
GLOBAL ELECTRONICS

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VALLEY WORKAHOLISM

In February, the **San Jose Mercury News** (February 17-24, 1985) published a seven-part series, "By Work Obsessed," based upon a scientific survey of 1,509 people living and working in Silicon Valley, as well as additional interviews and a review of government statistics. As expected, the **Mercury News** found that the Silicon Valley workforce is on average affluent and well educated. In addition, it learned that only 20% of the workforce is 45 years of age or older, well below the national average (31% between 45 and 64). A large number are single (31%) or divorced (14%), compared to only 20% and 11% respectively for the entire U.S. The survey, in what we consider a major oversight, did not ask respondents if they have children.

Though official statistics show the electronics industry with a smaller fraction of the Valley workforce, 45% of those surveyed identified their work as high-tech - presumably those doing support work for high-tech businesses call that work high-tech. Despite the Valley's reputation for encouraging the formation of small, innovative firms, two-fifths of the Valley's high-tech employees work at firms with more than a thousand employees. Some 20% of the Valley's workers have held their current jobs for less than one year, and another 25% switched jobs in the last three years.

The **Mercury News** confirmed that the typical high-tech employee in Silicon Valley works long hours and suffers from the stress. The survey found that 30% of Silicon Valley's employees (in all industries) work 41-50 hours per week and that another 10% work more than 50 hours, compared to 19% and 7% respectively in a 1982 national survey. The **Mercury News** survey found not only that most Valley employees like their work, but that those who work longer hours are even more positive. On the other hand, 38% reported that job-related stress and tension affect their lives off the job.

PACIFIC RESEARCH

PSC has ceased publication of **Pacific Research**, its journal on Asian affairs, after 15 years. With diminishing support and interest, we could no longer afford to publish. We have transferred outstanding **Pacific Research** subscriptions to **Global Electronics**. Should any former **Pacific Research** subscriber wish to be dropped from the **Global Electronics** mailing list, please let us know.

SEMI LEADERS

VLSI Research, Inc. has compiled a list of the world's top 50 producers of semiconductors. It estimates, for 1984, that global semiconductor "sales," captive as well as open-market, transistors as well as integrated circuits, totalled US\$33.8 billion. The top 50, says VLSI Research, accounted for \$30.6 billion. The 24 U.S.-headquartered firms in the top 50 accounted for \$14.9 billion; the 18 Japanese companies registered \$12.4 billion; and 8 European-controlled firms totalled \$3.3 billion. Worldwide, the top 10 semiconductor producers, with their semiconductor sales only (US\$ millions) for 1984 were (as printed in **Silicon Valley Tech News**, January 21/February 22, 1985):

Texas Instruments	2,429
NEC (Nippon Electric)	2,391
Motorola	2,385
Toshiba	2,021
Hitachi	1,894
IBM	1,602
National Semiconductor	1,315
Intel	1,215
Philips/Signetics	1,019
Advanced Micro Devices	980

IBM DRUG TESTS

Late in 1984 IBM initiated a program to screen all prospective employees for drug use. As part of the company's standard pre-employment physical, IBM requires a urinalysis test for illegal substances. Applicants who refuse to take the test are turned down.

Reactions has been somewhat predictable. Law enforcement officials endorse the practice. The American Civil Liberties Union calls it an invasion of privacy.

In Silicon Valley, where IBM directly employs about 14,000 people, other employers, including IBM's recent acquisition, ROLM, have rejected the approach. The practice, as well as IBM's operational style in general, conflicts with the casual industrial culture characteristic of the Valley's civilian firms. A spokesman for Hewlett-Packard, another of the Valley's largest employers, told the **Peninsula Times Tribune** (February 1, 1985) that drug testing "doesn't fit our way of life at H-P, which is to trust employees."

FAIRCHILD

In a two-part special report, the **San Jose Mercury News** (March 10 and 11, 1985) describes the latest chapter in the checkered history of Fairchild Semiconductor, now a subsidiary of Schlumberger. It reports that the company - known historically for losing key executives to Silicon Valley start-ups - still suffers management defections. He also reports that Thomas Roberts, head of Fairchild under Schlumberger from 1979 to the start of 1985, kept Fairchild out of the Semiconductor Industry Association's statistics program because "Roberts disapproved of the SIA's militant campaign against the Japanese semiconductor makers."

JAPAN CHIP LAW

Japan's mighty Ministry of International Trade and Industry (MITI) is drafting legislation, similar to the measure signed into law in the U.S. in 1984, to outlaw the piracy of chip designs. MITI took action following a recommendation by the Subcommittee on the Legal Problems Concerning Semiconductor Chips of MITI's advisory Industrial Structure Council. The study group, which included representatives of Intel Japan and Texas Instruments Japan, carefully reviewed the deliberations of the Judiciary Committee of the U.S. House of Representatives. (**Japan Semiconductor Quarterly**, February, 1985)

HONG KONG

British-controlled Hong Kong is recognized worldwide as a leading center of export-oriented industries. Though some conservative economists have argued that the colony's *laissez-faire* economic policies are responsible, Hong Kong has industrialized on the backs and fingers of its cheap, efficient workforce. To some degree, workers survive on low wages because the colony imports cheap foodstuffs and consumer goods from China. But Lui Tui Lok ("Industrialization of Hong Kong - All Laissez Faire," **Asian Exchange**, Vol. III, Nos. 3,4, 1984) suggests that government intervention, in the form of gradually growing social expenditures, has subsidized the reproduction of labor power. Of course, the government revenues that pay for such programs are dependent, to a large degree, upon the China trade.

YAWATA COOPERATES

Keiske Yawata, until recently the head of NEC Electronics, the giant Japanese firm's U.S. subsidiary, has signed on as the head of an American firm's Japanese affiliate. Yawata was a 26-year veteran of Nippon Electric and he was expected to be elevated to the company's Board of Directors. While in the U.S., he served as an articulate spokesman for Japanese high-tech industry. He also gained respect for certain American business practices, such as the use of stock options to recruit top professionals.

Yawata will run Nihon LSI Logic, which is

70%-owned by Silicon Valley's LSI Logic and 30% held by Japanese investors. LSI Logic, founded in 1979 by former Fairchild president Wilfred Corrigan, dominates the U.S. market for semi-custom "gate array" integrated circuits and is known for its proprietary design software. Its Japanese affiliate will initially operate a design center in Japan, fabricating chips in California, but Yawata plans to build a manufacturing plant in Japan as well.

Yawata's break from NEC violates the Japanese business tradition of lifetime employment, but it may be a sign of things to come. In future years some of the most effective high-tech businesses will be those which combine the strong suits of the American and Japanese electronics industry.

MORE ON A.R.C.I. SCANDAL

The loan recall and Philippine government investigation of the Asian Reliability Co. Inc. (ARCI) reported in the last **Global Electronics** (No. 50) may simply be symptoms of a struggle for control between company founder Vicente Chuidian, a Filipino who resides in Hillsborough, a wealthy suburb near Silicon Valley, and Philippine president and first lady Ferdinand and Imelda Marcos. The **San Francisco Examiner** (March 10, 1985) reports that ARCI was simply a holding company formed to give the Marcos family a secret fifty percent share of Chuidian's high-tech ventures, including Dynetics, a large Philippines semiconductor assembly subcontractor.

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V.H.S.I.C VS. COMMERCIAL CHIPS

The Pentagon's Very High Speed Integrated Circuit program, considered by some a response to Japan's government-organized joint semiconductor research program, is designed to serve military needs at the expense of commercial product development. This is the conclusion of Leslie Brueckner, whose "Assessing the Commercial Impact of the VHSIC Program" has been published by the Berkeley Roundtable on the International Economy. Brueckner's careful study appears to reflect the views of Silicon Valley chipmakers.

Though VHSIC includes of "generic" research into processing and design, conducted by universities as well as private corporations, it emphasizes product development contracts, which were awarded to several teams of private firms. In most cases, military systems manufacturers joined with semiconductor firms to win VHSIC contracts.

Brueckner concludes that the VHSIC project was designed well from the Pentagon's point of view. It concentrates resources in support of the development of advanced chips designed for particular military missions, and by combining chip design with system design from the start, it cuts the lag time between commercial chip development and military application.

However, to fulfill military requirements, five of the original six VHSIC contractor teams chose to develop custom, rather than standard, programmable chips suitable for mass production. Only Texas Instruments, which teamed its systems division with its semiconductor division to form a unitary team, chose the standard route, for it is the only team leader for which chip production is the primary business.

Within the field of custom chip design, VHSIC contractors have chosen design tools which minimize turn-around time, a Pentagon goal, but which do not maximize the utilization of the chip's surface. Commercial firms, however, seek high density designs which will pay off over long production runs.

In addition, the Pentagon and Commerce Department are trying to restrict the flow of VHSIC-generated technological information and the participation of foreign nationals in VHSIC-related research. To the degree that VHSIC generates commercially significant technological breakthroughs, security and export restrictions are likely to prevent their application. In fact, to avoid the imposition restrictions on their internally funded commercial research and development, VHSIC contractors are keeping their commercial and military programs at a distance, preventing any cross-pollination.

Since VHSIC contracts were awarded to large firms, not the innovative start-ups for which Silicon Valley is known, small firms may be penalized unless VHSIC results are allowed to diffuse throughout the high-tech community. Brueckner argues that this will retard the advance of commercial chip technologies.

Brueckner does not condemn the Pentagon, for it is carrying out its mission, but she argues that the U.S. should sponsor a civilian counterpart to VHSIC to

maintain the competitive strength of its commercial semiconductor industry.

MORE ON MILITARY CHIPS

Since more electronic functions - in fact, whole electronic systems - are being squeezed onto individual chips, integrated circuits are taking an increasing share of the rapidly growing military electronics budget. However, the commercial market is growing and is likely to grow at a faster rate than the military segment.

Though estimates vary, military semiconductor production accounts for a small portion of the U.S. market. Gnostic Concepts (*Electronics Week*, February 25, 1985) puts the 1984 total at \$1.9 billion. Still, because it requires that weapons contractors buy chips that meet military specifications, the Pentagon is effectively one of the largest customers for chips and transistors, with a great deal of influence over design, production, and testing.

Electronics Week (February 4, 1985) reports that merchant semiconductor producers have been able to reduce the delay between the design of commercial chips and their military counterparts by building commercial chips to military standards. In the same issue, however, Ed Macaruso, military sales manager at Signetics, suggests that the gap remains. He charges that even with VHSIC "the rate of technology insertion into production systems" has not increased.

Macaruso blames the Pentagon's emphasis upon testing and re-testing. In fact, he argues that the military's recurring problems with chip-sellers result from a misplaced emphasis upon testing, rather than quality-oriented production methods. He says, "It should not go unnoticed that a vendor's process-quality guarantee of 150 parts per million is substantially better than any known military screening method now in use, including 100% retesting of IC's when they arrive at the prime contractor's factory."

He also says that the specifications-and-testing approach to qualifying military semiconductors delays production, since paperwork and bureaucratic delays string out the process of changing official standards, usually for a full year. Screening, he adds, accounts for over half the cost of a typical military-qualified chip. "In fact," he charges, "it has been shown that excessive testing shortens circuit life by exposing IC's to inappropriate tests as well as to increased risk from electrostatic damage."

In a companion article. *Electronics Week's* Larry Waller says that Macaruso's views are shared throughout the industry. Though there is little doubt that suppliers have failed to follow military testing procedures, industry spokesmen agree that "quality and reliability come only from the total control of all manufacturing steps - from wafer start through assembly - rather than from screening and testing done after the fact." Waller relates a frequent industry claim, "of all the chips involved in the Mil-Spec entanglements of the past year, there has not been a single documented hardware failure."

OREGON

The national media, including **Business Week**, **Newsweek**, and the **Washington Post** have identified Oregon as an important new area of high-tech industrial growth. In particular, the suburbs to the west of Portland are now being called the "Silicon Forest." Tektronix, the instrument-maker that is by far Oregon's largest electronics manufacturer, is based there.

To attract Japanese high-tech investment, Oregon has lowered corporate income taxes by dropping the unitary method of allocating income, but at the urging of high-tech leaders it defeated a property tax rollback. Now, the Oregon branch of the American Electronics Association is well on the way to overcoming opposition in both major political parties, as well as the timber industry and the state AFL-CIO, to win passage of the state's first sales tax. (**Washington Post**, February 24, 1985)

A large part of Oregon's attractiveness is the result of its recent hostility to outsiders. The strong environmental movement there, which for years was considered anti-business, has given the state's quality of life the type of positive reputation that high-tech firms use to recruit professionals from the national and international job market. Oregon has less congestion and cheaper housing than Silicon Valley, but it has much more rain. It remains to be seen how many high-tech geniuses will chose life in the "Silicon Rain Forest."

LABOR HISTORY

The **Electrical Workers**, by Ron Schatz [University of Illinois Press], tells the story of the United Electrical, Radio, and Machine Workers growth and decline at

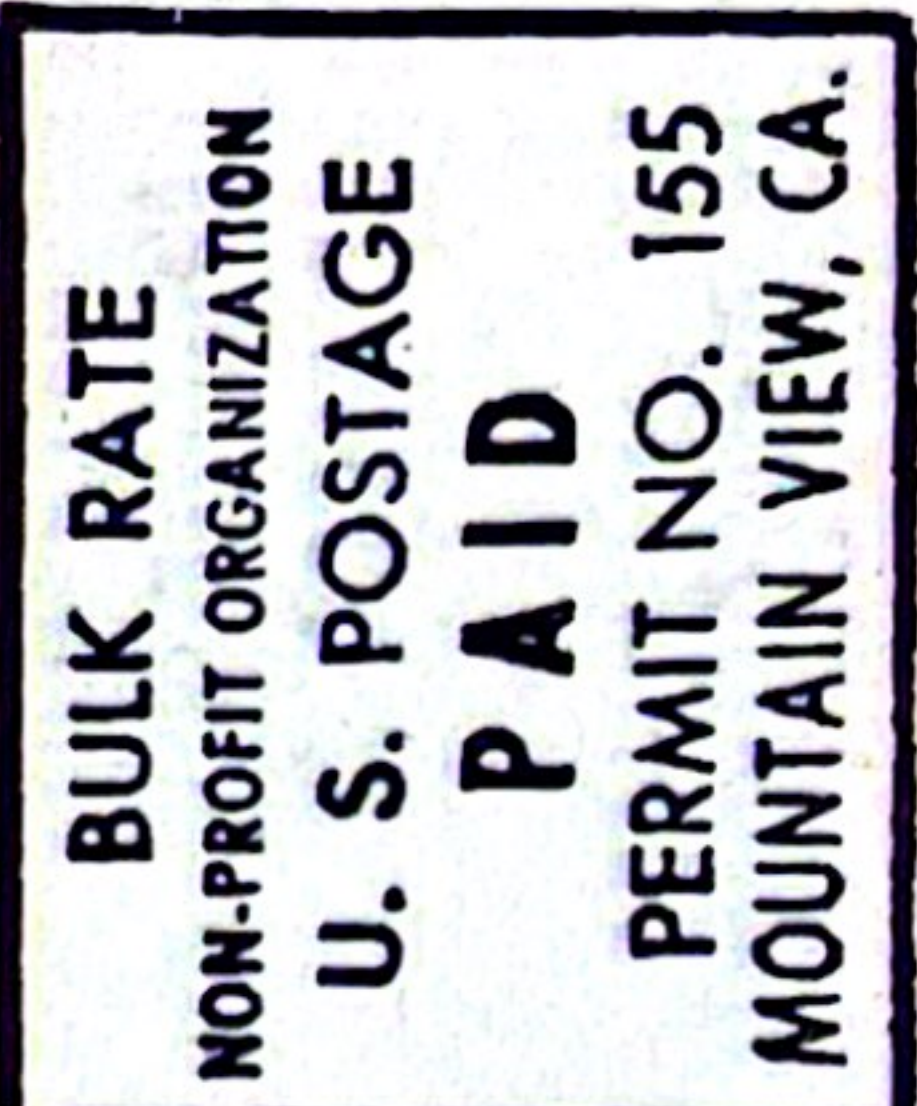
General Electric and Westinghouse between 1923 and 1960. Schatz traces the campaigns which organized the industry and the split forced by anti-Communists in the labor movement during the 1950's. Schatz challenges the suggestion that Communist Party labor policies undermined working conditions during World War II, and he notes that the UE worked to reform, not eliminate, incentive wage systems. He also compares the union activity, working conditions, and pay of female and male electrical workers. This well researched book serves as a reminder that the drive to defend and expand the rights of workers has never been easy.

CLEAN-UP ADVANCES

The Industry Clean Water Task Force, which is made up of four Silicon Valley electronics trade associations, has reviewed Regional Water Quality Control Board records of 82 "problem" sites in San Jose, Santa Clara, and Sunnyvale, and has found that 18 sites experienced no contamination and 21 required monitoring only. Of the remaining 43 sites, 8 were in full-scale clean-up. Clean-up had begun at 29 other sites, but 6 remained in investigation. Some other important pollution sites, such as an area of Mountain View where private wells have been contaminated, await action, but they were not covered in this study.

The Industry Task Force recommends that the Regional Water Board be given additional resources to expedite future clean-up, and it asks for the streamlining of permit processes, such as the one that covers the discharge of groundwater with low levels on contamination.

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