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Making the Invisible Visible:

Asian American/Pacific Islander Workers in Silicon Valley

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Abstract

The role of working-class Asian Americans/Pacific Islanders in Silicon Valley's high technology revolution has been obscured by imposed silences, erasures, and a fixation on the relatively few who have become wealthy from the electronics boom. In this article we consider the thousands of Asians/Pacific Islanders who make Silicon Valley possible by producing the hardware that runs the machinery upon which this modern-day empire was built. In particular, we address the health hazards experienced by those involved in home-based piecework. In addition, we consider a range of industry practices that produce and reinforce oppression among these workers. The low profile of working-class AAPI workers in Silicon Valley enables industry to withhold occupational and environmental safety improvements, repress efforts to organize unions, and maintain oppressive workplace cultures. Finally, we examine oppositional strategies among AAPI laborers to make themselves seen and heard on the shopfloor and in the community.

Introduction

The invisibility of Asian American/Pacific Islander workers in Silicon Valley today is stark and palpable largely because of how difficult and dangerous the work is. The "discovery" (or acknowledgement) of the painstaking and physically/mentally harmful nature of this labor makes the erasure of these workers from our history highly problematic and almost criminal. There is an underlying cultural mythology regarding the high-tech industry that provides a supportive framework for the institutional practices that produce and reinforce these silences and blindspots. That is, we are not accustomed to thinking about high technology or electronics as a production or manufacturing-oriented sector.[1] In fact,

for more than two decades, we have become accustomed to thinking about the United States as a whole as a service economy. One wonders where all the manufacturing has gone. While much of it has been shipped offshore to various Global South nations, high technology manufacturing is still performed in the United States. In general, manufacturing remains key to the nation's fiscal health. The largest manufacturing industry in the U.S. and in the world is the electronics sector, and "because of its growth and size, the chip industry is the pivotal driver of the world economy" (Semiconductor Industry Association).

In this paper we focus on the institutional forces producing the invisibility of AAPI labor in Silicon Valley; the impacts of these erasures; and various strategies workers and their allies are employing to redefine their roles as agents with a public/political presence and simultaneously redefining the industry itself.[2]

The Big Lie: Silicon Valley and High Technology as the Clean Industry

In post-World War II Northern California, a "new" economy, based on the emerging electronics industry and its defense and warfare orientation, was ushered in with a fanfare that promised new jobs in a "clean industry." Executives, politicians, and newspapers everywhere touted the clean image of the electronics industry. Harold Singer, an official of the San Francisco Bay Regional Water Quality Control Board, once stated, "the horizon above San Jose is unmarred by smokestacks, and people here are proud of that. They have worked hard at making the valley a base of the computer-electronics industry and an unpolluted place to live" (Cummings 1982). The highly toxic wafers from which microchips are cut are viewed by industry promoters as "pristine" and the chemical-laded water that washes semiconductor components in the electronics fabrication or "fab" plants is described as "pure" (Page 2000). These accounts leave the uninformed reader with the impression that high-tech firms are the paragon of hygiene, safety, and environmental responsibility.

The Toxic Reality

The "clean industry" image is deeply problematic because it was never rooted in reality. The truth about this sector is that it creates pollution inside and outside of the electronics plants that

rivals virtually any other industry in human history. This is particularly problematic for AAPI workers because they make up a significant portion of the industry's workforce (Pellow and Park 2002).

For every male worker on the shop floor in electronics and semiconductor manufacturing, there are three or four women workers. Most workers are people of color; in the 1970s and 1980s many were Latino women and men, while in the 1980s and 1990s the workforce became largely Asian and overwhelmingly female.[3]

These women include refugees and immigrants from the Southeast Asian wars in the 1970s (Vietnam and Cambodia, especially) as well as economic migrants from China, Korea, Indonesia, and Malaysia.

In contrast, management and administration are, according to most workers, overwhelmingly white (Pellow and Park 2002). Previous studies have shown that hiring practices for electronics and semiconductor manufacturing jobs include racial and gender profiling of workers, based on stereotypes about nimble-fingered and docile Asian and Latina immigrant women (Pellow and Park 2002). Scholars have documented the racial and gender division of the workforce and illustrated strategies by companies to overwhelmingly hire Filipinos in one shop and Vietnamese in another. Printed circuit board assembly jobs and clean room work might be assigned primarily to women, while printer assembly or cable cutting is assigned largely to men. By dividing work in this way, the social dynamics of the workplace actually *produce* what become seen as natural divisions—of gender, race and national origin (Hossfeld 1988).

The number of people employed in electronic components and accessories was 69,169, in 1996 (Benner 1999). And while this industry makes up more than half of the Valley's manufacturing employment, the wealth that workers produce is siphoned upward. In 1998, the average worker earning minimum wage in the Valley took home approximately $10,000 annually, after taxes. An estimated 20 percent of the area's jobs do not provide a living wage, and 55 percent do not offer enough pay to maintain a family of four above the poverty line (Working Partnerships USA 1998). In addition, these jobs are not only low wage and toxic, but they are also unstable. The temporary workforce in Silicon Valley earns 36 percent less than permanent workers; their wages are

decreasing (14.7 percent between 1995-2000); they are most likely young, female, immigrant or persons of color; and they are part of the fastest growing workforce in California (Santa Clara Center for Occupational Safety and Health 2000d). Between 27 and 40 percent of all employees in Santa Clara County are contingent or temporary workers. This workforce is growing faster than overall employment, so much so that nearly all of the region's net job growth during the 1980s and 1990s was attributable to the rise of temporary employment (Benner 1996). The statistics concerning the Asian Pacific Islander population in Silicon Valley underscore that this sector of the community is also suffering under the yoke of economic inequalities. In 1990 only 12 percent of managers in the high technology industry were Asian, while 42 percent of "laborers" and 31 percent of "blue collar" workers were Asian (Siegel 1994). By 1997, one report claimed that Asians made up 22 percent of the Valley's population yet held 31 percent of the "white collar" jobs while whites held 60 percent (*San Jose Mercury News* 1999). However, that same report documented that Asians held the majority of blue collar jobs at original manufacturing companies (59 percent) and in contract companies (77 percent), supporting the observation made by other scholars that a socioeconomic class bifurcation exists in the AAPI community there.

Contributing to the invisibility of AAPI workers in Silicon Valley is the pervasive myth of Asian Americans as the "Model Minority." This myth presumes that Asian Americans, in general, are all highly educated and occupationally successful, in sharp contrast to other minorities. Ignoring the reality that there are as many AAPIs who report annual household incomes below $25,000 as there are who report incomes above $95,000 (U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March Supplement 2000), this Model Minority myth conveniently highlights only the "good" story to promote a mistaken notion of the United States as the land of equal opportunity (Park 2005). In her study of occupational glass ceilings experienced by Asian Americans, Deborah Woo states, "Asian American educational achievement is not matched by comparable access to professional jobs which permit upward mobility in the long run" (Woo 2000). This finding contradicts the implicit notion of the Asian American Model Minority myth that hard work and education will necessarily lead to economic or occupational success. In addition, this

myth negates the existence of hardworking Asian Americans and Asian immigrants who continue to struggle to make ends meet. To make matters worse, the pristine image of Silicon Valley industries erases the real hazards experienced by these working-class Asian Americans/immigrants.

In a challenge to the "clean industry" image of the Valley, the USEPA has estimated that a large section of Mountain View, a city within Silicon Valley, will take $60 million and 300 years to clean the toxic contamination by eleven electronics plants. As for the once pure water and fertile land of the Silicon Valley region, fifty-seven private and forty-seven public drinking wells were contaminated as of 1992, while sixty-six plots of land have been declared too toxic for human beings to walk on. The portrait of environmental quality *inside* the plants is no better. In broad terms, the industry is quite toxic for many workers. In fact, the rates of work loss due to illness and injury in the semiconductor industry are more than twice that of all manufacturing jobs (Bureau of Labor Statistics 1997).

Flora Chu is a legal advocate for Asian workers in Silicon Valley. She places the story of one worker, Erlinda Carreon, in a broader political context:

> More than one hundred years ago, they lowered Asian men in baskets to insert and light the dynamite so that mountains could be blasted away and the Sierra railroads built. A hundred years later, Asian immigrants are still asked to put their health and life on the line so that California can prosper. Only now, the job hazards are sugar-coated so that workers do not know the hazards that they are facing until it is too late. Erlinda Carreon was a teacher in the Philippines until she emigrated here so that her daughter could have a better education. Like so many immigrants, she came to the Silicon Valley and worked in the electronics industry assembling discs that go into our computers. She put up with headaches, nausea and discomfort for the sake of a paycheck. What she did not realize was that it was the chemicals in her job that prevented her from having another child that she so desperately wanted. What she did not realize was that the chemicals that she worked with were building a cancer inside her. She died of a thymoma, a rare cancer that she realized too late was caused by her work. Erlinda's story is not unique for Asian immigrants. Many Asians form an underclass that

works in the low-paying high-hazard jobs under constant threat that they might lose their meager paycheck. They are constantly exposed to chemicals that can permanently disable them. Employers hire Asians into these jobs because they perceive that Asians are a docile workforce willing to perform monotonous repetitive duties without complaints (Chu 1998).

Cancer is a disease that embodies the invisibility of environmental and social harm associated with many forms of toxic work. Cancer itself is a condition that often becomes known only after years of building up in one's body, lying dormant and in hiding until the instant one's body is engaged in an internal battle for survival. Invisibility is a major theme in sociological studies of women of color employed by whites because it is so common in workplaces where, ironically, people of color are unseen but their labor is central to the survival of the enterprise (Rollins 1985).

Perhaps no form of labor in high tech underscores the subterranean nature of the work more than home-based piece rate labor.

Home-based Piecework

Several thousand Filipino, Vietnamese, Korean, and Cambodian immigrants work in production jobs in Silicon Valley. They are working out of their homes, not telecommuting like white collar workers managing web sites and writing HTML programs, but making circuit boards, cables, and other electronics components at piece rate pay. They labor in their living rooms, bathrooms, bedrooms, and kitchens. Lead, flux, solders, and acids are toxins these workers use in their homes everyday—they are the ingredients necessary for the creation of the nervous systems of electronic products, including computers—the infrastructure of the information superhighway. Children, siblings, grandparents, entire families, friends, and neighbors all pitch in to produce these parts, often washing components in acidic solutions in their kitchen sinks. The workers sometimes labor twenty-four hours straight at poverty wages with no benefits and the ever-looming possibility of dismissal (a reality that all temporary workers face). In some cases, home workers produce components and, in years past, have been paid as little as a penny for each one (Malone and Yoachum 1980).

The work done under these conditions generally involves the "stuffing" or assembly of printed circuit (PC) boards or cables.

This is some of the most labor-intensive and time-consuming work that occurs in Silicon Valley, and home assembly is viewed as the most efficient method because, according to one company executive, "it has to be done by hand, and there's no way to speed it up. But the home operation can really jam out a lot in a short time" (Carey and Malone 1980). Thus, "the 'speed' of home assemblers is frequently traceable to long hours, low pay" and the use of entire families (including children and the elderly) who work off the books (Markoff 1980). Managers and owners involved in coordinating home-based electronics operations point out that this type of labor is essentially the same as that which occurs in the garment industry in the Bay Area (and virtually everywhere else in the world), where expensive, name-brand clothing is produced under near slave-like conditions.

One electronics firm manager was said to have given a worker several hundred uncompleted circuit boards on a Friday evening and told her "if these are not completed by Monday morning then you may as well not even clock in when you come back" (Pellow and Park 2000). This particular job, like most, would be impossible to complete without the assistance of several individuals working under the table. Wage, tax, and child labor laws, and occupational health and safety regulations are thus routinely ignored and violated. Piecework itself is not necessarily illegal. However, the piece rate is subject to minimum wage and overtime laws. According to the law, companies cannot pay the same employee an hourly wage in the factory and then pay them piece rate for after-hours work. But this is exactly what happens twenty-four hours a day in Silicon Valley.

This may sound like a description of a home-based cottage industry from centuries ago, but this type of labor is now at the cutting edge of production for the hottest commodity in Silicon Valley and the computer industry worldwide: *speed*. In fact, more computer manufacturers are using this type of labor because it is both cheap and the turnaround is more rapid than any other type of non-automated production. Piecework is one of the last steps in the assembly of electronics parts, which are often air-freighted back to Silicon Valley from "export processing zones" in Hong Kong, Malaysia, Indonesia, Singapore, or South Korea, where workers perform assembly tasks on microchips. Workers "stuff" or insert the completed silicon chips and other components into holes in

small plastic boards that are at the heart of digital watches, computers, radios, and thousands of other consumer products.

Piecework has played a significant part in the development and success of many industries since the nineteenth century. And, like most other production jobs in Silicon Valley, these occupations also tend to feature a disproportionately large presence of women, particularly Asian (and Latina) immigrant women. They are often non-English speaking persons or simply need to supplement their income from their day job with work at home (because their day jobs pay so little in the first place and cost of living in the South Bay area or Silicon Valley is so exorbitant). Women are especially vulnerable to the piecework economy because it allows them to accomplish their dual duties as primary caretakers of their children and elders, and as income earners. Families are deeply involved in this work because the more people pitching in on a job, the more income the household earns. "Everybody helps," one Vietnamese man stated, referring to his wife and seven children. "If they don't have [school] homework to do they help me" (Ewell and Ha 1999b).

Kiet Anh Huynh, a production manager at Solectron Corporation from 1983 to 1992 and a Vietnamese immigrant, stated, "we give the workers 100 [printed circuit] boards and the next day they have to bring back 100 [completed] boards. Maybe at home they do it faster if they have brothers or sisters helping them" (Ewell and Ha 1999b). This is the case with Cuong Tran, a professional pieceworker. He's been assembling cables at home for Wilco Wire Technology, Inc. for ten years, with several siblings. With cables snaking across his living room floor, Tran explains that he routinely works twelve to fifteen hours per day, seven days per week, and frequently twenty-four hours at a stretch on rush jobs. He typically makes about $5 per hour, but can clear $20 per hour if his mother pitches in. His eleven-year-old daughter Mimi and her friends often help out by screwing wires to cable connectors.

Pieceworkers face myriad occupational hazards on the job. One Vietnamese pieceworker, Hoang Nguyen, casually rinses his circuit boards in his kitchen sink and blows them with a hair dryer. He is using lead and flux, which are hazardous industrial materials requiring special handling instructions, none of which are followed in the homes. One female pieceworker told a reporter, "When we soldered at home. . .you breathe all those chemicals.

Sometimes we do it all together, the whole family, in the garage" (Ewell and Ha 1999b). Employees of firms doing home-based work frequently experience neck and back pains, eye strains, sleep deprivation, respiratory disorders and continuous exposure to toxics.

For those immigrant employees who might not want to do piecework, they are often unfamiliar with U.S. wage and hour laws and have little choice but to do so; others simply feel coerced to do this kind of work despite their awareness of the law (Cook and Thompson 2000). Most home-based workers have regular jobs and are often approached at the end of a shift and asked to do home work.

While it is known that Filipino, Vietnamese, Korean, and Cambodian immigrants are involved in the home-based piecework economy of Silicon Valley, the actual scope of this informal workforce is unknown. As this type of work is most often performed underground, reliable statistics are unavailable. However, a *San Jose Mercury News* investigation estimated that contracting companies in the Valley utilized several hundred pieceworkers and their families (Ewell and Ha 1999). These journalistic investigations and our own interviews with key informant workers and advocates in Silicon Valley lead us to believe that home-based piecework is widespread in the production/manufacturing sector of the high-tech industry and is quite difficult to combat for three main reasons.

Reason #1: The Race to the Bottom

Silicon Valley subcontractors have an average corporate lifetime of less than two years. Competition is stiff and brutal. In this climate companies do whatever they deem necessary in order to stay ahead of the game, even if that means pushing their employees to make razor-thin profits. The piecework game starts when firms hire persons to do home assembly under the designation of "independent contractor," which allows the employer to legally ignore wage and hour laws and benefits that would normally apply if the contractor were an employee. Many pieceworkers, however, are not actually independent contractors, or even when they are, they generally employ others who are not—a legal violation. Piecework labor is only profitable for employers when workers agree to accept very low wages. According to research by Equal Rights Advocates (ERA), a women's civil rights organization in the San Francisco Bay Area, home workers' pay "did not add up

to the minimum wage of $5.75 per hour. One woman [in their study] earned only half that amount" (Wahlin 2001).

Most firms that use home-based labor justify their practices because it is believed to be one of the best ways to compete with foreign competition, particularly firms in Asia that can pay their workers much less than the U.S. minimum wage. This rationale taps into the more general sense that all international competition must be bested in the interests of national security and overall economic stability. Under this belief system, business and government are willing to make certain sacrifices, such as humane working conditions. As Joe Razo, a representative of a California State Division of Labor Standards task force, explained in 1980, "[T]he laborers suffer. In home work, the pervasive violation of minimum wage and overtime laws is chronic" (Carey and Malone 1980). Other managers see little wrong with piecework because, as Craig Jorgenson, director of operations for Pulnix America Inc. (in Sunnyvale), stated, "it works for us and it works for them" (Ewell and Ha 1999a).

This "rat race" also produces considerable revenue for some of the most powerful companies in the Valley, making regulators slow to offend the major beneficiaries of the piecework economy. Several large and mid-sized companies have been known to regularly contract work out to home-based assemblers, including Cisco Systems, Sun Microsystems, Hewlett-Packard, Flextronics, and Solectron. Solectron makes PC boards for both IBM and Sun Microsystems and has received two Malcolm Baldrige National Quality Awards, one of the most prestigious honors in the industry. The CEO of Solectron (a Japanese American man named Nishimura) was quoted as he received the honor from then President Bill Clinton: "The first time we won the Baldrige award, we came out of nowhere. We were looked on as a dirty, sweatshop kind of industry. That industry doesn't exist anymore" (Ewell and Ha 1999c). Solectron is the world's largest contract manufacturer and the tenth largest company in Silicon Valley, pulling in $5.3 billion in revenue in 1998.

Reason #2: Immigrant Mobility and Opportunity

The second reason why home-based piecework is difficult to eliminate is because many pieceworkers view this form of labor as their entrée into the high-tech economy. However imperfect, home-based assembly opens a window into Silicon Valley and can be a

form of entrepreneurialism for immigrants with meager resources. Some Asian immigrants have achieved success by working under these conditions themselves, and later hiring relatives and friends to do home assembly. Bing Nguyen is the CEO of Bentek, one of the Valley's fastest growing businesses. He is a Vietnamese immigrant who began as a pieceworker and is now a celebrated high-tech leader. He is also a rarity.

The piecework economy also provides a way for older, non-English speaking immigrants to contribute to the household economy when they are otherwise unemployable due to their lack of language skills and the prevalence of age discrimination. One of the authors spent many days applying for low-wage high-tech jobs in temporary employment agencies in early 1999. During this portion of fieldwork, it was a regular occurrence when an older immigrant was turned away because he or she was unable to take the written employment eligibility exam. One South Asian family we observed was devastated when the temporary agency supervisor informed the grandmother, "I'm sorry but we can't send her out on a job if she can't speak English" (Fieldnotes 1999). For this population, piecework is a ready-made opportunity for making badly needed economic contributions to the family unit.

Reason #3: Family Ties and Ethnic Networks

As part of the informal economy, home-based jobs are found through word-of-mouth in immigrant communities. It is common to see friends or relatives doubling as one's boss. Depending on one's perspective, this is intra-ethnic/co-ethnic exploitation or opportunity. However, as one Vietnamese woman—whose family pitches in several nights each week on piecework—explained to a worker's advocate, "Why do you all keep saying that home assembly is exploitation? We like it because we work together as a family unit when we do this kind of work, and that's the way we did it back in Vietnam" (Interview 2000). These cultural dynamics present a challenge to claims by activists that piecework in particular, and Silicon Valley production work in general, are entirely characterized by exploitation and injustice, and racial and gender discrimination. And it makes the task of remedying these situations even more difficult. Given the real probability of no income or a hazardous job outside the home, home-based piecework can be appealing. However, we maintain that greater safety protec-

tions and a livable wage are necessary for workers whether one is employed inside or outside the home. We contest the notion that any job is better than no job given the real social and health consequences of this hazardous labor.

Avenues for Reform?

Home-based piecework in the Valley originally came to light in 1980, around the time the toxic reality of Silicon Valley was just being exposed. Like the chemical spills and the poisoning of workers, piecework was a shameful blemish on the sleek public relations imagery the industry's boosters had worked so hard to create. The *San Jose Mercury News* broke the story in 1980:

> Beneath the Silicon Valley is an underground of cheap labor in which housewives, aliens, refugees, welfare recipients and others struggling to make ends meet earn less than the minimum wage and do without Social Security and workers' compensation benefits. It is a cash market. The companies that use it are able to eliminate 10 percent of their labor costs that go to payroll deductions, and if employees don't plan on reporting the income, the companies can reduce the pay by that much more. (Carey and Malone 1980)

In response to the *Mercury News* report, the state of California launched an investigation. However, this effort was stopped in its tracks for two reasons. First, there was a lack of government officials who could speak Vietnamese and communicate, given that many home workers were Vietnamese. And second, a group of industry leaders met with state labor officials and local politicians to request that they be allowed "to police themselves." Self-regulation has been one of the traditional approaches proposed by the electronics industry and, predictably, led to continued abuses of labor and environmental laws.

In June 1999, two decades after the first reports of home-based piecework in Silicon Valley, the *San Jose Mercury News* published an in-depth investigation into these practices that had grown into a major industry, with Asian and Latino women, men, and their families comprising the majority of this underground labor force. While it is impossible to document the exact size of this industry sector, investigators believe there are "several hundred assembly houses" in Silicon Valley, the largest concentration of these outfits anywhere in the nation. The *Mercury News'* Edito-

rial Board called on the industry to cease this practice, and urged state regulators to enforce the laws, which piecework firms regularly violate.

Within a week's time of the publication of the *Mercury News* report in 1999, the state Department of Labor Standards, the federal Department of Labor, and Cal/OSHA met to launch an investigation of home-based piecework practices. Immediately, many of the companies named in the report ceased sending work home with employees and cut off contracts with full-time home-based workers. This investigation had an immediate negative impact on both the workers' incomes and on the companies' bottom lines. One immigrant pieceworker, who was forced out of work as a result of the report, recited a Vietnamese saying, "The boss eats rice, and the workers eat rice gruel. If the boss doesn't eat, we don't eat" (Ewell and Ha 1999c). In December 1999, the California labor commissioner fined three electronics companies nearly $200,000 for violations associated with home-based piecework. Four other companies have been ordered to pay $284,500 in back wages to workers (Ha 2000).

Despite these penalties, more aggressive, basic legislation regarding high-tech work performed in the home is needed. Silicon Valley labor rights activists were dismayed when, in January 2000, the federal Occupational Safety and Health Administration (OSHA) decided to exempt all home offices—including piecework sites—from regulation. One of the major issues was the constitutionality of invasion of privacy that would be raised from government inspections of private homes. The Santa Clara Center for Occupational Safety and Health (SCCOSH) wrote a joint letter to the *Washington Post* protesting OSHA's action (SCCOSH 2000a). Later, at a hearing sponsored by the Senate Industrial Relations Committee in San Jose, California, activists argued that more health and employment resources were needed for immigrant workers and their families in the Valley, and that original equipment manufacturers (OEMs) must be held legally liable for the working conditions and wages that their subcontractors impose upon these employees (SCCOSH 2000b). SCCOSH also published and distributed its own literature for immigrant families and workers engaged in home-based assembly, which detailed the many hazards involved in this type of labor, and provided information on exposure prevention (SCCOSH 2000c).

Like the garment industry, electronics piecework is organized through a pyramid scheme of contractors, where the original equipment manufacturer outsources the work to "first tier" contractors, who then outsource their work to "second tier" contractors, and so on. Within this organizational structure, workers and supervisors in each subsequent tier are paid less and less, requiring them to work that much harder under unregulated conditions. This pyramid arrangement also allows the original equipment manufacturer to operate with legal immunity because contractors are made responsible for their own working conditions.

Activists successfully challenged this liability evasion tactic in the garment industry during the 1990s, part of a national campaign to bring clothing maker Jessica McClintock to justice for hiring contractors who failed to pay their Asian immigrant women employees. Asian Immigrant Women's Advocates (AIWA) was one of the principal organizing groups that successfully pressured Jessica McClintock to sign a historic agreement that acknowledged original equipment manufacturer liability. Efforts to do the same in the electronics industry have not been so successful. One Cambodian immigrant home-based worker, Kamsung Mao, was interviewed for the 1999 *San Jose Mercury News* investigation. Mr. Mao had developed respiratory problems as a result of working with several toxic chemicals in his home, while repairing power supplies for the firm Top Line. He later filed suit in federal court against two companies, Top Line and Lite-On, the company that contracted with Top Line. The suit was settled, with Mr. Mao winning financial compensation, but the case against Lite-On was dismissed, precluding a precedent-setting ruling for "joint-employer liability" in the electronics industry. However, Mr. Mao still made history in that his was the first-ever lawsuit challenging home assembly in the electronics industry. Flora Chu, a veteran Asian immigrant worker's legal advocate in the Valley, argues that "things will not improve unless we change the system. The garment industry made the ultimate owner responsible. That's one step in the right direction" (Chu 2000).

Resisting Erasure, Becoming Visible

Well before the toxic nature of Silicon Valley industries became public knowledge, a number of activist organizations had emerged to challenge the power of management and the dominant

discourse that claimed this was a "clean industry" leveling social hierarchies while also producing great wealth.

SCCOSH, AIWA, and other groups have stepped up to the challenge of providing services to the working-class populations in this area. SCCOSH's Working Women's Leadership Program (WeLeaP!) focuses on educating and empowering women workers in Silicon Valley's most toxic jobs. The program is a multi-ethnic, multi-lingual effort to provide participants with technical and practical information about the hazards associated with their jobs and the skills needed to negotiate with management regarding these issues. Classes have been conducted for Korean, Latino, Vietnamese, Cambodian, Filipino, and several other ethnic groups. Workers are encouraged to participate in what SCCOSH calls the "Worker Stories Process"—wherein participants tell "their story" about who they are, their problems and opportunities at work, and their plans for improving their situation. As Raquel Sancho, Program Director for SCCOSH and founder of WeLeaP!, explains,

> We developed a process for workers to communicate with each other. It's a process where you can draw [on paper], or say something focusing on who you are, where you come from and what are you doing here. We always have that every time we meet. The second part is, what is your story? They never pay attention to their body. [Usually the workers] never talk about headaches, other health symptoms. They just pay attention to their work, their family, their children. . . . WeLeaP! is the first time that anyone has asked many of these women workers to speak about their lives. (Sancho 2000)

A young Cambodian woman, a WeLeaP! member, told her story of immigration, hazardous work, and asserting herself on the job:

> I was born in Cambodia and moved to the U.S. at age 7. We escaped from our native country to find a better way of life. We escaped the war in Cambodia to go to Thailand. Anywhere but Cambodia was safe at that time. About 3 and a half years ago I worked in computers, doing assembly. That was my second job, right after high school. I worked with chemicals, ultraviolet ink, isopropyl alcohol. We only wore smocks, so our faces were all exposed. I was concerned about my health because the longer I worked, I got more headaches, skin rashes, and dizziness. I went to my supervi-

> sor and they didn't do much. I talked to my co-workers who felt the same way [as I did] but they never brought it up, out of fear of losing their jobs. My supervisor said they would do something about the problem, but they never did. I talked to the safety committee and they said the company already meets the standards, but I asked, "why do I still feel these pains?" And they didn't answer. My mother tells me to keep quiet, but I'm not like that—I speak out. (Anonymous Worker Testimony 2000)

As is the case for many workers, the major medium for addressing workplace concerns is through a management-controlled "safety committee" whose job is to reassure employees that all is well, rather than promoting real change.

WeLeaP! participants are taught, above all, to assert themselves on the job. Seeta is a Filipina immigrant female worker at a tech firm in the Valley. She has two jobs that pay $16 per hour. On one of these jobs she is the Quality Inspector, and proudly states, "I'm worth $1.5 million a day because, although I only get paid $16 an hour, I make 3,000 pieces a day worth $500 each" (Sancho 2000). She experiences a lot of stress from the job and this impacts her family, particularly her relationship with her daughter. She credits her training with SCCOSH's WeLeaP! program for giving her the confidence and skills to request and successfully receive a substantial pay raise from her boss.

One of the spin-offs of the WeLeaP! effort is the In-Visible Project Series at SCCOSH. This is a four-module workshop series that trains workers in storytelling, mural making, theater and film/video. It aims to "transform the immigrant/migrant, low-income worker from a consumer of cultural products to a culture creator, the better to reflect his/her issues and concerns to the outside world" (SCCOSH website). One of the first examples of the In-Visible Project in action was a "mock fashion show" centered around the theme of "Corporate and Economic Trends in Silicon Valley and How These Affect My Health and Well-being." In this project, worker-activists from six ethnic groups—Cambodian, Filipino, Indian, Korean, Indonesian, and Vietnamese—employed fashion to present their concerns and critiques of the industry:

> Clothes as the medium of the message hew closely to women's arts and crafts. By using sewing, which is an accepted private activity of women, the graduating trainees are transforming

a traditional women's craft into a public statement of individual, family and community issues. (SCCOSH website)

Some of the most effective forms of resistance activists engaged in involved campaigns that directly targeted particular corporations accused of violating workers' rights. For example in 1995, Rodrigo Cruz, a Filipino worker employed at a high tech hazardous waste management firm, was exposed to toxic fumes and suffered permanent brain damage. He was unable to work anymore and the company offered him no compensation. SCCOSH and numerous other advocacy groups formed a coalition in response to this incident, called the Justice for Cruz Campaign. The pressure placed on state and federal agencies resulted in investigations and penalties levied against the company, but also changed the state of California's permitting process, requiring permits for waste storage facilities for the first time. As with the activism concerning home-based piecework, Silicon Valley activists succeeded in moving a hidden form of exploitative labor into the public eye and placing questions of justice and equity on the policy agenda.

Recommendations for Action

The following are specific recommendations that speak to the environmental injustices associated with the electronics industry more generally as well as to the specific issues concerning home-based piecework. These points reflect existing or proposed legislation in select North American, European, and Asian nations and cities. In addition to these recommendations, we would like to emphasize the importance of public support for local organizations such as SCCOSH, AIWA, and the Asian Pacific Environmental Network (APEN) because these groups are leading the fight against toxic exposure of AAPI communities by the electronic industry.

Fair pay. The industry should institute a living wage for its workers throughout the product chain, including for employees of subcontractors and employees working in their homes. Original equipment manufacturers (OEMs) must be held legally liable for the working conditions and wages that their subcontractors impose upon these employees.

The right to organize. The industry must recognize and respect its workers' legal rights to organize in unions and to engage in collective bargaining, throughout the product chain, including those workers laboring at home.

Protect workers. The electronics industry should end exploitative and unsafe labor practices throughout the product chain, including hazardous working conditions and the use of prison labor. In the case of home-based pieceworkers, we urge the development of legally binding protocols that places, at the forefront, the safety and financial needs of workers and their families.

Proper handling of hazardous materials. Until safer substitutes are available, manufacturers of electronics should do their best to protect their workers, the public, and the environment from hazardous substances used in the industry.

Phase-out hazardous materials. The electronics industry should invest significant resources in developing safer alternatives to known hazardous materials (for example, lead, mercury, cadmium, brominated flame retardants, chlorinated solvents, etc.) with the goal of completely ceasing the use of materials that are harmful to human health and the ecosystem.

Adopt the Precautionary Principle. Where there is a threat to human health or the environment, a precautionary approach requires taking preventive action even before there is conclusive scientific evidence that harm is occurring. The federal government should develop and implement strict protocols for testing chemicals and mixtures before they are introduced into the markets. This regulatory approach departs from the traditional paradigm in that it shifts the burden of proving that a chemical is safe from the state to the producers of that substance. The City of San Francisco has formally adopted the Precautionary Principle, but a national standard is needed.

Each of these policy actions is reasonable and enforceable in Silicon Valley if the political will is present among labor rights organizers, government agencies, and industry leaders themselves. These practices are in place in numerous other municipalities around the nation and in various countries around the world where grassroots organizers have succeeded in pressing states and corporations to make these changes. In order to ensure that such policies would be enforced, labor unions and worker advocates would have to enjoy a more secure presence in the industry, and the state would have to take a much more hands-on regulatory approach toward this sector. Few employers are going to implement policies of this nature without the real threat of state sanctions or of resistance by workers and community members. We have little

choice, however, but to work toward these goals because to do otherwise would constitute an acceptance that countless persons are being poisoned and exploited mercilessly. The implications of these proposed policy changes are far reaching indeed because the impacts would be felt not only by AAPI workers in Silicon Valley, but by workers across virtually every industrial and service sector in the nation.

Conclusion

Through the deliberate social construction of high technology as a "clean" industry in the face of extraordinary toxics usage, and the maintenance of socially oppressive corporate cultures, Silicon Valley's leaders have manufactured a system that punishes and ignores thousands of AAPI workers. These workers engaged in high-tech production in Silicon Valley experience little of the vast volume of wealth enjoyed by the Valley's tycoons. The ultimate contradiction involved in these sectors is that the labor these workers perform is at the cutting edge of production, yet they exist at the margins of the industry.

We should be clear that, in the face of all of these challenges, these workers still perform their jobs with dignity. They are often able to separate their identity from the job and find "meaning in demeaning work" despite the difficulties (Glenn 1986). They have channeled their concerns into productive forms of empowerment and public engagement that have forced the industry, the state, and consumers to take notice.

References

Anonymous Worker. Workers Stories Process at the SCCOSH WeLeaP! Graduation, December 6, 2000, San Jose, California.

Benner, Chris. 1996. *Shock Absorbers in the Flexible Economy: The Rise of Contingent Employment in Silicon Valley*. San Jose, California: Working Partnerships USA.

—. 1999. "Silicon Valley Labor Markets: Overview of Structure, Dynamics, and Outcomes for Workers." Working Partnerships USA. Task Force Working Paper #WP07. San Jose, California.

Bureau of Labor Statistics. 1997. *Occupational Injuries and Illness in the United States.* United States Department of Labor. April.

Carey, Pete and Michael Malone. 1980. "Black Market in Silicon Valley." *San Jose Mercury*. August 31.

Chu, Flora. 1998. "Asian Workers Health Project." In *Silicon Dreams*. Santa Clara Center for Occupational Safety and Health's Workers'

Memorial Day Book. May 3.

—. 2000. Interview by David N. Pellow. Palo Alto, California. 21 June.

Cook, Christopher and Clay Thompson. 2000. "Silicon Hell." *San Francisco Bay Guardian*. April 26.

Cummings, Judith. 1982. "Leaking Chemicals in California's 'Silicon Valley' Alarm Neighbors." *New York Times*. May 20.

Ewell, Miranda and K. Oanh Ha. 1999a. "High Tech's Hidden Labor." *San Jose Mercury News.* June 26.

—. 1999b. "Long Nights and Low Wages." *San Jose Mercury News*. June 27.

—. 1999c. "Piecework Diminishes." *San Jose Mercury News*. October 17.

Fieldnotes. 1999. Excerpt from Notes in the Field. Silicon Valley, California. January.

Glenn, Evelyn Nakano. 1986. *Issei, Nissei, Warbride*. Philadelphia: Temple University Press.

Ha, K. Oanh. 2000. "Piecework Lawsuit Settled Claim Over Man's Home Assembly of Electronics." *San Jose Mercury News*. November 14.

Hossfeld, Karen. 1988. *Division of Labor, Division of Lives: Immigrant Women Workers in Silicon Valley*. Unpublished Dissertation, University of California, Santa Cruz.

Malone, Michael and Susan Yoachum. 1980. "The Chemistry of Electronics." *San Jose Mercury News*, April 7. Part of a Special Series entitled, "The Chemical Handlers."

Markoff, John. 1980. "California's Space-Age Sweatshops." *Los Angeles Times*. October 28.

Page, Jake. 2000. "Making the Chips that Run the World." *Smithsonian*. January, p. 40.

Park, Lisa Sun-Hee. 2005. *Consuming Citizenship: Children of Asian Immigrant Entrepreneurs.* Stanford: Stanford University Press.

Pellow, David N. and Lisa Sun-Hee Park. 2000.

"The Hazards of Work: Environmental Racism at the Point of Production." Paper Presented at the Annual Meetings of the American Sociological Association. Washington, D.C. August.

Pellow, David N. and Lisa Sun-Hee Park. 2002. *The Silicon Valley of Dreams: Environmental Injustice, Immigrant Workers, and the High-Tech Global Economy*. New York: New York University Press.

Rollins, Judith. 1985. *Between Women: Domestics and their Employers*. Philadelphia: Temple University Press.

Rue, Victoria. Interview. 2000. Interview by David N. Pellow and Lisa Sun-Hee Park. Oakland, California. 23 June.

Sancho, Raquel. 2000. SCCOSH Retreat. October 10.

San Jose Mercury News. 1999. "High-Tech Diversity in 1997." San Jose, California. 16 April.

SCCOSH (Santa Clara Center for Occupational Safety and Health) and the South Bay Central Labor Council. 2000a. "OSHA's Turnaround." *The Washington Post*. January 18.

—. 2000b. "Testimony before the Senate Industrial Relations Commit-

tee." San Jose, California. March 23.

—. 2000c. "Electronics Assemblers: Protect Your Family from Lead." San Jose, California.

—. 2000d. "If You are a Temporary Worker." Fact Sheet. San Jose.

SCCOSH Website. 2001. <http://www.sccosh.org>.

Semiconductor Industry Association Website. <http://www.semichips. org>.

Siegel, Lenny. 1994. *The Silicon Valley Experience: Why Labor Law Must Be Brought into the Twenty-First Century*. Testimony Before the U.S. Commission on the Future of Worker-Management Relations. Mountain View, California: Pacific Studies Center.

Wahlin, Britt. 2001. "Sweatshops, Silicon Valley Style." *Sojourner: The Women's Forum*. January.

Woo, Deborah. 2000. *Glass Ceilings and Asian Americans: The New Face of Workplace Barriers*. Walnut Creek, London, Delhi: AltaMira Press.

Working Partnerships USA and the Economic Policy Institute. 1998. *Growing Together or Drifting Apart? Working Families and Business in the New Economy. A Status Report on Social and Economic Well-Being in Silicon Valley*. San Jose, California: Working Partnerships USA and the EPI.

Notes

1. Like a number of scholars, we use the terms "high technology" and "electronics industry" interchangeably.

2. We draw on four principal research methods for this study, which we conducted between 1998–2001. First, we reviewed the literatures on environmental justice, immigrant/women's labor, and the electronics industry in Silicon Valley and other nations. Second, from several archives we performed systematic content analyses of newspaper articles, government documents, books and manuscripts on environmental conflicts, labor struggles, and racial strife in Santa Clara County. Third, we gathered data through participant observation. This involved fieldwork in a Silicon Valley firm for several weeks and volunteering at—and working for— community-based organizations in the area for three years. Finally, we conducted semi-structured interviews with workers and labor/ environmental activists directly engaged in environmental and social justice-related conflicts in Silicon Valley.

3. These women include refugees and immigrants from the Southeast Asian wars in the 1970s (Vietnam and Cambodia, especially) as well as economic migrants from China, Korea, Indonesia, and Malaysia.

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