With the discovery of gold in California in 1849 and its becoming a state of the Union in 1850, the die was cast for its ascendancy to become one of the most world-renowned areas for producing wines of superlative distinction. Several species of “wild” grapes existed in California, none of which were of any significance with regards to commercial wine production. It is believed that the introduction of Vitis vinifera grapes to California took place during the 18th and 19th centuries when the Mexican army and the Spanish missionaries started to move into California. Father Junipero Serra, born on the island of Majorca, Spain, was one of the first padres to enter California with the Mexican armies, and he is credited as the first missionary to plant vinifera grapes in California for making wine for mass. This grapevine, widely planted in California, was known as the Mission variety of Vitis vinifera.

The migrant gold miners, who came to California from other parts of the United States and Europe, were acquainted with European wines. When they became wealthy by prospecting for gold, they started to ask for good table wines from Europe. Such wines were not available on the West Coast due to transportation limitations. The railroads had not been built across America, and shipping such wines from Europe to California was prohibitively expensive or difficult.

Eventually, European immigrants began the cultivation of grapes in commercial vineyards for the production of wines. In the latter part of the 19th century, vineyards and wineries proliferated, and by 1900 a sizable grape and wine industry became established in California, mostly centered in the northern counties of Napa, Sonoma, and Mendocino as well as central and southern California. Demand for California wines increased to the point where many immigrants of Italian, French, and German origin dominated the grape and wine industries. The California legislature encouraged these activities and asked the University of California in the late 1800s to provide technical agricultural assistance for this new industry.

With the growth of the wine industry, demand for winemakers, wine technologists, and scientists increased significantly. Soon after the end of Prohibition, the University of California proceeded to increase their staff at the Department of Enology and Viticulture on the Davis campus by adding Harold Olmo and Maynard Amerine to assist Albert J. Winkler, who directed the department. On the Berkeley campus, George Marsh and Maynard Joslyn of the Department of Food Technology were also busy in the education of wine technologists and food scientists.

It was in the fall of 1950 when I, as a foreign student, enrolled at UC Davis to study enology at the world-famous Department of Viticulture and Enology. I was born and finished high school on the Mediterranean island of Cyprus. My family on my mother’s side were distillers producing brandy, ouzo, and other alcoholic beverages. They had no formal wine industries. The California legislature encouraged these activities and asked the University of California in the late 1800s to provide technical agricultural assistance for this new industry.

I followed the advice of Mr. Polycarpos Antoniades, chief enologist of the Cyprus government, who met and became friends with Professor Maynard Amerine, and decided that the best university for my education in enology would be UC Davis. Mr. Antoniades’ own son, Emilios, who graduated from the same high school two years earlier than I, also came to California to attend Modesto Junior College. He lived with Dr. Amerine’s mother in Modesto prior to his transfer to UC Berkeley where he eventually graduated with a Ph.D. in organic chemistry. I do not think that Mrs. Amerine had any influence on his selection of organic chemistry instead of enology, although in her younger years she had been a member of the Women’s Temperance Society.

My freshman class at the University in 1950 was very small, compared to the classes of today. In addition to myself, a foreign student, my classmates were Ramiro Jimenez, born and raised in the United States, Dimitri Tchelistcheff, born in France and raised in the United States, Humberto Perez, born in Mexico, Odette de Toledo, from Brazil, Father Ransford, who had worked at the Novitiate of Los Gatos Winery, and Nick Lolomis, born to Greek immigrants who were grape growers in Redwood Valley, near Ukiah, California.

The quality of instruction was first class. Despite the age differences between the faculty and the students, we all became friends, and we had easy access to our professors in their offices when the need arose. Among the professors from whom we received instruction were Albert J. Winkler, Maynard A. Amerine, James Guymon, A.D. Webb, John J.B. Castor, Cornelius Ough, Harold Berg, Lloyd Lider, Harold Olmo, Curt Alley, Robert Weaver, James Cook, Hank Nelson, Amand Kasimatis, George Marsh, Herman Phaff, and Emil Mrak.

I graduated with a bachelor of science in food science in 1953. During my studies between 1950 and 1953, my major professor was Maynard Amerine, whom I came to consider my mentor. Upon my graduation, he asked me if I had any plans to enter graduate school and after further discussion, I decided it was a good idea. I applied and was accepted in the graduate school while Dr. Amerine prevailed on the department chairman, Dr. Albert J. Winkler, to appoint me as Amerine’s research assistant within the department for the duration of my graduate studies. I became the first doctoral student of Dr. Amerine and thus began the long five-year journey toward a Ph.D. in agricultural chemistry. With the concurrence of Dr. Amerine, I chose the thesis topic of “the mechanism of isoamyl alcohol formation from leucine using radioactive tracer techniques.” My thesis was approved in the spring of 1958 and my Ph.D. was awarded that June.

Following graduation, the time came to seek gainful employment commensurate with my academic education. Again, my good mentor, Maynard Amerine, was very influential. He had grown up in Modesto and attended the Modesto Junior College prior to attending UC Berkeley. He was acquainted with the Gallo family, having been a high-school classmate of Ernest Gallo. He knew that the E. and J. Gallo Winery started a very serious effort in research, and he felt that I would fit in a research position with that company. He suggested that I consider this approach.
At some point, I met Dr. Robert Bouthilet, research director, and Charles Crawford, technical vice president, at Gallo. They both interviewed me separately and they both felt that I would be a good fit in their research endeavor. Unfortunately, they had just recently hired two research scientists, Dr. Richard Peterson and Mas Ueda. They asked me to wait until 1959 to reconsider a position at Gallo, which I agreed to do. In the meantime, I accepted a post-doctoral position with the Italian Swiss Colony Winery at Asti, California. In November 1959, Charles Crawford, with the approval of Julio Gallo, offered me a position as a research enologist. I gladly accepted their offer and started working for the E. & J. Gallo Winery in March 1960.

The Gallo Research Laboratory had already been in existence since the early fifties, having been started by Charles Crawford, with the assistance of Art Caputi, Jr., who would help during his vacations while attending the University of California as a student of chemistry. The scientists who were members of the Gallo Research Laboratory at the time of my arrival in March of 1960, included Art Caputi, Mas Ueda, Richard Peterson, Karel Popper, and Dimitri Tchelistcheff.

Soon after I started to work at the Gallo Winery, I realized that the California wine industry faced a serious problem of microbiological wine spoilage after bottling. In order to protect bottled wines from spoilage, the larger wineries use to pasteurize the wines prior to bottling. The wine was heated at high temperature for a short time and bottled at approximately 112°F. Most of the damage suffered by the wine was the result not only of the high temperature-short-time pasteurization but also of the elevated temperature the cased wine experienced during stacking and warehousing prior to shipping. The management of the Gallo Winery was seeking relief from the injurious effects of wine pasteurization, and I decided to tackle this problem as my first research project.

It was well known that by the year 1960 certain breweries were producing and bottling unpasteurized beer in small bottles and aluminum cans and marketing it as “keg beer” in small containers. The beer for this purpose was filtered through thin membranes of defined porosity to remove yeast and bacteria. Such filter membranes had become commercially available from the Millipore Filter Corporation of Bedford, Massachusetts. As a safety precaution, the companies which bottled unpasteurized membrane-filtered beer required their distributors and retailers to store the product under refrigeration. We decided to study this process for producing unpasteurized beer to determine its applicability to bottling wines in a similar fashion. We visited several breweries, including Coors and Schlitz, and became convinced that this operation could be applicable to wines. One problem that faced us was that wine distributors and retailers were not properly equipped to handle large quantities of unpasteurized wines under refrigerated storage.

Fortunately, about this time, Professors Cornelius Ough, John Ingraham, and some of their students at UC Davis began to experiment with a potentially new wine preservative from Germany, under the name diethyl pyrocarbonate, or DEPC. This material was very active against yeast contaminants at very low levels of usage, usually below 100 mg/L. In the presence of water, DEPC would hydrolyze to its components, ethyl alcohol and carbon dioxide, without leaving any significant by-products. DEPC gained the necessary government approvals and in 1960 it became one of the preservatives which could be used to protect wine against yeast spoilage. With the combination of membrane filtration and the judicial use of DEPC, when needed, E. & J. Gallo Winery saw its last use of wine pasteurization sometime in 1961.

In 1972 the government's approval for using DEPC in wines was withdrawn. However, with extra sanitation and great vigilance in our bottling room, the Gallo Winery continued to “cold bottle” its table wines without any serious spoilage incidents and continues to rely solely on membrane filtration to this date. The quality of the resultant table wines was so much improved since the reliance of sterile bottling that the demand for Gallo table wines increased so much that by 1964 the Gallo Winery surpassed every other winery in the United States in number of cases of wine sold. It has remained in that enviable position since 1964.

The E. & J. Gallo Winery started to bottle wines under their own name in the early 1940s, and they relied on the expertise of Charles Crawford for technical direction. He became the first technologist to be hired by the company in 1941, following his education at UC Berkeley and Cornell University.

Gallo began to use pure yeast strains to prepare the inocula needed to start grape fermentations, especially during the annual grape harvest. During the 1950s, the Gallo Winery had hired a microbologist, Billy Joe Williams, to help them conduct microbiological research and be responsible for the preparation of yeast starters for the winery's fermentations. By the time I arrived at Gallo, Mr. Williams had already departed and the winery was looking for a new microbologist. The enologist in charge of table wines was none other than my good friend, Lewis Stern. As a winemaker, Lewis Stern had technical jurisdiction over wine fermentations at Gallo as well as at our contract wineries in Napa and Sonoma. During the grape season, it was not unusual to find several 5-gallon jugs with active pure yeast starters to be delivered by Lewis Stern to Napa Coop, Sonoma County Coop, or Frei Bros. Winery. At times, accidents did happen and it was not unusual to find Mr. Stern's trunk flooded with select yeast starter as a result of breakage of one or more 5-gallon pyrex containers during transportation from Modesto to the northern wineries. After one of these unfortunate mishaps, Lewis Stern had an extensive conversation with me, during which I mentioned that in my graduate studies I completed several courses in yeast microbiology.

Lewis Stern seized the opportunity of this revelation. He approached Charles Crawford and Julio Gallo and convinced them that I should be assigned the interim position of research microbiologist until a permanent person could be hired for the vacant position. Both of them agreed to Mr. Stern's suggestion and he demanded that I continue to prepare pure yeast starters as needed by the northern wineries during their harvest season.

The winery at that time had an autoclave for use in the preparation of sterile agar media, Petri dishes, and other microbiological needs. In order to stabilize grape juice for scaling up to 5 gallons of pure yeast culture from a single yeast cell, it was necessary to heat about 5 gallons of reconstituted grape juice prepared from grape concentrate. Believe it or not, grape juice heated in a 5-gallon pyrex jug on top of a hot plate is an invitation to disaster. Several times, I had the not-so-rare opportunity to clean up 4 to 5 gallons of hot grape juice from the lab floors. Fortunately, the floors were covered with linoleum and not carpeted.

Art Caputi, Sr., the father of Art Caputi, Jr., whom all of us know very well, was chief of maintenance for the Gallo Winery. He took pity on me one day when I was cleaning up hot grape juice from the lab floor and falling far behind in the preparation of several gallons of yeast starter for Lewis Stern. Mr. Caputi invited me to join him for a short ride to Turlock, about 10 miles south of Modesto. We arrived at the local “surplus” yard where Mr. Caputi had seen a fairly good autoclave that had recently been discarded by a local hospital. The diameter of the centrifuge door was too small to admit a 5-gallon pyrex jug standing in a vertical position. Mr. Caputi did not seem to be bothered by such a small inconvenience. He told me that since the autoclave was otherwise in good operating condition, we could have it shipped to Modesto and he would see to it that I could use it for the preparation of sterile juice for yeast starters. The autoclave was sent to the winery's maintenance shop where Mr. Caputi had one of his assistants reorient the centrifuge in a vertical position instead of its horizontal position. Pyrex jugs of 4- or 5-gallon capacity could be vertically dropped and removed from the autoclave as needed. The difficulty of sterilizing grape juice for yeast starters had been eliminated, but the procedure of preparing several gallons of yeast starters remained cumbersome, time consuming, and in need of modernization.

During my graduate studies at UC Davis, I became aware that Dr. John J. B. Castor used to prepare gram quantities of compressed
He mentioned that a Canadian microbiologist, Dr. Adams, had prepared similar products. I was aware of the existence of commercial baker's yeast preparations for baking bread at home or in bakeries. The Red Star Yeast Corporation of Milwaukee, Wisconsin, was the major supplier of baker's yeast in the United States. I contacted this company about the possible production of wine yeast in a compressed or cake form. Their director of research, Dr. Gerald Reed, phoned me the following day and he sounded very enthusiastic. We met and discussed the possibilities. We established a confidential, cooperative research project between Gallo and Red Star Yeast. The first yeast we asked them to investigate for us was the UC Davis culture No. 522, which was otherwise known as the Montrachet strain of Saccharomyces cerevisiae, var. ellipsoideus. Gerald Reed and his research scientists were able to produce yeast cake from the Montrachet strain we provided. Much to the satisfaction of our management, winemakers, and especially Lewis Stern, we used compressed yeast for the company's fermentations during the 1962 grape season.

Because of its high moisture content, compressed yeast has a tendency to mold when stored at refrigerator temperature. The solution to this problem can be achieved by dehydrating, and we approached Gerald Reed and his personnel with this possibility. Again, the research department of Red Star Yeast went to work trying to dehydrate wine yeast. After several attempts, they succeeded and produced dehydrated Montrachet yeast which we used in our wine fermentations during the 1963 season. Several other varieties or strains of S. cerevisiae were prepared in the dry form. The dry yeast can be stored at room temperature and used throughout the year without appreciable loss in activity. Having seen this project to a successful conclusion, Gallo in 1964 released the Red Star Yeast Company from its confidentiality agreement and thus dehydrated wine yeasts became available to every winery at reasonable prices. Today it is widely used by most wineries.

During my early years of graduate studies at UC Davis, Professors Amerine and Ough developed a submerged yeast method for producing flor sherry. They used small, 25-gallon pressure tanks. These tanks were made of thick stainless steel and were designed to withstand pressures of 50 psi or more. Wine was inoculated with an active culture of flor yeast and a steady stream of compressed air was continually fed into the wine which was held under several atmospheres of pressure. After a short period of time, the wine began to show the development of acetaldehyde and acquire flavor characteristics reminiscent of flor sherry. This became known as the submerged flor sherry method.

The Gallo Winery liked the flor sherry produced by this method and wished to scale up the process to produce several hundred thousand gallons of flor sherry at a time. I consulted Mr. R.L. Nowlin, who was chief engineer at the time, and asked his advice about scaling up the process which Amerine and Ough proved successful at lower volumes. Mr. Nowlin was very sympathetic but he indicated that building a thick-gage pressure tank of 50,000, 100,000, or 200,000 gallon capacity would probably be difficult or near impossible at the time. The next day he called me with a possible solution. He thought that if we used one of the 100,000-gallon skinny, tall tanks, which were already available at the winery, we might be able to take advantage of the hydrostatic head pressure provided by the weight of the wine in the tank. Certainly, we would have a large hydrostatic pressure at the bottom of the tank. Mr. Nowlin asked Mr. Caputi, Sr. to have one of his maintenance people install a circular ceramic diffuser around the bottom of one of the 100,000-gallon stainless steel tanks in order to conduct our experiment with compressed air. The compressed air, in addition to providing the required oxygen for the flor process, would also act as a way to mix the wine in the tank so that all the wine at some time or another would be in the area of elevated hydrostatic pressure as required by the process. During the first experiment, we actually saw elevation of acetaldehyde within 48 hours. Yeast viability remained high and in two weeks, the acetaldehyde increased to over 1,000 mg/L. The wine acquired organoleptic characteristics similar to flor sherry. The winemaker for dessert wines, George Fujii, was satisfied with the quality of the flor sherry and he continued to blend small percentages of this product into his sherry blends for many years. We were able to produce flor sherry in large quantities using the submerged process originally developed by Amerine and Ough at the UC Davis.

In the early 1960s, David Gallo, following his graduation from the University of Notre Dame, returned to Modesto and started working with his father, Ernest Gallo, in the sales and marketing area. David always had a keen interest in the winemaking and grapegrowing areas of the business. David had a very well developed palate for wine tasting, and he often mingled with the winemakers and research enologists. Frequently, he would assist in the experimental small winery where every year we would vinify the grapes representing various experiments of interest to management, winemakers, and research enologists. He became a budding young winemaker.

During the 1950s the Gallo Winery began to show interest in eventually producing sparkling wines. When David started his career at the winery, his burning desire was to see the company enter the production of sparkling wine. With David's prompting, Ernest, Julio, and Charles Crawford decided to place this project on an accelerated basis. They asked me to work with David and develop an acceptable prototype of sparkling wine for eventual production.

By 1964, Ernest, Julio, and Charles Crawford had approved a final blend for white sparkling wine production. David Gallo worked on the packaging and had a name and label approved. In the meantime, Valley Foundry built and delivered four 2,000-gallon champagne tanks, and we were in business. Our first Charmat process sparkling wine came off the line sometime in August 1964. It was a white product named Eden Roc. The product was later renamed André de Montcort. David Gallo started calling me André. Charles Crawford asked me to become the winemaker for sparkling wines, a new department.

I made the transition from research enologist to winemaker and jack of all trades, including microbiology. The winemakers accepted me despite my limited experience. They were a select and choosy group that included Lewis Stern, Dawson Wright, George Fujii, Peter Vella, Mannie Jaffee, Guido Croce, Don Sanford, and others. The research department continued to give me their support. At some point, "de Montcort" was dropped and our sparkling wines became known simply as André. The demand expanded so fast that our production facilities could not keep up. We started to think about pressure tanks larger than 2,000 gallons, the then-accepted size in the industry. Finally, we settled for a larger tank size which could not be built by Valley Foundry or other suppliers. Art Caputi, Sr. located two 22,000-gallon tanks which became available when the government deactivated a Nike missile silo. They had been used by the Department of Defense to store liquid oxygen for the Nike missile project. They were retrofitted and ready to be used for sparkling wine production. With the expertise and ingenuity of Mr. Caputi, we increased our production of sparkling wines from 2,000- to 22,000-gallon tanks in one "easy" step. It became necessary to add more sparkling wine tank fermenters and bottling tanks. More Nike missile silos were deactivated, and we were absorbing surplus tanks as fast as they became available. These later tanks were as large as 44,000 gallons. Our capacity for producing sparkling wines was never in doubt despite the high increase in the demand for these products. Gallo became the largest producer and supplier of sparkling wines.

The new department grew so fast that we had to add Joe Cagnasso and Ray Heinmiller to assist me in the Champagne Department and Dr. Richard Jacobs to take over the microbiological duties I had previously inherited. Eventually, Dr. Richard Morenzoni, who received his doctorate as a graduate student of Professor Ralph Kunkee at UC Davis, joined our company and became the research microbiologist. Finally, the Microbiology Department had a well-respected, well-trained, and very capable person in charge. Morenzoni set up the department on a sound scientific basis and filled this
made by Carbelotto in Italy. After the tanks were made, they were
from Yugoslavian oak by Italian coopers. About 400 tanks were
been made from grapes harvested in Napa and Sonoma. The wine
for Chardonnay.

During his tenure, we continued the modernization program by removing the
old redwood tanks dating back to the 1890s and some of the old
tenure, we continued the modernization program by removing the
wooden buildings. Joe Dickie was named plant manager in 1985. He
continued to work out of Modesto, but the plant managers of
the wineries would administratively report to me, and I would
be responsible for wine production at these facilities. Guido Croce
and Joe Dickie would be invaluable in assisting me in the winemak-
ing functions at these facilities. My good friend, Dave Perez, plant
manager of the Napa Coop Winery, assisted me with a high degree
of professionalism. As the years went by, some of these facilities
closed to produce wines for Gallo. The cooperative wineries of
Woodbridge, Napa, and Sonoma eventually dissolved their associa-
tions. However, many former cooperative members continued to
deliver grapes to Gallo. The Liberty Winery ceased to function as
a winery during the early 1990s. The grapes previously processed at
Liberty and Woodbridge Coop started to be delivered to our winery
in Livingston for processing.

When I assumed responsibility for wine operations at the Frei Bros. Winery in Healdsburg, Ted Edwards was the plant manager.
The winery had old buildings, dated equipment and storage tanks. In 1975, the winery became wholly owned by Gallo. It had been es-

dablished in 1892 by the Frei family, which had done business with
Ernest and Julio since the 1940s. A modernization program began in
1975 with the addition of 36 stainless steel tanks of 20,000-gal-
lon capacity, each. These tanks could be used as fermenters during
the grape season or as storage tanks in the off season. The old
concrete fermenters were hammered away.

Following the departure of Ted Edwards, the position of plant
manager went to Bob Keeble, who transferred from our Fresno plant
to Frei Bros. in 1978 and continued until 1985. During Keeble’s
tenure, we continued the modernization program by removing the
old redwood tanks dating back to the 1890s and some of the old
wooden buildings. Joe Dickie was named plant manager in 1985. He
was transferred from Livingston to Healdsburg. During his tenure,
we established the underground wine aging cellar with oak barrel
aging for red wines and oak barrel fermentation and sur lie aging for Chardonnay.

When we bottled our 1978 Cabernet Sauvignon, the wine had
been made from grapes harvested in Napa and Sonoma. The wine
was made in Napa and Sonoma but was aged in 4,000-gallon oak
tanks in our underground cellar in Modesto. The tanks were made
from Yugoslavian oak by Italian cooperers. About 400 tanks were
made by Carbelotto in Italy. After the tanks were made, they were
tested and disassembled for shipment to Modesto. The 1978 Cab-
ernet was aged for two to three years and bottled in Modesto. Beginning with the 1980 Cabernet and Chardonnay, which had
been aged in small French oak cooperage and vintage dated, we
were on our way.

By the early 1990s, we bottled our first Estate wines. We re-
leased a 1990 Estate Cabernet and a 1992 Estate Chardonnay.
During the mid-1990s, Gallo of Sonoma built a modern bottling
facility at our winery in Healdsburg, formerly known as Frei Bros.
Winery. At about the same time, Matt Gallo, Bob’s son, who had
been responsible for viticulture assumed additional responsibilities
in the management of the winery. Joe Dickie continued as plant
manager with the assistance of Ted Coleman, Jim Coleman’s son
and grandson of Julio Gallo. The third generation of Gallo family
members began to assume prominent positions at Gallo Sonoma.
Gina Gallo was transferred from Modesto to Healdsburg, along
with Marcello Monticelli to continue their distinguished careers
in enology and winemaking at Gallo Sonoma. The prominence of
Gallo of Sonoma wines is a tribute to the third generation who
continue to make wines of excellence. In the late 1990s, Joe Dickie
transferred from Healdsburg to become a valuable member of the
table wine group under the direction of Guido Croce, Bob Gallo,
and Jim Coleman.

In early 1997 I was invited by Ernest Gallo to join his group
in marketing and sales as the vice president, senior winemaker. I
began to travel within the United States and overseas with my good
friend, Carmen Castorina, as spokesmen for Gallo wines. We visited
the various wine markets and presented the Gallo wines, along with
our local representatives to our distributors, retailers, and consum-
ers. Carmen and I presented wine tastings and dinners where we
explained the attributes of our wines and how they are made. We
functioned as wine educators for the E. & J. Gallo winery and met
with numerous wine writers, as well as radio and television com-
mentators who had wine programs in different cities. Carmen Cas-
torina continues in this capacity to this day. I thoroughly enjoyed
working with him. He is a good teacher, with a vast knowledge of
wines and wine people.

Finally, it was time for me to retire in early 2004. I will fondly
remember my association with the founders of the greatest wine
family and company in the world and the second and third genera-
tions of the Gallo family. I thank them for tolerating me for such
a long time. I enjoyed working with talented people from whom I
learned so much. The founders, Ernest and Julio, had a special gift
in being able to recognize good technical people, hire them, train
them, and keep them.

I thank my family, my dear wife, Ruth, my daughter, Elena, and
my son, Gerard, for their love support and encouragement; my loyal
administrative assistant of 25 years, Susie Taylor, who by her ex-
ample taught me humility.

I thank all of my colleagues at the Gallo Winery and the Uni-
versity of California, Davis for helping me remain current from a
technical perspective.

I respectfully thank ASEV President Tom Smith, the staff, espe-
cially Lyndie Boulton, and the Board of Directors of the American
Society for Enology and Viticulture for presenting me with their
most prestigious award. To have been named the 2005 Merit Award
recipient is the ultimate honor. It humbles me; I will cherish it.

To the members and friends of ASEV, I wish to confirm that
you are the future, which is bright. You will be the ones to elevate
wine technology to the next level. Work hard to help California
and America remain at the forefront of wine technology and wine
innovation. We are number one in the world of enology and viti-
culture and we wish to stay there. God bless you.

—G. Thoukis, June 22, 2005