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Fairchild Assembles An Asian Empire

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It All Began in a Loft

Sherman Fairchild, whose father George Fairchild was one of the founders of IBM Corporation, founded a company in 1920 that later became the Fairchild Camera and Instrument Corporation. While still in his early twenties Sherman had invented an aerial camera. Unable to find a manufacturer to fill an order for twenty cameras from the Army Signal Corps, he organized the Fairchild Aerial Camera Corporation, and began production in a loft in New York's garment district.

Fairchild soon began building planes as well, but he spun off his aircraft and engine divisions in 1936 to form the company now known as Fairchild Industries. Fairchild was enormously successful as an inventor and businessman, forming several other companies, including Conrac, another manufacturer of aircraft equipment. In addition, Sherman Fairchild served until his death in 1971 as a director of IBM, and with 509,000 shares, he was IBM's largest individual stockholder.

Fairchild Camera and Instrument, which adopted that name in 1944, grew slowly over its first forty years, manufacturing primarily cameras and electrical instruments. In 1957, however, the company provided financial backing for eight young scientists in Mountain View, California, to set up Fairchild's Semiconductor Division. All eight had been brought to nearby Palo Alto in 1955 by William Shockley, one of the inventors of the transistor, to work at Shockley Transistor. By 1957 the "traitorous eight," as Shockley dubbed them, were uphappy with Shockley Transistor. Unable to wrest control of the company from the Nobel Prize-winning boss, they sought funds to establish their own operation. This new division was probably the only good investment made by John Carter, Fairchild Camera's acquisition-happy board chairman.

Fairchild Semiconductor grew quickly, spurred by the scientific breakthroughs of its founders. In 1959, Fairchild introduced the revolutionary *planar* process for fabricating transistors, and the company lays claim to having developed the first integrated circuit in 1961. The division could not match its scientific achievement with management success, however. Beginning in 1959 and continuing to this day, top managers and scientists have left the company to form their own ventures. By the early 1970's, all of the eight founders had left in search of greener pastures.[1]

The semiconductor division, a leading producer in an expanding field, grew rapidly while most of the other divisions foundered. In 1967, semiconductor sales made up two thirds

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of the sales of the entire corporation. However, management conflicts persisted in the semiconductor division and the company began to miss deliveries. "In July, 1967, the semiconductor division lost money for the first time since 1958."[2]

To solve problems in the semiconductor division and weed out unprofitable operations, Sherman Fairchild personally searched for a new chief executive. He chose Lester Hogan, head of competitor Motorola's semiconductor division in Arizona.[3] As head of Fairchild Camera and Instrument Operation's, Hogan concluded the corporation's transformation into a semiconductor corporation. He moved company headquarters from Long Island to Mountain View, and continued to sell off portions of the company making instruments and graphics equipment.

Building Blocks

Fairchild is the third largest marketer of semiconductors in the US, behind Texas Instruments and Motorola.[4] In 1977, semiconductors accounted for $331 million of Fairchild's $460 million in revenues. *Semiconductors*, or solid state components, are the building blocks of computers, industrial electronics, and a host of remarkable consumer devices such as digital watches and pocket calculators.

Transistors and diodes — *discrete* semiconductors — now make up less than one tenth of the company's sales. These are sophisticated versions of the original solid state components that replaced vacuum tubes in radios, TV's, military electronics, etc. Because the technology of their use and manufacture is generally stable, discrete components are among Fairchild's steadier product lines.

Integrated circuits, fantastic devices containing as many as 40,000 transistors and other components on silicon chips of .035 sq. inches, account for most of Fairchild's semiconductor production and sales. Used for both logic and high-speed memories in large-scale computers, individual chips are now employed as microprocessors in a wide variety of industrial and consumer applications.[5] US automobile manufacturers, for instance, are soon expected to incorporate microprocessors into all new cars. Fairchild's F-8 microprocessor, which sells for about $5, has the same capability as the original ENIAC computer, built at the University of Pennsylvania in 1946. ENIAC, however, cost several million dollars to build and occupied several rooms.

In addition, both discrete semiconductors and integrated circuits are used in communications, avionics, reconnaissance, and electronic warfare equipment. Fairchild is one of several semiconductor firms which are qualified to sell *mil-spec* (military specification) components, devices designed to operate in adverse environments. A company official reports, "About 25 percent of our overall business is in military sales, with a good bit of it being built around our high technology products."[6]

The market for integrated circuits is highly competitive, with many small firms — most of which were started by former Fairchild engineers — and large corporations frequently cutting prices to hold on to their share of the market. In addition, the semiconductor market is sharply cyclical. For these two reasons, Fairchild, like most ofther semiconductor companies, suffers periodic losses.

In addition to producing integrated circuits, Fairchild manufactures sophisticated test equipment, used in the production of integrated circuits, for sale to its competitors. Most of Fairchild's domestic semiconductor production is based in Santa Clara County, California, around Mountain View, but the company also has plants in Sonoma County 100 miles to the north and in New York and Maine.

Fairchild began marketing consumer products in 1975, when it started producing digital watches. Since semiconductor components make up most of the cost of producing watches, Fairchild decided to make the complete product, by absorbing smaller companies which produced watch cases and digital displays.

The company invested in consumer products to hedge against the ups and downs of the computer market. Consumer product sales are also cyclical, but slowdowns generally do not coincide with computer market lows. In 1976 the company sold about $70 million in watches, but by mid-1977 the market was glutted and Fairchild had to write off excess production.

In late 1976, Fairchild introduced a line of programmable video games, built around the F-8 microprocessor. Video game sales skyrocketed in 1977, reaching nearly $37 million.[7] Domestic consumer production is also carried on in Santa Clara County.

The only other major product group at Fairchild is Space and Defense Systems, which fills about $40 million a year in contracts for the US government, primarily the Pentagon. This division continues the Fairchild tradition of producing aerial reconnaissance systems, and it makes a number of other avionics, communications, and countermeasures systems. Many of its products, such as its miniature television camera, utilize components and technology developed by the semiconductor division.

Technology . . . and Cheap Labor

Since its employees are Fairchild's number one resource, the company has located its labs and plants near sources of qualified professionals and inexpensive labor. Fairchild Semiconductor, since its inception, has concentrated in research, development, and design work in Santa Clara County, to utilize the scientific resources of Stanford University and the industrial complex that it spawned.

Santa Clara County, known as "Silicon Valley" for all its silicon semiconductor manufacturers, is characterized by what one writer calls "an innovative ferment on a scale without precedent in industrial history."[8] Former Stanford Provost and Engineering Dean Frederick Terman, who developed the Stanford complex in the two decades following World War II, has called the area a "community of technical scholars."

Armed with millions of dollars in research and development contracts from the Pentagon, Terman built Stanford into the nation's top school for electrical engineering and a leader in many other areas of science and technology. The university not only cranked out qualified graduates and specialists, but it encouraged its faculty and graduates to consult for existing local companies and to set up companies of their own. Several of those companies established plants on Stanford land, in the Stanford Industrial Park, and many

have participated in the university's continuing education programs for engineers. In return, industry has provided the university with substantial funds to support its science and technology activities.

Fairchild Semiconductor, of course, was spun off from Shockley, a company started by a Stanford professor on Stanford land. Though originally sited in Mountain View, Fairchild established its first building in the Stanford Industrial Park in 1961. Fairchild belongs to the Engineering School's Honors Cooperative Program, which allows working engineers to take graduate level courses either on campus or through a special instructional television system set up by the university and local industry.

With Stanford as a core, the Silicon Valley complex has spread well beyond the campus. The original companies, like Fairchild, have spun-off numerous others, and national companies like Ford Aerospace (Philco), Raytheon, and Teledyne have either established local facilities or bought out small local firms. Today Fairchild is integrated into the Silicon Valley complex, recruiting staff from many companies that were started by former Fairchild executives. In the present period of industry expansion, these firms are engaged in an escalating bidding war to attract experienced technical and managerial talent.[9]

Despite the company's reliance on technological achievement, professionals make up a small percentage of Fairchild's employees. Roughly half of the company's 7,700 domestic employees are production workers, while at least ninety percent of its 12,200 foreign workers are assemblers. Within the US, the company conducts its more capital-intensive production processes, as well as those that need constant supervision by scientific personnel. Thus, domestic semiconductor employees work in wafer fabrication — the chemical process of producing semiconductor chips — and the testing of the more sophisticated integrated circuits. Labor-intensive assembly work is generally not done in the US, but the company tries out new products in Mountain View, and it is required by US law to assemble mil-spec semiconductors domestically as well.

Domestic production utilizes extremely sophisticated machinery. The technicians who maintain and repair that machinery, generally men, are paid wages substantially below the professional staff, but well above the pay of unskilled assembly workers. Like the professionals, experienced technicians are benefitting from the bidding war caused by rapid industry expansion.

Although both semiconductor products and production machinery embody advanced technology, the bulk of the production workers are semiskilled. Because the industry is highly competitive, each company works hard to minimize labor costs. Fairchild, like its competitors, hires young women production workers — many of whom are Latin American or Filipino — and discourages union organizing. In 1973, when the United Electrical Workers (UE) launched an organizing drive at the Mountain View plants, Fairchild not only campaigned against the union, but it selectively promoted workers, red-baited the active ones, and hinted that it would shift production elsewhere if the union succeeded. The UE drive was blunted when slump-induced lay-offs decimated its ranks.

Today, none of the semiconductor-producers in Santa

Clara County are unionized; this is a major reason why companies are continuing to expand production there. Fairchild has been hiring in Mountain View, and none of its other domestic semiconductor plants are organized. In fact, Fairchild's only labor organization within the US is at the Space and Defense Systems division in Syosset, New York.

The unorganized production workers suffer from low wages, unhealthy working conditions, race and sex discrimination, and job insecurity. The starting assembler's wage at Fairchild-Mountain View is $2.85 per hour, just twenty cents above the minimum wage, and after sixty days it rises to just above $3.00 an hour. Workers, particularly in the diffusion portion of wafer fabrication and the metal-bonding portion of assembly, are exposed to a wide range of toxic chemicals and metals. Unprotected by union work rules, workers are subject to industrial speed-up.

Nevertheless, the company obviously considers its employees its greatest resource. It operates its own industrial "campus" for training all levels of workers and professionals. And it takes advantage of the infrastructure and support resources that have grown up around Stanford and the area's electronics firms. The company has access to specialized transportation, financing, data processing, and technical information services. When it expands its plants, it can lease or buy from developers that specialize in electronics factories. But because semiconductors require a substantial proportion of labor-intensive assembly work, Fairchild carries out most of its assembly in the Far East.

Around the Globe

Fairchild spans the globe with production, warehousing, administration, and sales activities, operating subsidiaries in at least 18 countries. Initially, the company established only sales and customer services facilities abroad. Today Fairchild operates about 25 foreign sales offices, primarily in Europe and Japan, and the company reported foreign sales of $142 million out of a $460 million total in 1977.

In the early 1960's, Fairchild established its first foreign manufacturing plants. Although the company has sited some plants to take advantage of regional markets — in Germany,

How Semiconductors Are Made

The semiconductor makers that build intergrated circuits — the essential components of solid-state electronics — have developed a system of mass production with a new wrinkle. Products are shipped overseas midway in the assembly line. Like the systems and equipment manufacturers, semiconductor firms center their research and development activity in Santa Clara County. Scientists and engineers in local labs and headquarters constantly come up with new products and new techniques for producing old ones.

Regardless of the function of an integrated circuit, production always begins with capital-intensive (requiring expensive equipment and little labor) *wafer fabrication*. Advanced Micro Devices president Jerry Sanders explains:

> This process consists of a series of chemical and physical processes in which photomasks are placed in contact with a thin slice of silicon called a "wafer" 2 or more inches in diameter. Additional chemical processing prepares the wafer for selected introduction of certain chemical impurities. These selective impurities impart to the silicon the properties necessary to form electronic components. Upon completion of the wafer fabrication, each wafer contains hundreds — or in some cases thousands — of identical monolithic circuits — "die" or "chips."

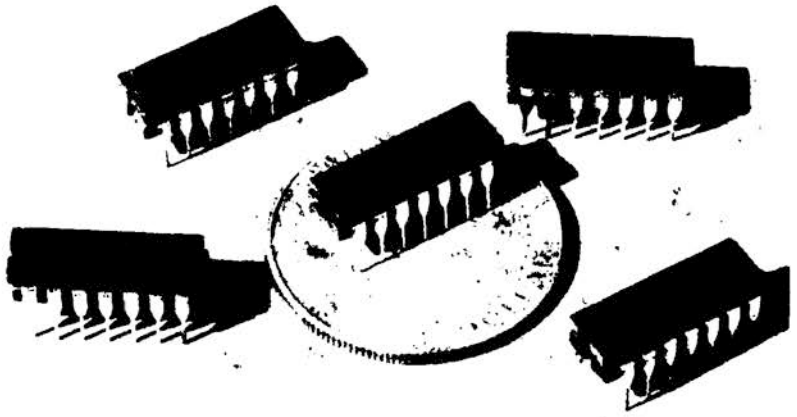
Most Silicon Valley companies carry out wafer fabrication locally, close to their management, engineers, and skilled personnel.

Once the wafers are fabricated, each of hundreds of circuits on each wafer must be tested individually, and those circuits which do not perform adequately are identified. Computerized test equipment, valued at $350,000 or more per tester, is required for this *wafer sort* process. This work is consequently also carried out in Santa Clara County plants.

Wafer circuits are useless unless wires are bonded to them. In the *assembly* process, the wafers are split into individual chips, and defective ones (already identified in wafer sort) are discarded. Wire leads thinner than a human hair, and sometimes only one tenth of an inch long, are bonded to the chips. These assemblies are then sealed in ceramic, metal, or plastic.

This microscopic work is highly repetitive, involving large amounts of manual labor. It requires little technology, equipment, or skill. Because it costs little to transport the lightweight circuits, even by air, all semiconductor companies conduct most of their labor in areas where labor is cheap. Although many companies carry out some assembly in Santa Clara County, where they can carefully watch the production process and test new methods, all also conduct assembly work in one or more Asian countries.

Although a major portion of the semiconductors assembled in Asia are eventually marketed in Japan, Europe, and other lands, most companies ship their assembled circuits back to the U.S. for final testing. Like wafer sort, final testing requires both high technology and expensive equipment. Special provisions in the U.S. tariff code — which the industry defends with vigorous lobbying — allow companies to pay tariffs only on what they say is the value added by the foreign assembly. That is, they need not pay duties on the imported chips, just the costs of the wires and frames and the pay of the assemblers.



Plastic-Encapsulated Integrated Circuits

This essay on the semiconductor production process is excerpted from "Silicon Valley: Paradise or Paradox?" a pamphlet produced by the Pacific Studies Center in November, 1977. The 62-page pamphlet contains sections on the history and structure of the Silicon Valley electronics industry, the applications of locally produced technology, electronics labor, and on the impact that the electronics industry has on Santa Clara Valley's environment and governments.

"Silicon Valley: Paradise or Paradox?" may be ordered from the Pacific Studies Center for $1.00 plus 50 cents postage and handling. Bulk orders – five or more copies – cost 50 cents per copy plus shipping costs.

Brazil, Okinawa, and Mexico — its chief reason for going abroad has been to lower production costs, particularly the cost of labor-intensive assembly. Consequently, the bulk of the company's overseas employment is in the low wage nations of the Far East.

Fairchild led other semiconductor firms in the creation of a unique form of international production. It has not simply replaced domestic production with foreign shops — the classical "runaways" — but it has developed an international division of labor. The company has described the process:

> The Company's foreign operations consist of assembly plants (principally in the Far East) and sales units (principally in Europe) included in both the Semiconductor Components and Consumer Products groups. Domestic management determines and controls production scheduling, acceptance of sales orders, and worldwide allocation of available product to consumers. The domestic operations design, develop, and manufacture the semiconductor die for the Semiconductor Components product group and certain subassemblies for the Consumer Products group. The majority of this product is then sent to the Far East for assembly. Approximately 75% of these finished products are sent back to the United States for sale, and most of the remainder is sold through the Company's European sales organization.[10]

When, in 1962-63, Fairchild established a semiconductor assembly plant in Hong Kong, it unleashed a flood of new American electronics projects in the Far East. Since the late 1960's, all US semiconductor makers, no matter how small, have either run their own foreign plants or subcontracted with foreign ventures to undertake the labor-intensive portion of semiconductor production.

Because of the ease with which young engineers could set up new ventures, the semiconductor industry has been traditionally competitive. For many years, companies frequently priced new products at or below cost just to develop a solid share of the market. To survive in a price-cutting industry, companies explored all avenues to cut costs. This is why they gravitated to non-union Silicon Valley, and this is why they went to Asia.

Despite the traditionally low wages in most Asian countries, it is not obvious why an industry as advanced as semiconductors could move to Asia. Production does not only involve semiskilled workers, but research and development, sophisticated equipment, and skilled technicians. However, the middle portion of the production process — assembly — is labor intensive, and it requires relatively little skill. In building the Hong Kong plant, Fairchild established a pattern: retain the capital-intensive initial steps in the US; airfreight the pieces to Asia for assembly; and airfreight the semiconductors back to the US for finishing and final testing. Fairchild's assembly line spanned the Pacific.

At most of Fairchild's Asian plants, long lines of women peer through microscopes, soldering or bonding metal leads onto semiconductor die (chips), or assembling watches and games from the semiconductor components. Initially, the work was done entirely by hand, utilizing no machinery other than soldering irons and microscopes, but the company has gradually introduced bonding machinery. The proportion of technicians and engineers, especially in Hong Kong and Singapore, has grown steadily over the years. In 1976, company president Wilfred Corrigan projected that the company would "automate" its Asian plants within the next five years.[11] This, of course, does not mean the elimination of semiskilled assemblers. It merely means providing them with machines to increase their productivity.

When Fairchild first went to Asia, it built plants in countries where other US manufacturers were already operating runaway consumer electronics factories. It began operation in Hong Kong in 1963 and South Korea in 1966. In 1969 it diversified, beginning production in both Singapore and Okinawa. It expanded its Hong Kong, Korea, and Singapore facilities over the years, while developing production plants in Mexico, the Navajo reservation in New Mexico, Germany, and Brazil. In 1975, Fairchild completed its Asian empire with an assembly plant in Jakarta, Indonesia. Today, the Hong Kong, Korea, Singapore, and Indonesia subsidiaries employ about 10,000 people.

At first, Fairchild's Asian plants merely assembled components for return to the US in unfinished form. Gradually, however, the company extended its division of labor to Asia. Hong Kong and Singapore facilities took over the testing of less sophisticated, high-volume products destined for Europe and Japan, and they include warehouses for the company's global inventory system. The more labor-intensive work is now concentrated in Korea and Indonesia. In 1975, the company closed its testing facility in South Portland, Maine, laying off 700 workers, and upgraded its Singapore test operation. Today, for most established Fairchild component product lines, the Singapore plant ships finished goods directly to customers in the US as well as abroad. The initial steps of production, however, as well as product research and development, remain in the US.

To complement its integrated production structure, Fairchild has established an administrative division of labor within Asia. The Hong Kong facilities control the administration and financing of the Asian plants, with the Hong Kong subsidiary actually owning the Singapore and Korea subsidiaries outright. Singapore, however, processes and stores more sophisticated products than the Hong Kong branch.

Control of all operations remains in Mountain View. In 1977, Fairchild organized all its orders, production, and supplies on a centralized data processing system, an IBM 3790 in Mountain View. Utilizing satellite communications, the Asian branch managers know immediately when to ship goods or adjust production goals.[12]

Footloose

Centralized management, essential for assembly operations spanning several countries, means that Asian plants have much less autonomy than traditional foreign-owned companies. Key decisions, such as plant expansion and layoffs (retrenchment is the preferred term in Asia) are made in the US. In fact, as production costs rise in individual countries, Fairchild and its competitors can and have shifted production to more profitable locations, at times even closing plants completely.

In Asia, the only country in which Fairchild has totally closed production has been Japan. Following the reversion of Okinawa to Japan in 1972, Fairchild merged its Okinawa subsidiary with a Japanese partner, phased out production

operations, and eventually bought out the Japanese partner. Today Fairchild uses the subsidiary exclusively for marketing its products in Japan.

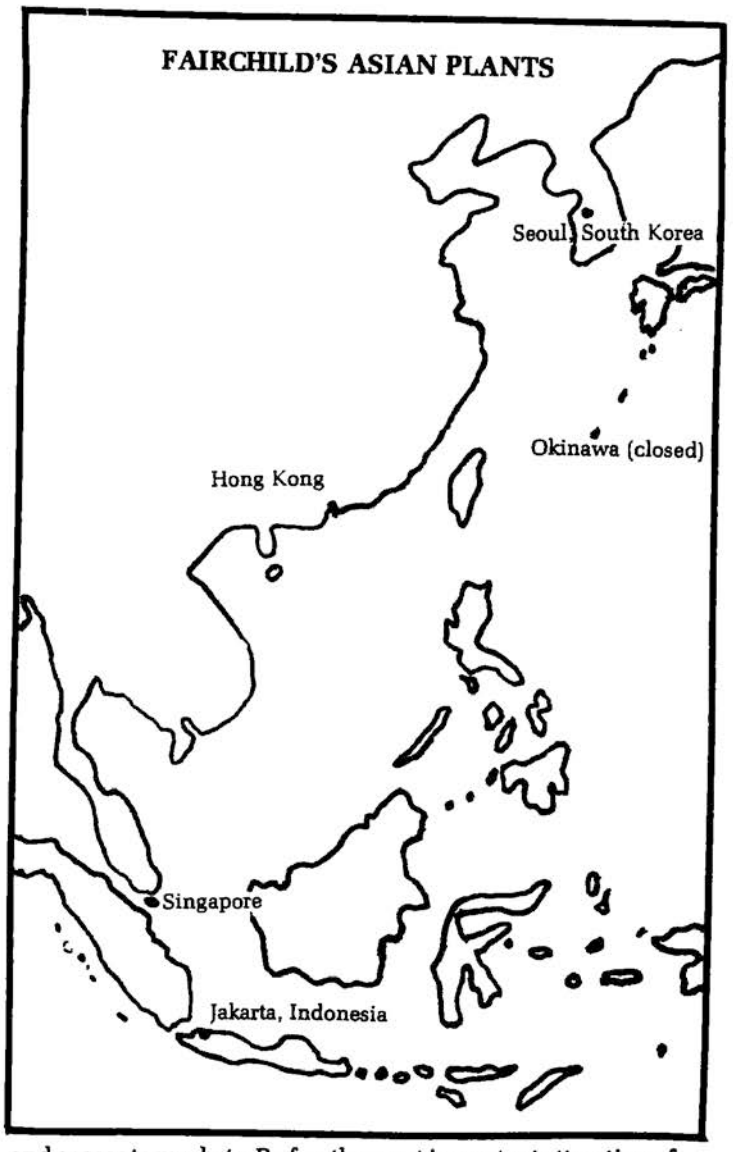
However, the company has drastically reduced employment in more expensive production areas. In general, the company has reduced employment worldwide during market downturns, but has reinstated workers more rapidly in subsidiaries that produce more cheaply. Thus Fairchild dropped its Singapore workforce from 3600 to 1700 during 1974, but in 1976, after business picked up, it only had 1900 workers on payroll. Overall production may have remained the same, however, since the company had introduced more capital- and technology-intensive testing operations.

The company has proven most footloose in the Southwest of North America, reducing and increasing Mexican production to avoid and discourage growing labor militancy. The most spectacular confrontation occurred in the company's Shiprock, New Mexico plant, which operated from 1968 to 1975. Though Shiprock is in the US, it is located on an Indian reservation, and Fairchild's facility there resembled a foreign plant. The company leased a factory from the Navajos, housed its young women assemblers in federally subsidized apartments, and used Bureau of Indian Affairs training funds to halve its payroll costs. In 1975, when Fairchild laid off 140 workers as part of a worldwide cutback, Indian activists occupied the plant. Fairchild soon closed the facility entirely, blaming the occupiers. But during the occupation Indians discovered that Fairchild already had plans to close the factory because the Bureau of Indian Affairs was planning to cut off the payroll subsidies.[13]

Over the years, Fairchild has been in the leadership of the industry's successful fight to retain special tariff provisions that subsidize goods that the company re-imports from its Asian plants. Under items 806.30 and 807.00 of the US Tariff Code, manufacturers are not charged duties on the entire value of re-imported goods. Rather, they are only charged on the value added abroad. Since most of the materials used in semiconductor manufacture, such as the etched silicon wafers, come from the US, duties are charged chiefly on the value added by cheap Asian labor. Since labor costs are low, and in practice may be understated on customs declaration, Fairchild pays relatively small import duties. One company official estimated that Fairchild Singapore re-exports products with about 25% local content, including 10% value added by local labor. Because labor costs make up such a small portion of production costs, Fairchild has reported that only 5% of the value of its production is done abroad, although more than 60% of its employees work outside the US.[14]

Items 806.30 and 807.00 have been under constant attack from organized labor in the US, which says the provisions encourage the export of American jobs. Although industry has been able to defeat each drive to change the tariff code, Fairchild has built a hedge against code revision by establishing the capability to ship components to Europe and Japan directly from Singapore, without going through the US and its customs regulations. In supporting its tariff privileges, Fairchild has strongly endorsed "free trade," but now it appears that the company only support free trade when such trade serves Fairchild's interests. Fairchild joined several other semiconductor makers in 1977 in asking that the US take steps to discourage Japanese semiconductor exports to the US.

In deciding where to locate overseas facilities, Fairchild considered many factors: availability of air transport and other infrastructure, political stability, bureaucratic red tape,



and access to markets. By far, the most important attraction of each Asian nation where the company has located has been low labor costs. Recently, as the company upgraded its production in Singapore and Hong Kong, the company had to evaluate the cost of training and retraining qualified technicians and engineers, as well as assemblers. Because of the more advanced educational systems in those countries, they provide more reliable skilled and professional workers. But in all countries, the company's major need is still assembly workers.

Low Pay

In 1975, the company's total labor cost (wages plus benefits) for Singapore workers was 80 cents per hour, compared to 72 cents in Hong Kong. Korean workers cost 47 cents per hour, while the generally less productive Indonesian employees cost the company a reported 22 cents per hour, less than one tenth of the American assemblers' wage!

Fairchild, like its competitors, assumes that its employees are not the heads of households. While praising the dexterity of smallfingered young Asian women, the company knows that it has found one of the world's cheapest workforces.

Company hiring policies are based explicitly on sex and age. (When Fairchild discovered that its policy of hiring only Navajo women assemblers was visibly disrupting the Indians social fabric, the company introduced a "new production technique more suitable to male aptitudes . . ." in the words of a pro-Fairchild observer.[15])

Fairchild attempts to boost its assembly labor productivity 15% each year. While automation of course contributes to increased productivity, the company also encourages simple speed-up. It employs a bonus (piece rate) system in addition to the low base wage, and it promotes contests between workers in the various plants.

For the company, low wages have meant that it could lower prices and still make a profit. Those lower prices have made it possible to enlarge the market, as consumers and other manufacturers have utilized growing quantities of low-priced semiconductor components. For the workers, the wages have meant continued poverty.

Bob Snow reported from Hong Kong in 1972 that wages in electronics were one-third less than in other industries, notably textiles, and that Fairchild had for a long time paid lower than average wages for electronics. He wrote:

> Fairchild's Hong Kong workforce is almost all women — young Chinese women and girls 14-18 years old. They work the same day as women in Mountain View — seven hours and twenty minutes — but they get about $2 a day. It is easy to say that the cost of living is a lot lower there, so a smaller wage is adequate. It's true that $2 buys a hell of a lot more in Hong Kong than in California, but it's nowhere near enough to live on. It takes over an hour's work to buy two pounds of rice. Rent for a 8x9 ft. room with a very shared kitchen and bathroom is about $15 a month — a week and a half's wages.[16]

Electronics plants appear cleaner than textile factories, the traditional East Asian export industry, because the products must be kept clean. Workers wear tunics — like nurse's aides' — and the plants are air-conditioned — again, to protect the product, not the workers. But the assemblers, like their American counterparts, are exposed to acids, dangerous solvents, and especially metal alloys such as solder. The rapid pace and microscopic precision are stressful, inducing worker hysteria in some plants (apparently not Fairchild). A Korean study of women who used microscopes to assemble electronics for American employers showed that 88% of the workers suffered chronic conjunctivitis, generally caused by toxic fumes and dust, 47% suffered near-sightedness, and 19% suffered astigmatism. The physician who examined the workers suggested that the nearsightedness and astigmatism were the direct result of microscope work.[17]

The electronics industry has a more subtle, but perhaps more pervasive impact on the lives of its employees. Most foreign electronics companies in Asia, including Fairchild, promote both the competitive spirit and western, material life-styles. Employers sponsor athletic tournaments, and beauty contests to promote loyalty and productivity. Since many of the young women are from rural, traditional social backgrounds, this disrupts both the lives of the women and the culture of their home society. Fairchild and other employers justify their intensive cultural indoctrination with claims that it liberates Asian women from oppressive traditional cultures, but it merely replaces traditional discipline with factory discipline. The companies promote athletics and the sale of cosmetics not because either will liberate their employees, but to make more money.

Corrigan addresses an annual meeting

In Korea and Singapore, government-controlled unions keep a lid on genuine worker organization, but there have been several strikes at the Hong Kong plant since its opening. In April, 1970, for instance, 1000 women on the morning shift walked out when the company announced a pay differential to attract more workers to the afternoon shift. The company locked the workers out for several days, and then it fired suspected leaders, breaking the strike.[18]

Conclusion

Fairchild Semiconductor, one of the leaders in one of the world's most dynamic industries, is representative of the American, Japanese, and European semiconductor companies that have established assembly operations throughout East Asia — in Taiwan, Malaysia, the Philippines, and Thailand, as well as Hong Kong, South Korea, Singapore, and Indonesia. Semiconductor chips are creating new technological needs and filling old ones. Stockholders, managers, and engineers in home countries benefit handsomely from these technological advances.

But the workers in Asia — and to some degree, in Silicon Valley — might just as well be back in the colonial era, with poor job security, low pay, and unhealthy conditions. Some observers have suggested that cheap labor is natural to Asia, but they ignore both history and present political circumstances.

Workers in electronics plants, such as Hong Kong-Fairchild, have shown a willingness to organize to improve their own lot, but in all countries but Hong Kong, governments directly repress genuine labor organization. Martial Law, dictatorial rule, and the corporate state (Singapore) do not accidentally create cheap labor for multinationals like Fairchild. Prevention of working class power is essential to their "development" strategies, the mobilization of production workers in export industries to generate foreign ex-

change. A company like Fairchild might not like the human rights records of the South Korea and Indonesian governments, or even that of Singapore, but it is unlikely to press for change, not because company executives believe in non-intervention, but because a decent human rights policy in any of those countries would make it difficult for the company to maintain its profit record.

Notes

1. Don C. Hoefler ("Silicon Valley — USA," *Electronic News*, January 11, January 18, and January 25, 1978, reprinted in *Technology and Economic Growth*, Joint Economic Committee, U.S. Congress, July 15, 1977) described the origins of the many semiconductor firms in the Santa Clara Valley. In addition, the Semiconductor Materials Institute (SEMI) publishes a wall chart, "Silicon Valley Genealogy."
2. "The Fight that Fairchild Won," *Business Week*, October 5, 1978.
3. To win Hogan from Motorola, Sherman Fairchild offered Hogan a $120,000 salary plus a lucrative stock option on 100,000 shares. So Hogan could take advantage of the stock option, Sherman Fairchild made him an unprecedented $5.4 million interest-free personal loan. *ibid.*
5. Microprocessors are integrated circuits which can be programmed to perform many distinct operations, upon command. Pocket calculators, for example, use only one integrated circuit.
6. *Military Electronics/Countermeasures*, August, 1978, p. 14.
7. Projected in "Fairchild's Problems: More than Watches," *Business Week*, August 15, 1977, p. 116.
8. Gene Bylinsky, "California's Great Breeding Ground for Industry," *Fortune*, June, 1974, pp. 129 ff.
9. For more background on Silicon Valley, see "Silicon Valley: Paradise or Paradox?" Pacific Studies Center, 1977.
10. Fairchild Camera and Instrument Corporation 1977 Annual Report, p. 27.
11. Myron Myers, Fairchild Corporation Aims for $1 Billion Sales," *Palo Alto Times*, June 21, 1976, p. 7.
12. Paul Voakes, "Fairchild Streamlines Worldwide Shipping System," *Palo Alto Times*, October 3, 1977, p. 29.
13. J.Z. Grover and Mark W. Nykanen, "Fairchild and the Navajos," *Progressive*, May, 1975, pp. 32-3.
14. Jack Robertson, "Hit Planned Tax Hike on Offshore Plants," *Electronic News*, June 4, 1973, p. 1.
15. Dr. Keith L. Fay, "Electronics Production — the New Indian Craft," reprinted in *Congressional Record*, February 24, 1977, p. S3001.
16. Bob Snow, draft article, February 22, 1972.
17. Walter B. Watson, "Eyestrain Suffered by Women Factory Workers," 1975.