Peninsula at War!
San Mateo County’s World War II Legacy, Part II
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Coming soon in La Peninsula, The Aftermath of World War II.

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Cover: Building a concrete ship at Belair Shipyards in South San Francisco, c. 1943.
They came by the busload. People of Japanese ancestry, dressed in their best clothes, arrived at what had been the Tanforan Racetrack in San Bruno, California. Designated the Tanforan Assembly Center in April 1942, it became the temporary home of 7,816 people of Japanese descent, many of them American citizens. Most of its population came from San Francisco, the East Bay, and the Peninsula – including 891 from San Mateo County.

From the day President Franklin D. Roosevelt signed Executive Order 9066 on February 19, which essentially permitted the U.S. Army to remove some 110,000 people of Japanese ancestry from the West Coast, there was not enough time to build facilities needed to incarcerate them. As a temporary measure, the Wartime Civil Control Administration (WCCA) – a civilian branch of the army – set up fifteen assembly and detention centers, twelve of them in California.¹

Four factors determined site selection: (1) adaptable pre-existing facilities suitable for shelter and community services; (2) immediate availability of power, light, and water; (3) access to road and rail services; and (4) space within the enclosure for recreation and other activities. Based on these criteria, the WCCA expropriated primarily racetracks and fairgrounds.²

The U.S. Army claimed that having the assembly centers so “close to home” – the army’s own words – yielded several advantages for those who would be held there. First, they could settle last-minute financial and property matters. Second, they faced only minimal travel. And third, they could accustom themselves to group life in a familiar climate.

Tanforan became the second largest assembly center in population, after Santa Anita in Southern California. A shopping center today, Tanforan is located in San Bruno on El Camino Real.

Buses carrying Japanese and Japanese Americans began rolling into Tanforan in late April 1942. As the buses pulled up to the racetrack, barbed wire, watchtowers, and armed guards greeted the passengers. At the entrance, they underwent an induction process that included registering all family members and undergoing searches for contraband items such as weapons and liquor. After the search, each person was subjected to a medical examination.

For many, one of the most dehumanizing parts of the experience concerned housing assignments. WCCA policy allotted a space of two hundred square feet per couple, in dimensions of ten-by-twenty feet. In practice, however, the general rule of thumb for the assembly
centers was that eight-person families were placed in twenty-by-twenty-foot rooms, six people in twelve-by-twenty-foot rooms, and four people in eight-by-twenty-foot rooms. At Tanforan, the newly constructed barracks had larger rooms; the older horse stables were smaller, measuring only nine-by-twenty feet. These confined spaces served as both sleeping and living areas for the six months people were housed involuntarily at the racetrack and stables.³

Families were kept together when possible, and bachelors – first assigned sleeping quarters among the general population – were later separated into the grandstand area where a makeshift dormitory housed hundreds of them, cot to cot.

Eventually, Tanforan had 180 buildings, twenty-six of them converted horse stalls. The living quarters were divided into “blocks,” each consisting of six hundred to eight hundred people. Each block had its own restroom facilities, washroom and, when possible, mess hall.⁴

Although some barracks had been hastily built in the center of the track, by the time prisoners began arriving, construction was still underway. For this reason, many families had to live in converted horse stalls: half had housed the horse and the other half, the tack and fodder. Tomoye “Tami” (Nozawa) Takahashi, who lived at Tanforan with her husband, father, sister, and sister-in-law, recalled, “Where one pedigreed horse was stalled, five adults…were assigned there.” Kimiye Ota, a young mother from San Mateo, said that, in her case, “The pail for feeding the horses was in the stall with the horse’s name. The name on the container was Ginger.” Although the stalls had been whitewashed prior to the arrival of their new human occupants, cleaning had been minimal. Hay, horsehair, and dung were embedded in the newly whitewashed walls.⁵

The stench of horse manure was overpowering. Over the years, manure had become encrusted on the floor and seeped between the floorboard cracks, collecting underneath the stables. Twenty-three-year old Redwood City native Yoneko (Inouye) Arimoto had a severe reaction. “The manure was coming out from the wood…I never knew anything like that before, like swollen mouth and swollen eyes when I got up.”⁶

Efforts to scrub the floor and walls with warm water and soap only made the smell worse. Some enterprising people covered the floors with cardboard or pieces of linoleum ripped out of the racetrack’s clubhouse in attempts to block out the odor from below. Twenty-two-year old Masako (Hanyu) Iwase who was a domestic worker when war broke out, remembered her mother collecting eucalyptus leaves to hang on the wall to try to mask the horse and manure odors.⁷

The barracks were different; though clean, they still had many drawbacks. They were flimsy and, as the unseasoned wood used in their construction shrank, cracks developed and let in the wind and cold air. Plus, the “apartments” had partitions that went up only three-quarters of the way rather than all the way to the ceiling. As a result, there was no privacy; people could hear each other twenty-four hours a day – intimate conversations, domestic quarrels, and crying babies.

Those now forced to stay at Tanforan for an uncertain
length of time set out to make their living quarters as comfortable as they could. General DeWitt’s final report on the removal of Japanese from the West Coast indicated that each “apartment” was furnished with army steel cots, blankets, pillows, and mattresses. In fact, Tanforan prisoners received cots and little else. For mattresses, they were given canvas bags of ticking and told to go to the hay pile to fill them up. Yon Kawakita, who was eighteen when he went to Tanforan, remembered, “We used to shove [the hay] in and take them back. And then, after the first night, you had to take it back and get some more because it got so patted down.” Many people still remember how the hay poked out of the ticking, jabbed them and made noise with every movement. For those with allergies, this signaled the beginning of runny noses and watery eyes that lasted for months.  

The earliest arrivals found that the communal washrooms, laundry rooms, and latrines had not yet been completed, and that the grandstand had the only functioning toilets. People who lived farther away had to allow time both for the walk and the wait in line. Those who arrived at Tanforan during the rainy days of April had to tromp through ankle-deep mud. Most people had not brought boots and thus had difficulty walking through the sucking mud. Drainage was poor; the odor of sewage and manure constantly filled the air. Everything was dirty.

In the beginning, all meals for the thousands of people were served in one big mess hall on the ground floor of the grandstand. People had to bring their own eating utensils and stand in line with more than seventy-eight hundred other people also waiting to get their food, cafeteria-style. Shazie (Yamaguchi) Tabata, a young mother, still has not forgotten what it was like. “Standing in line for food. That was tragic for me, most tragic. Holding out your plate to be filled, and they actually threw it at us, you know. We didn’t like that,” she said.

Many complained about the food. Prisoners themselves handled preparation, but many did not have the experience to cook for the masses. In his memoirs, George Fukui, a cook’s helper, wrote, “My first job was to learn to cook huge quantities of rice in twenty-gallon galvanized circular wash tubs with makeshift wooden lids. It’s amazing that we could cook rice just as we did at home in large quantities in those makeshift pots.” In the beginning, the kitchens ran out of food before everyone could be fed. The daily food allowance was fifty cents a day per person, but the Tanforan Assembly Center administration spent an average of only thirty-seven cents per person. The basic army rations reflected no sensitivity to the dietary preferences of the elderly Japanese. People who lived there remember being fed tripe, liver, beans, sauerkraut, canned luncheon meat, and canned sausages.

Kei Nakano, who was living at the Horgan Ranch in Redwood City before he was removed to Tanforan, could not forget his first assembly center meal. “We lined up at the Grand Mess Hall over there, and we had the JELL-O, the hardest JELL-O you can ever have, and the Vienna sausage and some other stuff we
the rules, two of them served meals family style instead of cafeteria style.

Personal hygiene took place in military-style latrines with communal sinks, showers, and half-walls to separate the door-less toilets. For the culturally modest Japanese, it was the ultimate offense.

Hot water was often at a premium because of the sheer demand and the unreliability of the boilers that heated the water. Many took to showering and bathing late at night when there was less demand for hot water and more privacy. New parents often ran into each other in the laundry room in the wee hours of the mornings as they took care of family washing needs. Mitsuye (Yamashita) Hirotsuka, the mother of three children, had to take extra steps to do her laundry. “Our laundry didn't have any hot water, so I had to walk clear over to the other side [of Tanforan] by crawling under the racetrack fencing. I went to launder every morning at four o'clock and would meet up with Dave Tatsuno, who was also doing diapers because he had a baby. The two Okada brothers saw me crawling through the fence, so they cut the board so I wouldn't have such a hard time. There was no laundry line, so we had to make our own.”

In dealing with their status as prisoners, most of those in Tanforan adopted the attitude of shikataganai, an often-used expression meaning, “it can’t be helped.” It embodied the Japanese cultural trait of making the best of a bad situation. They were resourceful in finding ways to make their rooms more habitable. No woodpile was safe; assembly center carpenters who left their work in the evening returned in the morning to find their materials depleted. People used the lumber to make shelves, tables and chairs.

To cook and provide heat, some people brought electric hot plates into their barracks. Unfortunately, this practice often overloaded the already-stressed electrical circuits, and blown fuses kept recurring.

As the new barracks in the infield were completed, inmates began to give the roads familiar names such as “Alameda Avenue,” “Berkeley Way,” and “San

Lining up for meal time, 1942. Photo by Dorothea Lange. Courtesy National Archives and Records Administration.

couldn’t eat. I remember the JELL-O. We could throw it on the floor, and it would bounce back and make faces at you.”

The meal routine, along with other contributing factors, affected the solidity of the family. In the past, families had eaten meals together at the kitchen or dining room table. Many parents initially insisted their families continue this tradition. Kei and Jim Hiroshi Nakano’s parents were in this group. “There were eight of us. We actually had a table, and we all sat with our family,” said Kei Nakano. “The thought at the time was to try and keep the family unit intact as much as possible and try to simulate a family environment as much as possible.” Some mothers went as far as waiting in line and bringing meals to their rooms back at the barracks. Tanforan’s mess hall meals, though, did little to encourage family togetherness. As time went on, many parents found it easier just to allow their children to eat with friends.

The food situation improved weeks later after the first food manager was replaced. Later, other mess halls in different parts of Tanforan opened up and, in defiance of
Francisco Avenue.” Not knowing how long they would be at Tanforan, people also set to work beautifying their small spaces and landscaping; organizing recreational programs and sports teams; starting classes for children and adults; and setting up a library, dental clinic, and medical clinic.

Slowly, Tanforan was becoming “home.”

The medical clinic was a barrack with no running water and with cots lined up along the walls. Even essentials, such as urinals or bedpans, were missing, and the only medications available had been brought in by Japanese American doctors incarcerated in Tanforan. Dr. Norton Benner, a San Mateo physician, recalled, “They were tossed into camp, and I remember my dad [Dr. Alan Benner] coming home and saying, ‘Gee whiz, they didn’t even give them any medical stuff to take. They didn’t even give them pencils and papers to write down their records of the people they were taking care of!’ So my dad took pencils, and my mother took up pens and papers and whatever else they needed in Tanforan.”

Childbirth took place in the clinic, with laboring women receiving little comfort and no privacy. The first baby born at Tanforan was seven-and-a-half pound Judy Naruo, born to Michio Naruo, arriving Monday, May 11, 1942. Later, due to red tape, a premature infant died before he could be transferred to the nearby county hospital. During the nearly six months that Tanforan operated as an assembly center, sixty-four babies were born and twenty-two people died.

Despite the lack of privacy and the oppressive setting, romance did bloom and marriage followed. Newlyweds received special permission and escorts to leave the compound and obtain marriage licenses, but they had to return to Tanforan as quickly as possible. Wedding celebrations were usually low-key affairs with very few refreshments and fellow inmate guests unable to give the kind of lavish gifts they might have in the past. Honeymoons took place in stables, surrounded by the odor of horse manure and with the knowledge that family members were just on the other side of the partition.

The Japanese American people realized that so much idle time among the prisoners could become a problem, so they organized social activities. Between meals, Tanforan’s mess halls eventually served as recreation halls where people came to watch movies, dance, and do arts and crafts.

East Bay resident Sachi Kajiwara, who became a recreation hall worker, recalled how the young girls in her care decorated the hall for a July 4 dance. “My seven- to ten-year old girls cut strips of newspaper and used pieces of crayons we got in camp to make paper chains all round in the room in the rec hall. It was very ironic that we were celebrating the Independence Day when we were behind the barbed wire fences.”

Organized religion offered another activity for Tanforan inmates. Government policy regarding religious worship during incarceration permitted Japanese prisoners “to promote religious services within the various centers and to request such Caucasian assistance for coordination of religious activities as might be necessary.” The government
prohibited practice of the Shinto religion, however, because officials linked it to emperor worship, and also forbade the use of the Japanese language during services “except where the use of English prevented the congregation from comprehending the service.”

Religious devotion was no shield against incarceration, so a number of ministers were imprisoned in Tanforan along with members of their congregations. On April 9, 1942, Buddhists gathered in a mess hall to hold their first service behind barbed wire, conducted by Bishop Ryotai Matsukage, the titular head of the church. Protestant ministers at the assembly center included the Reverends Taro Goto, Isao Tanaka, John Yamashita, Masamoto Nishimura, Eiji Kawamorita, Howard Toriumi, Joseph Tsukamoto, Norio Ozaki, Jiryu Fujii, Eihi Suyehiro, Shigeo Shimada; and seminary students George Aki and Sakae Hayakawa. At Tanforan, these men formed the Ministerial Association, which organized joint worship services in Japanese and English, Bible study groups, and prayer meetings. Tanforan’s Sunday religious schedule included Protestant, Catholic, Buddhist, and Seventh Day Adventist services.

Originally there was no provision for education in the assembly centers since these sites were meant to be temporary and most of the inmates arrived so close to the end of the school year. Because there were so few activities for the young people, who comprised nearly half of Tanforan’s population of approximately seventy-eight hundred, they had a lot of idle time on their hands. School seemed a good solution. At first, school was a haphazard arrangement. Students met by grade in various areas of the grandstand. Without books or supplies and only a few credentialed teachers, classes were mostly in lecture format. Those who were college educated and wanted to teach ran the program. The tenuous nature of the incarceration at Tanforan did not help with student motivation. Older students, in particular, did not see the purpose in studying, completing assignments, or taking tests when their futures were so uncertain.

San Mateo High School senior Yon Kawakita, forced to leave San Mateo High School just one month before graduating, had a different experience. His teachers came to Tanforan to visit him and other students and gave them assignments to prepare for final exams, which they later administered. Kawakita remembered the teachers returned a few weeks later to hold a graduation exercise. “It was quite fancy. I think there were about six of us, and I was a member of the school band, so the school band teacher Eugene Brose was there with a small group of band members, and they played Pomp and Circumstance and gave us a diploma. And it was quite nice.”

Even adults took advantage of their leisure time to take in some educational classes. For many Issei, the first generation from Japan, imprisonment at Tanforan was the first time they did not have work from sunup to sundown to eke out a living. Many of the older people used this time to improve their English, study American history, and participate in arts and crafts activities.

Tanforan Assembly Center became well known for the quality of its art classes, which were taught by a prestigious faculty of artists, among them University
of California, Berkeley, art professor Chiura Obata; Matsusaburo “George” Hibi and his wife Hisako, both painters who had been living in Hayward, California, when they were forced into Tanforan; and Miné Okubo, who preserved her incarceration experiences via text and illustrations in her book, *Citizen 13660*. Out of the despair and imprisonment they experienced during World War II, they still managed to see beauty and create art.20

Those with green thumbs used their talents to plant victory gardens and to landscape the area surrounding a lake created by prisoners. Author Miné Okubo wrote, “On August 2, North Lake was formally opened. It had been transformed from a mere wet spot in the Tanforan scenery into a miniature aquatic park, complete with bridge, promenade, and islands. The lake was a great joy to the residents and presented new material for the artists. In the morning sunlight and at sunset it added a great beauty to the bleak barracks.”21

One of the more pleasant memories shared by nearly everyone at Tanforan is of shows presented at the grandstand, where ready-made seating made it an ideal location to stage ceremonies and shows. Many recalled the musical performances, especially that of a young Goro Suzuki, who later came to be known as actor Jack Soo in the musical *Flower Drum Song* and the television show *Barney Miller*.

Those of dating age attended dances held various recreation halls throughout Tanforan and danced to the music of the 1930s and the big band sounds of the 1940s. Some young men such as Yon Kawakita, acquired instruments during their time at Tanforan and formed a band that provided live music at dances. A popular-and-ironic-favorite tune was, *Don’t Fence Me In*. More one-on-one social interaction was difficult, however, as Yoshio “Yo” Kasai recalled, “There was no privacy, and if you wanted to go visit a young girl, you had to do the visiting during the day. If you want any privacy, when the mother and the father and everybody else is out of the house, you have to go sneaking over there. It was not easy to go visiting and have any kind of semblance of privacy.”22

Although the Japanese and Japanese Americans worked hard to make incarcerated life as bearable and as normal as possible, they had constant reminders of their status. Jim Hiroshi Nakano, a clean-up crew member, said, “We used to walk along the fence and clean up the place, and I’ll never forget the feeling we had. The fence was right alongside the (sic) El Camino Real. The cars and buses are going back and forth and a fifteen-foot fence...We are in the inside, and the other people are on the outside. That’s when you really felt like prisoners. Because the guards are patrolling, walking back and forth, and as soon as we get close to the fence and put our fingers on the fence to look outside, they say, ‘Get back, get back.’”23

Outsiders granted permission to visit Tanforan were treated much like those at a prison. After they registered, guards searched them before allowing them to go to a special meeting room at the grandstand to chat across tables with inmates. Armed guards patrolled the area the whole time.

Those incarcerated could only shop for clothing and
domestic goods via mail order catalogues or through friends. They often asked people from the outside to bring this or that item during their next visit.

The prisoners quickly began to find out how vulnerable they still were outside of Tanforan’s barbed wire fence. Dave Tatsuno, whose family owned the Nichi Bei Bussan store in San Francisco, was able to secure a pass to leave Tanforan under escort and check on his property and the house he had rented out to a Caucasian family. His unannounced visit resulted in a surprise to both his renters and himself. They had broken into locked storage rooms and had helped themselves to Tatsuno family possessions that had been put away for safekeeping. Sachi Kajiwara’s parents, both storeowners, found themselves being sued by the building owner when their imprisonment forced them to break their lease.24

Counterbalancing those experiences were stories of many people who guarded and preserved the property and possessions of their Japanese friends during the years of incarceration. At Horgan Ranch in Redwood City, members of the flower-growing Mori and Nakano families remembered fondly how formerly employed Filipino workers took good care of their homes during their absence.25

At Tanforan, military police handled external security. They patrolled the perimeter and monitored the entrances and exits. Caucasian civilians – many of them deputized to handle lawbreakers – took charge of internal security. They performed constant patrols, twice-daily roll calls, and inspections for contraband articles—which included Japanese language Bibles, flashlights, short-wave radios, alcohol, and potential weapons (such as screwdrivers, knives, scissors, chisels, and saws).

Morale became a big problem for the prisoners, especially among the men who, prior to incarceration at Tanforan, had been breadwinners and heads of their households; many of them were near the high point of their lives and careers. While many of the women continued to care for the children and domestic matters, the men found themselves idle and purposeless. For both genders, at any given time, one could find them playing traditional Japanese strategy games such as go or shogi to pass the time.

The existence of the family unit was at risk. In addition to mess hall-style group meals, the lack of structure and difficulty in adapting to a new lifestyle contributed to reduced parental involvement in their children’s lives during the first few weeks of Tanforan incarceration. Since there was no need for concern regarding traffic and other safety issues, youngsters spent all day playing with each other, exploring their new environment with little adult or parental supervision.

For many adults, work became the saving grace. Every adult was given the opportunity to work, and the survival of Tanforan depended upon the labor of the cooks, dishwashers, latrine cleaners, doctors, nurses, and teachers. Initially, people worked on a voluntary basis, but soon they began to get paid for their work. Pay ranged from eight dollars a month for unskilled laborers, such as dishwashers, cook’s helpers, or junior clerks; to twelve dollars for skilled positions including...
In late summer 1942, news began circulating of plans to move the Tanforan prisoners to permanent confinement camps. The official closing of Tanforan that fall was preceded by two camp-wide inspections, one conducted by WCCA authorities looking for contraband and the other conducted by the U.S. Army with an armed guard posted at each section during the search. Finally, those incarcerated at Tanforan received word to pack up and prepare to move out. There was still no word about their destination, but inmates nevertheless hurriedly packed and crated their possessions for wherever their next stop would be.

The first people left Tanforan on September 9, 1942, via train to the Central Utah Relocation Center, commonly called, “Topaz.” These first prisoners helped prepare the camp for the arrival of the others. Word trickled back to the others in Tanforan about what to expect of Topaz life, including dust storms, scorpions, and lizards. Tanforan gradually emptied as its prisoners were sent in waves to Topaz.

The last people left Tanforan Assembly Center on October 13, 1942 – 169 days after the first prisoners had arrived. “Leaving Tanforan on the train as we approached San Mateo, we weren’t allowed to pull that curtain,” remembered Michiko Mukai, a San Mateo native who was six when the war broke out. “But we peeked, and we saw our house, and it was so good to see our house. It wasn’t our house, because we rented it, but still it was home to us.”

The reality of self-governance behind barbed wire was short-lived. At the end of May 1942, a WCCA memo ended any real power council members might have had when it mandated that they serve strictly in an advisory capacity and offer opinions on fairly innocuous topics, such as recreation, sanitation, and discipline.

One of the points of contention between the imposed Tanforan administration and the council was the Tanforan Totalizer, a newspaper, that the inmates wrote and edited. The Japanese Americans intended it to be a real newspaper that provided a forum for the prisoners to discuss issues. Administration officials, however, wanted it to be a house organ for the government, so they censored it from time to time. Tomoye “Tami” (Nozawa) Takahashi, whose husband Henri helped start up the Tanforan Totalizer, recalled it was mimeographed legal-size sheets that were distributed one newspaper to a unit. “The only things that we could print were births and deaths, reports of illnesses, meetings of church groups and hobby groups and new rules and regulations, results of elections, like we would elect a leader for one section of the shacks. Just things of that sort.”

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Editor’s Note

Building a Community: The Story of Japanese Americans in San Mateo County was published by the San Mateo Chapter JACL in 2003. In addition to the chapter on Tanforan excerpted here, the book includes chapters on the immediate reaction to the attack on Pearl Harbor on December 7, 1941, life at Topaz and the post-war years.
Wartime Relocation Authority (WRA) figures show more than 110,000 people were forcibly evacuated from the West Coast and about 120,000 people were detained in designated government “relocation centers.” War Relocation Authority Publication, May 1943, Council of Churches, Seattle, Box 15, Manuscripts and University Archives, University of Washington Libraries. Also, General J. L. DeWitt, U.S. Department of War, Final Report Japanese Evacuation from the West Coast 1942, Headquarters Western Defense Command and Fourth Army, Office of the Commanding General, Presidio of San Francisco, CA (Washington, D.C.: Government Printing Office, 1943), VIII.

DeWitt, Final Report, 151.

DeWitt, Final Report, 186.


George M. Fukui, unpublished memoir, June 4, 1997, 8; and DeWitt, Final Report, 186.


K. Nakano, interview by Ito.


DeWitt, Final Report, 211-212.

April 9, 1942, may be an incorrect date cited in this passage because Tanforan did not open until late April. San Mateo Buddhist Temple: 70th and 75th Anniversaries (Fresno, Calif.: Self-published by the San Mateo Buddhist Temple, circa 1986), unnumbered 24; and Lester E. Suzuki, Ministry in the Assembly and Relocation Centers of World War II (Berkeley, Calif.: Yardbird Pub. Co., 1979), 60-63.


Matsusaburo “George” Hibi, an immigrant from Japan, donated about fifty of his paintings to the Japanese American community. Hisako Hibi painted at least seventy works between 1942 and 1945 while she was incarcerated at Tanforan and Topaz.


Dave Tatsuno, interview by Dianne Fukami, San Jose, CA, February 5, 1995; S. Kajiwara, interview by Fukami.

J. Nakano, interview by Ito; and K. Nakano, interview by Ito.

DeWitt, Final Report, 205.

See Taylor, Jewel of the Desert, 73. Similar governing systems were set up at other assembly centers.

Taylor, Jewel of the Desert, 79.

T. Takahashi, interview by yamada. A “totalizer” at a racetrack is a board that shows race results.

Beginnings

“December 7, 1941, a date which will live in infamy.” Those fateful words of President Franklin D. Roosevelt plunged the United States into a world war and the Japanese communities in California, Oregon and Washington into chaos. Families and businesses had only a short time to arrange their lives for the upcoming imprisonment at internment camps in the far reaches of the nation.

The government had known for many years prior to Pearl Harbor that war between the United States and Japan was possible. By early 1940, the Military Intelligence Division (MID) of the government had been decrypting and translating Japanese diplomatic messages and, since there were very few messages, only a small group of translators were necessary. But by early 1941, the MID had to prepare for the upcoming conflict and needed to increase the number of translators as well as soldiers who could read and speak Japanese.

It was decided that if the Army faced the Japanese, it would need not just a dozen translators but hundreds or even thousands of translators and/or interrogators. In March 1941, the MID ordered that the Japanese-speaking soldiers in the ranks be identified. In a letter from the Far Eastern Branch, Office of Intelligence dated May 1941, it said, “In the event of a major emergency involving Japan, there will be a great demand for Japanese speaking men in intelligence units of many combatant troops and for certain duties under the War Department. It would appear desirable, therefore, to have readily available some record of this personnel, together with such information as to probable loyalty and ability as is obtainable.”

In April, Maj. Carlisle Dusenbury, a former language attache’ then in the Far East Branch, suggested using Nisei soldiers as linguists. Born in the United States to parents who were immigrants from Japan, “Some Nisei already spoke Japanese and would need training only in the military aspects of the language.” From July to October, 1941, 1,300 Nisei soldiers on the West Coast were interviewed. They were given books that were used by the Japanese Army as field service regulations and other books on applied tactics. In most cases, this complicated Japanese military terminology, heigo, could not be read by the Nisei soldiers. Judgement on their loyalty depended on whether any of a soldiers’ family still lived in Japan and interviews of friends and neighbors.

It was reported after the interviews and background checks that “only 40 men were sufficiently qualified linguistically to pursue a six month course in the Japanese language.” Of all the Nisei that were screened, only 3% could be rated “accomplished,” 4% “proficient” and 3% “fair.”

As tensions increased with Japan during 1941, the War Department Military Intelligence Division created an Intelligence School at the Presidio of San Francisco and 60 of the 1,300 Nisei who were interviewed made up the first class at the language school.

On the morning of December 7, five weeks had passed since classes began. When the students learned of the Pearl Harbor attack they all wondered how America would treat its Nisei soldiers. President Roosevelt signed Executive Order 9066 on February 19, 1942, which eventually forced all people of Japanese ancestry to be removed from the West Coast. At Crissy Field at the Presidio of San Francisco the students...
wondered how they could go on? They found the answer in the traditional phrase, Shikata ga nai (It cannot be helped). With quiet resolution they buckled down to their studies with intensity.

With the evacuation of the Japanese from the West Coast, the location of the school in San Francisco was untenable. New locations were scouted out and a visit was made to Minnesota Governor Harold Stassen. He was very cooperative, but his one Army base, Fort Snelling, was filled to capacity. He suggested a Civilian Conservation Corp near the small town of Savage, Minnesota.

The War Years

Because of their demonstrated loyalty, the Army felt that they could trust the Nisei soldier. This new attitude by the government led, in part, to the formation of an all Japanese unit. Thus was born the 442\textsuperscript{nd} Regimental Combat Team and the 100\textsuperscript{th} Infantry Battalion.

These combat units were trained and ultimately shipped over to the European theater as the Army felt that if they were sent to the Pacific they would be mistaken for the enemy. However, the Nisei that were trained in Japanese military jargon had to go to the Pacific.

Initially, the commanders in the Pacific were very reluctant to have the Nisei as part of their units, and the Nisei faced discrimination within the ranks. Promised promotions were not received, and Caucasian G.I.’s spewed racial epithets at the Nisei soldiers.

In actuality, the first Nisei translators were not in the Pacific but were assisting the code breakers in Washington, translating the communication of the Japanese Ambassador detailing the Nazi plans for defending the forthcoming Allied invasions. They also worked in New York as a part of the Manhattan Project monitoring Japanese attempts to devise their own atom bomb.

Once in the Pacific Theater, the Nisei translators and those interviewing the Japanese prisoners not only had to communicate to their officers the details of the interrogations but they also had to translate thousands of documents and maps that were found with the prisoners.

Once the Nisei soldiers demonstrated what they could do – when an interrogation disclosed an impending attack or a translation revealed enemy artillery positions – commanders quickly realized that the Nisei were their most valuable source of reliable intelligence on the front lines.

An Army veteran wrote in a California newspaper to protest the prejudice that the Japanese were facing back home: “We have gone to battle with loyal Americans of Japanese ancestry and they have acquitted themselves with honor and glory…We soldiers glory in the fact that these Japanese boys with us giving their full measure of devotion, while their brothers and sisters, in some cases, are in relocation camps.”
After the War: “The Occupation Forces”

The initial landings and formal surrender ceremony, on September 2, 1945, were followed by frantic activity as American troops poured into defeated Japan. Over the next several weeks ten divisions and six corps arrived. Each division and corps was accompanied by a team of *Nisei* linguists, who were needed everywhere at once. During the months of October, November and December, 1945, the acute need for trained linguists became clear to everyone. Requisitions for large numbers throughout the entire Pacific area were also received.

Unlike the occupation of Germany, in Japan the language barrier alone represented an effective bar to administration because the military government operated through established governmental mechanisms at all levels. Anthropologist Ruth Benedict opined in a strongly worded assertion of the cultural and linguistic gap: “The Japanese were the most alien enemy the United States had fought in an all-out struggle. In no other war with a major foe had it been necessary to take into account such exceedingly different habits of acting and thinking.” Now the U.S. Army needed the *Nisei* to help govern Japan in peace. Edwin O. Reischauer, later to be Ambassador to Japan, argued: “Such a unit might prove an invaluable asset in lessening the inevitable animosity of the Japanese populace for us and our troops. If liberal numbers of Japanese Americans were to be among the troops of occupation we may station in Japan or were to be among the units which receive the surrender of the Japanese armies, the bitterness of the defeat would be alleviated slightly and cooperation with the victor nations would seem more possible to the Japanese.”

The *Nisei* MIS were an important factor in achieving this unprecedented cooperation. They served as liaisons between military government officers and Japanese officials. They helped repatriate millions of Japanese servicemen from their overseas posts. They assisted with war crime investigations by translating Japanese officers’ testimony.

Reischauer also stated “Whatever the causes of this cooperativeness there can be no denying that it was the single most important factor in the history of the occupation, accounting in large part for the degree of success we had in Japan.”

Finally, the Emperor of Japan said to a young *Nisei* soldier, 1st Lt. Kan Tagami, “Your Japanese ability has truly made this government’s work much easier. The *Nisei* are a bridge across our two countries. Thank you very much.”

Conclusion

The accomplishments of the MIS *Nisei* remained little known after the war. While their brothers in the 442nd and 100th Battalion enjoyed public acclaim, the MIS boys remained true to their wartime pledge of secrecy. On the September 29, 1945, the War Department G-2 visited Fort Snelling for a graduation ceremony. His advice to the graduates was straightforward: “If you Japanese Americans are ever questioned as to your loyalty, don’t even bother to reply. The magnificent work of the graduates in the field has been seen by your fellow Americans. Their testimony to your gallant deeds under fire will speak so loudly that you need not answer.”

The boys took pride in their “gallant deeds under fire” and their service as a language bridge between America and Japan. Their ability to speak the language stemmed from their immigrant parents, long afternoons in after-school language classes, and, for some, from schooling in Japan. They learned from their instructors at Crissy Field, Camp Savage or Fort Snelling and then went out to prove their loyalty, courage, and skill on many battlefields. They served their country, brought honor to their families, and ultimately turned enemies into friends.

Information from:

Industries Support the War Effort

A Reichhold Chemical Corporation made paint, varnish and lacquer. In 1943, the company earned a U.S. Navy “E” award for Excellence in Production of war equipment. Courtesy South San Francisco Public Library Local History Collection.

B Workers at Bethlehem Steel in South San Francisco. By 1943, 10,000 workers were employed by Bethlehem Steel and other steelmakers. Courtesy Historical Society of South San Francisco.

C A crowd gathers at a ship launching at Western Pipe & Steel, August 16, 1945. Courtesy Historical Society of South San Francisco. For information on the company, see “Shipyards of South San Francisco” (pg. 28-29).
In 1932, Charles Litton opened Litton Engineering Laboratories in Redwood City. Relocated to San Carlos, the company created a radar tube so effective he was given awards of excellence from the Army and the Navy. Courtesy Litton Family.

In 1921, Tim Moseley started Dalmo Victor in San Francisco to manufacture simple electrical appliances. Moving to San Carlos during World War II, the company developed the first airborne radar antenna. Alexander Poniatoff worked for Dalmo Victor. In 1944, he established Ampex with Tim Moseley. The company manufactured airborne radar motors and generators for the Navy. Poniatoff (right) is shown with Ampex’s first recorder in 1948.

Based in San Bruno, Eimac manufactured transmission tubes for radar and other radio equipment. From Eimac News, Tenth Anniversary Edition, September 1944. The article “The Valley Before Silicon: San Bruno’s Eimac Tubes Turned It On” (pg. 18-27) highlights Eimac as an example of the importance of technology businesses both in supporting the war effort and to the development of the area.

During World War II, people were encouraged to support the war effort by working in local industries. In South San Francisco, steel and chemical factories provided material to two shipyards. Additionally, San Mateo County had a variety of businesses that supported the war effort with new technologies, especially those related to radar.
The Valley Before Silicon:
San Bruno’s Eimac Tubes Turned It On
by Don Shoecraft

Two scientifically-minded young men with an innovative idea, rejected by established manufacturers, quit their jobs, scraped together money to start up a business in a tiny shop, met with immediate success and within two years transformed the technology of their field.

To staff a suddenly expanding company they hand picked employees who shared their enthusiasms, inventing novel perks to keep them happy. Employees set their own wages and earned bonuses out of company profits. They had access to free medical clinics and free health care, to kitchens and cafeterias built into the shop, participated in diverse free recreation programs in archery, golf, baseball, bowling and many other sports. After shifts there were dances and company parties. Employees even had their own newspaper.¹

Within ten years company revenue was in the millions with more than 3,800 employees working three shifts a day in shops in two states. When the company recapitalized, employees got 20 percent of stock.²

The entrepreneurs were John “Jack” McCullough and William “Bill” Eitel, their company Eimac, the company birthplace San Bruno, the year 1934.

Their would be the archetypical Silicon Valley success story and would move the valley boundary far north out of Sunnyvale and Santa Clara to San Bruno were it not for the fact that their products — vacuum tubes — were not silicon based. These tubes for more than 80 years have been and remain vital technology for many industries, from the military to aviation to scientific research. Some of their later cousins are still in production by Eimac Products, part of the Microwave Power Products Division of Communications & Power Industries.

Eitel and McCullough were cutting edge for their time, sharing ideas and technology with other well-known titans of silicon-based electronics such as Charles Litton, Sr., David Packard and others.³

They were passionate radio amateurs as young men, Morse Code adepts, and tinkerers pushing the limits of small radio sets in the 1920s. Telegraph operators of the 1800s called non-proficient amateurs who broke into their commercial wire transmissions “plugs” and “hams.”⁴ While passionate radio amateurs inherited the name, “ham” lost the negative connotation of an earlier era. In current vernacular, they could be considered

“disruptors.” They are enthusiasts whose skills and knowledge, won by trial and error, advance a field of endeavor, often to the detriment of the established order. Amateur radio was more than a hobby; both men maintained ham licenses throughout their lives. They rarely allowed publication of their names without their radio call signs, Eitel's W6UF and McCullough's W6CHE.

Northern California swarmed with amateur radio enthusiasts in the 1920s. Ten percent of all the hams in the country at the time lived in San Francisco, most organized into clubs. Eitel and McCullough belonged to several, the San Francisco Radio Club, the San Mateo Radio Club and the Santa Clara County Amateur Radio Club, the largest of them all, which Eitel at one time served as president. Amateur radio was so important to them that they recruited fellow club members when they went into business a few years later. Six of their first seven employees were hams; only the seventh, Jerry Manly, was not, but his technological expertise was not a job requirement. Manly was a window washer hired to unpack glass tubes.

The Santa Clara club was noted in the ham brotherhood for a 1926 stunt in which a team of five ‘wild men’ packed a complete ham radio station to the Lick Observatory atop Mt. Hamilton with the idea that the mountain top antenna would allow their radio waves to propagate across seas and continents. They were so successful they established a radio station at the observatory that maintained contact between Lick astronomers and colleagues in Chile for two years. One of the wild men was Claire Foster, new to the ham radio fraternity but famous for having built many of the tallest buildings in New York and Frank Lloyd Wright’s Imperial Hotel in Tokyo. He was made colonel in the U.S. military for having invented after World War I an efficient method of moving war materiel around the globe. Though he came to the ham radio world only in 1926, he was one of its most famous practitioners because of accomplishments like the Mt. Hamilton escapade. He also participated in the “Count Von Luckner” affair. The Count, a German sea raider who took up trans-oceanic adventure sailing in post-war retirement, sailed his catamaran around the world in voyages the popular press chronicled in great detail. The news dispatches were made possible by regular radio contacts from the ship at sea to ham operators around the world. One was Col. Foster, who chatted with the Count as he sailed through the Panama Canal en route to San Francisco. South San Francisco vacuum tube manufacturer Heintz & Kaufman built the radio gear they used.

Heintz & Kaufman (H&K) gear also was aboard aircraft competing in the 1927 Dole Air Race from Oakland to Hawaii, and even made it to polar ice sheets on exploratory expeditions. Hams like Bill Eitel were invested in the minute detail of the H&K tubes that made long-distance radio communication possible. When Col. Foster, also a member of the Santa Clara club, invited Eitel to his home in Carmel for a social visit, Eitel accepted, with an ulterior motive.

“He had the latest equipment built by Ralph Heintz,” Eitel said, “even some special things made for him by Heintz...I (was) anxious to see his station, U6HM, so we went down. I told him more than anything I wanted to go to work for Ralph Heintz, because I knew he knew Heintz well. He said, ‘Okay, I’ll talk to Ralph.’”

Actually, working for Heintz & Kaufman was Eitel’s second choice. He really wanted to work for Federal Telegraph Company of Palo Alto. There were a number of reasons for Eitel to pursue a job at Federal Telegraph. The company was where Lee De Forest invented the vacuum tube amplifier and oscillator, two tubes that made long-distance radio communication possible. But the only reason Eitel ever stated was his desire to work with Charles Vincent Litton, Sr. A San Francisco native and a fellow ham, Litton also worked at Federal Telegraph.

As a Stanford undergraduate Litton invented the glass-blowing lathe, making possible a revolution in vacuum tube manufacturing that enabled quality mass
production of electromagnetic devices at the heart of radio. Eventually, he came to hold more than 65 patents for an array of tools and milling machines for the electronics industry, some of which are still in use. In 1932, the 28 year-old Litton founded Litton Industries, Inc. in San Carlos to produce vacuum tubes. In the same period and at the request of Frederick Terman, widely credited together with William Shockley of being the father of Silicon Valley, Litton put together a tube research laboratory at Stanford University. One of his lab hires was David Packard, co-founder of Hewlett-Packard. Another was Cecil Howard Green, who went on to found Texas Instruments.

Eitel could have been known as a founding member of this pantheon of brilliant pioneers whose ideas are still helping build a technology-based society had he gotten the job at Federal Telegraph. He applied at Federal “15 times” but “could not get through.”

Col. Foster arranged an interview with Ralph Heintz and, at age 21, Eitel went to work for Heintz & Kaufman running the tube lab.¹²

Jack McCullough’s career could have been very different had the Great Depression not struck in 1929.

A short time before the crash he and his brother had inherited their father’s San Francisco auto dealership, but hard times killed the business. Also a ham and colleague with Eitel in the same radio clubs, McCullough decided to look for a job in that field, and found one in a radio service store in the West Portal area of San Francisco. Three months later the store closed. One of the only radio manufacturing businesses left in the area was Heintz & Kaufman. He decided if he wanted his work to coincide with his passion H&K was the best and closest option. He was hired to work for Bill Eitel.

What kept H&K going was not selling radio equipment to polar explorers or German sea captains. Its core client was Dollar Steamship Company — Dollar owned two-thirds of the tube company.¹³ H&K supplied the vacuum tubes in transmitters manufactured by Globe Wireless that allowed Dollar’s San Francisco headquarters to communicate with ships at sea. However, it was a problem that the tubes were based on low-frequency gear used by the U.S. Navy in World War I that didn’t reliably reach Dollar ships in Hong Kong and Shanghai.

The tube shop’s assignment was to make a more
efficient oscillating circuit based on an established design H&K used, but the patents for which were held by RCA, General Electric, Western Electric and others. This “radio monopoly,” as McCullough described it, “…absolutely refused” to allow H&K to produce a design based on their devices. “It was not a question of being subtle about it. They refused to give any of their products to their competitors.”

To get around the patent issues, H&K designed what it called a “Gammatron” tube. It was “a peculiar tube,” McCullough said, but they were excited about the job because they got it to work.14

The Depression, however, deepened. As orders waned, Heintz & Kaufman cut costs, ultimately reducing workforce from several hundred to just six. Then McCullough was cut. Then it was down to one: Eitel. When he rebelled at doing the work of dozens, H&K expanded the shop to two; McCullough was brought back.

While H&K focused on manufacturing Gammatron tubes for Dollar lines, ham operators — Eitel and McCullough among those devoted to the cause — continually tinkered with ways to boost the power of personal radio gear. A great burst of energy and innovation occurred in 1932 when the federal government rejected or voided many tube manufacturers’ patents, an action that also opened up new frequencies in the radio spectrum, frequencies that would require new tube and radio designs to access.

In response, Eitel and McCullough fabricated higher-power tubes for their personal sets — whether as part of their H&K duties the record does not show — and fellow hams that saw them began to buy them privately. The two felt that these tubes could be a viable business line. They decided H&K should develop it and proposed to make them for the company. Heintz & Kaufman said no. “We were shocked,” McCullough said. “It was the first time we ever thought about leaving H&K.”

Jobs were scarce. They swallowed their disappointment and went back to work, but bad feelings persisted. One night in 1934 during an evening bridge party with friends the resentment came out. There were cocktails and “we were feeling no pain,” McCullough recalled.15

“I let the word out that if I had some money I could go into business and I could make a killing. That was a little frothy at the time. One of the guys there said, ‘You can? How much do you think you’ll need?’ I remember going way back in my mind and thinking the biggest number I could think of and I said, ‘Oh, about $5,000.’”

The ‘guy,’ Bradshaw Harrison, a well-known San Bruno realtor, took him at his word. Enlisting a friend, Walter Preddy, to match his $1,250, Harrison put up $2,500. Eitel and McCullough came up with $1,250 each and Eimac was born on a handshake among four owners.

Heintz’ methods practically were a template for how Eitel and McCullough came to manage Eimac, but they had no clue how to start. Twenty-first century Silicon Valley technocrats have a name for it: startup paralysis. Perhaps too loyal to the end, the entrepreneurs decided they’d ask H&K to sell their tubes, a good strategy in view of the fact that they didn’t have a shop, machinery or market.

“We went to management and told them we wanted to make the tubes for them,” McCullough said. “It seems kind of funny now, but they fired us on the spot.” Ralph Heintz, ‘amused’ by their proposal, said a very Silicon-Valley-like admiration for innovation made it easy for him to let the pair go, though he let a certain paranoia over patent challenges hang over their heads. “They were immature at business…They could be forgiven, because they were highly successful after that. Very innovative and very, very industrious and they’re good friends of mine.”16

Years later Eitel claimed he still admired Ralph Heintz for the way he ran H&K. “His managers were free to make most decisions. Heintz became intensely involved in new products. He worked late into the night and came to work early in the morning. He was patient. I looked up to him as a second father. To me, he was one of the greatest men in the world.”17
Braced with the ardor of having been good at their jobs and fired for it, Eitel and McCullough searched for a shop and found a location next door to South San Francisco at 592 San Mateo Avenue in San Bruno. The location cannot be established beyond a doubt, but circumstantial evidence shows it may still exist as part of the building at 598 San Mateo Avenue. According to Pacific Telephone and Telegraph directories of the 1930s and 1940s, the address 598 San Mateo Avenue was around years before 592 San Mateo Avenue showed up in 1933. The 592 address did not stay around for more than a decade or two. Only one image of the location is available, published in 1984 by Eimac in a commemorative booklet celebrating its 50th year. The photo purporting to show the 1934 shop, however, was taken at least two years after Eimac had left the premises. It shows a storefront with a door and a display window on either side, the words “Quality Market” painted on one of the panes. According to Pacific Telephone’s San Bruno directories, Quality Market didn’t exist until 1937.

The front wall of 598 San Mateo Avenue shares with the Quality Market photo distinctive trim and Art Deco drapery moldings, although the door and windows are gone and a blank wall has filled in their spaces. The interior is a large warehouse-style room with a small office area, but is sectioned by a beam into a one-third, two-thirds space front to back, the smaller one about the size Eimac occupied.

Eimac opened for business November 12, 1934. Since the demand to which they had responded had come from amateur enthusiasts, the partners decided to sell the tubes they had tried to convince H&K to let them build for that market.

Friend Charles V. Litton helped assemble the shop. Without payment he turned over to Eitel the design specifications, drawings and castings of his glass lathe and helped fabricate tools and fixtures that pumped gases and air out of glass tubes and sealed them without damaging grids and electrodes. “It was a big deal,” McCullough said.

First hire on December 1, 1934, was Ronald Gordon (call sign W6AAZ), formerly of Heintz & Kaufman, a college-trained engineer and amateur well known to shortwave radio enthusiasts. All three worked in the shop 24 hours a day to assemble the first product: five tubes to take to a Fresno amateur convention. They were fairly certain they would be well received and did not record much surprise when the amateurs “doted” on the tubes. Eimac sold out the stock. “Life was beautiful,” McCullough said, “until somebody looked at the tube and said, ‘What’s that there?’ I said, ‘Oh, gee, that looks like a crack.’” All five were cracked. “It turned out in our production of five tubes we had five duds.”

They took them back, solved the problem, sent good tubes to five buyers and started production. Within a year they had a business line: tubes with output ranging from 50 to 1,500 watts suitable for amateurs and commercial users that performed better at lower cost than the competition’s. Sales grew consistently.

The Laboratory is responsible for the company’s principal vacuum tube developments. From Eimac News, Tenth Anniversary Edition, September 1944.
and the workforce expanded. New hires, all hams, were recruited from competitors or amateur clubs. For years afterward Eitel and McCullough acknowledged that much of the company’s success was due to these employees’ passion, creativity, willingness to do hard work over long hours, and skill. For their part the employees might have credited the Eimac culture of fun. “A good percentage were amateurs,” McCullough said. “They would have worked for pay or not. They enjoyed what they were doing, which is an important criteria for any successful company.”

The term “corporate culture” hadn’t been invented, but entrepreneurs like Eitel and McCullough were already creating its outline: hire motivated employees who loved what they were doing and make sure they have fun.

Gordon Howes (W6CEO) left Wunderlich Radio to become the second Eimac employee on Feb. 1, 1935. Howes was noted for trans-Pacific communication with the Philippines and Asia. By the end of 1936 Jerry Manley, Tom Hall, Rad Leonard, Jack James, George Caldwell, Elliot Sigourney and Len Hart had joined the shop and Ruth Duncan, Lola Greer and Evelyn Gutierrez ran the office. That crew sold 2,394 tubes in 1936. The $40,940 in revenue on those sales represents $710,862 in 2017 dollars. All products were transmitter tubes. Eimac did not produce its first radio receiver tube until almost 30 years later.

Sales begin to double in the first quarter of 1937. Eimac moved to a larger building at “San Bruno & San Mateo Avenues” according to the telephone directory and company letterhead. It was common practice at the time for locations at major intersections to be listed that way, very economical when Eimac expanded to a larger building — across the railroad tracks but still technically at the San Bruno/San Mateo avenue intersection — without having to update letterhead. Also in 1937 Bill Eitel moved into a residence down the street at 1055 San Mateo Avenue, a residence still standing at that address.

Two developments, one simple and one incredibly complex, fueled the company’s growth through the years prior to World War II.

First, in the late 1930s airlines updated radio transmitters and radar gear at airports and on airplanes. Tubes from major manufacturers were expensive and difficult to use. “Our tubes happened to be available and a lot less expensive. We ended up supplying all” airlines with 2,500-watt tubes, McCullough said. It was, he said, “a big break.”

The second is a lesson in how technological innovators become victims of their own success. As Eimac’s tubes became more powerful and expensive they had less application for individuals and more for commercial buyers — by 1940 more than 53 percent of sales went to other manufacturers, radio companies, suppliers of police radios, television stations and others, a five-fold increase in less than three years. More importantly, Eimac tubes had found their way to the military, a development Eitel and McCullough had cultivated at least since they opened for business.
in 1936. That year the Army’s Chief of Coast Artillery established “military characteristics” specifying an “aircraft detector” whose research and development was assigned to engineers at the Army Signal Corps’ Ft. Monmouth Laboratories. Physicist Maj. Harold A. Zahl, also a radio ham (6BHI), was lab director from 1931 to 1945. According to his account of Eimac’s role in “Radio Position Finding (RPF)” — what became known as radar — Eitel and McCullough connected with a “young genius” named Melvin Baller at the corps’ Fort Hancock Laboratory in Sandy Hook, New Jersey. One of Eimac’s most popular tubes was the 100T, which the lab renamed the 100-TL.

Eitel and McCullough were “frequent visitors” to Sandy Hook, Zahl wrote, “pockets bulging with variations of their 100-TL...As Baller made tests with each new batch of tubes, the visitor from San Bruno (either Jack or Bill) would take careful notes. Then, on the next visit, the substance of these notes would be translated into samples. During this quite informal procurement arrangement, I seem to recall that the Army was charged an off-the-shelf price of about $13 for each of the tubes delivered. With round-trip fare from California about $400, this obviously was not a high-paying venture of Eimac…but a good gamble.”

The gamble paid off in 1940 with an order for thousands of tubes from the Army Signal Corps and the Naval Research Laboratory and 10,000 more from Western Electric, a defense contractor. The Eimac 100T was given the military procurement designation VT-127, the radar in which it was installed the designation SCR-268. It was impossible for the 22 employees in the San Bruno plant to fill the order. It forced the second company expansion in six years, but this time it would not be a local expansion. Defense wanted this factory out of reach of submarine or air attack. The optimal site acceptable to the government for safety and to Eimac for accessibility by rail and plane was Salt Lake City, Utah. Eimac and the nation’s manufacturing sector had become captive to preparations for war, which finally came on December 7, 1941. People reacted to the “sneak attack” on the Pacific Fleet by Japanese aircraft carriers in varied ways. Eimac employees, aware of their importance to national defense, showed up to work the day after with long guns and pistols from home. At the shop they encountered machine guns in the corridors. “By God,” McCullough said, “we were not going down without a fight.”

They were disheartened to learn that Eimac tubes in radar sets had detected the invading Japanese fleet 132 miles from the Hawaiian Islands and operators alerted the officer on duty, but the officer misinterpreted the signal. Consequently, Japanese bombers devastated a sleeping and undefended Pearl Harbor and Ford Field.

With federal approval that month Bill Eitel took Gordon Howes to Salt Lake City, bought land and began to build a plant mirroring the San Bruno operation in layout, production methods and staff. Eight months later Salt Lake City production started up. Within a year Eimac had 3,600 employees, 1,800 in each plant, working 24 hours a day, seven days a week.
A large workforce didn’t prevent the founders from making sure employees were happy at work. Bill Eitel recalled consulting with Bill Hewlett to see how he and Dave Packard were doing it at HP, which led to the decision to disperse all profits after reserves to bonuses. Fifty years later, Bob Hardman still marveled that he received a bonus, though he was in military service at the time and hadn’t worked a minute in the plant.25

Eimac tubes were so vital to the war effort that Gen. Douglas MacArthur personally intervened when thousands of tubes turned up broken in shipment. Wharf loading docks were rare in the Pacific theatre of war, so boxes of materiel, including delicate tubes, simply were dumped overboard to float ashore. Glass tubes rarely survived the 40- to 50-foot fall. Eimac, which also received MacArthur’s cable pleading for help, had the solution ready when Zahl arrived in San Bruno to work on the problem — new grids with 96 percent platinum and 4 percent titanium content, much stronger than platinum grids. Eitel and McCullough also were working on a metal they thought would make the grid unbreakable and able to endure thousands of hours of use.

Pace of production of the VT-127 tube never slowed. “We bought quite a few of them,” Zahl wrote. “How many million, I’m not sure anybody really remembers — or wants to.” He estimated tube development and procurement during the war cost “about $200,000,000.” But the 100-T’s wartime success almost destroyed the company. Life expectancy of the first tubes was tens to hundreds of hours. Because Eimac improved its designs and methods continuously, by the end of the war some still worked after thousands of hours of use. However, the military kept buying on the basis of the original life expectancy. Consequently, military inventory ballooned, by how much no one knew. Jack McCullough said Eimac wartime sales were at least 3,500 tubes a day, $1 million worth a year, or more than $17 million in 2017 dollars.

Periodically, Zahl sent his deputy, Max Markell, to Washington to eyeball warehouse stocks, a crude accounting system but the only one the lab used. One day Markell reported “hardly any requisitions from the field — tubes must be running forever. Lexington has over 500,000 in stock and production lots are still coming in by the thousands every week…we have tubes to fight a 50-year war.” Overnight, all orders for what Zahl called “the noble tube” were cancelled.

Eimac responded by firing 1,000 workers at the Salt Lake City plant on 24 hour’s notice. Effects of the catastrophe were felt for years after the war ended in 1945. Hundreds of thousands of the tubes were dumped on the commercial market, where they sold for ten cents on the dollar or less. Sales dropped to near zero. The Salt Lake plant closed. Over time more than 90 percent of Eimac workers lost their jobs because of the great success of World War II sales.26

Fortunately, Eimac always had new ideas in development and retained a core staff of inventors looking out for the next thing, which in this case meant television. The company credited its survival to its new
television broadcasting tube, a ‘beam tetrode,’ and the development of television picture tubes. A new plant opened in Salt Lake City to manufacture them. At the same time Eimac began to develop the first of its “super power tubes,” the klystrons.

The klystron ties Eimac’s past — its connections to Charlie Litton and colleagues Russell and Sigurd Varian — with its future. Litton developed microwave tube technology during the war, work for which he was presented a presidential certificate of merit, using tools that allowed the Varian brothers to manufacture for sale a linear-beam vacuum tube, a klystron, that they had invented while at Stanford University, a tube that also helped advance radar. The Varians, Litton and Eitel-McCullough often collaborated, sharing technology and techniques in a way not often seen modern manufacturing. Varian Associates incorporated in 1948 with $22,000 in capital, enough to open a small plant in San Carlos. Edward Ginzton was a founding director. He and another Varian associate, Marvin Chodorow, simultaneously consulted with Eimac, teaching its engineers klystron theory and design.  

The klystron became one of history’s most ubiquitous electronic tubes. Of them all Eimac’s iteration had the most colorful origin. Its magnetron, the X626, at 10 feet 5 inches long for a time the world’s largest, was conceived over beer and peanuts at Artichoke Joe’s cardroom across the railroad tracks from the plant. With it Eimac became crucial supplier in dozens of fields, from television to aviation to medical x-ray to Cold War installations like the Distant Early Warning system to satellite communication to particle physics research to space exploration. For 10 years the two companies were convivial competitors, Eimac evolving in the lower-frequency electromagnetic spectrum, Varian in the higher. Eimac even opened a new plant in San Carlos in 1958, not far from Varian’s. By 1959, Varian was four times as large as Eimac with sales exceeding $20 million.

Two events set the stage for the companies’ decision to merge in 1965. Klystron sales were leveling off on both ends of the spectrum. And both Varian brothers had died, Russell due to a heart ailment in 1959 and Sigurd in a private plane crash in 1961.

“We realized we had to do something with the company,” Eitel said. “McCullough and I were not going to live forever. Whatever we did with it, we wanted to make sure it was bedded down pretty well before something happened to us like what happened to the Varian brothers.”

The merger went smoothly. Eimac became a division of Varian and Eimac’s top manager, Dick Orth, took over Varian’s Eimac tube division. Eimac continued its pioneering ways. As a Varian division, Eimac pushed development of the klystron to create its patented Klystrode, for which it won a 1989 Emmy Award for technological achievement.  

In 1995 Varian sold its Electron Device Business, of which Eimac was a part, to the private equity fund Leonard Green & Partners, L.P., which reorganized as Communications & Power Industries (CPI). CPI took for its headquarters Varian’s main facility in the Stanford Industrial Park in Palo Alto.

Eimac lives on in Stanford Park as a division of CPI, evolved from its beginnings but still in the tube business.
1 Program references are contained in various issues of the company publication titled *Eye Mac News* and printed on newsprint in the early 1940s and titled *Eimac News* and printed in booklet form subsequently through the 1960s.

2 *Eimac News*, 30 November 1945, no. 4: 1.


6 William Eitel, interview by Arthur Norberg, no date, courtesy of Don Preist, manuscript, SMCHA Archives.


8 Don Preist, *The Story of EIMAC and the Remarkable Men Who Made It*, typewritten manuscript, no date, SMCHA Archives.


10 Eitel interview.


12 Eitel interview.


14 McCullough interview.

15 Ibid.


18 50 Years of Excellence 1934-1984, pdf: 5, SMCHA Archives.

19 Site visit by author, August, 2016.


21 McCullough Interview.

22 Various issues of *Eimac News*.


25 McCullough interview.


During the World Wars, South San Francisco shipyards became an important part of the war efforts. In 1917, a contract obtained by Western Pipe and Steel Company led to the building of a shipyard capable of producing cargo ships. Two vessels were completed before the end of the war. By 1920, 18 had been built.

In 1940, Western Pipe & Steel once more went into full gear, building cargo ships for the United States Maritime Commission. Some of the earliest ships produced were intended for the Lend-Lease program with Britain. Because of the limited waterfront, the yard was designed to launch ships sideways into the narrow basin. Side launching was not an issue for smaller ships, but for the larger cargo ships, dangers included foundering and damage to the rudder. Fortunately, all the ships were launched safely.

In total, Western Pipe and Steel built 48 cargo ships during World War II that could be modified for different purposes. Some of the ships became auxiliary aircraft carriers that the British Navy used. Many became troop and attack transport ships for the United States Army and Navy. They served in the European and Pacific Theatres of the War, including D-Day and the Battle of Iwo Jima.

The construction of concrete ships and barges is a little known story of World War II.

Concrete ships were not a new invention of the 1940s. In 1917, Redwood City attracted worldwide attention at its port with the construction of the steamship *Faith*, the world’s first cement-hulled ocean-going vessel. Five thousand people attended the launch in 1918.

During World War II, engineers returned to concrete barges for two reasons: the great savings in the use of
precious steel and the speed with which these vessels could be built.

Barret and Hilp received an $18 million contract to build 26 of these barges. Meant to be towed by other ships, the lack of an engine gave them 25% more cargo capacity. As the *Pacific Marine Review* commented, “They might not be as beautiful as a yacht, but they’ll move a heap of freight, from where it is to where it’s not.”

In July 1942, the company started converting South San Francisco tideland into the Belair Shipyard. The *Burlingame Advance* proclaimed “70 Acres of Useless Tidelands Transformed” as blasting and digging occurred to build 6 construction basins. Dredging was completed out to the Bay to allow completed ships to pass through.

The barges were shaped by plywood forms built in sections. With the basic form laid out, reinforced steel was formed into the frame. The barges were made of special light-weight concrete – 30 pounds lighter per cubic foot than that used in World War I. To complete the barge, three pours of concrete were done approximately 10 days apart. After a pour was completed, some of the plywood forms were removed to be reused.

At Belair, workers were challenged to complete one barge every three weeks. Due to shortage of male workers, women were among the construction force doing jobs as strenuous as welding.

Twenty barges were built at the Belair Shipyard. One of these barges, the *Quartz*, was towed from base to base in the South Pacific, loading and unloading cargo to faster ships. At 365 feet long, the barges were designed to carry 5,000 tons of cargo and a crew of 10.

Shipbuilding in South San Francisco ended after the war. However, one can still see the remnants of San Mateo County’s war projects at South San Francisco and other locations.
Rosie the Riveter

A A resident of Burlingame, Dorothy Shay had her son-in-law teach her how to use a drill press and lathe after Pearl Harbor. She quit her job at a bakery and went to work at Dalmo Victor in San Carlos as a drill press operator. Her plant’s personnel manager entered her in a Miss Victory contest intended to interest women in war work. At age 48, Shay became Miss Victory of Northern California, 1942. She received a $1,000 war bond, a diamond solitaire ring and her first orchid. Courtesy of the Burlingame Historical Society, Kathy Graves Collection.

B Female welders in the Plate Department at Eimac tacked little parts together into cylindrical plates. Eimac first hired women production workers in 1941. By 1944, the Eimac News described the company as “a largely feminine organization, at least so far as the production departments are concerned.” From Eimac News, Tenth Anniversary Edition, September 1944.

C Dina Jenny Brosio worked in the tool shed at Belair Shipyard in 1943. Her shift was from 6 a.m. to 5 p.m. She later estimated that there were 60 to 70 women working in production and production support jobs at Belair at the height of productivity. Courtesy of the NPS, Rosie the Riveter/WWII Home Front National Historical Park. RORI 720a-1.

D Women welded steel decks at Belair Shipyard, c. 1943
Discover Peninsula at War! San Mateo County’s World War II Legacy, on exhibit at the San Mateo County History Museum (December 7, 2016 - February 4, 2019). Through artifacts, images and oral histories, the exhibit explores the contributions of local service people and highlight home front activities including:

- Civilian Defense in San Mateo County
- Industries such as Eimac, Dalmo Victor, and Western Pipe & Steel
- Japanese American Internment
- Military Training Centers in San Mateo County
- Rationing of Food and Supplies
- Salvage and War Bond Drives
- USO Centers and Events for Service Members
- Wartime Hospitals
- Victory Gardens

Letter to the Editor

The African American Great Migration [Volume xlv, No. 1] is wonderful to see. My family wouldn’t exactly fit in this since we were in San Mateo early, at the end of the 1800s.

I have one issue that might just be editorial. On page 13 it says that my grandmother, Mabelle, passed as White.

I’ve never heard my grandmother described in this way. It hasn’t been a complimentary thing for a Black person to say this about another Black person. In my opinion it would have been better if not more accurate to say that she was Black but could pass as white. I don’t think it was my grandmother's intention to pass or she wouldn’t have married Noah and had four Black sons of various hues.

Or, Mabelle was Black but could be perceived as white....

Oh how can we preserve our legacy if we’re not writing it? I don’t know who told you why Mabelle sat in front of the restaurant but everybody has their own interpretation. I’ve heard worse things said about my family.

It’s nice the section was described as Resilience and Activism.

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