practice which is itself enmeshed in systems of power and oppression. As the Black Cross medics note

We believe that health care is political. The kind of care we do or don't receive, where and how we receive that care, who provides that care, who has access to training to provide care, and what kinds of trainings are smiled or frowned upon, all involve inherently political issues. We believe the system needs to be changed... the health care system right along with all the others.

(Black Cross Health Collective, 2003a)

Critically, the use of non-allopathic medicine in the eyes of the core group seemed to make their trainings "real." For instance, when explaining the differences in the three different medic trainings that the SSMC had organized, the core group explained

Carin : And the other, the first the ones with Isaac [one of the trainers] and those guys, we do a lot more like uh, uh like natural medicine. They go over homeopathic medicine; they go over acupressure.

Amy: (At same time) acupressure

Carin: They go over basic Chinese medicine like just like really, really basic things, uhm, which I appreciate a lot because it ends up feeling a little bit like theirs end up feeling less like uh first aid training and a little more *real* to what you're dealing with. (Interview 11/10/2008c1, time code: 184.61, emphasis mine)

The "real" here references more than just the Chinese medicine. It includes the simulations that Isaac and his co-trainers created involving explosions and fake tear gas as well as discussion of weapons and pretty horrifying tales from the field. But the practice of a more extensive, if alternative, medicine is clearly part of that reality. Importantly, medicine (i.e., the practices of being a medic) is distinguished here from first aid—medical practices that are more superficial, or even useless, as in the case of CPR. Chinese medicine (as well as herbal treatments), at least to Carin, seems to provide, again, in conjunction with other elements, some transcendence from the category of first aid.

Empiricist Medicine as a Boundary Project

The trajectory of the Black Cross experiments towards allopathic, empiricist medicine in many ways resembles the path Epstein describes of AIDS activists who started with challenging technoscientific, clinical medicine and ended by adopting the language and logics of it (Epstein, 1996). In both cases, "traditional" (allopathic) medicine was seen as the safest, most reliable, and critically, most "useful" approach. As the Black Cross explained, "But also it was made because it became clear to us that if we were going to subject our friends to fairly serious levels of pain, we wanted the data that came from that pain to be as *useful* as possible" (Black Cross Health Collective, 2003b, emphasis mine).

It should be noted that the medics were selective in the part of the allopathic tradition that they embraced. It was not the ontology (cosmology) of allopathy: germs, viruses, and prions that concerned them—though they do worry about such things—in the trials. Instead, it was the methodology of science that they embraced, and this methodology could serve as, what Joan Fujimura (1992) calls, a "standardized package," i.e., a collection of "boundary objects" (paradigm spanning material-semiotic actors) and methods that allow communication and even joint projects among witches, allopathic medics, herbalists, and homeopaths. The randomized trial methodology acted as such an intermediary precisely because it was

neutral about etiology, cosmology, cause and effect, and other details on which different medical paradigms might disagree. It was the empiricist element of technoscience that could be shared across medical languages and traditions, not its content. It's pragmatic orientation empties medicine of bioscience and reduces science to determinations of effective or ineffective.

The embrace of allopathy by the medics is ephemeral. The operating mode seems to be medical heteroglossia rather than an embrace of a specific medical paradigm. As such, the empirical medicine (aka "evidence based") adopted by the medics needs to be theorized not as a stable "standardized package" but a highly contingent one: what I would propose be thought of as a "boundary project," a contingent and temporary acceptance of a Fujimura style package, which is then reappropriated into different systems. The package is, as it were, dismantled. For example, there is no evidence of medics either reproducing the Black Cross experiment or extending it to other street medical problems (TASER removal, for instance).

Allopathy offered a temporary, commonplace to solve a critical medical problem. However, in the moment of the boundary project itself, the medics have to be understood as having in essence "scienced up" their critical practices. After all, empiricism is not cosmologically neutral. Rather, it is a cosmological orientation that involves specific philosophical commitments. For example, empiricism assumes that data precedes theory (rejection of the theory-ladenness of data) and that the effects of treatment are purely material. There is also, an assumption that knowledge flows out of the lab and into the field: truth (best practice) is determined in the clinic and then implemented by others. But such assumptions are actually problematized by the community of street medics themselves. It is, after all, important to note that while the Black Cross medics may *in theory* have found the most effective treatments for chemical weapons (MOfibA and LAW), *in practice*, clean water has proved to be the safer alternative for my trainers—at least with us novices—who were well aware of the Black Cross trials.

Conclusions: Science Literacy and Social Justice

To understand what scientific literacy means for projects of social justice, I want to return again to the idea of literacy as a habitus. The scientific literate imagined by the National Science Education Standards is a person disposed to conceptualize problems as a professional scientist would. He, she, or it would delineate controlled and manipulated variables; would reproduce results; would test against well-defined hypotheses. Science education, in this paradigm, is about inscribing such dispositions in the student body. Social justice is actually incorporated in this framework in the call for a "science education for all students." What this means practically, however, is that all students regardless of race, gender, or interest should be similarly inscribed. The Standards posit a universalizing and homogenizing discourse of science literacy. Rodriguez (1997) and Eisenhart et al. (1996) have already problematized this vision over ten years ago, and yet *the Standards* remain the benchmark for classroom practice and state policy.

This homogenizing vision stands in dramatic contrast with that of the street medics who choose working across huge epistemological differences, not merely as a politically pragmatic strategy, but as a living out or performance of their utopian dreams. The embrace of multiple contradicting traditions as evidenced by both the Athens Manifesto and the outlines that street medic trainers follow represent an alternate science literacy. Importantly these literacy practices, however undermined by contingent and reluctant turns to allopathic medicine as a part of boundary projects, represent a material living out of slogans we in science education often give voice to: embrace of difference, multiculturalism, and meeting individuals in their own needs and languages. Given that movements committed to egalitarian social transformation are marked by cultural, historical, and political difference, "science for all" cannot be "science for social justice," which is not to deny the powerful and sophisticated practices and models that mark allopathic medicine and technoscience.

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