BECOMING A WEAPONS SCIENTIST: SYLVIA AND ME

by Hugh Gusterson

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Introduction.

This paper is about transitions, transformations, and intersections. More specifically, it is about the charged intersection between my own life and that of a key subject in my fieldwork, Sylvia, at a moment when we were both undergoing a crucial process of transition and apprenticeship in our own professional lives.

Sylvia, who is my age, had earned a Ph.D. in physics from MIT. Although she had yet to design a nuclear device when I first met her, she was in the process of mastering her trade and joining the tiny and mysterious elite within the Lawrence Livermore Laboratory by becoming a nuclear warhead designer. I had recently been an anti-nuclear activist with the Nuclear Weapons Freeze Campaign in San Francisco, an organization dedicated to the termination of the Livermore Laboratory's principal mission. By the time I met Sylvia I had completed coursework in graduate school, ceased my work on behalf of the Nuclear Freeze, and was attempting to master my new trade as an anthropologist and to earn my own Ph.D. by studying Sylvia and her colleagues rather than the peasants, nomads, and slum-dwellers who are more customary targets of the anthropologist's exoticizing gaze. Although I did not know it at the time, my pursuit of Sylvia and her colleagues would eventually lead me, in my own professional transition, away from Livermore to Sylvia's alma mater, MIT.

Thus ran our lives, then, both parallel and opposed. At a moment when anthropologists are reflexively questioning the grounds of cultural knowledge and the established canons of ethnographic writing, developing a mode of analysis that Donna Haraway (1988) has called "situated knowledge," I would like to speak here about Sylvia's world not only in conventional ethnographic terms but also, in part, as an entity that has materialized in my writing in terms of its refraction through the prism of symmetries and contrasts between our two lives. But first, let me tell you about Sylvia.

A Typical Weapons Scientist?

Looking back through my fieldnotes, I find these scattered remarks about Sylvia written after our first encounter:

> Sylvia has worked at the lab for about two years. She is 30 and lives in a suburban house on her own except for a huge golden labrador... On the phone I was struck by her openness and friendliness. The interview was fairly short because she gets self-conscious talking at great length and soon trails off in embarrassed laughter... Before the interview she asked me to give her some suggestions for reading in the history of sociology... At the end of the interview she peppered me with questions about the protestors. Why do they do what they do? What do they think about the Russians? Do they know anything about science?

After Sylvia and I had got to know one another better she once said jokingly to me, "I think of myself as a six-feet-tall, blond, blue-eyed male." In fact she is rather shorter, dark-haired, dark-eyed, and very Japanese-American. She is, to my knowledge, the only non-white member of the Laboratory's elite cadre of warhead designers. Having lived for a year in Japan, Sylvia speaks Japanese and says she identifies quite strongly with her Japanese ancestry. During the Second World War her mother lived in Japan and her father, who is now a successful engineer, was put in an internment camp by the U.S. Government. On the day the first atomic bomb was dropped her aunt was taking her grandfather to Hiroshima, and she sustained a high enough dose of radiation that she developed radiation sickness, though she did survive and now lives in California. During one of our conversations Sylvia recounted for me her aunt's experience that day in 1945, as it had been told to her by her aunt herself, complete with a horrifyingly powerful image of the aunt standing on a bridge on the edge of Hiroshima looking down into a river choked with corpses and red with blood. How does your family feel about your nuclear weapons work, I ask. "I think they're against it," she says quietly. She adds, "they have this unspoken way of expressing themselves." Like the other Japanese-American scientist I knew at the Lab -- a weapons engineer who had relatives bombed at Nagasaki -- Sylvia, who doubts that the Americans would have dropped the atomic bomb on Europeans, says the U.S. Government had a racist attitude towards the Japanese.

When I first met Sylvia I was utterly bewildered that any one whose aunt was bombed at Hiroshima could now earn a living by designing nuclear weapons. However, such an attitude on my part preempted the fundamental question in regard to nuclear weapons -- the basic question at stake in my fieldwork -- namely whether nuclear weapons protect their bearers from danger or are themselves the danger from which we need to be protected. As someone whose own evolution into an anti-nuclear activist in my early 20s was subjectively associated with a sense of breaking through numbness and denial about the destructive capability of these weapons, for me any sense as intimate as Sylvia's of what nuclear weapons actually do to people could only be linked to an anti-nuclear sensibility. However, leaving aside for one moment the question of exactly how her aunt's experience of bodily suffering had been incorporated in memory for Sylvia, for those who are persuaded by the arguments in favor of nuclear weapons an awareness of the realities of Hiroshima may simply reinforce the notion that it is important for one's own country to have such weapons. Just as those whose relatives have been shot may decide to buy guns, so those whose relatives have been atom-bombed may decide to work on atom bombs. If the anti-nuclear movement of the 1980s sought in its literature and iconography to appropriate the shattered bodies of Hiroshimans as incontestable signs of our own imminent extinction should the arms race continue, this is not the only way these bodies can be read.

At least as puzzling for me as Sylvia's relationship to Hiroshima was the fact that she was a woman. I arrived in Livermore deeply marked by my earlier participation in the anti-nuclear movement of the 1980s. This movement -- as one of its foremost chroniclers, Barbara Epstein, has argued -- was deeply shaped by an array of feminisms from mainstream equal rights feminism to ecofeminism and the separatist feminism that informed the vision of the large women-only peace camps at Greenham Common in Britain and Seneca Falls in New York State. Women such as Randall Forsberg, Helen Caldicott, Pam Solo, Jane Gruenebaum, and Jesse Cocks were important national leaders of the American anti-nuclear movement, and the disparate but connected ideas of

Starhawk, Carol Gilligan, Susan Griffin, Nancy Chodorow, Gloria Steinem, and Ursula LeGuinn pulsed in pristine and mediated forms through the movement which, however imperfect its actual record in regard to women, was permeated by women's symbolism and women's consciousness. In this movement it was widely taken for granted that women represented a "different voice," that, as Carol Cohn, Jean Bethke Elshtain, Cynthia Enloe and others have argued, the militarist project is a masculine one, and that the project of making peace was deeply connected with the transformation of America's gender system. As Helen Caldicott, the most widely read if not the most deeply intellectual American peace activist of the 1980s put it in her book Missile Envy:

> A typical woman is very much in touch with her feelings... Women are nurturers. Their bodies are built anatomically and physically to nurture life... Mothers or not, most women care deeply about the preservation of life. Women are also capable of capitulation and can move into conflict resolution if they make a conscious decision. It is almost always the woman who makes the initial move to seek marriage or partner guidance counseling if there are problems in a relationship. (Caldicott 1984:236).

The general sentiments of this passage, if not necessarily its essentialism, were quite representative of the movement.

In terms of the framework I had internalized in the anti-nuclear movement, then, a woman warhead designer was an anomaly indeed. Sylvia does not quite see things this way, however. Although she works on weapons, she describes herself as a feminist, and I found her acutely aware of the problems women face in science. She was well aware, for example, that women accounted for only 26% of the employees at the Laboratory, and that most of these were secretaries or were concentrated in the fields of biomedicine, computer science, and environmental science (Rogers 1989; LLNL Women's Association 1988). Just under 6% of the Laboratory's physicists were women -- a number that is in line with the number of Ph.D.s in physics given to women nationally. Among the elite caste of warhead designers at the Laboratory I knew of only three women including Sylvia. "The only other women that I see regularly [at the Laboratory] are... computer analysts and

secretaries," she says. "There aren't that many engineers or scientists who are women and, in general in science, as soon as women move into a field, the average salary drops."

She has strong feelings about the male-dominated culture of university science departments, and is particularly critical of MIT. "My observation was that it was alright for a graduate student to be a woman because the professors had control over the students, but the competition from male faculty if you were a woman was something else... I know women faculty there, actually, who have had the chairman of their department saying that they will never get tenure as long as they were the chairman there."

At the Laboratory Sylvia has had no problem finding mentors among the senior male warhead designers, and she finds the Laboratory's treatment of women more favorable than MIT's. Still, she has run into a few problems -- technicians who, perhaps deliberately, open drawers containing centerfolds, even though such pictures are officially banned at the Laboratory, and invitation lists to design review meetings from which her name is omitted. Attendance at such meetings is important because this is how designers maintain a profile in their community while assuring access to the latest ideas and data. "I think it wasn't actually the other scientists that were missing me off the invitation list anyway," she told me. "I think it was the secretaries -- other women. And what seems to have happened is that they were told to include me on the lists when people realized they needed my numbers."

I once asked Sylvia what it meant to her to call herself a feminist. Arguing firmly against versions of feminism that essentialize or sentimentalize women by attributing to them a different voice or a unique consciousness grounded in the particular experience of motherhood, she replied: "I'm fighting for everybody's rights. Not just women. I just wish that people would let people be the way that they are, and not put them in little boxes." When I asked if she saw a connection between masculinity and the arms race on the one hand and mothering and participation in the peace movement on the other, her response embodied an inverting appropriation of Nancy

Chodorow's program on behalf of a technofeminist vision of liberation: "I think I'm protecting children. I feel as if I'm protecting, helping to protect the country... Anyway I don't think that looking after children is inherently men's or women's work. I think that we get socialized to take it that way." She added ironically, "I'm looking forward to the day scientists make it possible for a man to carry a baby. Then I can get on with my work." When I left the field Sylvia was busy raising money in her spare time to fund a special summer workshop to prepare local high school girls for careers in science.

Sylvia says she is not very political, but as an undergraduate she did protest her university's investments in South Africa. "If I had to label myself," she says, "I'd say I was a Humphrey Democrat." Maybe you are as surprised by this as I was. When I arrived at Livermore I expected its weapons scientists to all be communist-hating, Reagan-Bush-loving conservatives, but it turned out that I was wrong and that Sylvia was far from unusual.

Take Sylvia's colleague, Clark, for example. He is a warhead designer whose star is rising at the Laboratory. He has also been a member of the Sierra Club, an active supporter of women's rights, an opponent of U.S. intervention in Central America, a supporter of gun control and, in the 1970s just before he came to the Livermore Laboratory, an active protestor against the Vietnam War who wore his hair long and his ties wide.

A number of the scientists I interviewed said they had been opposed to the Vietnam War. Others were environmentalists who had been active members of the local Sierra Club before it took a position in favor of a Nuclear Freeze in the early 1980s, at which point its Livermore membership plummeted. One Laboratory scientist, Dana, told me she was so enraged by the Exxon Valdez oil-spill in Alaska that she cut her Exxon card in two, soaked it in oil, and mailed it back to Exxon. And Mark, a weapons designer on whose living room wall I could not help but notice a Gandhi poster, told me about his occasional daydreams of saving whales -- a cause as classically liberal as his methods were not:

> I had fantasies of being Captain Nemo in 20,000 Leagues under the Sea, torpedoing the whaling ships. What the fuck's wrong with that? They're willing to kill whales, so why not blow up their ship and leave them to figure out where to go from there?

Many Laboratory scientists had also been active in the civil rights movement. One warhead designer had helped organize a campaign in Livermore in the 1960s to prohibit racial discrimination in jobs and housing. Jeremy, a deeply religious weapons physicist, had spent part of the 1950s working with a worker-priest for racial integration in the American South before coming to the Laboratory. And Phil, a warhead designer who had some union-organizing experience and who liked to complain to me about the domination of American politics by corporate interests, told me he left his church because the minister opposed a social action program on behalf of minority inner city residents. He also got into a row with some high-ranking military officials when they visited the Laboratory:

> We had some colonels or lieutenant colonels over, and they were talking about something, and it was: they were here to defend capitalism versus communism. And I called them on it. I said, "you've got things all screwed up. I'm not supporting this country because it's a capitalistic country. I'm supporting it because of its form of government.

Just before the 1988 election one weapons designer took a straw poll of his colleagues to see for whom they planned to vote. He found they were split down the middle between Bush and Dukakis -- roughly the same spread I found in my own interview sample (two of whom told me they had voted for Jesse Jackson in the primary). In other words the Laboratory was a place of political diversity, where Reagan-Bush supporters, those with no great interest in politics at all, and liberals who had struggled for civil rights and against the Vietnam War all worked together in the development of nuclear weapons.

Theorizing Identity.

As my fieldwork proceeded, I began to wonder about the grounds of this collaboration. How were conservative and liberal scientists able to work together on nuclear weapons in the context of a society that, in the decade of Reagan's defense build-up and the Nuclear Freeze

movement, was contentiously divided, largely along liberal-conservative lines, about the need to keep building nuclear weapons? How were liberals -- some of whom had participated in the peace movement of the '60s and '70s and were critical of Ronald Reagan's policy priorities in the 1980s -- able to feel committed to their work developing nuclear weapons for Ronald Reagan's arms build-up? And if the kinds of overt political ideologies -- liberalism and conservatism, Democratic and Republican party political affiliation -- celebrated by the American media as the schismatic indices of political identity were not the ideological glue holding the Laboratory together, then what was? Evidently I had to think about political identity and ideology in new ways, not simply in terms of America's conventional political labels, if I was to understand the political integration of the Laboratory that enabled its mission to proceed.

Thus, instead of thinking about the Laboratory's integration solely in terms of its ability to recruit a particular type, I began to think about the practices through which the Laboratory resocializes recruits and constructs itself as a moral and political community in which people with diverse political belief systems can participate. In thinking about weapons scientists as made rather than born, my gaze shifted from social or psychological types to the social processes at the Laboratory, and in the wider community in which the Laboratory is embedded, that enable it to construct a community of people deeply convinced -- so deeply convinced that they often asked me in puzzlement to explain why anti-nuclear activists are so afraid of nuclear weapons -- that it is appropriate to develop nuclear weapons and that nuclear deterrence will not fail. This partly involved thinking of science itself -- the ideology that claims not to be one -- as a source of binding energy capable of holding the scientists together despite their apparent political differences. It also involved a conceptual shift away from a static preoccupation with types towards an emphasis on dynamic social practices for the active production of new thinking, feeling, believing, acting selves.

Insofar as other writers about weapons professionals have adopted a processual perspective, and I'm thinking of Robert Lifton, John Mack, and Pam Steiner in particular here, they have

tended to present the processes involved as largely repressive or subtractive: ethical questions are avoided, feelings are denied, and fears are repressed. In such analyses weapons professionals are defined as much in terms of what they lack as what they are. While part of the work of becoming a weapons scientist does indeed involve learning not to attend to particular fears, feelings, and questions -- just as part of the work of becoming an anti-nuclear activist also involves selective inattention to particular issues -- it also involves the active learning of discourses, feelings, and practices. To take the example of ethics, rather than ignoring the ethical dilemmas of their work, weapons scientists learn to resolve these dilemmas in particular socially patterned ways. In other words, becoming a weapons scientist involves much more complex and creative social and psychological processes than repression and avoidance. As Michel Foucault says, "power would be a fragile thing if it's only function were to repress" (Foucault 1980b:59).

> We must cease once and for all to describe the effects of power in negative terms: it 'excludes', it 'represses', it 'censors', it 'abstracts', it 'masks', it 'conceals'. In fact, power produces; it produces reality; it produces domains of objects and rituals of truth. The individual and the knowledge that may be gained of him belong to this production.
>
> Foucault (1979:194).

The power of the social processes sustaining the Laboratory's work lies in their ability to actively, positively produce and reshape the identities of its employees as they are transformed from neophytes into mature weapons scientists.

The process of social and psychological engineering involved here is ideological, but in a more fundamental way than we often mean when we use the term "ideology." Raymond Williams (1977) argues that we must think of ideologies not only in terms of discourses and ideas, but also as "structures of feeling" -- ways of experiencing and living in the world that profoundly reshape our emotions, bodily reflexes, and fantasies as well as our ideas and beliefs. As Renato Rosaldo puts it, arguing against a separation of (private) feelings from (public) ideas and beliefs:

> Even those so-called realms of pure freedom, our fantasy and our "innermost thoughts", are produced and limited by our own local culture. Human imaginations are as culturally formed as distinctive ways of weaving, performing a ritual, raising children, grieving or healing; they are specific to certain forms of life, whether these be Balinese, Anglo-American, Nyakyusa, or Basque."
> (Rosaldo 1989:25).

I should add here that my interest in the transformative effect on identity of particular milieus and social practices derived partly from a process of reflection on changes in my own identity as my fieldwork progressed. When I arrived in Livermore in 1987 I was no longer a practising peace activist, but in many ways I still had the consciousness of a peace activist. I was deeply concerned about the potentially catastrophic consequences of the arms race, a concern that manifested itself in, among other things, insurgent and graphic mental images of nuclear destruction; and, during my first interviews with Livermore scientists, I felt deeply conflicted about my role as polite ethnographer, which felt like a pose, and I wondered if I should stop even trying to be an anthropologist and simply present myself as a peace activist trying to find out how these people had become deranged enough to work on nuclear weapons. However, over the two years that I spent talking, eating, hiking, worshipping, and celebrating with nuclear weapons scientists, through a process I still find mysterious, my fear of nuclear war receded, my nightmares about nuclear war disappeared, and I began to find the dark apocalyptic rhetoric of anti-nuclear activists increasingly quaint, even tiresome. Moreover, after months of disciplined interviewing, note-taking, theorizing and academic writing, the notion that I was an anthropologist, which had at first seemed so hollow, took on increasing substance and became the anchoring principle of my existence. By behaving like an anthropologist, I had become one.

But enough about my voyage of initiation. Let us return, instead, to Sylvia's.

Becoming a Weapons Scientist

Moral philosophers have distinguished two basic positions in the debate on nuclear ethics: the deontological and the consequentialist. Deontologists believe that, if it is wrong to destroy an entire city, then it is wrong to threaten to do so. Consequentialists believe that actions should be

judged not by their intrinsic purity but by their consequences; hence, if threatening to destroy an entire city helps save the city, then it is moral to make the threat.

Unsurprisingly, Livermore scientists are consequentialists, and part of the process of becoming a nuclear weapons scientist involves internalizing a commitment to what we might call the central ideological axiom of Laboratory life: that scientists at the Laboratory design nuclear weapons to ensure, in a world stabilized by nuclear deterrence, that nuclear weapons will never be used. The pragmatic spirit of this central axiom enables it to transcend conventional political divisions of left and right and to unite weapons scientists, in theory at least, around the technocratic project of figuring out what works best. To anti-nuclear activists and Laboratory critics this central axiom of Laboratory life seems like a hollow and dangerous cliche, but then every group's most deeply held ideological beliefs appear to their opponents as inexplicable and meaningless cliches. As Clifford Geertz (1983) has remarked, ideology naturalizes itself as common sense, and one group's common sense is another group's nonsense. Part of the process of maturing as a weapons scientist, quite apart from learning the physics and engineering, is coming to see the Laboratory's central ideological axiom not as an empty cliche but as a comfortable truth.

From the perspective of Laboratory critics, anti-nuclear psychologists, and peace activists this process is one of denial, avoidance, and repression. Critics often accuse weapons scientists of spiritual deadness and a lack of imagination, and criticize them for not thinking about the moral issues raised by their work. For example Hugh DeWitt, an internal critic who has called for an end to weapons research at the Laboratory, calls his colleagues "Ph.D peons" who cannot see beyond their "high pay, job security, good benefits, excellent physical facilities, travel to scientific meetings, and good retirement programs." He says they do not think about the ethics of their work.

I will leave it to professional psychologists to decide whether Sylvia is "in denial", but we certainly cannot argue that she has not thought about her work, and it became increasingly clear to me that Sylvia deliberately sought out highly conflictual situations in order to incite such

thinking. The summer after she accepted the job at Livermore, but before she arrived at the Laboratory, Sylvia made a point of travelling to the Soviet Union to see if she would still feel comfortable working on nuclear weapons by the end of the trip. She did. Later, she made a point of travelling to Hiroshima and seeing the Peace Museum there, a museum which memorializes in the most graphic ways the damage inflicted on the people of Hiroshima by the first atomic bomb. She also, at one point, asked if I would take her to an anti-nuclear meeting and if she could borrow an anti-nuclear video I had so that she could see for herself what anti-nuclear activists were saying.

My discussions about nuclear ethics with Sylvia and her colleagues often surprised me. I was surprised, for example, when Sylvia told me of her disgust at the effects of American nuclear testing in the 1950s on Pacific Islanders. "It was very disturbing to me to see that these people had been screwed. Their land was taken away... If I had been around then, I hope that they wouldn't have done that. Either that or I would have quit." And I was surprised that, although she felt comfortable working on nuclear weapons, she said she would have difficulty working as a defense lawyer trying to secure the freedom of criminals. I was also surprised by her colleague Clark who told me he felt more comfortable working on nuclear weapons than he would working on conventional weapons. From my perspective as a lapsed anti-nuclear activist nuclear weapons were more immoral than conventional weapons because they could kill so many people and kill them so indiscriminately: they were genocidal weapons. For Clark, however, it was precisely because conventional weapons were less destructive that they were routinely used to kill people and, for this reason, he would have had difficulty working on them. As Sylvia's colleague Orrin put it, "the moral questions aren't simple. Your conscience should trouble you either way. If you do work on nuclear weapons, think of all the people those weapons might kill. If you don't work on nuclear weapons, think of all the people you may be endangering by leaving them undefended."

Seen in this light, then, in a situation of grave ethical and practical ambiguity, the process of becoming a weapons scientist is one of becoming increasingly certain that nuclear weapons are

reasonably safe, and this has been one of Sylvia's central achievements in her first six years at the Laboratory.

When I asked Sylvia why she took the job at Livermore, her response was, compared to those of other weapons scientists answering the same question, quite unique:

> The work is quite interesting, and that was definitely a consideration... But I decided to work at the lab, I think, because I had a fear of big weapons. I really wanted to see what was happening for myself. I wanted to see what was going on, rather than take other people's word.

My own fear of nuclear calamity, a fear that was socialized by the anti-nuclear movement and abetted by the extravagant military rhetoric about winnable nuclear wars during the first Reagan Administration, was organized around scenarios of nuclear wars blundered into or started deliberately by leaders who were either mad or so hyper-rational about the calculus of terror that they had lost touch with the human consequences of war. Projecting my concerns onto Sylvia, I presumed that she too feared an all-out nuclear war and was perplexed that she could hope to allay such a fear by learning more about the processes of nuclear weapons design rather than the processes of international relations and psychology. It took me a while to realize that she presumed our leaders too rational to start a nuclear war. "I'd say the odds of a nuclear war in my lifetime are very small and very low. I don't think any rational person would use them," she said. What mainly concerned her was not a deliberate nuclear war but the possibility of an accidental explosion of a nuclear weapon. What for me was a political and psychological issue -- my safety in a world full of nuclear weapons -- was for her a technical issue.

I have argued elsewhere that nuclear weapons tests are ritual simulations of human control over the awesome power of life and death embodied in nuclear weaponry, and that it is by participating in nuclear tests that nuclear scientists become confident in their mastery over these weapons. I have also suggested that nuclear tests might be seen as rites of passage in which young scientists are transformed into accepted designers by displaying their mastery over nuclear weapons to the community of weapons scientists at large -- an argument, I might add, that has not, on the

whole, been well received at the Laboratory. In the course of my research Sylvia worked her way through the nuclear cycle. While I was doing my fieldwork, she participated as a neophyte mastering her trade by assisting other designers in their tests. Throughout she was learning, both culturally and technically, how nuclear tests are done. Finally, just as I was finishing my dissertation, completing my own professional rite of passage, she oversaw her first test as lead physicist -- a test that, so far as I have been able to ascertain, went well.

The last few times I spoke to her Sylvia seemed changed in subtle but important ways. When I first met her Sylvia was fascinated by the counterculture of Berkeley, whose streets she liked to roam while thinking through difficult calculations, and she sometimes talked about moving from her suburban home to Berkeley. The last time I spoke to her, however, she had given up thoughts of moving to Berkeley -- "I'm working much harder now, and the commute would take up too much time. It's better to live close to the lab." Sylvia seemed preoccupied. Although she had been publishing in unclassified areas so that she could get a job outside the Laboratory if she needed to, she was concerned that the U.S. Government's restrictions on nuclear testing were creating a logjam of experiments, thus slowing down her and her colleagues' work, and that the Government might even agree to an outright ban on nuclear testing, which she now seems to oppose more confidently than she did when I first met her:

> I would like to see testing of things that have already been built, just to make sure nothing has happened, like quality of the sample, because things change... So knowing nothing, I mean, knowing incomplete information and then having that information change on you is very risky. Of course this would be my personal bias. I like to poke things and tear them apart. I would like these systems to be as predictable as possible.

Sylvia had become a weapons scientist.

Epilogue

As you have probably gathered by now, although she has been subjected to the same social processes as other weapons scientists, Sylvia has worked her way through them in her own way and is no ordinary weapons scientist. For me Sylvia was fascinating for her willingness to place herself

in conflictual situations and for the ebullient uniqueness of her life -- a life that fulfilled the career ambitions of an upwardly mobile Japanese-American family and of a generation of feminists but in the most improbable way either could have imagined. I also became preoccupied with Sylvia because she became for me what Sharon Traweek (1988) calls a "key informant" -- a term I find helpful even though I dislike the images of surveillance and betrayal conjured by the word "informant." Traweek says,

> For the anthropologist, key informants are crucial; they are people with whom one can try out tentative interpretations and hypotheses. People who are consciously interested in reflecting on their own culture tend to be atypical within it, whether leaders, geniuses, or simply marginal.
>
> (Traweek 1988:13).

My conversations with Sylvia became conduits for all kinds of communications that would not otherwise have taken place. For example, Sylvia used her relationship with me to find out more about the protestors, about whom she was greatly curious, and once even asked me, only half playfully I think, to let the protestors know that her division had enjoyed the theatrical nature of the latest protest at the Laboratory gates and that she had admired the giant puppets the protestors made especially for the occasion. As for me, thanks to my friendship with Sylvia I was able to find out not only what it meant to her to be a weapons designer, but also what her colleagues thought of particular hypotheses I was developing or papers I was writing, and how I was perceived among the community of warhead designers.

Above all, the reflexive nature of my conversations with Sylvia helped me realize the extent to which, despite my best efforts, I often read into the lives of Livermore scientists a pervasive sense of guilt and conflict about their work which, I now believe, existed far more in my mind than in theirs. A brief anecdote will illustrate the point. Sylvia once asked me if I would take her to an anti-nuclear meeting to rally supporters for an upcoming protest at the Nevada Nuclear Test Site. As we drove back from the meeting it was clear to me that Sylvia was upset about something. I presumed that the meeting, where speakers held forth at length about the evils of the arms race,

had brought to the surface her deep psychic conflicts about her work. No, she said, she was angry at me because, on the way to the meeting, I had told her exactly what to expect in such a way that I had, as she put it, "ruined the experiment."

Since I started to write about my fieldwork, Sylvia's response to my ideas has been ambivalent. When I wrote a series of articles for a local newspaper in Livermore, Sylvia passed on her own judgement and that of her colleagues that the articles "were well written and accurately reflected the mood around the lab." She also felt, unlike many of her colleagues, that there was something to my notion of nuclear tests as rituals, even if she did not completely agree with it. She was much less happy, however, about a passage in my dissertation where I analyzed one of our conversations. In that passage I mentioned that she had watched a television docudrama about the bombing of Hiroshima and had answered my question about the feelings the program aroused in her by saying, "it was poorly executed. They were quite accurate about the physical effects of the explosion, but the accents were all wrong." I used this response to illustrate my observation that a scientist's learned attentiveness to detail and objectivity could distance him or her from the suffering of human bodies. Sylvia responded quite angrily to this, saying:

> It is very natural and automatic for me to be able to distinguish between native and non-native Japanese speakers... I was not able to suspend my belief that this was not "real", just as I am not able to do so at a badly done film of any kind, and so it was difficult for me to empathize with the pain that those actors were trying to portray because, to me, they couldn't be real bomb survivors... But that does not mean I do not or cannot feel pain for the bomb victims. I remember your expression of disbelief when I described how some physicists have cringed when driving by a roadkill. But why is <u>this</u> so hard for you to believe? Why didn't you use <u>that</u> as an example of something?

For better or worse, Sylvia and I have become part of one another's lives. I must live with her criticisms of my work, and she must live with my interpretations of her life. The intrusiveness of this situation is encapsulated nicely in a card I once received from her when she was travelling in Japan in which she said, "I had a very strange dream about going through the Peace Museum in Hiroshima with a tape-recorded tour piped into my ear, except that the headphones were attached

to a microphone into which you were speaking. And there was no STOP button." As for me, unlike a former generation of anthropologists whose works were not read by their subjects, I must live with Sylvia's responses to my ideas. As Renato Rosaldo has written,

> We should take the criticisms of our subjects in much the same way that we take those of our colleagues. Not unlike other ethnographers, so-called natives can be insightful, sociologically correct, axe-grinding, self-interested, or mistaken. They do know their own cultures, and rather than being ruled out of court, their criticisms should be listened to and taken into account, to be accepted, rejected, or modified, as we reformulate our analyses.
>
> (Rosaldo 1989:50)

In such circumstances I believe it is helpful to refigure ethnography not as a series of authoritative pronouncements structured by the hierarchy of the knower and the known, but as a process of asymmetrical dialogue across differences. I have tried to convey some of the potentialities of such a dialogue in this paper.

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