GLOBAL ELECTRONICS

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THE L.A. UPRISING: A SIGN OF THE FUTURE

by Lenny Siegel

The recent "riots" in Los Angeles, sparked by verdict in the Rodney King beating case, hit the American political landscape like the wake-up call of an alarm clock with a snooze button. It reminded people that our cities are falling apart, but policy-makers are still likely to return to their slumber of neglect. They'll make a few speeches, take a few polls, and boost the budget for a few programs, but they are unlikely to consider how structural changes in the U.S. economy contributed to the unrest. Unless those changes—particularly the polarization of the workforce wrought by the application of new technologies—are analyzed and attacked, more such underclass eruptions are inevitable.

The rebellion did not take place in the rust belt or the declining East, but in the bustling core of the sunbelt. The Los Angeles metropolitan area is one of the nation's three major high-tech centers, but its underclass is no better off, and no less volatile, than the slum-dwellers of older urban centers.

About two weeks before the uprising, I was contacted by a newspaper reporter preparing an article, based on the 1990 census, on California's changing demographics. Since I've repeatedly profiled the state's high-tech workforce, he asked me how new technologies were influencing the future social structure of the state.

I repeated, as I had told interviewers innumerable times over the past several years, that both the production and use of high-technology electronics—computers, chips, and telecommunications—were polarizing the workforce. In Silicon Valley and other economic centers, professionals live and work in a world that is financially, culturally, and often geographically distinct from the world of production workers, service workers, and the unemployed.

Furthermore, I explained, it is extremely difficult to move from the lower tier to the professional class. Immigrant electronics assemblers in San Jose, black youths in Los Angeles, and other have-nots are essentially trapped at the bottom of the economic ladder. For those who cannot possibly become stockbrokers or computer scientists, gang membership may make economic sense.

I suggested, without full confidence in my warning, that the polarization of opportunity in California, at least, had created a potentially explosive situation. I had no idea how correct I was.

I believe that the L.A. uprising was caused by centuries of racism, decades of police oppression, years of conservative social policy, and more than a few months of recession. New technologies, instead of helping overcome those problems, have actually exacerbated them. We cannot afford to continue moving blindly ahead, developing faster processors, flashier memories, and more sophisticated software, without considering the social consequences.

For those who have read my book, articles, and newsletters, this analysis is by no means new. But it is timely. In the debates on police conduct, family values, and government-funded programs, we should not ignore the social impact of the ways that our institutions employ computer-related technologies.

It its heyday of the 1950's and 1960's, the American socio-economic graph looked like a bell curve. There were a handful of wealthy at the top; still too many poor at the bottom. But there was a vast middle-class, anchored by a unionized, blue-collar workforce. With experience, training, persistence, and luck, many people—even African-Americans and Hispanic-Americans—could work their way up.

New technologies, for all their benefits, have structurally altered that curve. A larger proportion of the population—generally white males with a high level of formal education—is affluent. But the curve now has two humps—the middle has almost disappeared.

By and large, the corporate and government institutions that control the means of production in the U.S. have chosen to substitute technology for

(continued on page 2)

skilled labor. Masked in rhetoric about efficiency and international competitiveness, this is the modern-day version of Taylorism or "scientific management."

The most obvious impact of computers and automated equipment is the displacement of human physical and mental labor. Production-line robots, automated teller machines, and telephone switching equipment all put people out of work.

Proponents of maximum automation argue that it boosts economic activity, creating new jobs. However, the net impact of automation on the number of jobs in the U.S. economy or, more appropriately, the world economy, is the subject of debate among economists and other experts. Everyone seems to agree, however, that it will take more than luck for any city, state, region, or country to maintain full employment throughout this period of change.

While it is difficult to measure that quantitative impact of new technologies, qualitative changes are easily apparent to workers thrown out of work by structural change. Except for positions reserved for professionals with significant formal education, new jobs are concentrated in low-paying, low-skill, low-status service jobs such as restaurant service or retail sales.

The downgrading of work is no accident. Nor is it the necessary result of new technologies. Rather, employers have chosen to use computer technology to de-skill their workforce. The knowledge and experience that it formerly took to run machine tools in auto plants or cash registers at fast-food restaurants have been programmed into the equipment.

The clerk who greets one at a MacDonald's no longer need to know how to figure change, memorize prices, or even write orders. The computerized cash register does it all. Some even substitute symbols—such as a drawing of a hamburger—for words. Such employers can hire unskilled, non-English speaking workers, and they save money by paying extremely low wages.

Equally important, many modern employer follow Tayloristic practices, using technology to fragment the work process. Each process is broken down into distinct tasks. Workers are hired only for their ability to accomplish a single task, and they are paid accordingly.

For example, banks, airline companies, and other bulk paper-shufflers have created massive data entry back-offices, in which typing is the only required skill. In fact, several companies even send this work overseas. Some even prefer that the typing be done by non-English speaking workers. These workers use state-of-the-art computers or terminals linked by advanced telecommunications networks, but their jobs require fewer skills than conventional secretaries. Their pay, again, is extremely low.

Finally, workers who do not have the status and ability to program or control machines must compete with them. Many more office, factory, and service jobs could be automated, but are not because people are cheaper for the task. But those people, whether on the open job market or negotiating collectively, recognize that higher pay—even if required to live comfortably in this society—would cause employers to hire machines instead.

The marginalization of the less educated population—such as the non-white denizens of inner cities—is unmistakable, but not irreversible. We can devise educational, social, and economic policies that encourage the development of more meaningful, decent jobs, but thus far hardly anyone has admitted that there is a problem.

Early in this century writers such as Jack London postulated that capitalism would rely on the "iron heel" of repression to maintain sharp class divisions, but working people were successful enough organizationally to force policies that led to the emergence of a massive American middle class.

Those victories are gradually disappearing. Unless technology-backed structural changes in American employment strategies are countered, a new level of repression will emerge to "keep them down in the city."

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FORMER SOVIET BLOC

Expect a slowly growing number of high-tech production plants to open in the former Soviet Union and its former allies. These countries have ample resources, skilled labor, and large potential markets. With foreign involvement, they can quickly obtain capital and technology—though little control.

In late April, southern California-based Unistor opened a joint-venture disk drive assembly plant in Volgograd, Russia. Built in an former nuclear-missile factory, the venture employs about 100 Russian workers, expanding eventually to 300. The plant, 65% owned by Unistor, will produce 2.5-inch disk drives for the Russian and neighboring markets. *(San Jose Mercury News,* April 27, 1992)

Meanwhile, a Hungarian-trained Vietnamese computer scientist, Nguyen Quang A, has established a joint venture, with France's Groupe Bull, to manufacture IBM PC clones in Ho Chi Minh City. In 1989 he formed socialist Vietnam's first privately held company, a software firm owned by Quang A and 16 other engineers. *(San Jose Mercury News,* May 25, 1992)

MILITARY COMPUTERS

Not long ago, "cots" in Silicon Valley meant apricots. Many high-tech factories and the developments that house their employers have been built on old apricot orchards. Now the U.S. military, the father of all acronyms, has found a new meaning.

COTS are "commercial off-the-shelf" computers. The U.S. armed services, which historically required that tactical computers meet rigid environmental specifications (mil-specs), are beginning to accept COTS products for many applications.

Mil-spec machines are, at least in theory, more reliable, but commercial vendors says their computers worked well in the war with Iraq. Furthermore, many of the military's environmental requirements are unnecessary for most uses. A Hewlett-Packard spokesman said, "We just completed an environmental test for a Navy program that involved 250-g shocks to one of our computers. It was a test-until-you-fail situation. While the computer withstood the abuse, it is not clear to me that any operator would."

The purchase cost of COTS computers is typically one tenth of that for comparable mil-spec machines. COTS machines are more compatible than custom-designed mil-spec computers. They require less software support. And with no need to pay a large workforce of skilled repair personnel, maintenance costs are lower.

The switch to COTS is already benefiting commercial suppliers, such as Sun Microsystems. As price becomes a more important factor in contract awards, it is likely that the military will increase its purchase of foreign-made machines. *(Journal of Electronic Defense,* February, 1992)

ENGINEER ALIENATION

In comparison to production workers, research and development engineers in high-tech industry generally achieve high status, pay, and power in the workplace. However, argues Michael Hillard *(Review of Radical Political Economics,* Vol. 23, 1 & 2, 1990), after ten to fifteen years in the electronics or computer industry, many R & D engineers become disillusioned.

In general R & D engineers share an ideology in which they expect "the power to influence the direction of invention, to have their individual contributions recognized and to advance in their careers on this basis." Particularly in large organizations, those expectations are not met.

First, power is generally centralized in the hands of R & D management. Staff engineers, says Hillard, have little influence over the technological direction of inventive activity. (Editors note: This is particularly hard to stomach when the engineer is actually more competent, in the relevant field, than the manager.)

Second, "The organization of the labor process into a technical division of labor tends to create a 'collective engineer'; this obscures individual responsibility." Individual competence or achievement, therefore, goes unrecognized and unrewarded, even for engineers who work hard, long, and well.

Third, opportunities for career advancement are limited. Unless an engineer abandons R & D for management, upward movement in not likely. And there are not enough management positions to absorb all the engineers who seek to go that route.

Hillard's analysis rings partially true, but there are now many large firms that are attempting to reward competent professionals on non-managerial career tracks. More important, growing entrepreneurial firms are often small enough to recognize achievement while expanding fast enough to provide advancement.

Yet perhaps the youth of the computer industry and many of its professionals masks the veracity of

(continued on page 4)

Hillard's claims. Maybe soon the typical electronics industry R & D engineer will soon recognize his/her fate: "alienation, overwork and, in many cases, vulnerability to unemployment."

LIFE CYCLE THEORY FALLS SHORT

Carolyn Sherwood-Call, an economist for the Federal Reserve Board of San Francisco, has put the product life cycle theory to the test. *(FRBSF Weekly Letter,* February 28, 1992) The theory suggests that electronics production in ten major U.S. high-tech centers would have declined as product lines matured, costs rose in innovating regions, and the links between innovation and manufacturing weakened. However, those innovative areas, including Silicon Valley, remain strong producers of components.

Sherwood-Call concludes, "The regions that were important producers [of semiconductors and printed circuit boards] in 1977 remain so today, and despite a modest decline in recent years, now have a far higher level of activity than they did then.... These findings reflect the facts that the pace of technological innovation in electronics components has been rapid enough to limit the extent of standardization in the industry, and that most of the important innovating regions in the U.S. were not particularly high-cost locations to begin with."

She does note, though, that over the same period U.S. producer's share of world production has fallen dramatically. She adds, "if the forces described by the product life cycle theory are at work, they are working in an international rather than a domestic context."

Sherwood-Call's findings are useful, but limited in scope by the availability of data. First, she chose—because of Census availability—a base year of 1977, just before high-tech industry's largest growth spurt. Second, she was forced to accept static definitions of product lines. Over the last fifteen years, much of the work that formerly went into making computers and other electronic equipment now is part of the component fabricating process. Third, there is no accurate, publicly available information on the source of products that are made on international assembly lines. The "U.S. producers' share of world production" may have little to do with the value added within the United States.

SEMATECH UPDATE

In a little noticed but potentially significant move, the House Armed Services Committee has earmarked $10 million for environmental programs as part of the fiscal year 1993 authorization for Sematech. Requested by the Campaign for Responsible Technology, this funding may mark the first time in recent history that "national needs"—other than military security—were considered in government support for a technology policy program. The authorization is likely to be approved by the full House of Representatives, but the Senate and the appropriations committees of both houses must concur.

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