

appointment to the Board of Regents. So in 1886, Stanford announced the founding of Leland Stanford Junior University and the dedication of his fortune to its endowment. The millions extracted from public loans and gifts, unorganized labor, a ruthless monopoly and huge land grants were to become the financial base of the new university.

He and Jane set out to talk with educators back East to clarify their education goals and to find a president for the school. They were impressed with the abundance of research at Johns Hopkins and with the importance of the applied sciences at MIT and Cornell. They tried to persuade Andrew White, ex-president of Cornell, to come West and build Stanford University. He refused, but recommended David Starr Jordan, then president of Indiana University, whom he called "one of the leading scientific men of the country." Jordan was favorably impressed by Stanford, and wrote later in his autobiography: "He hoped to develop in California a university of the highest order, a center of invention and research, where students should be trained for 'usefulness in life.' His educational ideas, it appeared, corresponded very closely with my own." Jordan accepted the job as president, and prepared to move West to begin the task of recruiting a faculty.

By this time Stanford's ideas had matured and his vision of the new university was fairly clear. It would provide tuition-free education to as many students as possible with emphasis on practical training. The President of the CP, who had amassed great wealth, now intended "to provide primarily for the masses. The rich can take care of themselves, but will always be welcome here."

Stanford envisioned more than a university: he told the San Francisco Examiner in March of 1891 that "... in time the University will be complete from the kindergarten to the post graduate course, but that can only be after a village has grown up around the University." Thus Stanford set out to build his university and the area surrounding it as a model to the state, nation and world.

His typical desire to build "the best" and "the greatest" showed itself in two areas: the design of the campus and the creation of the university town. He and Mrs. Stanford wanted the campus well planned, and retained an architectural firm and the landscape architect, Frederick Olmsted, to suggest a coherent proposal. Olmsted sought an ecological balance, with plenty of open space and a rational plan for the development of homes, buildings and limited roads. (Such care for the environment was certainly unique in the West and, as we shall see, has not persisted through the present time.) His basic proposal for the style and form of the main Quad was accepted, and has influenced all subsequent building at Stanford.

The university that Olmsted was designing needed a town that could serve it. The Mid-Peninsula area had been developing slowly through the late 1800's. Agriculture dominated the economy of the Santa Clara Valley; large and small farms extended far up the Peninsula. After the SP connected San Francisco with the Peninsula, many wealthy

businessmen established country estates in Southern San Mateo County. The village of Menlo Park, just north of the Stanford's farm, served some of these estates. The town of Mayfield, beginning south of the Palo Alto Farm at El Camino and Page Mill Road, supplied the farmers of the area.

Stanford originally planned to have the university front on the village of Mayfield. But when the Stanfords insisted that the 13 saloons in the town be closed to protect the morals of the students and faculty, the saloon-keepers responded in a language Stanford should have understood: we won't close down the source of our profits.

Stanford retaliated by locating the campus as far from Mayfield as possible, at the north end of the farm, and asked his good friend Timothy Hopkins (adopted son of Mark) to buy land nearby for a new town. In 1887, Hopkins bought 700 acres east of El Camino Real from John Greer and Henry Seale; the next year, he began renting lots for the town of University Park. The name was soon changed and land was offered in circulars advertising "Palo Alto: the business and residence town of the Leland Stanford Junior University." By the time the university opened its doors only a few houses, a boarding house and a general store had been built—but they were to the Stanford' liking.

PALO ALTO!

THE BUSINESS AND RESIDENCE TOWN
OF THE
LELAND STANFORD, JR., UNIVERSITY

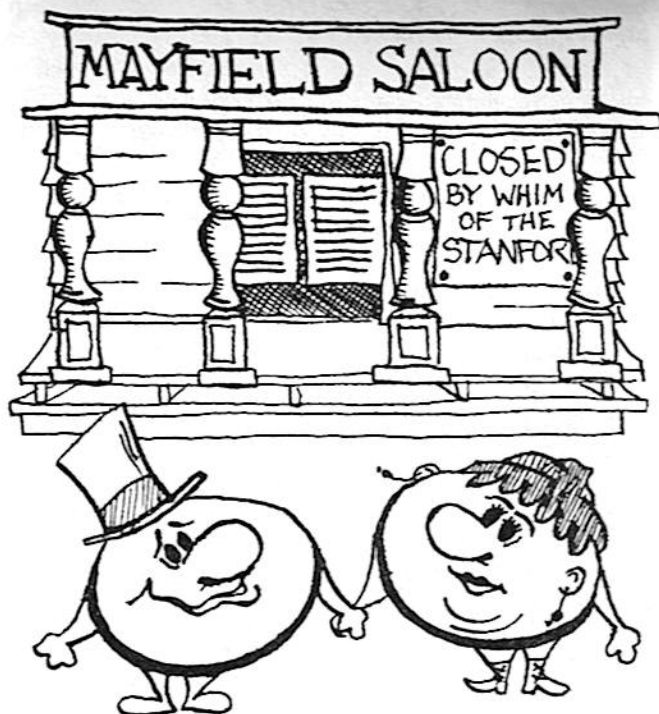


1,000 BEAUTIFUL LOTS,
AT AUCTION, ON THE GROUNDS,
THURSDAY, MAY 3rd, 1888,
AT 12 O'CLOCK M.

SPECIAL EXCURSION
Trains will leave: San Francisco: Fourth and Townsend Streets, 10 A.M., sharp; Valencia and 26th Streets, 10.10 A.M., sharp.
\$1.00—ROUND TRIP TICKETS—\$1.00
San Jose: S. P. R. R. Depot, Broad Gauge: 10.30 A.M., sharp.
50 Cts.—ROUND TRIP TICKETS.—50 Cts.

TERMS OF SALE, ONE-THIRD CASH.
Balance in Equal Payments, in 12 and 18 Months Interest, 6 per Cent per Annum

N. C. CARNALL & CO.
WM. BUTTERFIELD, Auctioneer. 624 Market Street, San Francisco.



With the Grant of Endowment passed, the campus built, and President Jordan hired, Stanford University began classes in the fall of 1891 with 415 students and a faculty of twenty. Within two years, the new school was in financial trouble. Leland Stanford's fortune rested on the railroad which was not firmly in Huntington's control. Huntington was never fond of Stanford's excessive spending, political ambition and inattention to the problems of the railroad. He became furious when in 1885 Stanford had himself appointed Senator from California, at the expense of Huntington's own nominee. Stanford built the university with borrowed funds, expecting to repay the debts with railroad profits, but Huntington refused to pay out the necessary dividends. Then Stanford died in June, 1893, leaving his stocks and money tied up in probate court.

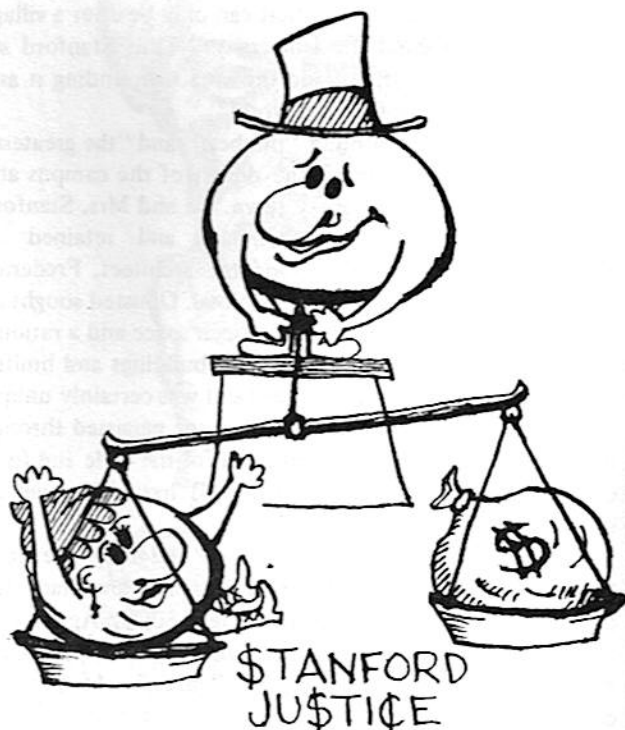
The strong-willed Mrs. Stanford pledged to keep the university open and to continue as sole governing Trustee. (The Board of Trustees provided for in the Endowment—businessmen friends of the Stanfords—was not to exercise power until the Stanfords died.) She set out to raise the necessary money, a task made more difficult by the Depression of 1893. A sympathetic probate judge stretched a few legal points and declared the President and staff of the university her personal servants, awarding her \$10,000 a month from the estate for their salaries. This amount, bolstered by a registration fee, sale of race horses, salary cuts and great frugality, enabled the university to survive.

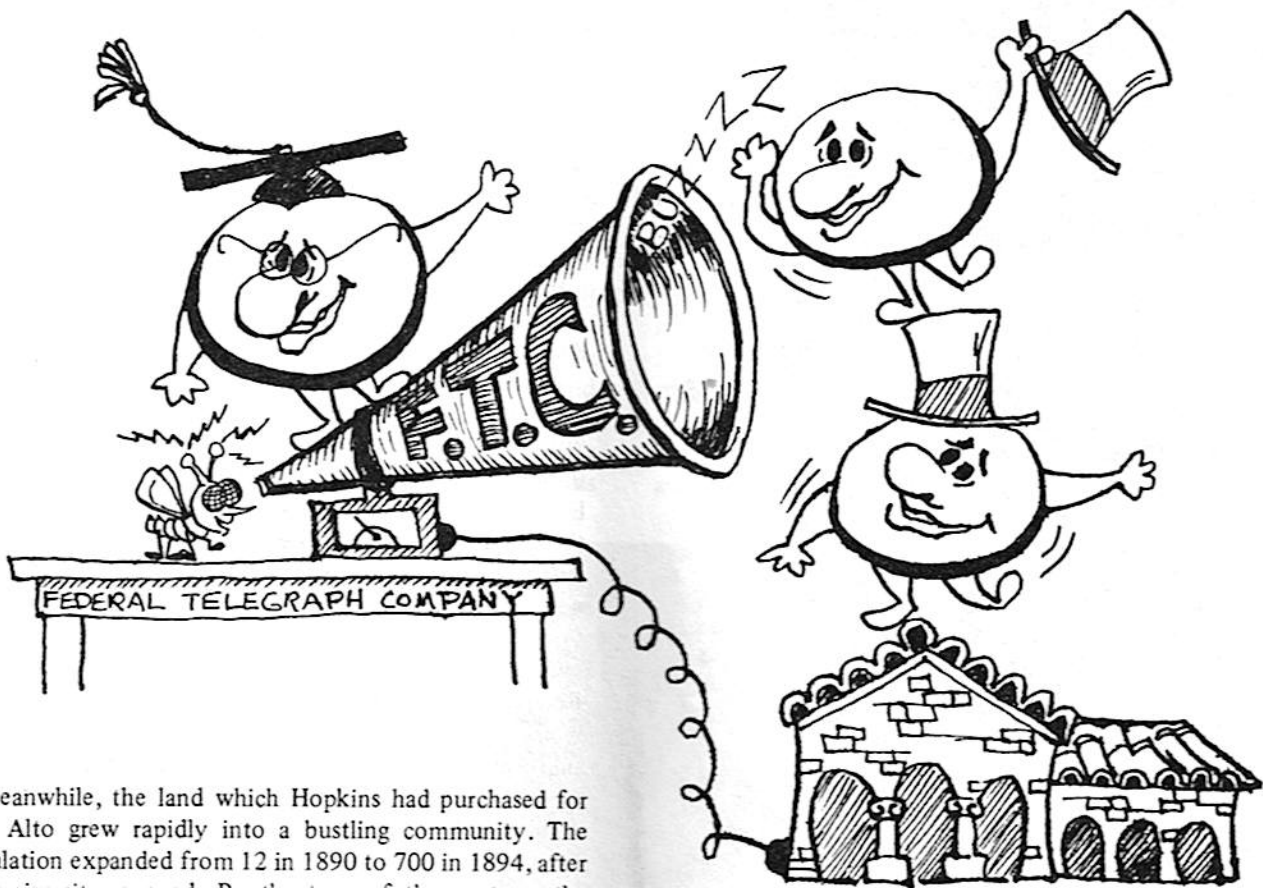
But in 1894 a greater threat appeared. The U.S. Government attached Stanford's estate for the re-payment of \$14 million worth of the bonds and interest that had built the Central Pacific. Under California law in the

1860's, when the CP incorporated, the Big Four were personally responsible for the CP debt—and they had often justified their vicious monopoly as the only way to earn the money necessary to repay the enormous, threatening deficit. But when the bill came due, the argument changed rapidly: now Stanford's lawyers argued that the SP as a corporation, not the Big Four as individuals, should bear the costs. The personal fortunes should remain untouched. Huntington was glad to see the Government sue Stanford's estate because it made the Stanford estate bear the legal costs of the case. Eventually the Supreme Court decided in favor of the Stanfords and the university's endowment was saved. Once again the Government was the loser, and both Stanfords died never knowing who, if anyone, would pay the enormous debt. (The Government was finally able, after much time and effort in various courts, to force the SP to pay in 1908.)

By 1899 the financial crisis was over. But the university had come to realize more clearly than ever the frailty of a private educational institution in a society which encountered frequent economic crises and which seldom gave money to a venture unless there was a clear profit in it.

In 1903 Mrs. Stanford turned her powers over to the Trustees and in 1905 she died. The Trustees' first crisis, the earthquake of 1906, forced them to rebuild much of the university. But generally speaking, the beginning of the 20th century was a time of retrenchment and quiet building at Stanford. The major new undertaking was the acquisition of the San Francisco-based Medical School, a valuable but very expensive addition that greatly increased pressure on an already tight budget.





Meanwhile, the land which Hopkins had purchased for Palo Alto grew rapidly into a bustling community. The population expanded from 12 in 1890 to 700 in 1894, after the university opened. By the turn of the century, the population was 1650, there was a severe housing shortage, and no rentals were available. Palo Alto far outstripped both Mayfield and Menlo Park, which began to regret their refusal to bow to Leland Stanford's wishes. By 1906, Palo Alto dominated the Peninsula.

Palo Alto had virtually no industry, but the university provided a sound and genteel economic base. Palo Altans prided themselves on the quality of their town—a quality Leland Stanford would have approved. There were no saloons, an abundance of trees, and a minimum of Orientals. The town remained dry for decades, largely due to restrictions on the deeds Hopkins sold, which provided that the property would revert to the university if alcohol was ever sold on the site. (This restriction still governs some of the property in downtown Palo Alto.)

As there was only one Negro in the area, E.B. "Sam" McDonald, who had worked for Stanford tenant farmers and for the university itself for years, there was no virulent anti-Negro sentiment. However, Orientals were seen as a threat to the high quality of Palo Alto. One historian says, "During the first decade of the twentieth century there existed in Palo Alto an Anti-Japanese Laundry League whose sole purpose was to persuade citizens to patronize laundries using only non-Oriental workers. In referring to the Chinese, newspapers invariably called them Chinamen, Chinks, Celestials and Pagans. Restaurants and laundries proudly advertised that they had no "coolie" help. Permits to open businesses in Palo Alto were denied the Chinese

Housing for them was limited to hovels."

Before World War I, two major events in Palo Alto occurred to tighten the bond between university and university town. In 1912, Lee de Forest and other employees of the tiny Federal Telegraph Company on Emerson Street heard a fly's footsteps amplified by de Forest's new invention, the vacuum tube. The company for which de Forest worked has been heralded as "the prototype of the close interrelationship between industry, the university and the entrepreneurs in developing the science-based electronics complex in Santa Clara County." When the company was started in 1909 by Cyrus Elwell, a Stanford graduate in electrical engineering, neither the word "electronics" nor the burgeoning development of Santa Clara County could be imagined. Elwell demonstrated a transmission system which could send both voice and telegraph signals to David Starr Jordan, and the Stanford president volunteered \$500 to help capitalize the new company. Dr. C.D. Marx, head of the civil engineering department, and other faculty members, also put money into the venture. Within a few years, discovery of new uses for the vacuum tube guaranteed the success of the new company. While FTC employees could hardly realize what they were starting, the discovery would set the model for the transformation of the still agricultural and residential Mid-Peninsula into a heavily populated industrial center.



(America joins the Great War and Stanford University enlists enthusiastically.)

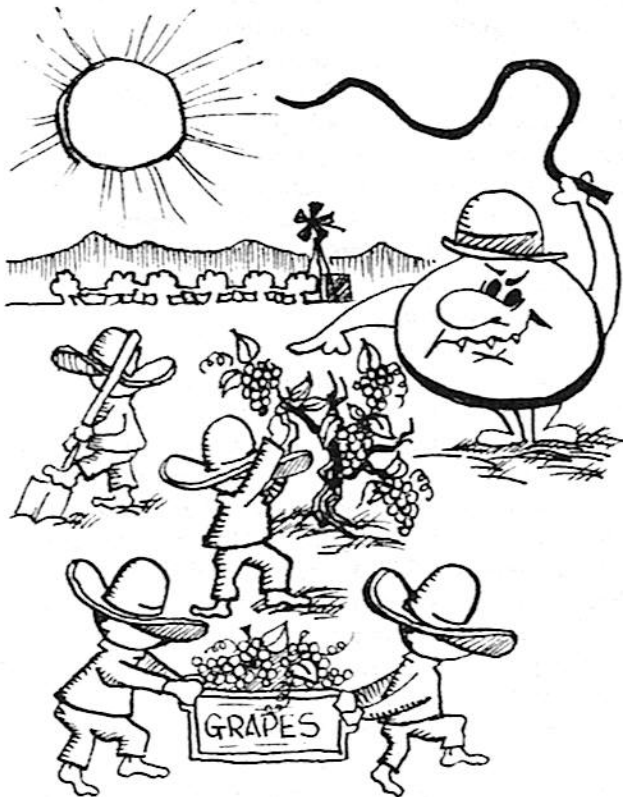
The United States entered World War I after the brief Stanford Presidency of Dr. Branner (1913-1916) and the appointment of Dr. Wilbur as President. Stanford responded fully to the call with the notable exception of ex-President and then Chancellor Jordan, who was preaching pacifism. Jordan's opposition to war and imperialism dated from 1899, when he was active in the Anti-Imperialist League opposing the U.S. seizure of the Philippines.

Stanford's student body and faculty were greatly depleted in World War I, a struggle known to millions as "the war to end war" which was actually fought to save our shipping and restore an acceptable balance of power in Europe. President Wilbur went to Washington to serve in the Food Administration under the successful Stanford graduate and dynamic new Trustee, Herbert Hoover, who was to gain fame later in the war as the director of the Commission for Relief in Belgium. Students enlisted, several hundred went through the newly established Reserve Officers Training Corps (ROTC), and men and women volunteered to form an Ambulance Corps. The university gave faculty leave with partial pay and opened up the university laboratories to the government. The medical school trained corpsmen. ROTC quarters were constructed on the campus, including stables for about 200 horses belonging to a student cavalry unit which was not disbanded until the 1940's.

The area around Stanford tooled up for the war as well. Camp Fremont in Menlo Park had as many as 43,000 men at a time in basic training. A hospital was built on Willow Road and a shooting range and artillery range were built near Page Mill Road. Merchants prospered as they filled the needs of the temporary population. The influx of soldiers once again strained the housing market. The first apartment house was built in Palo Alto in 1918-20 units on the corner of University and Cowper designed to meet the housing needs of Camp Fremont officers and wives. Many local residents took up vegetable farming, to supplement their own incomes and aid the government effort. Timothy Hopkins invited area residents to use his remaining lots for their gardens. Women, including some Stanford volunteers, helped with the county's harvest during the labor shortage following full-scale mobilization.

But the increased demand for farm products had an even more important effect on the area's economy. The war introduced Mexican farm labor into California. Myths about the laziness and ineptitude of the Mexicans—like the earlier myths about the "weak Chinese coolies"—gave way as the laborers proved diligent and effective. The use of Mexican labor continued after the war, and is still widespread throughout the state. The pay and working conditions of these laborers are different but not much better than those endured by the Chinese before them.

After World War I, life returned to easy "normalcy."

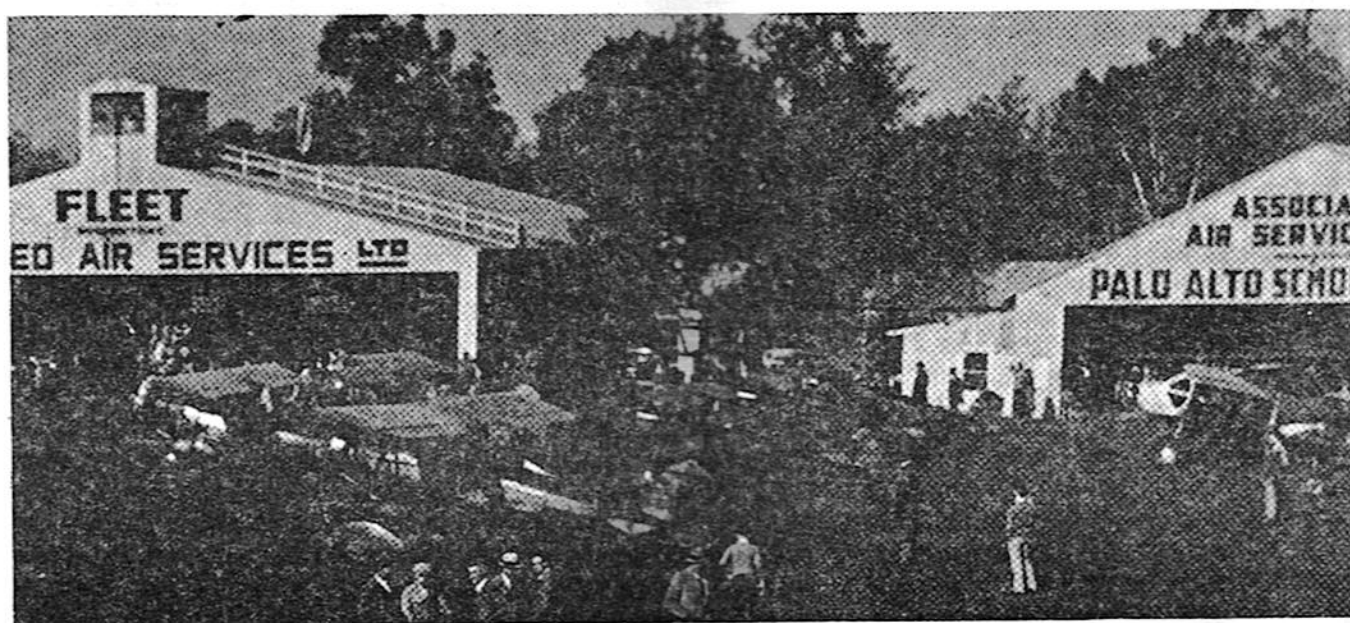


The war left little permanent mark on the area, unlike World War II, largely because it was primarily a European war fought with conventional weapons. The greatest activity took place on the more populous and industrialized East Coast.

Soon after Armistice, the trustees began to make major decisions relating to the use of Stanford lands. Deciding that farming was no longer profitable, they first liquidated all the remaining farm leases. Although farming no longer brought income to the university, the war had made it clear to the Trustees and the government that certain forms of cooperation might be mutually profitable. As Edith Mirrielees says in *Stanford: Story of a University*, "World War I had shown both government and business the uses of universities. And a university surrounded by empty acres had more uses than most. Throughout the over-prosperous

Financial relief also came in the form of tuition. Stanford had never really been a school "for the masses," and the introduction of fees in 1919 merely recognized the fact that most Stanford students were well off. But the rising tuition would eventually become a barrier to most poorer students. Leland Stanford's goal of building a university that would serve the needs of his workers' children grew more and more illusory.

As the Mid-Peninsula grew and changed through the 1920's, the university maintained the controlling hand it had as the area's major landowner and corporate power. Stanford's control extended even to determining the municipalities that would border on its land. In 1925, the old town of Mayfield voted its desire to be annexed to Palo Alto. Stanford owned land in both towns, and favored annexation so that it could deal with one municipality



The Palo Alto Airport stood on Stanford land now occupied by Escondido Village.

twenties, applications for the leasing of land came from many quarters..." The available land, laboratories and faculty at Stanford were a powerfully attractive combination, and the development during the twenties of several key departments and schools guaranteed Stanford's future success as the center of a wealthy Santa Clara County.

Three of the leases which Stanford accepted for its land during the twenties are representative. One was to the U.S. Government for an agricultural experiment; the second was to the Carnegie Foundation for a laboratory of Experimental Taxonomy and Genetics; and the third went to a privately-owned school of aviation which needed open land for runways. Government, foundations and private business—these were the groups which would help Stanford over its financial hurdles in the future in return for services rendered.

instead of two. But many Palo Alto residents were not so sure that annexation of Mayfield would benefit them. A lively campaign by opponents of annexation pointed out that taxes would be likely to rise with the incorporation of older, shabbier Mayfield. Also, annexation would diffuse the small-town character of Palo Alto, and lessen the influence that individual citizens had on municipal affairs.

The campaign against annexation was smashed by a threat from the university to withdraw the trade that provided Palo Alto's economic base. "One thing is certain," announced a university official, "if Palo Alto declines to annex further territory for the reasons urged by those who oppose consolidation, then the university will have no choice in the matter and will be compelled to develop its own municipality." In July, 1925, Palo Altans voted almost three-to-one to annex Mayfield. Stanford had once again kept its town in line.

(The Stirrings of Stanford's future Greatness.)

In the twenties, Stanford University started to grow along the lines that would one day transform the sleepy little school into a cornerstone of the American empire. The growth came in two professional schools: business and engineering. Behind each school was a dynamic personality: Herbert Hoover in business and Frederick Terman in engineering.

Hoover, of course, was a Trustee, just back from his relief work in Europe. An engineer by training, Hoover had been a very successful businessman with extensive mining operations in China, Australia, South Africa and Russia. He came to Stanford to affect it, and he did. The most powerful Trustee of the period, he helped establish the Food Research Institute under a Carnegie grant and he saw that academic rank was given to visiting fellows at the Institute—a practice that would be greatly expanded in later years. He convinced many Trustees, academicians and businessmen of the importance of teaching business skills and principles as an academic discipline, and saw the Stanford business school prove very successful at its task. He also raised money for the construction of the Hoover Institution, which housed the vast records he and his staff had gathered during their service in Europe on the causes of the Great War. He left the university to serve as President of the United States in 1929.

Engineering Prof. Frederick Terman was not a powerful figure like Hoover in the twenties. But Terman, who would rise to become Stanford's provost, was an exciting instructor and available to students. With the establishment



of the "communications lab" in an attic above Terman's office, a cluster of young engineers began to form around him. While he was inspiring these promising students with his teaching, few people could foresee that his genius would help to speed the total economic transformation of the area.

Even after the boost of the First World War, the economy of Santa Clara county remained agricultural, with only some industry in canning, processing and farm machinery. The future growth of the area would come from electronics industries, spawned or attracted by the engineering expertise at Stanford University. Terman could see the model for this growth in the Federal Telegraph Company of Palo Alto. Founded by Stanford engineers before the war and capitalized by professors, Federal Telegraph had found a lucrative market for its transmitters and receivers at U.S. Navy bases. By the twenties, a productive cooperation had grown up between the engineering school and Federal Telegraph. The bright young engineers and physicists who gathered at Terman's lab were naturally attracted to the dynamic electronics company. Many Stanford graduates went to work for Federal. By the mid-Twenties, the company was the world leader in the design and manufacture of high power apparatus for international communication.

Soon industry was giving money to Stanford to provide the engineering research it needed. General Electric, Pacific Gas & Electricity, and other firms paid for the Ryan High Voltage Laboratory in 1926, to improve the transmission of electric power over long distances. Contributions from the Daniel Guggenheim Fund for the Promotion of Aeronautics enabled engineering professors to establish a laboratory that

would do important work for military and aircraft manufacturers.

These early projects did not immediately spark the growth of an electronics industry around Palo Alto, and the Federal Telegraph Company moved to New Jersey in 1932. But they showed Federick Terman the potential for a university-based industrial center which he would later bring to fruition. Many years afterwards, Terman noted that industry had learned that "for activities involving creative work, location near a center of brains—that is, near a university with a good graduate program in engineering and science—is more important than location near raw materials, transportation, factory labor, or even markets."

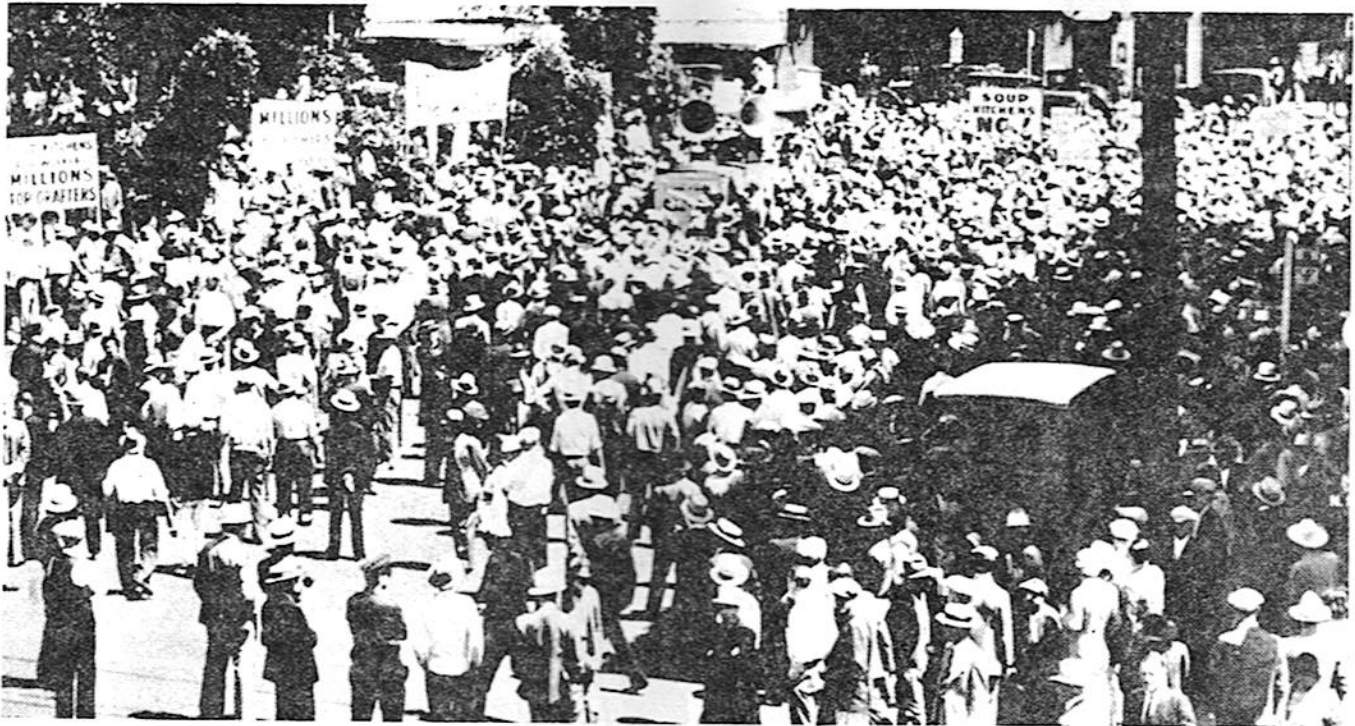
The electronics technology that Terman and others were developing in the twenties held out great promise for the betterment of human existence. But the Great Depression and World War II intervened. These upheavals in American capitalism would first stunt the growth of electronics, and then warp its development into a dependency on military contracting.

The stability and prosperity of the twenties rested on a shaky foundation, and finally proved illusory. The U.S. economy had suffered crises in irregular cycles before, such as the Panic of 1873 which almost wiped out the Central Pacific and the Depression of 1893 which threatened to close Stanford in its early years, but these threats to the social order were generally short-lived and usually followed by a long period of recovery and growth. The U.S. had never experienced a protracted crisis like the Great Depression of the Thirties, and certainly did not expect such a basic threat to its survival as the leading capitalist nation.

With the startling crash of the Market on "Black Friday" in October of 1929, the Great Depression struck the nation. The consequences are familiar history: unemployment, poverty, hunger and fear which led to intense social struggles. But such struggles did not mark the Mid-Peninsula.

The Depression affected the Santa Clara Valley and Stanford University more by limiting growth than by causing the death of either industries or educational institution. In fact, there was still very little industry around to die. Population growth slowed—Palo Alto grew by only 3,000 people during the decade, despite the migration to California of many poor whites fleeing the dust bowl in the Southwest. Poor whites could no more find work and afford to live in respectable, suburban Palo Alto in the 1930's than they can now. The "Okies" became migrant farm workers, competing with Mexican-Americans in the lower Santa Clara, San Joaquin and San Fernando Valleys. With the slow population growth, construction on the Peninsula fell to a bare minimum, and the one remaining manufacturing plant in Palo Alto, the Boden Automatic Hammer Factory, died a Depression death.

The University itself scraped through the Depression with a minimum of damage. It made 10 percent salary cuts in 1933, but ended the year with a \$2000 working surplus. By 1935, the Trustees were able to raise salaries slightly, although not back to 1932 levels. With the help of a committee formed during the thirties to solicit alumni gifts, Stanford survived the Depression in far better financial condition than one might expect from its rocky financial history.



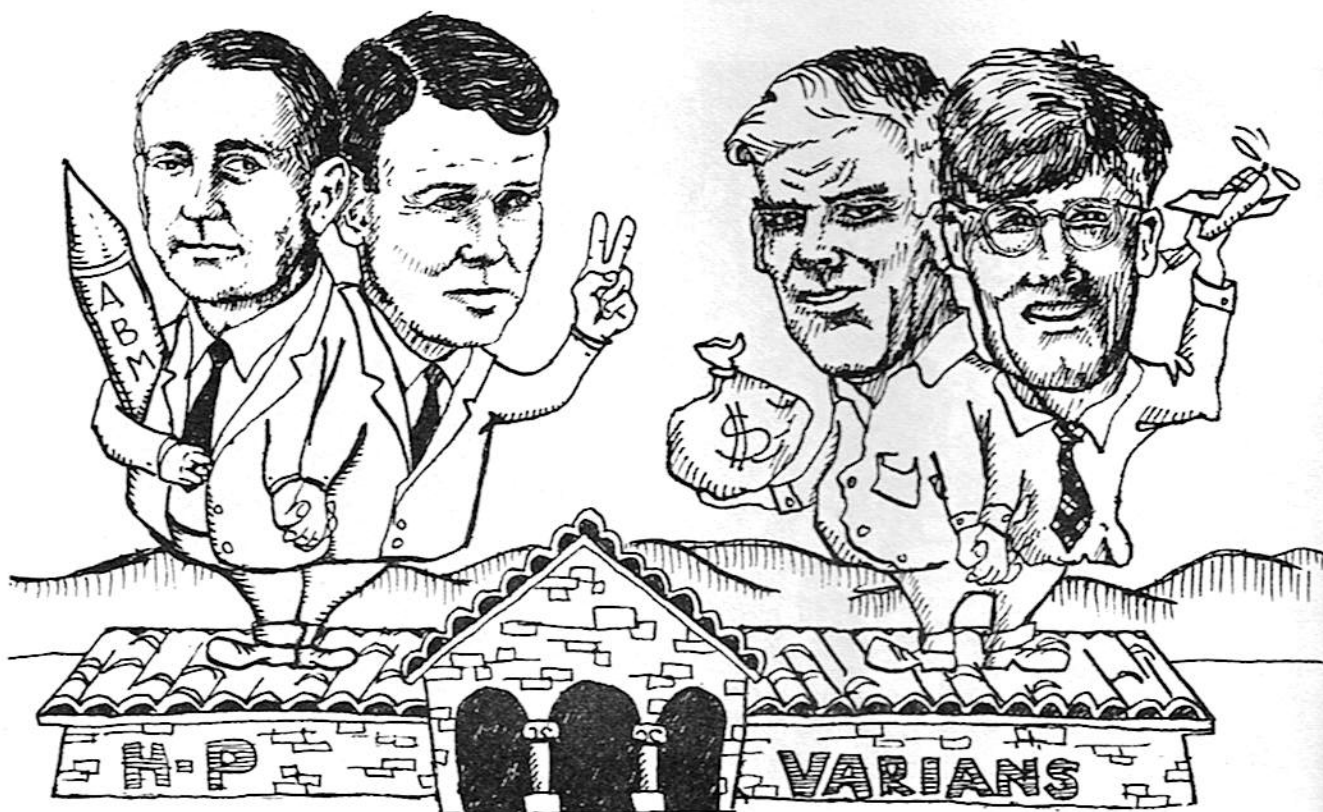
Masses rally during Depression.

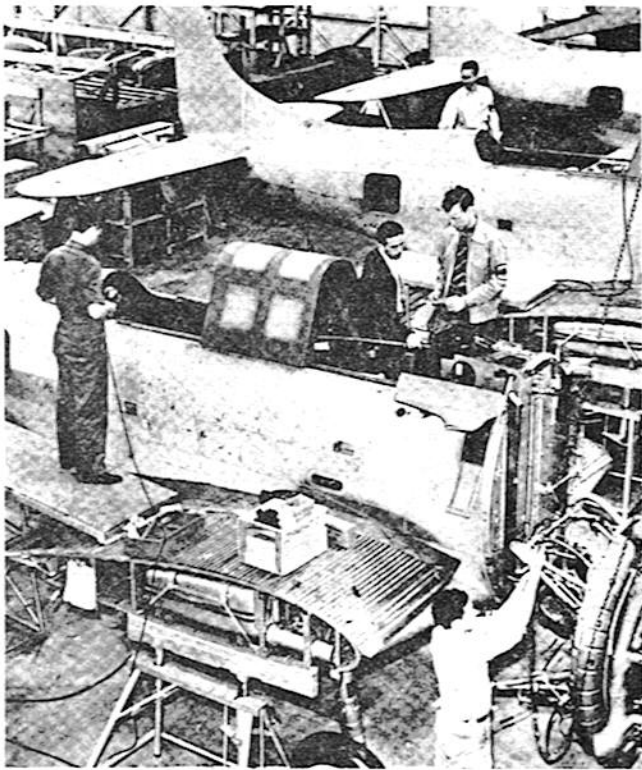
With a stagnant American economy, many Stanford graduates were unable to find employment that utilized their skills. The university, however, continued to foster the infant electronics industry. Future entrepreneurs like William Hewlett, David Packard, John Kaar and the Varian brothers kept one foot firmly planted at their alma mater as they started their fledgling enterprises.

Amateur radio grew as a hobby even in the darkest days of the depression, and provided a market for electronics hardware. Frederick Terman had built an amateur radio station in Palo Alto with Herbert Hoover, Jr., in the Twenties. His students joined in the tinkering and experimentation. In 1936, a year after earning his electrical engineering degree from Stanford, John Kaar opened a small radio shop in Menlo Park. First catering to Stanford engineers, radio hams, and repairmen, Kaar Engineering rapidly grew into a mobile communications business. When the huge military orders came with America's preparation for World War II, the company became the largest West Coast manufacturer of two-way radio telephone equipment. Terman helped two other students, William Hewlett and Dave Packard, start a part-time enterprise in a garage on Addison Avenue in Palo Alto in 1938. Their product was an audio oscillator invented by Hewlett. The first big order came from Disney Studios, which wanted nine oscillators to produce the stereophonic sound for "Fantasia." Encouraged, the two men formally organized the Hewlett-Packard Corporation in 1939, coincidentally the beginning of the war that would catapult them to fantastic

wealth and power.

The University had an even more intimate involvement with the founding of Varian Associates. In 1937, physics professor William Hansen persuaded the University's president, Ray Lyman Wilbur, to provide laboratory facilities for Russel and Sigurd Varian. Together with Hansen, the Varians were experimenting with devices which might make possible the detection of enemy planes from the ground, at night and in bad weather. Wilbur said that the university couldn't afford to put the Varians on salary, but he appointed them as research associates and gave them full use of the Stanford physics labs and \$100 to help pay project expenses. "In return," writes historian Jane Morgan, "the University was to share with the Varians and Hansen any financial return that might come of the research." The Varians developed the klystron tube, an essential component in radar. Commercial development was farmed out to Sperry Gyroscope, where the Varians worked and Hansen consulted until they founded their own company. In January, 1939, a proud President Wilbur announced the invention and its uses to the public. The university would receive more than two million dollars in royalties in return for sponsoring the early research. Other entrepreneurs would pay back the university for some of the benefits it gave them. Jack McCullough of Eimac, a San Bruno firm started in 1934, gave money and his name to the McCullough Engineering Building that houses much of Stanford's sprawling electrical engineering department today.





(America goes to War to overcome Fascism and Depression, and the Mid-Peninsula is never the Same.)

The late 1930's were not a good time for American capitalism. The Depression persisted and unemployment was rising again. Riots, strikes and sit-ins became commonplace as workers battled for union recognition. Radical socialist beliefs were making headway among American intellectuals. While America and her capitalist allies in Europe stagnated, the overtly fascist states of Germany and Japan mobilized for war. Germany threatened the balance of power in Europe, which the U.S. had fought to preserve in World War I. The Japanese had set out to create the Greater East Asia Co-Prosperity Sphere in the Pacific, a blunt denial of America's economic interests.

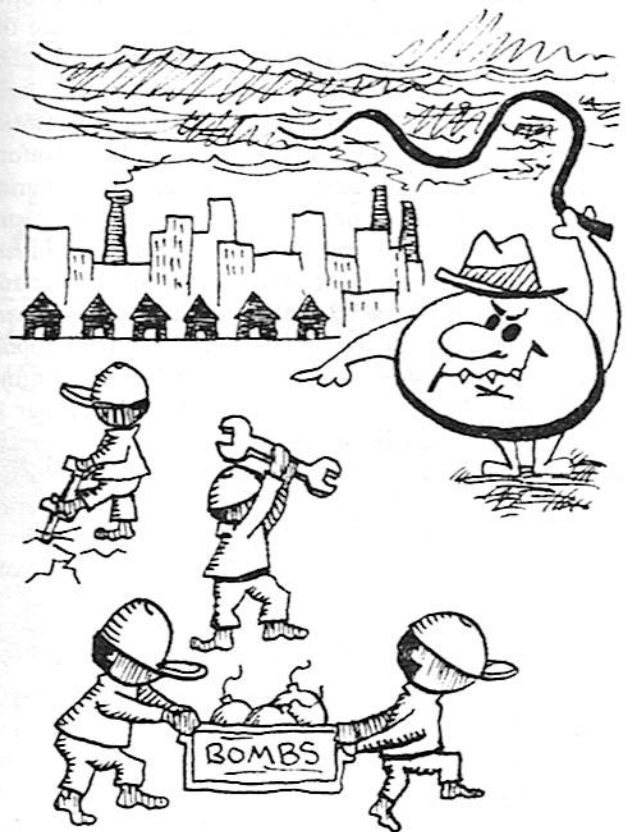
The eruption of war was widely heralded as a disaster, but its benefits for the men of wealth and power in this country were great. Not only did the war eventually expand their power in Europe and Asia, but it also managed to break the grip of a depression which was beginning to seem endless, and therefore very dangerous. With the coming of war, economic growth resumed and surged forward—especially in California.

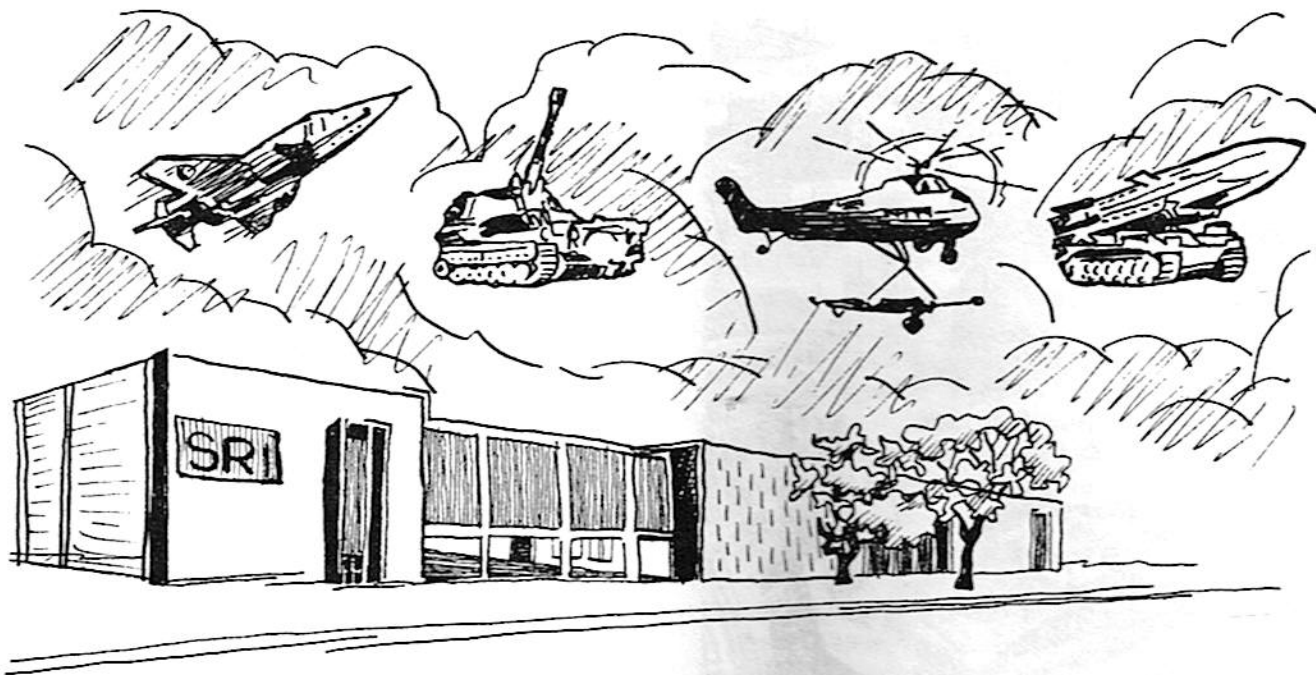
Unlike World War I, the second World War had a Pacific theater. The task fell to California of outfitting, dispatching and supplying the armed force that would seize the Pacific from the Japanese. The state was still primarily agricultural, with only light manufacturing; there was no steel plant in California until Kaiser built his Southern California works during the war. Soon, however, major manufacturing and

port complexes grew in the north as the government spent lavishly for war.

World War II created thousands and thousands of new jobs, which led to increased population and higher personal incomes. In the Santa Clara Valley farming intensified, and jobs opened up in the canneries and in industries like FMC as the country geared up for war production. The new electronics firms in the area grew rapidly as their products such as radio and radar proved crucial to the war effort. A great migration of people into the area followed, reversing a forty-year pattern which had seen the population of Santa Clara Valley fall further and further behind that of the state as a whole.

With the compulsory draft, manpower for jobs at home became scarce. Industries throughout the country, including the Peninsula, began to hire women as laborers, and found that it was possible to pay them less than men had been paid for the same jobs before the war. Blacks migrated to California during World War II from Texas and Louisiana. Many settled in Hunter's Point, south of San Francisco, working at shipbuilding for extremely low wages. Once again the growers who ran California's vast farmlands needed a large supply of cheap labor. They turned to Mexico, as they had done in World War I, importing thousands and thousands of laborers under a labor contracting system similar to that used by the Central Pacific in importing Chinese labor to build the railroad.





Although wages for some people were low during World War II, profits for defense industries were high. Hundreds of thousands of men sacrificed their lives, rationing was common and strikes were outlawed—but war profiteering proceeded smoothly. In this war, as in the Civil War which allowed lavish subsidy for the building of the Central Pacific, a federal government spent liberally to finance the growth of new industrial empires in electronic and other fields. Universities stood to gain from war as well. Government research contracts poured into laboratories across the nation. Electronics research by Stanford professors and students continued at a furious pace during the war, concentrating on solutions to military problems posed, and paid for, by the government. Frederick Terman, for instance, was on leave for the duration of the war and headed the Radio Research Laboratory at Harvard, where nearly 1,000 people worked on researching and developing radar countermeasures—a field in which the Stanford engineering schools would later excel through the war in Vietnam. The Engineering School itself took on a heavy load of training soldiers and students, particularly in the Specialized Army Training Corps and the Engineering Science Management War Training Program. The programs brought thousands of soldiers to campus for instruction in engineering.

The tremendous productive effort of the United States in this period was unsurpassed in world history. The full-scale mobilization of the labor force and the full use of existing factories and fields supplied the military and civilian population of this country and the needs of many of our Allies. New industry had grown up and a new, stronger partnership between the government, universities

and industry had formed. This powerful combination enabled the U.S. and its dependent Allies to vanquish Germany and Japan—leaving the United States as the most powerful nation in the world, in control of the former colonies of the enemies and in a superior position to the weakened allies. America alone had escaped massive destruction.

With the end of the war, the millions of men in the armed forces returned home. A larger number than ever before remained overseas to man our vast new network of bases, but the war-time civilian labor force was now unnecessary. Thousands of blacks who worked in the shipyards and other war industries were soon displaced by whites. The women who had worked in great numbers were relegated once again to the home. The only significant group of “war workers” which was retained was the Mexican farm laborers, who continued to do the low-paying, difficult jobs for which there was little competition.

When the war was over, men in industry, government and the university realized that the sort of cooperation which won the war could continue to profit the country—and industry, government and the university. In 1946, representatives of West Coast industry and Stanford University founded the Stanford Research Institute to do vital applied research. SRI, not coincidentally, found many of its research contracts coming from industry and government, particularly the Department of Defense. Until new laboratories could be constructed for the scientists, engineers and, ultimately, social scientists who worked on these contracts, the Institute was housed in temporary quarters at the university and in Menlo Park.

Researchers were not the only people who found themselves, after the war, in temporary living space. Once again, Stanford and Palo Alto were caught in a housing crisis. Population influxes caused by increased employment opportunities during the war, and veterans returning from overseas taxed every available housing facility. In August, 1944, there were, once more, no available rentals in Palo Alto. Stanford purchased war surplus quonset huts and turned Dibble Hospital, in Menlo Park, into Stanford Village to house its students. Soon the students found themselves sharing the Village quarters with SRI employees doing research. The construction industry, of course, prospered. Between 1943 and 1950, 490 subdivision developments were opened in the Santa Clara Valley, generally on orchard land.

The war economy would not prosper, however, without war. The new electronics-aeronautics industry around Stanford was threatened with a slump in the late forties. Like American industry in general, it had depended on World War II to provide the market for growth and expansion. With the restoration of peace, American capitalism was again faced with the challenge of providing full employment and technological progress without wasteful military expenditures. But war—first hot and then cold—intervened to rescue capitalism from the discomfort of facing this challenge.

The "loss" of China to the Communists in 1949 came as a great shock to the United States, which had other plans for Asia. America had been involved in trade in China, Japan, and the rest of Asia for a half-century. We were re-making Japan at the time with our military occupation, and we had placed military bases strategically throughout the area. The success of the Chinese revolution meant that the major Asian nation would now be hostile to American

business and serve as a model for socialist economic development to the colonies of Southeast Asia. In the American mind, China was the first Asian domino. The Korean War was the first major attempt to prevent the spread of this latter-day Yellow Peril. Many felt the war should expand to full-scale attack on China, but the most militant cold warriors did not carry the day. The nation had to settle for keeping half of Korea for free enterprise when the Korean and Chinese troops secured the North.

Korea was a high technology war. Widespread use of jet aircraft, better communications equipment, more highly developed radar and small missile guidance systems marked the war. These were the specialties of the growing electronics firms of Santa Clara and San Mateo Counties. The boom was on. The paving over of the Valley's orchards and farmland to meet the needs of industry became a steady trend from the Korean War to the present. Over 330 new industries located in the Santa Clara Valley between 1945 and 1960. Among these were Varian Associates, which the Varians opened in 1948 in San Carlos. By the mid-fifties, Ford, IBM, Lockheed, General Electric and Sylvania had joined Varian and Hewlett-Packard in bolstering the county's economy. The population of Palo Alto alone increased by almost 10,000 between 1940 and 1950. Homebuilding activities accelerated to keep pace with industrial expansion. In 1950, Palo Alto's residential community extended to include the Boulware Tract, seventy acres in the vicinity of Embarcadero and Newell Roads. During the fifties, new tracts opened in Palo Alto almost every six months, with as many as 200 homes in each, covering the orchard lands south to San Antonio Road with houses and streets. To serve these newcomers, the Town and Country Shopping Center opened in 1953 at El Camino and the Embarcadero.



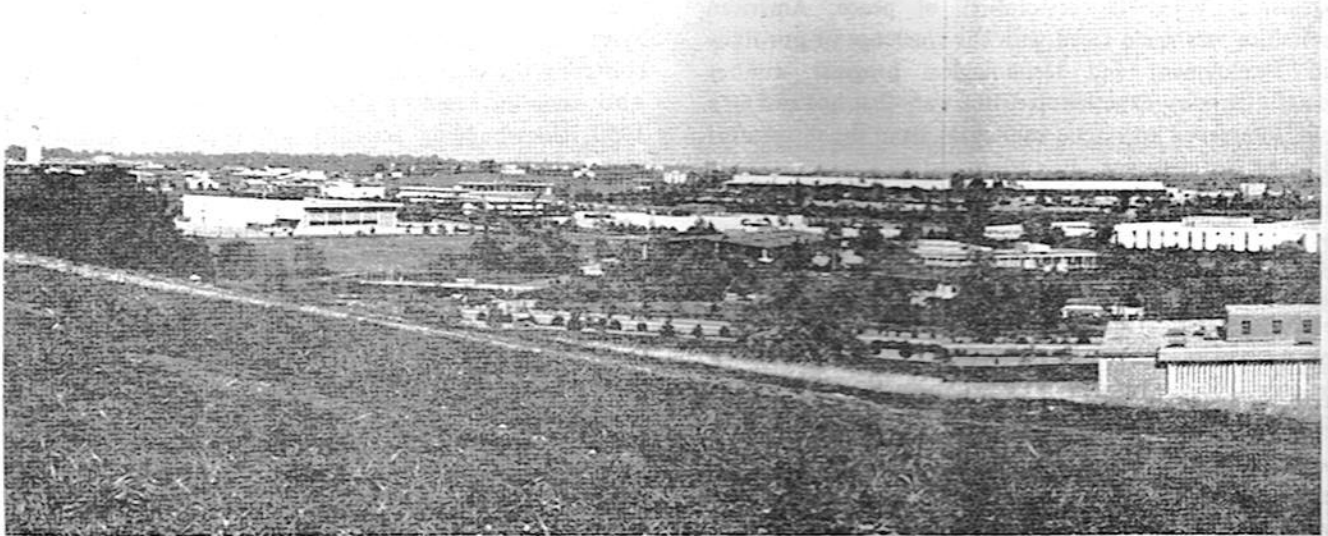
(Terman invites Industry to make the Most of Stanford.)

At Stanford, Frederick Terman's vision became a reality. Terman's post-war rise to dean of the engineering school and provost gave him the power to build around Stanford the "community of technical scholars" which had been forming in his mind during his early years at Stanford. As he would tell the Palo Alto Chamber of Commerce in 1965, "Such a community is composed of industries utilizing highly sophisticated technologies, together with a strong university that is sensitive to the creative activities of the surrounding industry." His desire for industrial development near the university meshed neatly with the Trustees' desire to find new sources of income from the leasing of Stanford lands to some of the familiar electronics firms in the area.

The first corporations to lease were Varian in 1951 and Hewlett-Packard a year later. The Stanford Industrial Park

surrounding area, and moved to the Park when they could afford it. Many of the firms in the Park located their R&D work in the Park and their production plants nearby: Lockheed is a case in point.

Lockheed opened new facilities in the Industrial Park in 1956. The story of the move, as told by a Lockheed public relations man, indicates the extent to which Terman's vision is shared by corporate executives. In the mid-fifties, Lockheed planned to set up a Missiles and Space division, including a new research facility. The federal government likes to see defense spending spread throughout the country for political reasons. Lockheed decided to locate its new division outside of Burbank, where it already controlled 25-30 percent of the local economy. According to Lockheed, four factors influenced the company's decision to locate its research laboratories on Stanford land. First, land was available at Stanford in a developed industrial park which was attracting similar R&D facilities. Second, location near a major university facilitates interchange between industrial researchers and university scholars.



was born. It was in 1954 that the Board of Trustees formally announced the policy that would govern the development of Industrial Park and of Stanford lands in general, saying, among other things, "The aim of the development shall be to produce in the ultimate a community of which the University Trustees and all those who have its welfare at heart can be proud and that will, by reason of the fact that it is a university project, serve in an important way as an educational example in the field of community development."

The Park proved an incredible success. The Stanford labs and SRI proved to be a powerful attraction. As Terman himself said "It is not just a coincidence that most of this type [of research-oriented] industry in the Bay Area lies within a 15-mile circle centered on Stanford..." These industries came to be near Stanford. There is a clear hierarchy in that fifteen-mile radius, with the choicest lots right next to the campus. Newcomers often settled in the

Many Lockheed researchers work or teach part time at Stanford; and Stanford engineers consult heavily at Lockheed. The environment of the Mid-Peninsula provided the third factor affecting the move. Palo Alto and its surrounding communities are full of attractive homes on tree-lined streets. The area, with its pleasant climate and the stimulating culture which has developed around Stanford, is conducive to creativity. The final factor inducing Lockheed to move its facilities to the Stanford Industrial Park was personal: its director of research at the time wanted to live in the Mid-Peninsula.

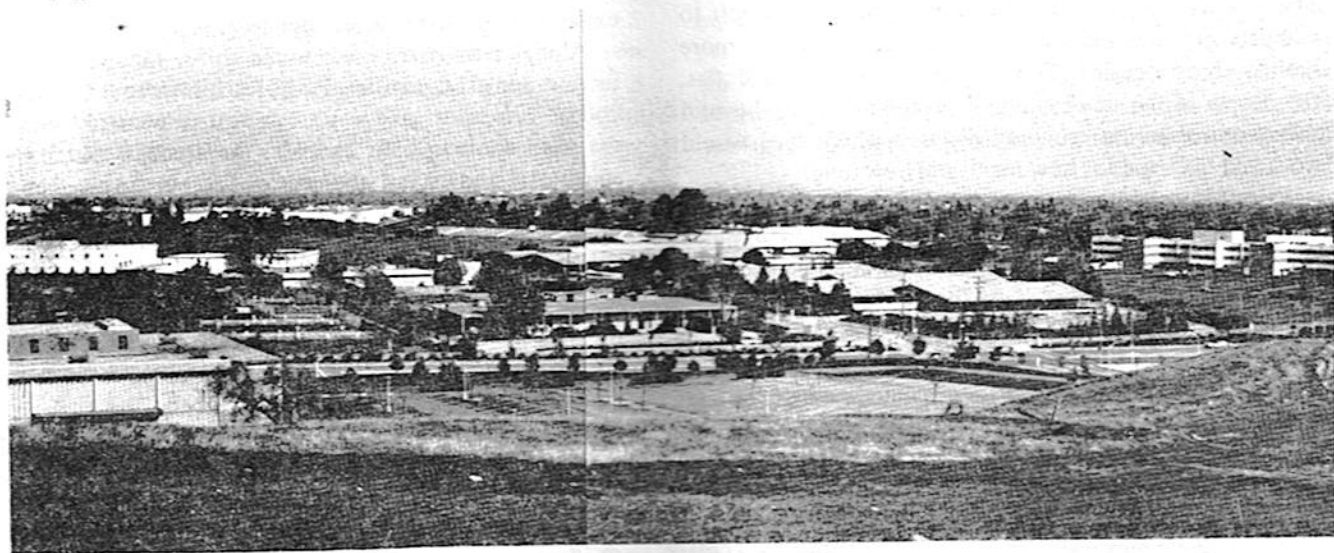
Lockheed decided to locate a manufacturing plant in nearby Sunnyvale in 1957, and bought 700 acres of inexpensive land. A major reason for settling in the Santa Clara Valley, besides closeness to the Stanford-based research facility, was the concentration of colleges where employees could continue their education, Stanford being the most attractive. The area was also not heavily developed

at the time, and the clear air and pleasant climate and the availability of land in the Santa Cruz mountains for a 4000-acre test facility, influenced the decision.

It was the year of Sputnik and the aerospace industry became our national saviour in the Space race. Lockheed was at the forefront, and soon the small agricultural community of Sunnyvale gave way to the community of tens of thousands of aerospace workers who put in their day at Lockheed, the Mid-Peninsula's largest employer, or the flock of smaller firms that surrounded it. With the Cold War in the background and the Russian missile and space "threat" in the foreground, money flowed fast and freely into the Bay Area. The circle of R&D-oriented firms filled in, with the Stanford Industrial Park growing steadily while other firms located in southern San Mateo County and the northern portion of Santa Clara County. Thousands and thousands of persons migrated to California to fill the new, higher-skill, higher-paying jobs. Between 1955 and 1963 Santa Clara County experienced a yearly increase in jobs and population of over 7 percent. The firms in the area and

subsidized by the lucrative military and space contracts which guaranteed profits—managed also to have much of their research subsidized as well: the government paid the University to do the desired research projects and equipped the labs. In the year 1958-59, the government gave Stanford six-and-a-half million dollars in contracts and overhead. That amount has since tripled, and the gain to the corporations and the university—or at least some departments of it—is great. Once again the public subsidy, given in the name of National Defense or the Space Race, ends up in private hands, for the benefit of the few.

The early sixties were the years of PACE, a drive by Stanford and the Ford Foundation to raise \$100 million to push Stanford "over the edge of greatness." In this decade, which began expecting a mild recession and ended anticipating another, Stanford prospered along with the rest of the area. The Medical School moved down from San Francisco on a site with the new Palo Alto-Stanford Hospital. Stanford won an intense competition with 125 other universities and towns for the Atomic Energy



the new population stimulated growth in other manufacturing industries, in housing construction, and in services such as banks and shopping centers.

Stanford was not standing still during this period. New buildings for research began to fill out the science and engineering side of Stanford's Quad. The number of faculty and graduate students increased throughout the university, but growth in engineering was most dramatic. As Terman was able to point out in 1965, "... Stanford with 1400 graduate students in engineering, is, after MIT, the largest producer of advanced engineering degrees in the country... This is of real significance in the research-oriented industries, whose success in the market place is a function of technological competence. On the average, the local companies have been able to recruit better brains than their competitors in other areas, and have in general been more successful as a result."

Thus industrial firms—which were already heavily

commission's linear Accelerator—a multi-million dollar research facility for which Stanford leased several thousand of its precious acres at no cost. The staff of the university grew accordingly, reaching over 8,000 persons by the end of the decade.

The Industrial Park had twenty-five tenants in 1961, with a total of 11,000 employees. The cluster of firms in Palo Alto's own industrial park and in the rest of the city grew even more rapidly. In the early sixties it was already clear that the Palo Alto-Stanford area was becoming the major employment center in the Mid-Peninsula.

The impact of this development on Palo Alto and the surrounding communities was profound. As Terman told a grateful Palo Alto Chamber of Commerce, "There was a time when unless you were connected with the university, or were a local merchant taking in your neighbor's wash, you had to commute to San Francisco to earn a living." Palo Alto-Stanford now had enough jobs not only for many

old residents of Palo Alto and several surrounding towns, but it caused thousands of persons to migrate into the area from other states. The structure of employment and the availability of jobs in the country drove many people to this area. This area's industries were currently the "growth industries"—they were the likely place for new jobs. Thus people who had lost jobs elsewhere, or whose own industries or towns were slowly dying, tore up their roots and moved West in the hope of something better.

The structure of the aerospace-electronics industry complicated this traditional chaotic aspect of our economic system: the jobs here generally required some training, if not extensive education and advanced degrees. Not everyone could work in the area. Higher paying jobs and the best housing went to educated whites at one end of the scale. At the other end were the marginal people in the newly transformed area: the blacks who had emigrated from the South or from earlier war-time employment in San Francisco and Oakland and the Mexican-Americans whose jobs on area farms had disappeared with the farms. These people and the badly educated whites were left to compete for the limited unskilled work and the more limited cheap housing. Throughout the fifties and sixties, the people of the area could only respond to forces beyond their control as the economy dictated where they would work and live—and for how much and how long.

Palo Alto and the surrounding hill towns became the plush, tranquil homes of the upper classes, a few minutes from work and the excellent schools and shopping facilities these people could afford. Less than a third of the people who worked in Palo Alto in 1960 lived there. The rest lived in less prosperous communities from San Jose to Daly City and across the Bay. New ghettos—created along class and race lines—formed throughout the area. The wealthy ghetto of Los Altos Hills, the poor and heavily black ghetto of East Palo Alto typified the split. The institutional racism of the Mid-Peninsula's development remained rigid throughout the Civil Rights movement of the sixties. In 1968, Stanford University belatedly announced that it would give preference to black and brown job applicants in an attempt to expand minority employment. But Stanford ironically had difficulty in finding minority people who could find housing within a reasonable distance of the university.

With the need for more and more workers to live farther and farther away, the Industrial Park employers and the Palo Alto city government pushed for the building of the Oregon Expressway to connect the Park to the Bayshore Freeway—and incidentally cut a wide swath through a heavily residential area. A strong campaign ensued, pitching the "residentialists" who wished to retain Palo Alto's small town character against the "commercialists" who saw the expressway as a necessary link in the further commercial and industrial development of Palo Alto. The issue went to the voters in 1962 and was decided in favor of the commercialists by a few hundred votes. These same groups fought again over a master plan for Palo Alto which set policy guidelines for the transformation of downtown Palo

Alto into a mall, surrounded by high-rise offices and expressways. The residentialists won a temporary victory in 1962 when this plan was set aside. But the "commercialists" won control of the City Council in a special recall election in 1967, and the essentials of the old plan have now been approved by the new council, as the Palo Alto Downtown Plan.

(Vietnam Arrives and History is just about Through.)

— We have seen that the history of Mid-Peninsula development is largely the history of America at war. Vietnam is no exception. This latest conflict began to escalate at about the time that the post-Sputnik spurt of growth and economic health was giving way to another recession. The exotic technology and research purchased by the Defense Department brought yet another boost to the Mid-Peninsula R&D economy, propelling the area's expansion into the new decade of the seventies.

Along with narrow economic gains, the war brought intense domestic conflict. Early teach-ins about the war on college campuses gave way to protest demonstrations. But the war continued to escalate. As students and others sought to understand the reason for our involvement in Vietnam, the Cold War myth of American defense of "freedom" was shattered by accounts of the tyrannical government of South Vietnam. The argument was advanced that America fought in Asia not to free it, but to control it for its own economic interests. If there was a military-industrial complex, it was the industrial side that was calling the shots, at home and abroad. This analysis of American foreign policy began to spread on college campuses. A large and active student movement—fueled by opposition to racism and imperialism—brought conflict to campuses throughout the country. The Mid-Peninsula, seat of a major portion of the war economy, did not escape the conflicts. Teach-ins and demonstrations against the war began at Stanford in 1965. Educational campaigns and demonstrations led to a series of sit-ins in the spring of 1969 aimed at controlling the war research of Stanford and SRI and to directing the university's research toward the country's vast social problems. The growing number of blacks and Mexican-Americans at Stanford pushed in the wake of Martin Luther King's assassination for increased minority admissions and a program of study that would meet their needs.

It was not only draft-age students and blacks who were beginning to resist war and racism. The prosperity which came with the war soon overheated into inflation, bringing higher taxes and finally the threat of a recession. Unrest and militancy in the form of wildcat strikes and strong union demands on wages and working conditions began to sweep the labor movement. Radical new organizing began in previously unorganized sectors of the work force, and black caucuses began to form in white-dominated unions.

At Stanford, the unorganized university employees formed organizing committees of the Union of Stanford Employees and the Teamsters. A growing number of students left the campuses and took jobs in surrounding industries as workers instead of employees.

Amid growing dissent, the Mid-Peninsula discovered that industrial development had brought harsh social problems and visible decay to the environment. The Industrial Park had expanded to sixty firms with over 19,000 employees. Stanford built several new science and engineering buildings in the late sixties, bringing in still more workers. The housing crisis worsened in the area, and bigger highways were put through to handle the expanding commuter traffic. Route 280, the Junipero Serra Freeway, was cut through the foothills to help workers travel more easily from farther away to their jobs in the Mid-Peninsula. Despite protests which are reminiscent of the Oregon Expressway fight earlier in the decade, the Willow Expressway—linking the East Bay to 280 and providing easy access to downtown Palo Alto and the industry along Sand Hill Road—has been approved.

The rapid development of Stanford lands and downtown Palo Alto shows little sign of abating. But opposition is growing from many quarters. The expansion of the Industrial Park into Coyote Hill and recently the

Dillingham Corporation's Palo Alto Square project on Stanford land have encountered opposition from persons concerned with the effect of further development on ecology and the housing market. Housing groups in Palo Alto fought to have the Corporation Yard site used for low-income housing, and lost. People in the area where Palo Alto's Medical Research Foundation Hospital may be built are fighting the destruction of their low-income neighborhood. Mexican-Americans in Mountain View have banded together to demand housing to replace their homes which were destroyed by a new expressway.

But the men who make the decisions in the Mid-Peninsula continue to build. The new Palo Alto Civic Center is testimony to plans to make this area a major office and financial center. Palo Alto's future growth appears to be linked to the needs of West Coast-based corporations that are planning to expand business in the Asian markets which have been defended in the Vietnam War.

The nature of the social chaos we have created by our rapid and unplanned development at home and abroad has only begun to be clear in this decade. The remaining sections of this pamphlet are an attempt to examine some of the current problems more closely and to suggest how our future development can benefit the many, not the few.

