

**Silicon Valley: From the Past
to the Future**

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California Pioneers
of Santa Clara County
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**By Sarah Rucker
1089 Leo Drive
San Jose, Ca 95129
(408) 257-2253
Prospect High School
Advisor: Mrs. Karen Rystad**

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Introduction

Santa Clara Valley was once well known for the numerous amounts of orchards. Farmers would grow cherries, plums, apricots, and apples on the acres of land that they owned. If we look around us today though, all we would see are buildings and houses. The orchards in our time are sparse compared to sixty years ago. The valley is no longer known as Santa Clara Valley but as Silicon Valley. In the book Silicon Valley: Inventing the Future it mentioned about the commercial distribution, "along with garlic, mushrooms, onions, and cherries, Santa Clara County now produces microprocessors, work stations, personal computers, and disk drives."¹

It is known as the place to become a millionaire. The story of Silicon Valley has small beginnings in a one car garage in Palo Alto fifty-seven years ago. Along with the computer business growing, so has the population. In 1950 the population of Santa Clara County was about 290,547. In 1980 it had increased to about 1,295,071 and continues to grow at tremendous rates. The amount of people coming to Silicon Valley is because "it is the most agreeable place to live and work."² The landscape of the area is usually beautiful all year round. Silicon Valley is most noted for its warm climate. Another thing that brings people to the area is the close location of recreation. The ocean, mountains, snow, forest, and amusement parks are all close by.

Many people have contributed to the valley becoming known

for computers and high technology. Frederick Terman, William Hewlett, David Packard, the Varian Brothers, Steve Jobs, Steve Wozniak, and many others are all known for their work in bringing Silicon Valley to how we see it today.

As technology continues to progress, there will be many in the valley who continue to assist in making this advancement possible.

A Trip Through Silicon Valley

Silicon Valley is known to some as the "birthplace of electronics."³ Santa Clara Valley has not always had this name. The name can be contributed to Don C. Hoefler. In 1971 he coined the name as the title of articles on the area in Electronic News. As the book Silicon Valley fever states, "It was cute and made sense. Semiconductor chips, made of silicon, are the fundamental product of the local high-technology industries and although the area isn't a valley in a strict geographical sense, most of the firms are located on level ground bounded on opposite sides by a range of hills and by San Francisco Bay. So with a little imagination it is a valley."⁴ So the name started to be used by the media and it has stuck till today.

Silicon Valley encompasses a thirty by ten mile strip, including many cities. San Jose, known as the Capital of Silicon Valley, has a population of 791,600. In downtown, on North 1st Street, can be found the center of industry. This area has kept the business image through much modernization in recent years. San Jose is international known as the Northern California trade center for the Pacific Rim. In 1990 San Jose opened the Center for International Trade and Development, for the purpose of foreign investment. Hotels have been remodeled or built to house all those who come to the area for trade shows or business. San Jose is the home of a few electronic companies

such as Amdahl Corporation, Goldstar, IBM, United Technologies, and Litton Applied Technology. With these different companies, San Jose has been able to create 70,00 new jobs in recent years.

Sunnyvale, known as the company town, began in 1898. In 1912 it was described as "the manufacturing suburb of San Francisco" in an ad in Colliers Magazine. Once an agricultural town, in 1956 it became industrialized with the opening of Lockheed Missiles and Space Company. When that opened there was a need to house the 22,000 personnel, so it soon grew into a city. Six hundred other firms have also opened in Sunnyvale including Amdahl, Advanced Micro Devices, and ESL.

Santa Clara, the mission city, was originally home of Santa Clara Mission and many orchards. It plays an important role in Silicon Valley because of its manufacturing. The landscape of Santa Clara was soon changed when Intel and National Semiconductors moved in, turning it into one of the leading industrial cities of Silicon Valley. In 1990 almost 500 manufacturing plants had moved into the area. The north part of the city is the industrial section, and the south part is the residential.

Mountain view, a city once well known for its wineries and shipping, is now the home of high technology. In 1953 it became the home of Shockley's Transistor Lab and later Fairchild Semiconductor. Also residing in Mountain View are Sun Microsystems, Silicon Graphics, GTE, Hewlett-Packard, Raytheon, Acuson, and Sprectra-Physics. Close by the city is Moffett

Field which includes NASA Ames Research Center and the U.S. Naval Air Station.

Palo Alto, home of Stanford University, had a lot to do with the history of Silicon Valley. With the opening of Stanford Industrial Park, new companies were opened there. Hewlett-Packard was one of them, but it was originally started in a garage also in Palo Alto. The first tenants was Varian Associates. Palo Alto is one of the fortunate cities that does not look industrialized yet because of the preservation of its open space.

The home of Apple Computers is Cupertino. In fact it dominates the buildings on DeAnza and Stevens Creek Boulevard. Other companies found in Cupertino are Tandem Computers and Measurex. The school district is known as one of the best in the area, so many families move there just to have their children be in that district.

Milpitas is the place for business people and their families to live. In 1978 it became high-tech with the opening of Oak Creek Industrial Park. Sun Microsystems, LSI Logic, and Quantam have all moved into the area. The problem they have to deal with though, is traffic congestion.

Known as the Prune Capital of the World, Campbell is mostly a retail city. It is a city that has kept its identity and preserved its history through many years.

The suburbs of the larger cities are where all the executives live. As one book noted, "When Silicon Valley

executive elite travel home at the end of a workday, more that likely they will head towards Saratoga, Los Gatos, Monte Sereno, Los Altos Hills, or Los Altos."⁵ Morgan Hill and Gilroy are what is left of the once farmland communities of Santa Clara Valley.

Contributions to Success

Since its beginning Silicon Valley has continued to grow, progress, and become successful. What has contributed to the success of the area? Many factors play a part in it. One of them is the education system of Santa Clara County.

Santa Clara Valley has a number of higher education institutions. One of the most well known is Stanford University. It is a private school that lead in new, high-technology development. The university was founded in 1885 in memory of the son of Leland Stanford and his wife Jane. At one time Stanford was free of tuition but that is no longer the case. There are 13,000 undergraduates and graduates, representing the different nationalities, that attend the school. The professors there are interested in keeping close ties with industry, so the students are prepared for the working world when they graduate.

Santa Clara University was started in 1851. It was a time of boom in California with the Gold Rush happening, so an educational institution was needed. The campus is 103 acres containing historical buildings, including Santa Clara de Asis Mission. Santa Clara University is one of the most influential schools and the best buy for an advanced education. Students are place in internships with local companies while working on their degrees.

The "engine that drives Silicon Valley"⁶ is San Jose State

University. This is because many graduates have stayed in the area and have opened businesses here in Silicon Valley after they get their degrees. The University prepares its students for many different professions, including engineering, business, teaching, nursing, journalism, and design. It was founded in 1857 and has approximately 30,000 students on campus and another 30,000 in San Jose State University extension programs. Students work together with businesses in research and development.

The community colleges also play an important role in Silicon Valley. De Anza and Foothill Community Colleges are some of the largest in the country. Each quarter about 47,000 students attend the two schools. Classes are available in the day or evening and on Saturdays to accommodate the student's needs. West Valley Junior College, found in Saratoga, is also a part of the educating of the workers of Silicon Valley. From any of these college one can get their Associates degree, a Program Certificate, or go on to a four-year school. "Studies have shown that Foothill/De Anza students who transfer to institutions of higher learning do as well at their new schools as those juniors who started as freshman at the same four-year school." So whatever school you may go to in the valley you most likely will get a very good education to equip you in working in Silicon Valley.

Men of Importance

Many men have contributed to the start of Silicon Valley. One of the men of great importance is Dr. William Shockley. While working in New Jersey at Bell Laboratories, he assisted in the research and development of the first transistor. He left the east coast to return to his hometown of Palo Alto, California in 1955, opening a Transistor Lab in Mountain View. Some of his employees were Robert Noyce, Gordon Moore, Gene Kleiner, Julius Bank, Victor Grinich, Jean Hoerni, Jay Last, and Sheldon Roberts. Many of these later became famous for inventions in the computer industry. A few years later, some of these employees broke away from the lab and formed Fairchild Semiconductor which was the progenitor to Silicon Valley chip companies. The chief of Fairchild became Robert Noyce who later invented and patented the Integrated Circuit.

Frederick Terman, a professor and later Vice-President at Stanford University, was known for starting the Stanford Binet Intelligence Quotient (IQ) Test. He also advocated a strong relationship between education and industry. Terman worked hard on making Stanford into the world's foremost scientific university. Working as an electronic engineering professor he encouraged his students to open businesses in electronics. To help with research and development of new products, in 1953 he helped establish Stanford Industrial Park. It was built on 660 acres of land owned by the university. Leases for fifty-one

years were put on each of the plots of land. The park became the center of new computer companies, before they outgrew the buildings.

David Packard and William R. Hewlett, two students taught by Terman became known for their invention of the variable frequency oscillators. They two had become good friends while being bench warmers for the varsity football team. Hewlett and Packard had similar interests in ham radios and electronics. They were working on their electrical engineering degrees at Stanford. For Hewlett's master thesis he built and evaluated a variable frequency oscillator. Frederick Terman encouraged him to market it, so Hewlett and Packard opened a shop in a one-car garage in Palo Alto. The company continued to grow though the years, in 1950 the company had 200 employees, sold 70 products, and had sales of about two million dollars. In 1985 they had 85,000 employees and sales over six billion dollars.

Sigurd and Russell Varian, also students at Stanford, developed an electron tube that would contribute greatly to radio and the radar. This came about when Sigurd was a pilot, he wanted a means of detecting planes from the ground. Sigurd teamed up with his brother, Russell, and William W. Hansen to create what became the klystron tube, which generates microwave radiation. The tube was later used in the design of radar detection. In 1948 they started Varian Associates which has now gone worldwide. The klystron tube is of great use in linear accelerators, radar, and other things.

Coming a little closer to our modern day Silicon Valley is the story of Apple Computers. The co-founders Steve Jobs and Steve Wozniak grew up in Silicon Valley, both with an interest in computers. Wozniak started playing with circuit boards when he was in the fourth grade and Jobs began building electronics in junior high. While attending Homestead High School, Wozniak was in the top of his class and scored a perfect score on the math section of the SAT. After graduating he went to the University of Colorado and then the University of California at Berkeley and got his degree in Computer Science. Jobs on the other hand started to go to college but dropped out and went off to discover India. In the 1970s Wozniak worked for Hewlett-Packard and Jobs was at Atari. The reason the two got together to design a computer was they both wanted to buy an Altair but could not afford it. They decided to design something that could be owned by families and individuals instead of just big corporations. They worked out of Jobs's garage in Los Altos designing what would become the circuit board of the Apple. By 1977 the company grew too large to work out of the garage so a larger building was necessary. Wozniak and Jobs went on to design the Apple II and now many more designs have been sold. In the book Silicon Valley Fever it mentioned, "There was a division of labor between Jobs and Wozniak in the early history of Apple's success: Woz was the brilliant technician, while Jobs created the infrastructure of the company."^a Through successes and failures the company has continued strong into recent years.

To help with management problems, John Sculley was hired as President of the company. "Sculley brought discipline and strategic planning to Apple without destroying its creative atmosphere," state the book Silicon Valley: High Tech Window to the Future.⁹ Apple has contributed much to the use of computers in the classroom. It has donated over 10,000 computers to all levels of the school system. Today Apple Computers continues to hold to the purpose of creating a personal computer that is easy to use.

The contributions of these men has been greatly appreciated by all in the world. Without these inventions we would still be using slide rules, typewriters, doing hand drafting, and would not be able to forecast the weather very well. Instead high technology has given us semiconductors, designers bone, electronic games, telephones, timed-release medicines and many more conveniences. Thanks to these brilliant men, it could be said of Silicon Valley, "The community of Silicon Valley is the first in the world in which virtually the whole society — the economy, the idle chatter, the world outlook — revolves around the new electronic technologies."¹⁰

A Look to the Future

The future of Silicon Valley looks bright, that is if research and development continue to progress. It was once said, "The optimistic view banks on Silicon Valley's innovators to keep inventing new technologies, thus staving off decay of their industry and their high-tech complex."¹¹ Another source said, "By the year 2020 two generations of Americans will have spent their entire lives before computers; computers will be an extension of people."¹² Some of the things that are now being developed are necessary for Silicon Valley to continue to prosper.

One of the goals of all Silicon Valley computer companies is to create the fastest yet the smallest chip. Eventually there will be a computerization of most jobs and industries. As it stands right now the computer is used to a limited extend in every industry. Image a computer "teaching math, diagnosing medical problems, being a skilled chemical laboratory assistant, and evaluating military tactics."¹³ To make this possible it is necessary to improve the illiteracy rate of the nation. About one-fourth of the population has a very basic or no reading level. It is essential that the children of the future learn to use the computer. "Some observers feel that children who grow up with computers will learn to be more logical and to think in linear sequences."¹⁴

There are some disadvantages for the valley though.

Because of the microelectronics industry problems are created. Some of these are pollution, shortages of housing, traffic congestion, and crime. For those who are not computer literate, there is the problem of understanding the new generation of computer language. For example a young ten year old would come up to his mom and say, "I think we need a gigabyte of memory and the ten megahertz 286 is way too slow, man." The mom may ask to have him translate into English for her. There is also the problems with the computer itself. A few that may come up are viruses in the computer, crashing the hard drive, or the disk drives not working. Any of these things would delay a job and cause problems in the company. Another problem could be people would take advantage of networks or electronic mail to get to children who would know better.

What would a day be like for a working person in the year 2020? Let us look into to the life of John. It is 8 a.m. on a Wednesday morning in Los Gatos. John is what people call a "telecommuter." Going to work for him means walking into his home office and turning on the computer. From his computer he accesses his electronic mail, watches clips of the news, and reads three newspapers. He could watch just segments of the news on a certain subject and then send them overseas by electronic mail to the branch of his company. By using a computer, he has saved the time of travelling to his office, reading through entire newspapers, or watching television, and John can now take the afternoon off to play golf.¹⁵

With progress continuing to happen, Silicon Valley will grow in population and prosper financially. The future should be one that is very high-tech. As the author, Thomas Mahon said, 'Silicon Valley represents a midpoint in the procession between King Arthur's plaintive plea for magic — "Merlin, make me a hawk so I can fly away!" — and the calm request of the starship's Captain Kirk — "Beam me up, Scotty."' ¹⁶

Footnotes

¹Sexton, Jean Deitz. Silicon Valley: Inventing the Future. (Hong Kong, 1992), p. 17.

²Bylinsky, Gene. Silicon Valley: High Tech Window to the Future. (Hong Kong, 1985), p. 26.

³Larsen, Judith K. and Everett M. Rogers. Silicon Valley Fever: Growth of High-Technology Culture. (New York, 1984), p. 26.

⁴Larsen, Judith K. and Everett M. Rogers. Silicon Valley Fever: Growth of High-Technology Culture. (New York, 1984), p. 26.

⁵Sexton, Jean Deitz. Silicon Valley: Inventing the Future. (Hong Kong, 1992), p. 48.

⁶Sexton, Jean Deitz. Silicon Valley Inventing the Future. (Hong Kong, 1992), p. 442.

⁷Sexton, Jean Deitz. Silicon Valley: Inventing the Future. (Hong Kong, 1992), p. 444.

⁸Larsen, Judith K. and Everett M. Rogers. Silicon Valley Fever: Growth of High-Technology Culture. (New York, 1984), p. 7.

⁹Bylinsky, Gene. Silicon Valley: High Tech Window to the Future. (Hong Kong, 1985), p. 101.

¹⁰Mahon, Thomas. Charged Bodies: People, Power, and Paradox in Silicon Valley. (U.S.A., 1985), p. 9.

¹¹Larsen, Judith K. and Everett M. Rogers. Silicon Valley Fever: Growth of High-Technology Culture. (New York, 1984), p. 250

¹²Sexton, Jean Deitz. Silicon Valley: Inventing the Future. (Hong Kong, 1992), p. 139.

¹³Larsen, Judith K. and Everett M. Rogers. Silicon Valley Fever: Growth of High-Technology Culture. (New York, 1984), p. 258.

¹⁴Larsen, Judith K. and Everett M. Rogers. Silicon Valley Fever: Growth of High-Technology Culture. (New York, 1984), p. 260.

¹⁵Sexton, Jean Deitz. Silicon Valley: Inventing the Future. (Hong Kong, 1992), p. 137-9.

¹⁶Mahon, Thomas. Charged Bodies: People, Power and Paradox in Silicon Valley. (U.S.A., 1985), p. 6.

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