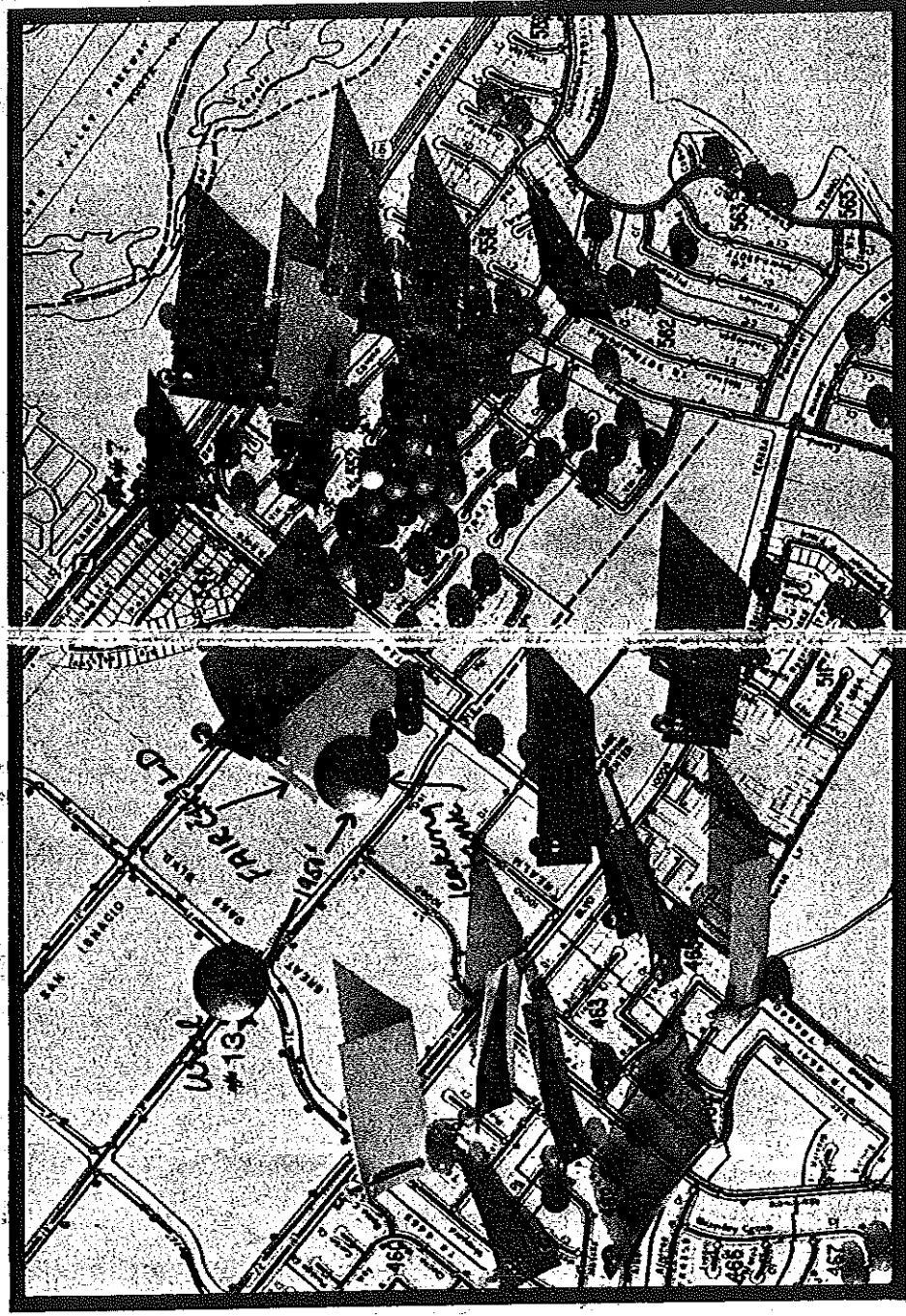


The Dark Side of Silicon Valley



Attorney Amanda Hawes's indictment: red flags represent children born with heart anomalies; blue pins mean miscarriages; yellow flags, cancer; black flags, recent death. And it may be decades before the full impact is known. . . .

BY LENNY SIEGEL

N THE SPACE of one month in early 1984, Silicon Valley was host to delegations headed by the king of Sweden and the presidents of Australia and France. The queen of England visited with her people the year before. These fact-finding tours come to arrive, and like priests back in a pilgrimage to High-tech Mecca, hassles go home to tell of a land where factories resemble college libraries, unemployment remains low, the base is solid and life is wonderful. What they don't see are telltale signs of Silicon Valley—the belt of communities circling the south end of the San Francisco Bay—has been beset with racial, environmental and financial ills: rampant housing costs, illegal cottage industry and a second society of production workers who live miles apart, both figuratively and literally, from their professional counterparts.

Though it's become a universal symbol for the promise of microelectronics age, Silicon Valley is in trouble.

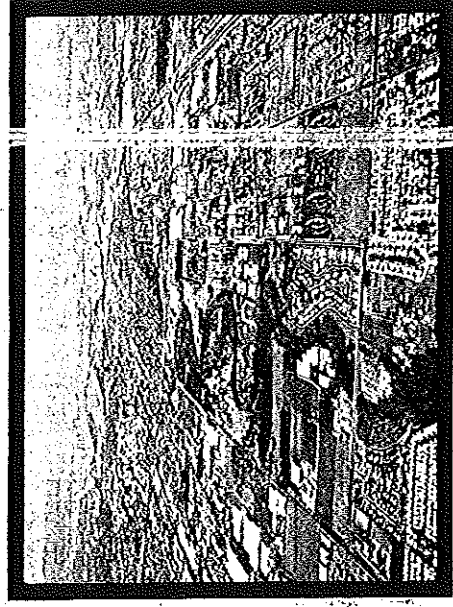
N THE PAST few years, investors have flooded Silicon Valley with funds to create scores of companies making micro chips and disk drives, far more companies than even the angriest market can support. Besides feeling the consequent financial threat, established companies—themselves relative newcomers—have had trouble finding onto key employees.

By view the new entrepreneurs with suspicion, worrying that this latest generation doesn't intend to follow the lead Apple's Steve Jobs or Intel's Robert Noyce, who built viable, ongoing enterprises. They worry too that new "venture capitalists" seem content to emulate Adam Osborne of Osborne Computer or Chuék Peddle, the founder of Intel, both of whom made millions in computers but whose companies went bankrupt.

Supporters of the new wave of entrepreneurs espouse a sort of economic "winism." They say that though many venture capital-based firms will die, the strong will survive, with mate good to the economy. While approach suits fast-profit venture capitalists and entrepreneurs, it makes a tech an unstable source of employment, even when business is booming. What is worse, the excessive profits reaped by successful venture capitalists

depend on a pay scale in which production workers are paid a bare minimum, one more factor which perpetuates the dangerous and ever-widening gap between the valley's rich and poor.

The upper stratum of managers, engineers and programmers in the world of Silicon Valley is centered in northern Santa Clara County. There, the high-tech companies are clustered, near Stanford University in Palo Alto with its industrial park, attractive suburbs and good schools. The influx of high-income families brought by high-tech development has driven up the cost of housing; since the seventies, rents and prices there have been among the nation's highest. These high costs have driven electronics production workers, the unemployed and the retired to San Jose, home to half the country's resi-



No belching smokestacks in sight, but a closer look reveals sweatshops, massive traffic jams and earth that's being poisoned.

dents. Though employees of all stripes are found in the valley's three-hour daily traffic jams, it's the industry's working poor who commute the greatest distance.

And so, the rich get richer. Palo Alto, which receives tax revenue from Stanford Industrial Park, easily provides effective municipal services to its relatively affluent citizens. San Jose, on the other hand, has a much smaller tax base from which it must serve the country's poorer residents. Electronics workers from San Jose spend the day in the north county, generating wealth for companies to pay into suburban treasuries. Then they return to homes protected by San Jose's more rigorous police and fire departments. Palo Alto's children attend one of the top-ranked school systems in the country, while in San Jose, in 1983, the Unified School District became the first in the nation since 1943 to declare bankruptcy.

The disparity in living conditions applies to a sizable proportion of high-tech employees. Though semiconductor and computer companies do most of their labor-intensive assembly overseas or in other parts of the U.S., semi-

skilled production workers still make up a third of the valley's electronics work force. Most of these workers are women; about half are minorities—Chicanos, Filipinos and Indo-Chinese—who cross paths with their professional coworkers only in company cafeterias and parking lots.

One in every twenty of those working in valley electronics (more than 10,000 people) work in printed circuit board assembly plants for little more than the minimum wage. As Joe Weber, human resources manager of the American Electronics Association, told a reporter, "Many of the printed circuit board companies are pretty much sweatshops. They pay what they must to stay in business."

Although silicon chips are fabricated with precise machinery in particle-free rooms, they can be attached by hand, anywhere, to the printed circuit boards that form the heart of most computer equipment. An illegal cottage industry has sprung up to do the work. Maria (a pseudonym); she asked that not even her actual first name be used) illegally stuffed and soldered thousands of printed circuit boards in her home in the course of the two years she worked for a middle-aged woman she called "Lady." Lady subcontracted assembly work from reputable big-name firms—so Maria was told—and had about a hundred minority women working for her, primarily immigrants and refugees from Latin America, Korea and Indochina. Indeed, the local yellow pages lists numerous other subcontractors like Lady, headquartered in small shops and private homes.

A political refugee from Argentina, Maria had quit her \$4.10 an hour production job when she had her first baby. She had gladly accepted the low-paying, at-home piecework because child care would have eaten up most of her after-tax earnings at a full-time job. She quit, however, when Lady asked her to wash her assembled boards by dipping them into a panful of solvents heated on her kitchen stove. Unlike most Silicon Valley cottage workers, Maria had studied chemistry, and she knew that the hydrocarbon fumes could make her young son, crawling around on the kitchen floor, seriously ill.

IN MANY QUARTERS, the electronics industry has an image as clean and shiny as a silicon wafer. In June 1983, for instance, Texas Governor Mark White, elated by Microelectronics and Computer Technology Corporation's decision to set up headquarters in Austin, told reporters, "I

don't think you'll find that there will be any pollution [in the electronics industry] unless their Japanese cars that they drive to and from work do it."

It isn't hard to see how high tech came by its reputation. Chips, computers and switchboards don't breathe exhaust or drip oil. Factories are stylish, well landscaped. No smokestacks protrude above their facades, since municipal standards require that manufacturers hide their vents. Production takes place in "clean" rooms, where the air is fanatically filtered; workers wear surgical caps, gloves and gowns. But the industry's vast investment in cleanliness is designed principally to protect microelectronic components from dust particles, not workers from toxic chemicals essential to high-tech manufacturing, which are some of the most dangerous materials known to humanity.

A few years back, several women on the morning shift at Verbatim, a Silicon Valley manufacturer of memory disks, complained of dizziness, shortness of breath and weakness. Some even reported seeing a haze in the factory air. Hours later, after the building had been evacuated, inspectors from the California Occupational Safety and Health Administration couldn't find fumes intense enough to explain the complaints, and they termed the episode "mass psychogenic illness," also known as assembly-line hysteria. In the stressful world of high-volume electronic assembly, mass hysteria is not unknown. But chances are that the Verbatim workers' bodies had registered the presence of toxic chemicals at a level that health officials could not detect.

Mass exposure to high levels of toxic chemicals doesn't happen every day in Silicon Valley, but employees and neighbors of high-tech manufacturers are constantly threatened by the release of hazardous materials into the environment. It may be decades before the full impact on public health is known. The industry uses thousands of toxic materials, and though the volume is small compared with chemical-intensive industries like petroleum and pesticides, a Bhopal-like incident is a serious possibility.

San Jose attorney Amanda Hawes is one of a handful of Silicon Valley activists who has warned repeatedly that high tech is indeed a hazardous industry. She has built her reputation by representing electronics workers injured by chemicals on the job. Today she and cocounsel John Tyndall represent residents of the Los Pasos neighborhood in southern San Jose, a new, comfortable, working-class suburb typical of the valley, which is distinguished by the presence of an idle chip manufacturing factory built by Fairchild Semiconductor in 1975.

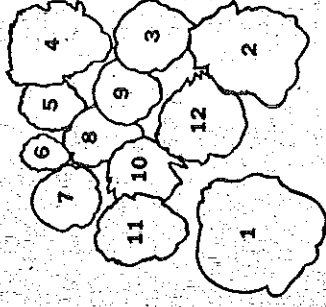
Hawes carried with her a large zoning map of the area surrounding the Fairchild plant. On every block in the neighborhood there were colored pins and flags. Each red flag represented a child born with heart anomalies; each blue pin marked a miscarriage; each yellow flag signaled a cancer case. Black flags, superimposed on the other markers, noted recent deaths. Hawes also had a supply of pins, and she frequently added one to the display. She charges that Fairchild is responsible for the area's high incidence of disease.

Before January 1982, most of Hawes's Los Pasos clients believed that electronics was a pollution-free industry. At that time, officials disclosed that six weeks earlier they had shut down a drinking water well operated by the Great Oaks Water Company just 2,000 feet from an underground chemical storage tank at Fairchild. Solvents from the tank, including suspected carcinogens trichloroethane and dichloroethylene, had entered the water supply. When residents learned of the leak, they quickly suspected that the company was to blame for the area's alarmingly high incidence of birth defects and miscarriages. Since then, Fairchild has spent at least \$15 million to reduce the concentration of solvents in the aquifer, but the water there will never be as clean as it was before Fairchild set up shop.

The Fairchild leak exploded in the local press, breaking through a long-standing barrier of silence on high-tech pollution. Today, scarcely a week passes without the revelation of a new leaking storage tank, poisonec well, or pollution-law violation. As soon as the extent of the Fairchild leak was known, other companies started to test the groundwater around their underground chemical tanks. Even firms with a reputation for environmental concern, such as Hewlett-Packard, found that they too had been leaking toxics into the ground.

In northern Santa Clara County, where large numbers of high-tech firms operate next door to each other, cleanup has proceeded slowly while companies contest their responsibility. Many small firms have yet to be tested. The public water supply, much of which is pumped from aquifers 200 feet or more beneath the surface, has thus far been protected by a thick layer of clay. It may be only a matter of time before the toxic plumes penetrate the clay and permanently poison a water supply serving hundreds of thousands of people.

Toxic chemicals from high-tech production follow other paths into the environment. For example, despite federal and state rules requiring manufacturers to pretreat their toxic sewage before discharging it, concentrations of toxic heavy metals such as nickel, lead and cadmium are building up in the San



1. Cranston, 2. Davis,
3. Dannemeyer, 4. Parker,
5. Laffer, 6. Lungren,
7. Fiedler, 8. Zschau,
9. Antonovich,
10. Herschensohn,
11. Ueberroth, 12. Reagan

MILLION DOLLAR FEET

Mornings, three-term incumbent Alan Cranston, 71, improves his stamina with a little jog. This time next year he should hope to be in a flat-out sprint, given the Republican mob already dogging his heels: candidates declared and undeclared—who might nevertheless change their minds, such as Foss ("Davy Crockett") Parker, Maureen ("First Family") Reagan and Peter ("Olympics") Ueberroth, though the million-dollar cost of a primary campaign in California will surely slow down some and wear out others. Who can catch him? Foss? Big Mo? Peter the Great? Polls say the best bet is state senator Ed ("Hang the hijackers at the airport") Davis, L.A.'s former police chief. Times are just right for Ed's no-nonsense style, say his backers. And that, they also say, is the trouble with Al C. He's known from the presidential primary as a liberal liberal. To win in these conservative times, he'll have to outrun his own reputation.

Francisco Bay, entering the food chain through the bay's surviving fish population. In fact, the Palo Alto sewage treatment plant earns more than \$50,000 a year by selling its incinerated solid waste to World Resources, Inc., which extracts about four ounces of gold from an average day's slug ash. The presence of gold and silver in Palo Alto's sewage sludge suggests that high-tech companies, even when they want to, can't remove all metallic waste from the sewage stream. And the public record is filled with complaints lodged against small printed circuit (electroplating) outfits that ignore sewage regulations outright. In July 1984, the Environmental Protection Agency ordered 32 valley firms to pretreat their effluents properly or pay fines of up to \$10,000 a day.

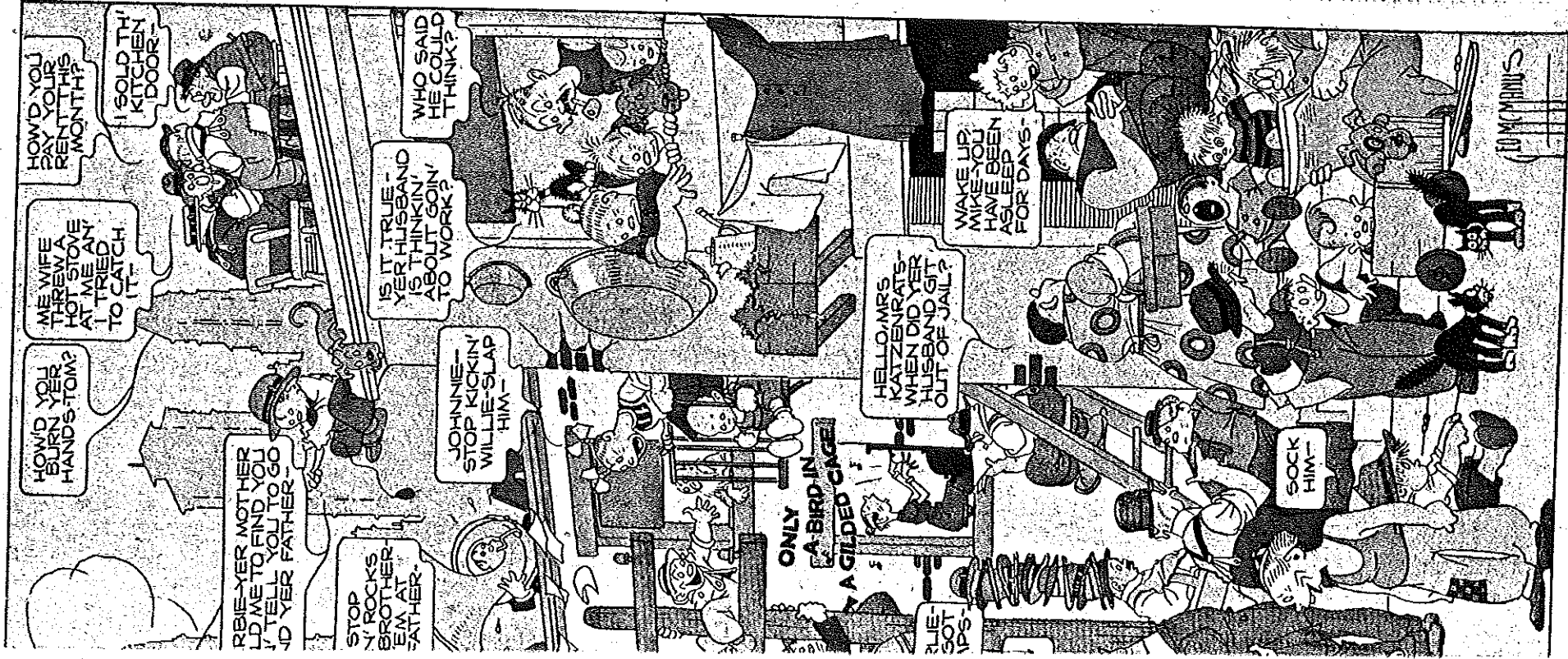
Sewage treatment districts, worried that toxic materials damage the organisms that process sewage at their treatment plants, closely monitor the presence of contaminants at the discharge pipes of valley companies. Most manufacturers comply with existing pretreatment standards. Such standards may protect the sewage plants, but they may not be sufficient to protect the bay, slowly being poisoned by high-tech sewage. Mike Belliveau, research director at Citizens for a Better Environment, warns, "Those standards originally were drafted more than ten years ago and were based upon deep ocean discharge, not for a dead-end lough at the south end of the bay where the water is only a few feet deep."

The almost daily smog that blankets the south Bay Area is much more obvious than the trickle of toxics entering the bay, but few people realize that high-tech plants spew tons of smog-producing fumes and toxic gases into the air every day through hidden vents. More dangerous still, a minor industrial accident, such as the rupture of a gas cylinder of a commonly used gas like arsine or phosphine, could hospitalize or even kill hundreds of local residents.

To their credit, electronics industry leaders have backed new legislation to prevent additional pollution. While the petroleum industry—both big oil and small station owners—objected to proposed local ordinances requiring that toxics, including gasoline, be stored in double-walled tanks, the electronics industry formed a task force to win technical modifications. But when the Air Quality district proposed stricter emission controls for semiconductor plants, companies accepted them in principle but worked for changes and delays that would reduce the cost of compliance.

Dependent more upon brainpower than raw materials, high-tech executives

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Silicon Valley

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recognize that Silicon Valley is the world's leading center for high-tech industry largely because it offers professionals an attractive quality of life. They know that if the valley becomes unlivable, it will be virtually impossible to recruit scientists, engineers and programmers from outside the area. Environmental protection, therefore, is in their long-term interest.

Those areas that wish to emulate the valley should recognize that carefully designed programs of environmental regulation will not drive away responsible high-tech firms. In fact, Oregon is winning new high-tech investment largely because it is perceived as a state which places a premium on environmental protection. Many companies prefer to work in areas with existing standards and experienced enforcement personnel. It's easier and cheaper for them to install a state-of-the-art chemical storage facility before a factory is built than to dig up the ground, clean up the contamination and replace the tank. Still, not enough is being done to develop new industrial processes that use fewer hazardous materials and generate less hazardous waste in the long run. The brains that have squeezed hundreds of thousands of electronic functions onto circuits smaller than the head of a nail will have to figure out how to do that at a minimum risk to the environment.

DURING THE 1960s, when high tech was new, most Americans viewed computers with suspicion, as though they were maniacal monsters like Hal in 2001. College students carried placards challenging the dehumanization inherent in IBM cards, warning: I AM A PERSON. DO NOT FOLD, SPINDLE OR MUTILATE! Even those willing to learn computer programming were denied direct access to the inner sanctums of corporate, government and university data processing centers. The birth of microcomputers in the 1970s changed all that; now computers are inexpensive, accessible, controllable—offering everyone a sense of power. Today the shiny image of high tech, like the sirens of Greek mythology, sings an alluring song, as it transforms the industrial wastelands into beehives of success. But for communities to benefit from the industry they must look beneath its surface to the dark side. Ulysses and his sailors protected themselves from the sirens' song by filling their ears with wax, but willful oblivion won't work here. In order for the problems of high tech to be solved, they must first be confronted.

Fashion

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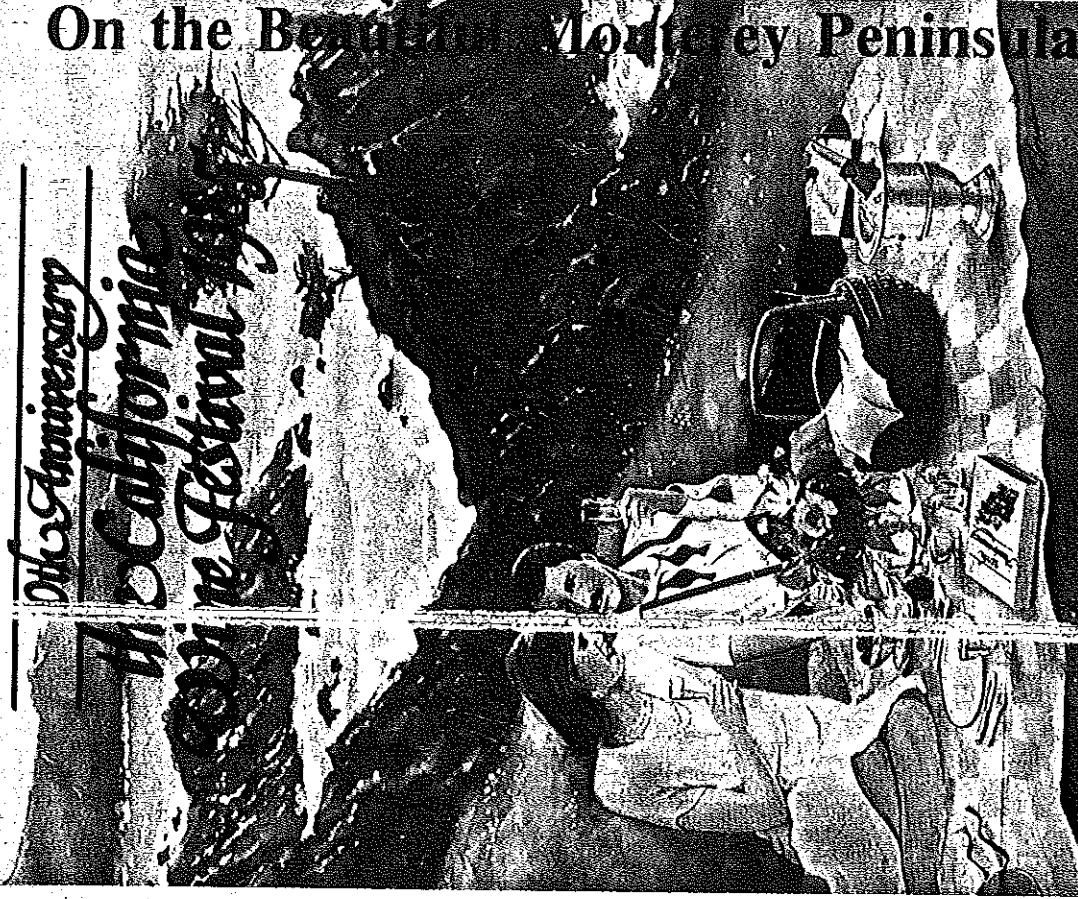
Azzedine Alaïa also at Aprupos, Newport Beach; Santa Ana; I. Magnin, Neiman-Marcus; S.F. Krizia at Macy's, Saks Fifth Avenue, S.F.; Wilkes Bashford, S.F. Terry Mugler at Aprupos, Newport Beach, San Diego, Santa Ana; I. Magnin, Neiman-Marcus, S.F. Devereau; at Maxfield, L.A.; Saks Fifth Avenue Beverly Hills; Fred Segal, L.A. Connie Parenté at Ad-dictions, L.A.; Aprupos, Newport Beach, San Diego, Santa Ana, Woodland Hills; Emphasis, Holly's Harp, Melons, L.A.; Ron Ross, Tarzana.

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