

A Historical Context and Archaeological Research Design for Agricultural Properties in California



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MANAGEMENT SUMMARY

The California Department of Transportation (Caltrans), in cooperation with the Federal Highway Administration, California Division, and the California State Historic Preservation Officer (SHPO), prepared this thematic study to assist with evaluating the information potential of agricultural properties in California, that is, for their eligibility for the National Register of Historic Places under Criterion D. To be eligible under Criterion D, National Register guidance states that a property must have, or have had, information to contribute to our understanding of human history or prehistory, and the information must be considered important. An integral part of this study is the development of a research design. The archaeological research design explicitly demonstrates the connection between the information a property contains and helps define important research issues or questions associated with a particular property.

While this document provides a framework for evaluating most types of agricultural properties found in California, it is not a comprehensive history of agriculture in the state, nor does it satisfy the requirements of site-specific research. Fundamentally, this study is to serve as both an analytical tool and a methodological framework to interpret and evaluate properties associated with the theme of agriculture in terms of their ability to yield important information. Researchers should also consider carefully whether additional National Register criteria may apply to individual sites, although those other possible values are not discussed in this study.

The historic context is a broad overview that touches on major themes in the state's agricultural history during the period from statehood in 1850 to the end of World War II in 1945. Future researchers are encouraged to use this context as a starting point when assessing the National Register values of an agricultural property.

Archaeological evidence collected during previous studies suggests that agricultural properties have the potential to address the following research themes within the contextual or interpretive approach: site structure and land use patterns, economic behavior, ethnicity and cultural diversity, agricultural technology and scientific innovation, household composition and lifeways, and labor history and relations. Research is not necessarily limited to these themes, however, and individual researchers may follow other theoretical approaches or find alternative research themes relevant to specific sites. In addition, this document includes an implementation plan that advocates specific methods to follow when assessing the information value of agricultural properties, in an effort to improve consistency and thereby facilitate better inter-site comparisons.

Any questions or comments on this study should be directed to the Chief, Cultural and Community Studies Office, Division of Environmental Analysis, MS 27, P.O. Box 942874, Sacramento, CA 94274-0001.

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CHAPTER 1. INTRODUCTION

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies take into account the effects of their undertakings upon historic properties. Caltrans, in cooperation with the State Historic Preservation Office (SHPO) and the Federal Highway Administration (FHWA), prepared this document to assist with evaluating the information potential of agricultural properties in California in an effort to streamline Section 106 consultation. This document is the first in a series produced by Caltrans, with consultant-prepared studies covering mining sites, work camps, and town sites each bound separately. Caltrans plans additional studies as funding permits.

Properties may be eligible for the National Register of Historic Places (NRHP) under any one, or combination, of four criteria. This document concerns itself solely with eligibility under Criterion D, which states that properties may be eligible for the National Register (NR) if they “have yielded, or may be likely to yield, information important in prehistory or history.”¹ National Register Bulletin 15 provides important guidance on applying Criterion D, which has two requirements that must both be met for a property to qualify: “the property must have, or have had, information to contribute to our understanding of human history or prehistory, and the information must be considered important.”² An integral part of this study is a research design that explicitly demonstrates the connection between the information and the property, and helps define whether the information that a property contains is important or not. A good research design “specifies not only the questions to be asked, but also the types of data needed to supply the answers.”³ The importance of a good research design and interdisciplinary research cannot be overstated. The need for integrated and holistic approaches to site-specific research has proven to be a valuable tool in reaching defensible arguments regarding eligibility.

This document provides a framework for evaluating the diverse range of agricultural properties found in California. It is not a comprehensive history of agriculture in the state, nor does it satisfy all of the requirements of site-specific research. Fundamentally, this research design will serve as both an analytical tool and a methodological framework to interpret and evaluate resources associated with the theme of agriculture in terms of their ability to yield important information relative to NR Criterion D. The view of archaeological and built elements of agricultural properties is primarily through the lens of the significant information they are likely to yield. Researchers should carefully consider whether additional NR criteria are applicable to individual sites even though these criteria are not discussed here in any detail.

This context is limited to the period from statehood in 1850 to the end of World War II in 1945. Thus, it does not address information on Native American horticulture in the period prior to colonization, nor does it cover early agriculture from 1769 to 1850. Properties associated with agriculture prior to the Gold Rush are rare, minimally understood, and generally have a high

¹ US Department of the Interior, National Park Service 1991; revised 1997 National Register Bulletin 15, “How to Apply the National Register Criteria for Evaluation.” (Washington D.C.: United States Department of the Interior, National Park Service, November 2006), Pg. 21 Available online at <http://www.cr.nps.gov/nr/publications/bulletins/nrb15/>. November, 2006.

² Ibid, 21.

³ Ibid, 22.

potential to yield data under NR Criterion D. The historic context (Chapter 2) is a broad overview that discusses the major themes in California's agricultural history, yet is necessarily limited in its detail. Caltrans recognizes the fact that while this document is informative, site-specific research will usually be required in order to make a defensible argument for eligibility. Future researchers are encouraged to use the historic context as a starting point when assessing the NR values of an agricultural property and cite whole sections rather than independently developing new context. Furthermore, the topically arranged bibliography includes many references that have not been specifically cited in the text, so researchers are encouraged to examine those sources when developing site-specific contexts.

The research design (Chapter 4) relies upon the historic context for defining historical events and trends of importance in the state's agricultural history. The research design posits that agricultural properties might address the following research themes within the contextual or interpretive approach: site structure and land use patterns, economic behavior, ethnicity and cultural diversity, agricultural technology and scientific innovation, household composition and lifeways, and labor history and relations. Individual researchers may follow other theoretical approaches or find alternative research themes relevant to the site under examination. This document includes an implementation plan (Chapter 5) that outlines specific methods to follow when assessing the information value of agricultural properties in order to improve consistency and thereby facilitate better inter-site comparisons.

Several assumptions help address the broad range of agricultural property types in California. First, agricultural sites reflect both internal and external forces that often share common traits. The material record often expresses those traits and is best understood through synthetic analysis of documentary records, archaeological research, and the broader landscape. Second, agricultural sites embody the traditions of many countries. Those traditions form the core of American values, morals, and economic independence. They also expose the racial turbulence expressed in the agricultural workforce, particularly as it relates to wages, housing, and social freedoms. Third, agricultural sites can be important for understanding technological change, interpreting gender issues, the acculturation of ethnic groups, and the interactions of minority groups within local, regional, or national market systems. Lastly, agricultural landscapes and sites may retain evidence of past ecological awareness and conservation or exploitation of the natural environment.

STUDY ORIGINS AND BACKGROUND

This study grew out of the Caltrans Cultural and Community Studies Office (CCSO) desire to improve its long-term planning efforts regarding site specific research and evaluation and the California State Historic Preservation Officer's (SHPO) recommendation that historical archaeology conducted in a Section 106 compliance setting in California could be improved. The importance of interdisciplinary research cannot be overstated. The need for integrated and holistic approaches to site-specific research has proved to be a valuable tool in reaching defensible arguments regarding eligibility

Caltrans Division of Transportation Planning, Office of Special Planning and Research provided funding to conduct a workshop, held in March 2005, whose purpose was to identify a series of themes and a process for evaluating certain property types under Criterion D. The first of a series of historical archaeological site-specific historic contexts and research designs, this agricultural study was intended to serve as a model for future studies. The interdisciplinary workshop participants included Margaret Buss, Dorene Clement, Kelly Hobbs, Julia Huddleson, Jill Hupp, Greg King, Anmarie Medin, Bob Pavlik, George Petershagen, Dana Supernowicz, Karen Swope, Judy Tordoff, Thad Van Bueren, Tom Wheeler, and Kimberly Wooten representing Caltrans; Stephanie Stoermer representing the Federal Highway Administration (FHWA); Steve Mikesell and Mike McGuirt representing the Office of Historic Preservation (OHP); and Kenneth Owens, Professor Emeritus, History Department, California State University, Sacramento, who also served as keynote speaker. Workshop participants discussed the aspects of developing the historic context, appropriate research themes, research questions, and data requirements. The workshop and subsequent research efforts provided the basic structure for this document.

ACKNOWLEDGEMENTS

This context is the product of a group of individuals who share common ideals, but whose diverse backgrounds and professions are instrumental in developing a document that will address important research questions, and ultimately, result in a more efficient and scholarly approach to studying the agricultural history of California.

Under the direction of CCSO Office Chief Greg King, Anmarie Medin, Dana Supernowicz, and Thad Van Bueren served as the principal authors of the study. Caltrans Research Assistants Paul J.P. Sandul and Michael R. Hibma provided research and technical assistance. Ken Trott at the California Department of Food and Agriculture reviewed the final draft. In addition, the previously mentioned workshop participants provided comments and helped in the development of the final document.

USING THIS DOCUMENT FOR SECTION 106 CONSULTATION

The California Department of Transportation's ultimate goal in producing this document is to streamline eligibility determination consultations with the SHPO under Section 106. To that end, researchers are encouraged to cite relevant sections of this document and apply specific research questions that relate to the property being evaluated.

The California SHPO reviewed the document, commented on its fundamental scope, and believes it to provide useful guidance when assessing information values of agricultural-oriented historical archaeology sites. As with all guidance, however, the SHPO staff will review individual submittals for the appropriate application of research questions contained herein as well as for the appropriate application of the recommended methods. The individual researcher must explain how the selected research questions apply to the site being evaluated; that is, what information is contained within the individual site and why it is important. As stated elsewhere in this document, other theoretical orientations, research issues, or individual research questions

not discussed herein may be identified as relevant to the site under study. If so, those other items would require an appropriate level of development for SHPO consultation.

FORMAT OF THE STUDY

Historical archaeologists generally use in-text citation style, as provided for in style guides for archaeological journals such as *American Antiquity* and *Historical Archaeology*; however, this document uses footnote citations. Why? Early versions of the study had alphabetical references, but included bibliographic material not specifically cited in the text. Several reviewers found the bibliography very cumbersome in that format, so the citations are now arranged topically. With a topical bibliography, however, it is difficult to find an alphabetical reference that might be under many subjects. Footnotes, following Turabian's style guide, have been employed to aid in identifying a reference.⁴ All in-text citations are included in the bibliography, while not all bibliographic references have been cited in the body of the report.

⁴ Kate L. Turabian, *A Manual for Writers of Term Papers, Theses, and Dissertations-Sixth Edition* (Chicago: University of Chicago Press, 1996), 273.

CHAPTER 2. HISTORICAL CONTEXT OF AGRICULTURAL SETTLEMENT IN CALIFORNIA

PREFACE

The history of agriculture is, without question, voluminous in its scope but of critical importance regarding the physical, social, political, economic, and technological development of California. As a model for settlement patterns, agricultural properties provide a unique opportunity for understanding the diffusion of culture and technology over time. Since California currently lacks any comprehensive preservation plan or broad statewide study of its agricultural resources, this context will serve as a framework for classifying agricultural sites by geographic region, and by property types.

Agricultural Historian Warren Johnston remarked, “California agriculture defies simple, accurate generalizations.”¹ Indeed, California’s agricultural history is incredibly diverse. Claude B. Hutchinson, in his history entitled *California Agriculture*, suggested that California had 118 distinct farming areas, as compared to another large agricultural state, such as Pennsylvania, which had only twenty.² Johnston divided the state into eight distinct regions, with Southern California having two sub-regions: the South Coast and the South Desert.³ A more detailed discussion about the agricultural or geomorphic regions presented in this report is largely taken from Beck and Haase and Johnston.⁴

Historians, geographers, and archaeologists have widely investigated agrarian households and their associated farming or ranching ventures in an effort to interpret patterns of change over time and across regions, as well as the adaptability of farmers from different backgrounds to changing environmental, social, and economic conditions.⁵ Johnston noted that, “the challenge to California’s farmers and ranchers has always been to match available, and often limited, physical, human, financial, and managerial resources to produce and market alternative outputs chosen from a long and constantly evolving set of potential agricultural commodities and value-added products.”⁶ The ever-evolving complex of producers, laborers, and buyers added to the diverse nature of the state’s agricultural industry. Ideology, tradition, and culture merged as agricultural communities formed. While some failed others succeeded and prospered.

¹ Johnston, Warren E. Johnston, “Cross Sections of a Diverse Agriculture: Profiles of California’s Agricultural Production Regions and Principal Commodities.” *California Agriculture Issues and Challenges*, edited by Jerry Siebert, pp. 63-100. (Berkeley: University of California, Giannini Foundation, 1997), 63.

² Claude B. Hutchison, ed. *California Agriculture* (Berkeley, CA: University of California Press, 1946).

³ Johnston, “Cross Sections”, 65.

⁴ Warren A. Beck and Ynez D. Haase, 1974 *Historical Atlas of California* (Norman, OK: University of Oklahoma Press, 1974); Johnston, “Cross Sections.”

⁵ Gilbert Fite, *The Farmer’s Frontier* (New York, NY: Holt, Reinhart, 1966).

Fite, *American Farmers: The New Minority* (Bloomington, IN: University of Indiana Press, 1981).

Patricia N. Limerick, *The Legacy of Conquest: The Unbroken Past of the American West* (New York, NY: W.W. Norton & Co., 1987).

Pat H. Stein, *Homesteading in Arizona, 1862 to 1940: A Guide to Studying, Evaluating, and Preserving Historic Homesteads* (Phoenix, AZ: State Historic Preservation Office, Arizona State Parks, 1990).

Charles E. Orser, Jr., Ed., “Historical Archaeology of Southern Plantations and Farms.” *Historical Archaeology* 24(4) (1991).

Steven Stoll, *The Fruits of Natural Advantage: Making the Industrial Countryside in California* (Berkeley, CA: University of California Press, 1998).

Alan Gonzales. “Filipino Farm Workers in American History,” *Kalayaan International* 1, No.2 (1971).

⁶ Johnston, “Cross Sections”, 30.

Today, second, third, and fourth generation farmers continue to seed their lands, ever-adapting to the changing political and environmental climate of California.

Patricia N. Limerick stated that, “Westward expansion was supposed to create a land of independent, agrarian landowners and to prevent the rise of a wage-dependent laboring population.”⁷ That ideal, however, proved elusive for a wide variety of reasons. Farming has always been a risky business dependent on the vagaries of nature and the marketplace. Western farms, in most cases, proved more challenging to establish and render viable than their eastern and southern counterparts, largely because of the general lack of knowledge regarding the state’s natural conditions. The early dominance of large commercial operations and ongoing issues of labor supply also challenged smaller independent agriculturalists.

If there was one singular event that shaped the course of California’s agricultural landscape, it was the discovery of gold at Sutter’s Mill in Coloma in 1848 and the ensuing Gold Rush. Not only did the Gold Rush almost instantly create a demand for a wide variety of agricultural foodstuffs, but it also set in motion a wave of settlement aimed at producing commercial food products. Unlike well-established agricultural regions of the United States, during the early 1850s in California there was no singular model for agricultural production. Neither was the development of agriculture a monolithic event solely geared towards mass production and marketing. Many would-be farmers in Gold Rush California considered themselves horticulturalists, experimenting with a wide-variety of products, and introducing new varieties from stock of their own creation. Credit should also be given to the earlier Spanish and later Mexican Period agriculturalists, who successfully cultivated a wide variety of crops that carried forward after statehood.

The cultural history of California agriculture is particularly important; but it is often not easily identifiable from just historic records alone. California’s agricultural provinces did not always have a clear distinction among cultural groups participating in the same industry, nor did most ethnic agricultural workers take the time to record their daily activities. At the turn of the century, Mexican laborers found work alongside Japanese, Chinese, and Filipinos. Many growers purposefully segregated worker housing based upon racial or ethnic lines. Understanding both the physical and cultural characteristics of workers’ housing in California’s agricultural industry is paramount to addressing questions related to acculturation, assimilation, race, gender, and family.

The technological history of agriculture is as important as its cultural history. California developed into a proving ground for new agricultural inventions, evidenced by the hundreds, if not thousands, of machines and implements advertised in trade journals or exhibited at agricultural fairs. Particularly important are mechanical devices that Californians invented, and in some cases, patented. Understanding technological change as it relates to agricultural properties is essential for establishing historic context and ultimately significance. A basic understanding of the variety of implements that California agriculturalists adopted during the nineteenth through the mid-twentieth centuries is also important. Accurate identification of farm equipment or machinery will ultimately assist in developing site chronology and historic context.

⁷ Limerick, *Legacy of Conquest*, 124.



Figure 1: A typical modest 1930s homestead (Keystone-Mast Collection, KU43131, UCR/California Museum of Photography, University of California. Riverside).

Several of the most important forces that spurred agricultural development in California include:

- Available agricultural labor from a succession of international sources including China, Japan, the Philippines, India, and Mexico,
- The spread of irrigation,
- Improved transportation including railroads, refrigerated rail cars, trucking and rural roads, and improved handling, storage, and technology,
- The development of marketing cooperatives,
- Increased mechanization.⁸

⁸ Alan L Olmstead and Paul W. Rhode, *The Agricultural Mechanization Controversy of the 1920s*, Working Paper Series No. 64, Agricultural History Center. (Davis, CA: University of California, 1990).

The transformation from expansive grain fields and grazing lands occurred relatively quickly and had profound consequences on the state's agriculture. Factors in this shift in agricultural production included a fivefold increase in the state's population from 1890 to 1930 (1 million to 5 million), rising incomes from 1910 to 1929, which drove consumer demand away from field crops to more specialized crops, the creation of a world class agricultural and research system in the state, and advancements in horticulture.⁹

Fortunately, resource materials relating to the state's agricultural history are plentiful and published books, periodicals, manuscripts, maps, and photographs related to agriculture exist at most libraries and record repositories in California. In addition, the Internet provides an important tool as federal agencies, libraries, and genealogical organizations transfer data into information accessible via a web browser. Of particular importance are four web-based data sites. The first are the records of the Bureau of Land Management (BLM) regarding homestead search by township and range for various land entries in California.¹⁰ The second is the California Lands Patent Database providing a county-by-county list of all the successful entries and the names of the individuals receiving patents, including the date, township, range, and section of the entry.¹¹ Unfortunately, the website does not list the specific type of patent issued. The National Archives holds copies of the patent records where land patenting occurred and will provide copies upon request for a fee. The third, established at UC Berkeley, includes images, documents, maps and other important information on all facets of California history.¹² The last site, titled, "Sonoma County Wine Library", focuses on the state's viticulture industry, and is based out of the Healdsburg Branch of the Sonoma County Library.¹³ This site is extremely useful for accessing source material related to the state's wine industry, including a large quantity of primary source documents.

In addition, unpublished or what is known as "grey literature," can also be extremely important in researching agricultural properties. The most obvious forms of grey literature are cultural resource studies produced by agencies, such as the California State Department of Transportation and private consulting firms. Theses and doctoral dissertations are also valuable research tools. The University of California, Los Angeles, Berkeley, and Davis, each have collections of theses and doctoral dissertations related to California Agriculture, some of which date back to the 1930s and include original photographs. The collections at the University of California, Davis, including the Agricultural History Center and the Shields Library Special Collections, focus specifically on agriculture and agricultural history. The Main Shields Library also contains a large collection of secondary sources related to agriculture, including bibliographies and bound issues of the Agricultural History Society's journal. The society itself dates back to 1919. Another resource of importance for international, national, and regional agricultural history, is a "Guide to Historical Research at the National Agricultural Library: The General Collection," by Susan Chapman.¹⁴ Noted in Chapman's Guide is the "Bibliography of Agriculture 1942-

⁹ Warren E. Johnston and Alex F. McCalla, "Whiter California Agriculture: Up, Down or Out? Some Thoughts About the Future," Giannini Foundation of Agricultural Economics, (Berkeley, Davis, & Riverside CA: University of California, 2004), <<http://giannini.ucop.edu/calag.htm>>, November 2006.

¹⁰ [www.glorerecords.blm.gov/PatentSearch/ Default.asp?](http://www.glorerecords.blm.gov/PatentSearch/Default.asp?)

¹¹ [ftp://ftp.rootsweb.com/pub/ usgenweb/ca](http://ftp.rootsweb.com/pub/usgenweb/ca)

¹² <http://sunsite.berkeley.edu>

¹³ www.sonoma.lib.ca.us/wine.

¹⁴ Susan Chapman, *Guide to Historical Research at the National Agricultural Library: The General Collection*, (Washington, D.C., 1995).

present,” that contains citations to journal articles, monographs, theses, patents, audiovisual material, and technical reports.

The California State Library, California Room, the government publications branch, and the California State Archives contain a variety of documents related to agricultural history, including journals such as the *California Farmer*, which later became the *Pacific Rural Press*, together with pamphlets, newspapers, photographs, and published books. The State Archives also holds articles of incorporation from 1850 to 1959, which are filed alphabetically by company name and include purpose, place of business, names of officers, and amount of capital invested. The archives house California trademarks from 1861 to the present, filed numerically by trademark number and chronologically by date of filing, including name of claimant, type of product, label specimen or written description and occasionally business address. Claimant and trademark name indexes are available. In regards to broad overviews of agriculture and farming in California, scholarship by Ellen Liebman and Lawrence J. Jelinek are essential.¹⁵ More specific histories by scholars Steven Stoll, David Igler, and Gilbert G. Gonzalez offer a glimpse at regional differences in the development of agriculture, labor, and specialized crops in California¹⁶. Of particular importance at the California State Archives are the collections associated with California’s Agricultural Society formed in 1854, otherwise known as the Transactions of the California Agricultural Society, and the William (Ham) J. Hammond Collection, which includes numerous maps, diaries, and journals related to water and irrigation.

The University of California, Davis retains several important collections regarding the history of agriculture in California, particularly the Sacramento and San Joaquin valleys. Those collections, which include numerous photographs, are distributed within the Shields Main Library, its Special Collections branch, and at the Agricultural History Center, where a series of “working papers” are maintained relating to all facets of the state’s agricultural history. The Shields Library also houses an important collection of documents related to viticulture and enology, and the university curates a diverse collection of seeds from historical properties throughout the state. In addition, virtually every library in the state houses a variety of regional publications related to the state’s agricultural history, including unpublished documents such as theses and dissertations. Finally, museums, such as the Merced Agricultural Museum, San Joaquin County Historical Museum, the California Citrus Heritage State Park in Riverside, focus on the state’s agricultural history and house artifacts and objects used in farming and ranching.

Natural conditions, land laws and regulations, technology, economics, and culture all interact to shape the diverse landscape of California. The literature on agriculture is so voluminous that it

¹⁵ Ellen Liebman, *California Farmland: A History of Large Agricultural Landholdings*, (Totowa, NJ: Rowman & Allanheld, 1983).

Lawrence J. Jelinek, *Harvest Empire: A History of California Agriculture*, (San Francisco, CA: Boyd & Fraser Publishing, 1982).

¹⁶ Steven Stoll, *The Fruits of Natural Advantage: Making the Industrial Countryside in California*, (Berkeley, CA: University of California Press, 1998).

David Igler, *Industrial Cowboys: Miller & Lux and the Transformation of the Far West, 1850-1920*, (Berkeley, CA: University of California Press, 2001).

Gilbert G. Gonzales, *Labor and Community: Mexican Citrus Worker Villages in a Southern California County, 1900-1950*, (Champaign, IL: University of Illinois Press, 1994).

would be difficult to consider every useful publication much less the substantial gray literature produced largely from cultural resource studies of individual properties. For that reason, this study seeks to synthesize some of the most important themes without filling in all the regional, cultural, and temporal variations typically considered when approaching the evaluation of a particular agricultural property. Some of the most important sources, however, receive particular attention in the Implementation Plan that provides suggestions for conducting site-specific resource evaluations. This historic context is divided into seven sections, which address the most important themes associated with California's agricultural history. Those themes are interdependent, since history is a continuum with no artificial boundaries.

THE IDEOLOGY OF AGRICULTURE SETTLEMENT IN CALIFORNIA

NINETEENTH CENTURY MODELS FOR AGRICULTURAL SETTLEMENT

Ideology, manifested in both settlement patterns and material objects, marks California's agricultural history. Although the material culture manifested by California's agricultural economy is the main focus of this study, and the fact that the ideological or philosophical nature of agriculture is not nearly as visually identifiable as the material culture, the ideological character of farm or ranch families is important in the broader interpretation of archaeological remains.

Foremost, agricultural properties reflect the broadest range of cultural traditions of any type of historic resource found across California's vast landscape. Agriculture has its roots in this nation's first settlements and in the philosophy of the country's first leaders and statesmen, such as Thomas Jefferson, "who envisioned the new republic as a nation dependent on citizen farmers for its stability and its freedom."¹⁷ Prevailing for the better half of the nineteenth century, Jeffersonian ideology equated hard work to virtue and sound moral judgment. Jefferson wrote in 1781, "those who labor in the earth are the chosen people of God, if ever he had a chosen people, whose breasts he has made his peculiar deposit for substantial and genuine virtue." A powerful statement reflecting the values of the time, like Jefferson's had a profound influence on the new republic during the late eighteenth and nineteenth century. Many of California's first agriculturalists were from the Eastern United States and had long family traditions associated with agriculture. For California, its diverse natural resources symbolized the opportunities that awaited those individuals who chose to toil upon the land.

While a variety of motivations characterized the development of agriculture in California, the concepts of private or individual ownership and free market economics, were of particular importance. Religion and faith also played an important part in both the daily life of farm families and in the broader social and cultural norms that helped define agricultural communities. While the concept of manifest destiny is less tangible, it served the needs of politicians and journalists who made the best of the idea as they adapted it to shape public opinion.

¹⁷ Michael J. Auer, "The Preservation of Historic Barns," *National Park Service Preservation Brief, No. 20*, (Washington D.C., U.S. Department of the Interior, 1989).



Figure 2: “Westward the Course of Empire Takes its Way.” In a bid to encourage people westward, advertisements told success stories of those who had trekked across the continent, claimed land, or had become successful. Pictures, such as the one seen here, were painted to exploit the theme of Manifest Destiny. (Robert B. Honeyman, Jr. Collection of Early Californian and Western American Pictorial Material, BANC PIC 1963.002:0743-E, courtesy of The Bancroft Library, University of California, Berkeley).

Manifest destiny, a phrase used by leaders and politicians in the mid-nineteenth century to justify continental expansion by the United States, created a sense of “mission” or national destiny for some Americans. Many believed a divine calling obligated them to extend the “boundaries of freedom” to others by imparting their idealism and belief in the institutions of democracy to those considered capable of self-government. Nonetheless, it often excluded people perceived as being incapable of democratic self-government, such as Native Americans and those of non-European origin. Freedom also meant fee simple ownership of the land and, at the time of U.S. Western colonization, the Mexican government had established claims to vast tracts of land in California. California, unlike the long established settlements on the East Coast, became a beacon for settlers who believed in the inherent right of individual land ownership and the notion that vast amounts of free land awaited them.

To what extent each or any one definition of manifest destiny actually motivated one person or groups of people to move to California cannot be known. To be sure, the notion of making better use of the land, agriculturally, parallels the earlier notion of Jeffersonian Democracy and the superiority of the yeoman farmer. Likewise, those bound for California during the 1850s in search of gold were persuaded to make the arduous journey not only to seek financial returns, but

also to join a larger movement of colonization and self-fulfillment that swept the nation and much of the world during the mid-nineteenth century. As the nineteenth century came to a close, the concept of manifest destiny shifted towards industrial resources as capitalists exploited the state's natural resources, particularly its fisheries, lumber, and minerals other than gold.

Historian Norman Graebner takes a pragmatic view of manifest destiny, at least as it applies to California. Graebner argued that manifest destiny is a broad generalization and that the state's physiographic opportunities, particularly its natural harbors, truly enabled westward expansion to occur.¹⁸ Graebner's observation is reasonable since California offered some of the best harbors in North America, which provided realistic alternatives to overland travel. Furthermore, intensive settlement in California occurred first in San Francisco and Sacramento during the Gold Rush period and extended into the hinterlands after miners followed the discovery of gold-bearing placer deposits. Whether through pragmatism or ideology, agricultural settlement occurred in California at a fevered pace during the early 1850s.

Other factors provided impetus for settlement of California during the nineteenth century, including the periodic high birth rate and increases in population due to immigration, and because agriculture, as the primary economic system in the United States, required large families to work the farms. Expansion into frontier areas created opportunities for new commerce and individual self-advancement. Land ownership often led to the creation of wealth, self-sufficiency, political power, and independent self-rule. Without question, not everyone benefited from the fruits of manifest destiny.

At the close of the Mexican-American War, although the Treaty of Guadalupe Hidalgo guaranteed the rights of resident *Californios*, many eventually lost their lands. Congress created the Land Law of 1851 to systematically address the problem. The act established a commission charged with reexamining all Spanish and Mexican land titles. This placed the burden of proof on existing landowners—a difficult task for most *Californios*. Many barely understood English and disreputable attorneys often victimized them.¹⁹ Thus, the Land Law either outright invalidated many rancho claims or forced their *Californio* owners to sell off all or part of the lands.

Enterprising Americans began to arrive in California in large numbers with the onset of the Gold Rush in 1848-49. They felt it intolerable that a few hundred Mexicans should control vast tracts of the most fertile and desirable lands. Squatters began to occupy much of the rancho land, sparking lawsuits, distrust, and a great deal of acrimony.²⁰ The San Francisco Bay Area experienced the most acute squatting, where by 1853, "every rancho within a day's march of San Francisco Bay had its contingent of uninhibited nonpaying guests," according to Pitt.²¹

¹⁸ Stephen Schwartz, *From West to East: California and the Making of the American Mind*, (New York, NY: The Free Press, 1998), 69.

¹⁹ Andrew Rolle, *California: A History*, (New York, NY: Thomas Y. Crowell Co., 1963).

Leonard Pitt, *The Decline of the Californios*, (Berkeley, CA: University of California Press, 1966).

²⁰ Rolle, *California: A History*, 1963.

Pitt, *Decline*, 1966.

²¹ Ibid, 97.

As to what else motivated settlers, farmers, and others to come to California, the answer is as multifarious as the many connotations of the term manifest destiny. Other pieces in the puzzle of understanding personal motivations, while not as dominant in the popular imagination, equally inspired countless others. The desire to cultivate, for example, whether hard work or eased by technological innovation, inspired many to trek to California for economic benefits. Likewise, the Gold Rush itself provided the impetus for mass numbers of people to initially settle in the foothills of the Sierra in dreams of striking it rich. While no single model explains the full range of settlement patterns that formed California's agricultural landscape, manifest destiny, the idea of natural right, geographical predestination, as well as other concepts played a part in the creation of agricultural properties.

Along with a strong will to succeed and knowledge of crops and soils, immigrant farmers also brought with them cultural traditions about family, religion, and work. Armed with this general knowledge, agriculturalists in California quickly took advantage of the state's relatively gentle climate, fertile soils, and geographic setting with its natural harbors, and its one principal navigable river-the Sacramento. Nineteenth century California historian John S. Hittell makes the following observation regarding the state's uniqueness:

California has a peculiar topography no other country comprises within so small a space . . . and such strongly marked natural diversions, isolated volcanic peaks, vast domes of granite, steep and rugged mountain ridges, fertile and beautiful valleys, waterfalls, picturesque lakes, extensive marshes, broad prairies, and dense forests.²²

For the vast majority of Americans, establishing a homestead epitomized the ideology expressed in Jeffersonian democracy, although in practice many homesteaders were motivated by market capitalism and the creation of wealth. Even so, homesteading formed the foundation for California's agricultural economy during the nineteenth century. Under the Preemption Act of 1841 settlers could preempt land in the public domain. Preempted lands were often later filed for under the Homestead Act of 1862. For many, the word "homestead" conjured up a self-fulfilling premonition of entitlement, property rights, individual freedom, and self-sufficiency. Many saw a homestead as an entitlement for every American who desired to succeed, raise a family, and achieve self-independence. While people homesteaded before the official Homestead Act of 1862, the legal mechanism for achieving self-independence and fee-simple ownership of land largely came about after the passage of the act in 1862. The Homestead Act has been called one the most important pieces of legislation in the history of the United States. The act turned over vast amounts of the public domain to private citizens. According to one report, "nearly 270 millions acres, or 10% of the area of the United States was claimed and settled under this act."²³

The dream of individual land ownership prevailed almost universally. Yet, for much of the world, individuals rarely obtained fee simple land ownership. America, and ultimately California, offered hope and soon became a symbol for this new freedom, although for many immigrants it meant great sacrifice and suffering racial prejudice.

²² John S. Hittell, *The Resources of California: Comprising Agriculture, Mining, Geography, Climate, Commerce, etc. etc. and the Past and Future Development of the State*, (San Francisco, CA: A. Roman & Company, 1863), 1.

²³ <http://www.nps.gov/archive/home/home.htm>



Figure 3: Front and side view of the, Wawona, CA. Notice the recently felled trees in the foreground. Many of the mountain homesteads included an orchard (The San Joaquin Valley Digitization Project, Bruce Family Collection, Mariposa County Library, San Joaquin Valley & Sierra Foothills Photo Heritage, mpa0029, San Joaquin Valley Library System, Fresno, California).

The zeal to acquire land as a basis for an independent and self-sufficient life, as well as the principle of manifest destiny that justified usurping it, provides only part of the picture. In Rodman W. Paul's essay "The Beginning of Agriculture in California: Innovation vs. Continuity," Paul made a convincing argument that in the early years of the development of agriculture in California "the chance to profit by growing food in California was too obvious to be overlooked."²⁴

The sudden population influx outstripped the food on hand, driving prices upward. Transportation remained difficult and perishable foods simply could not survive long journeys by land or sea.

Many of the food products that entered California during the early 1850s were not fresh but cured from salting or other similar means. Thus, many of California's first settlers turned to agriculture, not simply as a way to subsist, but as a way to profit because of the high demand for varieties and fresh foods.

During the latter part of the nineteenth century, the market-oriented capitalistic impetus for establishing many of the state's agricultural properties took place under the laissez faire economic policies of the period. Those policies, stemming in part from repugnance for earlier trade interference by the British government, dictated that the federal government should not interfere with economic development. This hands-off approach, coupled with the rapid consolidation of huge agricultural landholdings in California, had a profound effect on the evolution of agriculture in the state. For example, by the twentieth century, small operators had to struggle to compete with the domination of the marketplace by huge enterprises that pioneered mass production, use of machinery, pesticides, fertilizers, and irrigation, and distribution methods based on industrial or scientific models of production.

THE LAND OF MILK AND HONEY

Much of the nation viewed California as the land of riches, first through mining gold, and later, by taking advantage of the state's rich soils and mild climate, to harvest crops and raise

²⁴ Rodman W. Paul, "The Beginning of Agriculture in California: Innovation vs. Continuity," *California Historical Quarterly* 52, no. 1 (1973): 16.

livestock. California newspapers and periodicals extolled the state's economic opportunities during the 1850s while at the same time fledgling farmers experimented with a wide variety of agricultural products. In 1854 *The California Farmer*, the first periodical devoted to agriculture in the state, praised the hard work of local farmers who cultivated a variety of crops, including grapes, apples, strawberries, walnuts, pears, figs, potatoes, eggplant, wheat, buckwheat, barley, squash, chili peppers, turnips, beets, onions, pumpkins, Indian corn, and oats. California still imported citrus produce, such as oranges, limes, and citrons, mainly from Southern Europe, but that quickly changed during the 1870s and 1880s.

Agriculture became an important industry during the late 1850s, second only to mining. Experimentation seemed to be the singular most important aspect of agriculture during this period of unprecedented growth, and California farmers adapted quickly, taking advantage of the state's most fertile native soils.

In California, politicians recognized the importance of agriculture and land settlement and proclaimed its virtues and obstacles before the State Agricultural Society. In the Society's annual address for 1870-71, one of the commissioners commented on the state of agriculture in California:

As I am not a practical agriculturalist, you will not expect a dissertation on modes of improving stock, or fertilizers, or agricultural chemistry. But a few observations may be acceptable upon the question so interesting to every farmer and to every businessman of the State: Why does not California, with all its attractiveness and productiveness, grow more rapidly in population and development? The first, and to my mind the strongest reason, is the difficulty of acquiring lands cheaply in this State. Years ago, before Americans possessed this El Dorado, the Spaniard obtained grants of all the lands fanned by the sea breezes, where, the lord of vast tracts, he lived lazily, surrounded by herds and dependents. When his possessions were afterwards confirmed to him or to speculators who fleeced him, these great grants remained, and many remain, in very few hands, held at large rates per acre, and forbidding close settlement and improvement. To supplement this system came fraudulent land grants, absorbing whole counties, and often confirmed. California would be millions of dollars richer to-day had not the Mexican system of colonization been practiced in it, provided the valleys and hillsides subjected to Mexican grants had not been open to the second curse of our land system—that of private entry.²⁵

The comments from the State Agricultural Commission reflected the difficulty that many newly arrived agriculturalists faced with surging land prices and the best lands already under patent. In 1880, the honorable Frank M. Pixley of San Francisco addressed the California State Agricultural Society and proclaimed the benefits of "country life." He spoke of how it taught "good industry, economy, and made good citizens . . . where children honored and obeyed their parents, and parents worshiped God, and where marriage was sacrament and divorce

²⁵ California State Agricultural Society, *Transactions of the California State Agricultural Society During the Years 1870-1871*, (Sacramento, CA: State Printer, 1872): 82-83.

unknown.”²⁶ Challenging physical demands characterized life for American farm families during the late nineteenth century, which left little time for leisurely endeavors. Children were frequently exploited as laborers on farms, and women were often relegated to domestic roles and at times physically abused.

Paradoxically, in late nineteenth century California, the democratic ideal of owning the family farm came into conflict with the increasing demand by agriculturalists for a transient workforce, as small farms expanded through the acquisition of land or because of improved technology. The firm of Miller and Lux, owned by two of California’s most important land barons, acquired vast tracts of land in San Joaquin Valley. They understood the importance of maintaining a transient workforce together with a more stable workforce that would keep wages low and at the same time establish a paternalistic relationship with both day laborers and full-time employees.²⁷ Even Miller and Lux recognized the difficulties in transforming predominantly arid land into productive farmland, and through the use of cheap labor, manipulation of the land laws, and with a great deal of capital they were able to irrigate thousands of acres that would have otherwise have remained minimally productive. While Miller and Lux were reaping huge benefits from turning arid land into productive farm and grazing lands, other settlers were barely making ends meet.

At the turn of the century, rapid industrialization, urban growth, diversification of agricultural products, and an expanding pool of immigrant laborers characterized California. Popular magazines and local newspapers wrote about the virtues of farm life contrasted with the growing



Figure 4: The Old San Luis Ranch House of Miller & Lux. (*Jesse Brown Cook Scrapbooks Documenting San Francisco History and Law Enforcement, Volume 27, 19a, courtesy of The Bancroft Library, University of California, Berkeley*).

²⁶ California State Agricultural Society, *Transactions*, 230-231.

²⁷ David Igler, *Industrial Cowboys: Miller & Lux and the Transformation of the Far West, 1850-1920*, (Berkeley, CA: University of California Press, 2001).

health concerns evidenced in the nation's large cities. An outgrowth of these concerns, the back-to-the-land movement—sometimes referred to as the country-life movement, marked the beginning of a return to agrarian values, if not practically at least symbolically. The country-life movement achieved some national recognition in 1908 when President Theodore Roosevelt created the Country Life Commission to investigate the problems associated with efficiency and production in rural farms.²⁸ The movement focused largely on emotion despite the efforts of the politically appointed commission to instill a sense of urgency and help increase productivity and production. Still, it influenced relatively large numbers of people, “who desired a rural residence in the country, a home with a few acres of ground where they could grow fresh vegetables and perhaps a little grain and hay for the support of chickens and three or four cows.”²⁹ The movement may have also spurred interest in scientific farming methods, which were believed to improve the quantity and quality of farm produce, and to maximize efficiency.

Large-scale commercial farming was the antithesis of this movement, while owning one's own farm served as the movement's ideal. Other alternatives included the formation of agricultural colonies and the establishment of cooperatives that sought to pool resources in an effort to



Figure 5: Irrigation on a twenty-acre colony in Fresno County, ca. 1890 (*The San Joaquin Valley Digitization Project, Fresno County Free Library, California History and Genealogy Room, San Joaquin Valley & Sierra Foothills Photo Heritage, frb0017, San Joaquin Valley Library System, Fresno, California*).

²⁸ Ann Foley Scheuring, *Science & Service: A History of the Land-Grant University and Agriculture in California*, Division of Agriculture and Natural Resources, (Oakland, CA: The Regents of the University of California, 1995), 74.

²⁹ Standord J. Layton, *To No Privileged Class: The Rationalization of Homesteading and Rural Life in the Early Twentieth Century American West*, (Salt Lake City, UT: Charles Redd Center for Western Studies, Brigham Young University, 1988), 9-15. Scheuring, *Science & Service*, 74-75.

compete with industry giants. The Llano del Rio Cooperative Colony in California's Antelope Valley and the Durham State Demonstration Agricultural Colony in the Central Valley are two such examples of socialized farming. Neither colony, however, lasted the test of time, due in large part to overzealous claims, the unpredictability of natural conditions such as climate and crop-damaging diseases, maintaining a consistent supply of water for irrigation and domestic use, and the changing social and political climate of California.

The crusade to irrigate much of California played an important role in the expansion of mechanized farming and in the establishment of small farming communities. Irrigation meant a steady supply of water that farmers subsidized in certain cases through the sale of hydroelectric power. As a whole, California did not make a concerted effort to expand its agricultural water supply systems until the late nineteenth and early twentieth century, with the backing of the 1887 Wright Act, which fostered the creation of irrigation districts. Irrigation districts were intended to be fundamentally democratic because the costs and management of the districts were spread throughout the community or region. Individual users would pay a specified fee, which went to maintain and update the irrigation system. By the early 1900s, irrigation districts developed from the south end of the San Joaquin Valley to the north end of the Sacramento Valley. Thousands of acres were under irrigation by 1910, and row crops and orchards appeared where fallow fields once existed.

THE POLITICS OF AGRICULTURE FROM THE GRANGE MOVEMENT TO THE NEW DEAL

Ironically, as early as the 1880s in California, the family farm began disappearing with the onset of commercial and corporate farms. This dramatic shift had repercussions for communities who relied on a local workforce. Nativistic attitudes manifested in exclusive labor organizations as new immigrants entered the workforce. Farmers confronted the fluctuations in market prices for certain products in a more regional and competitive marketplace. Growers responded by creating farm cooperatives or other forms of communal subsistence and marketing techniques.

As Limerick observed, "western farmers in the late nineteenth century lived with a sense of being squeezed by history, in a vise built by dropping prices on one side and high costs on the other."³⁰ The forces arrayed against small family farmers provided the impetus for the formation of cooperatives such as the Grange (Patrons of Husbandry) and Farmers' Alliance, which put small farmers more on a par with big agricultural interests. Farmers' cooperatives were instrumental in promoting the earliest government regulation of commerce. The advocacy by farmers for government programs acted as "key agents in moving American public opinion toward acceptance of government involvement in economic affairs" in the late nineteenth century, and included passage of the Interstate Commerce Commission Act of 1887.³¹ This advocacy fell short of promoting direct aid to farmers due to the prevailing Jeffersonian sentiment that they should be the most self-reliant citizens. Nonetheless, farmers and ranchers were instrumental in promoting American expansionism overseas as a way to create broader global markets for the growing agricultural surpluses of the nation.

³⁰ Limerick, *Legacy of Conquest*, 130-131.

³¹ Walter Licht, *Industrializing America: the Nineteenth Century*, (Baltimore, MD: John Hopkins University Press, 1995), 189.

The politicization of small American farmers and ranchers subsequently waned from the early 1900s through World War I, during a period of welcome prosperity brought about by European crop failures, massive immigration to urban industrial centers, and an increase in money supply due to Alaskan gold discoveries.³² The urban population of the country had outstripped its rural householders by 1920, and in 1981, only 3 percent of the United States' population still farmed.³³ In the last two decades that number is likely to have decreased further as farmland is converted to suburban developments.

Notwithstanding the difficulties faced by farmers and ranchers during the nineteenth century, mechanization and industrialization altered the fabric of American life. The notion of a self-sufficient agricultural state had become outdated. Many farm families remained stuck in a state of economic dependency and beholden to others for employment as well as essential goods and services. American notions about democracy and the moral standing of the individual changed as specialization increased and as the country became more industrialized.³⁴

Yet, Americans, particularly farmers, rose to the occasion with a series of reform movements beginning in the 1870s, which saw the rise of the Grange movement. This movement blossomed into an agrarian political party, the Independent Party, which sought to counter the corporate interests of the Democratic and Republican parties. The 1890s witnessed the rise of the Populist Party. The Populist Party strove to empower workers and small farmers into party politics, which drew strong support from rural regions of the Midwest and South during the 1892 presidential election.

Corporations wielded a tremendous amount of power and spent immense sums of money in favor of certain candidates, as exemplified by their support of the pro-business candidate William McKinley in the presidential election of 1896. His opponent, the Populist Democrat William Jennings Bryan, who worried about business interests but appealed to small farmers with his inflationary notions of free silver, lost the election.³⁵ Local politics, however, probably had more influence on defining the state's agricultural economy, more than the influence of presidential politics in California. The divide between landowners and laborers, however, proved central to both local and national politics, particularly during the twentieth century when labor unrest became headline news.

In 1912, a formal Progressive Party formed which included insurgent Republicans under the leadership of Theodore Roosevelt and Hiram Johnson. World War I dramatically changed the political landscape of California, particularly for agriculturists who now depended upon a wartime economy. The 1920s were important years for agriculture because demand increased for a wide variety of products, and technology expanded as the wartime economy shifted to domestic needs. The halcyon years of the 1920s were dimmed following the stock market crash in 1929, when personal income plummeted and many saw agriculture and family farms as a

³² Licht, *Industrializing America*, 188-189.

³³ Limerick, *Legacy of Conquest*, 131.

³⁴ William Deverell & Thomas Sitton, *California Progressivism Revisited*, (Berkeley, CA: University of California Press, 1994).

LearnCalifornia.Org, *Progressivism in America: A Brief Overview*, (LearnCalifornia.Org, <<http://www.learncalifornia.org>>, 2002), April 2005.

³⁵ Ibid.

means of survival as jobs in the nation's cities began to vanish. The 1920s also witnessed social unrest and unionization, particularly among farm labor groups who sought better working conditions and higher wages.

The election of Franklin D. Roosevelt in 1932 created a new wave of optimism in the United States. During the ensuing years, Roosevelt's "New Deal" had major consequences for America's agricultural industry. Roosevelt tied New Deal virtues to democratic values. Foremost, liberalism served as the core of national and local politics. The New Deal conservation programs were aimed at renewing and rehabilitating the economies of rural areas and assisting farm families to remain on their land through a variety of subsidies and rural development programs. This agrarian ideology of the 1930s inspired major achievements in both infrastructure and economic development and allowed the Democratic Party to build a loyal rural constituency. Ultimately, the influence of the New Deal played an important role in postwar programs because it appeared to offer a rational solution for rural poverty. The 1920s and 1930s also witnessed the formation of unions comprised of farm laborers, who sought better wages and living conditions.

The Roosevelt administration and Congress passed a series of acts between 1933 and 1938 that created a handful of new agencies, many of which attempted to help rural farmers. The most important legislation related to agriculture included the National Industrial Recovery Act (NIRA) of 1933 that established the Public Works Administration (PWA) to manage public works projects. During its tenure the PWA spent \$7 billion, acted as the catalyst for employing millions of men, and set up the National Recovery Administration (NRA) to establish codes of practices for such things as hours worked, wages, unfair competition, and outlawing child labor. In addition, the New Dealers helped create an eight-hour workday and introduced a minimum wage of \$1.25 an hour. Yet, equal application of an eight-hour workday, established by California in 1908, to all industries across the state did not occur uniformly, particularly in farming. In 1935, the Supreme Court ruled NIRA unconstitutional.³⁶ No matter how important NIRA, NRA, and PWA were to working class Americans, for the thousands of farm laborers, with a few exceptions, they did little to improve working conditions.

Another act, perhaps with more consequences to America's farmers, was the Agricultural Adjustment Act of 1933 that attempted to stabilize prices and increase earnings. The act paid farmers to limit the amount of crops they grew or simply to plow under crops already grown. The federal government bought farm animals and then slaughtered them to raise the price of farm products. As a result, farm prices doubled between 1933 and 1937, but in 1936, the Supreme Court declared the AAA unconstitutional. A similar act, the Agricultural Adjustment Act of 1938, allowed the federal government to subsidize the price of a wide variety of farm products to gradually increase the subsidy until farm prices reached their pre-1914 numbers to give all farmers guaranteed minimum income.³⁷

³⁶ William E. Leuchtenburg. *Franklin D. Roosevelt and the New Deal, 1932-1940*, (New York, NY: Harper and Row, 1963).

³⁷ Lee Alston and Randy Rucker, *The Dynamics of Farm Failures and the Effectiveness of Government Policies to Alleviate Agricultural Distress: 1925-1939*, Working Paper Series No. 25. (Davis, CA: Department of Economics, Williams College, Agricultural History Center, University of California, 1986), 5-6.

The Soil Conservation Act, passed in 1936, provided the federal government the means to pay subsidies to farmers who agreed to leave land fallow or to plant crops that put nitrogen back into the soil. The federal government also financed research on soil conservation and alkalinity.

The creation of the Civilian Conservation Corps (CCC) in 1933 and the Works Project Administration (WPA) in 1935 affected agriculture as well. The CCC employed jobless single men between the ages of eighteen and twenty-five. They worked for six months in mountains and forests learning forestry, flood control, and fire prevention. Nearly three million men took part in the CCC program that ran from 1933 to 1941. The WPA coordinated all public works projects, spending over \$10.5 billion of federal money and employing approximately 3.8 million men from 1935 to 1941.³⁸ In California's Central Valley, the WPA and the CCC were involved with irrigation projects that directly benefited farmers and communities. The CCC and WPA also assisted with rural power development, electrification, and the irrigation of rural farms and communities in California. Finally, the Farm Credit Administration (FCA), created in the 1930s, provided federal money to pay off farm creditors and save farmers from bankruptcy. The FCA targeted farmers in the Midwest who persevered through the Dust Bowl years.³⁹



Figure 6: Civilian Conservation Corps (CCC) camp in the 1930s, Yucca, Tulare County. The CCC provided labor for construction and maintenance for many irrigation projects throughout California. (The San Joaquin Valley Digitization Project, Tulare County Free Library, Annie R. Mitchell Hist., San Joaquin Valley & Sierra Foothills Photo Heritage, tca0026, San Joaquin Valley Library System, Fresno, California).

³⁸ Alston and Rucker, *The Dynamics of Farm Failures*.

³⁹ Stan Cohen, *The Tree Army: A Pictorial History of the Civilian Conservation Corps, 1933-1942*, (Missoula, MT: Pictorial Histories Publishing Company, 1980).

Alston and Rucker, *The Dynamics of Farm Failures*, 5-6.

National Association of Civilian Conservation Corps Alumni, "A Brief History of the Civilian Conservation Corps," (St. Louis, MO: National Association of Civilian Conservation Corps Alumni Website, <www.cccalumni.org>), November 2000.

The 1930s were difficult years for California's agricultural industry, as farm failures were at an all-time high. Government, private industry, and popular culture combined to portray an indelible image of the California farmer during the Great Depression. The book and later motion picture "The Grapes of Wrath" exposed the graft, corruption, and exploitation associated with migrant laborers coming into California and perpetuated the image of a benevolent social service system that acted in the best interest of farm laborers. Most importantly, the 1930s introduced a sustained period of government intervention that succeeded in saving thousands of family farms throughout the nation and introduced a farm subsidy program that remains in place today.

Although government programs achieved some level of success at stabilizing prices for certain products, abating farm foreclosures, these programs brought little relief to the thousands of seasonal farm laborers who had become the backbone of the agricultural industry in California by the 1920s. Their story would unfold during the first two decades following World War II, as farm labor organizations, such as the American Federation of Labor and the Congress of Industrial Organizations (AFL-CIO), garnered political victories through boycotts and strikes, which ultimately improved both living standards and wages for seasonal workers.

In summary, the ideals fostered by an agrarian society were the cornerstone of American democracy. From the Jeffersonian views of democracy and the virtues of "laboring on the earth" came even more radical ideas expressed by organized labor, as well as a progression towards large-scale commercialized farms that relied on a more transient or seasonal labor force. For

California, the few decades of cheap, abundant land gave way to greed, corruption, and monopolization of the state's most fertile and productive public lands. The physical residue of ideological or political dogma is clearly not as apparent as are aspects of material culture found in historical archaeological sites. Nonetheless, understanding the acquisition and expansion of farms or ranches, technological adaptation, patterns of consumption, and ethnicity and gender issues in farm practices can provide important data that reveal attitudes, beliefs, and a broader understanding of agrarian life in California from the mid-nineteenth through mid-twentieth centuries.



Figure 7: Migrant children near Linnell Camp in Tulare County, ca. 1935. Note the simple board and batten wood frame temporary housing in the background. (The San Joaquin Valley Digitization Project, *Tulare County Free Library*, Annie R. Mitchell Hist, *San Joaquin Valley & Sierra Foothills Photo Heritage*, tca0150, San Joaquin Valley Library System, Fresno, California).

THE ROLE OF SOILS, CLIMATE, AND GEOMORPHOLOGY IN AGRICULTURAL LAND SETTLEMENT IN CALIFORNIA

California's climate and geology played a significant role in the failure and success of California farmers. Both climate and geology also influenced agricultural production and output. For the purposes of this study, geomorphology refers to the variety of landforms that comprise a particular region or province, such as the San Joaquin and Sacramento valleys. Geomorphic provinces have unique, but oftentimes overlapping features due to hydrologic systems that cross regional boundaries and mountain ranges that span large sections of the state. Geomorphology influences both climate and soils, which are particularly important for the sustainability of agriculture, and geomorphology defines the types of agriculture carried out within a particular area, since certain soils are more conducive to growing particular crops. Still, human-made systems, such as irrigation networks and railroads, also played an important role in defining agricultural enterprises and their sustainability and profitability.

Hundreds of books and articles, published from the 1860s through the 1880s, chronicle California's agricultural resources by region and county, much of which helped inform the following discussion. John S. Hittell's *Resources of California*, published first in 1863, and reprinted in 1866, 1869, 1874, and 1879, is one of the earliest and most popular books of the mid-nineteenth century. Hittell provides detailed descriptions of the region's resources and their potential wealth.⁴⁰ In addition, Henry De Groot published an "informational, general, and statistical" guide to California in 1884.⁴¹ By the late 1870s and 1880s hundreds of publications promoted California's climate, soils, and unlimited agricultural possibilities, although many of the nineteenth century publications often embellished the facts. During the twentieth century, periodicals and books generally took a more scientific view of the state's geomorphology and climate. Notwithstanding the numerous publications by state and federal agencies concerned with agricultural production, Claude Hutchinson among others, provided an excellent survey of how the state's agricultural history relates to landform.⁴²

GEOMORPHIC REGIONS

This study divides California into eight broadly defined geomorphic provinces following well-established boundaries with an emphasis on the state's diverse agricultural characteristics. These boundaries draw upon those established by the California Division of Mines and Geology and as described by Allen Schoenherr and the work of agricultural historian Warren Johnston.⁴³ Map 1 depicts those provinces in relationship to modern county boundaries. Those regions are as follows:

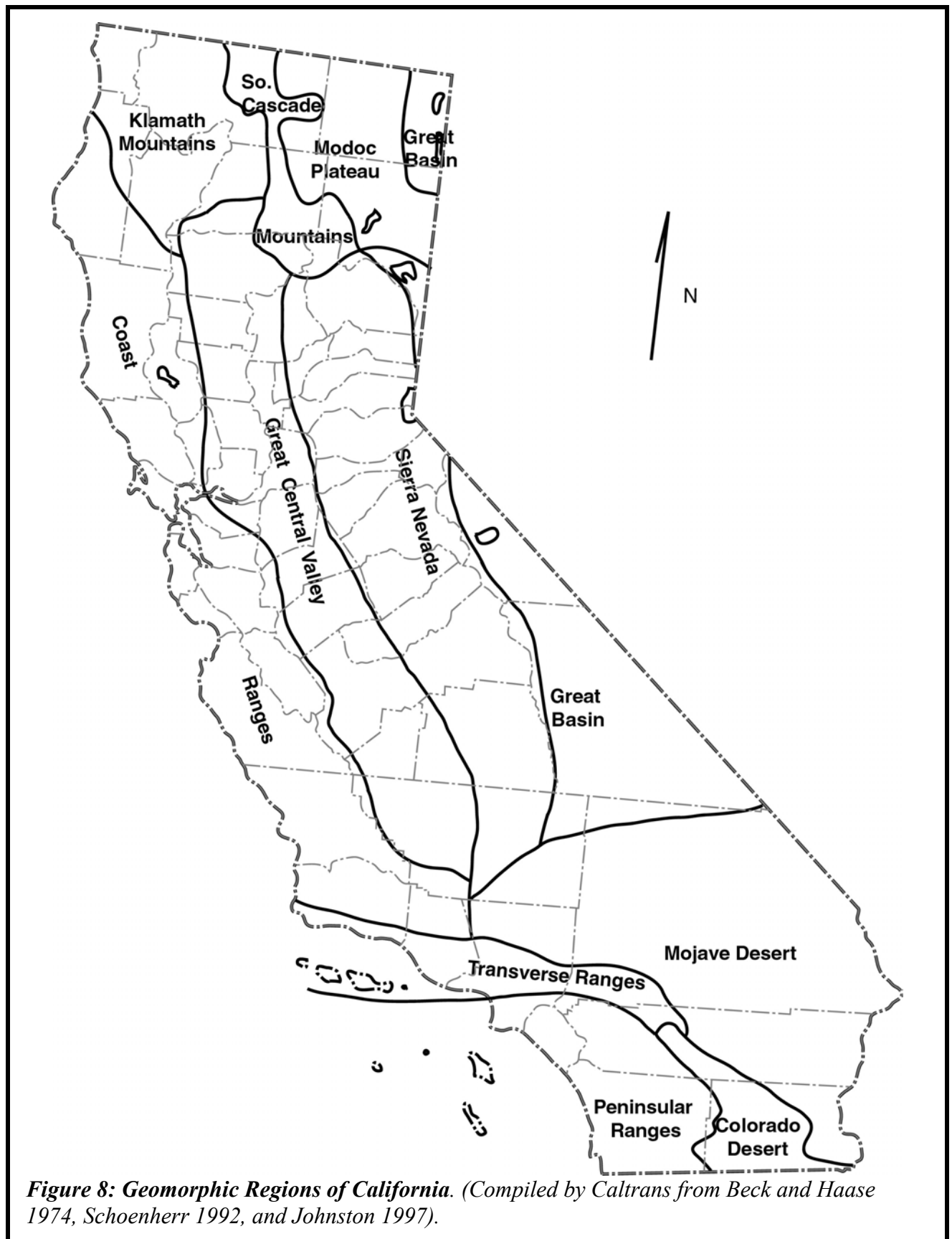
⁴⁰ John S. Hittell, *The Resources of California*.

⁴¹ Henry De Groot, "California: Information, General and Statistical, in Relation to the Agricultural, Commercial, Manufacturing, and other Resources, Interests, and Industries of the State," in *The 4th Annual Report of the State Mineralogist, California*, (Sacramento, CA: State Mining Bureau, 1884).

⁴² Claude B. Hutchison Ed., *California Agriculture*, (Berkeley, CA: University of California Press, 1946).

⁴³ Allan A. Schoenherr, *A Natural History of California*, (Berkeley, CA: University of California Press, 1992).

Warren E. Johnston, "Cross Sections of a Diverse Agriculture: Profiles of California's Agricultural Production Regions and Principal Commodities," in: *California Agriculture Issues and Challenges*, ed. Jerry Siebert, pp. 63-100. (Berkeley, CA: Giannini Foundation, Division of Agriculture and Natural Resources, University of California, 1997).



- Northern Province (encompassing the Klamath and Cascade Mountains).
- Sierra Nevada.
- Central Coast Ranges.
- Sacramento Valley.
- San Joaquin Valley (includes the Delta Region).
- South Coast (encompassing the Transverse and Peninsular Ranges).
- South Desert (encompassing the Mojave and Colorado Desert).
- Great Basin Desert (encompassing the Modoc Plateau and Basin-Range province).

A Mediterranean climate with wet winters and long dry summers generally characterizes California. The various mountain ranges influence weather patterns with as much as 80 inches of precipitation falling on the western slope and considerably less on the eastern slope. This creates a “rain shadow” that affects the entire eastern slope and contributes to the conditions that created the Great Basin. Much of California is arid and meets the technical definition of desert, receiving less than 10 inches of rain per year.⁴⁴ Those portions of the state lying east of the Cascades, Sierra Nevada, Transverse, and Peninsular ranges, as well as the southern end of the San Joaquin Valley, meet this definition.

Northern Province

The Northern Province includes the Klamath and Cascade Mountains, while the Modoc Plateau is part of the Great Basin Desert. Today, roughly half of the land is in public ownership and 17 percent is in farms, with 20 percent of that as cropland.⁴⁵ As compared to other regions within the state, this area had limited agricultural development, most of which occurred only after suitable irrigation systems were put in place.

The Klamath Mountains in the northwest corner of the state have peaks ranging from 5,000 to 7,000 feet in elevation, cut by the Smith, Klamath, and Trinity rivers. Rainfall averages 140 inches per year along the coast, contributing to the large, and scenic, river systems. Dense stands of Douglas fir, as well as a wide variety of other economically valuable tree species, dominate the landscape. Logging removed many of these stands and individual farmsteads were often established on logged-over lands. The Cascades lie farther to the east and form the southernmost extension of the range running from Washington through Oregon. Active volcanoes Shasta and Lassen are prominent peaks in this mountain chain. Precipitation averages around 80 inches per year on the western side of the Cascade Mountains, with the eastern side suffering the same rain shadow effects as the Sierra Nevada. The Pit River drains the Modoc Plateau region and feeds into Shasta Reservoir.⁴⁶

Ranching is the most widespread agricultural industry in this area and has been an important part of the regional economy for more than 130 years. Cattle and sheep graze on a combination of private and leased public land. Dairying was common along the coast. Large-scale agriculture is

⁴⁴ Schoenherr, *A Natural History*, 11.

⁴⁵ Johnston, *Cross Sections*, 68.

⁴⁶ Schoenherr, *Natural History*, 5-6.

generally limited to areas under irrigation where feed crops such as hay, barley, and alfalfa are grown. Historically, small apple orchards grew in sheltered valleys.⁴⁷

Sierra Nevada

Schoenherr described the Sierra Nevada as “the most conspicuous geographic feature of the state of California.”⁴⁸ This north-south trending mountain range consists of granite blocks that have been uplifted by tectonic activity. The western side of the Sierra forms a gradually uplifting slope cut by many rivers while a steep vertical drop of nearly two miles into the Owens Valley characterizes the eastern side. The mountain range contributes to the “rain shadow” effect that influences the entire state. The range includes thirteen peaks that are higher than 14,000 feet as well as the Mother Lode region known for its gold-mining.

As with the North, ranching-related activities on public and private lands dominate the Sierra Nevada region. The higher elevations support dense coniferous forests and alpine meadows that are used for seasonal grazing and pasturage, although less so in recent years. Most of the agricultural activity in this region occurs on the western slope with small-scale domestic agriculture, such as orchards and row crops, widely practiced in the foothills. The east side of the Sierra with the help of irrigation, developed both small and large farms devoted to the production of feed crops, such as hay and barley. A similar pattern followed in the Mother Lode region along the west side of the Sierra. Farming accounts for less than 10 percent of the area.⁴⁹ The abundant precipitation feeds rivers that drain into the Central and Owens valleys and provide water to the rest of the state.

Central Coast Ranges

The Coast Ranges consist of a series of northwest-to-southeast-trending ridges and broad valleys that define the western edge of the Great Central Valley. Mountain elevations in this region reach as high as 6,000 feet and snow is common on higher elevations. Many rivers carve through the valleys, creating broad alluvial fans and rich bottomlands that support diverse crops. Chaparral dominates south-facing slopes while evergreen oak woodland occupies cooler north-facing slopes (a vegetation pattern termed “slope effect”). On the coast side, stepped terraces indicate the uplift that has resulted from geological activity. Native oak woodlands and grasslands were converted to pastures or agricultural use along the central coast and interior valleys. The Central Coast region includes the counties of Lake, Sonoma, Napa, San Francisco, Alameda, Santa Clara, Monterey, Santa Cruz, San Benito, San Luis Obispo, and most of Santa Barbara County.

The Central Coast has long been important to the agricultural economy of the state. This region possesses a mild climate and fertile soils conducive to growing a wide variety of agricultural products. Coastal terraces and inland valleys provide fertile lands for various row crops, orchards, and vineyards. The Salinas Valley, which drains into Monterey, has been an important agricultural area for its row crops, such as lettuce and beets, as well as orchard crops, such as

⁴⁷ Johnston, *Cross Sections*, 68.

⁴⁸ Schoenherr, *Natural History*, 1.

⁴⁹ Johnston, *Cross Sections*, 71.

apples. Napa and Sonoma are world famous for the output of vineyards, some in existence since the 1850s. Livestock historically grazed the hills and valleys of this region and today interior valleys still support many cattle ranches and dairies. Poultry production began in Petaluma around 1875. By 1900, eggs were shipped in large quantities, thanks to the railroad, to the Midwest and Eastern states.⁵² The canning of both fruits and vegetables, particularly tomatoes, dramatically increased after 1900.⁵³

Sacramento Valley

The Sacramento Valley is part of the Great Central Valley, which is approximately 500 miles long and forty miles wide, and lies betwixt the Coast Ranges and the Sierra Nevada. The Central Valley “is generally regarded as the richest agricultural valley in the world.”⁵⁴ The principal counties in the Sacramento Valley include Glenn, portions of Butte, Colusa, Yolo, Solano, Yuba, Sutter, and Sacramento. The valley currently has the highest proportion of land in private ownership.⁵⁵ Cooler winters, higher rainfall, and less productive soils characterize the Sacramento Valley in comparison to the San Joaquin Valley, which lies immediately to the south beginning in San Joaquin County.

Scandinavian immigrants arrived in California during the Gold Rush, although small in numbers. They included Finns, Danes, Swedes, Norwegians, and Icelanders. All five cultural groups made important contributions to California’s economy and social history.

Finnish enclaves included Eureka, the Mendocino Coast, San Francisco County, portions of the East Bay, Rocklin in Placer County, and Reedley in the Central Valley. Census figures for 1860, 1870, and 1880 suggest that the majority of California Finns were enumerated as “seamen,” presumably working in the fishing industry. In Humboldt and Mendocino counties Finns were generally employed in the lumber industry.⁵⁰

One of California’s largest enclaves of Danish immigrants is in the Santa Ynez Valley. In 1910 three Danish visionaries contracted to purchase nearly 10,000 acres of land in the valley. The land had been part of the Mexican land grant, Rancho San Carlos de Jonata, and had offered a mild climate, adequate water supply and fertile soil. Stock in the newly formed Danish American Company was issued on October 19, 1910. Soon buildings were underway and businesses were opened in the fledgling town that became known as Solvang. The town included a church and folk school, which evolved into a college in 1914. Solvang has retained much of its rich cultural heritage and has a yearly celebration. Nearby the town were numerous dairies and fields planted in hay and other grains.⁵¹

⁵⁰ Jerry P. Schofer, *Urban and Rural Finnish Communities in California: 1860-1960*, (San Francisco, CA: R & E Research Associates, 1975), 35-41.

⁵¹ Jake R. Sudderth, “Migration of a Cultural Landscape Pattern: Leavenworth & Pacific Northwest Fabricated Communities,” *Columbia: The Magazine of Northwest History* (Winter 2001-2002): 37-44.

⁵² George H. Hart, “Wealth Pyramiding in the Production of Livestock,” in *California Agriculture*, ed. Claude B. Hutchinson, pp. 51-112 (Berkeley, CA: University of California, 1946), 97.

⁵³ Warren P. Tufts, “The Rich Pattern of California Crops,” in *California Agriculture*, ed. Claude B. Hutchinson, pp. 113-238. (Berkeley, CA: University of California, 1946), 146.

⁵⁴ Johnston, *Cross Sections*, 72.

⁵⁵ Johnston, *Cross Sections*, 72.

The Sacramento Valley, historically, served as the center of wheat production in the state. The region, if one were to include the San Joaquin Valley, accounted for three million bushels in 1860, and by 1870, that figure rose to over eleven million bushels, a feat accomplished without use of the combine until after 1870.⁵⁶ California ranked second in the nation in wheat production by 1889. However, barley and alfalfa, much of it grown in the Sacramento Valley, surpassed wheat by 1900.⁵⁷ Today approximately 82 percent of all the cropland in the valley is under irrigation, in part a result of the Central Valley Project (CVP) and the State Water Project (SWP).⁵⁸ Reclamation activities along the Sacramento River resulted in the construction of huge levees to create rich, productive cropland. Wheat, corn, alfalfa, dry beans, sunflowers, safflower, rice, almonds, peaches, pears, prunes, and walnuts are important crops grown in the valley. Rice, a major export crop, first grew in the Sacramento Valley in 1906, and local varieties were soon developed.⁵⁹

San Joaquin Valley

The San Joaquin Valley forms the southernmost part of the Great Central Valley. The region includes the counties of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern. Approximately one third of the state's farmland lies in the San Joaquin Valley, and nearly 90 percent of the valley is currently under irrigation.⁶⁰ No single river runs through the entire valley, although the San Joaquin River drains the northern portion of the valley and forms the core of the state's Delta region. Lake basins, once fed by runoff from the Sierra Nevada, formed the southern end of the valley. Early farming depended upon natural aquifers for irrigation, and on the reclamation of the Tulare and Buena Vista Lake Basins. The 1940s and 1950s saw increased irrigation water into the southern end of the valley through projects such as the California Valley Project (CVP).

The San Joaquin Valley is home to a wide variety of farming enterprises, ranging from smaller, intensively cultivated farms to large, extensive, industrial enterprises. Fruit and nuts are important crops, as are many other field crops (e.g., barley, beans, corn, hay, potatoes, sugar beets, and wheat). Cotton has been among the most important field crops in the valley since its introduction in 1871.⁶¹ Livestock is widely distributed throughout the valley floor, including the former home to the famous Miller and Lux cattle enterprise. Other products include milk, chickens, turkeys, eggs, and apiary products. Grain sorghum became important in the area after 1870 as a summer grain crop.⁶²

⁵⁶ Frank Adams, "The Historical Background of California Agriculture," in *California Agriculture*, ed. Claude B. Hutchinson. pp. 113-238. (Berkeley, CA: University of California, 1946), 35.

⁵⁷ Tufts, *Rich Pattern of California Crops*, 114.

⁵⁸ Johnston, *Cross Sections*, 73.

⁵⁹ Tufts, *Rich Pattern of California Crops*, 117.

⁶⁰ Johnston, *Cross Sections*, 73.

⁶¹ Ibid.

⁶² Tufts, *Rich Pattern of California Crops*, 118.

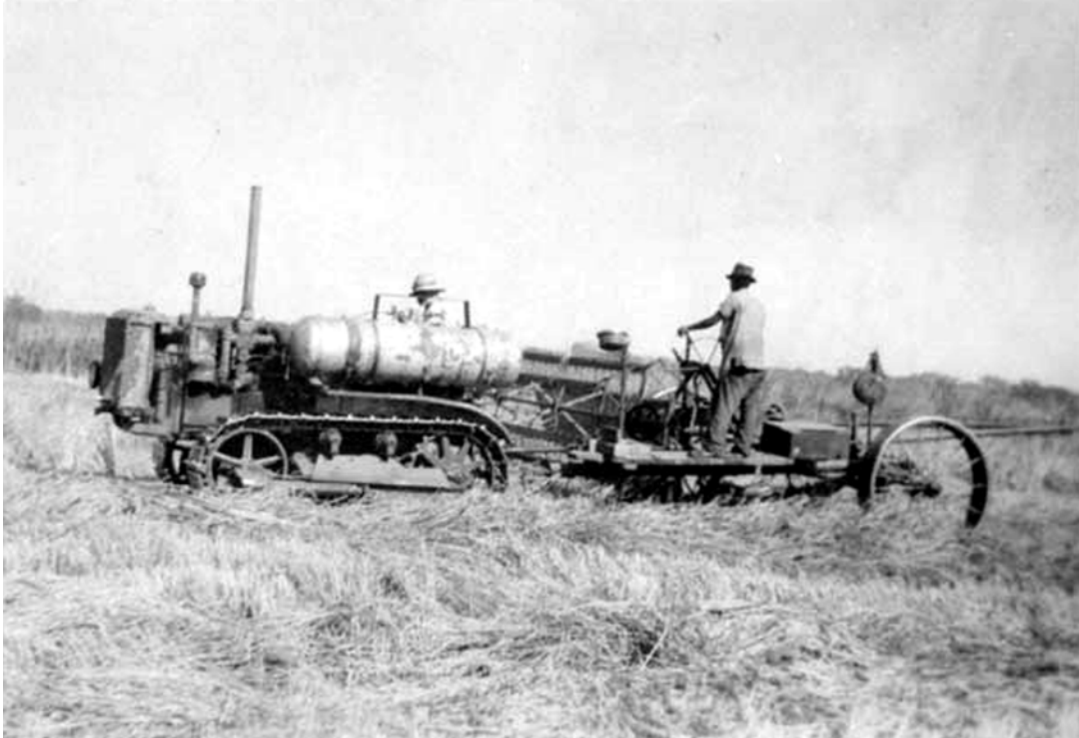


Figure 9: Japanese rice harvesting in Butte County, ca. 1930s (*Japanese American Archival Collection, JC17: 244, Department of Special Collections and University Archives, California State University, Sacramento*).

South Coast

The South Coast region consists of the Peninsular and Transverse ranges and includes the counties of Ventura, Los Angeles, Orange, and San Diego, and the southern portion of Santa Barbara County. The Transverse Range runs east to west, continues into the ocean, and encompasses the Channel Islands. The range, which forms the northern border of the Los Angeles basin, consists of several distinct mountains with peaks over 10,000 feet, including the Santa Monica, San Gabriel, and San Bernardino mountains. The Peninsular Ranges form the northern end of the Baja peninsula and lie west of the San Andreas Fault. The ranges, as well as Santa Catalina and San Clemente islands, have been uplifted along the numerous fault lines that cross the region.

The Los Angeles basin is part of the Peninsular Ranges, although the basin itself is merely lowland filled with sediments from runoff of the Transverse and Peninsular ranges. Marshy grassland characterized the basin before the channelization of the rivers. Precipitation for the entire region is considerably lower than in Northern California, with south-facing slopes averaging 30 to 40 inches of rain and north facing slopes averaging 15 to 20 inches per year. Despite this difference, north-facing slopes are actually moister, because they do not suffer the evaporative effects of the long hot summer. This slope effect causes chaparral to cover south-facing slopes, while north-facing slopes have coniferous forests that extend nearly to the desert floor.

The South Coast, historically, was an important agricultural region. “Los Angeles County was once the most important agricultural county in the United States, measured by the value of its agricultural production” into the 1950s.⁶³ The region is known for its high-value nursery products, fruits, and vegetables, including flowers, avocados, strawberries, wine grapes, dates, broccoli, celery, lettuce, and bell peppers. Citrus trees got their start in the southland with over 45,000 trees planted by 1870.⁶⁴ Livestock has always been economically significant, with dairying important throughout the region’s history. Between the early 1900s and 1930, poultry farms dramatically increased in the south region. Several ostrich farms began in the region in the 1880s to take advantage of the fashionable uses for their feathers. The southland also led the state in turkey farms during the 1890s.⁶⁵



Figure 10: Ostrich farm near Pasadena, San Gabriel Valley. *Ostrich were generally farmed for their feathers or plumes, which were the rage during the late nineteenth and early twentieth century for women’s clothing (Views from a Trip to California, Volume 2, 199.17, courtesy of The Bancroft Library, University of California, Berkeley).*

South Desert

The South Desert region lies east of Los Angeles and includes most of San Bernardino, Riverside, and Imperial counties. Sub-regions include the Antelope, Coachella, Palo Verde, and Imperial valleys. This region includes the Mojave Desert that extends eastward to Nevada and Arizona. The San Bernardino Mountains and the San Andreas Fault form its southern border. The Mojave is the “high desert” in Southern California, with an average elevation of 3,500 feet. Precipitation falls mostly in the winter, with snowfall at higher elevations. Native vegetation includes pinyon pines, Joshua trees, and creosote bush. Much of the land is currently under government management either as military bases (Edwards Air Force Base, Fort Irwin, China Lake Air Weapons Station, upgraded to Mohave National Preserve) or as parklands (Joshua Tree National Park, East Mojave National Scenic Area).

Irrigation provides water for the majority of cropland today, as well as historically, mainly from canal systems conveying water from the Colorado River, such as the All-American Canal. San

⁶³ Johnston, *Cross Section*, 74.

⁶⁴ Adams, *Historical Background*, 40.

⁶⁵ Hart, *Wealth Pyramiding*, 104.

Bernardino and Riverside counties gained recognition for their citrus crops and dairying, industries that continue today. Field production includes alfalfa, cotton, sugar beets, and wheat. During the early 1900s, vegetable production in this region rapidly developed as the demand increased, particularly in eastern markets. By 1929, Imperial County led the state in acres of vegetables.⁶⁶ After 1900, the cantaloupe industry in California began in Imperial and Coachella valleys.⁶⁷ Flax, first planted in the 1930s, quickly expanded in production, as did cotton.⁶⁸

Great Basin Desert

The Great Basin is the largest desert in North America and extends a short way into eastern California. Portions in California include two geomorphic provinces: the Modoc Plateau and the Basin-Range province. The Modoc Plateau, averaging 4,000 to 5,000 feet in elevation, is an undulating flatland east of the Cascades drained by the Pit River. The Basin-Range province lies south and east of the Modoc Plateau, along the eastern edge of the Sierra Nevada. It includes Owens and Death valleys, separated by the Inyo-White Mountains, with many smaller mountain ranges and valleys in between. Ecologically, sagebrush dominates the landscape, with pine trees at higher elevations and saltbush at lower elevations. Most precipitation falls as snow that percolates into the soil as it melts, resulting in lush spring growth. The Los Angeles Aqueduct conveys much of the region's water to Southern California.

The Modoc Plateau, supported by intensive irrigation, supplies alfalfa and other field crops, together with its numerous cattle and sheep ranches. The Owens Valley produced a wide variety of commercially viable crops before Los Angeles Department of Water and Power took much of the viable agricultural land out of production and conveyed the region's water to Southern California. Today, livestock graze on public and private lands, and feed crops, particularly hay and alfalfa, are grown.

GEOMORPHOLOGICAL FACTORS THAT INFLUENCED SETTLEMENT

Agriculturalists, particularly homesteaders, were sensitive to the location and quality of the land, and therefore, attempted to select the most fertile areas where they could easily divert water to their fields. Soils, climate, and geomorphology influenced not only where settlement would occur, but also the type of settlement, the success of the settlement, and ultimately, the productivity and value of the land. Landforms, particularly river or stream courses, were the first visual features that lured settlers to particular locations that were suitable for agricultural use.

A great variety of geomorphologic conditions characterize California. Geographer Allen R. Eigenheer theorizes that settlers used the following criteria to judge the agricultural worth of a particular area:

- Physical features of the landscape, such as vegetation and soil color and texture (a common criterion for virtually all homesteaders or settlers).

⁶⁶ Tufts, *Rich Pattern of California Crops*, 136-137.

⁶⁷ Ibid, 149.

⁶⁸ Ibid, 128.

- The adaptability of crops to an unfamiliar climate (factored by the experience level of the homesteaders or settlers and their personal experience with certain crops).
- The availability of free or cheap land, including the uncertainty of land titles resulting from existing land grants (constantly in flux as lands became settled or reclamation projects opened up new agricultural areas).
- Accessibility of the area to potential markets for commerce and trade (important for long-term sustainability, particularly so for expanding agricultural- based farms or homesteads).
- Availability of a reliable supply of water (critical factor in determining the location of a homestead or settlement. If the water had to be purchased then this cost would have to be weighed before acquiring the land. The longevity of water sources was also a factor in the boom and bust cycles of homesteads).⁶⁹

Geomorphology played a role in influencing each of the above-mentioned criteria, although geomorphologic conditions alone did not serve as a basis for all of them.



Figure 11: Aerial view of Tulare County agricultural land, ca. 1940. Note the uniform grid or patchwork patterns of various fields broken only by rows of trees, curvilinear canals, and roads (The San Joaquin Valley Digitization Project, Tulare County Free Library, George Serpa Collection, San Joaquin Valley & Sierra Foothills Photo Heritage, tps0135, San Joaquin Valley Library System, Fresno, California).

⁶⁹ Allen R. Eigenheer, "Early Perceptions of Agricultural Resources in the Central Valley of California" (Ph.D. diss., University of California, Davis, CA. 1976).

Soils and Landforms

Soils and landforms were important factors in deciding where to settle, not only because of their physical composition and structure, but also because of their visual attributes. The perceived visual similarity of certain provinces in California to their homeland was a powerful force for many immigrants who chose to settle in a specific region. For example, the northern Coast Range in Sonoma County shared many characteristics with northern Italy, and hence Italians from the provinces of Genoa and Tuscany settled in Sonoma County. Similarly, Azoreans settled in large numbers along the Central Coast, particularly in the Monterey region, and Armenians settled in the Fresno area.⁷³ This pattern of selective settlement does not pertain to every immigrant group that settled in California. For many, friends and family members encouraged settlement in a particular locale or region. In other cases, unscrupulous investors who purchased large tracts of land made unrealistic predictions of natural conditions, and while attracting settlement in those areas, a high rate of farm failures often resulted. In order to attract developers and home seekers, local governments through their chambers of commerce would proclaim frequently embellished advantages of their communities.

Crop rotation was an important part of California agriculture. Crop rotation is a centuries-old system, in which farmers continue to grow a series of crops in sequence on the same piece of ground. Farmers generally group crops into three broad categories when they plan rotations: cultivated row crops (including fallow land), hay or sod crops, and close-sown small-grain crops.

While Italian immigration to the United States was less than 10 percent of all immigrants from Europe, between 1890-1930, Italians comprised almost one-quarter of all immigrants arriving in America.⁷⁰

Many of the early Italian or Italian-Swiss immigrants to California had experience in agriculture or the trades. Later waves of Italian immigrants were mainly peasants and common laborers.

By far the highest percentage of Italian immigrants in California settled in the San Francisco Bay Area, although during the 1860s and 1870s many had migrated north to Sonoma and Napa counties and to the Mother Lode Region.⁷¹

By the 1870s Italians and Italian-Swiss could be found working in a wide variety of industries in California, including logging, cattle, wheat, and factories. In the 1870s Alberto Trescony is credited with establishing a major sheep operation in Monterey County and hiring Chinese, local vaqueros, and some of the first Basque shepherds. At one time Trescony controlled a many as 44,000 acres of land in Monterey County. The sheep were sold for meat, wool, and hides.⁷²

⁷⁰ Palmer, Hans Christian Palmer, "Italian Immigration and the Development of California Agriculture." (Ph.D. diss., University of California, Berkeley, 1965), 11.

⁷¹ Ibid, 124.

⁷² Ibid, 203.

⁷³ Robert L. Santos, *Azoreans to California: A History of Migration and Settlement*, (Denair, CA: Alley-Cass Publications, 1995).



Figure 12: Cultivation and grading at the vast Rivergarden Farms, Sacramento County (*Rivergarden Farms, 69, courtesy of The Bancroft Library, University of California, Berkeley*).



Figure 13: Japanese potato diggers in the rich alluvial soils of the Sacramento Delta, ca. 1905 (*Photographs of Agricultural Laborers in California, BANC PIC 1905.02678-PIC, courtesy of The Bancroft Library, University of California, Berkeley*).

Row crops include corn, cotton, fodder roots, potatoes, sugar beets, soybeans, and vegetables. They can be cultivated through the loosening or breaking up of the soil in order to kill weeds before the seeds have time to germinate. Row crops generally facilitate erosion, particularly on sloping land, and require fertilization. Hay or grain crops, however, hold soils and generally reduce soil erosion, and consequently grains played an important part in California agricultural economy during the nineteenth century.

Field operations of the United States Soil Survey, now known as the National Cooperative Soil Survey, began in 1899. The recognition and initial documentation of San Joaquin soil as one of the first four soil series in California considered to have agricultural importance occurred in 1900. The United States Department of Agriculture and the Soil Conservation Service meticulously mapped out the state's diverse soil types and published the results by county between the early 1930s and 1960s. These documents include detailed descriptions, maps, and photographs, and are available at the California State Library, Government Publications Section, Sacramento.

Soil also determined settlement patterns and sustainability. Deep alluvial floodplain soils formed within portions of the Sacramento and San Joaquin valleys. These soils are low in organic material and calcareous at the southern end of the San Joaquin Valley. South of Fresno and Turlock are a series of sandy, wind-modified soils, which are light brown, neutral in reaction, and possess poor water-holding capacity. Organic soils formed by the decomposition of tules and reeds characterize the Delta region. The peat soils are dark colored and acidic in reaction. Terraced lands having red-iron hardpan soils characterize the eastern side of the Central Valley. These soils have dense clay subsoil resting on a silica-iron hardpan impermeable to roots and water. United States Department of Agriculture (USDA) soil surveys initiated around the turn of the century provide important data towards understanding what the soil constituents are in a particular area. This data gathered by the state's early soil scientists assisted agriculturalists in deciding what species of crops to plant, and today the old soils publications can provide archaeologists and historians with a reliable predictive model for the type and degree of agriculture present on any particular site. Overflow lands, which occurred all along the Sacramento and San Joaquin rivers, were detrimental to certain types of cultivation, although settlers took advantage of these seasonally flooded lands for cultivating feed crops, such as barley, oats, wheat, alfalfa, and row crops, such as beans, and for grazing livestock.

Soil and landform are key components towards interpreting the agricultural landscape. The level of knowledge that early-day agriculturalists had regarding soils, climate, and hydrology were particularly important. Agriculturalists with pre-existing knowledge, or those who chose to study scientific data as it became available, generally fared better than their counterparts who relied solely upon traditional methods of farming.

Climate, Droughts, and Flooding

Agriculture is dependent upon the availability of water, whether through rainfall, internal sources within the property such as natural aquifers, wells, or holding tanks, or through external means such as water conveyance systems. In order to provide a consistent supply of water, reservoirs costing immense sums of money were required for most arable lands. The opposite is true for

tule lands that required draining to cultivate the soils. Levees were constructed to keep water out of farmlands until released via ditches, canals, or weirs.

While the state's natural environment offered unlimited potential for the development of agriculture, the actual labor required to sustain certain crops under variable and harsh environmental conditions was an arduous task. Allen Eigenheer notes that during the early 1850s portions of the Sacramento and San Joaquin valleys had an image as being unhealthy, a perception based upon the large areas of marshland generally infested with swarms of malaria-bearing mosquitoes during the summer months.⁷⁴ In addition to disease—a result of bad water and/or insects—floods and droughts played havoc with both miners and farmers, who had little or no foreknowledge of the state's precarious climate.

Before the development of irrigation systems, agriculturalists relied upon seasonal rainfall to replenish the soils, sustain groundwater tables, and germinate seeds for harvest later. Dry-land farmers were particularly vulnerable to droughts, because they relied upon the seasonal rains for germination.

California's geomorphology plays a central role in determining the amount of precipitation and where it would fall. California's agriculturalists could not reliably predict the timing and amounts of rainfall that would fall within any given year.



Figure 14: Fresno Flood of 1884. Note the Hotel Fresno in the background with water lapping at the front door. View of H and Tulare Streets from Southern Pacific Railroad Depot (The San Joaquin Valley Digitization Project, Fresno County Free Library, California History and Genealogy Room, San Joaquin Valley & Sierra Foothills Photo Heritage, fp0143, San Joaquin Valley Library System, Fresno, California).

⁷⁴ Eigenheer, *Early Perceptions*, 187.

Records indicate that California witnessed periodic droughts followed by above-average precipitation. For example, the floods of 1861-1862, one of the wettest years on record, preceded the great drought of 1863-1864.⁷⁵ William H. Brewer, who crisscrossed the state from Los Angeles to the east side of the Sierra, took meticulous notes on its natural landforms and peoples, and observed the flood during the winter of 1861-1862. Brewer provided the following description:

Nearly every house and farm over this immense region [Sacramento Valley through the northern San Joaquin Valley in the foothills of the Sierra] is gone. Such a body of water 250 to 300 miles long and 20 to 60 miles wide had winds that made high waves that beat the farm homes in pieces. America has never before seen such desolation by flood. But the spirits of the people are rising, and it will make them more careful in the future.⁷⁶

During the nineteenth century, lacking any major water impoundments, virtually all of the state's runoff ultimately went out into the Pacific Ocean. During the twentieth century, however, the construction of reservoirs and dams impounded water and helped prevent annual flooding. The drought of 1863-1864 proved particularly devastating to wheat farmers and ranchers, the floods of previous years prevented germination of the next year's crops. The State Agricultural Society filed a report that commented on the drought in 1872 and noted the great scarcity of grazing and hay for stock and the drought's widespread effect on the entire state.⁷⁷ The drought led to a pattern of transhumance characterized by moving livestock, particularly sheep, to the foothills and the Sierra Nevada during the late spring and summer months. The development of many of the state's first irrigation systems also resulted from the 1863-1864 drought. Ultimately, the floods of 1861-62 and the drought of 1863-64 had significant consequences for the development of California agriculture. While the floods spurred improvements to areas subject to seasonal flooding, together with improved transportation systems following the destruction of hundreds of miles of wagon roads and bridges, the drought established a pattern of transhumance that continued unabated in California until the second half of the twentieth century.

By the late 1860s, California's homesteaders had already preempted and improved much of the state's most fertile lands, characterized by high ground outside the flood plain, rich alluvial soils, and mature overstory vegetation, such as sycamores and oaks. The settlement of marginal lands, either within the flood plain or in areas lacking fertile soils or permanent water, generally occurred later. California's Central Valley, one of the most fertile agricultural regions in the United States, still reflects the model presented above, particularly the settlement patterns that followed riparian corridors.

The purveyors of gravity-fed irrigation systems took advantage of the state's natural topography. Of particular importance are the Sierra Nevada and Coast Range that form a ring around the Great Central Valley. Snow accumulates in the mountains drains into a series of rivers and their tributaries and works its way into the valley, ultimately flowing out to the Pacific Ocean.

⁷⁵ Norris Hundley Jr. *The Great Thirst, Californians and Water: A History*, (Berkeley, CA: University of California Press, 2001).

⁷⁶ Sue McClurg, *Water & the Shaping of California*, (Berkeley, CA: Heyday Books, 2000), 41.

⁷⁷ California State Agricultural Society, *Transactions*, 1872.



Figure 15: Friant Kern Canal, Friant Dam, Friant, California, ca. 1945 (*The San Joaquin Valley Digitization Project, Fresno County Free Library, California History and Genealogy Room, San Joaquin Valley & Sierra Foothills Photo Heritage, fp0159, San Joaquin Valley Library System, Fresno, California*).

Mining companies in the early 1850s, and later agriculturalists in the 1880s, faced the challenge of harnessing this great source of power. Clearly, for California's agriculturalists, water was akin to liquid gold, sought so desperately by miners. In California the evolution of water development can be separated into three major topical areas – water for industry, agriculture and domestic use.

One of the most important court decisions involving water rights in California was instigated in 1879 when Henry Miller and his partner, Charles Lux, filed for an injunction against irrigation developer James Ben Ali Haggin. At issue was water from the Kern River in the southern San Joaquin Valley. Miller believed that he held a riparian right to the river, rooted in English Common Law and the California Constitution, which prevented others from taking water, which he needed to grow grass along the river to feed his livestock. Haggin, on the other hand, believed that appropriating the water into a canal, which ran some distance from the river improved the land through irrigation.⁷⁸

What became known as the “Riparian Doctrine,” evolved from English Common Law and held that the owner of the bank of a river owns the right to water flowing past or through the property.

⁷⁸ U.C. Berkeley, California Water Resource Library. “Liquid Gold: California’s Water,” an Exhibit by the Water Resources Center Archives, 1997.

It does not allow water rights attached to the property to be separated. The principle of “Appropriation,” however, provides that the first person to divert water from a stream has the right to continue diverting as much water as needed, even if the water is transported to a location far from the stream. The appropriator has the first right to the water itself, separate from any rights to the land adjacent to the stream from which the water was taken. The conflict that arose between these two principles ultimately resulted in the "California Doctrine" of dual water rights, established by the State Supreme Court in the case of *Lux v. Haggin* in 1886⁷⁹

Following the State Supreme Court's *Lux v. Haggin* ruling, advocates of irrigation projects in the Legislature argued for laws to limit riparian rights. In a special session in 1887, lawmakers debated issues of appropriation, riparian rights, and the role of state government. The most significant legislation to come out of the special session was sponsored by Assemblyman C.C. Wright of Modesto. This law provided for the establishment of irrigation districts under local public control. It did not, however, abolish the "California Doctrine" of dual water rights, which would continue to be defined in later years by the courts. Few of the initial districts formed under the Wright Act, however, were successful, but by the beginning of the twentieth century much of the Central Valley was under cultivation assisted by irrigation districts and private water companies.⁸⁰

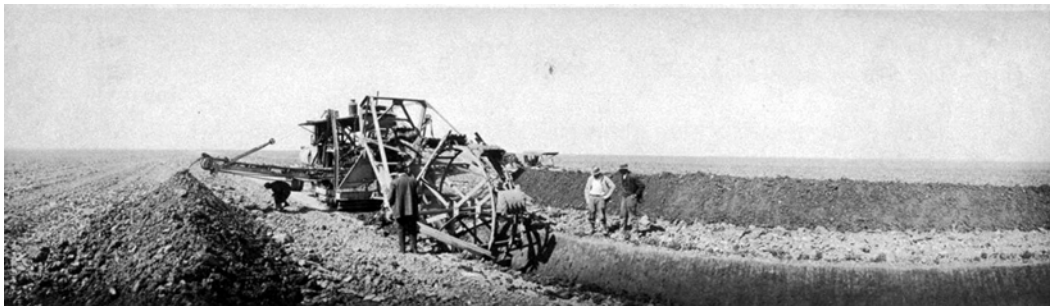


Figure 16: Austen Ditcher bought about 1910 by Solano Irrigation Farms, sold to River Farms in 1916. Pictured here is a ditch being dug in Yolo County, courtesy of The Bancroft Library, University of California, Berkeley).

Following the passage of Wright Act in 1887, Turlock Irrigation District (TID) became the first irrigation district formed in California, with the first water becoming available in 1901, when 3,757 acres were under irrigation. The history of the Modesto Irrigation District (MID) parallels that of TID, with water becoming available in 1904, distributed to over 7,000 acres. Today, the two districts combined irrigate over 200,000 acres of agricultural lands in the lower San Joaquin Valley. To the south other irrigation districts formed around Fresno, and in the 1920s the Department of Public Works' Engineering and Irrigation Division developed the State Water Plan, which called for dams on the Sacramento River above Redding and pumping stations to deliver the water into the San Joaquin Valley.⁸¹ The State Water Plan evolved into the Central Valley Project (CVP), which resulted in the construction of the Shasta Dam and a series of canals that distribute water from Northern to Southern California.

⁷⁹ Ibid.

⁸⁰ Ibid.

⁸¹ Ibid.

While the historic development of water storage and conveyance systems is integral to our understanding of agricultural economics and consequently the level of production, water development in California has been treated in a similar thematic study prepared in December 2000, by JRP Historical Consulting Services under contract with the California Department of Transportation, entitled “Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures.” The California Department of Transportation completed and published the final report.⁸²

The study serves as a useful model for interpreting the evolution of canals, reservoirs, and other water conveyance systems in California, many of which were designed for agricultural use. Other important works that provide a broad context for irrigation and water resources include scholarship by Donald J. Pisani, Norris Hundley, Jr., and Donald Worster.⁸³

In summary, California’s diverse geomorphology lent itself to the development of a wide-range of agricultural properties. Climate, soils, and hydrologic systems together played a part in determining which crops were planted where, at what time of year, and under what conditions. Ironically, the state’s natural resources that once appeared to be unlimited, under certain conditions had real limitations. Droughts, floods, changing groundwater tables, human intervention such as the construction of dams, canals, and reservoirs; and in more recent times the use of pesticides and chemicals, all affected the scale and productivity of farmland and had deleterious effects to the environment.

LAWS AND REGULATIONS GOVERNING THE ACQUISITION OF PUBLIC LANDS

California’s agricultural landscape is as much a product of natural forces as it is of politics, laws, regulations, land acquisition, and cultural influences. The acquisition of California’s public domain proved difficult. The settling of California lands, though often exceedingly slow, resulted from complications from Spanish, and later Mexican land laws and conflicting federal regulations. Beck and Hasse illustrate the relationship of Mexican land grants to regions later subject to intensive agricultural use.⁸⁴

Archaeology can be a valuable tool in comparing claims with the actual improvements.

Colonization of California, notwithstanding the tragic consequences to native peoples, came quickly following the discovery of gold in 1848. For many settlers, it took years to gain clear title to the lands they squatted or preempted. Some were never successful and lost their claims due to unscrupulous attorneys or because they failed to file the proper papers with the local land office in time. Nonetheless, by the late nineteenth century, most of California’s most fertile and accessible lands were under private ownership. Four types of grants ratified by the federal government

⁸² JRP Historical Consulting Services & California Department of Transportation (Caltrans), *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures*, (Sacramento, CA: Caltrans, Cultural Studies Office, 2000).

⁸³ Donald J. Pisani, *From the Family Farm to Agribusiness: The Irrigation Crusade in California and the West, 1850-1931*, (Berkeley, CA: University of California Press, 1984).
Hundley, *Great Thirst*.

Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West*, (New York, NY: Pantheon Books, 1985).

⁸⁴ Warren A. Beck and Ynez D. Haase, *Historical Atlas*.

characterized land disposal by the state between 1841 and 1861. Those state land grants included lands for internal improvements, for swamp or overflow lands, for public schools, and for agricultural or mechanical colleges, such as the University of California, Berkeley.⁸⁵

Between the 1850s and 1860s, capitalized land brokers, such as John Parrott, preempted the tasks usually assigned to the U.S. Land Office. Besides his other business ventures, Parrott specialized in the acquisition and exchange of California lands. Ironically, his iron-front commercial building in San Francisco also housed the officers of the U.S. Board of Land Claims Commissioners.⁸⁶ Parrot also surrounded himself with attorneys, politicians, and influential businessmen, such as Miller and Lux. Parrott's success at helping clients acquire vast tracts of land in California during the early 1850s and 1860s partly resulted from the restructuring of private property rights. The 1851 Land Law, which harmed Mexican land claimants, compelled rancheros to prove their land grant title before the Land Claims Commission in San Francisco or Los Angeles, most often unsuccessfully.⁸⁷

Until 1858, California had no state-administered land sales because local governments generally handled land transactions. Conflicts often arose when the state granted applicants lands through warrants on lands not surveyed. This policy, declared illegal in 1863, along with an 1866 federal law, averted the problem that confirmed titles granted by the state in cases of dual grants.⁸⁸ The most corrupt sales were associated with swamp and school lieu lands, which the office of the State Surveyor General poorly administered. In many cases, unscrupulous attorneys, such as the San Francisco firm of Mullen and Hyde, used dummy buyers to help them in acquiring large tracts of land.⁸⁹ The fact that 516 individuals, including companies and corporations, had holdings over 5,000 acres in size, which covered roughly 8.7 million acres by the 1870s, attests to the dramatic land monopolization that occurred during the mid-nineteenth century in California.⁹⁰

California had eight primary methods of federal land disposal during the latter part of the nineteenth and first half of the twentieth century. They included cash land sales, homesteads, Desert Land Act entries, Timber and Stone Act entries, scrip or lieu, mineral entries, Timber Culture Act entries, and railroad grants. The Preemption Act of 1841, enacted for the settlement of western lands, allowed for cash sales and became the primary method of land acquisition during the nineteenth century. Script and lieu included military bounty warrants, such as those issued after the Civil War, agricultural college scrip, Valentine scrip, Sioux Indian scrip, etc. Through military bounty bills, assignable warrants could be provided to any soldier, or his heirs, who had served a minimum of nine days in any war after 1790 or in the Revolutionary War. Speculators later purchased many of the warrants and used them to acquire land in the West. Exploiting various types of land scrip to acquire land in California also occurred, while the Forest Lieu Land Act of 1897 assisted in the acquisition of the state's valuable timberland. The federal government enacted a number of laws granting lands to aid railroad construction between 1850 and 1871. The allocated sections were alternating, odd-numbered, and within

⁸⁵ Liebman, *California Farmland*, 20-21.

⁸⁶ Igler, *Industrial Cowboys*, 41.

⁸⁷ *Ibid.*, 45.

⁸⁸ Liebman, *California Farmland*, 21.

⁸⁹ *Ibid.*, 22.

⁹⁰ *Ibid.*

twenty miles of the side of a road. In addition, the grant generally exempted all previously disposed-of land. Selling excess land occurred within three years after the construction of the Transcontinental Railroad. By 1958, California had disposed of 38,784,000 acres of federal land.⁹¹

HOMESTEADING THE FRONTIER

The Homestead Act in 1862 is perhaps the most sweeping piece of federal legislation passed during the late nineteenth century. William W. Robinson and Stan Stein examine the effects of federal homesteading laws and their influence on the broad patterns of rural agrarian life in the West.⁹² The data in Table 1 shows the number of homestead claims granted in California. The proportion of claims and claimed acreage to all California agricultural properties differs markedly from other Western and Midwestern states. By 1900 homestead entries stabilized at just under half of all farm and ranch properties. The low proportion of entries reflects substantial consolidations of agricultural land because of prior Mexican and Spanish land grants, fraudulent federal and state land claims, and sections of land deeded to railroads as enticements to develop transportation systems to serve the state.

TABLE 1. FEDERAL LAND RECORDS, CALIFORNIA BY COUNTY

County	Number of Entries	County	Number of Entries
Alameda	2,085	Orange	1,467
Alpine	702	Placer	3,917
Amador	3,109	Plumas	5,654
Butte	5,322	Riverside	12,655
Calaveras	6,045	Sacramento	2,461
Colusa	3,780	San Benito	4,444
Contra Costa	1,920	San Bernardino	34,030
Del Norte	2,228	San Diego	13,289
El Dorado	6,317	San Francisco	86
Fresno	11,823	San Joaquin	3,694
Glenn	3,613	San Luis Obispo	10,031
Humboldt	18,946	San Mateo	1,299
Imperial	9,047	Santa Barbara	5,412
Inyo	3,877	Santa Clara	3,925
Kern	18,780	Santa Cruz	1,551
Kings	2,491	Shasta	9,994
Lake	4,050	Sierra	1,799
Lassen	10,958	Siskiyou	10,714
Los Angeles	10,490	Solano	2,180
Madera	6,758	Sonoma	6,795
Marin	1,124	Stanislaus	4,897
Mariposa	4,317	Sutter	1,961
Mendocino	20,286	Tehama	6,453
Merced	6,142	Trinity	4,379
Modoc	8,959	Tulare	8,991
Mono	2,169	Tuolumne	4,864
Monterey	10,097	Ventura	3,083
Napa	3,148	Yolo	3,140
Nevada	3,615	Yuba	2,067

The data in Table 1 illustrates that the acreage claimed by homesteaders continued to rise until it made up about a third of all agricultural land by 1940. That ratio is deceptive, however, because residual federal lands poorly suited for agriculture characterized most twentieth-century claims. In addition, uncertainty exists about whether or not the data used to create the table accounts for the abandoned and rejected claims that rose greatly after the turn of the century. For example, many Desert Land Entries were never “proven up” due to inadequate water and harsh conditions.

The transfer of public lands to late-nineteenth century settlers is as much of an example of an experiment in socialized agriculture as an ongoing effort by the federal government to encourage settlement west of the Mississippi River. It operated on the theory that “both labor and rewards were distributed evenly through the population; permanent, responsible settlement resulted; families anchored people in space and through time; farm products provided an essential self-sufficiency; and an unlimited cycle of planting and harvesting ran no risk of depletion.”⁹⁴ Homesteading laws deceived many “into thinking that securing a piece of land was all that was necessary to make a competence for the owner.”⁹⁵ In actual practice, much work, investment, and luck proved necessary before even the relatively cheap federal or state lands yielded their first proceeds. Until that time, many homesteaders had to take out loans and live frugally in the hope that this American dream would eventually pay off.

The following summarizes fundamental legislation that enabled settlement of California’s federal and state agricultural lands.⁹³

Preemption Act of 1841: Bona fide settlers could settle upon and purchase at \$1.25 per acre up to 160 acres of surveyed, non-mineral, unoccupied, and unreserved public land. The act extended to California in 1853 and cash sales began in California in that year. The terms of the Preemption Act extended to lands not yet surveyed in 1862. This meant that squatters anywhere on the public domain, on land that did not turn out to be mineral or reserved when surveyed, had the first option to buy that land. In California, preemption was the major source of cash land sales. Repeal of preemptions and cash sales, however, occurred in 1891. Fraud ran rampant and dummy entrymen often put in hastily built improvements, did not cultivate the land, and still filed for entry.

Swampland Act of 1850: Allowed for the segregation and donation of lands designated as “swamp or overflow” to the state, with the proceeds from the sale used for their reclamation. In California, with outright purchasing of federal land prohibited prior to the early 1850s, speculators used this land measure to acquire extensive acreages, particularly in the San Joaquin and Sacramento valleys.

⁹³ David Hornbeck, “The Patenting of California’s Private Land Claims, 1851-1885,” *Geographical Review* 69, No. 4 (1979): 434-448.

Liebman, *California Farmland*, 30-42.

Stein, *Homesteading in Arizona*.

Michael Bedeau, ed., *Homesteading and Agricultural Development Context*. (Vermillion, SD: South Dakota State Historical Preservation Center, 1994).

⁹⁴ Limerick, *Legacy of Conquest*, 124.

⁹⁵ Fite, *The Farmer’s Frontier*, 17.

The unpredictability of nature with its droughts and other risks, combined with the inexperience and poor farming practices of some settlers, led to hardships and the abandonment of many farms across the West and Midwest. The Depression Era Dust Bowl is the most widely known disaster as it ruined many Plains farms and led to a mass migration to California. As Limerick observes, “in their haste to produce marketable crops, farmers did not necessarily work with long-term stability in mind; getting crops in and out could become something close to an extractive industry - another way of mining the soil.”⁹⁶

The methods put into practice by western farmers varied widely, reflecting differences in background, experience, intention, and attitudes toward the environment. Some of the most successful farmers were immigrants who gravitated toward areas and types of agriculture compatible with their traditional homelands. Others came with no experience and disparate motivations.

Bowen recognized at least four distinct motivations for establishing homesteads in Nevada, which seem to mirror homesteads in California.⁹⁷ Claimants included those wishing to establish farms, settlers who wanted to enlarge their existing holdings, those who simply wanted a country estate, and land speculators. These differences clearly influenced land use, residency, and the types of development strategies employed. Fabricated claims, however, were most likely among speculators and claimants adding acreage to an existing

Homestead Act of 1862: Established a pattern of small family farms within the public domain. Individuals who desired additional land could file under both the Preemption and the Homestead Act for land totaling 320 acres. A homesteader had only to be the head of a household and at least 21 years of age to claim a 160-acre parcel of land. Settlers from all walks of life including newly arrived immigrants, farmers from the east, single women, and former slaves came to meet the challenge of “proving up” and keeping this “free land.” Each homesteader had to live on the land, build a home, make improvements, and farm for five years before they were eligible to “prove up.” A total filing fee of \$18 was the only money required. Since both required proof of residence, the first parcel or filing had to be carried to patent before entry on the second parcel. Preemptors, between 1862 and 1880, had an advantage over homesteaders as the right of preemption attached from the date of actual settlement, while the right of homestead dated from the entry at the local land office. Preemptions became commutable to homesteads (land not surveyed could be homesteaded) in 1878 and the right to a homestead pushed back to the date of settlement in 1880. Straw entries also abused this law. Entrymen often sold off the land to engrossers after waiting the necessary six months.

Timber Culture Act of 1873: Entitled an applicant to 160 acres of land naturally devoid of timber if, on the day of the final proof eight years after entry, at least 675 trees were in living and thriving condition on ten acres of the land. Settlement was not a requirement. The purpose of the act was to increase tree cover in sub-humid environments in order to provide a much-needed supply of lumber and fuel. The use of this act was very limited in arid environments. The Timber Culture Act was repealed in 1891 (associated with establishment of Forest Reserves, in 1907 renamed national forests).

⁹⁶ Limerick, *Legacy of Conquest*, 124-125.

⁹⁷ M. Bowen, “The Desert Homestead as a Non-Farm Residence.” *Nevada Historical Society Quarterly* 31, no. 3 (1988): 198-211.

holding, not those with a bona fide interest in establishing a homestead.

The hard realities of the arid West, shortages of labor, costs of transporting crops to market, and depressed wholesale prices forced many aspiring western farmers to abandon their dreams. Lands available for homesteading also became increasingly marginal over time, requiring ever-larger tracts to achieve success. As Gilbert Fite observes, “for most farm operations the needed efficiency required larger units”.⁹⁸ In California, large estates from the Mexican and Spanish eras and enormous holdings controlled by railroad barons led to a pattern of large-scale factory type farming that came to dominate the regional marketplace.

Frank Norris’ classic 1901 novel, *The Octopus: A Story of California* considers how small farmers were often subjected to predatory freight rates that made it difficult for them to compete with larger, capitalized farms. Increasing mechanization also required investments daunting to most small farmers.

In summary, the long-term effect of land disposal in California proved advantageous to some and harmful to others. Large landowners, such as Miller and Lux, acquired hundreds of thousands of acres of land. Nonetheless, settlers frequently used the federal land acts to acquire property through the legal mandates governing land disposal, such as the Homestead and Desert Land Act. To distinguish which lands were actually held under legal title proved difficult, if not impossible for many, because vast tracts of land, as in the case of the Central Valley, were never developed but rather used as open range for grazing livestock.

Desert Land Act of 1877: Designed to promote settlement in arid regions of the country, particularly the Far West. The act had no residency requirement. Each applicant was entitled to 640 acres of land. Twenty-five cents per acre was paid upon filing a desert land claim, and the balance of one dollar per acre was to be paid within three years when proof of reclamation by artificial irrigation was made. Reputedly, this act was designed for speculators or monopolists to acquire vast tracts of land. Because of the minimal \$0.25 down payment and three-year payment period, stockmen and speculators were able to control thousands of acres for a nominal amount, barring entry and use by others.

Enlarged Homestead Act of 1909 (Dry Farming Homestead Act): Extended the 160 acres promised in the original Homestead Act to 320 acres, with five years occupation and cultivation. California was included in the act in 1910. California, Idaho, Kansas, North Dakota, and South Dakota, initially included, were ultimately withdrawn upon request of their congressional representations. Generally, lands that fell under this act were marginal for sustained agriculture. The Act became applicable in California after 1912 (Robinson 1948:169). The Enlarged Homestead Act of 1909 was probably the least important rural Homestead Act for California.

Stock Raising Homestead Act of 1916: Provided for a maximum of 640 acres on grazing land. Residency was required and improvements were valued at \$1.25 per acre. The bill was associated with the “Progressive Movement” in the U.S and the philosophical argument that the act would result in an economic boom to the West. Californians used this act more frequently than others during the 1920s, although lands taken under this act were generally marginal for long-term settlement.

⁹⁸ Fite, *The Farmer’s Frontier*, 238.

THE DIVERSIFICATION OF CALIFORNIA AGRICULTURE

The rapid infusion of settlers into California during the Gold Rush, along with unprecedented technological innovation, resulted in the diversification of agriculture and agricultural products in the state. That diversification led to the establishment of many different types of agricultural properties, while the demand for fresh foods and the high cost of imported food products created an impetus for local agricultural ventures.

Farmers and ranchers initially sought to satisfy local demand by growing a diverse range of products desired by the burgeoning and ethnically diverse population. Markets with a wide range of agricultural products familiar to the newly arrived immigrants emerged because culturally derived food preferences are among the most conservative cultural practices.

The state's diverse geomorphic conditions presented opportunities to grow and experiment with a wide variety of agricultural products. Many purchased seeds and seedlings from nursery catalogs or propagated them from stock available at missions and other early settlements. Commercial nurseries appeared in California during the early 1850s. Ranchers recognized the opportunities available to them in vast open rangelands that under certain conditions could produce abundant feed for their sheep and cattle. Before irrigation, natural groundwater, precipitation, and runoff from winter snows provided agriculturalists with the means to cultivate their crops. As diverse as California's soils and climate were, however, droughts, floods, insects, alkaline soils, and changing market conditions still hampered agriculturalists.

California growers experimented to find the most appropriate plant stocks, including the introduction of exotic species and the creation of new varieties. Plums and prune trees came in from France and Japan; grape vines from France, Italy, Spain, and Germany; and figs from Greece and Turkey. Horticulturists such as Luther Burbank, who settled in California in 1875, developed hundreds of new varieties of plums and other fruits.⁹⁹ Olives, grapes, and other fruits were also propagated using the stock established at California's missions.

Regional and international market conditions influenced production and development of new products. During the 1860s, California served as the principal source of agricultural products for the Comstock boom in Nevada. Until the 1870s, virtually all the fresh products available in the Comstock came from California. Local agriculturalists benefited from improved transportation, starting with the growing role of steam-powered shipping together with the enormous boost that occurred with the completion of the Transcontinental Railroad in 1869.

In many cases, agriculturalists altered their production strategies, which provide opportunities for further research.

The federal government's laissez-faire economic policies gradually faded in the late nineteenth century due to growing international trade imbalances, volatility in gold prices, and political pressure from farmers and American manufacturers.

⁹⁹ Olmstead and Rhode, *Overview of the History*, 7.

Many key trade partners gradually adopted the gold standard as a way to adjust exchange rates. Tariffs imposed on an expanding array of foreign goods directly stimulated increasing diversification of the products grown in California.

Continuing experimentation, coupled with new immigrants with different food preferences, fostered ongoing diversification of the crops grown in California in the early twentieth century. During the Great Depression of the 1930s, direct government subsidies and price controls affected agricultural production.

Table 2 summarizes the production patterns for the state during the late nineteenth century, and Table 3 summarizes the same for the early twentieth century, using data compiled by the U.S. Census Bureau. The compilation of data appears separately because the census changed its methods of accounting from amounts to dollar values. Those patterns reveal only the highlights of statewide production while more detailed summaries of major plant and animal products appear below. The summaries consider changing trends in production through time and devote special attention to the varying material evidence of these different agricultural pursuits. The products grown on farms and ranches also influenced labor patterns.

TABLE 2. CALIFORNIA'S LATE NINETEENTH CENTURY AGRICULTURAL PRODUCTION

Description		1850	1860	1870	1880	1890	1900
<i>Animal-based Production</i>	All Cattle	262,659	1,180,142	631,398	815,044	1,608,418	1,115,194
	Dairy Cows	4,280	205,407	164,093	210,078	317,201	307,245
	Equines	23,385	164,291	209,806	266,053	453,700	480,209
	Swine	2,776	456,396	444,617	868,419	594,009	598,336
	Sheep	17,574	1,088,002	2,768,187	4,152,349	2,475,140	2,563,353
	Poultry	ND	ND	ND	1,610,167	3,987,223	4,196,268
	Milk (gallons)	ND	ND	3,693,021	12,353,178	111,191,186	153,684,741
	Butter (pounds)	705	3,095,035	7,969,744	14,084,405	26,776,704	20,853,360
	Cheese (pounds)	150	1,343,689	3,395,074	2,566,618	3,871,575	4,249,588
	Eggs (dozens)	ND	ND	ND	5,771,323	13,679,423	24,443,540
	Honey (pounds)	ND	12,276	294,326	574,029	3,929,889	3,667,738
<i>Plant-based Production</i>	Barley (bushels)	9,712	4,415,426	8,783,490	12,463,561	17,548,386	ND
	Buckwheat (bushels)	ND	76,887	21,928	22,307	10,388	ND
	Corn (bushels)	12,236	510,708	1,221,222	1,993,325	2,381,270	ND
	Oats (bushels)	ND	1,043,006	1,757,507	1,341,271	1,463,068	ND
	Rye (bushels)	ND	52,140	26,275	181,681	243,871	ND
	Wheat (bushels)	17,328	5,928,470	16,676,702	29,017,707	40,869,337	ND
	Flax Seed (bushels)	ND	ND	13,294	45,770	4,130	ND
	Molasses (gallons)	ND	552	333	2,459	1,670	ND
	Tobacco (pounds)	1,000	3,150	63,809	73,317	12,907	ND
	Hops (pounds)	ND	80	625,064	1,444,077	6,547,338	ND
	Potatoes (bushels)	10,292	2,003,770	2,251,262	4,636,849	3,785,772	ND
	Peas/beans (bushels)	2,292	165,574	380,010	419,777	745,844	ND
	Hay (tons)	2,038	305,655	551,773	1,045,119	2,218,285	ND
*From U.S. Census Bureau compilations at the time of the census. ND=no data compilation available.							

TABLE 3. VALUE OF CALIFORNIA'S AGRICULTURAL PRODUCTION, 1910-1950

Description	1910	1920	1930	1940	1950
All Products	284,553,259	784,629,039	583,026,459	361,479,929	1,741,961,237
Livestock	144,179,180	221,141,462	146,569,400	112,254,656	ND
Market Gardens	12,121,958	47,377,921	1,533,041	ND	180,862,162
Orchards/Vineyards	50,706,869	273,068,064	296,241,840	157,928,799	350,327,175
Cereals	28,039,826	108,570,469	43,040,180	31,212,341	ND
Other Grains & Seeds	7,318,211	38,349,277	28,779,437	17,906,182	ND
Forage	42,187,215	96,121,846	66,862,561	42,177,951	ND

The diversification and capitalization of California agriculture had much broader consequences for the international marketplace, as traditional exporters of many crops, particularly those from the Europe and South America, were driven from the lucrative U.S. market and faced stiff competition from California growers who had introduced similar products on their respective farms.

According to Olmstead and Rhode, the transformation of California agriculture resulted in part because of the following factors:

- Increases in demand for fruit products in eastern urban markets.
- Improvements in transportation, especially the completion of the Transcontinental Railroad in 1869.
- Reductions in the profitability of wheat due to slumping world grain prices and falling local yields.
- The spread of irrigation and accompanying breakup of large land holdings.
- The increased availability of “cheap” labor.
- The accumulation of knowledge about California’s environment and suitable agricultural practices.¹⁰⁰

Other factors that fostered diversification in California agriculture included capital investment, availability of cheap land, the introduction of fertilizers, and more drought and insect resistant plants or seeds. Technological advances in refrigeration, first within the brewing and meat packing industry and later within the perishable vegetable and fruit industry, influenced the market and made shipping products regionally more feasible. Refrigerated rail cars appeared sporadically in the Eastern United States to transport milk and dairy products by the 1840s. The refrigerated rail car, which included insulated cars and ice bunkers, did not make climate-controlled transport relatively safe, efficient, and more feasible until the late 1860s. Even then, long-distance transport during the hot summer months was risky, particularly if a car derailed and delayed the journey.¹⁰¹ During the early twentieth century icing plants were developed in concert with refrigerated marketing facilities along California’s railways.¹⁰²

¹⁰⁰ Ibid, 6.

¹⁰¹ Barbara Krasner-Khait, “Impact of Refrigeration.” *History Magazine*, February/March 2005. <<http://www.history-magazine.com>>. April 2005.

¹⁰² Douglas Cazaux Sackman, “By Their Fruits Ye Shall Know Them: Nature Cross Culture Hybridization and the California Citrus Industry, 1890-1940,” *California History*, Vol. LXXIV, No. 1 (1995): 87.

A variety of publications are available that describe California's agricultural diversity. The *California Farmer* (later the Pacific Rural Press), which dates to 1854, is perhaps the oldest and most informative periodicals on specific products and technology, including individual farms and ranches. The California Agricultural Society published the proceeding of its annual meetings beginning in the 1850s. The society's publications provide a good context for interpreting the evolution of California agriculture, its products, and requisite technologies. A wide variety of more descriptive books emerged between the 1860s and 1880s and often outlined each county's resources as they related to various industries. County or regional histories became widespread after 1880 and extolled the virtues of the region's industries, such as agriculture. Critical analyses regarding the state's diverse agricultural industry appeared later in the twentieth century. Of particular importance to interpreting California's diverse citrus industry is a series of articles that appeared in *California History* in the Spring of 1995. The volume entitled "Citriculture and Southern California" provides a good overview of the citrus industry and how it evolved.

Much of the state's agricultural history has focused on the wheat industry because of its unprecedented economic importance, as well as the consequences of the industry in the development of new technology and the beginnings of mechanized farming. The cattle industry has garnered attention, in books by Paul F. Starr, David Igler, and a series of articles in various journals including the *Journal of San Diego History*.¹⁰³

Interest in the viticulture industry has gained the attention of both historians and journalists in recent years because of brisk wine sales across the United States and has resulted in the publication of hundreds of books and articles on the subject. Vincent Carosso provides a good overview of how the industry evolved in California from the nineteenth through the mid-twentieth century.¹⁰⁴

The following are summaries of specific agricultural industries in California that had a marked change upon the state's physical and cultural landscape. These agricultural industries are categorized and treated in culinary terms and not botanical. Likewise, such culinary categorization and treatment is consistent with the historical and popular literature and receive treatment as such in the common American vernacular and popular imagination. Consequently, botanical terms and concepts are only referred to when they better inform or add insight for the reader on the history of California's agriculture.

THE GRAIN AND FEED CROP INDUSTRY

Much of the literature discussing California's early agriculture focuses on the production of wheat. Wheat became the principal crop of California's farmers during much of the nineteenth century and propelled the state's economy for over two decades. Wheat's preeminence in California during the 1860s and 1870s influenced the scale of farms, and often resulted in

¹⁰³ Paul F. Starr, *Let the Cowboy Ride: Cattle Ranching in the American West*. (Baltimore, MD: Johns Hopkins University Press, 1998).

Igler, *Industrial Cowboys*, 2001.

¹⁰⁴ Vincent P. Carosso, *The California Wine Industry: A Study of the Formative Years 1830-1895*, (Berkeley, CA: University of California Press, 1951).

absentee land ownership, mechanization, and increased debt.¹⁰⁵ By the mid-1850s, according to Olmstead and Rhode, “the state’s wheat output exceeded local consumption, and California’s grain operations began to evolve into a form of agriculture quite different from the family farms of the American North.”¹⁰⁶ The production of wheat and barley in California not only influenced new technologies in the state, but also established a world market for these products.

Two fundamental events created a major wheat boom in California during the 1870s. The first was completion of the transcontinental railroad in 1869, and the second was the introduction of new technology, particularly mechanical equipment such as threshing machines that improved production and made rather infertile land suitable for wheat production.¹⁰⁷

No fewer than 25 varieties of wheat were exhibited at the Third District Agricultural Association Meetings in California in 1880. The Third District included Sutter, Yuba, Butte, Colusa, Tehama, Yolo, and Sacramento counties. Sutter, Butte, Colusa, and Yuba counties were credited with producing 8,867,356 bushels of the 17,451,181 bushels reported by the assessor’s offices in California in 1880.¹⁰⁸

By 1889, California had approximately 3.5 million acres of land dedicated to wheat production, most of it in the Central Valley. As important as California’s wheat production was during the nineteenth century, by the twentieth century, wheat production plunged by seventy-six percent and total acreage fell by fifty percent. This abrupt shift left thousands of acres of land idle and much of this land was infertile due to over-production with very little thought given to crop rotation or the use of fertilizers to enhance the crop yields.¹⁰⁹



Figure 17: Hand-stacking wheat circa 1920s (Keystone-Mast Collection, KU45933, UCR/California Museum of Photography, University of California, Riverside).

¹⁰⁵ Jelinek, *Harvest Empire*, 39.

¹⁰⁶ Olmstead and Rhode, *Overview of the History*, 2.

¹⁰⁷ Morton Rothstein, “The California Wheat Kings,” (Davis, CA: University of California, Agricultural History Center, Working Paper Series, 1985), 4.

¹⁰⁸ California State Agricultural Society, *Transactions, 1881*: 268-269.

¹⁰⁹ Olmstead and Rhode, *Overview of the History*, 3.

In concert with the production of wheat and barley was the planting of alfalfa. According to Santos:

Alfalfa was grown in ancient Egypt, Greece, and Rome. Its name meant, “horse fodder.” It came to be known as *lucern* or *lucerne* in France and England. Alfalfa came to California from Chile in 1851 and was called “Chilean clover.” In 1851, W.E. Cameron had planted several hundred acres of alfalfa along the Yuba River near Marysville. Alfalfa became particularly adaptable to California’s climate and soil. When irrigated the plant is quite productive.¹¹⁰

Articles on alfalfa first appeared in the *Transactions* of the California State Agricultural Society during the year of 1872, while others followed in 1878, 1887, 1892, 1894, 1903, and 1909. Each article discussed planting techniques, soils, fertilizers, harvesting, and many other useful topics important to California’s farmers.

According to Olmstead and Rhode, between 1859 and 1929, because of irrigation, increased production of alfalfa, and mechanization, the number of farms increased about seven hundred percent. “The average size of farms dropped from roughly 475 acres per farm in 1869 to about



Figure 18: Agricultural Implement Store Orange County, Michael Eltiste & Son Store Interior, 1910
(Orange Public Library Local History Collection, Orange Public Library, Orange, California).

¹¹⁰ Santos, *Azoreans to California*.



Figure 19: Haystacks and hay wagons in Kings County area, ca. 1880s. *The San Joaquin Valley Digitization Project, Kings County Library, San Joaquin Valley & Sierra Foothills Photo Heritage, kia0141, San Joaquin Valley Library System, Fresno, California).*

220 acres in 1929, and improved land per farm dropped from 260 acres to about 84 acres over the same period.”¹¹¹ Irrigation followed in concert with intensification and diversification of California’s farms. By 1929, nearly 16 percent of California’s farmland had some form of irrigation.¹¹²

California’s agriculturalists produced products that were in high demand, like wheat, barley, alfalfa, and hay. Because of the vast numbers of livestock imported into California during and after the Gold Rush, the demand for feed crops such as hay outstripped the supply available. While the Central Valley concentrated on the lucrative wheat market, mountainous counties, such as Mendocino and Siskiyou, produced the highest tonnage of hay during the 1870s. In Mendocino County, 75,000 acres went to hay, and production rose to 137,000 tons in 1870-71.¹¹³

Wheat and hay alone did not drive California’s economy during the mid to the late-nineteenth century. During the 1850s much of what Californians consumed came from the East Coast and from a wide range of countries. Importation also meant relatively high prices for agricultural products as well as including implements such as shovels, plows, spades, axes, threshing

¹¹¹ Olmstead and Rhode, *Overview of the History*, 4.

¹¹² Ibid.

¹¹³ California State Agricultural Society. *Transactions*, 1872: 392.

machines, straw cutters, rakes, pitchforks, hoes, butter churns, and flour mills, to name a few. Products that reached San Francisco were then shipped out via the Sacramento or San Joaquin rivers to various distribution points such as Red Bluff, Marysville, Sacramento, and Stockton. From these commercial hubs, jobbers would re-sell the merchandise at much higher prices. In some cases, products were shipped out once again via wagons to rural outlets where local merchants would sell them at even higher prices. Because of the cost of transportation and strong demand, prices remained high for most agricultural products in California through the 1850s and 1860s.

Types of material remains associated with grain and forage production include plows for cultivation and planting, shelters such as barns, farriery associated with draft animals, harvesting machines that evolved over time, and silos and granaries for product storage. Grain and forage-production properties often required seasonal or temporary laborers. Those workers may have lived in temporary camps, served by traveling food wagons, or in more permanent housing near the core residential area of farms or ranches.

ORCHARD CROPS AND THE CITRUS INDUSTRY

The antecedents of California's citrus, olive, fig, and grape industries began during the Spanish and later Mission Period. The Spanish reportedly planted 400 citrus seedlings on six acres around 1804 or 1805 at San Gabriel Mission.¹¹⁴ Following secularization of the missions in the 1830s, William Wolfskill in Southern California acquired some of the surviving trees and replanted them on his property. Yet, colonists in Riverside did not plant large numbers of citrus trees until the 1870s. Riverside's citrus industry dramatically increased during the 1880s, and promotion of



Figure 20: Agricultural exhibit for Tulare County at the San Diego Exposition, 1915. Note the effort that went into arranging the exhibit and the indication of the importance of agriculture in the state during the period (The San Joaquin Valley Digitization Project, Tulare County Free Library, Annie R. Mitchell Hist, San Joaquin Valley & Sierra Foothills Photo Heritage, tca0006, San Joaquin Valley Library System, Fresno, California).

¹¹⁴ Gilbert G. Gonzalez, "Women, Work, and Community in the Mexican Colonies of Southern California Citrus Belt," *California History* 74, no.1, (2001): 18.

the region increasingly focused on its potential wealth in agriculture.¹¹⁵

Oranges, pears, cherries, plums, prunes, peaches, apples, figs, apricots, nectarines, and grapes were planted in the state beginning in the nineteenth century. In 1849, several miles north of Sacramento on 50 acres of land, A. P. Smith began one of the state's first nurseries. In 1850, Smith planted pears, which he exhibited at the state fair several years later.¹¹⁶ Nurseries developed in San Jose, Alameda, Napa, and Stockton by the mid-1850s. Charles Reed started a nursery in Sacramento in 1855 and introduced 20,000 fruit trees and a quantity of fruit seed. In 1856, he had one million trees in his nursery.¹¹⁷



Figure 21: Apple harvest, ca. 1922. Note the use of wooden barrels for gathering and packing. (Keystone-Mast Collection, KU43616, UCR/California Museum of Photography, University of California, Riverside).

By 1859, California had a reported 212,650 pear trees planted. By 1930 over 728,000 fruit trees had been planted in Sacramento County alone.¹¹⁸ The pear blight of the 1950s, however,

¹¹⁵ Ibid, 19.

¹¹⁶ Harry M. Butterfield, *History of Deciduous Fruits in California*, (Sacramento, CA: California Fruit Exchange, 1938): 4.

¹¹⁷ Ibid, 5.

¹¹⁸ Ibid, 5.

virtually wiped out the state's pear industry. By the 1870s, California exceeded most other states in orchard-related crops. In 1870-71, Santa Clara County alone had planted 1,107,840 apple trees, in addition to 83,650 peach trees, 75,260 pear trees, 25,890 plum trees, and 20,430 cherry trees.¹¹⁹ In 1889, California reportedly distributed 780,000 boxes of fruit to various markets. Only 30 years earlier, the United States imported virtually its entire citrus produce.¹²⁰

Regional variations among orchard crops were a result of demand, adequate soils, available technology, and irrigation. For example, cherry production developed in Sacramento in the early 1850s, but by the mid-1850s the industry shifted to Santa Clara County. Thousands of trees planted in San Jose by the late 1850s offered a wide variety of species. Napa County also earned a reputation as a cherry producer until growers noticed that cherries ripened earlier to the south resulting in a gradual shift towards the Vacaville area.¹²¹ While production of fruit, such as cherries, was largely successful, marketing the product was fraught with difficulties, particularly in transporting perishable goods to market, until efficient rail service became available. During the early 1900s, persimmons, raisins, apricots, nectarines, quinces, and pomegranates gained importance as California's orchard industry expanded.

THE CITRUS INDUSTRY

The introduction of thousands of new species of crops by the late nineteenth century transformed California's agriculture. "Between 1890 and 1914, the California farm economy swiftly shifted from large-scale ranching and grain-growing operations to smaller-scale, intensive fruit cultivation."¹²² By the 1910s, California emerged as the world's principal producer of grapes, citrus, and a wide variety of other fruits. Along with the diversification of crops came allied industries, such as canning, packing, food machinery, and transportation services.¹²³

California's fruit industry would never have been so significant to the state's economy without the immigrant laborers who sustained the industry. Minorities, such as Chinese, Japanese, Filipinos, and Mexicans created a workforce that drove the industry to financial success. Women and children also played a significant role in the prosperity realized by California citrus farmers. What emerged within the state's agricultural belts were villages integral to individual or multiple farming units. From grain farms to a variety of specialized farms, agriculture expanded throughout the state's geomorphic provinces. By the late nineteenth century, regional specialization became the norm.

When specific species of citrus or other fruits were first introduced to California farms is a research question that may be addressed through documentary and archaeological evidence. Pollen analysis performed in deposits from privies or other sealed deposits may address questions related to cultural preferences and the dating of specific species of fruit to a particular site or region.

¹¹⁹ California State Agricultural Society, *Transactions*, 1872: 392.

¹²⁰ California State Agricultural Society, *Transactions*, 1890: 194-195.

¹²¹ Butterfield, *History of Deciduous Fruits*, 8.

¹²² Olmstead and Rhode, *Overview of the History*, 3.

¹²³ *Ibid*, 4.



Figure 22: Japanese-American farmers working on a typical “truck” farm in Florin, near Sacramento, early 1900s. Many Japanese immigrants planted grapes and strawberries in Florin. They learned about the shallow soil and, by planting grapes between rows of berries, they insured two crops annually (Japanese American Archival Collection, JC17:112, Department of Special Collections and University Archives, California State University, Sacramento).

Citrus production extended through twelve counties of southern, central, and Northern California. Citrus emerged as the state’s principal agricultural product by the 1930s and became the predominant product of the Southern California economy.¹²⁴ In California, citrus production peaked during World War II and then declined. The expanding network of suburban and urban developments, such as Anaheim, Tustin, and Garden Grove in Southern California, engulfed the small citrus related villages.¹²⁵

The Chinese were the first cultural group to participate as laborers in virtually every agricultural industry. Japanese laborers replaced diminishing Chinese laborers following the passage of the Exclusion Act in 1882. Japanese remained a dominant part of the industry through the early 1900s, when a large influx of Mexican laborers appeared, filling the demand for pickers.¹²⁶ According to Gonzalez, “most Mexican citrus worker communities formed during the 1910-30 migration, and later evolved into today’s suburban barrios.”¹²⁷

The commercialization and specialization of citrus farms, for example, had a markedly different history from the general fruit or orchard industry. This translated into company or corporate

¹²⁴ Gilbert G. Gonzalez, *Labor and Community: Mexican Citrus Worker Villages in a Southern California County, 1900-1950*, (Champaign, IL: University of Illinois Press, 1994): 6.

¹²⁵ *Ibid.*, 58-68.

¹²⁶ *Ibid.*, 6.

¹²⁷ Gonzalez, *Women, Work, and Community*, 7.

giants such as Sunkist, which carefully managed a segregated class structure in all its operations. Family-owned orchard crops characterized the citrus industry with seasonal laborers doing the bulk of the work. Fundamental differences should be manifest when comparing the physical composition of the farms and labor camps. Orchard crops, particularly citrus, required more sustained labor than other crops, due to killing frosts, maintenance of the irrigation systems, picking the fruit, and pruning. Thus, while fundamental differences should be evident through the physical composition of the farms and labor camps, often more permanent types of worker housing are present at farms that grew citrus or orchard products. In addition to worker housing, properties devoted to orchard crops often had barns for temporary produce storage and processing areas or sheds associated with drying and packaging the crops.

Agricultural work camps were like their counterparts in other industries, artificial communities created by employers, in most cases never designed to be complete, full-service towns.¹²⁸



Figure 23: Depression era migrant labor camp (Little Hooverville) in Sacramento below a river levee, ca. 1939 (*Migrant Labor Camp Photographs from the Harry Everett Drobish Papers, BANC PIC 1954.013:48—PIC, courtesy of The Bancroft Library, University of California, Berkeley*).

¹²⁸ Thad M. Van Bueren, Judith Marvin, Sunshine Psota, and Michael Stoyka. *Building the Los Angeles Aqueduct: Archaeological Data Recovery at the Alabama Gates Construction Camp*, (Bishop, CA: California Department of Transportation, 1999).

They often provided only the most meager amenities and workers had to simply camp out. Room and board was typically deducted from wages. In some cases employers deliberately paid with checks from distant banks, discounting wages paid in cash, or offering scrip redeemable at company stores where exploited workers encountered inflated pricing. These hidden costs effectively reduced real earnings and created a captive market that employers took advantage of to reduce their overall operating costs.



Figure 24: Japanese laborers and white foremen in a vegetable field, ca. 1905 (Photographs of Agricultural Laborers in California, BANC PIC 1905.02641-PIC, courtesy of The Bancroft Library, University of California, Berkeley).

Housing for workers has taken a myriad of forms depending in part on the geographical location of the work, duration and timing of work, capital investment by owners, and the particular crop harvested. Housing for workers typically appeared on-site, particularly in the days before automobile and truck transportation, because of farms and ranches' rural location. If the work proved short, such as the harvesting of a specific crop, workers may have just camped out. Operations that required labor for longer periods or even year round, however, likely had some kind of permanent housing. In some cases, large agricultural operations had company-owned housing off-site. In addition, some workers rented private housing or a room in a nearby town. Therefore, worker housing may vary from ephemeral campsites to more permanent wood frame dwellings. Some operations may have had company stores and other facilities designed to service the seasonal workers. Each of these settlement enclaves had its distinctive

Among the first wave of immigrants that entered the agricultural workforce as laborers, were the Overseas Chinese. The majority of Chinese immigrants were from the provinces of Kwangtung, whose industries were associated largely with agriculture.¹²⁹ According to Chan, there were four stages in Chinese occupation patterns in California:

- **An initial period from 1850 to 1865 when the Chinese worked mainly as miners and traders;**
- **a period of growth and development from 1865 to the late 1870s, when they branched into agriculture, light manufacturing, and common labor;**
- **a period of consolidation from the late 1870s to the late 1880s, when they competed successfully with others in a wide variety of occupations; and**
- **a period of decline from the late 1880s to the turn of the century, when they were forced to abandon many occupations.¹³⁰**

¹²⁹ Chan, *Bitter Sweet Soil*, 16-17.

¹³⁰ Ibid, 52.

characteristics dictated by the owner or operator.¹³¹

Finally, agricultural diversification helped sustain other industries and formed the nucleus of the state's trucking industry after World War II. It also required an unprecedented amount of human labor and resulted in the creation of thousands of farms scattered throughout the state. In the words of A. Whitney Griswold, a political scientist and former president of Yale University:

Family farming cannot save democracy. Only democracy can save the family farm. A family farm of the type and dimensions stipulated by our theory --- one 'on which the operator, with the help of his family and perhaps a moderate amount of outside labor, can make a satisfactory living and maintain the farm's productivity and assets' --- affords scope for a citizen to live and work more or less on his own terms, to develop the initiative and resourcefulness, the sense of responsibility and the self-respect that have always and everywhere been considered among the greatest assets of democracy.¹³²



Figure 25: Arvin Migratory Labor Camp, Spring 1936. Note the row of tent dwellings on the right and a sanitary unit on the left. (Migrant Labor Camp Photographs from the Harry Everett Drobish Papers, BANC PIC 1954.013:20-PIC, courtesy of The Bancroft Library, University of California, Berkeley).

¹³¹ Gregory R. Woirol, *In the Floating Army: F. C. Mills on Itinerant Life in California, 1914*, (Chicago, IL: University of Illinois Press, 1992).

¹³² Richard Griswold del Castillo & Richard A. Garcia, *Cesar Chavez: A Triumph of Spirit*, (Norman, OK: University of Oklahoma Press, 1995).

Unfortunately, not everyone could own a farm, and for those that could not, it meant being dependent upon the growers to provide sustainable employment in an industry fraught with abuse and neglect for its workers through the nineteenth and most of the twentieth century.

Plums and Prunes

The plum and prune industry in California has its antecedents in the late eighteenth century at missions, such as Santa Barbara, San Gabriel, Santa Clara, and San Luis Rey. Known as the “mission prune,” plums grew at Santa Clara Mission as late as the 1870s. The first commercial plum production in California was reportedly at Seth Lewelling’s ranch in Sacramento around 1851. The first plums imported to the ranch came from Valpariso, Chile, but by the early 1850s, over 18 varieties were grown, and that number doubled by the late 1850s.¹³³ The Santa Clara Valley became a center for plum production in the 1850s, and by 1859 a reported 105,631 plum trees grew in California. The first prunes grown in California were in the mission gardens, and the first prunes reportedly appeared on display at the California State Fair in 1863.¹³⁴

The Japanese plum first appeared in California in 1870, and Luther Burbank introduced other Japanese varieties in the 1880s. Plums, like other perishable fruit, were constrained to sales within a local market until the advent of railroads and refrigeration.¹³⁵ Plums grew in ranches throughout the Sierra Nevada foothills by the 1920s. Like apples, plums are one of the most common species found in many homestead sites.

Peaches

Peaches enjoyed widespread popularity in California during the nineteenth and twentieth centuries. During the 1790s, the Spanish planted peaches in mission gardens, such as Mission Dolores and Santa Clara.¹³⁶ Likewise, the Russians reportedly planted peaches at Fort Ross in 1814.¹³⁷ Sutter planted peaches and nectarines in his orchards in 1851, and Lewelling is credited with importing the first peach varieties to California for his Sacramento orchards. Three to four million peach trees reportedly grew in the state by the 1890s, and that number increased to over 13 million by 1924. The commercial canning of peaches occurred with increased planting and surplus inventories. The first peaches commercially canned were freestones and, later, clings. In 1886, 675,000 packed peach cases reportedly shipped from California. The total soared to two million cases by 1913 and reached five million cases during World War II.¹³⁸ Peach orchards developed along the east side of the upper Sacramento Valley between Marysville and Chico during the 1930s. Today, that region forms an important part of the state’s peach industry.

Apples

Apples were another important variety of fruit grown in California during the nineteenth and twentieth century. California’s native apple species, commonly known as the “crab apple,” were

¹³³ Butterfield, *History of Deciduous Fruits*, 9.

¹³⁴ Ibid, 10.

¹³⁵ Ibid, 12-13.

¹³⁶ Ibid, 14.

¹³⁷ Ibid, 15.

¹³⁸ Ibid, 18.

a food source for California Indians and early settlers. Apples were grown in the missions and at Fort Ross by Russian colonists. The Russians planted Gravenstein apples, a variety that gained widespread popularity during the nineteenth century.¹³⁹ In 1850, William. H. Nash and R. L. Kilburn are credited with importing the first varieties of apples from New York, including Rhode Island Greening, Roxbury Russet, Winesap, Red Romanite, and Esopus Spitzenberg. Kilburn and Nash planted these trees in Napa Valley near Calistoga.¹⁴⁰ By the mid to late 1850s, apple orchards had sprung up along the Sacramento and Santa Clara valleys and in the foothills of the Sierra Nevada. By the late 1850s, Santa Clara Valley had earned a reputation as one the state's principal apple producing regions. In 1857, Smith and Winchell had 100,000 trees in their nursery alone.¹⁴¹ Apples also appeared in Southern California. The numbers, however, were fewer than in the northern part of the state. In 1910, 2,482,762 bearing apple trees grew in California. That number increased to almost 2.9 million in 1930.¹⁴² Dried apples were also popular during the nineteenth century. In 1911, nine million pounds were dried in California, with Sonoma and Santa Cruz leading the state.¹⁴³

Figs

Figs were an important part of the state's fruit industry during the late nineteenth and twentieth centuries. Figs have fewer varieties as compared to many other fruits grown in California. During the California Mission Period, the common fig was referred to as the Mission, Black Mission, Black Mexican, California Black, or San Jose Black.¹⁴⁴ During the 1850s, figs grew in rancho gardens and ultimately found their way to early farms and ranches across the state, some growing to enormous size. The importation of other varieties of figs, many from France, began during the 1850s, and California nurseries began to advertise figs in their stock. William B. West of Stockton, one of the earliest fig growers, planted the varieties he imported from Massachusetts in the early 1850s.¹⁴⁵ Also, the Smyrna fig, a popular fruit, first appeared in California during the 1870s, and over 100 other varieties of figs surfaced by the early 1900s. Dried figs appeared early but did not become a part of the market until the 1880s. Nonetheless, by 1936, production of dried figs reached 20,000 tons and fresh fig production 9,600 tons.¹⁴⁶

Raisins

Raisins were reportedly introduced to California during the 1860s, although dried grape production for local consumption developed during the Spanish and Mission periods. B. N. Bugbey of Natoma Vineyards near Folsom, Sacramento County emerged as one of the first commercial growers of raisins. In 1867, Bugbey advertised 1,500 boxes of fresh California raisins. Large pans, heated at night, were once used to dry grapes into raisins; later the pans were replaced with paper trays. Curing machines for making raisins first sold during the 1870s. The commercial value raisins increased after the introduction of seeded raisins and the output

¹³⁹ Ibid, 19-20.

¹⁴⁰ Ibid, 20.

¹⁴¹ Ibid, 21.

¹⁴² Ibid, 22.

¹⁴³ Ibid, 22.

¹⁴⁴ Ibid, 24.

¹⁴⁵ Ibid, 25.

¹⁴⁶ Ibid, 27.



Figure 26: Raisins and figs drying on burlap ground cloth at Rancho El Tejon, Kern County, ca. 1880s (*The San Joaquin Valley Digitization Project, Beale Memorial Library Local History Room, Bakersfield, CA, San Joaquin Valley & Sierra Foothills Photo Heritage, kew0012, San Joaquin Valley Library System, Fresno, California*).

rose to 700 tons in 1896, increasing to 43,000 tons in 1912.¹⁴⁷ The raisin industry was one of the first in California to form cooperatives, employing a variety of ethnic groups, particularly Armenians from the Fresno area.¹⁴⁸

APRICOTS, QUINCES, AND POMEGRANATES

The introduction of apricots, like peaches, occurred during the Spanish Period. Improved varieties of apricots were propagated during the 1850s in Sacramento, Alameda, San Jose, and other regions of the state.¹⁴⁹ Apricots, although well adapted to California's climate, were susceptible to frost, and thus were not grown in the same quantities as other popular fruits, such as peaches. In 1886, California reportedly harvested over three million pounds of apricots. While dried apricots became popular in the 1880s, large commercial packs of canned apricots did not reach the market until after 1900.¹⁵⁰ The introduction of nectarines, unlike many of the state's other fruits, did not take place until after 1850. By 1938, about 147,306 nectarine trees grew in the state.¹⁵¹

¹⁴⁷ Ibid, 31.

¹⁴⁸ Victoria Saker Woeste, *The Farmer Benevolent Trust: Law and Agricultural Cooperation in Industrial America, 1865-1945*, (Chapel Hill, NC: University of North Carolina Press, 1998)

¹⁴⁹ Butterfield, *History of Deciduous Fruits*, 33.

¹⁵⁰ Ibid, 34.

¹⁵¹ Ibid, 35.



Figure 27: McPherson warehouse and fruit processing plant, ca. 1880, Orange, California. *The McPherson warehouse is shown here when the raisin industry was in full swing (Orange Public Library Local History, Orange Public Library, Orange, California).*

Quinces and pomegranates date to the Spanish and Mission periods, although persimmons were not grown in the state until the early 1850s. During the first decades of the twentieth century, most of the state's quince production occurred within Placer, San Bernardino, Sonoma, Sutter and Tulare counties.¹⁵² Also, at that time large pomegranate orchards were established, focused largely in Fresno, Tulare, Imperial, Kern, and Riverside counties. Pomegranates never saw widespread commercial popularity in California.¹⁵³

NUTS (DRUPES)

The history of California's nut or drupe crops is as varied as the products themselves. Nuts are often confused with seeds and drupes, such as almonds (a drupe) and cashews (a seed). To be more precise, a nut, in the botanical sense, is a dry fruit with one seed, rarely two, in which the ovary wall or part of it becomes very hard (stony or woody) at maturity. Furthermore, while a nut is a seed, not all seeds are nuts. A seed comes from fruit and can be removed from the fruit while a nut is a compound ovary that is both the seed and the fruit that cannot be separated, such as a hazelnut or chestnut. Technically, a drupe is a type of fruit in which an outer fleshy part (exocarp or skin and mesocarp or flesh) surrounds a shell (the pit or stone) of hardened endocarp with a seed inside. Thus, some of the more popular drupes in California, more commonly associated with fruits, include peaches, plums, and cherries. These "fruits," however, receive discussion with citrus and orchard crops in this report. Likewise, just as most drupes receive

¹⁵² Ibid, 37.

¹⁵³ Ibid, 37.

discussion under the guise of fruits, historically and in literature, so do they receive treatment as nuts both in the culinary world and in literature. Indeed, numerous agricultural histories of California, such as Claude B. Hutchinson's *California Agriculture* and Harry M. Butterfield's *A History of Subtropical Fruits and Nuts in California*, treat drupes such as almonds and walnuts as nuts, while cherries and plums are treated as fruits. For the purposes of this study, drupes commonly referred to as nuts, as well as one true nut, the chestnut, are all treated as nuts.

Chestnuts are California's commercial true nut crop, although today small in numbers with only 155 acres under cultivation in 2005 (personal communication; Ken Trott, California Department of Agriculture, January 2006). Immigrants brought chestnuts to California during the Gold Rush, mostly as seed of the European chestnut, but also some chestnuts of mixed origin and grafted varieties. Hundred-plus- year-old chestnut trees still exist in the Mother Lode, as well as in the North Coast and Central Valley. Most of the current chestnut production in California reflects post-World War II production.¹⁵⁴

The most successful nuts grown commercially in California are walnuts and almonds. Post World War II era nut production also included macadamia, pistachio, and pecan. Most pecan plantings in California occurred in the San Joaquin Valley after 1980.¹⁵⁵

Professor C. H. Dwinelle of the University of California at Berkeley first introduced the macadamia nut to California in 1877. He obtained seeds from Australia and planted several seedlings along Strawberry Creek on the Berkeley campus. In addition, two nurserymen, Ernest Braunton and Charles Knowlton, started selling seedling trees in Southern California around 1910. Yet, commercial planting of macadamia did not begin in California until 1946 when Robert W. Todd planted two acres of seedling trees on his property on Grandview Street in Oceanside. Today, the macadamia grows from San Luis Obispo south to the Mexican border. Southern California has in the neighborhood of 2,500 acres planted in macadamias.¹⁵⁶

American traders first introduced the pistachio in the 1880s, primarily because of increased demand. In 1929 the commercial development of pistachios began when American plant scientist William E. Whitehouse spent six months in Persia (modern day Iran) collecting seed that he brought back to California. The next year, experimental plantings were established in California. Yet, no standout pistachio trees emerged until 1950, because pistachio trees require at least a full seven to ten years maturing. The California variety, named Kerman for the famous carpet-making city near which the seed came from, began to expand throughout the state in the 1960s. another account suggests that Kerman was actually named after two land speculators who subdivided and sold lots off to start the town (personal communication; Ken Trott, California Department of Agriculture, January 2006). Today California is the second largest producer of pistachios worldwide and has over 100,000 acres planted.¹⁵⁷

¹⁵⁴ Paul Vossen, "Chestnut Culture in California," Publication 8010 (Oakland, CA: University of California Division of Agriculture and Natural Resources, 2004)

¹⁵⁵ Esteban Herrera, *Historical Background of Pecan Plantings in the Western Region*, (College of Agriculture and Home Economics, New Mexico State University, Guide H-626 PH 1-110, 2000) <http://www.cahe.nmsu.edu/pubs/_h/h-626.html>. December 2005.

¹⁵⁶ California Macadamia Society, *The Macadamia*, (Fallbrook, CA: California Macadamia Society, <http://users.aol.com/CalMacSociety>, 2001), Accessed December 2005.

¹⁵⁷ California Pistachio Commission, *History*, California Pistachio Commission, <http://www.pistachios.org/History/History.asp>, 2005), Accessed December 2005.

The walnut, although first introduced by the Spanish padres around 1769, did not flourish until the time of the early American settlers. The first attempt at commercial production was reportedly established at Warner's Ranch in San Diego County in 1843. More than a dozen plantings existed by 1850, mainly near Los Angeles but also scattered from San Diego to Napa. Joseph Sexton, a horticulturist, initiated California's first commercial walnut enterprise in 1867-1868, when he planted a grove of English walnuts in Goleta, next to Santa Barbara. Within a few years, 65 percent of all fertile land in this region grew Sexton's English walnuts. Over the next thirty years, orchard plantings multiplied and extended as far north as Chico. In 1875, the State Agricultural Society recorded 138,673 walnut trees, with 15 counties reporting more than 1,000 trees each.¹⁵⁸

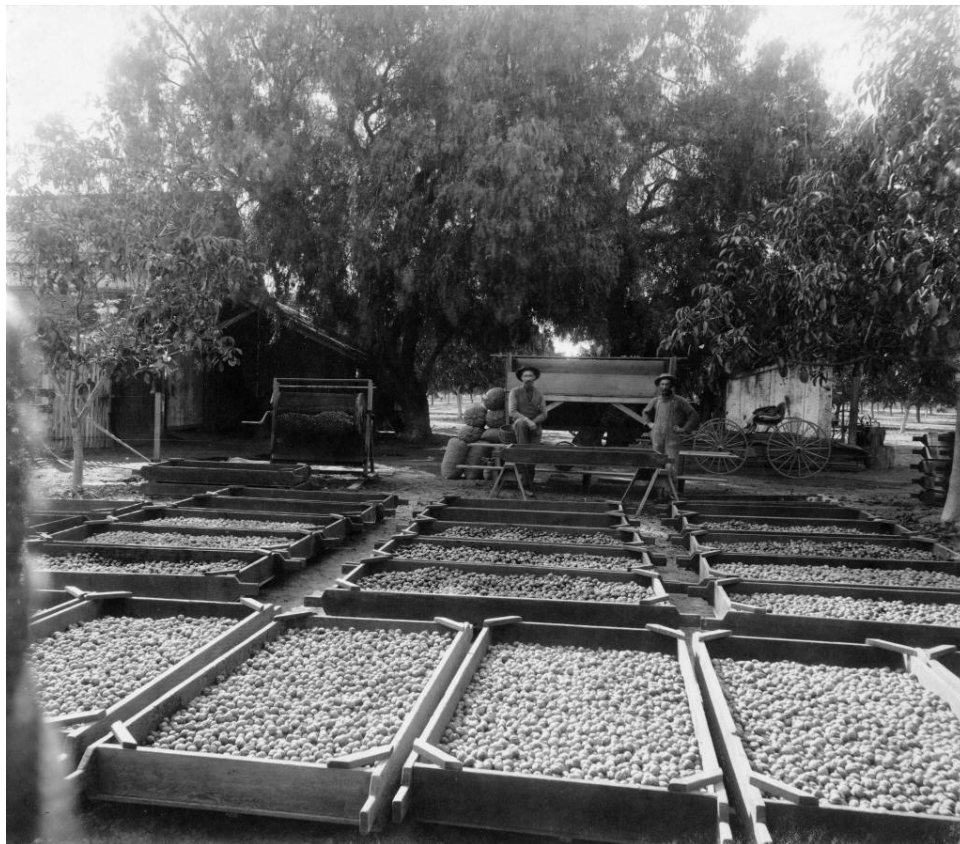


Figure 28: Drying walnuts on the John B. Rea Ranch in Anaheim circa 1900 (Courtesy Anaheim Public Library, Anaheim, California).

The 1870s marks a watershed for walnuts in California. Until this time, walnut plantings had consisted entirely of the small, round, hard-shelled, inferior walnuts introduced by the padres. Along with Joseph Sexton's introduction of the soft-shell English walnut, however, the rise to the greatly superior seedling type grew as Felix Gillet introduced and developed at Nevada City certain French varieties, later the basis for the industry in central and Northern California and in Oregon. The large-scale commercial growing of walnuts began around 1880 with the planting of

¹⁵⁸ Hutchison, *California Agriculture*, 211.

the Santa Barbara soft-shell type in Southern California. About 15,000 acres were planted. Between 1880 and 1905 superior varieties of walnuts were planted, including Placentia and Eureka, which now make up most of the Southern California production.¹⁵⁹

Between 1900 and 1930 walnut acreage increased nearly sevenfold and production tenfold. The California Walnut Growers' Association organized in 1912 and successfully applied the principles of cooperative effort to the solution of the problems of the industry. By 1910, with the introduction of Valencia oranges and lemons along with increased population in Southern California, resulted in the elimination of walnut orchards in Los Angeles and Orange counties. In addition, declining yields and quality, including warmer winters than in years past that caused a delay of blooming resulted in the restriction of acreage in Southern California and consistent expansion in the north. By the 1930s the commercial walnut business moved northward to Stockton where improved irrigation, better pest control, ideal climate, and rich soil were more conducive to larger yields.¹⁶⁰ By this time the California walnut had virtually displaced the imported product in United States markets and had become an important factor abroad. California emerged as the largest producers of walnuts in the world by the 1940s.¹⁶¹ Today, the Sacramento and San Joaquin valleys are the center of walnut production, producing 99 percent of the commercial United States walnut supply. On the global market, California produces two-thirds of the world's supply of walnuts.¹⁶²

Almonds are today California's largest drupe crop in both value and acreage. The Spanish introduced the almond tree to California in the late 1700s. The moist, cool weather of the coastal missions, however, did not provide ideal growing conditions, and trees were not successfully planted inland until the 1800s. The first attempts to grow almonds commercially in the United States occurred in New England and the Middle Atlantic and Southern states. Nevertheless, growers soon learned that the early blooming almond succumbed to late frosts or disease in areas of high humidity. California's Central Valley, with its Mediterranean climate, provided the right environmental conditions for successful almond production. In the early 1850s, plantings near Sacramento, Monterey, and Los Angeles all showed promise.¹⁶³

During the 1870s, through research and crossbreeding, several of today's prominent almond varieties had been developed. By the turn of the twentieth century, the almond industry firmly established itself in the Sacramento and San Joaquin valley. The rise of almond production in California is largely the result of Blue Diamond. In 1909, J. P. Dargitz of Acampo near Stockton took an active lead in promoting an almond cooperative and made an appeal for a state organization. Members from nine independent almond growing associations in Antelope, Orangevale, Fair Oaks, Davis, Capay, Sutter County, Live Oak, Oakley, and San Joaquin County then met in Sacramento on March 18, 1910 to discuss the formation of such a state organization. As a result, the California Almond Growers Exchange formed on May 7, 1910, with headquarters in Sacramento. In 1915 the cooperative adopted the name Blue Diamond, and as a result of their marketing efforts, government lobbying, and quality control, California's almond

¹⁵⁹ Ibid, 212.

¹⁶⁰ Ibid, 212-213.

¹⁶¹ Ibid, 213.

¹⁶² Walnut Marketing Board and California Walnut Commission, *Walnut History*, (California Walnuts, <<http://www.walnuts.org>>, 2005), Accessed December 2005.

¹⁶³ Hutchison, *California Agriculture*, 170-176.

production increased from an annual average of 3,500 tons in the 1910s to 9,440 tons in the 1920s.¹⁶⁴ In 1910, the cooperative started with 230 independent growers and grew to 2,000 by 1940, and today approximately 3,500 growers cooperatively own Blue Diamond. These 3,500 Blue Diamond growers, along with another 2,500 growers in California, produce the entire supply of almonds in the United States and nearly 80 percent of the worldwide production. In addition, today almonds rank as the seventh largest U.S. food export.¹⁶⁵ Today, California is the only place in North America where almonds are grown commercially, with more than 450,000 acres planted in the San Joaquin and Sacramento valleys, stretching 400 miles between Bakersfield and Red Bluff.¹⁶⁶

VEGETABLES

Among the first crops grown in California by the Spanish, Mexican, and later, Anglo-European immigrants, were vegetables. Seeds were clearly more easily transportable than trees and took up little room in the baggage of California's gold seekers. Friends and family also sent vegetable seeds, or one could obtain them through seed catalogs from nurserymen and dealers. Most importantly, vegetables grew more quickly than other agricultural products and agriculturalists could profit on their initial investment within weeks, rather than months or years. In the early 1850s, however, most fledgling farmers relied on dry land farming techniques, which limited the amount of acreage that could be harvested.

Vegetable gardens appeared throughout the state by the early 1850s. The state's first horticultural exhibition or fair, such as the one held in San Francisco in 1851, displayed vegetables.¹⁶⁷ Competition ran fierce among vegetable growers, as new products filled the markets, and prices fluctuated wildly as speculation was common. Transportation of vegetables seriously concerned early growers. Exorbitant shipping costs precluded widespread use of the Transcontinental Railroad during the 1870s as a primary source for distributing vegetable products. The lack of reliable cross-country refrigeration also made shipping across the Great Basin and the Intermountain West precarious at best.

By the late 1910s, California ranked at the top of the nation in vegetable production, other than potatoes and sweet potatoes. In 1919, 115,260 acres were devoted to vegetables with a total value of more than 17 million.¹⁶⁸ The most popular vegetables grown during the first few decades of the twentieth century included asparagus, cabbage, cantaloupes, carrots, cauliflower, celery, cucumbers, lettuce, peppers, spinach, tomatoes, turnips, sugar beets, and watermelons.

By the 1920s, there emerged two principal types of growers; those who produced vegetables solely for commercial purposes and long-distance shipping, and those who produced vegetables for home or local consumption, sometimes referred to as truck gardeners.

¹⁶⁴ California Almond Growers Exchange, *Almonds from California*, (Sacramento, CA: California Almond Growers Exchange, 1955), 12-20.

¹⁶⁵ Blue Diamond, *The Blue Diamond Story*, (Sacramento, CA: Blue Diamond, <<http://www.bluediamond.com/about/history/index.cfm>>, 2004), Accessed December 2005.

¹⁶⁶ Ibid.

¹⁶⁷ Edward J. Wickson, *The California Vegetables in Garden and Field: A Manual of Practice With and Without Irrigation for Semi-Tropical Countries*, (San Francisco, CA: Pacific Rural Press, 1923), 7.

¹⁶⁸ Ibid, 13.



Figure 29: A traction engine hauls sugar beets 20 miles to a factory, Monterey County, ca. 1900 (Chinese in California, FN-23999, California Historical Society, North Baker Research Library, San Francisco, California).

For commercial growers the key was to ascertain the vegetable that brought the best crop at the right time for shipment. Vegetable growers relied upon the state's diverse immigrant workforce. Japanese, and later Filipino and Mexican laborers followed the Chinese. By the early 1900s, with a large immigrant workforce in place, the volume of canned and dried vegetables increased. Both canned and dried vegetables could be shipped out to national and international markets with little concern over spoilage. In the 1920s, the most common commercially canned vegetables included asparagus, string beans, peas, spinach, and tomatoes.¹⁶⁹ Other sundry vegetable crops that were popular during the late nineteenth and early twentieth centuries included corn, onions, peppers, capers, chayote, chervil, watercress, gherkin, ginger, mushrooms, mustard, okra, parsley, yams, and udo, a vegetable similar to asparagus grown by the Japanese.

¹⁶⁹ Wickson, *California Vegetables*, 14.

During the California Gold Rush, California's growing population shipped out perishable goods, such as oysters, fish, and meat in tin cans. Early cans commonly appear in historical archaeological sites, although fewer during the 1850s and 1860s than from the 1870s forward, when commercial canneries expanded across the United States. Nineteenth century canning technology was fraught with health concerns. Initial methods used soldered seams that could result in spoilage and botulism, which limited public acceptance. As the technology improved, canned products gained acceptance among the public and ultimately influenced the marketing of agricultural products, fueling greater production.

In summary, vegetable production was an integral part of California farms and ranches since the first years of the Gold Rush. With the advent of irrigation, the spatial area of vegetable farms dramatically increased, as did the market for fresh vegetables. New technologies applied to canning vegetables gained wider acceptance after the turn of the century. Farmers marketed their surplus products to canning companies or cooperatives, which helped sustain them during price fluctuations or downturns in the economy. Cheap immigrant labor was a key component in farming vegetables. By the late nineteenth century, Japanese laborers replaced Chinese. Prior to World War II, Japanese were able to purchase labor. After 1900, Mexican laborers, who worked for even lower wages, replaced Japanese in many of California's vegetable farms.

Following in the footsteps of Chinese laborers were Japanese, who began immigrating to California in large numbers after 1900. The Japanese played a significant role in the development and specialization of agriculture in California. In 1869, settlers with the Wakamatsu Tea and Silk Farm Colony in El Dorado County were among the first to arrive from Japan. They brought mulberry trees, silk cocoons, tea plants and bamboo roots. Unfortunately, the silk farm was not a commercial success and the Japanese immigrants left for other areas. By 1880, 148 Japanese lived in the United States.¹⁷⁰

There are a number of published works that serve as models for interpreting the Japanese experience in California, particularly as it relates to agriculture. Kathy Nichols and James Borg explore Japanese culture, particularly as it relates to assimilation within Monterey County, and in the spring of 1994 the journal *California History* published by the California Historical Society, devoted its entire magazine to Japanese Americans in California.¹⁷¹

COTTON

The Spanish first brought cotton to California in the late eighteenth century. Nevertheless, while cotton could potentially be grown on virtually all good irrigated lands, cotton's rise came slowly because of the lack of a home market, relatively high production costs, and competition with profitable fruit crops. Not until the early 1900s and 1910s did farmers who began to settle in the Imperial Valley and the lower reaches of the San Joaquin Valley attempt to grow cotton in any quantity.¹⁷² World War I produced a cotton boom that flourished in the vast San Joaquin Valley. Likewise, boll weevil infestations devastated the cotton industry in the South while demand soared for the long-staple varieties used in a variety of industries.

¹⁷⁰ Lynn Jones, "The History of Japanese Immigration and Assimilation," *The Brown Quarterly* 3 No.4 2000: 1-4.

¹⁷¹ Kathy McKenzie Nichols & Jane W. Borg, *Nihon Bunka, Japanese Culture*.

¹⁷² Hutchison, *California Agriculture*, 129-131.

The arid West remained the only region free from this pest and suitable for growing long-staple cotton. The USDA sent Wofford B. Camp, a young agronomist, to the San Joaquin Valley in 1917. Camp had an enormous impact upon the introduction and spread of cotton, having developed the varieties best suited to the region and helping organize farmers. The tremendous increase in California's cotton acreage in every decade since the 1920s contrasts sharply with the decline in cotton acreage for the United States as a whole. California's acreage in cotton ranked fourteenth out of fifteen cotton-producing states in 1919. Between 1925 and 1929, as well as 1955 and 1959, California's cotton production increased almost 900 percent, while total U.S. production declined by 15 percent.¹⁷³ One of the remarkable features of cotton production in California has been the exceptionally high yields per acre.

While most of California's cotton grows in the southern interior valleys where rainfall is deficient, the Los Angeles Aqueduct, completed in 1919, and the Central Valley Project, with the first delivery of water coming in 1940, as well as the State Water Project which began during the early 1950s, provided controlled irrigation for cotton growers. In addition, during the 1940s, expensive wells, sunk as deep as two thousand feet, cleared the way for a significant expansion in cotton cultivation in these former arid lands. The combination of the dry, hot climate and irrigation water set western production apart from the old Cotton South.

The exodus of the Japanese to the United States only began after Japan relaxed laws prohibiting emigration in 1885, and Japanese farm laborers began to replace the aging Chinese in the fields of Hawaii, California, Oregon and Washington. As Nichols explains, "unlike many Chinese, early Japanese immigrants had a high degree of literacy, the vision to become landowners with the ambition to work toward this goal and a high value placed on mutual aid, all of which led to their future success."¹⁷⁴ As the number of Chinese agricultural workers declined, the number of Japanese immigrants steadily increased, particularly those who were engaged in California's strawberry industry along the Central Coast and the citrus industry in Southern California. The organization of Japanese labor was similar to that of the Chinese labor system with a "labor boss" acting on behalf of group of laborers, who received an annual fee, and from whom the contractor, generally white, secured the requisite labor necessary to complete a particular job. The labor boss also served as a mediator between the employer and the workers.

The assurance of sufficient water delivered at the correct time gave California farmers a significant advantage over many producers in the South. Yield losses in the South due to insufficient or excessive moisture were larger than the losses attributed to the boll weevil in all but ten years between 1909 and 1950. Technologically advanced agricultural practices in the West, such as tractor-drawn cultivators greatly reducing weed growth, while wet weather in the South prevented similar practices in the fields for much of the growing season.¹⁷⁵

¹⁷³ Moses S. Musoke & Alan L. Olmstead, "The Rise of the Cotton Industry in California: A Comparative Perspective," *The Journal of Economic History* 42 No. 2 (1982): 385-412.

¹⁷⁴ Kathy McKenzie Nichols & Jane W. Borg, *Nihon Bunka: Japanese Culture: One Hundred Years in the Pajaro Valley*, (Watsonville, CA: Pajaro Valley Arts Council, 1992).

¹⁷⁵ Ibid, 387-389.

The structure of cotton farming in California differed from other states, particularly southern states. The California State Legislature passed laws in 1925 declaring that only a specific Acala strain could grow legally in the San Joaquin Valley (apart from experimental plots). These laws protected high-quality cotton from contamination arising from cross-pollination with inferior strains and varieties, as well as ensuring local gins of a uniform-quality raw material. The legislation increased the importance of the USDA cotton research facilities at Shafter in Kern County. This station conducted a continuing program to breed higher yielding strains of Acala and became the main source for the improved strains used in the Central Valley.

California cotton producers harvested three to four times as many acres of cotton as the average cotton farmer in the country between 1924 and 1959. The scale of cotton farming in California reflects other important structural differences, such as western cotton farmers specializing in cash crops. Another distinctive feature of California cotton farms was the intensive use of mechanical equipment. California cotton farms adopted tractors earlier and in greater numbers than did farmers in the south.

The migration into California during the 1930s was dramatically different in that almost half of the migrants settled in non-metropolitan areas of the state. Most migrants entering the state in the 1930s were themselves rural-oriented, whether they came from farms or simply rural America. Perhaps drawn by familiarity with their previous place of residence, many chose to settle in similar settings or landscapes and work in areas familiar to them.

In California, there were two enclaves that attracted the vast majority of rural migrants during the 1930s, namely the San Joaquin Valley and the greater Los Angeles basin.



Figure 30: San Joaquin Valley cotton field, ca. 1940 (*The San Joaquin Valley Digitization Project, Tulare County Free Library, Annie R. Mitchell Hist, San Joaquin Valley & Sierra Foothills Photo Heritage, tca0102, San Joaquin Valley Library System, Fresno, California*).

When picking machines became available, farmers already possessed the mechanical skills and attitudes needed for machine-based production. The transformation from dry-land farming to irrigated farming meant greater capitalization and a shift towards marginal or under-utilized lands, such as those in the Southern San Joaquin Valley. By 1950, cotton had become California's most valuable crop.

The contract labor system developed as a response to a fundamentally different seasonal pattern of labor demand found in the California cotton fields. In other seasons, many of these workers found jobs elsewhere, picking the state's fruits and vegetables. Yet, in the South, because of the lack of mechanization, wet weather, and weeds, workers remained in high



Figure 31: Pickets on the highway calling workers from the fields during the 1933 cotton strike. Probably near Corcoran in the Central Valley (California Cornerstones: Selected Images from the Bancroft Library Pictorial Collection, 1945.007:6, courtesy of The Bancroft Library, University of California, Berkeley).

numbers during the chopping and hoeing season (spring and early summer), often two-thirds of, and sometime equal to, the peak labor requirements of the picking season. In California, the actual number of workers employed during the height of the harvest was approximately five times the number employed during the peak of the chopping period. This more variable seasonal labor pattern provided an enormous incentive to mechanize the cotton harvest in California.¹⁷⁶ Likewise, in 1933, Congress passed the Federal Emergency Relief Act (ERA) and funds for migrant workers' camps became available. The flood of "dust bowlers" that arrived in California from Oklahoma and neighboring states in the latter half of the 1930s grew to about 350,000. These workers flocked into small communities that were unprepared to cope with human needs on such a magnitude. In all, the new migrants represented a 50 percent increase in population for California's valley counties, doubling school enrollment and skyrocketing health costs.

Thus, most cotton laborers camped out in "labor camps" because of the lack of permanent housing or even temporary housing. It was the poor conditions of migrant farm life and housing during the Depression, which John Steinbeck's meticulously described in *The Grapes of Wrath*, which provided the spark for many labor instabilities throughout the 1930s.¹⁷⁷

¹⁷⁶ Ibid, 396-397.

¹⁷⁷ John Turner, *White Gold Comes to California*, (Bakersfield, CA: California Planting Cotton Distributors, 1981), 84.

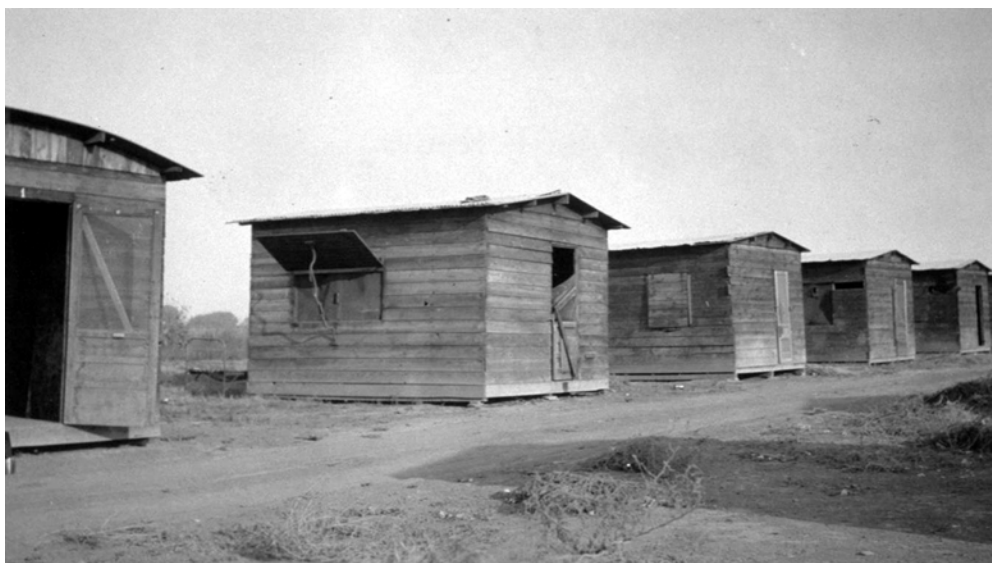


Figure 32: Farm laborer cabins in Kern County, 1936 (*Migrant Labor Camp Photographs from the Harry Everett Drobish Papers, July, 1936, Kern County, Kern Lake District, BANC PIC 1954.013:32-PIC, courtesy of The Bancroft Library, University of California, Berkeley*).

Labor scarcity and cost provided another impetus for mechanization. San Joaquin Valley growers often took pains to point out that their hand picking rates always ranked among the highest in the nation because of the seasonal work. Consequently, early attempts to build a mechanical picker in the Imperial Valley date back to 1911, just a few years after cotton cultivation reappeared in California. Between 1917 and 1922, for example, several experiments with pneumatic machines in the Imperial Valley captured the attention of the agricultural press, but none of these machines proved acceptable. At about the same time, University of California agricultural engineers built and tested cotton-stripping machines. Professor H. B. Walker, head of the Department of Agricultural Engineering at Davis, took an active interest in cotton mechanization and developed the first detailed study on machine performance in the state. He observed a Gyracotn (made by George R. Myercord and Associates of Chicago) operate in Kern County in 1931. Although the Gyracotn collected almost one bale of cotton an hour, it left about 17 percent of the cotton in the field. Given that hand pickers probably left 2 to 3 percent of the crop, a net loss of about 15 percent occurred. This field waste, together with quality losses of two or more grades compared with hand picking, made the Gyracotn picker uncompetitive at depression wage rates. Likewise, California became the center of the Rust Brothers' developmental efforts in the 1930s. Mack Rust, along with his brother John, were leading figures in cotton mechanization research and they developed several different versions of a spindle picker, a device consisting of moistened rotating spindles that grabbed the cotton fibers from open bolls, leaving the rest of the plant intact. Spindle pickers produced cotton that was as clean as or cleaner than handpicked cotton.

Both International Harvester and the Rust Brothers had made important strides in perfecting their equipment by the early 1940s. Yet, in 1943, only five International Harvester one-row pickers were reportedly operating commercially in the San Joaquin Valley. Beginning in 1949 Ben Pearson, Inc., and Allis Chalmers began manufacturing machines under the Rust license.

In these early years, however, the International Harvester machines were more reliable and they captured a far larger share of the California market. By 1945, approximately 20 machines were in use in California.¹⁷⁸

In reviewing the early history of cotton in California, one recognizes the crucial role of government policies during an era when farming had generally been free of government intervention. Camp's educational campaigns, the Shafter station's research program, and the political influence of cotton growers resulted in instigating massive government investment in water development. The single-variety community and centralized sources of seed, besides facilitating marketing and improving yields, brought farmers together with important consequences for labor relations, lobbying activities, and the spread of new techniques.¹⁷⁹ California's cotton industry also gained a reputation for its abuse of immigrant and child labor, which ultimately caused the state's first widespread labor strikes, particularly during the 1930s.

CUT FLOWER INDUSTRY

The history of the cut flower industry in California dates to the 1870s, although the production of cut flowers was limited to specific geomorphic provinces within the state due to climatic conditions necessary for opportune flower growth. Reportedly, Theodosia Shepard, a Ventura homemaker, sold the flowers she grew in her garden during the 1870s. Not long afterward, other women were cutting their flowers for the local market, and eventually the retail floral profession developed.¹⁸⁰ By the early 1900s, the industry expanded across portions of Northern, Central, and Southern California, "as many immigrant families turned their love of beauty and their botanical talents to flower production, including Chinese, Japanese, Italians, and Dutch."¹⁸¹

Floriculture was concentrated in California's coastal counties, and as it spread to Northern California, the industry came to rely on greenhouses. California's Mediterranean climate was ideal for growing year-round flowers, particularly along the Southern California coast. The floriculture industry in California included the production of bedding and potted plants, shrubbery, fruit stock, and cut flowers.



Figure 33: Paul S. Goya, former nurseryman from Sierra Madre, California. Goya, in charge of all flowers grown in the nursery, is shown with a bed of prize summer sweet peas. (War Relocation Authority Photographs of Japanese-American Evacuation and Resettlement, Series 2: Gila River Relocation Center [Rivers, AZ], Volume 4, Section A, WRA no. B-465, courtesy of The Bancroft Library, University of California, Berkeley).

¹⁷⁸ Musoke and Olmstead, *Rise of the Cotton Industry*, 397-400.

¹⁷⁹ Ibid, 389-390.

¹⁸⁰ California Foundation for Agriculture in the Classroom (CFAITC), *Commodity Fact Sheet: Cut Flowers*, (Sacramento, CA: California Cut Flower Commission, 2005).

¹⁸¹ Ibid.



Figure 34: Koenig Vineyard and Winery, Anaheim, California, ca. 1885 (Anaheim Public Library Photograph Collection on Anaheim Local History, P43 and 43XX, Anaheim Public Library, Anaheim, California).

Flowers first harvested by hand requiring cooling to prevent heat buildup and decay.¹⁸² The industry was particularly labor intensive, requiring a large number of laborers per acre, as compared to other agricultural industries. Allied industries in California also included the harvesting of toyon or toyon berries in the Sierra Nevada for decoration, particularly at Christmas time.

THE WINE INDUSTRY

California's wine industry deserves special attention because of its relationship to the development of other forms of agriculture in the state and its economic importance, particularly after 1900. The growing and harvesting of grapes receives particular attention almost invariably in much of the early literature discussing the state's agricultural bounty. California's viticulture industry had its antecedents during the Mission Period when grapes, commonly referred to as "mission grapes," were planted around 1770.¹⁸³

Reports suggest virtually all of California's missions established between 1769 and 1830 had varieties of grapes grown within their confines. Mission grapes, by far the most common, were grown because they were hardy, fast growing, and matured quickly in most regions in the state.

¹⁸² Ibid.

¹⁸³ Betty Dopson, *Fruit of the Vine: 200 Years of Winemaking in California*, (San Francisco, CA: Lexikos, 1988). Carosso, *California Wine Industry*.

While mediocrity defined the quality of the wine produced through rather primitive standards, it proved adequate because imported varieties were expensive and often difficult to acquire.

Following secularization of the Missions after 1834, vineyards were either abandoned completely or poorly attended, leading to the demise of many acres of grapes throughout California. Before statehood even though the grape industry had largely collapsed, it had proven that California's climate, topography, and soils were conducive to successful vineyards. The legacy of the Mission Period went to Mexican land grantees such as General Mariano Guadalupe Vallejo who revived wine growing near Sonoma Mission in 1836. His prosperous vineyards also attracted other growers to the Sonoma Valley.¹⁸⁴ During the early 1850s, the *California Farmer* routinely mentions Vallejo's successful vineyards and the grapes he exhibited at local fairs and exhibitions.

Southern California gained a reputation as a region where wine grapes could be successfully grown, at a time when Northern California was still in the fledgling stage of winemaking. Two of Southern California's early viticulturalists were Jean Louis Vignes and William Wolfskill, who arrived in the Los Angeles area in the 1820s and 1830s. In 1849, Wolfskill is credited as being the first winemaker on record in California to export his wines.¹⁸⁵ Other Southern California growers include Benjamin Davis Wilson, Louis Bouchet, Juan Domingo, William Logan, William George Chard, and Richard Laughlin.¹⁸⁶



Figure 35: Picking grapes in Hanford, near Lemoore. Note the young children and women assisting in the picking (The San Joaquin Valley Digitization Project, Kings County Library, San Joaquin Valley & Sierra Foothills Photo Heritage, kia0037, San Joaquin Valley Library System, Fresno, California).

¹⁸⁴ Dopson, *Fruit of the Vine*, 11.

¹⁸⁵ Ibid, 12.

¹⁸⁶ Julius L. Jacobs, "California's Pioneer Wine Families," *California Historical Quarterly* Vol. LIV, No. 2 (1975): 139-174.

During the nineteenth century, vintners exhibited their products at local and regional agricultural fairs. The more successful vintners sometimes built lavish homes and expensive outbuildings for themselves to house their winemaking equipment, particularly in Southern California and the Napa and Sonoma valleys.

While Napa and Sonoma counties are often viewed as the wine capital of California today, in the 1870s Los Angeles County exceeded the Napa-Sonoma region in wine production, with 1,064,000 gallons as opposed to Sonoma's 750,000 gallons. Los Angeles County in the 1870s was also the leader in the production of brandy, with 59,600 gallons.¹⁸⁷ Don Luis Vignes, credited with the development of some of California's first premium wines, emerged as the first California vintner to age wine in any quantity, including claret, muscat, sherry, and angelica. Vignes immigrated to the United States from Bordeaux, France where he was trained as a distiller and cooper. He is credited in 1843 with producing 40,000 gallons¹⁸⁸.

While most of the wine consumed during the peak years of the California Gold Rush appears to have come from abroad, particularly from France, local vintners eventually took advantage of the lucrative local demand for wine. Likewise, during the 1860s, the Sansevaine brothers produced some of the state's first champagne. The Sansevaine brothers also receive credit for shipping the first California wines to New York and opening a wine cellar there in 1860.¹⁸⁹

Southern California's wine industry waned by the 1860s while the industry in Northern California expanded. The first grapes were reportedly planted in the Mother Lode region in 1849 near the present-day community of Rescue in El Dorado County. In the 1850s in Amador County, Benjamin Burt planted vineyards along Rancheria Creek near Amador City with Catawba, Isabella, and other foreign varieties.¹⁹¹ Widespread production, however, did not begin until the next decade, and it was not until the 1970s that premium Mother Lode wines were produced.

Between 1870 and 1900, the wine industry witnessed strong growth, particularly in the Napa-Sonoma region. Like other agricultural products, wine grapes were susceptible to pests, such as phylloxera, an insect of the aphid family.

***The Italian-Swiss Colony was headquartered in Asti in Sonoma County and had marketing cellars in San Francisco. The company began in 1881 as an experimental venture in cooperative grape production. According to Palmer, "the entry of the Italian-Swiss venture marked not only the beginning of large-scale Italian participation in the state's wine industry but also the beginning of the first phase of the wine industry's modern history."*¹⁹⁰ In 1892, wine merchants formed the California Wine Association, many of whom were of Italian descent. Families, like Gallo, ultimately became household names among the leaders in state's wine industry.**

¹⁸⁷ California State Agricultural Society, *Transcripts 1872*, 392.

¹⁸⁸ Jacobs, *California's Pioneer Wine Families*, 140.

¹⁸⁹ Dopson, *Fruit of the Vine*, 6.

Carosso, *California Wine Industry*, 69-70.

¹⁹⁰ Hans Christian Palmer, *Italian Immigration and the Development of California Agriculture*, Ph.D. diss., University of California, Berkeley, 1965), 251.

¹⁹¹ Edward J. Costa, *Old Vines: A History of Winegrowing in Amador County*, (Jackson, CA: Cenotto Publications, 1994), 3.

The phylloxera attacked vineyards in France in 1855 and eventually reached California where it slowly spread through the 1880s and 1890s. The phylloxera decimated vineyards in the Napa and Sonoma Valleys and then spread to other portions of the state before grafting techniques were able to abate it, including resistant root stock.¹⁹²

Another major blow to California's wine industry was Prohibition, which in 1919 began with the passage of the 18th Amendment to the Constitution. Prohibition lasted until 1933 when the 21st Amendment repealed it. Part of the effort to regulate the sale of liquors, including wines, was through propaganda suggesting wines were as evil as other alcoholic beverages like whiskey and gin.¹⁹³ This campaign, coupled with stiffer enforcement, nearly decimated the wine industry, except for the fact that a provision in the law allowed for limited home manufacture and consumption. During the 1920s home winemakers bought thousands of tons of fresh grapes. In some cases, those home winemakers were actually bootleggers who distributed the grapes out of state. Other winemakers dried their grapes, installing evaporators, or chose to sell their grapes for juice or syrups, for medicinal or religious use.¹⁹⁴ While some of the state's vintners closed their doors for good during Prohibition, others sustained themselves through imaginative sales tactics or diversified their vineyards. By 1936, there were reportedly 257,000,000 grape vines in the state, as compared to 1,540,134 in 1856.¹⁹⁵ Wine sales diminished during the Great Depression and through World War II, but California's wine industry emerged in the late 1950s and 1960s as one of the state's most important agricultural industries, as wine sales and winery production and development increased at an unprecedented rate.



Figure 36: Cutting grapes at the Buena Vista Vineyard, Sonoma County, ca. 1880 (Lone Mountain College Collection of Stereographs by Eadweard Muybridge, Series 1, Vol. 3, 4169, courtesy of The Bancroft Library, University of California, Berkeley).

¹⁹² Dopson, *Fruit of the Vine*, 84-85.

¹⁹³ Jacobs, *California's Pioneer Wine Families*, 149.

¹⁹⁴ Dopson, *Fruit of the Vine*, 91-93.

¹⁹⁵ Butterfield, *History of Deciduous Fruits*, 32.

BRANDY, SHERRY, AND CORDIALS

Fermenting grapes into brandies and sherry, or other cordials, expanded along with winemaking during the 1860s. During the nineteenth century wineries often produced both wine and brandy. Brandy, in particular, saw widespread use during this period. The Brookside-Vasche Winery in San Bernardino County produced both wine and brandy and distributed it to markets on the East Coast.

Conti's stone distillery, built against a hillside in Newton (east of Placerville), El Dorado County, is one of the earliest known manufacturers of brandies in California. A stone cantina, where the serving of distilled beverages took place, stood next door to the distillery. The distillery, which is still standing, has circular walls and once included a wooden second story where the grapes were stored and crushed. Similar distilleries emerged throughout California during the 1850s through the 1870s. Brandy production continued in California through the twentieth century, although foreign competition resulted in a steady decline in its manufacture. Without further research, however, what impact California's distilled spirits industry had on the overall market is unclear because imports remained strong throughout the nineteenth century.

Archaeological evidence may be useful in discerning whether wineries included dual operations. Since brandies involved distilleries, the physical manifestations found at archaeological sites may be somewhat different.

BARLEY AND HOPS FARMING

Beer manufacture began in California during the 1850s, made possible by the rapid expansion of local production of its chief ingredients—barley and hops. Barley production rose from just under 10,000 bushels in 1850 to over 17.5 million bushels by 1890. Kilns were used to make malt from the barley, but that mostly took place at breweries and not farms. During the late 1850s most of the hops production in the United States was in New York, but by the late nineteenth century California's Central Valley and the Northern California Coast had become important hops-growing regions.¹⁹⁶ Places like Hopland in Mendocino County and Sloughhouse in Sacramento County were noteworthy for their hops production, as were portions of the northern Bay Area.

The first hops in California were planted in 1856, and by 1880 California had become a leader in the production of hops. By the early 1900s, however, hops growing in the state fell victim to the economics of competition from the Pacific

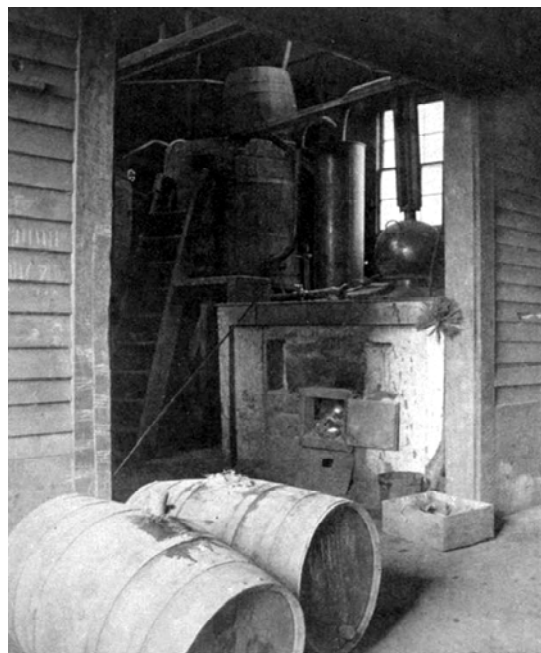


Figure 37: An interior view of the distillery at Buena Vista Vineyard, Sonoma County, ca. 1900s (Photographer's Series: Photographic Illustrations of the Pacific Coast, 1988.103:15, courtesy of The Bancroft Library, University of California, Berkeley).

¹⁹⁶ James J. Parsons, "Hops in Early California Agriculture," *Agricultural History*. 14 (1940): 110-116.

Northwest, which became a major hops-producing region after 1900.¹⁹⁷ Steady demand drove the market through the late nineteenth and early twentieth century. Large-scale hops production in California largely ended during the 1960s.

One the state's first hops-growing region was in Sonoma County. By 1900, California had approximately 2,000 acres of hops in production and Sonoma County claimed responsibility for nearly one-half of all the hops grown. One third of all the hops grown Sonoma County was in or near Healdsburg.¹⁹⁸ The Sacramento and San Joaquin valleys also successfully grew hops. Hops farms were developed along the rich fertile valleys along the Cosumnes River. Tom Mahon provides a detailed description of picking and curing hops for market along the Cosumnes River:

Hop plants were spaced about six to eight feet apart in rows. The roots would send out new vines in the spring. They started by hand and then put up strings attached to the ground before finally attached to an overhead trellis at the other end. All summer the vines would grow, however, in the late summer the plants would start to lose their vigor. When time came to harvest the buds a large force of Chinese workers were assembled. These men would pull down the vines and pluck off every precious bud. The buds then went to a hop house, which is like a kiln, for drying. Hop houses were two-story buildings. A burlap-slatted floor covered the room on top. On this floor, the buds would be poured out and raked around to create an even depth. The bottom floor, which was the ground, is where the heating unit was contained. This heating unit often came from the boiler of an old steam engine that no longer seemed safe to hold high pressure. These boilers came from old steamships used on the Sacramento or San Joaquin Rivers, as well as from stationary engines. Boilers received modification for use as a wood-burning heater by drilling a series of holes with a breast drill and then chiseling between the holes to break out square pieces to feed the fire and vent the smoke. Pans of sulfur were set near the boilers and the fires were stoked by someone experienced enough to keep the heat just right. Cordwood fed the boilers day and night and the hot sulfur released its noxious fumes to retard the growth of mold and mildew and act as a preservative while the hops dried. The hops moved to a press after judged dry. The press was a stout box with a plunger. Two long pieces of burlap laid into the hops press at right angles to form a loose cross shape. The hops poured in to the press and a horse in harness pulled on lines attached to a great, geared hoist to compress them into a bale. When the bale formed to the desired size and weight, two men with needles sewed the four sides and top closed. The bales would then be loaded on wagons. Around the turn of the century many of the Chinese laborers that had formerly worked in the fields had moved to the city presumably Stockton or Sacramento. Japanese immigrants began replacing the Chinese in the hops fields along the Cosumnes River.

¹⁹⁷ Jerald J. Hilton, "Hops: The Essence of Beer, 160th Anniversary Edition," (New York, NY: Hopsteiner, S. S. Steiner, Inc., 2002, <<http://www.hopsteiner.com/history1.htm>>), Accessed April 2005.

¹⁹⁸ Healdsburg Museum and Historical Society, *Agriculture and Industries, Healdsburg Cultural Resource Survey, Final Report*, (Healdsburg, CA: Healdsburg Museum and Historical Society, 1983), <<http://www.healdsburgmuseum.org/NewResearch/new-overview.html>>, Accessed April 2005.



Figure 38: Hop Fields on Sacramento River bottomlands, ca. 1920s. Note the poles and line used to suspend the hop plants off the ground (Rivergarden Farms, 14, courtesy of The Bancroft Library, University of California, Berkeley).

By 1917 so many hops had been planted in California, Washington, Oregon, and Idaho that prices were plummeting. Instead of hops, alfalfa for hay was being planted along the Cosumnes River.¹⁹⁹

Similar descriptions can be found for other hops operations in California, although Chinese are rarely mentioned as being laborers in hops production across the state, perhaps because their numbers diminished after the 1880s. What is clear is that by the early 1900s hops production had become an important industry in California. The industry also required a large labor force, and was also particularly vulnerable to the changing labor market and the instability created by a largely transient work force.

The industry also changed as new technologies were introduced, however, the production of wine, brandies, and beer required a basic knowledge of soils, climate, and chemistry. By the middle of the twentieth century mechanization had taken over much of what was accomplished by hand labor in previous decades.

Improvements in housing, job safety, and wages did not happen uniformly and both historical research and archaeology can help elucidate such matters.

¹⁹⁹ Tom Mahon, "A Brief History of the Cosumnes River near Elk Grove," South County Citizens for Responsible Growth, (Elk Grove, CA: <<http://www.sccrg.org/index.htm>>, 2005), Accessed April 2005.

The cultural residue of California's wine, brandy, and hops manufacturing remains evident in the large number of geomorphic provinces in the state. Manufacturing buildings and structures, terraced walls that once supported vineyards or hops fields, barns, and equipment, provide visual evidence of these important industries. Notwithstanding the importance of the physical features associated with manufacturing and growing sites, California's labor history had its antecedents with the hops and later the grape industry.

CATTLE, SHEEP, AND HOGS

California's economy before statehood included the consumption of meat products from cattle, sheep, and hogs. Sheep, of course, provided an important commodity, wool, while cattle were a source of tallow, hides, butter, cheese, and milk. Nonetheless, not until after the discovery of gold at Sutter's Mill and the rapid influx of new immigrants into California, did the demand for meat products and other animal by-products far outstrip the available supply. Ranchers, recognizing the shortages of meat products in the state, drove cattle, sheep, and hogs overland or transported them aboard ships bound for California, along with other live animals, including poultry. During the 1850s, emigrants drove large herds of sheep overland into California. Kit Carson receives credit for bringing a large herd into California in 1853-1854. Carson purchased the sheep in New Mexico for 50 cents a head and sold them in California for \$5.50 a head, making a handsome profit.²⁰⁰ Because of the rapid immigration into California during the 1850s, meat products were in high demand, and sheep constituted one of the principal sources of food, although not always the most desirable form of food.

By the 1860s, much of the northern end of the San Joaquin Valley and eastward into the foothills of the Sierra Nevada had well-established herds of sheep. As forage diminished in the lower foothills during the late spring, herders brought their sheep into the higher elevations of the Sierra where sufficient browse grew. In the Sierra, seasonal sheep camps were established, evidenced by rock cairns, holding pens, and trail markers. In some instances, they included a simple wood-framed cabin, while in other cases they consisted of canvas tents or simply a sheltered location where the flock spent the night to avoid loss to predators, particularly coyotes. The home ranch was generally much more substantial, often including a shearing barn or shed, feed barn, ranch house, lambing sheds, corrals, and other outbuildings, such as a slaughterhouse, if the sheep and lambs were raised for consumption.

American sheep, such as Merinos, did not replace what some people considered inferior New Mexico and Arizona sheep (sheep introduced from Spain in the early 1800s) until the 1860s and 1870s. One of the state's earliest and most successful breeders was William Wells Hollister. Hollister traveled to Ohio and purchased six thousand Merino sheep that he herded to California, although only two thousand survived the long journey.²⁰¹ By 1875, records suggest that seven million head of sheep ranged through California's mountains, hills, and valleys.²⁰² The completion of the Transcontinental Railroad in 1869 allowed for the shipping of sheep and wool to points east, opening new markets and increasing the profitability for ranchers.

²⁰⁰ Milo Milton Quaife, ed., *Kit Carson's Autobiography*, (Chicago, IL: R.R. Donnelley & Sons Co., 1935).

²⁰¹ Theodore S. Solomons, "Sheep Raising in California," *California History Nugget*. 6 No. 6 (1939): 178, (Los Angeles, CA: California State Historical Association).

²⁰² *Ibid*, 180.

Irish and Welsh sheepherders enjoyed some success establishing sizeable herds and ranches. During the latter half of the nineteenth century in El Dorado County, the Quinn brothers operated a large sheep operation, moving their animals from the foothills east along present-day State Highway 88 to the public domain that they considered their grazing lands. During the 1860s, sustained drought resulted in feuds between sheepherders and cattlemen as each sought out the best grazing land in the Sierra. According to Forest Service records, an incident within the present-day El Dorado National Forest resulted in the murder of several sheepherders by cattlemen. The sheepherders were reportedly from the British Isles and were buried in unmarked graves near the site of their murder.²⁰³

A handful of Basques, such as Jean Baptiste Garat and Jean Pierre Indart, had settled in Nevada and California by the 1870s. Yet, they became cattlemen rather than sheepherders.²⁰⁴ Basque people did not play an important role in shepherding in California and Nevada until after 1900. Author Robert Laxalt characterized the Basque herders as “lonely sentinels of the West.”²⁰⁵ During the early 1900s, Basques migrated to California and Nevada in large numbers for many of the same reasons as other immigrants from Southern Europe. Many took jobs in the sheep industry, which peaked between 1900 and 1910. The ubiquitous reminders in the high Sierra of Basque herding are the numerous carved aspen trees. Rock cairns, stone lambing corrals, and seasonal campsites also provide reminders of Basques in the Sierra during the early 1900s. Basques also settled in the San Joaquin Valley, particularly in and around Los Baños and Bakersfield. Today, Basque families still reside in both communities, and Basque cultural history has left an important legacy for future generations.

For cattlemen, drought and disease were the two most serious threats to their livelihood. Nonetheless, ranchers employed creative methods to sustain themselves during episodes of drought and disease. For example, during the drought of 1863-1865, herders drove out both cattle and sheep from their home range into the foothills or coastal mountains in search of feed. During the drought, hundreds of thousands of cattle and sheep perished or were slaughtered for their meat. The greatest losses reportedly occurred in the San Joaquin Valley and in Southern California.²⁰⁶ Between 1876 and 1877, another drought struck California resulting in the loss of thousands of cattle “on the ranges in Fresno, Tulare, and Kern counties, and during that drought hundreds of cattle were slaughtered to save the hides.”²⁰⁷ During the 1870s and 1880s irrigated pastures or wells helped sustain feed within home ranges when droughts occurred.

There appear to be three levels of ranches that evolved in California associated with the cattle industry: the large corporate or company ranch (generally exceeded 160 acres), the mid-sized ranch (from 40 to 160 acres on average), and the small ranch (from 1 to 40 acres). Generally, the privatization of most of the state’s grazing lands by the 1870s rarely allowed for the upward mobility from the mid-sized ranch to the large corporate ranch. In addition, large companies or corporations such as Miller and Lux controlled the largest tracts of land and had the advantages

²⁰³ United States Department of Agriculture, Forest Service, El Dorado National Forest *Records*, Placerville, California.

²⁰⁴ J. Mallea-Olaetxe, *Speaking Through the Aspens: Basque Tree Carvings in California and Nevada*, (Reno, NV: University of Nevada Press, 2000), 9.

²⁰⁵ Ibid, 8.

²⁰⁶ Hazel Adele Pulling, “California’s Range-Cattle Industry: Decimation of the Herds, 1870-1912,” *Journal of San Diego History* 11 No. 1 (1965): 1-3, (San Diego, CA: San Diego Historical Society).

²⁰⁷ Ibid, 3.

of better capitalization and market dominance. Small ranchers and farmers, however, still had opportunities to expand their land holdings and acquire larger herds or greater acreage, generally through mortgaging their property. Examples of each level of ranch appear throughout the state's grazing lands, as do ancillary properties, which were needed to facilitate patterns of transhumance and the marketing of products. Small ranches generally created by individual homesteads, may consist of the main ranch house, barn, a windmill, slaughterhouse, corrals and pastures. Mid-sized ranches may comprise multiple homesteads joined to form one large parcel or discontinuous ranches with the primary or home ranch and then grazing land located elsewhere. Large or corporate or company ranches may include multiple barns, feed lots, elaborate water systems, loading chutes, slaughterhouses, and bunkhouses for workers. Large ranches often consume thousands of acres that may be separated by hundreds of miles. The smallest property types are ranchettes, which became popular after the turn of the century, and were generally less than 40 acres and often as little as five acres.



Figure 39: A sheep ranch in the hills near Anaheim, ca. 1880s. Note the denuding of virtually all the vegetation from intensive grazing in one area (Anaheim Public Library Photograph Collection on Anaheim Local History, P25, Anaheim Public Library, Anaheim, California).

Owners of these properties practiced more intensive forms of agriculture but had to purchase virtually all of their feed from another source, because the land base was inadequate to sustain their livestock. During the 1930s small dairy farms emerged throughout the Central Valley, providing dairy products to the local community or selling products to cooperatives or large corporate farms.

Even the most successful ranches were unsuccessful at preventing disease during much of the nineteenth century. As Pulling points out, the greatest scourge among California cattle herds was that of Texas or Southern fever. In 1866, the president of the State Board of Agriculture warned California cattlemen of the possibility that the cattle then arriving from Texas might introduce the disease to California herds. Yet, no quarantine occurred. By 1887, losses from the disease had become so great in the state that the United States Department of Agriculture sent a special investigator to determine the nature, and if possible, the cause of the disease.²⁰⁸ Other diseases include blackleg, anthrax, and those produced by cattle ticks. Together, these diseases, if not kept in check, could wreak havoc for cattlemen.

The creation of cattle and sheep ranches followed a similar pattern, as did the creation of farms, often taking advantage of the current land laws. Ranchers often abused regulations governing public land disposal, particularly where marginal lands existed within the Central and San Joaquin valleys. Miller and Lux, among others, monopolized vast tracts of land within the San Joaquin Valley.²⁰⁹ Acquiring large acreages helped sustain herds of cattle and sheep because of the unpredictability of rainfall and the uncertainty of forage or browse each year.

Whereas farmers generally concentrated their improvements, cattle and sheep ranchers spread their improvements over large areas of land and frequently moved from one location to another as the need arose. This pattern of land use required an adequate labor force and a general knowledge of husbandry if large herds of animals were involved. A similar pattern of land ownership evolved in other parts of California where the predominant industry was grazing livestock. Most of the western San Joaquin Valley was consolidated into vast ranches, particularly those owned by Miller & Lux. With the advent of the railroad, shipping cattle between states became more pragmatic, but due to rough handling, cattle often arrived in poor condition.²¹⁰

As Breschini notes, “the shift in economic dominance from cattle raising to grain farming was marked by a shift in political clout from the stockmen to the farmers with the passage of the ‘No-Fence Law’ in 1872.”²¹¹ Where livestock formerly roamed freely, the new law required fencing them in so they would not damage crops. The law did not apply uniformly to all California counties, and regular enforcement most likely never occurred.

Unlike cattle and sheep operations, hog farms never attained the size and economic value of other industries, although there were apparently more hogs than cattle in the state according to the U.S Census for 1890.

²⁰⁸ Ibid.

²⁰⁹ Igler, *Industrial Cowboys*, 60-61.

²¹⁰ Ibid: 150.

²¹¹ G.S. Breschini, T. Haversat, & R.P. Hampson, *A Cultural Resources Overview of the Coast and Coast-Valley Study Areas [California]*, (Salinas, CA: Coyote Press, 1983).

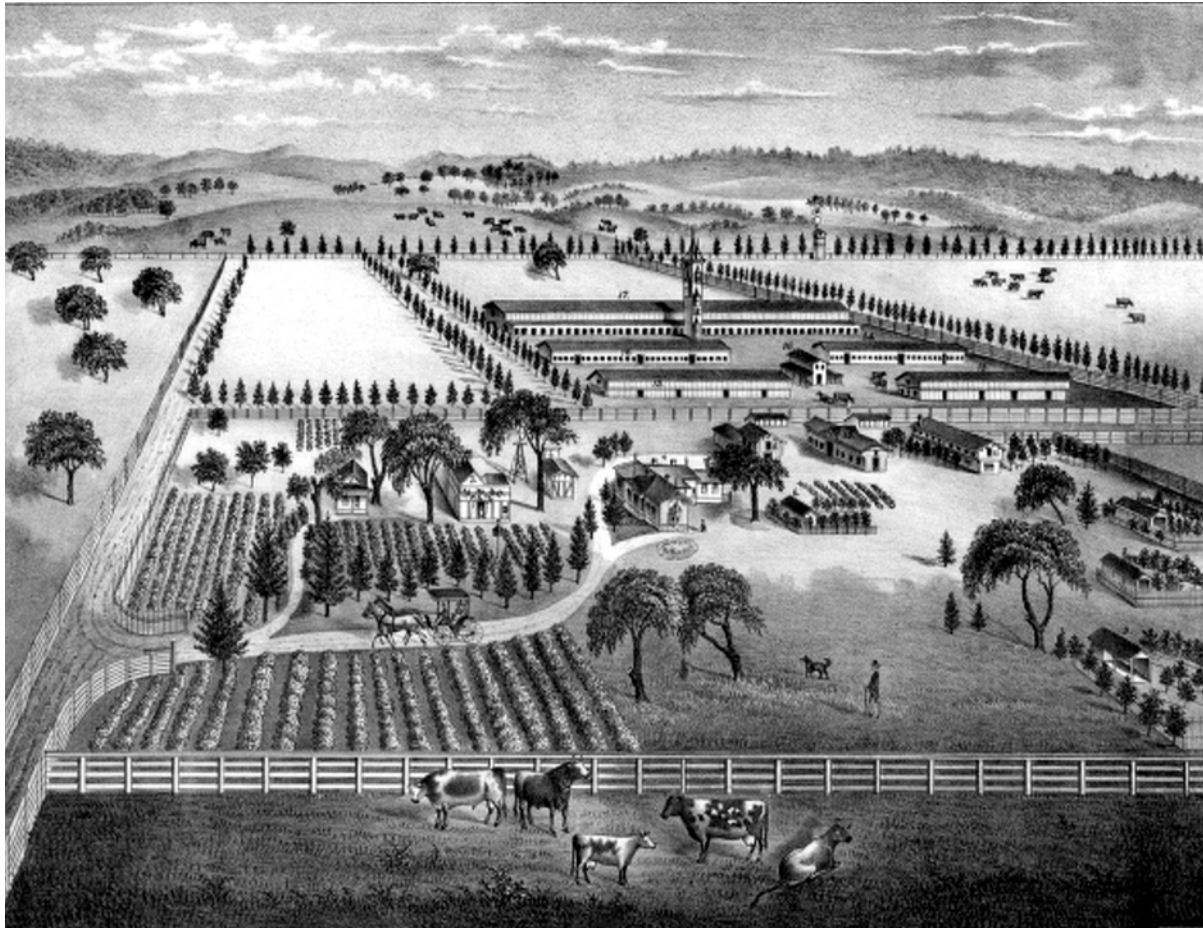


Figure 40: Peter Coutts Ayrshire Farm, Palo Alto, California, 1876. *The illustration suggests a strict spatial order to the farm that was more often than not idealized by the artist (Originally Published by Thompson & West, 1876, Republished by David Rumsey Digital Map Collection).*

The lack of literature regarding hog farming in California during the nineteenth century may be a result of the general view that hog farmers were a lower class than cattle ranchers. The sheer number of escaped domestic hogs that later became feral indicates that hogs were a ubiquitous part of California's farm and ranch industry. Pork remained a popular food through the nineteenth and twentieth century and was a staple on many menus in restaurants throughout the state.

During the nineteenth century, virtually every farm kept a few hogs for domestic consumption. Farms devoted solely to hog production do not appear to be as common as farms that devoted part of their operation to hog farming, perhaps because of the stigma of being labeled as "hog farmers," or it may have been more economically viable to diversify the livestock on any single farm. California's Chinese are well known to have consumed large quantities of pork, but little information is available that discusses the source of the meat, that is whether they owned the hogs or acquired them from local farmers or ranchers.

By the early 1900s, the commercial meat industry shifted to a more industrial model, away from butchering at farms and corner butcher shops in cities to one that emphasized larger packing plants. This trend resulted in greater emphasis on feedlots as an intermediary stage of production. Range animals together with hogs were an important part of California's economy during the nineteenth and twentieth centuries. The cattle industry was well entrenched in the state by the 1880s, and large ranchers, such as Miller and Lux, held control over vast acreages of land in the San Joaquin Valley.

THE DAIRY INDUSTRY

California was also a leader in the production of dairy products during the 1870s, particularly butter and cheese. In 1870-71, Sonoma County produced 850,250 pounds of butter and 200,250 pounds of cheese. Santa Clara County, however, exceeded Sonoma County in cheese production, having produced 2,375,440 pounds in 1870-71.²¹² Other dairy regions in the state included San Luis Obispo County, San Bernardino County, the San Gabriel Valley, and by the 1900s, portions of the San Joaquin Valley.

While historical archaeological studies have treated California dairies incidentally, there have been a number of regional and statewide historic studies of this important industry. Anthony Kirk produced a comprehensive bibliography about the dairying industry between 1770 and 1945.²¹³ Much of what Kirk extracted came from records at the California Dairy Museum and Educational Foundation at Cal Poly San Luis Obispo. Of particular importance are works by Sue Abbot, Lawrence Jelinek, and Robert Santos.²¹⁴ Santos, in particular, provides a well documented and comprehensive glimpse at the industry from its beginning through the first part of the twentieth century. Irrigation went hand in hand with the expansion of dairying in California because of the need to grow forage year round. Irrigation also proved responsible for a much broader diversification of agricultural products, which this study treats elsewhere. Before statehood, dairying was rare and its practice crude. The demand for dairy products dramatically increased following the discovery of gold in 1848. California's Argonauts brought with them their desire for milk, cheese, and butter, and in certain cases, they also brought along the family cow to supply those needs. Surplus milk generally sold to the miners for a considerable profit. This excerpt from Phillip Lynch, of Ophir, Placer County, in 1851 underscores their success:

About October 1, 1851, I bought two American cows fresh with young for \$400. These cows have averaged 12 quarts each per day, which I have sold at 50 cents per quart, totaling \$720 for the two months. These cows I have fed on hay at \$80 per ton, meal at \$8 cwt and potatoes at \$4 per cwt, at a cost not over \$100 for the two months. I would not sell my two cows for \$1,000.²¹⁵

²¹² California State Agricultural Society, *Transcripts*, 1872, 392.

²¹³ Anthony Kirk, *A Bibliography of Dairying in California 1770-1945*, (Sacramento, CA: California Dairy and Educational Foundation, 2000).

²¹⁴ Sue Abbott, *North Bay Dairylands: Reading a California Landscape*, (Berkeley, CA: Penstemon Press 1989).
Jelinek, *Harvest Empire*.

Santos, *Dairying in California*, 175-94.

²¹⁵ Santos. 1994.

One of the first regions to develop as a center for dairy products was along the Northern California Coast. Because of heightened demand, abundant rain, and extensive natural pasturage, this region was ideal for dairies. A second dairy region developed on the Central California Coast. Rainfall is

Portuguese involvement in and dominance of the California dairying industry is largely a 20th century phenomenon. In 1880, only 5% of Portuguese in the state were involved in dairying. By 1929, Portuguese controlled 80% to 85 % of the state's total dairy industry.²¹⁶ Today's concentration of Portuguese-owned and operated dairies in the San Joaquin Valley is directly associated with irrigation improvements in the early twentieth century.²¹⁷

less and temperatures in this region are milder than the northern coast, so dairies in this region generally stockpiled more feed and irrigated their pastures more frequently. The third geomorphic province or region for concentrated dairying is within the vast Central Valley, which is arid but has moderate rainfall during the winter months. Irrigation and the stockpiling of hay for winter-feeding were critical in this region because of the uncertainty of rainfall. The final concentrated dairying region is the Sierra Nevada. In this region, snowfall exceeds rain, and the summer months are relatively dry with abundant natural feed.

According to Santos, dairy cattle introduced into California during the 1850s and 1860s were predominantly of the Jersey breed.²¹⁸ Cowboys drove shorthorn cattle from Texas to California to feed the hungry miners. Shorthorn cattle, although primarily used for meat, better served dairymen than the older Mexican stock. Dairy farmers and industries desired sturdy stock because of their use for meat as well as for dairying. In fact, the introduction of Devons and Durhams in the early 1850s abided by this model, followed during the 1860s by Alderneys and Ayrshires.²¹⁹ As the urban population grew, the demand increased for dairy products, and by the mid-1870s, the Jersey became the dominant breed of dairy cattle in California.

Overall, the Jersey produced more butterfat, a critical ingredient for butter and cheese production. During the 1880s, Holstein-Friesians were introduced to California and soon became the leading dairy breed in the state. The Holstein-Friesian reportedly produced more milk and stood larger and stronger than the Jersey.²²⁰ This breed of cattle is highly popularized in the public mind, serving as the quintessential cow featuring the stereotypical black on white coloring, popularly depicted as a happier breed of cattle.

California had a reported 210,000 dairy cows by 1860, rising to 307,000 in 1900, and 382,000 by 1910. The Central Valley reportedly had 101,000 dairy cows in 1860, and that number reached 163,000 head by 1910. The *Overland Monthly* commented in 1870 that California had an “estimated one thousand dairies . . . containing from twenty to one hundred cows each.”²²¹

²¹⁶ Alvin Graves, *The Portuguese Californians: Immigrants in Agriculture*, (San Jose, CA: Portuguese Heritage Publications of California, Inc., 2004), 69.

²¹⁷ Ibid, 74.

²¹⁸ Santos, *Dairying in California*, 178.

²¹⁹ *California Farmer*, 1854; Santos, *Dairying in California*, 178.

²²⁰ Santos, *Dairying in California*, 178-179.

²²¹ Ibid, 179.



Figure 41: *Near Rivergarden Farms (Rivergarden Farms, 17, courtesy of The Bancroft Library, University of California, Berkeley).*



Figure 42: *California Fruit Exchange Dairy, Graeagle, Plumas County, California, 1939. Note the use of native cobblestones and the parapet walls (Eastman's Originals Collection, Group 5, B-904, Special Collections, University of California Library, Davis).*

California produced 705 pounds of butter and 150 pounds of cheese in 1850. Butter production rose to 16 million pounds in 1880 while the production of cheese also rose to 3.7 million pounds. The production of butter rose to 52.5 million pounds and cheese rose to 43 million pounds by 1910.²²² These figures suggest how important the dairy industry had become in California by the early 1900s.

California also produced its own distinctive brand of cheeses. Of particular importance was the cheese known commonly as “Monterey Jack.” According to Santos, David Jacks, a Scottish immigrant, owned several dairies in the Monterey Peninsula and developed a cheese based on the Swiss method of production. The cheese had high moisture, cured quickly, and had the texture of soft cheddar, which had a distinctive flavor of its own. Monterey Jack cheese shipped east and ultimately gained widespread popularity by the 1890s.²²³ A number of important technological changes helped propel dairying into one of the state’s most important industries. California’s dairying success “came about with the introduction of the cream separator, refrigeration, irrigation, the milking machine, and extensive planting of alfalfa.”²²⁴ Santos provides a description of how dairymen separated cream:

The cream separator was first introduced in the United States in 1879. It was initially powered by steam. Prior to the development of the cream separator, separating cream from milk was done by placing milk in shallow pans and allowing the cream to rise to the top. The cream was skimmed off and processed, and the skimmed milk was fed to hogs or calves. In using the new cream separator, milk was fed into a bowl traveling at 6,000-7,000 rpms. The heavy particles found in the milk, usually manure or flies, were thrown at the top part of the bowl followed by the lighter particles of butterfat. The butterfat escaped through a tube while the skimmed milk below flowed out through another tube. With the introduction of the hand separator by Carl Gustaf De Laval of Sweden, dairymen could separate cream from milk at home rather than taking it to the creamery or separator stations. This relieved the dairymen from having to transport the skimmed milk back to their farms. Centralized creameries were soon located near the dairies, and dairies were developed farther out in the countryside.²²⁵

Larger dairies often transported their milk to the creameries or separator stations. According to Santos, “by 1896 virtually all creameries in California had separators.”²²⁶ The introduction and widespread use of the milking machine, unlike the cream separator, occurred more slowly. According to Santos:

The first recorded attempt at inventing a machine for milking was in 1819, which was followed by other futile attempts in 1837 and 1854. It wasn’t until 1878 that the first workable milking machine was invented in New York. To be successful

²²² Ibid, 180.

²²³ Ibid, 180-181.

California Milk Advisory Board, “Monterey Jack: California’s Native Cheese, Facts, Folklore, & History,” MooMilk.com. <<http://www.moomilk.com/archive/highlights-08.htm#MONTEREY%20JACK>>, 2005), Accessed April 2005.

Anonymous, Monterey County Historical Society Local History Website, (Monterey, CA: Monterey County Historical Society, 2002, <<http://www.mchsmuseum.com>>).

²²⁴ Santos, *Dairying in California*, 183.

²²⁵ Ibid, 183-184.

²²⁶ Ibid, 184.

milking machines had to be cost-effective, easy to use, maintain, clean, and not injurious to the cow. Most milkers welcomed the machine as it freed them from the monotony and drudgery of milking by hand. It also gave them valuable time to perform other duties.²²⁷

Dairymen along with the public were concerned about the quality and quantity of milk produced. According to Santos:

Experimentation found that everything depended upon the skill and technique of the milker. In certain cases older cows held up their milk and had to have their udders massaged as done when milked by hand. Generally, if cows were introduced to the milking machines as heifers, very little difficulty existed. By the 1920s and 1930s, dairymen began to breed stock selectively to produce a cow whose physiology was more conducive to machine milking.²²⁸

No discussion of dairying during this period would be complete without taking into consideration dairy sanitation, disease, and subsequent changes made to upgrade dairy standards. Early California dairying did not take into account the potential for water-borne or fecal-borne diseases, particularly given the lack of scientific information available at the time. As dairying increased, so did interest in scientific principles of dairying. Dairy farmers also worried about the bacteria in milk products. The cleaning of cows' udders, as well as the equipment involved with the milking machines, was important in order to prevent bacteria from entering the milk supply. As Santos explains:

In the 1880s and 1890s state officials and others, who were concerned about public health, became more alarmed daily as to the impurities that were being found in milk. Milk, being a nutrient, was considered especially beneficial to children. Milk looked pure because of its white color, but it was a deception as it could carry bacteria which would cause a variety of disease, namely, tuberculosis, diphtheria, scarlet fever, typhoid, and sore throat.²²⁹

Dairy stocks located near cities often fed on distillery swill, brewery slops, and garbage, which produced poor milk. The 1894 *Transactions* of the California State Agricultural Society reported that "Many people . . . have little or no idea of the scrupulous cleanliness that must be observed and practiced in all things connected with dairy."²³⁰ Besides bad feed and water, unkempt corrals and barns, filthy milking equipment, dirty clothes used by milkers, and improper cooling and handling often caused diseased milk.²³¹ Before 1900, little or no money went to dairy inspections. This changed in the early 1900s as California allocated funds towards inspections and assisting dairy owners to sanitize their barns and meet new state standards. These standards were imposed on the physical design and construction of California's dairies. Farmers were advised to use concrete, cement, and steel, and to introduce standards for easy cleaning. Those that met these standards were referred to in the industry as Grade A dairies. Grade B dairies,

²²⁷ Ibid, 185.

²²⁸ Ibid, 185.

²²⁹ Ibid.

²³⁰ California State Agricultural Society, *Transactions*, 1895.

²³¹ Santos, *Dairying in California*, 175-194.

common prior to 1930, generally lacked the sanitation standards of the Grade A dairies, and were much less expensive to construct. The reports of the California Dairy Bureau, along with local farm assistance organizations, passed out or sold designs of structures to help dairymen improve their operations. As dairy farmers acquired new technology, dairy farms increased in both size and capacity throughout California. Technological improvements were as important as were improvements in transportation, particularly the development of branch or short-line railroads.



Figure 43: Dairy cattle grazing near Santa Cruz (Alice Iola Hare Photograph Collection, 05022, courtesy of The Bancroft Library, University of California, Berkeley).

Much like the Central Coast, dairy farming prospered in the valleys of Southern California. By the 1880's there were a number of cheese factories and creameries in the Los Angeles area, with small, local dairies providing milk. Many of them were concentrated between Compton and Buena Park. As the dairy business expanded after the turn of the century, more milkers were needed, and Portuguese who had worked at dairies in the San Joaquin Valley moved to Los Angeles County. As residential and commercial development expanded beyond the margins of the communities in the San Gabriel Valley, the dairies were pushed eastward, so that by the 1940's the Hynes-Clearwater area was the dairy center of Southern California.²³²

During the 1930's Dutch people immigrated to the United States, and ultimately to Southern California where they found work in the dairy industry. Southern California dairy farms decreased in size after the 1920s, but increased productivity. The animals were fed scientifically regulated fodder that included hay, cottonseed meal, copra, and exotic silage. During the 1940's the dairy industry in Southern California reportedly produced 500,000 gallons of milk monthly, for an annual profit of some 61 million. The temperate climate of the area was excellent for the cows and made possible the phenomenal milk production. Some Southern California cows produced three thousand gallons of milk a year - twice the national average. By the early 1950's,

²³² Marilyn Cenovich, *The Story of Cerritos: A History in Progress*, (Cerritos, CA: City of Cerritos, 1995).

Hynes-Clearwater had combined as the community of Paramount and had become an internationally recognized center for the sale of hay. In 1953, business amounted to 32 million in hay and 12 million in other dairy feeds. The Dutch farmers established what became known as “Little Holland” in the area from Paramount to west Buena Park. They could hear sermons in the Dutch Reformed churches, read Dutch newspapers, and enjoy a rich social and cultural life in their own language. When Queen Juliana and Prince Bernhard of the Netherlands toured the United States in 1952, they made a special visit to this area.



Figure 44: Dairy products speaker and agricultural exhibits train, 1930. (*The San Joaquin Valley Digitization Project, Kings County Library, San Joaquin Valley & Sierra Foothills Photo Heritage, kia0105, San Joaquin Valley Library System, Fresno, California*).

By the late 1950s with encroaching development and demand for land rising, many of the smaller family-owned dairies in the Los Angeles Basin and the San Gabriel Valley closed. While many small dairies closed, other dairies continued to operate supplying milk to large grocery chains such as Ralph’s Markets. For nearly 75 years, California’s dairies were clearly one of state’s most important industries. With the development of new technology, dairy farmers were able to increase production and lower costs. In general dairy farm acreage decreased over time, but the number of milking cows per farm increased. Post-1900 dairy sites, particularly those developed after 1920, should reflect the technological changes occurring in the dairy industry, particularly the upgraded operations from Grade B to Grade A dairies.

Much the improvement was related to sanitation that gained national attention during the early 1900s due to high infant mortality rates. During the 1930s cooperatives increased in order to support local dairymen, and to encourage competitive pricing. Dairies were also breeding grounds for cultural diffusion, since many were owned or managed by a variety of ethnic groups,

such a Portuguese, Dutch, Italians, Italian-Swiss, and Scandinavians. Today, dairies remain an important part of local economies, particularly in the San Joaquin Valley and along the Central Coast.

POULTRY FARMING

California's poultry industry gained importance regionally as certain communities attracted farmers who recognized the value of raising and marketing poultry. Before the turn of the century, poultry farming, like hog farming, provided subsistence in addition to profit. Poultry farms seem to have been scattered across the state in the 1880s through the 1900s, although most were in the valleys where the climate was more favorable to the birds. Common breeds of chickens imported to California during the 1880s included Black Javas, Mottled Javas, Wyandottes, Plymouth Rocks, and Brahmas, to name just a few. Disease struck often, particularly where flocks of poultry roamed freely. Nonetheless, poultry farming became more of a science in the early 1900s as new methods of raising poultry improved productivity, the health of poultry, and ultimately the profitability of the operation.

According to Charles Weeks, an early California poultry farmer, at the turn of the century poultry farming lacked consistency, at least in regards to the physical aspects of the operation, because of the wide variety of brooders and laying houses.²³³ After 1900, farmers began to experiment with portable incubators and houses. In some instances, canvas tent-like houses formed brooders for the poultry. What was essential, as Weeks explains, "were good hens, a large variety of green feed, rich soil, and irrigation."²³⁴

Poultry farmers would feed their chickens virtually any greens. Nonetheless, Weeks recommended feeding the chickens beets, kale, chard, barley, rape, and alfalfa.²³⁵ Philo Elmiro of New York reportedly helped revolutionize the poultry industry by printing a small pamphlet about raising chickens in small pens with no outside runs. Philo's methods included small flocks with lots of feed and water, in sanitary conditions with long sheds and flat shed roofs.²³⁶

Discarding antiquated methods of incubation also occurred during the first two decades of the twentieth century. A number of self-regulating incubators were on the market by the 1910s. Successful brooding, according to Weeks, involved having good parent stock, modern incubation techniques, plenty of fresh air, and no dust.²³⁷ By the 1920s, poultry cooperatives and marketing arms, such as the Central California Poultry Producers, surfaced. In the 1910s, Weeks established the Runnymede Colony or Cooperative in Palo Alto, where he offered small parcels of land for sale to what he termed "colonists." The colony owned and operated a large poultry warehouse and exhibited their fowl and products at annual exhibits put on by the colonists. About the same time, in Southern California, the Rose Lawn Poultry Farm in Artesia was marketing its products. Rose Lawn used the "Corning" type laying houses, which called for a simple wood gable design with a vent on one end for air circulation and a water tank or cooler

²³³ Charles Weeks, *Egg Farming in California: A Poultry Book*, (San Francisco, CA: Schwabacher-Frey Stationery Co., (1920), 27.

²³⁴ Ibid: 34.

²³⁵ Ibid: 39.

²³⁶ Ibid: 43.

²³⁷ Ibid: 55.

attached to the side wall. Roofs were canvas and the entire structure was easily moved about from one location to another. Other components of the poultry farm included the feed house, which consisted of a 1½ story gabled barn, and the laying house, a long shed-like wooden building with large operable shutters on one of the structure's sidewalls.²³⁸

In California, Petaluma eventually became the “world’s egg basket,” a term the city used until the industry waned after World War II. Poultry farming in and around Petaluma began in earnest in the 1880s. A poultry society formed, and several years later, the Petaluma Incubator Company built a 2,000-egg incubator, reportedly the largest known at the time.²³⁹ Petaluma’s poultry industry flourished through the 1940s, as World War II created a demand for eggs and chickens. During the 1950s, however, the local industry slowly declined as new technology resulted in the creation of huge corporate chicken farms that forced the smaller operators, such as those in Petaluma to cease operations.²⁴⁰ Today, one can still see the sheds, brooders, and barns associated with this once flourishing business throughout the Petaluma area, although many of the now abandoned ranches have been demolished in recent decades.

California diversified agricultural products in many ways insulated the state’s economy from cyclical shifts in individual crops or products. Diversification also created demands for new and improved technology. For example, the shift towards cotton, which began in the 1920s, had broader implications, including the more intensive use of power. In California, farms were twenty times more likely to have a tractor than similar farms in Mississippi. Tractors reduced the need for more labor and led to further modernization. Physical indicators of this transformation are visible on post-1920s farms in California in the form of abandoned machinery and other farm equipment, and perhaps also found in capital investment records that reflect new purchases and obsolete equipment.

Application of irrigation water to row crops occurred in a variety of ways. A ditch or canal system, while expensive to build and maintain, was the most efficient. Water was pumped into a raised bed or distributed by gravity into a sunken bed. Along California’s coast, field irrigation happened by use of a windmill extracting groundwater through a pump to the high point where gravity fed it through various furrows, side ditches, or flumes to water the crops. Sprinklers were introduced in the early 1900s, however, water-loss was great, and maintenance costs were higher than a simple gravity watering system. Cultivation strategies of early farmers included ridging by a plow or other mechanical device, raised beds, particularly for winter crops, tillage to release excessive moisture, thinning, and transplanting to secure proper spacing.²⁴¹ Fertilization practice also took place during the nineteenth and early twentieth century because some crops depleted nutrients from the soil. The use of horse, cow, sheep, hog, and hen manure in varying amounts to fertilize sterile soils helped to raise nitrogen, potash, and phosphoric acid levels.

²³⁸ *Artesian California*, *Rose Lawn Poultry Farm Brochure*, 1900.

²³⁹ Thea S. Lowry, ed., *Petaluma’s Poultry Pioneers: Recall the Heyday of Chicken Ranching*, (Ross CA: Manifold Press, 1993).

²⁴⁰ Ibid.

²⁴¹ Wickson, *California Vegetables*, 73-74.

In summary, California's climate, geomorphology, laissez faire economic system, and large immigrant labor force led to the creation of a diversity of agricultural industries and products throughout the state during the nineteenth and early twentieth century.

TRANSPORTATION, MECHANIZATION, AND THE INFRASTRUCTURE OF THE AGRICULTURAL INDUSTRY IN CALIFORNIA

TRANSPORTATION

With the development of an industrialized society, the efficient movement of goods and services from the grower or producer to the market is essential. In the case of California, largely because of the Gold Rush, the state had already developed a complex network of roads. While maintenance of the state's transportation system was a recurring issue throughout the nineteenth century, this network of roads linked most of the state's major commercial centers with each other, and with smaller communities, many of which were located in prime agricultural areas. Designed mainly for horse-drawn wagons and stages, California's early transportation system provided farmers an opportunity to market their products regionally, although not necessarily efficiently.

Of particular importance to California's agricultural industry was the discovery of gold and silver in the Comstock Lode in 1859 and the subsequent rush to Washoe. Between 1860 and 1866, a network of new roads opened up between San Francisco, Sacramento, and Virginia City, and thousands of tons of merchandise and foodstuffs were shipped out over the Sierra Nevada to the fledgling mining camps on the Comstock Lode. This commerce included a wide variety of agricultural products that were in high demand in Nevada, particularly products that could not be grown in the harsh environment of the Great Basin. California farmers also had the ability to charge exorbitant prices for certain perishable products, such as milk, butter, cheese, fresh vegetables, and fresh fruit. Many sections of these earlier routes later morphed into the main Trans-Sierran routes of the Pioneer section of the Lincoln Highway and the modern Highways 50 and 80. Remnants of unused sections can still be viewed from the modern roadway.

California's navigable waterways served as important natural features and quickly became main transportation and commercial corridors. By the mid-1850s, a regular trade developed along the Sacramento and San Joaquin rivers. In the central and northern portions of the Central Valley, the river courses served as the primary routes for transporting the bulk of products in this section of the state, particularly wheat and feed crops. From the 1850s through the 1930s, paddle wheelers powered by steam plied the waters of the San Joaquin and Sacramento rivers.



Figure 45: Steamboats on the Sacramento River hauling grains and produce (*Rivergarden Farms, 17, courtesy of The Bancroft Library, University of California, Berkeley*).

During the nineteenth and early twentieth centuries, agricultural products shipped out via ocean-going schooners or steamships to various ports in the Northwest, Hawaii, Mexico, South America, and East Asia. Partly due to improved transportation systems, particularly the completion of the transcontinental railroad and improved overseas shipping, a broad diversity of agricultural products were being shipped from California by the 1870s, including many exotic varieties. In an address before the California Agricultural Society in 1880, members lauded the significance of the Southern Pacific Railroad (formerly the Central Pacific) in regards to its ability to solve the issue of affordable and efficient transportation of agricultural products.²⁴²

²⁴² California State Agricultural Society, *Transactions*, 1881, 182-183.

During the 1880s, techniques were invented to improve the long-term preservation of agricultural products, particularly canned fruits and vegetable. By 1889, 39,313,740 canned goods shipped out from California via the Southern Pacific Company's railroad. In addition, 33,132,050 pounds of dried fruits also shipped out via the railroad.²⁴³ The demand for canned and dried fruit products led to increased industrialization of the agricultural industry in California and a demand for cheap labor. Jose Morilla Critz, Allen L. Olmstead, and Paul W. Rhode provide an in-depth analysis of the dried fruit industry, particularly as it relates to international competition and its development from 1880-1930.²⁴⁴

The merchandizing or sale of agricultural products to regional markets was speculative. During the late 1880s shipments of citrus and vegetables to eastern markets were auctioned off to the highest bidder. Prices varied widely, however, depending upon supply and demand at the time of arrival. This unpredictability continued through much of the early twentieth century until New Deal legislation created subsidies and price controls to protect farmers from rapidly declining prices or market competition.

In California, a network of railroads crisscrossed the state, the most significant being the Central Pacific Railroad in 1869, which provided transcontinental commerce and trade. The 1870s witnessed the construction of thousands of miles of railroad grades in California, including those through the Central Valley, along the Coast, and in Southern California.

Further expansion occurred during the 1880s with the Southern Pacific Railroad extending branch lines into the Sierra Nevada and through the Coast Range and into Northern California. Although the railroad offered new opportunities for those who had access to a rail line, high costs and overcharging reduced the profitability for agriculturalists.

The increased rail construction throughout California was significant, and went hand in hand with an improved highway transportation system in the state. By the early 1900s, spurred by the "Good Roads Movement" both in California and the nation, private investors together with various states were helping to build new transportation systems, such as the Lincoln Highway



Figure 46: Santa Fe Depot with railroad cars bearing a tractor shipment for M. Eltiste Company, Orange 1922 (Orange Co. Public Library, Local History Collection, Orange, CA).

²⁴³ California State Agricultural Society, *Transactions*, 1890, 196-197.

²⁴⁴ Jose Morilla Critz, Allen L. Olmsted, and Paul W. Rhode, *International Competition and the Development of the Dried Fruit Industry, 1880-1930*, Working Paper Series No. 99, (Davis, CA: Agricultural History Center, University of California, 1999).

and later the Victory Highway. The Lincoln Highway, created in 1912, purported to be the first transcontinental highway in the nation, was actually a network of loosely knitted automobile, wagon, and farm roads that began in New York and terminated in San Francisco. The boosterism associated with the highway generated a great deal of interest leading to local or state initiatives at road improvements. Even though the Lincoln Highway received much attention in the 1910s, railroads were still the primary mode of transportation for agricultural products.

During the 1920s, as both automobiles and trucks became an integral part of the state's modes of transportation, new highways were being built to form large swaths across California's farmland. Highways influenced the transport of farm products in a variety of ways. Combined with improved trucks for transport, California's highways connected distribution points across the state providing outlets for a much broader range of agricultural products. Highways also improved efficiency and generally lowered the cost of transportation.



Figure 47: Road building with Fresno Scrapers in Kings County, ca. 1915 (*The San Joaquin Valley Digitization Project, Kings County Library, CA, San Joaquin Valley & Sierra Foothills Photo Heritage, kia0116, San Joaquin Valley Library System, Fresno, California*).

California's modern highway system, which began in 1909, ultimately became the principal mode of transportation for agricultural products in the state. The highway system, coupled with improvements in diesel trucks, opened new markets and made transport of agricultural products much more efficient. Individual farmers could now take their produce directly to the marketplace.

MECHANIZATION OF AGRICULTURE

During most of the nineteenth century the primary asset of most California farms was the horse and mule. According to Olmstead and Rhode, “in 1870 the average number of horses and mules on California farms was almost three times the national average and the number of horses and mules per male worker was more than twice the national average.”²⁴⁵ Equines provided power to till the soil, as well as to transport crops to market.

By the 1860s California had become the proving ground for new technology. According to agricultural historian Lawrence J. Jelinek, “The H.C. Shaw Plow Works manufactured 20,000 gang plows between 1852 and 1886, which helped transform Stockton into a major agricultural implement center.”²⁴⁶ Combine harvesters had replaced outdated horse-drawn equipment in



Figure 48: Heading grain in the Anaheim Hills, ca. 1880s (Anaheim Public Library Photograph Collection on Anaheim Local History, P27, Anaheim Public Library, Anaheim, California).

California’s wheat fields long before midwestern farmers adopted them during the 1870s. “In 1887, George Berry constructed one of the first straw burning, steam powered combine harvesters on his Tulare farm, and one year earlier the first steam powered tractor made its appearance in the San Joaquin Valley.”²⁴⁷ Through the 1880s into the early 1900s, technological advances abounded in agriculture.

²⁴⁵ Olmstead and Rhode, *Overview of the History*, 15-16.

²⁴⁶ Jelinek, *Harvest Empire*, 41.

²⁴⁷ Ibid, 41.

An examination of several mid to late- nineteenth century agricultural periodicals seems to bear out Olmstead and Rhode's assertion regarding the rapid adaptation by California farmers of new technologies.

The California Farmer, later the *Pacific Coast Rural Press*, provided numerous descriptions of the newest and most efficient agricultural implements available for sale in San Francisco. The newspaper also noted what might have been one of California's first agricultural fairs in 1854 with the exhibition of the newest farm equipment, such as the "Clipper or Prairie Plow," which could "cut furrows 16" deep."²⁴⁸ This early mechanization seems to have set the stage for later developments that Olmstead and Rhode outline.



Figure 49: Mule team & grain combine harvesting, San Joaquin Valley, ca. 1930s. Note the newly constructed electrical towers in the background. Even with mechanized equipment being available, animal power was still a part of many operations prior to World War II. (*The San Joaquin Valley Digitization Project*, Tulare County Free Library, Annie R. Mitchel, *San Joaquin Valley & Sierra Foothills Photo Heritage*, tca0012, San Joaquin Valley Library System, Fresno, California).

Whether or not this rapid mechanization held true for farmers who operated on marginal lands or owned farms located in some of the state's less accessible areas, such as the Sierra Nevada region, the Siskiyou Mountains of Northern California, and the Great Basin, remains unclear. Archaeological evidence along with documentary evidence found in journals, such as the *California Farmer*, may ultimately be a good indicator of adaptation and the degree of mechanization of many of California's farms.

²⁴⁸ Unknown, "California Farmer," *California Farmer* 1 No.1 (1854).

By the turn of the century, California's farms had undergone a major transformation. The transport of agricultural products and the mechanization of California farms and ranches went hand in hand with diversification and intensification. According to Olmstead and Rhode, "a hallmark of California agriculture since the wheat era has been its highly mechanized farms."²⁴⁹ Industrialization and mechanization created multiple spheres of production, often many miles away from the actual farm where the products grew. The interconnection of these spheres or feature systems is critical towards interpreting the scale of agricultural development and production and the mechanics of the system as a whole.



Figure 50: Abandoned animal-drawn farm equipment, ca. 1930s (Anaheim Public Library Photograph Collection on Anaheim Local History, P3911, Anaheim Public Library, Anaheim, California).

During the twentieth century, California farmers led the nation in the adoption of gasoline tractors, mechanical cotton pickers, sugar beet harvesters, tomato harvesters, electric pumps, and irrigation systems. Farm mechanization went hand-in-hand with the inventive efforts of local farmers and merchants as specialized crops and growing conditions created demands for new and more efficient types of machinery and equipment. As Olmstead and Rhode point out, "the conversion from draft power to the internal combustion engine was one of the most far-reaching

technological changes ever to occur in the United States."²⁵⁰ Of particular significance was the localized development of specific farm machinery adopted primarily for California farming conditions and specialized crops, including track laying tractors, giant land planes, tomato pickers, and sugar beet harvesters, along with the Caterpillar tractor, made famous in Stockton

²⁴⁹ Olmstead and Rhode, *Overview of the History*, 14.

²⁵⁰ Alan L. Olmstead & Paul W. Rhode, *The Agricultural Mechanization Controversy of the 1920s*, Working Paper Series No. 64. (Davis, CA: Agricultural History Center, University of California, Davis, 1990): 1-2.

area for its use in the Delta. J. Brownlee Davidson's *Farm Machinery and Farm Motors* presents a particularly good overview, including numerous illustrations of the range of farm equipment available at the turn of the century.²⁵¹

Several factors led to the mechanization of California agriculture. According to Olmstead and Rhode, California farmers were generally more educated and more prosperous than farmers in many areas of the United States.²⁵²

In addition, California had many large-scale farms where the fixed cost of expensive equipment was nearly as much as burden as it was on small farms. This in turn put pressure on smaller operators to adopt newer technologies and methods in order to compete with the market dominance and efficiencies achieved by the larger growers. Lastly, the scarcity of labor meant relatively high wages and periods of uncertain labor supply, and California's climate and soils were also favorable to mechanized



Figure 51: Early diesel powered traction engine in California's Central Valley, ca. 1920 (Rivergarden Farms, 2, courtesy of The Bancroft Library, University of California, Berkeley)



Figure 52: A 60 horsepower Caterpillar Tractor and butane tank-pulling harvester drops rice automatically as its bagged in a Butte County farm, ca. 1930s. (Japanese American Archival Collection, JC17: 246, Department of Special Collections and University Archives, California State University, Sacramento).

²⁵¹ J. Brownlee Davidson, *Farm Machinery and Farm Motors*, (New York, NY: Orange Judd Company, 1908).

²⁵² Olmstead and Rhode, *Overview of the History*, 15.

farming.²⁵³

California was the leader in the early adoption of mechanical tractors. For the moist soils of the San Joaquin Delta region, Benjamin Holt built the first commercially significant steam powered “caterpillar track” tractor in 1904. He designed a tractor powered by a gasoline engine two years later.²⁵⁴ “By 1920, over 10 percent of California farms had tractors compared with 3.6 percent for the nation as a whole.”²⁵⁵ Tractors developed on the West Coast were generally larger than those found elsewhere. California’s farmers were also leaders in the use of electric power. The expansion of electric power was also a factor in the stimulation of innovation.



Figure 53: Stacking sacks of barley near Huron, San Joaquin County, California, 1935 (*The San Joaquin Valley Digitization Project, Mouren family of Coalinga, Coalinga Huron Library District, San Joaquin Valley & Sierra Foothills Photo Heritage, com0009, San Joaquin Valley Library System, Fresno, California*).

Reportedly, the first use of electricity in the world for irrigation pumping occurred in the Central Valley just before the turn of the century, and “between 1910 and 1940, California accounted for roughly 70 percent of all of the nation’s agricultural pumps.”²⁵⁶ Both groundwater and surface water were pumped from one location to another, often with deleterious affects to natural aquifers.

One question is whether innovation occurred universally across California or if it occurred primarily in specific geomorphic provinces. Evidence of technological change on California’s farms should emerge in both the physical aspects of the farm itself, the transition from animal to mechanical power, and the introduction of new equipment and machinery as the need emerged.

²⁵³ Ibid, 15.

²⁵⁴ Jelinek, *Harvest Empire*, 41.

²⁵⁵ Olmstead and Rhode, *Overview of the History*, 16.

²⁵⁶ Ibid, 16.

Evidence may also exist concerning the diversity and intensity of production and technological change, along with labor practices reflective of the new technology and innovation.

AGRICULTURE INFRASTRUCTURE

The infrastructure of agricultural properties includes a wide variety of buildings and structures that provided specific functions. Understanding how these buildings and structures evolved is an important part of interpreting the significance of a property.



Figure 54: A No. 60 Caterpillar Tractor Pulling a 1935 Ford truck in a grain field, ca. 1940s. By the 1930s California Farmers had embraced mechanized equipment, particularly tractors built by Caterpillar and Holt (*The San Joaquin Valley Digitization Project, Mouren family of Coalinga, Coalinga Huron Library District, San Joaquin Valley & Sierra Foothills Photo Heritage, com0030, San Joaquin Valley Library System, Fresno, California*).

At the regional level are transportation systems and processing facilities. These types of properties are scattered throughout every geomorphic province in California. At the local level of agricultural infrastructure are fences, fields, and pastures. Often the only evidence of an agricultural property is a fence and the field that it encloses. Agriculturalists built fences to mark the boundaries of their properties, to subdivide their properties into manageable units, and to control the movement of their livestock.²⁵⁷

²⁵⁷ Hart, *Rural Landscape*, 167.

In the past agriculturalists used native stone, brush, logs, boards, hedgerows, and various forms of wire for enclosures. In some instances, ditches, canals, or levees form the demarcations of property lines or act as barriers. The type of fencing may be indicative of the variety of livestock housed within the enclosed or fenced unit. For example, low fieldstone walls often marked property boundaries, as well as to enclose sheep or goats. Barbed wire commonly held in cattle while woven wire fencing, also known as “hog fencing,” enclosed hogs or protected young livestock from predatory animals. Barbed wire appeared around 1867, although it was not until the 1880 that hundreds of different patents ultimately reached the marketplace. Decorative fencing, generally iron or wire, also appeared around some farm dwellings to keep livestock or domestic animals out of those areas.

In California, hedgerows, which are expensive and take time to grow, were probably the least common form of fencing. Nonetheless, hedgerows often helped to mark property boundaries and to provide windbreaks, particularly along the coast and Central Valley. Beginning in the late 1880s in California, the planting of eucalyptus trees not only created windbreaks, but also the trees denoted property boundaries.

The majority of immigrants identified as Portuguese during the late 19th and early 20th century were from the Azores Islands about 900 miles off the coast of Portugal. The system of land tenure on the islands limited opportunity for advancement. Approximately 3% of the population owned all the agricultural lands and most worked as peasants. The majority of Azoreans were illiterate and most if not all were Roman Catholic.²⁵⁸

Portuguese immigration to California started in the 1850s with miners settling in the Sierra and whalers settling on the Central Coast. Whaling peaked in the 1860s and 1870s, and virtually disappeared by the 1880s.²⁵⁹ With this downturn, many Portuguese turned to agriculture, a main industry of their homeland. Agriculture quickly dominated the range of professions Portuguese engaged in. “As early as 1860, one of every four Portuguese males in California was involved in agricultural activities.”²⁶⁰ By 1880, over 50% of the Portuguese worked as farmers or farm laborers.²⁶¹ In addition, by 1880, 74% of the agricultural population of Portuguese was concentrated within the Central Coast Region.²⁶² After 1880 immigration increased greatly with most newcomers residing in the San Francisco Bay-Area.²⁶³ After about 1900, more Portuguese settled along the North Coast and Southern California, with the majority in the San Joaquin Valley.

Early on, the Portuguese specialized in market gardening, sheep herding, and dairy farming or worked as laborers. In the 1850s, dairying was favored in Marin County due to natural pasturage and close proximity to markets in San Francisco and Oakland. By contrast, in the 1860s-1880s, Portuguese in the southern San Joaquin Valley worked almost exclusively as both sheepherders and owners²⁶⁴

²⁵⁸ Graves, *Portuguese Californians*, 11-13.

²⁵⁹ Ibid, 19-21.

²⁶⁰ Ibid, 23.

²⁶¹ Ibid, 25.

²⁶² Ibid, 32.

²⁶³ Ibid, 33-34.

²⁶⁴ Ibid, 72.

In many cases, the original fencing or barriers may be gone, but fence posts may still be intact. Examining the posts for machine-cut vs. wire nails, and other types of hardware may help reveal the time in which the fence was first raised. Barbed wire, which can also be easily dated, is still extant on many posts. Many agricultural properties include corrals and feedlots. Corrals provided farm animals protection from predatory animals, such as coyotes, for branding, loading, or medical treatment. Corrals were often built of the same materials as fences, which include stone, wood, and wire. Feedlots are enclosed areas where clusters of animals were fattened before slaughter. The lot may have ranged in size from less than one acre to over 500 acres, depending upon the number of livestock. Today, California's largest feedlot is at Harris Ranch adjacent to Interstate 5 near Coalinga. The basic components of feedlots, such as at Harris Ranch, have changed little during the past 100 years, although prior to highways and trucks, virtually all the livestock was transferred to the lot or slaughter houses via the railroad.

In the case of dairy operations, the lots were generally from one to five acres and included wood, metal, or concrete troughs in which to place feed. Where irrigation was available, evidence may exist of canals, penstocks, reservoirs, wells, windmills, and perhaps water lifting devices such as electric or gas pumps, steam engines, Chinese pumps, also known as overshot water wheels that lifted water out of a canal, current wheels, siphons, and other related equipment. Reservoirs were either subterranean cisterns or they were raised above the ground through the construction of wood, stone, brick, or concrete walls.

Farm animals usually resided in specific structures, often referred to as stables, sheds, or pens, depending upon the type of animal. Barns were perhaps the most important part of the infrastructure of agricultural properties. Each barn reflected the specific needs of the agricultural property and the construction of each barn was one of the greatest single financial outlays a farmer would make during his or her lifetime. The antecedents for most American barns come from Europe. Barns were designed with specific functions, such as storing grain after it has been threshed, providing shelter for livestock, shearing sheep, storing equipment, or providing housing for laborers.

Gable roof barns were the most common barn type built in America and in California. The angle or steepness of the gable varied markedly depending upon the function, elevation, and skills of the carpenter. Barns are composed of beams, braces, posts, rafters, purlins, sills, plates, struts, and other architectural details. Many of California's earliest barns have tall sidewalls, moderately steep gable roofs, rectangular massing, and post and beam construction. Barns built after 1880 generally used either machine-cut or wire nails for framing. Throughout California, regardless of the geomorphic province, barns appear to share similar characteristics, particularly massing and design. Interpreting the size, shape, and function of barns is critical to understanding the history of the agricultural property. Barn designs, in some cases, may be good hallmarks of ethnicity.²⁶⁵

²⁶⁵ Noble, *Wood, Brick and Stone*.
Hart, *Rural Landscape*, 202-204.

Karana Hattersley-Drayton, "Style Versus Type: The Transverse Crib (Frame) Barns of Los Banos," in *Historic Evaluation Report and Historic Architecture Survey Report for Los Banos Bypass State Route 152, Merced County, 10-MER-152, PM 17/24, 10-419100*, (Fresno, CA: California Department of Transportation, Central Region, 2002), Appendix E.

California witnessed an unprecedented number of new immigrants between 1890 and 1910. California's immigrants brought with them specialized skills, including those expressed in the construction of agricultural buildings. Thus, regional variations in agricultural buildings, particularly barns, may be a cultural manifestation or perhaps a result of acculturation and assimilation. One case in point is the dairy barns surrounding Los Banos erected by Portuguese immigrants between 1890 and 1940. The Los Banos barns



Figure 55: Grain elevators near Tulelake, California, 1953 (Eastman's Originals Collection, Group 104, B-8125, Special Collections, University of California Library, Davis).

have “verticality” and from a typological standpoint can be classified as “transverse crib” because of their steeply pitched gable roof with box-gabled hay hoods, together with their massing or plan.²⁶⁶ While further research is still needed, these barns seem to be indigenous to Portuguese peoples and to one particular area of California.

While barns are clearly the most ubiquitous built environment resource on agricultural properties, other structures can also be found, including smoke houses, poultry houses and sheds, hog houses, corncribs, grain bins, grain elevators (generally part of agricultural cooperatives), silos, water tanks, well houses, and ice or cold storage houses. Other important, but perhaps less obvious, improvements include manure pits and tanks. The manure site was generally located downwind and away from the principal residence.

In summary, the spatial arrangement of the barn, ancillary structures, residence, bunkhouse, field or pasture, etc., was generally planned, and often designed by the farmer through practical knowledge and experience, or perhaps with the assistance of popular journals and scientific publications that provided various examples. Many of the early-day agricultural properties in California seem aligned to a southern exposure while others front transportation corridors or watercourses. Understanding the relationships between various architectural and archaeological properties is key to interpreting the function, temporal period of use, and ultimately the significance of agricultural properties.

THE SCIENCE OF AGRICULTURE

Soon after the first settlers arrived in California, “scientific” observations regarding the region's variable climate emerged. This information was published in a variety of ways, to attract settlement in certain areas by embellished stories of the area's natural resources, and for practical

²⁶⁶ Ibid, 1.

reasons so that settlers could make better decisions regarding planting times, fertility of soils, and sources of permanent water. Similarly, through trial and error, California's first horticulturalists learned what crops would be successful under certain conditions.

Agricultural fairs and exhibitions, which came to California during the early 1850s, provided useful scientific information to would-be farmers, including the latest and most efficient farm implements and machinery.

The *California Farmer* served as one medium to advertise agricultural fairs and exhibitions in California.

Experimentation with crops, as well as with growing methods, has research value as a record of successes and failures that may be visible in the archaeological record.

In 1854, the state legislature created the California Agricultural Society and authorized it to hold an exhibition of livestock, manufacturers, and crop production. In 1863, a Board of Agriculture began in the state, and in 1880, the Board became a formally declared state institution. In Southern California an annual fair was held in Riverside from the late 1870s on, which helped popularize the new Bahia variety of orange. In Sacramento, the California State Fair was largely an agricultural fair, which included exhibits, scientific information, and displayed a wide variety of products as well as livestock. In 1929, the Department of Finance took over the Board's duties, and in 1963 the Board, including the State Fair, transferred over to General Services.²⁶⁷

Throughout the nineteenth century, California agriculturalists took advantage of the newest technology and applied scientific methods of farming to increase productivity. Although we may never know exactly what influenced agriculturalists in their decision-making, science most likely played an important role, leading to greater efficiency and productivity, particularly in California. The downside was that scientific knowledge regarding agriculture at the turn of the century was still fraught with inaccurate data and unsubstantiated, wildly optimistic claims.

In 1881, the California State Board of Horticulture was created, providing an active forum through publications and annual conventions and exhibits. The Agricultural College of the University of California intensified its research efforts on horticulture and viticulture after the mid-1880s. By the early 1900s, the United States Department of Agriculture, the state agricultural research system, and local cooperatives worked together to acquire and spread knowledge regarding the quality of fruit and the economic aspects of packing, shipping, and marketing agricultural products.²⁶⁸

Scheuring provides an excellent chronological history of the land-grant university system and agriculture in California.²⁶⁹ The need for better science was one of the hallmarks of early college education in California. The Land-Grant College Act, commonly known as the Morrill Act, gave each state 30,000 acres of public land for each of the Senators and Representatives in Congress.

²⁶⁷ Anonymous, *Finding Aid for the Department of Agriculture Records 1915-1975*, (Sacramento, CA: California State Archives).

²⁶⁸ Olmstead and Rhode, *Overview of the History*, 8.

²⁶⁹ Ann Foley Scheuring, *Science & Service: A History of the Land-Grant University and Agriculture in California*, (Oakland, CA: The Regents of the University of California, Division of Agriculture and Natural Resources, 1995).

The money from the sales of those lands would be used to support at least one college, whose main function would be to teach agriculture and the mechanical arts.²⁷⁰ A bill drafted in 1867 called for the creation of the University of California, which included a school of mines and agriculture to meet the stipulations of the Morrill Act. The bill passed the legislature in 1868, and the University of California was officially established, with its first campus at Berkeley.²⁷¹

In 1874, Eugene Woldemar Hilgard became professor of agriculture and director of the University Agricultural Experiment Station. He served from 1875 to 1905 and was instrumental in initial inventorying of the state's soils. In 1880, he published a major report regarding the alkali soils of the San Joaquin Valley, discussing the implications of irrigation and suitable crops.²⁷² Recognizing the potential for disastrous consequences to California's burgeoning agricultural industry, Hilgard and others conducted research and published monographs regarding the state's agricultural pests, such as phylloxera, the peach worm, and root gall.²⁷³ In 1887, the Hatch Act passed and expanded the creation of new state agricultural experiment stations by contributing federal funds to their development and use.²⁷⁴

The turn of the twentieth century brought many changes to the science of agriculture, including the establishment of the Forest Reserves, and in 1905, the U.S. Forest Service. The wheat boom had faded and new varieties of crops emerged. Participants in California's booming agricultural economy took advantage of the waves of new immigrants entering the country and often embellished the agricultural potential of a region. California's agricultural colleges, however, acted as a counter to unscrupulous land companies and continued to conduct research and publish sound scientific information for California's diverse agricultural industry.

In 1905, the California legislature appropriated funds to purchase the Jerome Davis Ranch, which was to be renamed the "University Farm," to teach scientific and practical agriculture and to provide an appropriate location for research on California agriculture. The acquisition of the Davis campus and formal instruction began in 1909. In 1906, a citrus experiment station, along with a pathology laboratory, opened below Mt. Roubidoux in Riverside.²⁷⁵

By the 1920s, colleges such as the University of California, Davis and Riverside, as well as the United States Department of Agriculture, Pacific Southwest Range and Experiment Station in Albany, produced hundreds of brochures and circulars designed to assist rural agricultural development in California.

Archaeology may provide insights into the demise of particular plant species or the introduction of new species.

Topics included crop rotation, irrigation, technological improvements, costs of shipping goods, reclamation of swamplands, and flood control. Soil surveys, which began around the turn of the century, delineated soils by type, quality, and region. Research efforts by leading colleges and private institutions also included agro-chemicals, biological learning regarding crops and cultural

²⁷⁰ Ibid: xii.

²⁷¹ Ibid: 10-11.

²⁷² Ibid: 32.

²⁷³ Ibid: 38-39.

²⁷⁴ Ibid: xii.

²⁷⁵ Ibid, 66-68; 72.

practices, as well as land clearing and preparation techniques. Research involving irrigation, flood control, and soils were particularly important to virtually all farmers in California.

The College of Agriculture at the University of California, Davis, officially began on July 1, 1952 as a part of the reorganization plan of the University system, which the Regents approved on March 30, 1951. The reorganization provided for coordination of the teaching and research on the four major campuses, which had agricultural programs. Since the 1950s, major advancements in the science of agriculture have abounded, particularly those related to biogenetic research, plant propagation, disease resistant plants, and advanced water delivery systems.

AGRICULTURAL MANAGEMENT AND WORKFORCE

No consideration of California agriculture would be complete without a discussion of the people who lived and worked in the state's farms and ranches. Given the vast scale of California's agriculture, virtually every ethnic group present in the state found employment in farming and ranching in one capacity or another. Even indigenous populations played an important role until their numbers were depleted by the 1860s. Thus, agricultural sites provide a wide variety of opportunities to understand not only the evolution of agriculture as a business, but also the differing experiences, adaptations, adjustments, and struggles of the diverse people who worked and lived at those properties.

Understanding who was present on California's agricultural properties is of course a prerequisite for meaningful interpretation and evaluation. The internal and external relations of agricultural properties are crucial, not just for understanding agricultural practices, but also for interpreting domestic life. A primary objective of social science is to understand how factors such as ethnicity, class, religious affiliation, household composition, gender, and age have influenced behavior and adjustments to life in America's multi-cultural society. From an archaeological standpoint, some of the richest and most complex features and deposits at agricultural properties are also typically associated with the places that workers, tenants, managers, and owners lived. These areas and their requisite archaeological deposits may enable insights well beyond the household sphere. For example, they may help address questions such as the relationship between workers and owners, the effects of industrialization on the work force, labor organizing and resistance, the retention of cultural or traditional values, and lifestyles and living conditions.

Discerning who lived and worked at agricultural properties is not always a straightforward matter. The contributions of wage laborers, tenants, and managers will often be invisible in historical records, as compared to the documentary evidence left by property owners. The seasonal nature of agricultural work, as well as the transience of workers and tenants, makes interpreting the history of a large segment of the work force challenging at best. Documentary evidence may reveal that owners managed agricultural properties themselves, leased them out for cash or a share of the crops, or hired managers. At the bottom of the economic ladder were agricultural workers who often left little or no documentary evidence. They typically moved from job to job, received low pay for grueling work, and made the best of poor living conditions.

Archaeology can add to our knowledge regarding the relationship between laborers, tenants, managers, and owners of agricultural properties.

GENERAL EMPLOYMENT TRENDS

The following discussion first considers the broad patterns of agricultural employment in California between 1850 and 1945. Compilations published by the U.S. Census Bureau, narrative histories and other sources provide insight into employment patterns.²⁷⁶ Particular attention is devoted to the roles of ethnic groups and the changing gender and age composition of the workforce. Brief sketches are provided for key ethnic groups. Attention then turns to the differing interests and approaches adopted by major economic stakeholders (owners, middlemen, and laborers) and how labor relations evolved over time. Woven into that discussion is a consideration of how industrialization affected all of those employed in agriculture.

Agricultural properties are particularly important in addressing a wide range of questions associated with labor and ethnicity through a combination of archaeological data, historic records, and oral history. Between 1850 and 1950, California witnessed radical changes in the relationship between farm ownership, management, and the workforce. California, perhaps more than any other state in the nation, historically required both skilled and unskilled laborers that could only have been possible through a largely transient labor force, composed mainly of immigrants.

Throughout much of this nation's history farmers remained a dominant constituency in local, regional, and national politics. Often referred to as the "Farmer Movement," rural farm families engaged in populist struggles, albeit at first mainly out of self-interest. Most farmers, however, were inherently distrustful of the government. Their entry into politics, particularly as participants in the state's Populist Movement, provided some assuredness that the government offered opportunities for purchasing land, obtaining low interest loans, and increasing productivity.

As the immigrant labor force increased throughout California, the disparities between fee simple land ownership and tenant farming became quickly evident, as the state's best agricultural lands were subsumed into large land holdings. Societal prejudices, government regulations, fluctuations in the supply of labor and many other factors contributed to the opportunities and constraints faced by particular groups as they sought to own, rent, or simply find work on California's farms and ranches.

The general patterns summarized here provide a way to interpret the degree of assimilation and/or acculturation of an individual or a particular cultural group within California's agricultural workforce. The U.S. Census Bureau did not summarize the ethnic, gender, and age composition of the agricultural work force during the initial decades after statehood. Archaeological research and detailed site-specific historical studies may help interpret employment trends during that period. Employment trends in subsequent decades are more apparent because census compilations focused greater attention on those issues.

²⁷⁶ Daniel Cornford, ed., *Working People in California*, (Berkeley, CA: University of California Press, 1995).
Richard S. Street, *Beasts of the Field: A Narrative History of California Farmworkers, 1769-1913*. (Stanford, CA: Stanford University Press, 2004a).
Lawrence J. Jalineck, "Property of Every Kind: Ranching and Farming During the Gold Rush Era," in *A Golden State: Mining and Economic Development in Gold Rush California*, James J. Rawls and Richard J. Orsi, eds., *California History* 77 No.4 (1999): 233, 1999.

For this reason, reliance on anecdotal evidence provides the major characterization of agricultural employment patterns during the initial decades of statehood. According to the U.S. Census, between 1850 and 1940, the number of those employed in agriculture rose from 2,059 to nearly 232,000, a more than one hundred-fold increase (Table 4). That figure includes all people employed in agriculture from owners to tenants and laborers. The number of agricultural laborers in the first two decades after statehood, however, is clearly underreported because labor, coerced or otherwise, provided by indigenous people was not systematically documented. With most people working in more profitable or less physically taxing types of employment, farmers and ranchers in the 1850s and 1860s took advantage of Native American and later overseas Chinese workers to establish and expand production. Census figures for labor in those early decades probably exclude most indigenous labor. Not until the 1870 census did census compilations for agricultural labor become more reliable. By that time the indigenous population had plummeted, their importance in the agricultural work force steadily declined, and census enumerators began to count indigenous workers as part of the general work force.

Evidence supports the premise that Native Americans were crucial to the success of California agriculture during the Spanish and Mexican eras.²⁷⁷ That they were also an important source of agricultural labor during the initial period of statehood requires additional research. While the U.S. Congress debated whether to admit California as a free or slave state, the state legislature passed a bill entitled “An Act for the Government and Protection of Indians” in April 1850. That law allowed farmers to obtain Indian labor under a variety of pretexts including “vagrancy.”²⁷⁸

Any farmer or employer could have an unemployed or otherwise “vagrant” Indian arrested. Once tried, convicted, and “fined” for his crime, an Indian could be bailed out and set to work for a proscribed period of time, or until he had repaid the amount of the fine and cost of bail. In effect, this made any Indian available for farm labor and, while field hands were supposed to be treated humanely and properly fed and clothed, no provision to enforce those provisions existed. And since no white farmer could be convicted of mistreatment on the testimony of an Indian, field hands obtained in this way became, in effect, slaves.²⁷⁹

The Indian Indenture Act also allowed the adoption of Indian children as apprentices.²⁸⁰ Under that provision, whites could appear before a justice of the peace with “parents or friends” of an Indian child and obtain charge of that minor simply by demonstrating no coercion was involved. The new law also stripped Indians of rights to access traditional food sources, forbade the use of methods such as setting fires for game drives and the promotion of favored plants, and gave Indians no rights to bring lawsuits, vote, or otherwise fairly redress grievances. Hence, it essentially legalized the system of peonage first implemented under Mexican rule, forcing many indigenous people into farm work and other manual labor at a time when few people wanted such jobs. In many cases Indians received little more than food, consent to pursue traditional subsistence on lands usurped

²⁷⁷ Julia G. Costello & Mary L. Maniery, *Rice Bowls in the Delta: Artifacts Recovered from the 1915 Asian Community of Walnut Grove*, (Los Angeles, CA: University of California, Los Angeles, Institute of Archaeology, 1988).

Stephen W. Silliman, *Lost Laborers in Colonial California: Native Americans and the Archaeology of Rancho Petaluma*, (Tucson, AZ: University of Arizona Press, 2004).

²⁷⁸ Street, *Beasts of the Field*, 120.

²⁷⁹ Ibid, 120-121.

by white settlers, and limited protection from white aggression in exchange for labor. In a manner that differed from slavery only by nuance, Indians who tried to escape this coerced farm labor system were often hunted down and severely punished or killed.²⁸¹

Table 4. Agricultural Employment from Census Compilations

Agricultural Employment		1850	1860	1870	1880	1890	1900	1910	1930	1940
Owners/Foremen	Farmers	1,486	20,836	24,090	43,489	61,808	64,171	61,554	ND	ND
	Fruit, Nursery, & Florist	111	1,862	2,670	ND	ND	5,096	15,752	ND	ND
	Dairy Farmers	ND	ND	1,010	ND	ND	3,102	4,720	ND	ND
	Stock Raisers	6	108	1,860	2,483*	2,934*	2,264	3,935	ND	ND
	Apiarists	ND	59	4	0	249	256	496	ND	ND
	Total	1,603	22,865	29,634	45,972	64,991	74,889	86,457	135,676	96,487
	% Female	ND	ND	ND	ND	4.0%	5.8%	4.8%	ND	ND
Laborers	General	ND	ND	16,231	23,856	51,799	63,266	85,199	ND	ND
	Dairy	ND	ND	ND	ND	4,253	2,345	5,830	ND	ND
	Fruit/Nursery	ND	ND	ND	ND	5,298	4,227	12,103	ND	ND
	Ranch & Poultry	ND	722	1,998	2,483*	2,934*	1,838	7,415	ND	135,213
	Total	456	10,421	18,229	26,339	64,284	71,676	110,547	ND	ND
	% Female	ND	ND	ND	ND	0.5%	0.7%	2.6%	ND	ND
All Agricultural Workers	Age 15 & Under	ND	ND	ND	1,158	ND	ND	2,459	ND	ND
	All Agricultural Workers	2,059	33,286	47,863	73,311	129,275	146,565	197,004	ND	231,700
	% Of Agricultural Workers Reflecting Owner's Families	78%	69%	61%	64%	50%	51%	44%	ND	42%
% Of All Workers		2.6%	15.2%	20.1%	19.2%	23.8%	22.9%	17.8%	ND	ND
* Stock raisers and ranch hands were not separated in 1880 and 1890. In keeping with the general pattern in earlier and later decades, 50 percent were arbitrarily allocated to each group. ND means the census bureau compiled no data.										

Street notes “many natives would continue working on farms - even dominating crops and harvest in some areas - until well into the second decade of the next century.”²⁸² Yet their numbers declined precipitously from about 100,000 in 1850 to an estimated 16,500 by 1880 due to violence, disease, and other causes.²⁸³

²⁸¹ Ibid, 150.

²⁸² Ibid, 139.

²⁸³ Merriam, *Indian Population of California*, 1905.

One local study found that 22 percent of the Native Americans listing an occupation in Amador County in 1880 worked on farms, while another 51 percent were laborers that may have worked partly or entirely as farm workers.²⁸⁶ The indigenous population of Amador County, however, composed only 2.2 percent of the total population by that time, and agriculture had become the primary source of income due to dramatic shift away from gold mining. While other groups were hired at farms and ranches, indigenous groups and Chinese workers “were more readily available, worked hard, and at least for a time accepted the lowest wages.” While Americans and Mexicans tended to bargain and complain individually, Native American and Chinese laborers simplified grower contact with workers by using one of their own as boss and doing what they were told.”²⁸⁷

By the mid-1860s California was twelfth in the United States in total farm production, and agriculture was challenging mining as the primary industry in the state.²⁸⁸ That exponential growth occurred despite a chronic shortage of labor and significant fluctuations in market conditions. The families of farm and ranch owners carried much of the early development out with limited help from hired hands and an uncertain amount of indigenous labor.

The reasons for leaving traditional homelands in Eastern Europe match those experienced in many parts of the world. Political and religious repression angered many and economic difficulties, including crop failures and high taxation, were just a few reasons for immigration. Establishment of railroads opened many areas and provided easier access to ports. From there, immigrants could travel to the United States and other locations of perceived opportunity. In Croatia, immigration began in the early 1870s while in Serbia; immigration largely began after 1892 due to an increase in political repression and several years of crop failures. Croatians and Serbians found California similar to their homeland in many respects and many established orchards in the Santa Clara Valley, the Bay Area, and the San Joaquin Valley. Mark Rabasa is remembered for starting the apple industry in Watsonville in the Salinas Valley. Stephen Mitrovich is credited with reinvigorating the fig industry in California. Immigrants from Prussia came after the U.S. Civil War, again because of political unrest in their homeland. Most Poles settled in cities, despite coming from agricultural areas. Immigrants began coming in the 1870s from what is today the Czech Republic, however they comprised the smallest numerical group of all Slavic immigrants. While Russia established a presence at Fort Ross early in the 19th century, the Russian American Company’s abandonment of that post effectively removed Russians from California for many decades. Russian immigration to California followed the pattern of other Slavic groups and was driven by political unrest at home. As with the Poles, Russians settled mainly in cities and did not have a large agricultural presence in California.²⁸⁹

²⁸⁴ Dorthea Jean Paule, “The German Settlement at Anaheim” M.A. thesis, University of Southern California, 1952), reprinted, 1974, (San Francisco, CA: R and E Research Associates.

²⁸⁵ Igler, *Industrial Cowboys*, 12.

²⁸⁶ Thad M. Van Bueren, *Lending a Hand: Archaeological Perspectives on Farm Labor at the Brown and Sanderson Farm (CA-AMA-364/H) in Amador County, California*, (Stockton, CA: California Department of Transportation, District 10, 2005).

²⁸⁷ Jelinek, *Property of Every Kind*, 244.

²⁸⁸ Street, *Beasts of the Field*, 145.

²⁸⁹ Helene Caire, “On the Trail of the Slavonic Pioneers,” in *Slavs in California*, Stephen N. Sestanovich. Ed., (Oakland, CA: Slavonic Alliance of California, 1937), 20-27.

Nevertheless, judging by the ratio of owners and their families to wage laborers, reliance on outside help steadily increased over time (see Table 4 above). That steady rise in the proportion of wage laborers underscores the market orientation of most California agricultural ventures and how they diverged from small family-operated farms based upon the Jeffersonian ideal.

Although early employment compilations were skewed, employment in agriculture occupied a growing proportion of the state's work force during the late nineteenth century. It rose from less than 3 percent of the non-indigenous work force in 1850 to nearly a quarter of all employed workers by 1890. In later years, agricultural employment declined in relation to other types of employment due to mechanization and ongoing expansion of other industries.

The problem of inadequate labor supplies changed after the completion of the transcontinental railroad in 1869. As anticipated, the railroad provided new markets for California agricultural products. At the same time, it spawned a regional economic recession because local products now had to compete against cheap imports. In certain regions of the state unemployment increased. Compounding the loss of jobs in some California industries was a flood of newly unemployed railroad construction workers, largely overseas Chinese, and large numbers of new job seekers arriving from the east by train. Those factors contributed to an unemployment rate that exceeded 20 percent in California in 1870.²⁹⁰ Starting in the 1870s, the U.S. Census Bureau began compiling more detailed employment statistics by race, ethnicity, gender, and age (Table 5). Whites owned the vast majority of farms and ranches—a pattern that changed little over time. California's agricultural properties were owned or operated by native-born individuals twice as often as by immigrants.

This finding is consistent with the fact that many foreign-born people arrived with few economic reserves in the hope of taking advantage of the American dream. Most foreign-born owners were from northern European countries, although other groups such as Mexicans, Italians, and Portuguese did establish farms and ranches in limited numbers. Ownership by persons of color, taken in the census to encompass groups such as Asians, Pakistanis, Blacks, and Native Americans, composed a small proportion of all farm owners in the state during the century embraced by this context. It steadily rose, however, from just 1.6 percent of all farms to over 5 percent from 1890 to the early twentieth century.

Tenancy provided limited opportunities for economic advancement and stable employment for those who could not buy land, whether because of lack of funds or because of discrimination. The proportion of colored or black tenants, as enumerated in the census, rose dramatically from about 13 percent of all tenants in 1910 to 31 percent by 1940 (Table 6). Tenants rented land for the cash or a share of the crops they grew. The dramatic increase in colored tenants is significant because tenancy rates remained at a consistent level for cash and sharecroppers from 1910 through 1940, the only years the Census Bureau consistently compiled this data. By that period, only the most marginal lands remained available for homesteading, since the best arable lands already had owners or occupants. Thus, tenancy became a key strategy of marginalized groups such as persons of color and recent immigrants for realizing the American dream of owning land and becoming economically self-sufficient.

²⁹⁰ Varden Fuller, *Hired Hands in California's Farm Fields: Collected Essays on California's Farm Labor History and Policy*, (Davis, CA: Giannini Foundation of Agricultural Economics, University of California, Davis, 1991), 9-10.

Table 5. Ethnicity of California Agricultural Workers, 1870-1940

ETHNICITY		1870	1880	1890	1900	1910	1920	1930	1940
AGRICULTURAL OWNERS/OPERATORS	All Owners/Operators	29,634	79,396	66,384	74,889	84,582	117,670	135,676	132,658
	White	All Whites	ND	ND	65,306	ND	81,504	111,184	125,928
		Native-born	ND	ND	45,195	ND	55,162	ND	ND
		Foreign-born	ND	ND	20,111	ND	26,342	ND	ND
		Irish	ND	5,220	3,246	ND	ND	ND	ND
		German	ND	4,231	4,076	ND	ND	ND	ND
		British	ND	5,756	5,098	ND	ND	ND	ND
		Scandinavian	ND	738	1,571	ND	ND	ND	ND
	Other	All Non-Whites	ND	ND	1,078	ND	3,078	5,472	6,730
		African American	ND	ND	ND	159	290	424	327
		Native American	ND	ND	ND	591	578	758	864
		Japanese	ND	ND	ND	1,816	5,152	3,956	5,135
		Chinese	ND	ND	ND	512	466	292	236
		Other Non-White	ND	ND	ND	ND	ND	42	168
AGRICULTURAL LABORERS	All Farm Laborers	18,229	23,856	78,684	71,676	135,353	ND	ND	135,213
	White	All Whites	ND	ND	58,076	ND	87,923	ND	ND
		Native-born	ND	ND	32,158	ND	56,882	ND	ND
		Foreign-born	ND	ND	25,918	ND	31,041	ND	ND
		Irish	ND	1,210	2,124	ND	ND	ND	ND
		German	ND	890	2,892	ND	ND	ND	ND
		British	ND	1,269	3,090	ND	ND	ND	ND
		Scandinavian	ND	233	1,995	ND	ND	ND	ND
	Other	All Non-Whites	ND	ND	10,507	ND	25,704	ND	ND
		African American	ND	ND	ND	450	ND	ND	ND
		Other Non-Whites	ND	ND	ND	22,252	ND	ND	ND
TOTAL EMPLOYED	Native-born	30,629	ND	99,039	ND	140,826	ND	ND	ND
	Foreign-born	17,234	ND	46,029	ND	57,383	ND	ND	ND
	All Whites	ND	ND	123,382	ND	169,427	ND	ND	ND
	All Non-Whites	ND	ND	21,686	ND	28,782	ND	ND	ND
	Irish	3,803	6,430	5,370	ND	ND	ND	ND	ND
	German	2,756	5,121	6,968	ND	ND	ND	ND	ND
	British	2,472	7,025	8,188	ND	ND	ND	ND	ND
	Scandinavian	588	971	3,566	ND	ND	ND	ND	ND
	Chinese & Japanese	2,694	ND	ND	ND	ND	ND	ND	ND
	Grand Total	47,863	103,252	145,068	146,565	198,209	ND	ND	267,871
* Owner/operators include family members engaged in agriculture. ND = no data compilations available.									

Farms owned or operated by persons of color and recent immigrants have research value not only because they are relatively rare, but also because they have the potential to reveal the adaptations, accommodations, and sometimes resiliency of minority populations. Researchers are interested in understanding how and why different ethnic groups maintained, altered, or abandoned traditional approaches to agriculture.

Farms and ranches owned or operated (leased) by women constitute another relatively scarce type of agricultural property that have the potential to address questions concerning gender strategies, adaptations, and economic opportunity.

Table 6. California Farm Tenants by County, 1910-1950

County	1910			1920			1930	1940			1950	
	Cash	Share	Colored	Cash	Share	Colored	Cash	Cash	Share	Colored	Cash	Share
Alameda	386	183	9.3%	458	271	21.1%	284	318	112	32.8%	147	79
Alpine	7	0	0.0%	3	0	0.0%	2	0	0	0.0%	0	0
Amador	73	9	2.4%	68	18	1.2%	53	55	1	0.0%	18	1
Butte	86	89	9.1%	131	132	9.5%	157	164	132	9.1%	58	92
Calaveras	26	11	8.1%	36	13	0.0%	42	50	4	1.9%	21	0
Colusa	54	92	4.1%	88	129	9.7%	85	46	101	5.4%	26	81
Contra Costa	313	153	5.6%	312	203	15.5%	196	190	71	28.7%	93	42
Del Norte	17	1	16.7%	31	2	12.1%	37	36	9	82.2%	17	9
El Dorado	40	9	8.2%	70	22	4.3%	42	56	8	7.8%	24	11
Fresno	254	403	17.2%	333	996	32.9%	468	532	738	39.2%	298	524
Glenn	44	81	0.8%	89	102	3.1%	113	137	84	1.4%	61	61
Humboldt	436	15	0.9%	550	22	0.5%	544	271	70	44.3%	140	178
Imperial	242	145	13.2%	928	403	23.9%	893	623	276	46.4%	289	105
Inyo	33	18	5.9%	43	20	6.3%	118	72	2	117.6%	70	1
Kern	137	52	21.2%	208	153	10.2%	258	395	168	7.8%	254	219
Kings	188	185	9.4%	306	218	14.9%	267	298	130	11.0%	161	107
Klamath	0	0	0.0%	0	0	0.0%	0	0	0	0.0%	0	0
Lake	82	17	1.0%	62	40	0.0%	68	68	27	10.5%	27	16
Lassen	36	26	0.0%	41	38	0.0%	63	48	16	17.2%	13	8
Los Angeles	1,297	413	34.5%	2,547	533	48.1%	1,848	2,555	216	57.5%	1,180	98
Madera	17	101	7.6%	105	117	4.1%	108	123	141	22.0%	85	102
Marin	274	7	0.0%	300	9	0.6%	289	194	5	3.5%	138	3
Mariposa	24	5	3.4%	24	14	2.6%	34	56	4	10.0%	6	2
Mendocino	174	33	1.4%	214	72	0.7%	156	170	70	20.8%	61	24
Merced	156	199	1.4%	398	255	2.6%	525	555	317	15.4%	393	169
Modoc	43	67	0.0%	51	57	0.0%	47	53	35	8.0%	81	19
Mono	8	5	0.0%	4	0	0.0%	1	14	1	40.0%	7	0
Monterey	251	249	9.4%	294	254	15.9%	347	433	228	20.6%	206	125
Napa	204	68	1.5%	131	76	1.0%	133	143	89	2.6%	45	15
Nevada	48	5	9.4%	53	6	1.7%	59	45	2	0.0%	17	4
Orange	200	271	16.6%	192	245	35.7%	210	380	161	47.3%	165	79
Placer	211	59	61.1%	179	227	55.2%	127	116	73	87.8%	42	42
Plumas	19	2	0.0%	27	4	6.5%	26	16	0	12.5%	10	0
Riverside	95	134	7.4%	212	318	6.6%	194	286	200	40.3%	126	93
Sacramento	295	195	42.2%	612	418	48.9%	355	368	193	81.3%	184	104
San Benito	84	104	8.5%	91	84	14.3%	86	106	81	21.9%	56	50

The period between 1900 and 1920 was a time of robust agricultural production brought about by spirited economic growth in the United States, European crop failures, massive immigration to urban industrial centers, and an increase in money supply due to Alaskan gold discoveries.²⁹¹

²⁹¹ Licht, *Industrializing America*, 188-189.

TABLE 6. CALIFORNIA FARM TENANTS BY COUNTY, 1910-1950, (CONTINUED)

County	1910			1920			1930	1940			1950	
	Cash	Share	Colored	Cash	Share	Colored	Cash	Cash	Share	Colored	Cash	Share
San Bernardino	67	91	3.2%	162	130	4.1%	248	274	103	11.7%	120	29
San Diego	180	115	7.1%	367	248	22.9%	263	495	79	56.6%	169	27
San Francisco	38	0	21.1%	27	1	7.1%	41	24	0	0.0%	5	0
San Joaquin	296	411	15.8%	512	522	27.3%	587	605	456	24.8%	300	278
San Luis Obispo	374	195	3.0%	290	270	8.6%	384	440	161	15.1%	188	77
San Mateo	243	26	4.1%	340	54	12.2%	289	330	38	29.3%	149	14
Santa Barbara	293	159	4.6%	233	298	11.1%	192	228	163	16.4%	124	84
Santa Clara	467	341	16.5%	374	258	24.7%	388	518	287	51.6%	255	207
Santa Cruz	229	81	7.4%	278	106	21.4%	243	258	72	33.0%	101	27
Shasta	107	21	5.5%	98	29	1.6%	121	147	28	19.4%	36	7
Sierra	10	1	0.0%	8	0	0.0%	9	8	0	0.0%	3	0
Siskiyou	54	39	1.1%	69	58	0.0%	118	165	50	15.8%	53	28
Solano	197	104	20.3%	240	169	29.1%	160	161	104	34.0%	69	79
Sonoma	461	150	2.8%	603	233	3.8%	726	642	178	6.2%	329	95
Stanislaus	147	239	0.8%	495	487	6.2%	561	551	345	4.5%	500	274
Sutter	88	64	11.8%	77	167	17.6%	56	58	115	14.5%	23	107
Tehama	103	35	5.8%	107	57	9.8%	168	215	52	3.4%	65	26
Trinity	16	3	21.1%	24	4	3.6%	30	19	4	13.0%	11	1
Tulare	233	212	3.8%	373	537	11.0%	737	566	283	21.7%	328	258
Tuolumne	18	2	0.0%	24	9	0.0%	12	47	2	22.4%	20	2
Ventura	60	253	6.4%	59	281	7.1%	62	80	120	13.0%	56	70
Yolo	137	167	18.4%	229	210	30.8%	184	150	139	34.6%	64	107
Yuba	65	20	8.2%	50	44	11.7%	66	60	33	22.6%	24	22
TOTALS	9737	6135	13.1%	14230	9643	21.30%	13880	15013	6577	31.20%	7511	4282
% of All Farms	11.0%	7.0%	2.4%	12.1%	8.2%	4.3%	10.2%	11.3%	5.0%	5.1%	5.5%	3.1%

**Derived from U.S. Census Bureau compilations.*

The agricultural work force nearly doubled between 1900 and 1910, and the value of agricultural production increased nearly six-fold to 785 million dollars by 1920. As the demand for agricultural laborers rose following the turn of the century, their ranks swelled with an increasing proportion of native-born white and non-white workers, while the number of foreign-born white workers remained relatively constant. Of the native-born white workers Street notes:

Like their predecessors . . . these men had, for a variety of reasons, abandoned societal mores and taken to a life on the road as a means of survival. Filling the void created as the Japanese moved up and out of farm labor, and the Chinese and native Indian populations [that had] died out, bindlemen became so essential to the prosperity and growth of California agriculture that they should have earned the respect and admiration of their fellow citizens as well as the gratitude of farmers and rural communities. But this was not the case. Despite their central

role, they remained social outcasts. Among farmworkers, no group—with the possible exception of the Indians—was more ill treated, no group was more misunderstood or taken for granted by the agricultural industry, and none led a more perilous or mobile existence.²⁹²

While new waves of immigrants and native-born people of color continued to comprise the largest part of the agricultural labor pool, native-born white men resorted to that hard and relatively low-paying employment in significant numbers between the 1870s and the First World War. In the years 1890 and 1910, according to the U.S. Census Bureau, more than 40 percent of California's agricultural work force consisted of native-born white men.



Figure 56: Japanese farm laborer's shack, 1905. Segregated and poor housing for Japanese farm laborers, such as the one seen here, was common (*Photographs of Agricultural Laborers in California*, BANC PIC 1905.02645-PIC, courtesy of The Bancroft Library, University of California, Berkeley)

Waves of new immigrants made up the rest of the agricultural work force. One-third of the foreign-born agricultural work force was still composed of northern Europeans in 1890, but their numbers were eclipsed after the turn of the century by immigrants from southern and eastern Europe, Japan, Mexico, and India. Anecdotal evidence suggests the pool of foreign-born agricultural workers came largely from recent immigrants, although census compilations for the period do not list the respective contributions of particular ethnic groups to the agricultural labor

²⁹² Street, *Beasts of the Field*, 529.

pool. Recent immigrants often had to resort to the lowest paying, unskilled jobs, which included agricultural work. Because recent foreign arrivals and native-born persons of color from other states often entered the California work force at the bottom of the wage scale, many likely resorted to unskilled, low-paying agricultural work at least some of the time.

Immigration trends for some of the most noteworthy groups involved in agriculture appear in Figure 55. The numbers reflect the entire population of each group, not the number of workers engaged in agricultural work. Some groups came to be closely associated with certain regions and agricultural products. For example, Basques from northern Spain came to dominate the sheep industry in eastern California, while Italians and Italian-Swiss were heavily involved in the wine industry.

By the end of the nineteenth century, the changing character of the agricultural work force may have coincided with the placement of greater physical and social distance between some farm families and their hired hands, as one study suggests.²⁹⁵ That separation was

While Black Americans never engaged in large numbers in California's agricultural industry, they deserve recognition as pioneers in the development of several agricultural enclaves or colonies in the state. Black Americans also were engaged as farm laborers, particularly in the Imperial Valley where cotton was being cultivated in the 1910s.²⁹³

According to Ramsey and Lewis, "at least two different efforts at black colonization occurred in San Bernardino County between 1900 and 1910. The Forum, a Los Angeles civic club organized in 1903, solicited families to homestead government land in the Sidewinder Valley near Victorville. The first homesteader preempted a 640-acre site "where ground water could be easily lifted, but water, although critical to subsequent development, was never available in ample supply." While little is known about the actual number of families who relocated to Sidewinder Valley during the Forum's promotional effort, in 1914, the Forum reported, "more than 20,000 acres had been homesteaded by Blacks." Lucerne, which lies nearby in the Sidewinder Valley, has also been labeled by pioneers in Sidewinder Valley as an originally Black settlement.

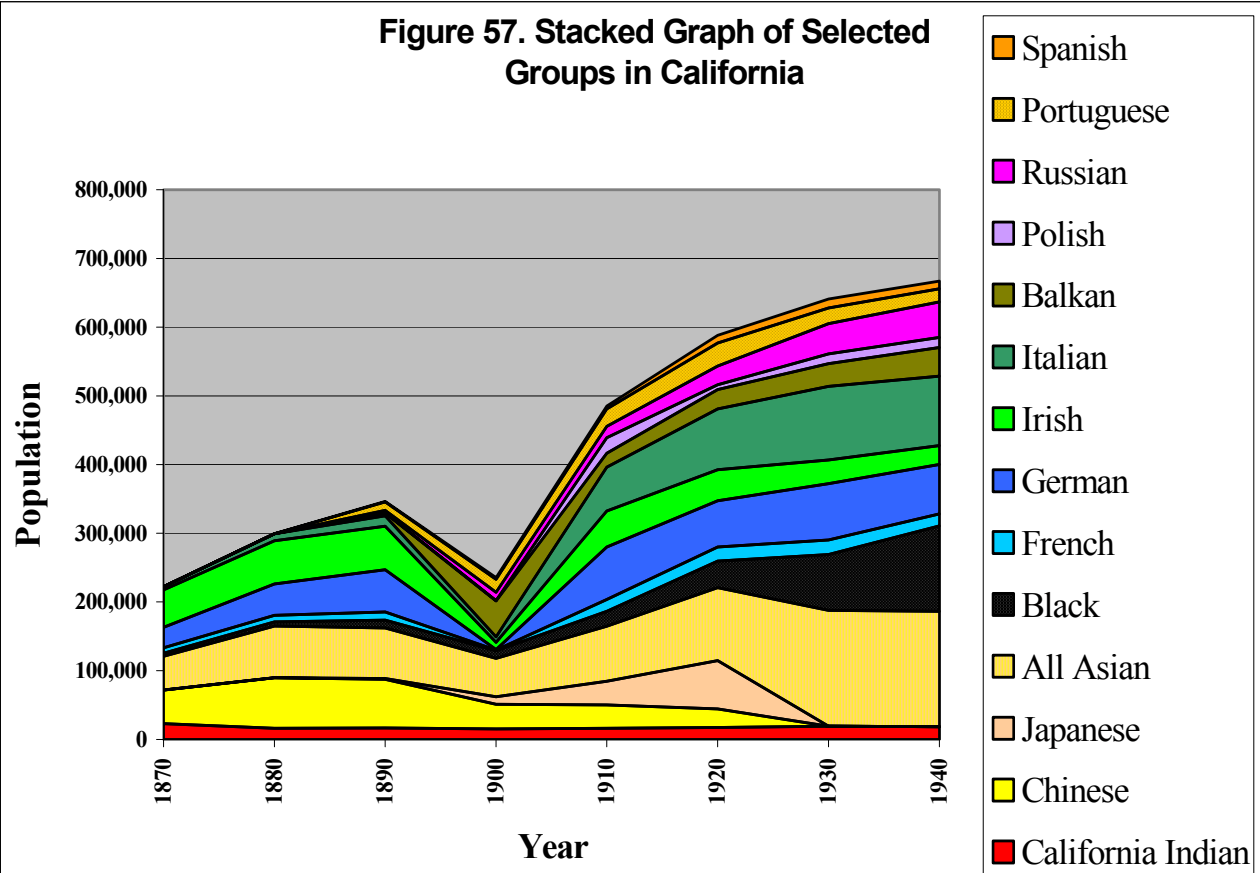
In Tulare County, African-Americans settled in a small community they named Allensworth. Established in 1908, Allensworth was created as a self-governed Black town. The town's promoters attracted more than 200 settlers in its first few years. Given the harsh environment of the southern San Joaquin Valley where the town was plotted, Allensworth's pioneers struggled. Underground aquifers soon stopped flowing at a volume needed to provide the community with its required domestic and agricultural needs. While plans were implemented to acquire water elsewhere, the community declined in population, and ultimately the settlement was abandoned. By the third and fourth decades of the twentieth century, Black Americans were migrating away from the state's agricultural belt to the urban centers of the state, particularly the Bay Area and the Los Angeles Basin.²⁹⁴

²⁹⁴ California State Office of Historic Preservation Five Views: An Ethnic Sites Survey for California, (Sacramento, CA: State of California, the Resources Agency, Department of Parks and Recreation, Office of Historic Preservation, 1988), 66-68.

²⁹⁵ Van Bueren, *Lending a Hand*.

likely an outgrowth of a shift from the old paternalistic patterns rooted in the peonage of the Mexican and early American periods to a system that increasingly emphasized a strict wage labor relationship, and a general upsurge of racism in American society, particularly in California directed against Asians and Hispanics. As agricultural producers emphasized industrial approaches to production, employment became increasingly transient, as work became more seasonal. Wider separation of dwellings used by workers and owners also may have stemmed from the belief that transient workers were morally suspect.

Another facet of agricultural labor involves the contributions of women and children. Very little systematically collected information exists about either segment of the work force. In many cases, women and children who were part of a farm or ranch family may have worked part or even full time, while the census lists them as “keeping house” or “at school.” This seems to be confirmed by the fact that in California women are listed as working in agriculture nine times more frequently as owners or operators than as wage laborers in the years 1890 and 1900 (see Table X above). The proportion of women wage laborers, however, rose from less than 1 percent to 2.6 percent of the agricultural work force by 1910. Since that time their contributions to the labor pool have steadily increased.



While the average job tenure in California in 1900 was a remarkable 13 years and less than 7 percent of the work force held jobs lasting under three years, wage employment at many farms was by its very nature short term.²⁹⁶ Transience favored single men, although families did work together, particularly in some agricultural industries.

The adaptations made by workers to this strongly male-dominated work culture have the potential to shed light on broader social issues concerning the impacts of industrialization on society, community cohesiveness, and other related matters, particularly when contrasted with agricultural ventures that included greater use of families.

The steady increase of families in the agricultural wage labor pool resulted in other changes, such as the need for segregated housing by race, temporary housing for families, and more educational service. Information regarding children working in agriculture is scarce. According to some estimates up to one-quarter of all farms and ranches may have relied on such workers.²⁹⁷ In California, a total of 1158 children age 15 and under were listed as agricultural laborers in 1880, constituting 4.4 percent of all workers in that industry at the time. That figure likely reflects only those children actually engaged in agricultural work at



Figure 58: A young child working the cotton fields at Linnell Camp, Tulare County, ca. 1930s (*The San Joaquin Valley Digitization Project, Tulare County Free Library, Annie R. Mitchell Hist, San Joaquin Valley & Sierra Foothills Photo Heritage, tca0151, San Joaquin Valley Library System, Fresno, California*).

More distinct separations of worker and owner housing may have important implications when dealing with archaeological sites. The spatial arrangement of agricultural properties and their eligible deposits and features may have evolved as a direct result of changing employment conditions.

the time census enumerators visited farms and ranches. Many were likely engaged in part-time work or even missed school during harvest season, and thus, census officials never counted them. By 1910, 2,459 children under 16 years of age worked as agricultural laborers, a figure that reflected a reduction to just 2.2 percent of the agricultural work force. The reduction in child labor after the turn of the century reflects in part the efforts of progressives to curtail some of the abuses of industrial capitalists. Yet, agriculture was different in many respects from other types of industries. Thus, when farm labor organizing efforts met with some solid victories

²⁹⁶ Susan B. Carter & Elizabeth Savoca, "Gender Differences and Earning in Nineteenth Century America: The Role of Expected Job and Career Attachment," *Explorations in Economic History*. 28 (1991): 323-343.

²⁹⁷ Street, *Beasts of the Field*, 149.

starting in 1903, farmers sought to promote the idea of using juvenile delinquents from cities to harvest crops, based on the idea that it would provide a healthful atmosphere in which to reform them.²⁹⁸ Advertisements appeared in San Francisco newspapers. Public support for that program evaporated quickly after the well-publicized trial of a 14-year-old boy named Claude F. Hankins, however. Hankins shot a foreman who had whipped him and committed “a crime against nature.” During the trial, another boy named Charles Dray testified that, “we were slaves on that ranch.”²⁹⁹ Child labor diminished as it fell under greater governmental control in the twentieth century.

The composition of the agricultural work force has continued to evolve throughout the twentieth century as new waves of immigrants have entered the California economy. Sikhs from India began to enter the agricultural work force after the World War I. During the Dust Bowl and Great Depression of the 1930s, large numbers of “Okies” from Texas, Arkansas, Oklahoma, and Nebraska migrated to the San Joaquin and Salinas Valleys looking for work. The census did not separately compile data on persons of Hispanic origin until 1940, a year in which 415,113 of them lived in the state.

Starting in the 1940s, intensified immigration from Mexico also took place, largely associated with the Bracero program. The Bracero movement began as a binational temporary contract labor program initiated in August, 1942 through an exchange of diplomatic notes between the United States and Mexico. The program was designed initially to bring a few hundred experienced Mexican agricultural laborers to harvest sugar beets in the Stockton area. The program soon spread throughout the United States to provide much needed farm workers during World War II. Simultaneously, the railroad bracero program was negotiated to supply U.S. railroads initially with unskilled workers for track



Figure 59: Migrant family of Mexicans on the road, 1936 (*California Cornerstones: Selected Images from the Bancroft Library Pictorial Collection, 1942.008, Folder 101, #2464E, courtesy of The Bancroft Library, University of California, Berkeley*).

²⁹⁸ Ibid, 472-473.

²⁹⁹ Ibid, 474.

maintenance, but it eventually covered other unskilled and skilled labor. By 1945, the quota for the agricultural program was more than 50,000 braceros and 75,000 for the railroad program. The railroad program ended promptly with the conclusion of World War II, but the agricultural program under various forms survived until 1964, when the two governments ended it as a response to harsh criticisms and reports of human rights abuses. The program made a large contribution to agriculture throughout California and the rest of the United States. Most consider the program from a human rights standpoint to be an complete failure. No known figures exist to clarify exactly how many of Mexicans worked in agriculture, since so many were undocumented, but the number was and remains high to this day. Subsequent waves of immigration during the late twentieth century have included Southeast Asian populations, such as the Hmong.

COOPERATIVES, THE GRANGE, AND FARM BUREAUS

Farm and ranch owners played an important role in local, regional, and national politics throughout much of this nation's history. Agricultural property owners engaged in populist struggles, often referred to as the "Farmer Movement," sought opportunities for public land acquisition, low-interest loans, government-assisted infrastructure improvements such as irrigation, roads, and rural electrification, and government intervention in commerce and labor disputes. The economic importance of agriculture gave property owners significant political influence, but the interests of small and large operators also diverged in important ways.

Although the average size of agricultural properties steadily declined in California during the century following statehood, a significant issue faced by the state's many small farmers and ranchers was the domination of the marketplace by a growing number of large operators. Large operators had the advantage of greater capital and the consequent ability to produce goods at lower cost. Spreading the costs of new and more efficient technology, irrigation, product transport, and other expenses over larger acreages, increased efficiency and profit. Smaller operators found it challenging to remain competitive. They did so in part by forming cooperatives, organizing the Grange to promote their political interests, and improving the efficiency of production by using scientific advice provided by the Farm Bureau and other sources.

Cooperatives gave small agricultural operators the ability to share certain production and marketing expenses, and thus lower individual costs as a way to compete effectively against company or corporate farms, although some cooperatives worked in the interest of the large growers by stymieing competition and prohibiting labor organization. But in general cooperatives shared processing and packing expenses, negotiated more competitive transportation costs, and shared investments in infrastructure, such as irrigation systems and equipment. As the timing of product sales increased in importance, cooperatives also invested in storage facilities for durable products that could sell later at more profitable rates. In certain instances, which may have been the case with the California Raisin Grower's Association, forming cooperatives provided the means to garner greater control over marketing and prices. Cooperatives also had the end result of insulating workers from labor unions, whose members

sought improvements in regards to hours worked, wages, and housing.³⁰⁰ Whether cooperatives ultimately benefited the worker is a question deserving of further research.

The need for some form of local or regional organization became vital to the interests of farmers as California's agricultural production increased. The California State Grange became the earliest organization in California to rally behind small farmers. In contrast, large corporate or company farms relied directly on politicians for support and favorable policies and legislation. The establishment of the Grange in California on July 1873 paralleled the development of the National Grange movement. The persistent indebtedness of farmers through heavy mortgages, high rates of interest, transportation costs, manipulation of prices on certain products, uncertain land titles, and acquisition of water rights contributed, in part, to the popularity of the Grange.³⁰¹



Figure 60: Butte Co-operative Farm, Gridley, California. This group of Filipino workers and their children engaged in distributing boxes to the orchards where they had been employed for two weeks (War-Relocation Authority Photographs of Japanese-American Evacuation and Resettlement, Series 16: Resettlement, Volume 80, Section K, WRA no. 196, courtesy of The Bancroft Library, University of California, Berkeley).

Oliver Hudson Kelley, a Minnesota farmer, activist, and clerk for the U.S. Bureau of Agriculture receives credit for establishing the National Grange in 1867. Kelley believed that farmers, “because of their independent and scattered nature,” needed a national organization that would represent them in the same manner as unions were beginning to do for industrial workers. Many looked upon the Grange, officially known as “the Order of Patrons of Husbandry,” as a fraternal group akin to the Masonic Order. The early Grange leaders promoted cooperatives, which could help farmers economically. In theory, the Grange strived for nonpartisanship and generally did not endorse candidates for public office nor contribute to their campaigns.³⁰²

Grange halls acted as community centers in rural areas where

residents gathered for “educational events, dances, potlucks, town meetings, political rallies and other meetings.”³⁰³ On July 15, 1873, delegates from twenty-eight Granges met in Napa to write

³⁰⁰ Woeste, *Farmer Benevolent Trust*.

³⁰¹ Chambers, *California Farm Organizations*, 9.

³⁰² The Grange Connection [1996-2004]. America's Family Fraternity. <<http://www.grange.org>>. April 2005.

³⁰³ David H. Howard, *People, Pride and Progress: 125 Years of the Grange in America*, (Washington D.C.: The National Grange, 1992).

a constitution for the California State Grange. In 1874, membership had grown to over 14,000 individuals representing Napa, Sonoma, Santa Clara, Sacramento, San Joaquin, Santa Cruz, Sutter, El Dorado, and Los Angeles counties. Most of the early members were grain farmers.³⁰⁴ By 1879, membership in the California Grange reportedly dropped to less than 4,000 members statewide, as the wheat boom slowly died down. The Depression of the mid 1870s made the plight of California's farmers more severe, although it ultimately led to political reforms as Grange members became more active in state politics. Between 1880 and 1921, the California Grange slowly increased its membership, particularly in Northern California. The rapid diversification of the state's agricultural products and the lack of confidence farmers had in the Grange's financial activities contributed to the failure of the California Grange to become a formidable institution.³⁰⁵

Most of the California Grange's success came in its fraternal and social activities rather than its political influence or financial capabilities. For rural areas, the Grange formed the center of social, community-based activities. Granges throughout the state had a reported 638,804 members before their decline in the early 1940s.³⁰⁶ Today, the Grange continues to function in much the same way as did prior to 1940, although with fewer Grange halls and active members.

Following the demise of the Grange, the Farm Bureau became one of the most important organizing forces in California agriculture during the twentieth century. The university and its Agricultural Extension Service served as the organizing arm in the birth of the Farm Bureau movement in California. Created by Congress in 1914, the Agricultural Extension Service operated through the nation's land grant colleges, providing educational programs to counties.³⁰⁷

Humboldt formed its bureau in 1913 and became the first county in California to qualify under the Farm Bureau system. Yolo, San Joaquin, and San Diego counties founded their Farm Bureaus the next year, and B.H. Crocheron became the founder of California's Agricultural Extension Service. In a circular written in 1917, Crocheron envisioned the county Farm Bureau acting as "a sort of rural chamber of commerce and ... the guardian of rural affairs. It can take the lead in agitation for good roads, for better schools, and for cheaper methods of buying and selling."³⁰⁸ In September 1919, thirty-two county Farm Bureaus met in Berkeley to create the California Farm Bureau Federation. The fledgling organization, with a combined membership of 24,168, elected Dr. W.H. Walker of Willows as its first president and occupied two rooms within Hilgard Hall on the University of California campus in Berkeley.

Today, the Farm Bureau still serves as a grassroots organization where policy making begins at the local level. The Farm Bureau provided a number of functions including representing farmers' interests in regards to laws and utilities, the legal system, and at agricultural commission meetings. The *Farm Bureau Monthly*, which began publication in 1921, included scientific information for fledgling farmers. In an effort to improve the quality of life in the state's rural areas, the bureau established a Farm Home Department.

³⁰⁴ Chambers, *California Farm Organizations*, 10.

³⁰⁵ Ibid, 12.

³⁰⁶ Ibid.

³⁰⁷ Ibid, 21-25., California Farm Bureau Federation. [2005] Farm Bureau History. <http://www.cfbf.com/about/fbhistory.cfm>. April 2005.

³⁰⁸ Ibid, 21-25.

The purpose of the department was “to assist the farm family to maintain an adequate standard of living by supporting home-demonstration work and by exchanges of experiences in homemaking.”³⁰⁹ Farm Bureau membership decreased during the Great Depression, bottoming out at 15,270 in 1932 before recovering slowly the rest of the decade. The postwar years of the late 1940s saw increased membership and the establishment of “Young People’s Program” bureaus, now the Young Farmer’s and Rancher’s program. The program began in 1947, designed to help young agriculturalists succeed in the business and to train new generations of Farm Bureau leaders.³¹⁰

The 4-H youth development program a part of the Cooperative Extension, originated at the turn of the century because of a vital need to improve life in rural areas, and was designed to engage youth in activities involving virtually every aspect of farm life. The symbolic four-leaf clover or “4-H” stood for “head, heart, hands, and health.”



Figure 61. 4-H youth displaying prized cattle 1946 (Courtesy of U.C. Davis, Special Collections).

The words reflected the goals and mission of the organization. The first record of any known 4-H type activity was in 1898 when Liberty Hyde Bailey of Cornell University established a system of junior naturalist leaflets in rural schools and helped organize nature study clubs. In

³⁰⁹ Ibid.

³¹⁰ Ibid.

1907, 4-H worked under the auspices of the U.S. Department of Agriculture. In 1914, the Cooperative Extension provided the professional staff and support needed to direct the growth of the program. In 1915, there were 4-H clubs in all 47 states.³¹¹ The term 4-H was reportedly first used in a federal publication written in 1918 by Gertrude Warren, one of the pioneers of 4-H. In the early 1920s, a group at a conference in Washington, D.C., discussed the need to give boys' and girls' club work a distinctive name that could be used nationally.

Several people, including Miss Warren, favored 4-H as the formal name for the organization. In 1924, Boys' and Girls' Club work became known as 4-H. The pledge was officially adopted in 1927.³¹² Introducing improved methods of farming and homemaking, 4-H taught youth to "learn by doing."³¹³ The yearly program in one of those early clubs consisted of growing corn, planting a garden, testing soil, club meetings, and visits to club members' plots and exhibits. There was a close affiliation between the school and the home in early 4-H programs. Adults were often persuaded to adopt new practices because of the successes experienced by the 4-H youth.

A major change in 4H occurred during World War II when many of the club's efforts were directed towards victory gardens, civilian defense, salvage programs, and bond campaigns, as well as food preservation. The victory garden program also brought 4-H to urban areas. Following a period of readjustment after the war, 4-H membership grew. Some states



Figure 62: Agricultural students at College of the Sequoias studying the fine points of dairy operations, ca. 1940 (*The San Joaquin Valley Digitization Project, Tulare County Free Library, Annie R. Mitchell Hist, San Joaquin Valley & Sierra Foothills Photo Heritage, tca0013, San Joaquin Valley Library System, Fresno, California*).

developed 4-H programs in close relationship to local school districts, while others established clubs as community programs separate from schools. The 1950s and 1960s witnessed increasing numbers of non-farm youth enrolling in the program. In 1948, 4-H turned international with the creation of the International Four-H Youth Exchange (IFYE, first called the International Farm Youth Exchange.) Today, Cooperative Extension and its 4-H programs serve people in towns, cities, and rural areas providing information on agriculture, family living, community development, and other related subjects.³¹⁴

³¹¹ History of the 4H, www.ext.nodak.edu/4h/history.htm, accessed 2005.

³¹² Ibid.

³¹³ Ibid.

³¹⁴ Ibid.

LABOR RELATIONS AND WORKING CONDITIONS

As the composition of California's agricultural work force evolved and mechanized farming increased, the character of relations between agricultural workers and their employers underwent significant changes. The initial decades after the U. S. annexation of California were characterized by labor practices that included coercing the indigenous population into virtual slavery and relying on other recent immigrants, especially the Chinese, who accepted less pay than white workers.

In many cases, teams of native and Chinese laborers worked under the direction of a member of their own group who could speak English and served as a cultural intermediary. Labor relations during this early period were generally paternalistic and often abusive. Law and strong social prejudices among the dominant population made the poor treatment of indigenous and Chinese workers possible. Historical documents also suggest that Anglo-American landowners frequently leased their fallow lands to Chinese. In some cases, absentee owners leased entire tracts of uncultivated land while in other cases the Chinese leased out only portions of existing farms. In the Delta region of the San Joaquin Valley, Chinese built levees, irrigation ditches, broke the sod, cultivated the fields, and planted potatoes, beans, onions, and sometimes asparagus on their leased land.³¹⁵

Indigenous populations by this time had dramatically declined due to violence, disease, and other causes, so farmers and ranchers were desperate for help. Thus, Chinese workers had mixed success overcoming racial prejudice, but were in demand because they worked hard, were reliable, and generally cost less than white workers. In 1880, as one example, Chinese fruit pickers in the Santa Clara Valley struck to increase their share of the harvest from half to two-thirds of the crop.³¹⁶

Improvements in housing, job safety, and wages did not happen uniformly and both historical research and archaeology at farms and ranches can help elucidate such matters.

Ironically, while few whites were actually willing to work for low wages and do the menial labor Chinese had done for years, anti-Chinese sentiments reached a crescendo in the late 1870s and early 1880s. Incendiary speeches, threats, barn burnings, and violence promulgated by various racist groups like the Order of Caucasians and the Workingman's Party intimidated employers and harassed Chinese workers.³¹⁷ Those sentiments eventually contributed to the passage of the Chinese Exclusion Act of 1882, despite the opposition of many farmers. The Chinese community widely resented the act, and its passage contributed to growing Chinese militancy, collective action, and the strengthening of insular communities that offered protection and solidarity for besieged Chinese immigrants. Chinese workers from the same clan typically worked together in gangs, and the Six Companies, a well-organized group of various clans headquartered in San Francisco, played a significant role in labor contracts, labor peonage, and other legal and cultural matters. The Chinese Exclusion Act did lead to a steady decline in

³¹⁵ Sucheng Chan, *This Bitter Sweet Soil: The Chinese in California Agriculture, 1860-1910*, (Berkeley, CA: University of California Press, 1986), 194.

³¹⁶ Street, *Beasts of the Field*, 319-320.

³¹⁷ Street, *Beasts of the Field*, 307.

Chinese immigration, although many new immigrants were able to exploit its loopholes with the help of the Six Companies.

White workers generally demanded a minimum of \$2.00 per day throughout much of the late nineteenth century. Unlike white workers who generally demanded cash, the Chinese shrewdly cultivated a variety of arrangements with farmers that proved mutually beneficial. Chinese agriculturalists were able to negotiate arrangements that gradually raised their hourly income into essential parity with white agricultural laborers because they worked hard and with considerable efficiency. Chinese agricultural laborers often worked for shares of crops instead of wages and, in many cases, they also developed various tenancy arrangements whereby they worked the land directly for themselves. Some Chinese gang bosses even obtained the free use of land in exchange for reclaiming and readying new land for agriculture.³²⁰ Production intensified on lands directly controlled by the Chinese, a fact noticed by other farmers who undoubtedly changed their practices as a result.

Passage of the Interstate Commerce Act of 1887 and the McKinley Tariff Act in 1892 both expanded markets for California's agricultural products, contributing to significant growth in the industry by the turn of the century. While mechanization began to reduce labor requirements for some tasks, the work force continued to expand rapidly and became more ethnically diverse. This played into the hands of employers who exploited ethnic rivalries and sought to create an oversupply of labor by encouraging immigration, significantly expanding the use of children, and other similar measures. Employers thus gained the upper hand and as a result, wages and working conditions did not improve and perhaps even deteriorated in some cases.

Chinese were already working in the delta region of the San Joaquin Valley in the 1850s, helping construct levees and dikes. They also served as cooks and gardeners for wealthy landowners throughout the state. Their presence as part of the growing state's agriculture is evidenced in sites within the Santa Clara, Sacramento, and San Joaquin valleys. As early as the 1860s there was sporadic agitation against Chinese.

Nevertheless, it was not until the 1870s that anti-Chinese agitation gained significant political traction, ultimately culminating in the passage of the Chinese Exclusion Act in 1882. During the 1870s, Chinese immigrants increasingly took employment in agriculture because they were forced out of other occupations.³¹⁸ In 1870, the greatest percent of Chinese farm laborers were concentrated in San Mateo County, followed by Alameda, then San Joaquin, and finally Santa Clara County. By 1900, that ratio had shifted, with Kern, San Joaquin, and Monterey counties having the highest percentage of Chinese farm laborers³¹⁹. The shift reflects the state's evolving agricultural lands and the demand for cheap labor in the Central Valley and portions of Monterey County.

By the first decade of the twentieth century, while Chinese could be found in agriculture throughout the state, their numbers had dwindled and other ethnic groups had begun to replace them.

³¹⁸ Chan, *Bitter Sweet Soil*.

³¹⁹ Chan, *Bitter Sweet Soil*, 319.

³²⁰ Ibid, 238-240; 259-267.

In the spring of 1903, California witnessed its first effective labor action that brought together the interests of more than one immigrant group. It involved the nascent sugar beet industry, a crop made profitable by the heavy tax imposed on imported sugar by the Dingley Tariff Act of 1897. Oxnard growers sought to control the largely Mexican and Japanese work force with an industry-sponsored union that used scrip payable at the Japanese-American Mercantile Store but provided no real benefits to workers.³²¹ Recognizing their position, workers sought help from established labor unions. While rebuffed by the American Federation of Labor, an organization that represented white workers in skilled trades, the Oxnard sugar beet workers organized the Japanese and Mexican Labor Association (JMLA). Help also came from Fred C. Wheeler and John M. Murray of the Los Angeles County Council of Labor (LACCL) and from the support of local commercial businesses thwarted by the scrip policy of the industry's union.

The industry repeatedly brought in strikebreakers while JMLA members sought to block and dissuade them. Several JMLA leaders went to jail but then were acquitted and released, to the dismay of the beet growers. The situation reached a climax on March 23, 1905, when JMLA strikers blocked several wagonloads of non-union laborers who organized as a second industry union. A melee ensued when an industry union member shot JMLA member Perfecto Ogas. When the turmoil quieted, at least five JMLA men were badly injured, and one died two days later.³²²

As negotiations continued, the JMLA was in a strong negotiating position with more than 1,300 members, against the roughly sixty strikebreakers or scabs in the industry's union. The JMLA held together and provided support to its members throughout the strike. With the immediate need to thin and plant, costs mounting for armed guards to protect scabs, and an



Figure 63: United Farm Workers' Strike. United Farm Workers striking in 1965 in Delano at the edge of a Central California grape field. (California Cultures, Los Angeles Times Photographic Archive, uclamss_1429_b560_230496-1, Department of Special Collections, University of California Los Angeles Library, Los Angeles, CA).

³²¹ Street, *Beasts of the Field*, 446-451.

³²² Ibid: 457-460.

impending visit by President Roosevelt, growers were forced to settle with the JMLA. The JMLA success reverberated across the state and was widely reported in newspapers. It challenged the idea that agricultural workers were impossible to organize, “establishing a basis for interracial action, and inaugurated a struggle that would grow over the next century.”³²³ No trade union would accept Japanese or Mexican farm workers into their ranks despite their victory. In addition, many problems concerning the equitable allocation of work contracts surfaced. More importantly, graft among the union’s labor contractors quickly eroded the support of members. As a result, the union dissolved by the next year. Japanese farm workers continued to expand their role in California agriculture in subsequent decades under the leadership of gang bosses or *keiyaku-nin*, while Mexicans, Sikhs, and other minorities also generally resorted to independent negotiations to improve their wages and working conditions. Yet, the possibility of organizing the multiethnic agricultural work force was now part of the broadening landscape of labor relations.

The International Workers of the World (I.W.W.) was the first national labor organization to take up the cause of agricultural workers in a concerted fashion, although their efforts fell far short of embracing minorities. Often called “Wobblies,” the revolutionary organization of I.W.W. members contrasted sharply with those of other powerful national trade organizations like the American Federation of Labor (AFL), which sought to work within the system. Appealing to crowds of transient or seasonal laborers who sought work in cities to tide them over between harvests, I.W.W. soapboxers, as they were called at the time, began to organize agricultural workers and other unskilled laborers at the bottom of the wage scale starting in 1908. “By the summer of 1910, I.W.W. halls were serving as homes to hundreds of bindlemen, or migrant laborers in every city and agricultural district of California.”³²⁴ Nothing scared farm owners more than the idea of a broad-based union comprised of bindlemen, Mexicans, and Asians.

A showdown of major importance took place in Fresno in 1910 and 1911.³²⁵ Fresno Police Chief Shaw banned speaking on public streets due to the mounting success of I.W.W. efforts to organize railroad and agricultural workers there. I.W.W. soapboxers defied the ban and went to jail in ever-growing numbers starting in the fall of 1910. As I.W.W. Local 66 continued to rally support from transient workers, Fresno citizens became more aggressive. The police chief encouraged vigilante action and took no measures to stop violence against I.W.W. speakers. Despite such provocations, I.W.W. soapboxers bravely continued to speak. The Fresno jail became so overcrowded with their numbers, the Sheriff refused to accept more by February 1911. Wobblies continued to stream into town. Their presence assumed an ominous tone due in part to I.W.W. support of Mexican revolutionaries who won several skirmishes against government troops in Mexicali. On the last day of February 1911, the Wobblies negotiated a decisive victory with city officials and a citizens’ group. It freed jailed speakers and established their right to speak in public on the condition that I.W.W. members cancel an impending demonstration and that those members who could not find work would have to move on.

While the I.W.W. delegates always stressed non-violent resistance; the Fresno action firmly established their revolutionary credentials. Their newsletter, the *Industrial Worker*, also

³²³ Ibid: 465.

³²⁴ Ibid: 602.

³²⁵ Ibid: 604-615.

blatantly encouraged sabotage of farm machinery, work slowdowns, and other measures that changed the character of the struggle between agricultural workers and employers. In addition, workers had many grievances other than just poor wages. They often had to live in squalor, were paid in scrip that only overpriced company stores redeemed, or had their pay docked for room and board. The I.W.W. was also active in Northern California actively organizing agricultural, lumber, and dockworkers. As living conditions deteriorated at the farm, labor agitation increased culminating in the largest strike at the time in California history. What followed mirrored the growing concerns of workers across the county, state, and country. An attempt at local organization of migrant laborers ended in bloodshed and failure on the Durst hop ranch in Wheatland, California, on August 13, 1913, resulting in a bloody confrontation, as described in the following quote:

When the toilets overflowed, drinking water became befouled, a system of wage holdbacks was instituted, and only a third of the twenty eight hundred hop-pickers, including many families with women and children, could get work. After walking out in the largest strike of farm workers in California history, the pickers gathered with job delegates [I.W.W. representatives] to debate what to do. At that point, Yuba County sheriff's deputies and the district attorney arrived on the scene. A brief and violent riot broke out, there was a shoot-out, and two hop-pickers, the deputy district attorney, and a deputy sheriff died of gunshot wounds. . . . After the pickers fled, the National Guard arrived to impose order and California police conducted a dragnet and arrested dozens of suspects. Two strike leaders were later tried and convicted of murder and inciting a riot and sentenced to twenty years in San Quentin Prison. During the subsequent decade-long struggle to free them, bindlemen and their allies marshaled their discontent and challenged California agriculture on an industry-wide basis for the first time.³²⁶

The hops pickers in Wheatland comprised of an amalgam of various classes, including women and young children.³²⁷ According to one account, the hops pickers in Wheatland gathered with job delegates from the I.W.W. to debate what to do regarding working conditions. At that point, Yuba County sheriff's deputies and the district attorney arrived on the scene. A brief and violent riot broke resulting in a shoot-out that claimed the lives of two hop-pickers, the deputy district attorney, and a deputy sheriff. The pickers fled as the National Guard arrived to impose order and California police conducted a dragnet and arrested dozens of suspects, including two strike leaders who were sentenced to twenty-five years in San Quentin Prison.

The Wheatland Hop Riot showed, almost overnight, "that San Francisco unionism was not the sum total of her [California's] labor problem."³²⁸ The riot, according to Carleton H. Parker, a young economist that served as the secretary to the Commission of Immigration and Housing of California, "brought the state to some degree of self-realization."³²⁹ Parker concluded, "The most import result of the riot was the study of the economics of the labor field."³³⁰ The California Commission on Immigration and Housing specifically formed because of the Wheatland Hop Riot. The commission produced an advisory pamphlet the following year with recommendations

³²⁶ Ibid, 624-625.

³²⁷ Carlton H. Parker, "The California Casual and His Revolt." *The Quarterly Journal of Economics* 30 No. 1 (1915): 113.

³²⁸ Ibid, 110.

³²⁹ Ibid, 114.

³³⁰ Ibid, 115.

for improving work camps.³³¹ Among other recommendations, they suggested minimum standards for the square feet of space allocated per worker in dwellings, ventilation, the location, design, and number of toilets required to serve a given population, standards for potable water supply and trash disposal, and other related specifications. While labor instability existed in some of the state's larger farms, other smaller farming operations continued to flourish without any disruptions in production due to labor unrest

Labor actions did provide the impetus for progressive legal reforms and gradual improvements in working and living conditions for California workers, including those laboring on the state's many farms and ranches. For example, California's first eight-hour work day law was passed in 1908 and expanded three years later to cover women and children.³³² The California Commission on Immigration and Housing was formed in the wake of the Wheatland Hop Riot. The Commission produced an advisory pamphlet the following year with recommendations for improving work camps.³³³ The pamphlet suggested minimal standards for the square feet of space allocated per worker in dwellings, proper ventilation, the location, design, and number of toilets required to serve a given population, standards for potable water supply and trash disposal, and other related improvements.

The Wheatland Hop Riot changed the character of agricultural labor relations, precipitating a new episode of violence and class warfare. While the labor strike in Wheatland resulted in some positive changes to working conditions for migrant workers, the labor struggle among



Figure 64: Depression era migrant camp in Sacramento, ca. 1935 (*Migrant Labor Camp Photographs from the Harry Everett Drobish Papers, BANC PIC 1954.013:48—PIC, courtesy of The Bancroft Library, University of California, Berkeley*).

³³¹ Anonymous, *Advisory Pamphlet on Camp Sanitation and Housing*, (San Francisco, CA: California Commission of Immigration and Housing, 1914).

³³² James C. Foster, "A True Blue Labor Organizer: Edward Crough and the Western Federation of Miners, 1907-1920," *Labor's Heritage* 6 No.2 (1994): 4-21.

³³³ Anonymous, *Advisory Pamphlet on Camp Sanitation and Housing*, (San Francisco, CA: California Commission of Immigration and Housing, 1914).

agricultural workers persisted through the much of the twentieth century.

During the 1930s a number of labor strikes caused instability and work stoppages. From the cotton fields of the San Joaquin Valley to the berry fields surrounding El Monte in the Los Angeles Basin, workers began organizing largely spurred on by labor organizations such as the Agricultural Workers industrial Union (CAWIU).³³⁴ In subsequent years the government became more involved in suppressing labor actions that sought to better the conditions of agricultural workers. Nevertheless, some efforts also emerged to curb the worst abuses of farmers and other employers that operated work camps.

The larger size of cotton operations in California and the more intensive use of tractors reflected a fundamentally different form of labor organization than in the Cotton South. By the 1940s, on the eve of rapid mechanization, most of the cotton picked in California came on a piece-rate basis by seasonal laborers under a contract system. Not surprisingly, then, California agricultural labor relations also witnessed frequent, widespread, and often violent disputes. During the upsurge of farm labor organizing of the 1930s, which erupted in 150 labor disturbances, strikes in California's cotton fields drew more workers on a larger scale than those in any other crop in the state. In 1933 alone, an estimated 50,000 farm workers participated in 37 labor disturbances, culminating in October when 18,000 cotton pickers went on strike in the San Joaquin Valley.³³⁵ The massive San Joaquin cotton strike of 1933, along with other strikes in 1938 and 1939, was an event of national significance and ranked among the largest and bloodiest strikes ever witnessed in American agriculture.³³⁶

Housing for workers has taken a myriad of forms depending in part on the geographical location of the work, duration and timing of work, capital investment by owners, and the harvesting of a particular crop.

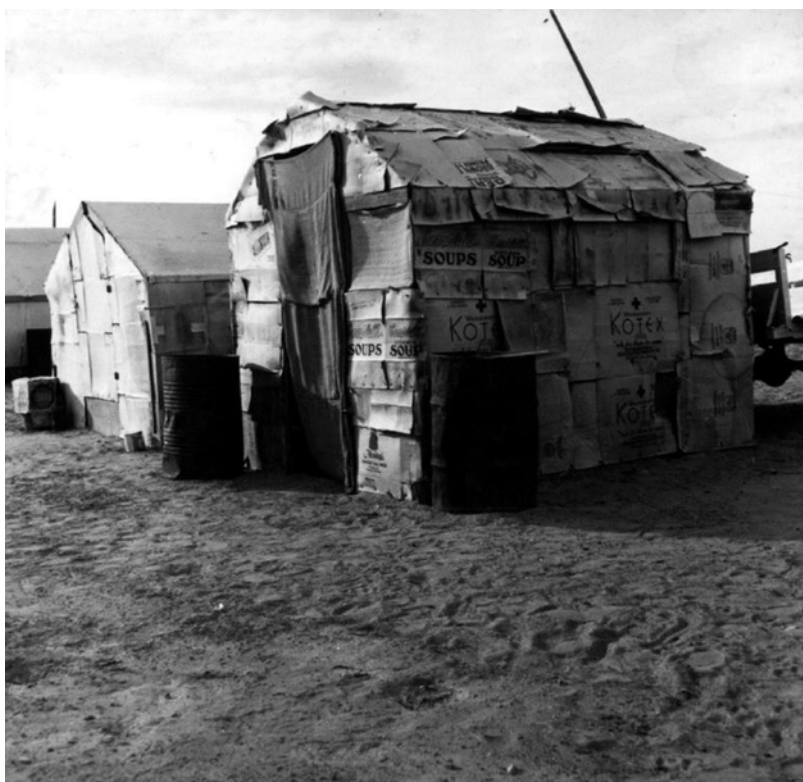


Figure 65: Migratory Mexican field worker's home, Imperial Valley, 1937 (California Cornerstones: Selected Images from the Bancroft Library Pictorial Collection, 1942.008, Folder 102, Part 2, #16439E, courtesy of The Bancroft Library, University of California, Berkeley).

³³⁴ Charles Wollenburg, "Race and Class in Rural California: The El Monte Berry Strike of 1933," *California Historical Quarterly*, LI, No. 2, (Summer 1972): 155-164.

³³⁵ David Vaught, David, *Cultivating California: Growers, Specialty Crops, and Labor, 1875-1920*, (Baltimore, MD: The Johns Hopkins University Press, 1999), 4-6.

³³⁶ Musoke and Olmstead, *Rise of the Cotton Industry*, 395-396.

Because farms and ranches are often rural, worker housing was generally located on-site, particularly in the days before automobile and truck transportation.

If the work was short, such as harvesting a crop, workers may have just camped out. Operations that required labor for longer periods or even year-round were more likely to have had some kind of permanent housing. In some cases, large agricultural operations had company-owned housing off-site.

In addition, some workers rented private housing or a room in a nearby town. Therefore, worker housing may vary from temporary camps to more permanent wood frame dwellings in year-round camps. Some operations may have included a company store and other facilities designed to service the seasonal workers. Each of these settlement enclaves had its distinctive characteristics dictated by the owner or manager.

Charles Teague's Limoniera Ranch in Ventura County, one of the largest producers of lemons in California, operated with a hierarchical division among management and labor.³⁴⁰ Segregated housing separated laborers from middle management, who received a full range of recreational benefits not offered to the laborers and pickers. Generally, segregation of mixed ethnic groups included both the camp and the field.³⁴¹

Unions formed by Chicanos included "El Confederacion de Uniones Obreras Mexicanas" (CUOM, Confederation of Mexican Labor Unions), which was formed in 1928. The union sought equal pay, "termination of job discrimination against Chicano workers, and limitation on the immigration of Mexican workers into the United States. At its height, CUOM had about 20 locals and 3,000 workers."³³⁷

The Great Depression of the 1930s resulted in displacement of thousands of Mexican laborers, as the waves of "Dust Bowl" migrant laborers flooded California's agricultural labor market. The shrinking job market of the 1930s and competition for agricultural jobs created a hostile environment for some Mexican laborers. The government's solution was the Repatriation Program, which applied pressure on Mexicans to "voluntarily" return to Mexico. At times, this procedure resulted in outright deportation. "Mexican aliens who lacked documents of legal residency, including many who had entered the United States in good faith during an earlier period when immigration from Mexico was a more informal process, were particularly vulnerable." Many of those most affected, were "naturalized and U.S.-born husbands, wives, and children of Mexican repatriates, who had to choose between remaining in the United States or maintaining family unity by moving to Mexico."³³⁸

With the advent of the Bracero program in the early 1940s, Mexican citizens were permitted to take temporary agricultural work in the United States. By 1942, Mexican laborers, generally single-males, began arriving in large numbers in the state's agricultural fields. "Over the program's 22-year lifespan more than 4.5 million Mexican citizens were legally hired for work in the United States, primarily in Texas and California."³³⁹

³³⁷ Ibid.

³³⁸ Ibid.

³³⁹ John Ramon Martinez, *Mexican Emigration to the U.S. 1910-1930*, (San Francisco, CA: University of California & R & E Research Associations, 1971).

³⁴⁰ McBane, *Role of Gender*, 69-81.

Braceros, who began arriving in the citrus regions of the state around 1942, were dominated by single males, in contrast to the earlier more family-oriented laborer. Thus, the spatial relationship of housing, work, and other facilities may reveal a great deal about labor relations at such properties.

INDUSTRIALIZATION AND LABOR

The progressive development of mechanized agriculture had an enormous impact on California's agricultural work force. Spurred in part by the early consolidation of arable land into huge farms and ranches, California was at the forefront of efforts to intensify agricultural productivity and maximize profits. Although agricultural workers were among the lowest paid workers in the state, company housing, steady work, and the low cost of goods and services made agricultural work attractive through much of the twentieth century.

Fluctuations in the labor supply and organized strikes, as well as regional and national economic trends, strongly influenced agricultural wages. When labor was in short supply, workers could demand higher wages and "vote with their feet," choosing other employment. High unemployment reversed the dynamic in favor of employers. As a general trend, however, agricultural employers had to compete with the increasing concentration of jobs in urban areas.

In the century following the annexation of California by the United States, those living in rural areas dropped from 59 percent of the population to just 29 percent, according to the federal population census. Agricultural employers used a variety of tactics to limit labor costs and reduce the uncertainties

Mexican farm workers are perhaps the largest single cultural group that participated in all aspects of agriculture. Their impact to California agriculture, particularly during the early twentieth century, cannot be overstated. "Between 1910 and 1930 three quarters of a million Mexicans flooded the labor market and provided a seemingly inexhaustible labor supply."³⁴² The exodus from Mexico during the first three decades of the twentieth century was associated with deteriorating economic and political conditions in their home country.

"In 1903, more than 1,000 Mexican and Japanese sugar-beet workers carried out a successful strike near Ventura. In 1913, Mexican workers participated in a strike against degrading conditions on the Durst hop ranch, near Wheatland, Yuba County. Although the intervention of National Guard troops and the arrest of some 100 migrant workers broke the back of the strike, the Wheatland events contributed to establishment of the California Commission on Immigration and Housing, and recognition of the oppressive living and working conditions of agricultural laborers."³⁴³

The 1920s and 1930s were no exception, as Mexicans engaged in a number of strikes in the state, including the strawberry fields of El Monte, the cotton fields of the San Joaquin Valley, Hayward's pea fields, the lettuce fields in the Salinas Valley, Redland's citrus groves, and Ventura's lemon groves."³⁴⁴

³⁴¹ Gonzales, *Labor and Community & Women, Work, and Community*.

³⁴² Gonzalez, *Labor and Community*, 7.

³⁴³ Waught, Isami A. Waught, et al., *Japanese Americans in California*.

³⁴⁴ Ibid.

associated with fluctuations in the labor supply. Some of those tactics involved efforts to artificially increase labor supplies and suppress organized labor, in part through hiring transient or seasonal laborers.

The other way farmers reduced labor expenses and sought to increase their profits was by transforming production from traditional smaller family-run approaches to larger ventures predicated on an industrial model that stressed efficiency and the maximization of profit. The mechanization of the agriculture industry also meant intensified production using machines, irrigation, soil amendments, and pesticides.

Large-scale mechanization came into use for some of the most labor-intensive tasks in agriculture such as tilling and harvesting. Over time, the invention of new machinery emerged to carry out virtually every agricultural task that was previously dependent almost solely on manual labor. While California agriculturalists appear to have been more willing to invest in new equipment as compared to their counterparts in the Midwest or East, initially only the largest farms could afford such mechanized approaches. Yet, the market dominance of large producers, combined with rising wages, and market competition that resulted in a wide variety of choices of equipment, eventually led most farmers to follow suit.

Investments in machinery, irrigation, soil amendments, and pesticides all began to escalate significantly after the turn of the twentieth century as this industrial approach came to dominate the marketplace. Amendments were used to address the depletion of soil nutrients, while pesticides protected large areas planted in a single crop that was vulnerable to infestations of pests.

The mechanization of agriculture had several noteworthy impacts on California farm and ranch workers. First, less labor was needed to produce a given amount of food. For example, combined harvester machines pulled by teams of horses or mules had by the 1890s reduced grain harvesting and threshing crews from twenty-one or more to as few as three or four men.³⁴⁷

At a personal level are stories retold by Filipinos who participated in California's agricultural industry, such as Frank Barba. Barba, a Filipino born northwest of Manila, came to California in 1924 after a brief stay in Hawaii. Barba managed a Filipino labor camp in Watsonville in 1927, acting as a labor contractor for the Birbeck Company who produced lettuce, string beans, broccoli, and sugar beets. Barba was interviewed in 1977 and provided a candid view of his experiences as a labor contractor in Monterey County during the 1920s through the 1960s.³⁴⁵ Barba's experience mirrors several other cultural groups, including Japanese and Mexican farm laborers, who also worked in the Salinas area. However, Filipinos witnessed extreme prejudice during the late 1920s and early 1930, exemplified by anti-Filipino race riots in Watsonville. The passage of the Tydings-McDuffie Act in 1934, granted independence to the Philippines, but resulted in a process of legal exclusion of Filipinos by establishing quotas.³⁴⁶

³⁴⁵ University of California, Santa Cruz, *Regional History Project*, McHenry Library, or online at <http://library.ucsc.edu/reg-hist>.

³⁴⁶ Frank Barba, "Filipino Labor Contractor Watsonville, California, 1927-1977," (Santa Cruz, CA: Interview, University of California, Santa Cruz, *Regional History Project*, McHenry Library, Santa Cruz, CA, 1977), <[http:// library.ucsc.edu/reg-hist/](http://library.ucsc.edu/reg-hist/)>, 1-4. Accessed April 2005.

³⁴⁷ Street, *Beasts of the Field*, 224-225.

While human labor was still required for many farm tasks, that work began to decline as a proportion of all employment in California after the turn of the century. The dangers inherent in farm labor also increased greatly as farmers adopted mechanized approaches, as workers and farm owners both faced serious physical injuries or death. Soil amendments and pesticides have known health risks, although symptoms were not always immediately apparent. Industrial safety standards and recourse to health care and disability benefits would take many years of struggle to establish, and some workers still lack those benefits today.

The operation of agricultural properties also had a number of other effects on hired workers. Agricultural work gradually changed from the flagrant abuses and paternalism of the Mission and the early American period, to a more subtle exploitation based largely on wages. Jobs became more contingent and agricultural workers more replaceable, creating a wandering work force of unprecedented proportions. Ethnic diversity within that work force was sometimes used as a wedge to pit one group against another, by conferring better wages or benefits on some groups, while paying less to others. Those beleaguered by public discrimination often received the lowest wages because they were the most desperate for work. The more industrialized farms separated the work force into a hierarchy of positions that received different pay and duration of work assignments.

California's diversified agricultural industry provided opportunities for newly arrived Filipinos. Filipinos began to be recruited by sugar growers in Hawaii in large numbers under the Gentlemen's Agreement of 1907, and later through the Immigration Act of 1924, which depleted the Japanese agricultural workforce. Those who came were mainly single with limited education and skills, and many intended to return home after saving some money.³⁴⁸ Like Chinese, and later Japanese, and Hindustani agricultural workers, Filipinos generally began working for labor contractors. Because many Filipinos could not speak English, contractors would act on their behalf in organizing work, providing transportation, and of course taking a cut from the grower or grower's agent.

In part, "as a result of growers recruiting in the Philippines and Hawaii, where thousands of young Filipinos worked in the sugar fields, the California Filipino population grew from only five in 1900 to over 30,000 by 1930, when Filipino workers made up nearly 15 percent of all California agricultural workers."³⁴⁹ The influx of predominately male laborers became concentrated in specific agricultural provinces where specialized crops were harvested, such as sugar beets in the Salinas Valley. In the Sacramento and San Joaquin Valleys, Filipinos comprised nearly the entire asparagus-picking work force. They were also engaged in fruit picking, rice harvesting, grape picking, celery planting and ranch labor. As the newest recruits into the labor force, Filipino workers were generally paid lower wages, and in the case of certain crops like asparagus, growers found it more profitable to work more laborers per acre. Filipinos had a long history as laborers working in the sugar cane fields of Hawaii. "So when conditions demanded a similar response in California's fields, many Filipino workers had the organizing sophistication and experience, having already been involved in work slow-downs, stoppages and full-fledged strikes."³⁵⁰

³⁴⁸ Ibid, 1

³⁴⁹ Salomon, *Filipinos Build a Movement*.

SUMMARY

California agriculture and its farmland form a significant chapter in the state's environmental, social, and economic history. Several characteristics set California apart from virtually every other state in the nation. First, an already existing system of Spanish/Mexican laws that were in direct conflict with American laws regarding land acquisition and ownership influenced California's settlement patterns. Land division in parts of California, such as in Sonoma County, reflects the conflict between Mexican and American land laws. Second, the discovery of gold at Sutter's Mill in Coloma in 1848 led to California's rapid settlement. These two factors, combined with the ethnic diversity of the state after 1850 and the high demand for agricultural products created an economic boom for those willing to invest in farmland.

Another unique characteristic of California agriculture was its rapid mechanization. Economic forces drove the desire to mechanize, particularly market demand products, experimentation, and the state's natural resources and favorable climate. The mechanization of California agriculture, together with the consolidation of large land holdings, led to labor shortages, and consequently the migration into the state of a large pool of ethnically diverse laborers. By the 1870s, large company-owned farms, whose workforce was made-up largely of transient laborers, replaced the ideals of a Jeffersonian democratic society based on yeomen farmers. By this time, California's most productive farmland was in private hands, and acquisition of new lands, at least for some, was out of reach. Between 1850 and the 1920s Congress enacted legislation that provided for the settlement of the nation's remaining public lands. The Homestead Act of 1862 followed the Preemption Act of 1841. The Homestead Act, widely used in California, provided for the acquisition of 160-acre parcels through improvement and use and with minimal cash outlay. While the Homestead Act had its share of abuse, individuals seeking to consolidate vast tracts of land for their personal benefit consistently abused other acts as well, such as the Swamp and Timber and Stone Act.

By the 1870s, California's agricultural economy was booming, and wheat was the dominant crop cultivated on many of the state's agricultural lands. By the end of the nineteenth century with prices for wheat plummeting, California entered another period of sustained growth, this time focusing on other products such as citrus. By the early 1900s, major regional variations appeared, because of product specific industries, capital investment, and a widespread and ethnically diverse agricultural workforce. The Japanese had largely replaced the Chinese in the fields working alongside Mexicans, Filipinos, and later, Pakistanis, to name just a few. Inequality was prevalent throughout the labor pool, but agricultural work in California paid far better than the wages earned in other developing countries, particularly Mexico. Thus, opportunity and persuasion from corporate farmers who required a labor-intensive seasonal workforce drove the labor supply.

The vestiges of California's nineteenth and twentieth century agricultural history remain, both as part of the landscape and as part of the state's cultural history. The primary goal of this study was to establish a baseline of information that Caltrans cultural resources staff and various other professionals in public and private employ could use to evaluate the significance of the state's diverse agricultural resources, which are ubiquitous along the state's highway system. It is

³⁵⁰ Ibid.

hoped that the information gathered in this study, together with site-specific data, will lead to defensible arguments regarding National Register of Historic Places Criterion D. The information in this study should also assist in evaluation of built environment resources of both abandoned and working agricultural properties encountered along the state's highway system.

CHAPTER 3. PROPERTY TYPES

Agricultural properties in California contain a wide variety of features and elements used to raise plants and animals. Property types have been described as “a grouping of individual properties based on shared physical or associative characteristics” A linkage should exist between the historic context and each respective property type.¹

Existing databases or encoding forms, such as site records, rarely call out the subtle differences between agricultural properties. The end result is a lack of distinction between the vastly different historic archaeological resources that define California’s agricultural history. Therefore, comparative analysis is nearly impossible because of a general lack of consistency in recordation and treatment standards.

Many people describe rural properties as either a farm or a ranch, but employment of those terms varies a great deal. This lack of consistency makes it difficult to classify property types. This chapter of the report is intended to provide a general guide to facilitate a greater understanding of the range of agricultural property types that may be encountered in California and perhaps more consistent definitions of specific property types. There will always be a variety of permutations of each property type based upon the temporal period when an agricultural property is developed, the local landforms, the amount of capital available to facilitate the construction of improvements, and perhaps social or cultural influences. Recognizing the shortcomings of existing resource inventory databases and the apparent lack of consistency when recording and describing the state’s agricultural resources, it is recommended that a relatively small number of broadly defined, yet comprehensive property types was preferable, and that historic archaeological sites should be attributable to a property type based upon a combination of physical characteristics identified in the field and through documentary research.

With this in mind, this study proposes two broad agricultural property types, farms and ranches. Generally, farms are associated with growing plant products while ranches are associated with raising animals, but people engaged in many combinations of activities. Does the researcher designate a property as a farm because the landowner called himself a farmer in the census? Does that apply to a “gentleman farmer” landowner who actually ran cattle but did not grow crops? Furthermore, such distinct classifications do not directly serve the purposes of evaluating properties for their information potential.

There are only a handful of comprehensive approaches in the United States focused on documenting agricultural properties in terms of their archaeological data potential. Two such approaches include a study of “Homesteading and Agricultural Development Context”² for South Dakota (South Dakota State Historical Preservation Center 1994), and another for Delaware, entitled “Historic Context for the Archaeology of Agriculture and Farm Life in the

¹ LuAnn De Cunzo, & Garcia, “Historic Context for the Archaeology of Agriculture and Farm Life in the New Castle and Kent Counties, Delaware,” (Delaware Department of Transportation, 1992), Accessed on-line: http://www.deldot.net/static/projects/archaeology/ag_farm_1830_1940/index.shtml November, 2006, 233.

² A. Brooks, & S. Jacon, “Homesteading and Agricultural Development Context,” (Vermillion, SD: South Dakota State Historical Preservation Center, 1994).

New Castle and Kent Counties, Delaware.”³ The South Dakota study focuses primarily on the built environment and follows the standard guidance provided by the National Register of Historic Places, Bulletin 16. The Delaware study, on the other hand, relies upon the state’s comprehensive historic preservation plan developed in 1989, which defines significant temporal periods for the state’s development, along with eighteen themes, and in particular, the theme of agriculture and rural life.⁴ Such a comprehensive inventory was not possible for this study due to the complexity of California’s agriculture and the limits of the study. Instead, this study proposes a functional property typology and provides examples to illustrate the various property types.

Initially, properties should be classified broadly as to whether they are a ranch, farm, or multi-use property. Within that broad classification it should then be possible to break down individual components by the type of feature system. Two types of feature systems have been identified for agricultural properties, domestic and agricultural. Donald Hardesty introduced the feature system concept to historical archaeologists in his 1988 monograph on the archaeology of mining and miners.⁵ Since then, many archaeological contexts have broadly applied the feature system.

David S. Rotenstein, building on the work of Henry Glassie, explained that, because houses and barns are the principal buildings of farmsteads, all other buildings might be viewed as extensions of either the house or the barn. Thus, the domestic feature system consists of the house and ancillary structures whose primary function is to support domestic activities. The agricultural feature system consists of the barn as well as fencing, fields, irrigation systems, and specialty structures whose primary function is support of agricultural activities. Rotenstein’s structural division recognizes some of Glassie’s limitations in his imposition of dual activity spheres based on the gendered division of labor.⁶

When assigning archaeological sites or built environment resources to a system, it is tempting to organize them solely on spatial proximity. Researchers should instead, consider classifying them to either domestic or agricultural systems. Some properties will have complex features that may fall into both systems. Researchers should always consider the individual site’s historic context in order to categorize features, recognizing that some overlap may be inevitable.

Agricultural properties share many common traits, although they vary markedly from region to region. Identifying the key characteristics of a property is critical to its context and ultimately its significance. At the broadest level or scale are agricultural landscapes that may consist of hundreds of acres of land. It is a continuity of features sharing a common history and temporal period that best defines the landscape. Certain agricultural property types, such as wheat or cotton farms for example, generally require large acreages in order to sustain a profit. In these cases, features may be widely scattered across the landscape and the unit of study would

³ LuAnn De Cunzio, & Garcia, *Historic Context*.

⁴ Ibid.

⁵ Donald L. Hardesty, *The Archaeology of Mining and Miners: A View from the Silver State*, (Pleasant Hill, CA: The Society for Historical Archaeology, 1988).

⁶ David S. Rotenstein, *Phase II Historical Archaeological Research Design, U.S. Route 30 Project, Wayne County, Ohio*. (Pittsburgh, PA: Center for Cultural Resources Research, University of Pittsburgh, 1995), <<http://davidsr01.home.mindspring.com/html/wayne.htm>>, Accessed April 2005.

consequently be much larger. On the other hand, row crops or citrus orchards require less land and the unit of study may consist of smaller acreages. Determining the spatial arrangement of features is also important for interpreting the agricultural property. Agricultural properties were generally well organized to function efficiently, relying upon either traditional farm practices or contemporaneous scientific knowledge. In general, California's farms and ranches have been at the technological forefront in innovation, as evidenced by more rapid acceptance of new technology when compared to the rest of the nation.⁷

Economics, existing technology, and the availability and cost of labor influenced decisions regarding the use of local materials for the development of agricultural properties. Similarly, California was a melting pot of many cultural groups who together influenced building traditions. Many of California's earliest farms and ranches dating from the 1840s through the 1860s relied upon local materials, such as adobe clay, fieldstone, and wood in aspects of construction, and used gravity to convey water for irrigation or domestic use. As an example, before barbed wire, the use of fieldstone helped delineate property boundaries and restrain livestock, most often sheep, from roaming freely. Wood or brush, gathered locally, went atop the low fieldstone walls to increase the barrier and at the same time assisted in land clearing. A number of cultural groups, including those from the British Isles, Italy, and China, participated in this practice. Fieldstone fences often became foundations for barbed wire fences, with wooden posts that supported the barbed wire mounted in the stone fence. Stone construction in residential buildings and structures is generally associated with Italian or British Isle immigrants, while the use of adobe is associated primarily with Hispanic groups. There were, of course, exceptions as cultural groups assimilated and learned new skills and technologies.

In many cases, the lone presence today of exotic species, such as black locust, black walnut trees, Chinese Trees of Heaven, a rose or lilac bush, abandoned windbreaks, or ground cover such as horehound or *Vinca major*, may identify agricultural properties. Similarly, remnant orchards, row crops, or vineyards, provide evidence of cultivation and specific species grown and harvested. The University of California, Davis is developing a repository of seeds from exotic species identified at homesteads in the Central Valley. The seed database has the potential to interpret species introduction and dissemination both spatially and by specific cultural groups.

PROPERTY TYPES

Any discussion of property types is fraught by overlapping and changing uses of a particularly property or properties over time, and oftentimes conflicting data gathered through archaeological and documentary research. For the purpose of this study property types have been broken down into three broad functional classifications: ranches, farms, and multi-use properties. Each of these property types in turn can be broken down into specific functions, or sub-classifications, such as a cattle ranch, sheep ranch, poultry farm, citrus farm, dairy, orchard, truck garden, etc. Finally each sub-classification can be further refined to the function or use of an individual feature based upon physical evidence or documentary records, such as a residence, worker's or

⁷ Alan L. Olmstead & Paul W. Rhode, *An Overview of the History of California Agriculture*, Working Paper Series No. 89, (Davis, CA: Agricultural History Center, University of California, Davis, 1997).

Morton Rothstein, "The California Wheat Kings," Working Paper Series, (Davis, CA: Agricultural History Center, University of California, Davis, 1985).

laborer's cabin, barn, smoke house, cistern, water tank, etc. While there may be many variations of the above-mentioned properties, the following descriptions apply to the most common property types found throughout California. Similarly, the range of components or features will vary with each broad property type, although the properties primary function will generally necessitate some continuity in the physical remains present at the site.

RANCHES

Ranches were generally comprised of buildings and structures that facilitated the raising of livestock for domestic and commercial use. While cattle and sheep comprised the majority of ranches developed in California between 1850 and 1950, horses, goats, and hogs were also raised either concurrently within the same property or independently. Generally, ranch properties contain a minimum of 40 acres. Larger ranches may contain many thousands of acres, such as the Miller and Lux properties scattered throughout the Central Valley.

FARMS

Farms, like ranches, were generally comprised of buildings and structures that facilitated the growing and production of foodstuffs such as citrus, vegetables, and nuts. Cotton and other products used in manufacturing were also grown on farms. Farms ranged in size from as little as 10 acres to well over one thousand acres. Unlike ranches, farm buildings were generally clustered together, since roaming cattle or sheep were not an issue. Census records can be useful tool to verify the occupation of the owner of each property. Did the owner consider himself or herself a rancher or a farmer?

MULTI-USE PROPERTIES

While many agriculture properties were acquired and developed for a specific purpose or use, other properties are characterized by a variety of activities, particularly during the mid to late nineteenth century and within lands that were marginally suitable for agriculture. Geomorphic regions with marginal soils, in particular, are characterized by multiple-use properties. In the montane regions of California homesteaders often carried out subsistence agriculture that included raising livestock, planting row crops, and having a small orchard. In other areas where water was an scarce, such as the southern San Joaquin Valley, Imperial Valley portions of the east side of the Sierra Nevada Mountains, and Mohave Desert, prior to the development of irrigation agricultural property owners had to diversify in order to subsist and perhaps turn a minor profit.

DOMESTIC FEATURE SYSTEMS

The domestic feature system comprises those parts of an agricultural property associated with the household activities of the owner or tenant. They may include a house, cellar or basement, privy, well, sheet refuse, trash dumps, cistern, and other associated elements. A cellar is distinguished from a basement in that the former is defined as primarily for storage rather than as living space, while the later is defined as the "lower part of the walls of a building...supporting the principal

story.”⁸ For purposes of this study, therefore, a cellar would likely contain remains of food preparation or storage materials, whereas a basement might also contain evidence of habitation or craft industries.

RESIDENCES AND OTHER FORMS OF HOUSING

Property types associated with domestic features systems generally comprise the primary building or structure that serves as shelter for the owner of the property. The shelter may consist of a rudimentary cabin or a grand Victorian style residence. As noted earlier, the primary shelter generally supports the needs of the farm or ranch family, and its related household activities. The domestic feature system may also include specialty structures and activity areas such as a summer kitchen, bake ovens, kitchen gardens, and sheet refuse in yard areas. Designed or natural landscaping is included in the domestic feature system when oriented around the residence.

There are wide variety of residential dwelling styles that were built on agricultural properties in California between 1850 and 1950. The choice of materials, design, size, and location were dependent upon regional differences, cultural traditions, and personal wealth of the occupants. Historic documents and photographs do not suggest that there were significant differences between ranch and farm dwellings, although the spatial arrangement of buildings and structures likely were predicated on the primary function of the property.

Residential houses, bunkhouses, and temporary houses can be broken down into form and materials. In regards to the use of building materials, four principal materials were used in the construction of residential houses, bunkhouses and temporary housing on agricultural sites. Those materials include adobe, by far the earliest material used, stone, logs, and milled lumber, which was by far the most common building material used. The use of stone and logs generally occurred in geomorphic regions where the materials occurred naturally, particularly California’s montane regions.

The use of adobe block and rammed earth adobe materials largely occurred in California from the 1830s through the early 1850s, with a resurgence in use beginning in the 1930s. Native fieldstone construction was common in the 1850s and generally declined by the 1870s, although exterior stone cladding gained popularity in Southern California after the turn of the century. Log construction generally occurred in geomorphic regions where the wood was readily available, and in areas where milled lumber would not sustain heavy loading by winter snowfall. Logs were also preferred by specific immigrant groups, whose traditions used logs for all forms of building construction in their respective home countries. Scandinavians and Germans are credited with spreading log construction technology throughout the United States.

Milled boards balloon-framed or block-framed was the most common material and form used throughout California from 1850 through 1950. The California Gold Rush can be credited with the advancement of this building technology, since sawmills in the Northeastern United States recognized the opportunity to ship their products to California and receive premium prices.

⁸ James Steven Curl, *Oxford Dictionary of Architecture*, (Oxford, UK: Oxford University Press, 1999): 58, 136.

Most of the materials produced in the early 1850s in California were simple 12” to 16” rough-sawn milled boards and 4” –5” battens, along with non-dimensional 2” x 4” and 2” x 6” framing material. Where milled materials were not readily available logs were rived to form 3’ to 4’ long boards that were applied to the exterior horizontally as cladding. Shakes and shingles remained a popular choice for both roof and sidewall cladding from the 1850s through the twentieth century.

During the 1850s little differences existed between urban and agricultural home construction. By the mid-1850s sawmills were operating in San Francisco and throughout most of the montane regions of California where lumber was readily available. By the 1860s sash and door companies had opened in many of California’s larger more urban communities, and by the 1870s sash and door materials were readily available throughout California. While timber framing and log joinery was used for residential and barn construction, wood or stick-framing was accomplished with cut nails and after 1900 with wire nails.

Greek Revival, Gothic Revival, Italianate, Second Empire, and Queen Anne style homes were constructed in California’s agricultural areas through the nineteenth century, as were more vernacular designs that were interpretation of popular architectural styles or amalgams of several different styles. The footprints of these homes provide some clues, particularly how they were constructed, their configuration or massing, and perhaps the degree of skill that was employed in their construction.

After the turn of the century, many agriculturalists and ranchers chose stock or standard plans that were found in numerous popular magazines and house journals of the period. Local contractors, or in some cases the property owner, would order the plans and then acquire the building material locally. In certain cases the entire house was shipped piece-by-piece via the railroad to the nearest depot, where it could be taken to the job site and assembled. The following are photographic examples of properties classified as part of the domestic feature system.



Figure 66: Adobe Ranch House Kern County 1880s Generally adobe homes had a mudsill or fieldstone foundation. Note the central courtyard and “U” shaped design of the residence. In this case the courtyard has become the central location for social activities. (San Joaquin Valley Library System).

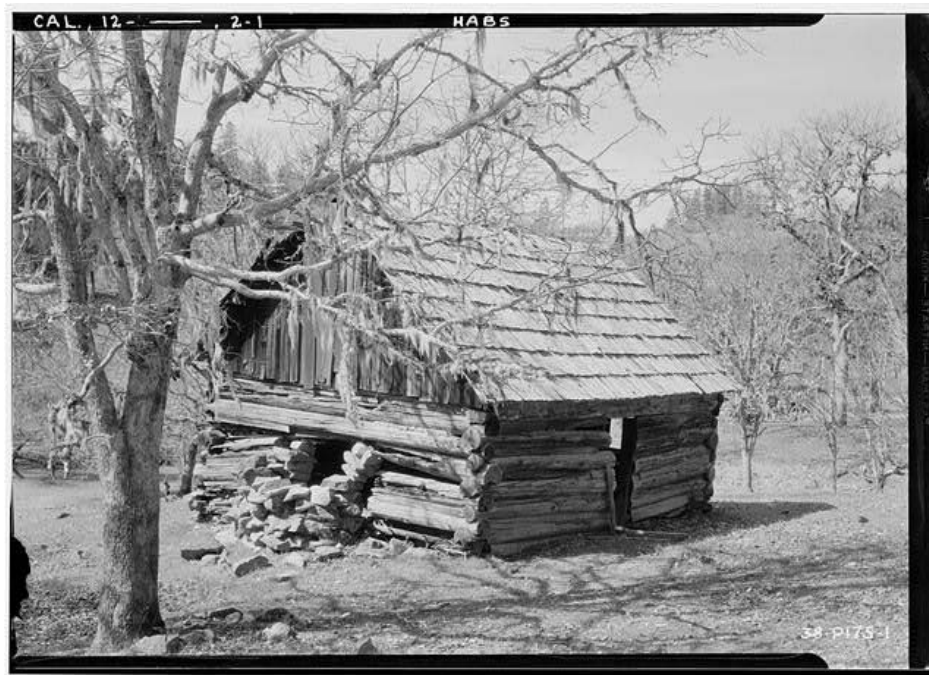


Figure 67: Erickson Ranch Log Cabin, Mad River, Humboldt County, CA. Note that a “saddle notch” in this case joins the logs and the walls were likely chinked with mud or clay, 1934 (HABS photo, Library of Congress).



Figure 68: Greek Revival influenced residence at the Fair Ranch near Knights Landing 1910s. While this residence lacks the returns on the eaves, its overall circa 1860s design reflects the styles of homes brought to California from the Northeast (U.C. Berkeley, Bancroft Library).



Figure 69: Typical side-gable, stick-frame vernacular style farm residence. The Belvue ranch house reflects one of the most enduring styles found throughout California having been built from the early 1850s through the 1930. From an archaeological standpoint one might expect to find a stone foundation with post and piers set on stones, or perhaps a partial brick foundation with post and piers set on stone. In the rear is the carriage house. Photo dates to 1880 (San Joaquin Valley Library System).



Figure 70: Queen Anne farm near Watsonville. Note the ancillary structures, which include a barn, bunkhouse, and sheds. Note that the house is literally surrounded by tilled fields (U.C. Berkeley, Bancroft Library).



Figure 71: Typical California Bungalow, Stockton, ca. 1905. Common style hipped roof farm residence, with a wood water tank and a Aermotor Company windmill. Note the elevation of the main floor and the open front and rear verandas, (U.C. Berkeley, Bancroft Library).



Figure 72: *State Land Settlement, Delhi, California, circa 1915. Simple stick-frame (pre-fabricated) farm residence, (U.C. Berkeley, Bancroft Library).*



Figure 73: *Unusual post-war Japanese influenced farm residence owned by Hirasaki family of Gilroy, 1945 (U.C. Berkeley, Bancroft Library).*



Figure 74: *Japanese Vernacular stick-frame board and batten farm houses near Mountain View, 1942. The house on the right has been referred to as a “shotgun” design because of its orientation at the gable end and narrow rectangular shape. The property is indicative of what was commonly referred to as “truck gardening.” (U.C. Berkeley, Bancroft Library).*



Figure 75: *Hudson-Cippa-Wolf Ranch, Bunkhouse and main residence, Sorento Road, Sacramento, Sacramento County, CA (HABS photo, Library of Congress).*

AGRICULTURAL FEATURE SYSTEMS

Agricultural feature systems comprise those elements of the property oriented primarily or exclusively toward production for market or personal consumption, including areas occupied by workers. Barns are the most common element of the agricultural feature system. Barns served a wide variety of functions and thus possess many distinctive architectural elements related to those functions.⁹ (Noble 1984). The agricultural feature system also includes fencing, corrals, pens, fields, orchards, activity areas, trash dumps, agricultural machinery, water conveyance system/irrigation features, access roads, silos, etc. Specialty structures might include milk houses or creameries, long rectangular poultry sheds, slaughterhouses, blacksmithing areas, cold storage or ice houses, loading chutes, and smokehouses.

Agricultural properties may also include satellite features such as permanent worker housing complexes, temporary camps used by workers, holding pens at railroad sidings, corrals, water troughs, and salt or mineral licks. These are categorized as components of the agricultural feature system, because while worker housing and temporary camps provided shelter, their primary function supported agricultural production. Features such as privies and sheet refuse would still be expected at worker housing.

There may also be evidence of specialized activities or craft industries, such as distilling, weaving, spinning, woodworking, or metalworking. While some portion of the craft production may be for domestic use, craft industries are usually part of the “working” portion of agricultural properties, and are classified here as part of the agricultural feature system.

Property types associated with agricultural features systems generally comprise the work area in which specific activities occurred in order to produce a particular product, such as a dairy or orchard, or to raise a particular species of animal, such as cattle, sheep, hogs, or horses. In essence the agricultural feature system is the infrastructure necessary for a property to operate at its most efficient level. The amount of infrastructure within a particular property was generally dependent upon capital, labor, marketing, and technology. Depending upon the size of the operation, the type of product being produced, and the amount of capital available, laborer housing was either relegated to a specific location away from the domestic feature system or contained within or near the domestic feature system. Within most agricultural feature systems are numerous ancillary buildings and structures that together function together or independent of the primary sphere of production. In essence, farms and ranches may have independent parts that lie within the same property, but function quite differently in order to support the farm or ranch family. One of the most common dual agricultural feature systems includes the combination of orchards with row crops, or ranches that are divided between sheep and cattle.

⁹ Allen George Noble, *Wood, Brick and Stone, the North American Settlement Landscape: Barns and Farm Structures*, (Amherst, MA: University of Massachusetts Press, 1986).

BARNs AND ANCILLARY BUILDINGS AND STRUCTURES

There are three principal types of barns constructed on California ranches: cattle barns, sheep barns, and horse barns. Dairy barns are classified under farms, since dairying made more intensive use of land, often within small acreages. Virtually all ranches include at least one barn, and many had multiple barns. Farms, on the other hand, may include only one barn, along with numerous sheds used for specific tasks. Many farms also used temporary or makeshift sheds or shelters since their operations were seasonal.

Barns can be broken down into form and materials. Barn forms or types are often described for their regional attributes, many associated with particular ethnic groups. For example, Scandinavian or German immigrants are often associated with log barns, while stone barns are associated with immigrants from the British Isles. Although most of the barns built in California have been classified as “Western” barn types, in actuality there were important variations to this form of barn.

There were four primary building materials used in barn construction: adobe (least common), logs (common mainly in the mountain regions of California), stone, and wood-frame. Wood-frame barns are clearly the most common among the barn types represented throughout California. Wood frame barns were generally built with mortise and tenons or were stick-frame construction held together by nails and spikes. Identifying the age of barns may be accomplished by the technology employed in their construction. Mortise and tenon barns generally pre-date 1900. The same is true for cut nails used in framing. After 1900 wire nails become much more common and by 1910 virtually all stick-frame barns were built with wire nails. In many cases cut nails and wire nails are found together because many barns were rebuilt or remodeled having sustained heavy use or having suffered from extreme environmental conditions, such as heavy snows, rain, winds, and flooding. Typically, archaeological barn remains include foundations of mortared or unmortared fieldstone, stone piers, stacked fieldstone walls, fieldstone floors, floor joists, cut and wire nails, and concrete perimeter foundations and slabs. In the Sierra foothills, many pre-1880 barns were built into side hill cuts that required bank stabilization in the form of ashlar or randomly stacked rock or fieldstone walls. Many of these barns could be entered from the top of the bank, which are commonly referred to as bank barns in the Northeast United States. The underside of the barn was used for livestock while the upper floors, generally of wood, were used to store feed and equipment.

Agricultural properties, besides having the requisite housing infrastructure and barns, generally include a variety of other building, structures, or objects specifically designed for various functions associated with the property. Examples include cisterns, water storage towers and windmills, cold-storage or ice houses, smoke houses, watering troughs, wells, silos, granaries, and privies. A wide variety of materials were used in the construction of ancillary agricultural properties built between 1850 and 1950, including adobe, stone, brick, milled lumber, concrete, iron, and steel. The following are photographic examples of properties classified as part of the agricultural feature system:



Figure 76: Kern County farm laborers cabins, 1936 (U.C Berkeley, Bancroft Library).



Figure 77: Sherry Barn reportedly built by Chinese laborers in 1884 for the Kohler and Frohling Winery. Jack London later acquired the property and converted the barn to a stable for his horses (Jack London State historic Park, Sonoma County, California).

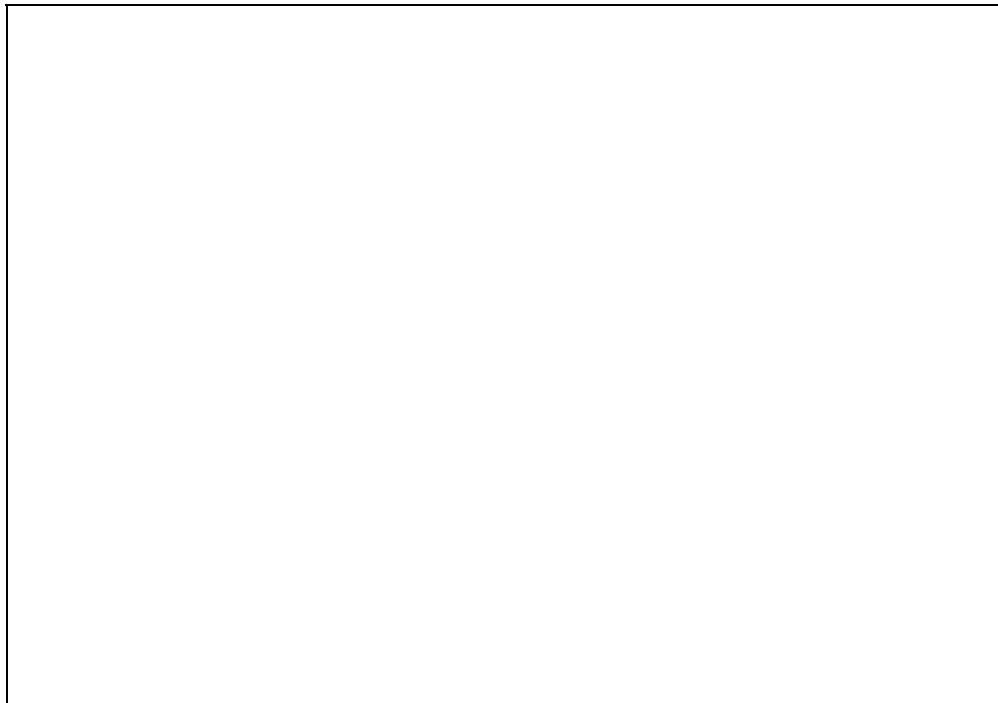


Figure 78: Yorba adobe shed or barn near Plecentia, Orange County, California (Santa Ana Public Library).



Figure 79: Santos Farm, Santos Barn and concrete watering trough, 1481 Mowry Avenue, Fremont, Alameda County, CA (HABS photo, Library of Congress).



Figure 80: California "bank barn" Mother Lode, Felix, Calaveras County, 1936. Note the stacked rock wall that forms an interior wall and supports the footings for the barn on the upper bank. The lower side of the barn is used for livestock formed by an open-sided shed. (HABS photo, Library of Congress).



Figure 81: Simple wood-frame barn near Oleta, Amador County, 1934 (HABS photo, Library of Congress).



Figure 82: Sheep barn clad with corrugated iron sheeting, 1911. The use of galvanized iron panel siding was that it cut down on maintenance, and provided sheer wall strength.. Note the low profile of the barn and the barn's centrally located stacked gable that serves as ventilation. The corral adjacent to the barn was used to secure ewes and sheep during shearing season and from predators, such as coyotes (U.C. Berkeley, Bancroft Library).



Figure 83: Typical California wood or stick-frame dairy barn at the F.E. Baxter Ranch, Durham, California, circa 1920. Note the board and batten siding, poured concrete perimeter or stem wall foundation, and lack of any stacked ventilation gable. The pop-out side windows, sidewall vent and large bay doors may have been adequate to ventilate the building during the hot summer months. This barn may have a poured concrete floor for improved sanitation. Other features include the silo on the opposing side, and feed loft. In this photograph a traction engine is being used to force-feed or grain through a centrifugal device up a pipe and into the loft (U.C. Berkeley, Bancroft Library).



Figure 84: Extremely rare Lima-Pereira circa 1900 octagonal or round style barn located at South Higuera Street, San Luis Obispo, San Luis Obispo County. Octagonal barns were relatively rare in California, (Caltrans photo).

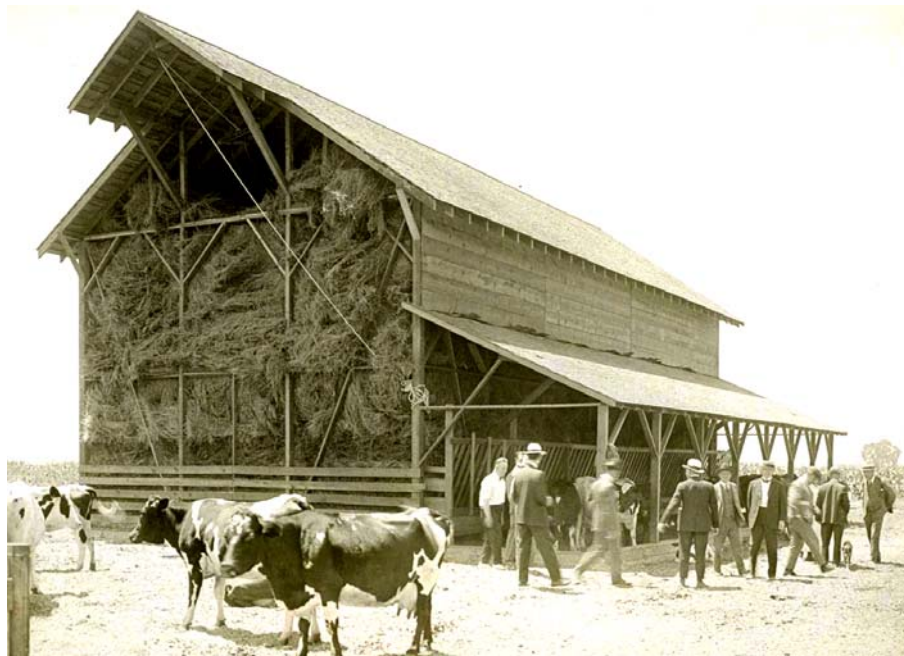


Figure 85: Pole-frame grain storage or hay barn with a large roof hood, and an attached shed roof feed area. The barn was located at the Durham State Demonstration Agricultural Colony, near present-day Durham, California. Hay barns generally had steep gables and open sidewalls for ventilation, preventing the hay from mildewing. In this case a shed roof was built to shelter the dairy cattle while they were fed (John Daly Hay Barn, Durham, California, U.C. Berkeley, Bancroft Library).



Figure 86: Mineral King Cooperative Farm modern shed style hay barn, Tulare County 1940 (HABS photo, Library of Congress).

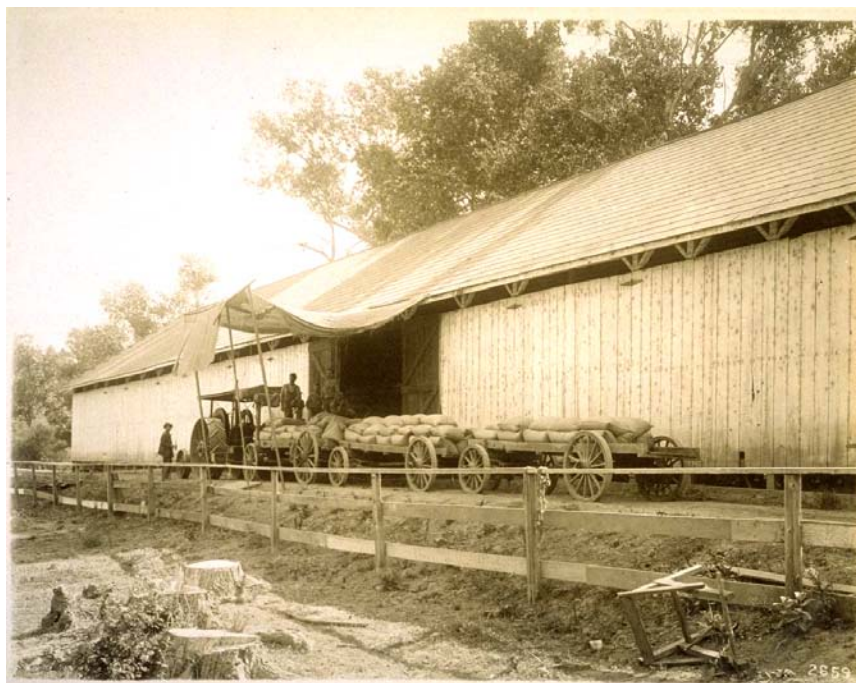


Figure 87: Large wood-frame grain warehouse style barn circa 1900. Note the open eaves and exposed kingposts designed to allow for ventilation inside the barn. (U.C. Berkeley, Bancroft Library)



Figure 88: Poultry farm, San Joaquin Valley, circa 1910. Note the long rectangular wood-frame sheds with ventilation stacked gables atop the roof (structures left of photo). Generally poultry sheds were placed far enough from the residence (far right of photo) to avoid the odor associated with the operations (U.C. Berkeley, Bancroft Library).



Figure 89: Peach drying shed, Kings County. Note the wooden drying rack, residence (background), orchard, barns, and other building, which form an integrated farm complex (San Joaquin Valley Library System).



Figure 90: Abandoned feed barn and concrete foundations, milking barn, Twin Oaks Dairy, Santa Clara County. This was probably a Class B type dairy. The first dairy inspection law was passed in 1899. The Act required the Bureau to inspect the sanitary condition of all dairies in the State and to inspect any (dairy) animals upon receipt of complaint. The first annual report showed 823 dairy farms inspected, 83 of which were unsanitary; 32 creameries inspected; and 44,253 cows inspected, of which 536 were condemned. In 1915 the following grades of milk were established: certified milk, guaranteed milk, grade A milk, grade B milk and milk not suitable for human consumption. The Attorney General ruled that dairies producing milk to be sold in counties or cities maintaining an inspection service should be rated on a scorecard adopted by the Bureau of Animal Industry of the U.S.D.A. (HABS photo, Library of Congress).



Figure 91: Typical early 1900s wood-frame milk storage house at Twin Oaks Dairy, Santa Clara County (HABS Photo, Library of Congress).



Figure 92: Gambrel or “Midwestern” style barn, Carl Rubel Ranch, Yuba County, California circa 1940 (HABS photo, Library of Congress)



Figure 93: Pitzer Ranch Barn, Claremont, Los Angeles County, n.d. In this case the structure is built of concrete and the walls are clad with cobbles obtained locally (HABS photo, Library of Congress)



Figure 94: Fountain Grove Hop Kilns, Santa Rosa, Sonoma County, CA (HABS photo, Library of Congress).



Figure 95: Burris family King's County Victorian water tank and residence. Note the architectural detailing of the windows and corbels under the roof eave of the tank house (San Joaquin Valley Library System).



Figure 96: Circa 1880s artesian well, Bakersfield. The wood-frame building in the background probably housed a water storage tank (San Joaquin Valley Library System).



Figure 97: *Artesian well near Lemoore, California, circa 1915. Note the concrete derrick above the well (San Joaquin Valley Library System).*



Figure 98: *Wooden tank house and windmill, State Land Settlement, Delhi, circa 1915 (U.C. Berkeley, Bancroft Library).*

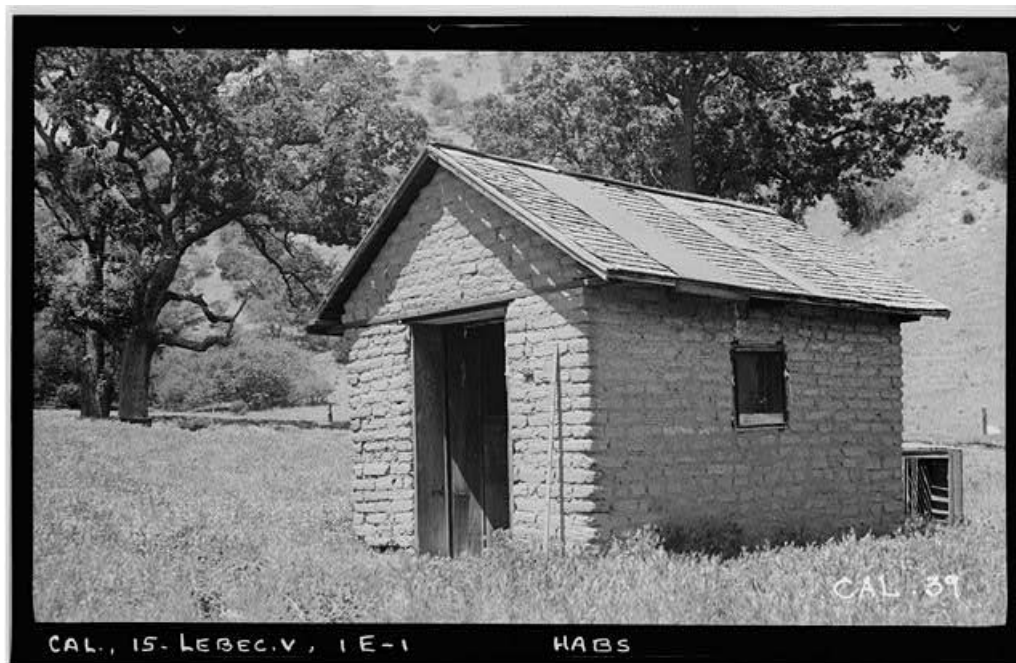


Figure 99: Fort Tejon adobe smokehouse, Kern County, May 1937 (HABS Photo, Library of Congress).



Figure 100: Sansevaine Ranch, Fontana, San Bernardino County, mortared cobble smokehouse (HABS photo, Library of Congress).



Figure 101: Migratory Mexican fieldworkers vernacular temporary housing, ca. 1937. Note the use of labeled cardboard boxes, cloth hanging from the front door, and the burn barrels. Presumably these temporary houses had either wood or earthen floors covered by cloth. (U.C. Berkeley, Bancroft Library)



Figure 102: Portable shed or cookhouse, San Joaquin Valley (San Joaquin Valley Library System).

CHAPTER 4. ARCHAEOLOGICAL RESEARCH DESIGN

What importance do the remains of one abandoned farm have in the grand scheme of things? At any one of literally thousands of farms in California, it is reasonable to ask what can the struggles, daily toil, and life experience of the family or families that occupied this particular place teach us. More specifically, what can historical archaeology contribute to our understanding of that family's life history and how it fits into a larger understanding of our collective past? Scholars have been debating the subject for decades and still have not reached consensus on exactly how historical archaeology contributes important information to our understanding of the past. To address that question squarely, we must first consider what others have previously asked and learned from studies of similar kinds of sites and the people who lived at them.

Using physical remains to address important historical questions depends on thoughtful evaluation of documentary and other testimonial evidence whenever available. Three potential sources of information (archival, archaeological, and oral history) constitute independent lines of evidence that can be usefully compared to strengthen interpretations and address the biases and gaps present in each individual source. However, it is important to recognize that physical remains may possess the ability to inform important questions regardless of whether historical evidence is either scarce or abundantly available.

Abundant documentation does not necessarily restrict the contribution of archaeological data because all evidence in the social sciences is *interpreted* and, thus, subjective and essentially contestable. As Herbert Gutman observed, "recreating the past is an ongoing selective process. But the principles that guide that process are not objective and are often shaped by a particular overview."¹ It is also true that no single line of evidence is inherently privileged. As Alison Wylie noted, "historical reasoning from documentary evidence is mediated, in practice, in all the same ways as is historical reasoning from archaeological evidence."² It is not possible to reinforce, alter, or challenge current assumptions about the past if historical sources are presumed *a priori* to have a corner on the truth. What is needed instead is a "vigilantly incredulous [critical] attitude"³ about all sources of historical data. In many cases abundant documentation actually affords the best opportunity to refine both archaeological and historical methods, while at the same time deepening interpretations.

On the other end of the spectrum, it is sometimes inappropriately assumed that poorly documented remains have little value for addressing important historical questions. While it is certainly true that limited documentation may make it difficult to define sharply focused associations, one of archaeology's strengths is the ability to recreate the lifeways of poorly documented groups. Additional guidance on using the following research themes to evaluate the information potential of agricultural properties is presented below in the Implementation Plan chapter.

¹ Herbert G. Gutman, *Work, Culture, and Society in Industrializing America*. (New York, NY: Vintage, 1997), 271.

² Alison Wylie, 1999: 34.

³ Ibid, 33.

Although many research themes might be relevant to agricultural properties, this study focuses on specific themes where archaeological data could contribute to a better understanding of those themes. The themes include economics, ethnicity and retention of traditional behaviors, technology and scientific innovation, household composition and lifeways, and labor history and relations.

The following sections provide background on historical inquiry into agricultural properties with emphasis on the unique manifestations of western life, a suggested theoretical orientation taking into account current professional thought, and suggested research themes with general research questions and data needs.

ARCHAEOLOGICAL RESEARCH ON AGRICULTURAL PROPERTIES

Archaeological studies of farms and homesteads have approached some of the selected topics using a combination of historical and archaeological data, offering a variety of perspectives on individual farming households in relationship to the broad issues played out in local settings.

At the national level, several edited volumes focused attention on farms in the Northeast⁴ and South.⁵ Friedlander⁶ pointed to the potential for examining regional differences and the reasons why Eastern and Southern farms were generally more stable than those in the West and Midwest. While work in other regions of the United States reveals differences in research orientations, some shared themes have broad applicability. Klein and others⁷ tabulated how Northeastern archaeologists rated the relative importance of different research topics and concluded that the most significant issues were the transition from subsistence to market farming in the nineteenth century, ethnicity, and the impacts of technological innovation on farming.

On South Carolina's Aiken Plateau, Cabak and Inkrot studied 54 rural farmsteads that were purchased by the federal government *en masse* in 1951 to build a nuclear power plant. The authors used modernization theory to explain how farm life changed during the period when technological innovations were rapidly restructuring agrarian lifeways in many parts of the nation. Modernization theory initially developed during the Cold War to explain cultural and socioeconomic processes. Scholars, recognizing its limits, restructured the theory and today see it primarily as a theory of economic development. Today "modernization is considered to be the result of technological, agricultural, and industrial forces, including urbanization."⁸ Cabak and

⁴ Sherene Baugher and Terry H. Klein, eds., "Introduction to the Archaeology of Nineteenth-Century Farmsteads in Northeastern Canada and the United States," *Northeast Historical Archaeology* 30-31 (2002): 1-8.

⁵ Charles E. Orser, "Historical Archaeology of Southern Plantations and Farms," *Historical Archaeology* 24, no. 4 (1990).

⁶ Amy Friedlander, "Beyond Regionalism: History, Archaeology, and the Future," *Historical Archaeology of Southern Plantations and Farms*, edited by Charles E. Orser, Jr., pp. 102-109. *Historical Archaeology* 24, no. 4 (1990). "House and Barn: The Wealth of Farmers, 1795-1815," *Historical Archaeology* 25, no.2 (1991): 15-29.

⁷ Terry H. Klein, et al., "The Archaeology of 19th-Century Farmsteads: The Results of a Workshop Held at the 1997 Annual Meeting of the Council on Northeast Historical Archaeology." In *Historic Preservation and the Archaeology of Nineteenth-Century Farmsteads in the Northeast*, Sherene Baugher, and Terry H. Klein, eds., pp. 9-14. In *Northeast Historical Archaeology* 30 & 31 (2002): 11.

⁸ Melanie A. Cabak and Mary M. Inkrot, *Old Farm, New Farm: An Archaeology of Rural Modernization in the Aiken Plateau, 1875-1950*, Savannah River Archaeological Research Papers 9, (Columbia, SC: University of South Carolina, South Carolina Institute of Archaeology and Anthropology, 1997), 17.

Inkrot's study examined regional architectural trends, socioeconomic differences between tenure classes, and the extent of farmstead complexity.

Some investigators have sought to examine how rural farming households responded to the emerging dominant cultural values and practices of the rising urban middle class in the late 19th century. Friedlander suggested that investigations of status in farming households are not about making obvious statements such as "rich people buy expensive ceramics," but rather "how was consciousness of status or aspiration to status reinforced by the dishes on the table, pictures on the wall, and clothes on people's backs?"⁹ Viewed in this way, artifacts deliberately convey messages regarding class orientation and social mores, reinforcing the social position of a given household. Rural and urban households employed different economic strategies and had different opportunities for social intercourse. Nevertheless, the emergence of mass marketing, the domestic reform movement, and other pervasive changes that swept the nation in the late nineteenth and early twentieth centuries influenced both. Despite this, farmers were characteristically more frugal than their urban counterparts and wealth was often measured in terms of acreage or herd size rather than material possessions. There is, thus, significant interest in comparing the experiences and practices of rural and urban households. It may also be useful to compare purchasing habits during periods when the regional or national economy was most depressed, such as during the 1870s, 1890s, and 1930s.

The importance of analyzing farms as entire landscapes encompassing the farmhouse, outbuildings, fields, fences, water systems, and other elements has also been widely recognized. Adams suggested, for example, "The placement of structures in relation to one another and to the outside world reflects the degree of conservatism and innovation of the farmer."¹⁰ Such observations are important for understanding adaptations of people emigrating from pre-industrial countries and their responses to the dominant culture surrounding them. In California's Central Valley for example, Swedish, Armenian, and Portuguese immigrants created whole communities independent from other European groups. There is also a potential to glean insights concerning the evolution of sustainable versus extractive approaches to farming within a landscape approach, including how farming practices from different regions were adapted to California. In a similar vein, Beaudry argued that:

An archaeology geared to the level of the household is not adequate for comprehending farms as farms; rather, what is required is a landscape archaeology approach that examines the farm feature system as an integrated whole. Ideally, archaeology done at the level of the household intersects with and enriches the results of broader scale work done at the level of the farm as a whole.¹¹

⁹ Friedlander, *Beyond Regionalism*, 104.

¹⁰ William Adams, "Landscape Archaeology, Landscape History, and the American Farmstead," in *Historical Archaeology of Southern Plantations and Farms*, Charles E. Orser, Jr., ed., *Historical Archaeology* 24, no. 4 (1990): 101.

¹¹ Mary Beaudry, "Trying to Think Progressively About 19th-Century Farms," In *Historic Preservation and the Archaeology of Nineteenth-Century Farmsteads in the Northeast*, Sherene Baugher, and Terry H. Klein, eds., pp. 129-142. *Northeast Historical Archaeology* 30-31 (2002): 139.

Some of the questions Beaudry raised include, “What can we learn about the structure of the farm family and perhaps of its multiple income strategies? How can we link the individual farm to the farm neighborhood?”¹² LuAnn De Cunzo similarly called for an effort to “delineate the ‘cultures of agriculture’” through a melding of landscape archaeology, documentary research, and ethnography.¹³ De Cunzo pointed out the importance of understanding the transformation from an agrarian to an industrialized society as reflected in the agricultural sites of farmers and farm laborers of different means. In a paper delivered as a plenary address to the Society for Historical Archaeology in 2003, Lou Ann Wurst argued that rural households and industries joined in a dialectical interrelationship with urban households and industrialization and not as passive, static recipients of an exclusively urban process of industrialization.¹⁴

As vernacular creations, agricultural landscapes illustrate not only the practices employed by farmers and ranchers, but also their social values and attitudes toward nature. In analyzing the use of fences by Mormon farmers, for example, Leone observed that “no library has the answer to the question: What do Mormon fences enable Mormons to do?”¹⁵ He concluded that fences protected crops from the destructive force of the wind, drew a line between closeness and privacy, conveyed “the state of [a Mormon’s] religion,” and reinforced the compartmentalization of apparent contradictions in the way Mormons understand their world.¹⁶ In a similar way, the orderly visages conveyed in so many late nineteenth century illustrations of farms reveal Victorian concepts of structure, order, productivity, and subjugation of nature. Some farmers designed their farms based on explicit plans provided in numerous publications and guidebooks. Archaeology has the ability to consider whether and how agricultural landscapes are reflections of the values of farm families.

Prior anthropological and historical studies have also examined the influence of household life course, inheritance, and women’s roles in long-term family farming ventures. Hine and Faragher note many women homesteaded their own land and, in fact, “women proved up at a similar or better rate than men.”¹⁷ They also acknowledge that women often did men’s work on farms due to labor shortages or extended absence or death of the husband. “Girls who grew up on cattle ranches usually worked outside with their fathers” and there is “little doubt that growing up on a ranch helped to develop women of strong and independent character.”¹⁸ One archaeological study of a Colorado farm homesteaded by a woman supported the idea that women did extend themselves into spheres such as farm management and finances normally dominated by men.¹⁹

¹² Beaudry, *Trying to Think Progressively*, 139.

¹³ LuAnn De Cunzo, “The Archaeology of Agriculture and Rural Life in Northern Delaware, 1800-1940,” in *Historic Preservation and the Archaeology of Nineteenth-Century Farmsteads in the Northeast*, Sherene Baugher and Teryr H. Klein, eds., pp. 85-112. *Northeast Historical Archaeology* 30-31 (2002): 105.

¹⁴ LouAnn Wurst, “A Breath of Fresh Air: Viewing Industrialization from the Countryside,” paper presented at the Society for Historical Archaeology annual meeting (Providence, RI, 2003).

¹⁵ Mark Leone, “Archaeology as the Science of Technology: Mormon Town Plans and Fences,” in *Historical Archaeology: A Guide to Substantive and Theoretical Contributions*, R. L. Schuyler, ed., pp. 191-200, (Farmingdale, NY: Baywood Publishing Company, Inc., 1978), 197.

¹⁶ Leone, *Archaeology as the Science*, 199.

¹⁷ Robert V. Hine and John M. Faragher, *The American West: A New Interpretive History* (New Haven, CT: Yale University Press, 2000), 345.

¹⁸ Hine and Faragher, *American West*, 316.

¹⁹ Tammy Stone, “The Renegotiation of Gender Roles on Homesteads in Colorado During the Victorian Era,” paper presented at the annual meeting of the Society for Historical Archaeology (Salt Lake City, UT: 1998).

Increasingly, published diaries and journals are available to support and expand study of women's roles on the farm. Religion, ethnicity, economics, and family structure are just a few factors that would influence whether and how a female agriculturalist chose to manage the family farm.

Women routinely controlled the management of the household, or at least some of its key functions. Changes in fashion and the advance of domestic reform and mass consumption gradually transformed the economic strategies of farm households. Changes in the female head of household, however, often produced the most dramatic and sudden wholesale changes in farmhouses, farmyards, and materials discarded because of household renovation. Archaeologist Kathleen Wheeler examined such changes at several late eighteenth and early nineteenth century New England residences, and her approach holds broad value for sites occupied for more than one generation. She found that changes in the female head of household coincided with discards of entire groups of kitchen and serving wares and the construction of new wings on residential structures.²⁰

Dontal B. Marti noted that the Grange, one of the most important institutions found in most farm communities across America during the late nineteenth century, "created opportunities for sociability and cooperation among women. The Grange was also instrumental in promoting women's voting rights."²¹

Marilyn Irvin Holt pointed out that "the push for rural change was as likely to come from the outside agricultural districts as from the inside."²² Furthermore, progressives saw farm women as the progenitors of change within the farm community. Farm women were enlisted to promote "social engineering and economic growth."²³ As a matter of caution, historian Paula Nelson noted that "it is important that the lives of women in the West, as elsewhere, be understood in all their diversity and complexity and that no rigid interpretive framework be forced onto the study."²⁴

THE WEST

Stein's 1989 summarial context for Arizona homesteads is relevant to this study, although its focus is not the broad topic of agriculture but rather individual homesteads.²⁵ Based on archaeological studies of only seven homesteads, Stein identified the following research issues:

1. To what extent were homesteads economically self-sufficient?
2. To what extent was agriculture practiced?

²⁰ Kathleen Wheeler, "Women, Architecture, and Artifacts," paper presented at the annual meeting of the Society for Historical Archaeology (Long Beach, CA: 1999).

²¹ Dontal B. Marti, *Women of the Grange: Mutuality and Sisterhood in Rural America, 1866-1920*, (New York, NY: Greenwood Press, 1991), 1.

²² Marilyn I. Holt, *Linoleum: Better Babies & the Modern Farm Woman 1890-1930*, (Albuquerque, NM: University of New Mexico Press, 1995), 5.

²³ Ibid, 5.

²⁴ Ibid, 6.

²⁵ Pat H. Stein, *Homesteading in Arizona*, (Phoenix, AZ: Arizona State Historic Preservation Office, 1990).

3. What was the role [or roles] of women?
4. What were the patterns of land use?
5. How did the social mores of particular groups evolve in response to life on the frontier?
6. What were the long-range goals, or motives, of homesteaders in staking claims, and how successfully were those goals met?
7. What factors contributed to the “success” of a homestead, as measured by the conveyance of a title patent from the government to the claimant?

A concern central to the archaeological endeavor and underlying many of Stein’s research questions is the comparison of the actual behavior of homesteaders to what is known or expected from documentary evidence or oral history. For example, archaeology may prove to be the most reliable method to reveal disparities between requirements for proving up claims and the actual improvements made on a property. Archaeological data may shed light on topics such applied technology, adaptive reuse of artifacts, home production versus purchasing of new goods, farm layout, and the evolution of agricultural approaches stemming from traditional practices originating in other regions.

Panelli has placed many of the same questions in an evolutionary ecological framework, focusing attention on early twentieth century homesteads in Nevada.²⁶ She suggested that many late period homesteaders had to resort to highly flexible adaptive behavior just to survive. In addition, she saw the development of a strong tendency to conserve available resources and minimize purchases. While this observation is plausible for remote, post-1900 homesteads in Nevada where water was at best unreliable and soils were marginally productive for agriculture, it should be judiciously extended only to the most arid parts of California. A study of nine homesteads in Colorado documented the same conservative tendency, with much adaptive reuse of artifacts indicated.²⁷

It is not always clear what factors stimulated greater dependence on outside markets, as opposed to higher self-reliance among farmers. While standard economic theories looking at costs of goods and transportation may help predict certain behaviors, human beings sometimes disregarded rational behavior. One might expect reliance on purchased goods would be minimized during periods of economic hardship, however archaeological findings sometimes provide conflicting evidence and there is significant interest in ascertaining why.

For example, a study of 10 homesteads and three ranches in northeastern California and northwestern Nevada investigated in connection with the Tuscarora Gas Pipeline Project noticed a pattern of reliance on purchased goods despite the relative isolation.²⁸ In that study, all of the homesteads were successfully proved, though some were later abandoned. In contrast, Ayers

²⁶ Mary Panelli, “A Ethnohistorical Study of Homesteading in Central Nevada” (M.A. thesis, University of Nevada, Reno, 1983).

²⁷ W.G. Buckles and N.B. Rossillon, “Summary—High Mountain Valley Ranching and Farming Area,” in *Old Dallas Historical Archaeological Program, Dallas Creek Project*, by W. G. Buckles et al., pp. 343-370. (Salt Lake City, UT: U.S. Bureau of Reclamation, 1986).

²⁸ Barbara Mackey, et al., “Jackrabbit Tamale: Recipe for Historic Era Homesteading,” in *Culture Change Along the Eastern Sierra Nevada/Cascade Front, VIII*, (Reno, NV: Submitted to the Tuscarora Gas Transmission Company, 1997).

and Seymour saw establishing a homestead on available government land as one Arizona family's solution to economic problems brought about by the Great Depression.²⁹

Several homesteads occupied during the 1930s in Arizona revealed less self-sufficiency in hard times.³⁰ By the 1930s, however, transportation had improved to such a point that goods and services could be acquired more cheaply and perhaps more efficiently through direct purchase rather than re-use. Time management, rather than cultural or environmental factors, then became more relevant to the adaptation strategies of an individual household.

CALIFORNIA EXAMPLES

An extensive homestead study on Edwards Air Force Base in the South Desert also followed the evolutionary ecological framework. Researchers defined successful economic adaptation as “the ability for home site settlers to derive and sustain a long-term successful economic existence from their rural home site.”³¹ The study measured economic success in terms of the relationship between length of occupation and structural complexity of the home site, that is, variety and diversity of structures. Researchers found a complex mix of factors influenced success of a homestead, but ultimately they interpreted the sites to indicate that success depended upon the ability to adapt to local environmental conditions as well as local and national economic conditions. Adaptation included diversification of economic pursuits, such as the presence of mining, farming, and railroad equipment at a single site. Settlers might also diversify their crops or experiment by growing two crops at once. In response to national economic conditions, such as the depression of the 1930s, many homesteaders chose to leave the region rather than adapt. National trends such as Congress' passage of the Enlarged Homestead Act and rise of the Scientific Dry Farming movement were seen as influencing land prices and stability.

Mackey and others found that late 19th and early 20th century homesteads in their northern California and Nevada study never achieved a high level of self-sufficiency. Claimants remained dependent on purchased goods, as illustrated in the variety and dominance of manufactured goods found at the sites. Most lived at “a subsistence level, in a style less than the contemporary ideal” supplementing their income with wage labor.³² Ranchers with larger spreads fared much better, exhibiting more diversity within functional assemblages when compared to farming families. These differences imply the need for further research into how purchasing patterns of rural agrarian households correlated with hardship, cycles of economic depression, and the expanding availability of mass-produced goods that resulted from late nineteenth century industrialization.

Yet another investigation in northeastern California suggested the most successful farmers invested the most in improvements, were willing to experiment, and were innovative in coping

²⁹ James Ayers and Gregory Seymour, *Life on a 1930s Homestead: Historical Archaeological Investigations of the Brown Homestead on the Middle Agua Fria River, Yavapai County, Arizona*, (Tucson, AZ: SWCA Anthropological Research Paper Number 2, 1993).

³⁰ Stein, *Homesteading in Arizona*, 1989.

³¹ Tetra Tech, Inc., “Cultural Resources Evaluation of Historic Period Homesites, Edwards Air Force Base, California,” (Prepared by Tetra Tech, Inc. and Jones & Stokes, Inc. 2004), 54.

³² Mackey, et al., *Jackrabbit Tamale*, 30-45.

with the dry environment.³³ In certain situations among California farms, various public water projects provided a steady and reliable supply of water that mitigated environmental uncertainty. Innovation, however, was not the sole predictor of success, as many immigrants employed traditional farming techniques with good results.

Studies of farms and homesteads in northern California mirror many of the interests that have motivated archaeological work elsewhere in the West and beyond. A study of rural homesteads in the Knoxville and Morgan Valley areas of Lake and Napa counties found that local homesteading experiences ranged from long-term, successful agricultural ventures to short-lived, debt-ridden occupations.³⁴ More successful ventures developed earlier in time (1860s) and had a higher degree of self-sufficiency. In this setting, self-sufficiency emerged in a wider variety of crops grown and wider variety of artifacts remaining on site. Later homesteads (e.g., 1890s and later) often failed, despite the easing of reporting requirements for proving them up. Such failures may have been due to market conditions (e.g., the recession of the 1890s), household dependency on external suppliers, settlement of increasingly marginal lands, and other factors.

More research into individual household adaptations to unique circumstances is needed, although agriculturalists in general were more self-sufficient than their urban counterparts due to cultural traditions, the make-up of the family or household, and differing access to goods and materials. The effects of industrialism on modes of sufficiency or adaptation on agricultural properties are worthy of further research.

A large study for the New Melones Reservoir Project in Calaveras and Tuolumne counties involved excavations at four rural homesteads.³⁵ A social history model helps to examine a continuum of relations between core and peripheral areas in the developing global economy. On this continuum, the model expects rural agrarian households to exhibit considerable self-sufficiency. Based on studies of the Coffill Ranch, Douglas Ranch, Shea Homestead, Vonich Homestead, and other sites, Greenwood and Shoup noted a change from a dependent economy during the Gold Rush to increasing self-sufficiency until about 1900. This interpretation critically notes that farms and ranches in New Melones were clearly part of the Gold Rush economic system in that Mother Lode economies included a wider diversity of products and services than remote rural farms or isolated mining settlements. Although the farms and ranches continued to exhibit self-sufficient behavior after the turn of the century, increasingly affordable mass-produced goods gradually became more prevalent. Ongoing adaptations at such properties included supplementation of agriculture with small-scale mining, particularly during the Great Depression.

Commenting on the New Melones results, Tordoff observed some widespread changes in trade patterns and dependency on external markets over time. With regard to the availability of imported goods, the New Melones sites reveal an early dependence on materials imported from

³³ D.T. Garate, *Termo to Madeline: Northern California's Last Frontier*, (Susanville, CA: Graphic Dynamics, 1982).

³⁴ Mary Praetzellis and Adrian Praetzellis, *Historical Archaeology in the Knoxville and Morgan Valley Areas, Lake and Napa Counties, California*, (Rohnert Park, CA: Sonoma State University, Anthropological Studies Center, 1985).

³⁵ Roberta S. Greenwood and Laurence H. Shoup, "New Melones Archaeological Project, California: Review and Synthesis of Research at Historical Sites," Final Report of the New Melones Archaeological Project, VII., (Washington, DC: Submitted to the National Park Service, 1983).

outside California. While there was continuing demand for products from the eastern U.S. and foreign markets later in time, products made within the state increased not only in volume, but also in importance as California became more industrialized. The growing availability of cheaper mass-produced products in the latter nineteenth century influenced even the most self-sufficient rural householders. Tordoff concluded that the most productive topics for future investigations involve local, regional, and international trade; ethnic group acculturation; the growth and loss of community autonomy; and the effects of industrialization on such rural agrarian households.³⁶

Investigations at the Vasco adobe site have also looked at the importance of social relations among rural households of an isolated portion of eastern Contra Costa County. The remoteness of the Vasco site contributed to the emphasis on interaction among the culturally diverse families of that area.³⁷ Relative isolation forced people of varying cultural backgrounds to interact for both social and economic reasons. Purser also has considered social visiting by women in bordering regions of rural northern Nevada and California. She found women played a prominent role in maintaining social and economic ties among widely dispersed farms and ranches. Those ties facilitated seasonal exchanges of labor, resources, and information.³⁸

Two California studies have involved farms operated by Irish immigrants. They compared a small minority of Irish immigrants that returned to farming for a livelihood. An excavation of two privies associated with the four-acre Haggarty Farm near Castroville found deposits from the mid-1870s to circa 1890. This diachronic evidence suggested the Haggartys remained poor and relied on a combination of home production, materials gathered from the wild, and careful purchases. Despite their limited means, the Haggartys placed importance on Victorian values such as education, social display, gender-based divisions of labor, and aspirations for social advancement. How much religion and culture, rather than Victorianism per se, bound these values is uncertain.³⁹

A trash dump associated with the Carnduff farm near Menlo Park in San Mateo County provides an interesting example of the wide range of interpretations that may be possible in cases where such deposits connect to pivotal household transitions. The Carnduff farm, established in 1865 by Irish immigrants, remained in the same family until the mid-1940s. After Samuel Carnduff's death in 1884, Anne Carnduff operated the farm with the help of her only son William until she passed away in 1917. The historic dump remained when Anne died. It provides insights into farm and household management by a woman. It also reveals how the different values of two

³⁶ Judith D. Tordoff, "Historical Archeology: Interpretations," in *Culture Change in the Central Sierra Nevada, 8000 B.C.-A.D. 1950, Final Report of the New Melones Archeological Project IX*, by Michael J. Moratto, Judith D. Tordoff, and Laurence H. Shoup, pp. 477-496, (Washington, DC., 1988).

³⁷ Grace H. Zeising, "Investigations of Three Historic Archaeological Sites, CA-CCO-447/H, CA-CCO-445H, and CA-CCO-427H, for the Los Vaqueros Project, Alameda and Contra Costa Counties, California," (Concord, CA: Anthropological Studies Center, Submitted to the Contra Costa Water District, 1996).

³⁸ Margaret Purser, "'Several Paradise Ladies Are Visiting in Town': Gender Strategies in the Early Industrial West," in *Gender in Historical Archaeology* (Special Issue), Donna J. Seifert, ed., *Historical Archaeology* 25, no. 4 (1991): 6-16.

³⁹ Thad Van Bueren, Steve Grantham, and Julia Huddleson, "CA-MNT-1382/H," in *Phase II Archaeological Investigations for the Castroville Bypass Project, Monterey County, California* by Terry L. Jones, Thad M. Van Bueren, Steve Grantham, Julia Huddleson, and Teresa Fung, pp. 115-182, (San Luis Obispo, CA: Submitted to California Department of Transportation, District 5, 1994).

generations may have resulted in the wholesale renovation of the household by Anne's daughter-in-law Kate at the time she assumed control of the household.⁴⁰

Also under the rubric of ethnicity shaping farming practices, an investigation of a Japanese truck farm established on Otay Mesa in 1952 discerned evidence of the ethnic practices of the farm owners in the aftermath of their internment during World War II. The farm complex included a traditional bath (*ofuru*), among other features.⁴¹ Elsewhere, Kelly and Gerike used a landscape perspective to evaluate a Japanese-American farm in Placer County and found it provided important information on how Japanese-Americans retained cultural traditions while adapting to the economic and agricultural conditions present in California.⁴² Larger samples will help to analyze the role that cultural affiliation played in farming practices and the lifeways of western farm households.

The investigations of several late nineteenth and early twentieth century agrarian households in various California locales have also occurred. Within San Diego County, the Root, Liefering, Hubert, Israel/Taylor, Peñasquitos, Rancho Jamul, and Schott farmsteads received the attention of one or more episodes of archaeological study.⁴³ Several other rural households in the Rainbow and Woods valley localities, elsewhere in the county, have received attention.⁴⁴ Those San Diego County investigations share a common emphasis on the recognition of functional artifact patterns, following the approach developed by Stanley South.⁴⁵ The goal of such efforts has been to define patterned regularities in human behavior to support comparisons among sites. Discussion of a "rural community cultural pattern" dating between 1870 and 1940 for the local area has occurred.⁴⁶ While efforts to understand patterning are important, few local studies have

⁴⁰ Thad Van Bueren and others, "Contemplating Household Transitions: Investigations at the Carnduff Dump (CA-SMA-368/H) in San Mateo County, California," (California Department of Transportation, District 4, Oakland, CA, 2004).

⁴¹ Thad Van Bueren and Susan Walter, *Historical Study Report for the Root Homestead (CA-SDI-9258H) and Yamamoto Farm Workers Camp, Interstate 125 South Project*, (California Department of Transportation, District 11, San Diego, CA, 1994).

⁴² John Kelly and Christian Gerike, *Historic Study Report for the Sierra College Boulevard/Interstate 80 Interchange Modification, City of Rocklin, Placer County, California*, (Rocklin, CA: LSA Associates, Inc., Submitted to City of Rocklin, Engineering Services Division. 2002).

⁴³ Stephen Van Wormer, "Historical Analysis of Site W-2198," in *Phase I Archaeological Investigations at Rancho Jamul Estates, Unit 3, Jamul, California*, by Richard L. Carrico, (Submitted to San Diego County Department of Planning and Land Use, San Diego, CA, 1979). *Analysis of Refuse Recovered from Two Privies at the Hubert Ranch, Oceanside, California*, (Submitted to San Diego County Department of Planning and Land Use, San Diego, CA, 1984). Susan Hector, "Cultural Resource Management Plan for Los Peñasquitos Ranch House Resource Area, San Diego," *Proceedings of the Society for California Archaeology* 6, (1984): 129-139. Susan Hector and Stephen Van Wormer, *Broken Fragments of Past Lifeways: Archaeological Excavations at Los Peñasquitos Ranch House Resource Area, San Diego*, (submitted to the City of San Diego, Department of Parks and Recreation, San Diego, CA, 1986). Douglas Kupel, "Historical Analysis," in *Bonita-Miguel Substation: Archaeological Investigations into the History and Prehistory of the Substation Area*, by WIRTH Environmental Services, pp. 128-190, (submitted to San Diego Gas and Electric, San Diego, CA, 1986). Van Wormer, Stephen R., and Susan M. Hector, *Historical and Archaeological Assessment of the Liefering House*, (submitted to San Diego County Department of Planning and Land Use, San Diego, CA, 1988). Stephen R. Van Wormer and Jerry Schaefer, *Hardscrabble Ranch: Archaeological Investigations at the Robert Israel Adobe*, (Submitted to Olivenhain Municipal Water District, Encinitas, CA, 1988).

⁴⁴ Steven Van Wormer, "An Analysis of a Historic Trash Deposit at W-1969," *Pacific Coast Archaeological Society Quarterly* 21 no. 4 (1985): 39-50. Sue A. Wade, Dale M. Cheever, and Stephen Van Wormer, *An Archaeological Testing Program for Twelve Sites within the Woods Valley Ranch Project Area, Valley Center, California*, (Submitted to San Diego County Department of Planning and Land Use, San Diego, CA, 1990).

⁴⁵ Stanley South, *Method and Theory in Historical Archaeology*, (New York, NY: Academic Press, 1977).

⁴⁶ Stephen R. Van Wormer and Jerry Schaefer, *Hardscrabble Ranch: Archaeological Investigations at the Robert Israel Adobe*, (Submitted to Olivenhain Municipal Water District, Encinitas, CA, 1988). M. Steven Shackley and Stephen Van Wormer, *Cultural Resources Technical Appendix for the Mt. Israel Reservoir Project*, (Submitted to Olivenhain Municipal Water District, Encinitas, CA, 1989). Jerry Schaefer, Stephen Van Wormer, and Susan Walter, "Draft Historic Study Report of Sites CA-SDI-

gone on to ask what those patterns mean and why they developed. Yet, criticism over pattern recognition as a viable approach has emerged because it tends to mask variations among households of differing age, wealth, and ethnic composition. Such variations are important subjects for anthropological and historical study.

Data recovery excavations at a farm near Sutter Creek (CA-AMA-364/H) identified interesting archaeological assemblages associated with several structures that had been occupied by hired hands.⁴⁷ Earlier in time, farm hands occupied a semi-subterranean dwelling near the main house, and evidence of Chinese and Native American workers were also discovered. Starting in the 1890s workers lived in a dwelling located farther from the main house. A wide array of ethnic artifacts suggests significant turnover in the transient male work force. An unusual collection of women's health and other personal articles buried in the earth floor of the feature suggests visits, rather than occupation, by women. The author interpreted the group of special materials as possible evidence of visits by prostitutes based on comparisons with assemblages from brothels, families, and transient male housing sites.

PROPOSED THEORETICAL ORIENTATION

Explanation of the theoretical orientation that guides this study, the contextual or interpretive approach, is necessary before discussing the specific research themes that underscore agricultural properties. While a contextual approach is advocated in this study, the authors recognize that alternative theoretical orientations should be examined whenever the archaeologist suspects they may be relevant.

Inquiries of all kinds guide not only the scope and breadth of questions asked, but also *how* to frame those questions. The orientation underlying this research design is based on the belief that all archaeological scholarship is essentially interpretive, a perspective influenced by views articulated by Hodder, Marcus and Fischer, and Praetzelis, among others.⁴⁸ From that point of view, no absolute or definitive truths exist about the past, only more or less convincing explanations. The goal is not absolute proof, but deeper insights into the human condition. Thus, even the most well studied topics may yield important new insights when approached from new perspectives or with new data. It also follows that the analyst's role in creating (or recreating) the past must be expressly acknowledged.

This perspective arises from the notion that understanding human behavior best comes in relation to its specific social and historical context. Central to this approach is the understanding of "the

11374H, -11383H, -12272H, and -12273H for State Route 125 on Otay Mesa, San Diego County, California, 11-SD-125, 0.0/9.6, 11221-926475," (submitted to California Department of Transportation, District 11, San Diego, CA, 1994).

⁴⁷ Thad Van Bueren, *Lending a Hand: Archaeological Perspectives on Farm Labor at the Brown and Sanderson Farm (CA-AMA-364/H) in Amador County, California*, (California Department of Transportation, District 10, Stockton, CA, 2005).

⁴⁸ Ian Hodder, *Reading the Past: Current Approaches to Interpretation in Archaeology*, (Cambridge, England: Cambridge University Press, 1986), Marcus and Fischer (1986). Mary Praetzelis, ed., *West Oakland, A Place to Start From, Research Design and Treatment Plan, Cypress I-880 Replacement Project, Volume 1: Historical Archaeology*, (Rohnert Park, CA: Anthropological Studies Center, Sonoma State University, prepared for California Department of Transportation, Oakland, CA, 1994).

meaning of social life to those who enact it.”⁴⁹ Thus a focus on semiotics is vital for unraveling the complexities of life in modern, pluralistic social settings like America where people of diverse backgrounds and values met, adapted, and forged new vocabularies of interaction. In that chaotic milieu, symbols and meanings were at once multi-layered, complex, and subject to change. Understanding the ways that cultural materials were used as symbols is thus essential for gaining insight into the structure of social relations and why people have acted in certain ways.

The contextual or interpretive approaches differ in key respects from the processual model favored by some investigators. Where processualists stress predictability and seek to establish sweeping normative generalizations, the semiotic approach recognizes that artifacts do not have fixed meanings that compare across the board.⁵⁰ Rather, their meanings depend on the context of their use. An essential focus of contextual studies is thus to explain how and why artifacts have been used in different ways in different social settings. Comparisons that ignore such differences, such as the “patterns” pioneered by Stanley South, are often unproductive because they tend to trivialize the archaeological record by glossing over the role of individual agency and variability. Only by looking for the reasons behind the similarities and differences in the way people used artifacts will deeper insights emerge into the variable fabric of American life.

This emphasis on context comports well with *National Register Bulletin* 36, which identifies one of the main objectives of archaeology as an effort that “describes, records, and reconstructs past lifeways across time and space.”⁵¹ The other primary goals identified by *Bulletin* 36 are to test new hypotheses about the past and to reinforce, alter, or challenge current assumptions. Rather than presuming that life was the same from one place to another, this interpretive approach recognizes and seeks to understand the variable fabric of American life and the reasons why it has evolved in that way.

In the contextual approach, detailed reconstruction of lifeways in particular places and times allows for the arrival of multifaceted explanations of social meanings constructed through balanced assessments of artifacts, documents, and spoken memories. Comparisons among these data sources are essential for challenging or reinforcing current assumptions and exposing biases in each type of data. Both deduction and induction play a role in the creation of interpretations based on critical appraisal of those varied data. The resulting interpretive endeavor is one in which research themes are gradually refined and deepened as cases that are more specific are considered. Central to this view is a concept of culture not as a nomothetic construct, but something participated in and understood in different ways by its myriad participants. Clifford Geertz clearly articulates this view of culture as a system of intersecting understandings.⁵²

The orientation described here is particularly well-suited as a way to approach the nineteenth century shift from a predominantly agrarian society to an industrialized and increasingly urban one.⁵³ In contrast to early views that this transformation was a simple, linear process,⁵⁴ the view

⁴⁹ Marcus and Fischer, *Anthropology as Cultural Critique*, 8.

⁵⁰ Ian Hodder, *Reading the Past*.

⁵¹ Barbara J. Little and others, (2000), 27.

⁵² Clifford Geertz, *The Interpretation of Cultures*, (New York, NY: Basic Books, 1973).

⁵³ Herbert G. Gutman, *Work, Culture, and Society in Industrializing America*, (New York, NY: Vintage, 1977).

taken here is that it was both complex and multilinear. Social relations underwent a chaotic adjustment as huge waves of immigrants with widely differing cultural expectations came together with native-born Americans in a period of drastic social and technological upheaval. This was not a period of orderly, rational change. It was a time when all actors were grasping for meaning and opportunity. In this regard, Monkkonen has stressed the need to understand the essential “contingencies, unexpected consequences, unplanned chains of events, and ungrasped opportunities” that characterized life in America during that period, cautioning against deterministic views based on economic and technological forces.⁵⁵

The drastic transformation from a traditional “face-to-face” society to one that emphasized rationality in economic relationships, specialization, anonymity, and efficiency profoundly affected native-born and immigrant peoples alike. Measurement of progress in this period became, to a large degree, dependent on material terms.⁵⁶ Materials in fact became the *lingua franca* of this new age, and understanding how their meanings evolved in the contexts of the dynamic social interactions is at the center of the research agenda considered here. Much recent work in the social sciences generally, and within archaeology in particular, has focused on the multilinear and complex nature of this social revolution.⁵⁷ This has included the examination of multicultural influences, symbolism and meaning, conflict, and resistance.

To understand this fundamental shift in the tenor of life in the California agricultural landscape, it is necessary to look at how particular individuals or groups responded to and sought to make sense of the changes discussed above. Only through the examination of many specific cases will it be possible to progressively build an understanding of a process that so fundamentally transformed American life.

PROPOSED RESEARCH THEMES FOR AGRICULTURAL PROPERTIES

This section identifies research themes that may be useful for evaluating the significance of agricultural properties under National Register Criterion D. The research themes are introduced with some contextual discussion, followed by some specific research questions and description of various types of data that might inform the questions. The proposed questions are necessarily broadly stated and general. They are grouped as a way to highlight particular aspects of human behavior, although most topics are in reality inextricably linked. The most important topics animating current research are included, but this research design should not be considered comprehensive. It is instead merely a place to initiate investigations. Not every research theme

⁵⁴ W.W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto*, (London, England, Cambridge University Press, 1960).

⁵⁵ Eric Monkkonen, *America Becomes Urban: The Development of U.S. Cities and Towns, 1780-1980*, (Berkeley, CA: University of California Press, 1988), 3.

⁵⁶ Richard D. Brown, “Modernization: A Victorian Climax,” in *Victorian America*, edited by Daniel Howe, pp. 29-46, Philadelphia, PA: University of Pennsylvania Press, 1976), 29. Immanuel Wallerstein, *The Modern World System II: Mercantilism and the Consolidation of the European World Economy, 1600-1750*, (New York, NY, Academic Press, 1980).

⁵⁷ Gutman, *Work, Culture, and Society*, Thomas Bender, *Community and Social Change in America*, (Baltimore, MD: John Hopkins University Press, 1978), Hodder, *Reading the Past*, Leone, *Relationship*, Orser, *Historical Archaeology*, Anne-Marie Cantwell and Diana diZerega Wall, *Unearthing Gotham: The Archaeology of New York City*, (New Haven, CT: Yale University Press, 2001).

is expected to apply in all situations. Individual researchers may modify and supplement these themes and questions as appropriate, given the specific site conditions and historic context. The historical context provides base level data necessary for the formulation of research questions and theoretical assumptions of agriculture in California.

SITE STRUCTURE AND LAND USE PATTERNS

At the most basic level, the history of an individual site should be known (who, what, when, and where) to allow a meaningful interpretation of the archaeological data that inform our understanding of history. This research theme sets the physical stage for other analyses: the nature of the site must be understood in order to meaningfully interpret the lives of its occupants. Determining the nature and size of farm or ranch support facilities provides indications of the site's wealth, economic activities, and household composition. The dates of construction, configuration, use, modification, and abandonment of site structures provide important information on the history and behaviors of the inhabitants. This research theme is essentially a building block and application of it alone would not constitute the level of importance necessary for National Register eligibility under Criterion D.

In addition to answering basic questions on site use and chronology, this research theme also incorporates larger social, historical, and anthropological issues. William Adams' settlement analysis of Silcott, Washington, showed that farmers would build structures on the least agriculturally desirable portion of their property to maximize usable land.⁵⁸ Environmental variables such as elevation, slope, aspect, and soils factored greatly in site location and layout. In some cases, farmers had folk wisdom about solar energy and put it into practice with respect to the location of their farmhouses, fields, and pastures.⁵⁹ Also knowing whether the occupants owned the property or were tenant farmers is crucial to a well-constructed interpretation. Researchers have shown that tenant farmers were less likely to invest money or time and labor in improvements or changes where they would not realize a return on their investment.⁶⁰

Research Questions

What factors contributed to the differences in the ways agricultural properties were organized? To what extent are those differences attributable to variations in household composition, ethnicity, duration of occupation, environmental constraints, or other factors? Do the orientation, layout, or composition of structures and buildings on the property reflect changes in household composition over time? What do the structures, features, and layout of the property reveal about the philosophy and approaches used to carry out agriculture? Is continuity evident in those approaches or did they change over time, and why?

Are there indications of specialized work areas or gendered uses of space, and what do they reveal about the organization of work and how it may have changed over time? Do land use

⁵⁸ William Adams, *Silcott, Washington*.

⁵⁹ Peter Mires, "The Importance of Aspect to Historic Farmstead Site Location in the Green Mountains of Vermont," *Historical Archaeology* 27, no. 4 (1993): 82-91.

⁶⁰ Melanie Cabak and Mary Inkrot, *Old Farm, New Farm*; Ziesing, *Three Historic Archaeological Sites*.

patterns reflect traditional ethnic behavior? How do cultural enclaves, such as Los Banos or Solvang, result in creation of distinct settlement patterns, building styles, or material remains?

Is there a high degree of specialization or more generalized use of the property and activity areas? Was production diversified or specialized, and did the focus change over time? What factors account for changes in production focus? Is there evidence that the plot size changed over time and how does that relate to broader historical trends of land ownership? Is there evidence that changing plot size influenced the degree of family participation or adoption of scientific farming practices?

To what extent did geomorphological conditions influence the success or failure of a settlement? Did distance to major transportation routes influence the long-term success of the farmstead? Does the layout and organization of the property reveal information about the way the owner or tenant related to neighbors?

Data Needs

Archaeological: Evidence of environmental adaptations such as windbreaks, drainage systems, reservoirs, etc.; the locations of features and deposits with identifiable functions and periods of use; undisturbed land where past remains may have survived; hollow, refuse-filled features with distinguishable depositional integrity and identifiable association; horizontal distribution of features such as foundations indicating spatial organization or sheet refuse indicative of activity areas or landscaping remnants; trash pits associated with individual or group disposal patterns; sheet midden; structural remains with evidence to distinguish function; fence post holes corresponding to corrals and/or other structures or spatial divisions; spatial arrangement of surviving plantings, particularly non-native trees and hedges.

Primary Documentary Sources: property or tax assessments, official deeds, leases, agreements, probates, water rights, maps, correspondence, journals, diaries, census reports, genealogies, church records (marriage, baptismal, and death records), financial and production records and other accounts, and oral history.

Contextual Sources: comparisons to similar-sized properties to form expectations on above questions, general information on the range of size and wealth for similar types of properties; various economic strategies and their impact on the residents; comparison of archaeological findings from other sites.

Artifacts: artifacts in identifiable features; sufficient variety of distinctive materials; materials associated with specific activities; minimum number of items (MNI) frequency/proportion to support interpretation.

ECONOMIC STRATEGIES

This theme broadly encompasses the economic strategies employed by agricultural property owners, tenants, and hired hands. For those operating farms and ranches, decisions concerning

how to meet household needs and produce income or basic subsistence from agricultural production were integrally linked. In many cases, income may have been supplemented with other types of activities or work outside of the farm. For hired hands, economic strategies were forever contingent and subject to negotiation.

Consumer behavior and the economic strategies of households are longstanding concerns in the field of historical archaeology, and material remains are by their very nature well suited to examining such issues. Within this theme special attention is devoted to the shift from a bartering economy to one based on cash, why a “throwaway culture replaced one grounded in reuse.”⁶¹ Other focuses of inquiry may include how large-scale economic fluctuations influenced household purchasing patterns, and how a pattern of conspicuous consumption and discard came to dominate American life, albeit at different rates among different population segments, or vice versa when greater rural self-sufficiency increased as farmsteads mature and home production became more diversified. Farm families reflect a type of household and economic orientation that shifted regionally in terms of settlement patterns and the use of certain lands over time. Hence, historical archaeology provides an opportunity to examine the ways such families adapted to changes and how their lives compared to households in other settings.

As a mode of exchange, barter may have continued in rural settings for much longer than it did in urban ones. Country stores and traveling peddlers regularly exchanged farm products and secondhand items for newly manufactured goods during the late nineteenth century.⁶² In these exchanges, relationships between merchants and customers were personal and deals were negotiated. By the 1870s, however, cash stores and mass marketing rapidly came to replace this traditional system of exchange, especially in urban centers. This new system was based on principles of economic rationality including fixed standards (one price for all buyers), efficient mass production, and even anonymity (especially that made possible by mail orders).⁶³ There is much to be gained in understanding how mass marketing and urbanization influenced traditional systems of exchange for farm families.

Collectively, these changes contributed to the depersonalization of commerce, lower costs for many goods, and the ascendancy of advertising as a means to promote consumption. At the same time, “the growth of markets for new products came to depend in part on the continuous disposal of old things,” rather than their reuse, repair, or resale as valuable recyclable material.⁶⁴ Hence, disposability was from an early period promoted to make people feel rich, while reuse was discouraged as unfashionable. In this light, the practice of discarding useful materials increasingly came to symbolize social standing. At the same time, reuse and repair remained essential economic strategies for many households. This subject is also explored under the agricultural science and technology research theme.

Why and how these changes occurred is something archaeology is in a good position to illuminate. Some factors that may have influenced changes in consumer practices include, but

⁶¹ Susan Strasser, *Waste and Want: A Social History of Trash*, (New York, NY: Henry Holt, 1999), 18.

⁶² Gerald Carson, *The Old Country Store*, (New York, NY: Oxford University Press, 1954), 19-38. Strasser, *Waste and Want*, 1999.

⁶³ Brown, *Modernization: A Victorian Climax*, 42-43.

⁶⁴ Strasser, *Waste and Want*, 15.

are not limited to, access to resources, cost, product familiarity and reliability, fashion, cultural or ethnic preferences, differences in wealth, and status aspirations.⁶⁵ National or regional economic instability cycles, as well as direct changes in the circumstances of families, undoubtedly had an influence on the strategies employed by farm families.

Archaeological research at agricultural properties may yield important information concerning national economic cycles and the degree of self-sufficiency manifested at the site.⁶⁶ The relative abundance of imported goods may provide some indication of the degree of reliance on and general availability of purchased commodities. Other materials such as crocks, canning jars, and related items, combined with the presence or absence of wild game, indications of home butchering, floral microconstituents, and related indicators may be instrumental in the evaluation of how much home production was occurring at the site. Evidence of repair, reuse, and on-site fabrication may be present in the form of sewing paraphernalia, home craft industries, or home blacksmithing. The following research questions examine some potentially relevant aspects of this broad topic.

Research Questions

To what extent did outside factors (e.g., access to shipping facilities, market forces on crop prices, etc.) influence choices in what to produce at farms and ranches, and how quickly did the owners or tenants respond to changing external market conditions? To what extent did access to capital, that is, ability to procure new technology, influence changes in production methods and the types of products grown on the farm?

To what extent did access to markets influence individual or household purchasing decisions? Is it possible to see the influence of mass marketing and urbanization in how the household is managed? To what degree did site occupants depend on products of an industrialized world for their material needs?

How did households adapt to changing economic circumstances brought about by changing market conditions, variable production output, and periodic environmental disasters such as drought, flood, and pestilence? Under what circumstances were manufactured goods favored over home-made products, recycling, and repair, and did that change over time? What does that indicate about household purchasing decisions? Was more home production a response to decreased economic circumstances?

Were site occupants full-time farmers and ranchers or did they work for wages off-site, mine their property, or participate in craft industries? How would such differing economic strategies influence the material remains at an individual site? How do the remains from such sites compare to sites where economic diversification was not practiced? Is the conservative ideology generally attributed to farming families, as manifest in industry, frugality, and family stability,

⁶⁵ Anne Yentsch, "Domestic Sites," in *Tar Flat, Rincon Hill, and the Shore of Mission Bay: Archaeological Research Design and Treatment Plan for SF-480 Terminal Separation Rebuild*, Mary Praetzellis and Adrian Praetzellis, eds., pp. 256-285, (submitted to California Department of Transportation District 4, Oakland, CA: 1993): 278.

⁶⁶ Thad Van Bueren, *Dragstones and Stockraising: Results of Archaeological Test Excavations at CA-AMA-363/H and -364/H in Amador County, California*, (submitted to the California Department of Transportation, District 10, Stockton, CA, 1998).

visible in the archaeological record? What other factors might contribute to the conservative ideology? Is the conservative ideology aptly defined and how might a specific site contribute to its revision?

Is there any evidence that by the 1930s farm families were more self-sufficient than in previous years or perhaps later years? When comparing homesteaders from the 1860s or 1870s to the 1920s or 1930s, what are commonalities or differences? What do those commonalities and differences suggest for larger interpretations of agricultural history?

Data Needs

Archaeological: hollow refuse-filled features with depositional integrity and identifiable associations; temporally discrete refuse dumps or sheet refuse deposits; deposits with sufficient quantity and variety of materials to support statistically valid analyses; landscape features; farm equipment and workshop areas; presence or absence of cellars, smokehouses, and other features that may indicate home production.

Primary Documentary Sources: census; agricultural census data; tax assessment; probate; newspaper; legal records; personal papers; oral histories; photographs; financial records (lease, rents, chattel mortgage); identifiable labor force.

Contextual Sources: secondary literature on general economic trends as they relate to California agriculture; agricultural journals; product specialty journals; local history; gray literature studies on similar property type.

Artifacts: materials reflective of self sufficiency would include canning jars, homemade items; proportion of materials demonstrating repair or refurbishment in comparison to items showing little use; proportion of decorative versus functional items; proportion of items indicative of home manufacture versus commercially manufactured; relative costs of materials purchased.

Ecofacts: faunal: wild versus domestic species; commercially versus home butchered; indications of ethnic preferences; retention of traditional dietary practices; preference in meat cuts; spatial organization of farm fields; planting and crop patterns.

ETHNICITY AND CULTURAL ADAPTATION

People in traditional societies share common understandings that help define a way of life and maintain an operating vision of social order. Much of nineteenth century America lacked this familiarity and precedent, although agricultural enclaves may be an exception. Certainly during the California Gold Rush diverse people were thrown together not knowing what to expect in an environment of chaotic growth and opportunity. These different scenarios invoke fundamental questions such as “how have the members of these aggregations managed to coalesce, interact, and function as civic entities?”⁶⁷ There is thus considerable interest in understanding how

⁶⁷ Carl Abbott, “Thinking About Cities: The Central Tradition in U. S. Urban History,” *Journal of Urban History* 22, no. 6 (1996): 688.

particular households of known ethnic derivation adapted to life in pluralistic and monolithic settings. What aspects of their cultural background were retained or rejected, and how were new social identities and alliances forged?

The roles of cultural pluralism and ethnicity remain an active area of debate. Early twentieth century models stressed cultural assimilation into a “melting pot” that effectively extinguished the diverse pasts of immigrant populations. Those models advocated a top-down approach where immigrants uniformly assumed a new, homogenized American identity. With the ascendancy of the civil rights movement at mid-century, scholars began to question that interpretation and to recognize that immigrants did not in fact abandon their cultural roots, but instead adapted to the shifting influences of a pluralistic society. Commonly referred to as acculturation, some investigators have instead used the stronger term “accommodation” to recognize how ethnic identities are negotiated within multicultural settings. Understanding that process of negotiation and adaptation is a central concern for historical scholarship.

Archaeologists in recent years have focused increasing attention on unraveling the complex layers of meaning that artifacts acquire in pluralistic social settings, soundly rejecting the uncritical use of ethnically derived artifacts as indicators of preconceived ethnic behavior. This has facilitated the deconstruction of stereotypes, allowing more sophisticated insights into the true complexity and variability of ethnic adaptations. Studies of sites such as a predominantly Irish block in New York’s Five Points neighborhood⁶⁸ and Sacramento’s Chinatown⁶⁹ suggest that material expressions of ethnicity are often complex, requiring careful consideration of factors influencing the use and meaning of both traditional and non-traditional items. Farms owned and operated by persons of color and other immigrants are particularly likely to have research value not only because they are relatively rare, but also because they have the potential to reveal the retention of traditional practices along with adaptations and accommodations made by minority populations to the dominant culture.

There is ample evidence that acculturation occurs in a piecemeal fashion, with certain new traits readily adopted while various traditional practices are retained. For example, immigrants may adopt fashionable new clothing styles, while adhering to traditional religious observances and social institutions. In this way, immigrants may adopt different identities for private and public spheres. In the complex process of negotiating social identities, artifacts also frequently acquire meanings different from those assigned by the dominant culture. Understanding those meanings and the sequence and rate at which nontraditional artifacts have been adopted is essential for explaining the acculturation process and how particular ethnic subcultures have adapted over time. A key focus for many recent studies has thus been to understand the ways in which artifacts were used as symbols in multicultural interactions.

⁶⁸ Heather Griggs, “GOGCUIRE DIA RATH AGUS BLATH ORT (God Grant That You Prosper and Flourish): Social and Economic Mobility Among the Irish in Nineteenth Century New York City,” *Historical Archaeology* 33, no. 1 (1999): 87-101; Rebecca Yamin, *Tales of the Five Points: Working-class Life in 19th-century New York*, (submitted to U.S. General Services Administration, 1998); Rebecca Yamin, “Becoming New York: The Five Points Neighborhood,” *Historical Archaeology* 35, no.3, (2001).

⁶⁹ Mary Praetzelis and Adrian Praetzelis, *Historical Archaeology of an Overseas Chinese Community in Sacramento, California, Volume 1: Archaeological Excavations*, (submitted to U.S. General Services Administration, San Francisco, CA, 1997).

Research Questions

To what degree did people retain or adapt traditional ethnic behavior as reflected in site structure, materials, composition, technology employed, or farm/ranch production orientation? To what extent do differences in material culture at the site indicate ethnic preferences in purchasing decisions, access to goods, or other factors?

How did people from different ethnic groups respond to discrimination or marginalization? Did the degree of cultural integration influence adaptation? What evidence of retention of traditional behaviors is present and what does that evidence indicate about cultural adaptation?

What degree of market integration is discernible at the site (e.g., how extensively did site residents emphasize the purchase of mass-produced goods over traditional or home-made ones)? What does it indicate about the site occupants?

Data Needs

Archaeological: hollow refuse-filled features with depositional integrity and identifiable ethnic associations; deposits with sufficient quantity and variety of materials to support statistically valid analyses; features such as foundations indicating spatial organization or sheet refuse indicative of activity areas or landscaping remnants; family burial plots; general layout of the property and relationships between structures and the natural landscape as they may indicate traditional approaches and philosophies.

Primary Documentary Sources: census, agricultural census data; tax assessment; probate; newspapers; vital statistics and legal records; personal papers; oral histories; photographs; financial records (lease, rents, chattel mortgage); maps; church, school, or fraternal organization membership lists and records; Farm Resettlement Agency, Bureau of Indian Affairs records.

Contextual Sources: ethnic and local history; gray literature studies on similar property types; ethnic agricultural history; understanding of homeland traditions; relevant historical and anthropological literature.

Artifacts: materials reflective of ethnic identities or origins; materials that are not specific to a particular ethnic group; materials that can be identified as to place of origin or manufacture; evidence of use of materials different from their manufacturers' intended use.

Ecofacts: faunal analysis: wild versus domestic species; ethnically distinct butchering patterns; retention of traditional dietary practices; preference in species or meat cuts; floral analysis: botanical remains (seeds, pits, pollen, kernels) indicative of diet; special studies: parasite analysis.

AGRICULTURAL TECHNOLOGY AND SCIENCE

The historic context explains that California was a focal point for technological innovation, and agricultural change and innovation happened earlier and at a more rapid pace than in Eastern states. This has been attributed to a variety of factors, including the state's once vast public domain, labor shortages that inspired technological solutions, rich soil and natural resources, public and private educational efforts, and general inventiveness of an immigrant population not bound by established patterns. Changes in technology were closely tied to market availability, both as a source for manufactured items and a market for agricultural items produced in the state. It is well known that the transcontinental railroad opened Eastern markets to California farmers at the same time it provided them access to suppliers and manufactured goods. Invention of refrigerated rail cars had an enormous impact on bringing California produce to wider markets. At the property level, availability of electricity altered the industry of California farms and influenced changes in social or cultural patterns of work and leisure.

Homesteads in particular are excellent laboratories for understanding the difference between "real" versus "ideal" behavior and investment in agricultural improvements.

First, there is the government's perspective on what should have happened at homesteads, as stated in laws and regulations. Second, there is the homesteader's sworn testimony of what he or she claimed to have done to satisfy these legal requirements and attempt to take title to the land. Third, there is the homesteader's recollection, often many years after the fact, of what he or she remembers doing on the property. And fourth, there is the testimony of the physical remains themselves to act as an independent check on the homesteader's word. Sometimes these data sets coincide tidily to produce an unambiguous picture of the past. But more often they conflict, and it is at this collision point that the social scientist's fun begins.⁷⁰

Adaptive reuse or modification of readily available items may indicate resistance to technological change, but may just as equally indicate acceptance of the Victorian concept of thriftiness. Researchers at Edwards Air Force Base found a "philosophy of opportunity" among occupants of the region: "the concept of 'secondary usefulness' was retained among consumers...despite the amount and variety of obtainable goods: 'Every individual was aware of an object's secondary value, a use generally beyond its intended function'."⁷¹

The timing and extent of adoption of mechanized equipment, intensified use of fertilizers and pesticides, development of more productive or better-adapted hybrids and animal stock, and other related industrial approaches to production are of key interest. In many cases, larger operators pioneered such approaches, while smaller operators were compelled to follow suit or become uncompetitive. There is considerable interest in understanding the variable responses of different operators as agriculturalists focused increasing energy on market production over time. The adoption of industrial practices varied widely due to differences in the size of properties,

⁷⁰ Pat H. Stein, *Homesteading in Arizona*, 25.

⁷¹ Wendy Nettles and others, (2003) 6.25, cited in Tetra Tech (2004): 61.

wealth of their owners, labor shortages and uncertainties, cooperation, and other factors. Understanding the forces that contributed to such changes and the roles of experimentation and labor in the transformation are a central concern in the history of American agriculture.

In California, where much of the precipitation falls in the winter and spring, leaving six months of the year virtually dry, irrigation became an important part of farm infrastructures. In many areas, windmill technology was crucial for a reliable supply of water, but even so, wells could run dry as groundwater supplies diminished. Aerometer Company was instrumental in the conversion of windmills from wood to steel and dominated the market by 1900.⁷² On the Vasco Rancho in eastern Contra Costa County, continual use of older windmill pump technology was seen as reflecting the economic status of the occupying family, “or perhaps the disappointing performance of the tenanted land.”⁷³ Alternatively, since windmill pump technology is universally similar and has changed little over the years, such a decision may reflect simple practicality rather than direct expression of economic status. At Edwards Air Force Base, Tetra Tech, Inc. saw changes in pumping technology such as using gasoline motors (evidenced by concrete engine mounts) as acceptance of and investment in new technology. They caution that changes in market availability due to World War I and World War II production priorities should be considered when analyzing agricultural properties from such periods.⁷⁴

Research Questions

Is there evidence of efforts to increase productivity through the application of new technologies, irrigation, amendments, and other practices associated with the rise of mechanized agriculture? To what extent is new technology employed over adaptive re-use of existing technology? Is diffusion of technology visible at the site? What can it be attributed to?

Did diversification of activities at individual agricultural properties influence the success of the settlement, and to what extent?

Is there evidence of crop experimentation or innovation in growing techniques? What was the short-term and/or long-term success of such innovations? Were certain ethnic groups more likely to experiment and innovate?

Are the policies and advisories of agricultural institutions, cooperatives, or governmental entities reflected in the archaeological record, demonstrating whether or how those policies were followed?

Data Needs

Archaeological: features such as foundations indicating spatial organization or sheet refuse indicative of activity areas or landscaping remnants; abundance, type and manufacture dates of farm equipment; evidence of equipment repair/modification; presence and period of use for

⁷² Baker, *Field Guide*, 38

⁷³ Ziesing, *Three Historic Archaeological Sites*, 207.

⁷⁴ Tetra Tech, Inc. (2004): 61.

irrigation systems; relict orchards and vineyards; chemical residues and plant remains found through soil analysis; processing areas (winery, drying sheds, etc.); deposits and structural features indicating the size of work force through time.

Primary Documentary Sources: agricultural census data; tax assessment; probate; newspapers; legal records; personal papers; oral histories; aerial and other photographs; financial records (lease, rents, chattel mortgage); identifiable labor force; maps; agency advisory publications; county fair records and photographs.

Contextual Sources: secondary literature on evolution of technology trends as they relate to California agriculture; agricultural journals; product specialty journals; local history; gray literature studies on similar property types.

Artifacts: machinery; hand tools; evidence of rate of adoption of technologies; evidence of repair or reuse; materials/tools recommended in government advisory publications.

Ecofacts: faunal: variation in species; floral: botanical remains (seeds, pits, pollen, kernels) indicative of crops.

HOUSEHOLD COMPOSITION AND LIFEWAYS

Households constitute the smallest residential units that can usually be discerned in archaeological analyses. A household, in the sense used here, refers to any group of people “sharing domestic activities such as consumption and production.”⁷⁵ It may consist of single individuals, a nuclear or extended family, or some other combination such as a group of unrelated individuals sharing living quarters (e.g. a boarding house, worker housing). As discrete social and economic units, households reflect patterns of behavior that are a microcosm of broader societal interactions.⁷⁶ The study of households thus affords a foundation for understanding interactions within a domestic unit, as well as relationships between that domestic group and the larger society in which its members were actors.⁷⁷

Agricultural sites hosted a wide variety of household types that may be compared and contrasted to understand the diverse experiences of owners, tenants, and workers. The experiences of such agrarian households can also be compared to their urban and suburban counterparts to evaluate differences and explain what factors were responsible for those variations. To understand the adaptations of different agrarian households, it will be important to sample for many possible factors such as ethnic identity and origins (immigrant, second generation [native born], etc.), household composition, gender of household heads, position (owner, tenant, wage laborer), household wealth, and other factors that may have contributed to observed variations.

⁷⁵ Donald Hardesty, *The Archaeology of Mining and Miners: A View from the Silver State*, (Pleasant Hill, CA: The Society for Historical Archaeology, 1988), 15.

⁷⁶ James Deetz, “Households: A Structural Key to Archaeological Explanation,” in *Archaeology of the Household: Building a Prehistory of Domestic Life*, Richard R. Wilk and William D. Rathje, eds., pp. 717-725. *American Behavioral Scientist* 25 (1982): 724.

⁷⁷ Wilk and Rathje, eds., *Archaeology of the Household*. Mary Beaudry, *Archaeology and the Historical Household*. Hardesty, *Archaeology of Mining*.

Ethnicity has already been discussed as a separate research theme, but it is clearly relevant to any consideration of household differences. Because agrarian households other than those occupied by transient workers often achieved some measure of independence by providing for their own subsistence, traditional lifeways may have been more persistent than in other settings such as cities. Foodways are one aspect of culture that often change slowly, but other traditional aspects of culture also may have been retained, and there is interest in ascertaining why and under what circumstances. In some cases, transient workers associated with a single ethnic group moved from one location to another together seeking work. Those groups, typically consisting of single males, may be identifiable through artifact deposits present on agricultural properties.

Farms and ranches owned and operated by women constitute a relatively rare type of agricultural property, but one that has the potential to address many important questions concerning issues related to gender strategies, adaptations, and economic opportunity. For example, there is much interest in learning if women used different income and spending strategies than men, what factors contributed to the success or failure of women-owned ventures, and other related topics. Even on agricultural properties largely controlled by men, women often had substantial charge of the domestic sphere and in many cases contributed significantly to other farm and ranch functions. Many investigators have pointed to the need to critically appraise how gender roles were actively created through continuous negotiation in a rapidly changing society.⁷⁸ Susan Strasser suggested paying particular attention to understanding how men and women influenced economic decisions, a perspective amenable to the material focus of archaeological studies.⁷⁹ There is considerable interest in the social sciences in comparing urban and rural woman-run households. Likewise, there is interest in understanding whether and how rural households embraced the “cult of domesticity” favored by the urban middle and upper class social reformers. Called “domestic science” by its proponents, the cult emphasized gadgets that supposedly simplified household tasks and promoted cleanliness and hygiene. Part of that agenda involved purchasing new, “clean,” disposable products—a practice at odds with a tradition of reuse still essential to the economic survival of many farm and ranch households.

The analysis of class relations also may be particularly amendable to study using households on agricultural properties. Class is an essentially relational concept wherein one’s position is defined relative to others through social practices, affiliations, and the symbolic use of cultural materials. In contrast to cities where different classes resided separately in a process that Walter Licht called “a districting of difference,”⁸⁰ owners and laborers on farms and ranches often lived and worked in close proximity. How did that social proximity influence the negotiation of class relations and display of class-related ideology? Were class struggles and social differences brought into sharper focus, sublimated, or more readily subject to resolution because the locus of conflict encompassed work and residential areas all located relatively close together?

⁷⁸ Margaret Purser, *Several Paradise Ladies*; Donna Seifert, “Within Sight of the White House: The Archaeology of Working Women,” *Historical Archaeology* 25, no. 4 (1991): 82-108; Suzanne Spencer-Wood, “Feminist Historical Archaeology and the Transformation of American Culture by Domestic Reform Movements, 1840-1925,” in *Historical Archaeology and the Study of American Culture*, Lu Ann De Cunzio and Bernard L. Herman, eds., pp. 397-446, (Winterthur, DE: Henry Francis De Pont Winterthur Museum, 1996).

⁷⁹ Strasser, *Waste and Want*.

⁸⁰ Walter Licht, *Industrializing America: the Nineteenth Century*, (Baltimore, MD: John Hopkins University Press, 1995), 65.

Differential access to resources, opportunity, and power are at the root of perceived class differences. While the struggle between owners and wage laborers defines a fundamental duality in the capitalist world economy, class exists as a dynamic relationship that permeates all levels of social interaction and is affected by many other variables.⁸¹

At the most general level the term “class” is perhaps most flexibly understood as a relationship among members of society that is subject to continuous negotiation. When seen as “the struggles among members of society over the exercise of social power,”⁸² the concept provides for the analysis of class “as an analytical concept that operates on many scales and thus can be used to tease out the complexity of the social relations of everyday life.”⁸³ That broad perspective avoids a rigid scheme of rankings that have ambiguous validity and are oversimplified by rote efforts to rank status based on ceramic indicators and related procedures. Instead, efforts to examine class relations may more productively seek to expose the manipulation of class-specific ideologies as a facet of the class struggles. That approach has been most clearly articulated by Beaudry.⁸⁴

The values most commonly associated with the rising Anglo-American middle class in the Victorian era included emphases on hard work, duty, social order, progress, morality, and punctuality.⁸⁵ Such values permeated both private and social life, with an emphasis placed on outward symbols that were later considered by some social critics as gaudy and ostentatious. The outward symbols of Victorian value systems included formal dining and social visits, which demanded the use of appropriate tableware and parlor decorations symbolic of an orderly and moral social life. Victorian values also emphasized proper upbringing and education of children. The practice of social visiting among rural householders, particularly women, served an additional function by facilitating the adoption and dissemination of such Victorian values.⁸⁶

Victorian material expressions were promoted by the dominant classes during the late nineteenth century but, by the 1890s, came to be seen as cluttered gaudiness that connoted moral rigidity. These material expressions were then largely rejected in favor of materials that evoked simplicity, efficiency, and naturalness epitomized by the Craftsman style. There is some question, however, whether rural farm families’ adoption of this physical change really signaled a change in personal value systems as they related to material things, social mores, and/or religion. Of course, not all members of society adopted changing fashions and aesthetics across the board. The working classes and some rural householders continued to embrace the clutter of Victorian décor long after it was considered unfashionable, while maintaining some traditional practices rejected by the dominant culture.

Agrarian households of all types hold interest for many reasons other than the few outlined above. Research issues pursued in connection with many other types of households are likely to

⁸¹ Matthew Spriggs, *Marxist Perspectives in Archaeology*, (New York, NY: Cambridge University Press, 1984).

⁸² Randall H. McGuire and Robert Paynter, eds., *The Archaeology of Inequality*, (Oxford, England: Basil Blackwell, 1991), 1.

⁸³ LouAnn Wurst and Robert K. Fitts, eds., “Confronting Class,” *Historical Archaeology* 33 no. 1 (1999): 3.

⁸⁴ Mary Beaudry 1991.

⁸⁵ W.E. Houghton, *The Victorian Frame of Mind, 1830-1870*, (New Haven, CT: Yale University Press, 1957); D.W. Howe, “American Victorianism as Culture,” *American Quarterly* 27 (1975): 507-532.

⁸⁶ Purser, *Several Paradise Ladies*.

have at least some general relevance for evaluations of those encountered on agricultural sites. The foregoing social context thus provides a place to begin thinking about the research value of domestic feature systems at agricultural sites. It is not intended as a comprehensive treatment of all aspects of social life at farms that may be worth investigating.

Research Questions

How did site occupants manifest age or gender roles, whether traditional or not? What methods can be used to effectively distinguish and interpret individual behaviors (disabilities, gender roles, sexual orientation, and mental health) at agricultural properties? Is it possible to distinguish control of household assets by individual members? Is there evidence of familial priorities valued over individual priorities and what might those priorities indicate about the household?

How is the teaching of values (family, social, political, moral, religious) reflected in children's artifacts? Is there evidence of the household's general health and physical condition? What can poor or good health be attributed to? Is there evidence of the family life cycle and changes over time? What would such evidence indicate about household adaptations? How did religion, ethnicity, or regional cultural differences factor into how an agricultural household was managed and by whom?

How did the households of owners, tenants, and workers identify their class status using cultural materials? Is there a difference in the material record associated with owner occupancy versus tenancy? Is there evidence of class distinctions and/or social distancing (e.g., hired help treated differently)? Is there material evidence of the way agrarian households negotiated relations with neighbors, landlords/tenants, and employers/employees? Is it possible to distinguish public from private space or activities? What would such evidence indicate about the household? Is it possible to see larger patterns that indicate changing influences of traditional institutions such as the Grange and social clubs?

Data Needs

Archaeological: hollow refuse-filled features with depositional integrity and a wide variety of identifiable associations; deposits with sufficient quantity and variety of materials to support statistically valid analyses; features such as foundations indicating spatial organization or sheet refuse indicative of activity areas or landscaping remnants; family burial plot; specialized activity areas such as outdoor ovens, kitchen gardens, smokehouses, saunas/baths, cellars/cold storage areas, etc.

Primary Documentary Sources: census, agricultural census data; tax assessment; probate; newspapers; vital statistics and legal records; personal papers; oral histories; photographs; financial records (lease, rents, chattel mortgage); maps; church, school, or fraternal organization membership lists and records; Farm Resettlement Agency, Bureau of Indian Affairs records.

Contextual Sources: social history; gray literature studies on similar property type; gender-based studies of agricultural history; relevant historical and anthropological literature; oral history.

Artifacts: medicines indicative of health, hidden items indicative of surreptitious behavior; artifacts attributable to specific gender or age groups; materials that are *not* specific to a particular social group; evidence of modification of artifacts.

Ecofacts: faunal analysis: wild versus domestic species; preference in species or meat cuts; floral analysis: botanical remains (seeds, pits, pollen, kernels) indicative of diet; special studies: parasite analysis.

LABOR HISTORY

Understanding the composition of the agricultural/ farm labor system is a prerequisite for placing the material remains in a rational evaluation context. Knowing who created an archaeological deposit, or its associations, is essential to accurately interpret patterning and variability in behavior linked to ethnicity, class, religious affiliation, household composition, and other factors. Yet, discerning who lived and worked at agricultural properties is sometimes difficult. While it is usually possible to learn a fair amount about property owners and even tenants, workers are in many cases virtually invisible in the historical record because they commonly led such transient lives. That implies archaeology can add significantly to our knowledge of those poorly known agricultural workers. Those contributions, however, are also circumscribed by the degree of uncertainty about who actually created certain archaeological deposits.

One study suggests the changing character of the agricultural workforce may have coincided with the placement of greater physical and social distance between some farm families and their hired hands by the end of the nineteenth century.⁸⁷ That separation was likely an outgrowth of a shift from the old paternalistic patterns rooted in the peonage of the Mexican and early American periods, or perhaps through societal traditions brought to America from Western Europe, to a system that increasingly emphasized a strict wage-labor relationship. As agricultural producers across the nation emphasized more mechanized modes of production, employment became increasingly transient and contingent. This in turn eroded the social fabric that formerly bound owners and workers into more stable, albeit no less objectionable, relationships. Wider separation of dwellings used by workers and owners also may have stemmed from the belief that transient workers were morally suspect. Whatever the cause, more distinct separations of worker and owner housing have important archaeological implications for the layout of agricultural properties.

During the 1850s and 1860s, indigenous peoples were exploited as labor, although the full extent of their participation in agricultural work remains poorly documented. Chinese laborers were also widely employed, and they assumed an ever-larger role in agriculture in the last quarter of the nineteenth century as they were pushed out of other lines of employment due to widespread unemployment and prejudice. The composition of the workforce also evolved during the later

⁸⁷ Thad Van Bueren, *Lending a Hand*.

nineteenth century as a variety of ethnic groups resorted to the hard agricultural work few others wanted.

The negotiation of relations between workers and owners/tenants is an important area of research. Both employers and workers, in a struggle that continues up to the present day, used wide varieties of strategies. Living and working conditions for laborers gradually improved because of organized strikes, sabotage, and other resistance, but occasionally enlightened employers saw an advantage to improving conditions on their own. Progress was irregular and many employers sought their own advantage by using methods such as scrip payments, charging room and board, playing different ethnic groups against each other, and providing poor living conditions. Striker camps and worker housing areas, while often lacking closely focused associations, are in some cases the only way to learn about the struggles of an enormous sector of the agricultural work force. This potential has been explored in studies of other worker camps such as the coal strike settlements and the Ludlow, Colorado, massacre site.⁸⁸

Research Questions

To what extent did site occupants rely upon family labor or hired help? To what extent were farm workers integrated into farm households, and how did that influence social life, farm success, and cultural accommodation over time? How were relations between farm labor and owners/managers influenced by industrial modes of production that emphasized mechanization, labor specialization, etc.? Is it possible to distinguish differences between the social structure of agrarian versus urban hired help or servants?

Is there evidence in the archaeological record of employers' efforts to control farm workers' behavior? Is there evidence of workers' responses to those control efforts? What does such evidence indicate about the nature of the management/labor relationship? How can the archaeological data contribute to our understanding of labor conflict, resistance, and the experiences of striking workers?

Is there evidence in the archaeological record of improvements in worker's living conditions? To what can those improvements be attributed (e.g., labor activism, paternalism, government regulation)?

Is it possible to distinguish inter-cultural divisions, particularly among rival cultural groups? Are there regional differences within one ethnic group from one geomorphic province to another? When comparing workers in California to elsewhere in the nation, what trends remain consistent and what change over time? Was the California labor force more transient than that of the nation as a whole? What implications does that have for material remains?

Data Needs

Archaeological: hollow refuse-filled features with depositional integrity and identifiable associations with farm workers, owners, and tenant households reflecting a variety of different

⁸⁸ McGuire and Recknor, *Unromantic West*.

ethnic groups; deposits with sufficient quantity and variety of materials to support statistically valid analyses; sheet refuse indicative of activity areas; layout and general living conditions indicated for different habitation areas on a property.

Primary Documentary Sources: census, agricultural census data; tax assessment; newspapers; personal papers; oral histories; labor history archives; photographs; maps; Farm Resettlement Agency, Bureau of Indian Affairs records.

Contextual Sources: social history; gray literature studies on similar property type; labor history studies of agriculture; relevant historical and anthropological literature.

Artifacts: materials associated with specific activities; MNI frequency/proportion to support interpretation, sufficient variety of distinctive materials; artifacts in identifiable features; evidence of labor organization efforts (membership pins, etc.); sabotage of equipment or facilities; evidence of resistance or violent altercations.

Ecofacts: faunal analysis: wild versus domestic species; preference in species or meat cuts; floral analysis: botanical remains (seeds, pits, pollen, kernels) indicative of diet; special studies: parasite analysis.

CHAPTER 5. IMPLEMENTATION PLAN

The preceding historic context and archaeological research design are general in nature. California is such a complex state that it would be difficult to identify conclusively every agricultural permutation or possible research avenue. Rather, this document is a starting point for considering the information potential of agricultural properties. With the framework of a historic context and research design, it is now possible to approach evaluation of individual properties. The following sections provide guidance on what actions are necessary at the site-specific level to implement this document. The basic process is first briefly introduced here.

Evaluations may involve one or more steps, depending on the complexity, condition, and expected research potential of the individual property and the nature of the compliance process that is being followed (36 CFR 800, Programmatic Agreement, etc.). The first step in all cases involves recordation and historical research to define context, associations, likely data potential, and information about the anticipated survival of archaeological data. Where appropriate, remote sensing techniques may be useful as a way to identify possible buried features such as artifact-filled pits, foundations, and other subsurface deposits during the initial phase of work. Requirements for historical research, discussed below, depend upon the complexity of the property, duration of occupation, and other factors.

It may be possible to determine, after the initial phase of research, that some agricultural properties are ineligible. That finding is appropriate in cases where the property lacks intact buildings, where there are good reasons to believe eligible deposits were never created at the site (e.g., very ephemeral or late occupation; use of septic tanks; off-site disposal; etc.), or where the integrity of observed and anticipated archaeological remains has been totally compromised through massive disturbance (mixing of deposits from different periods and the like). Absent these conditions, presuming eligibility without subsurface testing is recommended only in cases where avoidance will occur, because it provides no sound basis for assessing effects or designing data recovery measures. In all other situations, archaeological testing is the standard and preferred approach to resolve questions concerning site eligibility under Criterion D.

The following discussion first provides an overview of the information needed to make an evaluation. It is followed by suggestions concerning how to gather information using standardized methods in order to facilitate comparisons. Specific attention is devoted to when testing is generally necessary to gather information on a property. The suggested standard methods are also appropriate for investigations designed to recover important information under the terms of a data recovery plan at an eligible agricultural property. Lastly, a method is described for analyzing information and reaching a conclusion about the eligibility of an agricultural property under Criterion D.

INFORMATION REQUIREMENTS

SITE-SPECIFIC HISTORIC AND ARCHAEOLOGICAL CONTEXT

Once an agricultural property has been identified, archival research must be conducted to develop a site-specific historic context. The researcher must learn who lived at the site, when, and as much as possible about what activities occurred on the property. The subsequent section on archival research provides specific recommendations on where such information might be obtained. This preliminary information gathering should focus on answering such basic questions as who, what, when, where, and how, and should be continually augmented as the researcher finds additional information, be it archival, oral, or archaeological.

Information gathering forms the first stage of research on the property and informs expectations for archaeological deposits; that is, what features might be present given historic activities and land use, and what important information they might provide. Is it likely a privy was used on site, or was the house built with indoor plumbing and a septic tank for waste? The answer to this will rely upon knowledge of local legislation such as when building codes were passed as well as general historical trends such as whether people complied with such legislation. For the agricultural feature system, were craft industries employed that might leave distinct archaeological features? Was blacksmithing conducted on-site? Was the barn, or portions of it, devoted to specific activities (e.g., dairying, hog raising, chickens)? If so, what archaeological signatures might be expected? Did laborers reside away from the main house and what archaeological remains might they have left behind? This preliminary investigation will also inform expectations for what features might have survived to the present, given subsequent land use and/or modifications that could have affected the property's integrity (discussed further below).

With this site-specific historic and archaeological context, the researcher must then explain the information potential of any identified archaeological features. This is accomplished in the research design that lays out specific research questions and the data the site must contain in order to address those questions. Archaeological testing, then, becomes a matter of finding the data. When the site contains the data that the research design says is important, the site should be evaluated as eligible for the National Register under Criterion D. The Evaluation of Significance section below discusses this further.

PERIOD OF SIGNIFICANCE

A basic step in evaluation is determining the period of significance at any given site. The National Register defines the period of significance as “the time range during which the property was occupied or used and for which the property is likely to yield important information.”¹ There can be more than one period of significance, and they can be discontinuous. See National Register Bulletin 15 and others for more information on determining a period of significance.

¹ Barbara Little, Erika Martin Seibert, Jan Townsend, John H. Sprinkle, Jr., and John Knoerl, *National Register Bulletin Guidelines for Evaluating and Registering Archaeological Properties*, (Washington, D.C.: National Park Service, 2000): 34.

Care should be taken in determining the period of significance because it frames the evaluation. Many agricultural properties have been occupied sequentially by different families over many years, each phase of occupation leaving its own signature on the property. Distinguishing information-bearing features and associating them with known occupants may be more difficult than at sites occupied for shorter periods or by single families. Despite this difficulty, sites with longer occupation histories have the potential to address important diachronic questions, provided archaeological remains are associated with the appropriate period(s) of significance.

INTEGRITY

A property must retain integrity to be eligible for the National Register; that is, it must be able to convey its historical importance. In National Register terms, an eligible property has integrity of location, design, setting, materials, workmanship, feeling, and association. These concepts must be carefully applied, particularly when considering a property's ability to yield important information.

Little and others discuss in detail how the seven aspects of integrity might be considered for archaeological properties and researchers should refer to that document for specific guidance (sidebar). For archaeological sites in general, integrity describes “the level of preservation or quality of information contained within a district, site, or excavated assemblage. A property with good archaeological integrity has archaeological deposits that are relatively intact and complete”². Integrity at archeological properties is quite different from that at built environment properties.

A property possessing information potential does not need to recall visually an event, person, process, or construction technique. It is important that the significant data contained in the property remain sufficiently intact to yield the expected important information, if the appropriate study techniques are employed³.

The concepts of archaeological focus and visibility, introduced by James Deetz, more accurately explain how integrity of archaeological properties might be assessed. “*Focus* means the degree to which a [feature] can be ‘read’ clearly... *Visibility* means the actual amount of physical remains, however clearly or ambiguously they might be perceived”⁴. To further clarify:

By focus, Deetz refers to the level of clarity with which the archaeological remains can be seen to represent a particular phenomenon. Remains that represent a number of activities or other characteristics that cannot be separated out from one another are said to lack focus. Where focus is lacking as the result of disturbance, a property also lacks integrity. Implicit in this definition of integrity is that the deposit be rooted in a historical context, and therefore have strong

² Little, et al., *National Register Bulletin* 36.

³ Patrick W. Andrus, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, ed. Rebecca H. Shrimpton, (Washington, D.C.: National Park Service, 1991): 23.

⁴ James Deetz, *In Small Things Forgotten*, (Garden City, NY: Anchor Press, Doubleday, 1977): 94.

associations with an individual household, an ethnic or socioeconomic group, or a specific property use⁵.

Archaeologist John Wilson offers three sets of questions to aid in assessing integrity:

1. Are the archaeological features and other deposits temporally diagnostic, spatially discrete, and functionally defined? Can you interpret what activities took place at the property and when they occurred?
2. How did the historic property become an archaeological site? Were the cultural and natural site formation processes catastrophic, deliberate, or gradual? How did these changes impact the property's archaeological deposits?
3. What is the quality of the documentary record associated with the occupation and subsequent uses of the property? Are the archaeological deposits assignable to a particular individual's, family's, or group's activities?⁶

METHODOLOGICAL CONSISTENCY

ARCHIVAL/CONTEXTUAL RESEARCH

One of the fundamental principles behind defensible eligibility determinations is both the level and adequacy of the requisite research conducted during each investigation. The historic overview chapter serves as a tool that provides a broad outline regarding the development of agriculture in California. Individual sites will need to be studied within their respective historic contexts, which includes the examination of primary and secondary materials in order to establish a site-specific historic context that will assist in predicting the kinds of remains likely to be present, as well as disturbances to the property and potential survival of archaeological deposits. The following guidance summarizes standard research techniques employed in gaining sufficient information to evaluate historical archaeological properties. Stein's monograph on homesteading in Arizona, which is available through Arizona State Parks web page, provides a summary of how to acquire and use some specific types of information.

Once an agricultural property is identified, the historic context (Chapter 2) included in this study should be reviewed, followed by examination of secondary and primary source materials in preparation of a land-use history that interprets the type, length and characteristics of occupation and the activities that occurred on the property. Information may include "grey literature," such as previous cultural resource studies, along with dissertations and theses. Research may include Bureau of Land Management (BLM) records and/or county records, such as the recorder/tax assessor's office, to determine how the land was acquired (homestead entry, cash entry, claim, etc.). Local records, including the grantor/grantee or deed files, may provide important legal information and establish a property's chain of title. U.S. population and agricultural census records should be examined for family composition, ethnicity, nativity, economic status, and

⁵ Julia Costello, et al., "Historical Archaeology at the Headquarters Facility Project Site, The Metropolitan Water District of Southern California," *Volume 1: Data Report*, (Altadena: CA, Submitted to Union Station Partners, 1998), 27.

⁶ John Wilson, "We've got Thousands of These: What Makes a Historic Farmstead Significant," *Historical Archaeology* 24, no. 2 (1990): 30.

agricultural production details. Records at local historical societies should also be examined for regional histories, as well as primary source materials, such as family files, newspaper clippings, and photographs. Map research, which today can often be done through the Internet, is important when documenting the patterns of landscape change. In addition, Caltrans right-of-way and as-built maps often depict important details that can provide information on land use history. Oral history can be invaluable in addressing site-specific questions and land use history.

Next, researchers should correlate the research data and place the individual site within its larger historical and cultural context. As deemed necessary, researchers should collect additional information on occupants and land use history that will help determine whether the site has the potential to address important research questions. Depending on the potential for subsurface archaeological deposits, more information should be gathered relating to the general context of what activities occurred at the site. For example, it might be useful to consult with an agricultural history specialist or visit an agricultural museum to learn about material correlates to changes in technology. The topical bibliography in this document should be examined for additional sources to expand the historic context as necessary. Professional training and experience should guide the researcher in determining the appropriate level of effort necessary to develop an adequate context to assist in the evaluation of the property.

Not all archival sources and repositories need to be examined for every property. Researchers only need to obtain enough information to make an assessment as to information potential. If the initial investigation reveals no or very little potential for subsurface deposits, and the surface of the site is heavily disturbed, the site is clearly not eligible and research can stop. While it may be interesting to know every detail about the property under examination, if such inquiries do not lead to conclusions about eligibility they should be abandoned.

ARCHAEOLOGICAL RESEARCH

In order to effectively interpret and evaluate a site, one must understand the materials discarded by its occupants. Generally accepted professional standards or “best practices” should be employed by all researchers attempting to evaluate the information potential of any historical archaeological site. The following text offers some guidance on employing such standards; however, it should not be considered comprehensive or the last word on the subject. Researchers are encouraged to consult with other professionals to ensure accurate implementation of field and laboratory methods. Methodological consistency is important because the key to intersite comparison is collecting information in a standard manner so that other researchers can examine the raw data.

Specific methods recommended at historic sites include use of the English measurement system (feet and inches) if the site was laid out in such increments, stratigraphic excavation, and use of broad, open exposures at appropriate features. Archaeologists should consider whether to use the *vara* system on sites from the Spanish or Mexican periods that were occupied into the American period, depending on the predominance of features from former periods.

Recording

Following the property typology proposed at the beginning of this document, archaeologists should attempt to identify buildings, structures, and features as part of the domestic or agricultural feature systems. The feature systems may overlap, some features may operate within more than one system, or it may be impossible to assign an individual feature to one system. Regardless, identifying a domestic area distinct from an agricultural area will aid in predicting locations of information-bearing archaeological features. For example, if the house location and orientation are known, the area in the rear might be the location of a former privy. As always, when feature locations are based on predictive modeling, the rationale should be explained in the site record or report. In many cases, detailed recording of features may collect all their important information. The potential for further information, and thus eligibility under Criterion D, would then be considered when completing the evaluation matrix discussed below.

Excavation

As stated at the beginning of this chapter, archaeological excavation is necessary when there is a likelihood that information-bearing archaeological deposits are present at the site, and they cannot be avoided. There is no hard-and-fast rule on how much excavation is necessary to determine eligibility. It is recognized that “the patterning of artifacts and features on the ground surface of some properties may be sufficient to warrant nominating them to the National Register, [thus] demonstrating the presence of intact subsurface artifact or features patterning through test excavations may not be required”⁷. In the context of taxpayer-funded research, archaeologists should conduct the minimum amount of research necessary to determine eligibility. Furthermore, the non-renewable nature of archaeological properties argues for a conservation ethic.

Researchers working under Section 106 compliance in California should limit their archaeological excavation to portions of the site that will potentially be impacted by proposed undertakings. Presuming eligibility without subsurface testing, however, is recommended only in cases where avoidance is ensured because it provides no sound basis for assessing project effects or designing data recovery measures. In all other situations, testing is the standard and preferred approach to resolve questions concerning site eligibility. While the field effort may be focused on a specific area that a project might impact, the National Register eligibility determination should consider the property as a whole. Researchers are encouraged to consider sites in terms of contributing and non-contributing elements using the domestic/agricultural feature system (see evaluation matrix below). Thus, for Section 106 compliance, a project that avoids the information-bearing deposits of an eligible archaeological property (the contributing elements) may be found to have “no adverse effect” (36 CFR § 800.5(b)).

Archaeological investigation of a site may utilize hand excavation, machine excavation, or any combination thereof. Often a backhoe with a flat scraper blade can scrape topsoil to expose buried features in plan, effectively speeding up field time. Excavation should be focused on

⁷ Little, et al., *National Register Bulletin Guidelines*, 31.

portions of the site subject to project impacts where subsurface features are reasonably likely to be present. The excavation proposal should explain rational for feature expectation and the potentially important information contained within those features.

Many rural properties include sheet refuse features. Frequently the information contained in sheet refuse features may be recovered by gridding the refuse scatter and recording in detail the artifacts within randomly sampled grid squares. Shovel test pits may be appropriate to confirm the surficial nature of the archaeological deposit. When extremely detailed recording has recovered all the important information at the site, and there is data to support the determination that subsurface deposits are unlikely, it is reasonable to conclude that the site is not eligible under Criterion D. Ample precedence for this is available in National Register guidance. National Register Bulletin 15 explains that at a collected surface site or excavated buried site, the “site is not eligible since the physical remains capable of yielding important information no longer exist at the site.”⁸ Remember, however, that this is an eligibility determination that must be reviewed by SHPO.

Depositional Context

Archaeologists should use the Harris matrix to record site stratigraphy.⁹ The matrix is a method for mapping three-dimensional stratigraphic relationships in two-dimensional format by assigning each layer or interface a unique number. The matrix has lines linking boxes, inside which are written the context numbers of the layers which they represent. The lines represent the stratigraphic relationships, that is, which contexts came before or after a specific context. The result is a diagram that depicts context numbers in a sort of flow-chart going from latest (top) to earliest (bottom). The matrix helps in the process of recording, clarifying, and understanding the build-up of deposits encountered during an excavation. For further details on applying the matrix, visit www.harrismatrix.com.

The essential benefit of using the matrix is determining which archaeological deposits belong to which occupation phase at the site. For example, if two families occupied the site sequentially, it is important to distinguish their refuse to be able to interpret their unique life histories. Analyzing the entire assemblage as a whole would obscure differences in behavior between the families. If the deposit is so mixed as to make that distinction impossible, then its research value is limited. Furthermore, individual features from the same occupation should be analyzed separately to facilitate richer interpretation of the remains.

Crossmends occur when two fragments or shards of an artifact are matched together, confirming that they represent one vessel (discussed further under MNI or MNV below). Crossmends are integral to determining depositional phases of a site. In a pit feature filled with several layers, if artifacts crossmend through the feature, it is clear that the pit was filled quickly, likely in one event such as a yard cleaning, housecleaning, or change in ownership. If artifacts crossmend horizontally across a site, that may indicate integrity problems when attempting to distinguish surface activity areas. While time consuming, this concept of crossmends to determine

⁸ Andrus, *National Register Bulletin 15*, 23.

⁹ Edward Harris, *Principles of Archaeological Stratigraphy*, (London, U.K.: Academic Press, 1989).

stratigraphic integrity and phasing is extremely important to analyzing and interpreting a site. It is particularly important when several different occupations occurred on a property and the archaeologist needs to determine which features are associated with which occupants. If such distinctions are not possible at a site with a long occupation history, the site's ability to address important research issues is limited.

ARTIFACT ANALYSIS

In general, analysis of materials from each artifact type should be conducted using the following professional standards or best practices. The minimum number of items (MNI) or minimum number of vessels (MNV) should be calculated, as should the proportion of the class (see Table 7) each type represents. Glass materials should be sorted by functional category, color, and type following methods developed by Parks Canada.¹⁰ Ceramics should be sorted for functional type, form, fabric, and decorative elements, with special attention paid to makers' marks. Where appropriate, analysis might determine date of deposition using methods such as South's mean dating,¹¹ and relative cost of the collection using methods such as George Miller's economic scaling.¹² These two methods are less effective on later sites, particularly where there is rich documentary record on site occupation. Faunal remains should be sorted by taxon, element, side, butchering cut, age, and weight. Butchering cuts may be analyzed according to late 19th century retail values established by Schulz and Gust.¹³

Analysis of historic-era artifacts provides information on past lifeways such as consumer behavior, general health, and evidence of social display in the form of decorative items. The information gained from artifact analysis allows the archaeologist to make comparative statements about purchasing power and consumer choice, among other things, at the household level. Food bone may be used to study retail and home butchering, ethnic foodways, consumer behavior, and adaptive strategies within rural settings.

Functional Categorization of Artifacts

Consistent classification of artifacts is crucial if meaningful comparisons are to be accomplished. Since one goal of this thematic context is to promote such comparisons, a standardized approach to the classification of observed materials is strongly recommended. The approach suggested here categorizes materials according to functional groupings. Stanley South first introduced the concept of functional groupings in 1977. Since then, archaeologists have expanded the concept with groupings modified for use in Western U.S. and later-period sites. Table 7 suggests groupings for specific materials. This system has already been widely used to catalog materials from hundreds of urban and rural sites in California, thus, comparative information is already available.

¹⁰ Olive Jones and Catherine Sullivan, *The Parks Canada Glass Glossary for the Description of Containers, Tableware, Flat Glass, and Closures*, (Hull, Quebec: National Historic Parks and Sites, Canadian Parks Service, 1989).

¹¹ Stanley South, *Method and Theory in Historical Archaeology*, (New York, NY: Academic Press, 1977).

¹² George Miller, "Classification and Economic Scaling of the 19th Century Ceramics," in *Approaches to Material Culture Research for Historical Archaeologists*, compiled by David R. Brauner, pp. 3-58, (Rockville, MD: The Society for Historical Archaeology, 2000).

¹³ Pete Schulz and Sherri Gust, "Faunal Remains and Social Status in 19th Century Sacramento," *Historical Archaeology* 17, no. 1 (1983): 44-54.

The groupings may and should be modified where appropriate to reflect site-specific activities more accurately. If modifications are made, explain the rationale. For example, red clay pots would normally be grouped under domestic furnishings because they usually represent houseplants on display. However, on one particular site, about 20 were recovered in a backyard privy along with a cast iron weeding fork. It was reasonable to assume they represented the hobby of outdoor gardening. In that situation, the red clay pots were cataloged under the activities group and gardening class. The new gardening classification was created to capture the activities of the historic occupants. The archaeologists conducted additional research on the popularity of gardening during the Victorian era, research that only happened because of the preponderance of one artifact type.¹⁴

MNI or MNV

Calculation of MNI for artifacts is important for the analysis and interpretation of the site. Furthermore, it is crucial to inter- and intra-site comparison. While there are many ways to estimate MNIs (e.g. weight, shard counts, estimating), most methods do not adequately allow for variables such as differing artifact size and archaeological preservation. This document recommends calculating MNI by reconstructing artifacts as much as possible, then calculating the remaining MNI by analyzing distinctive elements.

Erica Gibson, Laboratory Director at the Anthropological Studies Center at Sonoma State University, compiled the following guidance (with applicability on all historical archaeological sites) for staff working on Caltrans' Cypress I-880 project in West Oakland.¹⁵ Gibson offers the following specific methods for determining MNI or MNV:

- Each intact/complete/reconstructable item receives an MNV of 1.
- If after sorting there are a number of bases/rims that cannot be definitely associated with one another (but may be), count the number of each and use the higher figure for the MNV. For example, if you have 5 bases and 3 rims, there are at least 5 forms present (possibly as many as 8), thus MNV=5.
- Do not include body fragments in the MNV counts unless they clearly do not belong to bases/rims elsewhere in the context.
- If there are crossmends across stratigraphic layers, only the deeper layer will receive the MNV count.

Recognizing crossmends requires the laboratory staff to physically reconstruct bottles and dishes from the many broken shards in a feature. While time consuming, tracking crossmends is important for analyzing site integrity and depositional phases, discussed in more detail below.

¹⁴ Thad Van Bueren et al., *A Germanic Enclave in West Oakland: Archaeological Investigations for the Mandela Park and Ride Relocation Project in the City of Oakland, California*, (Oakland, CA: California Department of Transportation, 2004)

¹⁵ Erica Gibson, Jack McIlroy, and Elaine-Maryse Solari, "How To Manual for the Cypress Freeway Project," (Rohnert Park, CA: Anthropological Studies Center, Sonoma State University, 1995), 5.

PUTTING IT ALL TOGETHER or EVALUATING SIGNIFICANCE

The overarching goal of this document is to facilitate evaluation of agricultural properties for their potential to yield information, that is, to meet Criterion D of the National Register of Historic Places. This document may also be useful where properties with a combination of built environment features and archaeological features are being assessed for information potential. Individual researchers should still consider if other National Register criteria are relevant or applicable. See National Register Bulletin 15 for guidance on applying the four criteria, but also see National Register Bulletin 36 for more detailed guidance on how to apply criteria A, B, and C to archaeological properties.¹⁶

National Register eligibility under Criterion D is contingent upon a property possessing important information. Importance is a relative concept, and individual researchers should not be expected to force their studies into a preconceived research design. The research themes and specific questions raised in this document should be carefully reviewed before selecting which ones are appropriate to the property in question. As stated in the research design chapter, additional research issues should be examined whenever the archaeologist suspects they may be relevant.

With the methodological rigor outlined in the above paragraphs applied to documenting the archaeological site, it is possible to correlate occupation phases to specific archaeological remains or features and to know what features were created by which occupants. A site that contains information to address issues of site structure but no other research issues would not be considered eligible for the National Register because the information can largely be recovered through the recordation process and the remaining information would not be considered important.

“AIMS-R”

There are many models available in the archaeological literature on how to evaluate agricultural properties, each of varying degrees of quality and professionalism. It is beyond the scope of this document to review or evaluate all those models. Instead, this document recommends following evaluation methods that have been successfully applied to agricultural properties in California for Section 106 compliance.

Historical archaeologists Adrian and Mary Praetzellis¹⁷ have refined a set of principles designed to assess archaeological research potential of a specific property or feature that is informative for this study. This technique may be used on a feature-by-feature basis to determine contributing or

¹⁶ Little, et al., *National Register Bulletin Guidelines*, 34.

¹⁷ Jack McIlroy and Mary Praetzellis, “Vanished Community—19th Century San Francisco Neighborhoods: From Fourth Street to Mission Creek and Beyond,” *Archaeological Research Design and Treatment Plan for the SF-80 Bayshore Viaduct Seismic Retrofit Projects*, (Rohnert Park, CA: Sonoma State University, Anthropological Studies Center, Prepared for California Department of Transportation, Oakland, CA, 1997): 277.

non-contributing elements, or may be used to determine eligibility of the site as a whole. The mnemonic AIMS-R captures the following set of principles:

1. *Association* refers to the ability to link an assemblage of artifacts, ecofacts, and other cultural remains with an individual household, an ethnic or socioeconomic group, or a specific activity or property use.
2. *Integrity* addresses the physical condition of the deposit, referring to the intact nature of the archaeological remains. In order for a feature to be most useful, it should be in much the same state as when it was deposited. However, even disturbed deposits can yield important information (e.g., a tightly dated deposit with an unequivocal association).
3. *Materials* refers to the number and variety of artifacts present. Large assemblages provide more secure interpretations as there are more datable items to determine when the deposit was made, and the collection will be more representative of the household, or activity. Likewise, the interpretive potential of a deposit is generally increased with the diversity of its contents, although the lack of diversity in certain assemblages also may signal important behavioral or consumer patterns.
4. *Stratigraphy* refers to the vertically or horizontally discrete depositional units that are distinguishable. Remains from an archaeological feature with a complex stratigraphic sequence representative of several events over time can have the added advantage of providing an independent chronological check on artifact diagnosis and the interpretation of the sequence of environmental or sociocultural events.
5. *Rarity* refers to remains linked to household types or activities that are uncommon. Because they are scarce, they may have importance even in cases where they otherwise fail to meet other thresholds of importance.

Archaeologist Julia Costello,¹⁸ building on the Praetzelis' work, uses the mnemonic QIVA which stands for Quantity, Integrity, Variety, and Association. Similar definitions may be applied to Costello's system with quantity and variety being extensions of the materials category in AIMS. This second acronym is provided here to clarify for researchers reading the gray literature that they essentially encompass the same criteria.

The researcher should keep in mind that smaller, incremental contributions at an agricultural property may collectively inform important research issues and thus a small site might still be eligible under Criterion D. The archaeologist's professional expertise and own research interests should inform that somewhat subjective threshold.¹⁹

APPLYING THE EVALUATION MATRIX

Agricultural properties can be very complex and quite large, therefore it is useful to think of them in National Register terms as a district composed of contributing and non-contributing

¹⁸ Julia Costello, et al., *Historical Archaeology*, 27-28.

¹⁹ Little, et al., *National Register Bulletin Guidelines*.

elements. National Register Bulletin 15 has additional guidance on categorizing and evaluating a historic district, and the organizing mechanism of contributing and non-contributing elements is of primary usefulness.

When applying the AIMS-R criteria, a feature should be assessed for its structural and stratigraphic integrity, approximate date of deposition, and range and quantity of artifacts. Features with strong AIMS correlation are deemed capable of addressing important research questions. Some feature systems may contain little information relevant to specific research questions, while others may address many research issues. The AIMS criteria assumes remains are in their most favorable condition, that is, retain integrity and information. Table 8 contains an evaluation matrix that suggests evaluation ratings for specific feature types. Table 9 contains the same table with blank evaluations; the individual researcher should complete the form as a heuristic device to evaluate the property under consideration.

Where the only information is found in surface deposits, intensive recordation could collect all *important* information contained in the site. Recording spatial proximity and relationships of specific features such as fences or fields may collect all relevant information relating to site structure and land use patterns. If the feature component does not contain information relating to other research domains, the feature component may be considered not to be a contributing element under criterion D. As stated above, this is an eligibility determination that must be reviewed by SHPO.

For example, fences and irrigation systems provide information on site layout and spatial relationships, and maybe technological advancements, but are unlikely to address issues such as household lifeways. Recording the fences in detail on a property would conceivably collect all their important information. Of course, researchers should consider other National Register values when determining whether features are contributing or non-contributing elements to the larger property.

Table 8. Sample Evaluation Matrix.

Research Issues	Site Structure and Land Use Patterns (layout, land use, feature function)	Economics (self sufficiency, consumer behavior, wealth indicators)	Agricultural Technology and Science (innovations, methods,)	Ethnicity and Cultural Diversity (religion, race)	Household composition and Lifeways (gender, children)	Labor Relations
Feature Type						
Domestic feature system	High	High	Low	High	High	Moderate
House (foundation only)	High	Low	Low	Moderate (retention of traditional building techniques)	Low	Low
House (cellar, basement)	High	Moderate	Moderate	Moderate	High	Low
Pit features (privy, well, pits)	High	High	Moderate	High	High	Moderate
Specialty structures (summer kitchen, bake oven, craft industries)	High	High	Low	Moderate (trad. techniques)	Moderate	Moderate
Sheet refuse	Moderate	Moderate	Low	Moderate	Moderate	Moderate
Designed landscaping	Moderate	Low	Low	Moderate (trad. plantings)	Low	Low
Agriculture feature system	High	Low	High	Low	Low	Moderate
Barn	High	Low	Moderate	Moderate (traditional building)	Low	Moderate
Fencing/corrals	High	Low	Low	Low	Low	Low
Fields/orchards	High	Low	Moderate	Low	Low	Low
Irrigation system	High	Low	High	Low	Low	Low
Specialty Structures (blacksmithing, sheds, craft industries)	High	Moderate	High	Moderate	Low	Moderate
Satellite features (line camps)	High	Low	Moderate	Moderate	Low	High

Table 9. Blank Evaluation Matrix.

Research Issues	Site Structure and Land Use Patterns (layout, land use, feature function)	Economics (self sufficiency, consumer behavior, wealth indicators)	Agricultural Technology and Science (innovations, methods,)	Ethnicity and Cultural Diversity (religion, race)	Household composition and Lifeways (gender, children)	Labor Relations
Feature Type						
Domestic feature system						
House (foundation only)						
House (cellar, basement)						
Pit features (privy, well, pits)						
Specialty structures (summer kitchen, bake oven, craft industries)						
Sheet refuse						
Designed landscaping						
Agriculture feature system						
Barn						
Fencing/corrals						
Fields/orchards						
Irrigation system						
Specialty Structures (blacksmithing, sheds, craft industries)						
Satellite features (line camps)						

Barns serve a wide variety of functions and thus possess many distinctive architectural elements related to those functions. Allen Noble's 1984 monograph on barns provides standard terminology and layouts of barn types, and describes functions of specific structural forms and secondary farm structures.²⁰ It and other seminal literature should be consulted when recording agricultural properties to ensure all relevant details are accurately documented.

Using the above archaeological procedures, it *may* be possible to obtain enough information without excavating to determine the information potential of an agricultural property. Where research shows post-occupation land use has substantially altered the site and mixed temporal deposits, and there is no potential for intact subsurface deposits, the overwhelming lack of integrity clearly limits the property's information potential. Again, integrity relative to assessing eligibility under other National Register criteria would need to be considered separately and is not discussed in this document.

REDUNDANT DATA

While archaeological sampling of some segments of the universe of agricultural properties may one day produce redundant data, the number of agricultural sites evaluated under Criterion D remains very limited at present. Given the geomorphic diversity of the state and the highly varied associations indicated in this thematic context, it is unlikely sampling will come up against that issue in the foreseeable future. Statistical inferences depend on the diversity present in a given universe of variables.²¹ To evaluate the respective contributions of even a small number of variables such as ethnicity, wealth, household size, time period, and gender relative to a given research topic, sampling all of the different combinations possible in that sample universe is required. Small samples may suffice if the data are extremely uniform, but larger samples are required when diversity is present. All available information suggests great diversity and change over time in California agriculture. Sampling also must occur in direct proportion to the universe it seeks to explain. For example, sampling within one region cannot be used to extrapolate behavior in the entire state unless the measured variables in both populations are virtually identical.

With that said, it also bears special mention that less frequent types of associations merit special consideration. Because of their scarcity, even limited data values may be grounds for finding such properties eligible. Examples include farms and ranches owned or operated by women and persons of color, as well as agricultural properties operated in the initial decades of statehood when labor practices and production were poorly documented. Special research priority should also be given to the camps and residential compounds inhabited by transient agricultural workers, whose lives are poorly documented but nevertheless important in the history of California agriculture.

Table 10 goes directly to this issue of redundancy. It contains a summary by county of agricultural properties in the California Office of Historic Preservation's Historic Properties Directory database. Of the 2628 agricultural properties in the database, less than 10 percent

²⁰ Allen G. Noble, *Wood, Brick and Stone, the North American Settlement Landscape: Barns and Farm Structures*, (Amherst, MA: University of Massachusetts Press, 1984).

²¹ David Hurst Thomas, *Refiguring Anthropology: First Principles of Probability & Statistics*. (Long Grove, IL: Waveland Press, 1986).

(n=258) have been found eligible under any of the National Register criteria, and more than 35 percent (n=941) have not actually been evaluated. While there are obviously numerous agricultural properties in California, it is clear that we do not know everything there is to know about them.

Table 10. Summary by County of Agricultural Properties in the Office of Historic Preservation Historic Properties Directory (HPD) database. ‡

County	Identified Properties					Criteria			
	NRHP Eligible	Other Listings	Not Eligible	Not Evaluated	Total	A	B	C	D
Alameda	7	7	7	11	32	2	0	2	1
Alpine	0	0	0	3	3	0	0	0	0
Amador	7	8	7	31	53	2	0	2	1
Butte	0	1	14	12	27	0	0	0	0
Calaveras	0	1	0	9	10	0	0	0	0
Colusa	1	0	3	1	5	0	0	1	0
Contra Costa	8	6	11	13	38	3	1	4	1
Del Norte	0	0	0	5	5	0	0	0	0
Eldorado	4	0	7	2	13	2	0	2	0
Fresno	4	0	16	6	26	1	0	2	0
Glenn	0	0	1	1	2	0	0	0	0
Humboldt	8	1	10	16	35	4	2	5	0
Imperial	0	0	3	1	4	0	0	0	0
Inyo	0	2	1	5	8	0	0	0	0
Kern	0	1	5	7	13	0	0	0	0
Kings	0	0	5	2	7	0	0	0	0
Klamath	0	0	0	0	0	0	0	0	0
Lake	2	1	6	10	19	0	0	0	2
Lassen	1	0	0	4	5	0	0	1	1
Los Angeles	12	11	5	21	49	3	3	8	0
Madera	0	0	5	8	13	0	0	0	0
Marin	3	0	1	6	10	2	1	3	2
Mariposa	0	35	2	7	44	0	0	0	0
Mendocino	2	1	5	26	34	0	0	0	0
Merced	6	2	66	4	78	6	0	6	0
Modoc	16	2	9	5	32	16	0	0	0
Mono	1	0	0	2	3	0	0	1	0
Monterey	6	1	15	61	83	0	1	0	0
Napa	8	24	4	19	55	4	0	1	0
Nevada	0	1	4	3	8	0	0	0	0
Orange	9	20	4	17	50	5	0	4	0
Placer	6	2	11	76	95	0	0	6	0
Plumas	0	0	3	7	10	0	0	0	0
Riverside	9	214	33	51	307	4	1	3	4
Sacramento	11	1	15	6	33	2	1	2	1
San Benito	2	11	11	10	34	1	0	2	0
San Bernardino	6	13	2	93	114	2	1	3	1

Table 10. Summary by County of Agricultural Properties, (Continued)

County	Identified Properties					Criteria			
	NRHP Eligible	Other Listings	Not Eligible	Not Evaluated	Total	A	B	C	D
San Diego	14	3	32	15	64	6	5	2	2
San Francisco	1	0	0	0	1	0	0	0	0
San Joaquin	3	0	2	5	10	0	0	1	0
San Luis Obispo	5	0	8	12	25	1	0	3	3
San Mateo	4	13	1	10	28	5	0	1	0
Santa Barbara	4	6	5	20	35	1	1	2	2
Santa Clara	11	4	8	31	54	4	0	4	0
Santa Cruz	27	9	5	14	55	26	22	3	1
Shasta	2	0	4	5	11	0	0	0	0
Sierra	0	0	0	7	7	0	0	0	0
Siskiyou	0	0	0	5	5	0	0	0	0
Solano	4	4	14	7	29	3	1	4	0
Sonoma	22	168	20	134	344	11	4	15	2
Stanislaus	0	1	19	1	21	0	0	0	0
Sutter	0	0	9	2	11	0	0	0	0
Tehama	0	0	2	1	3	0	0	0	0
Trinity	3	16	6	26	51	1	0	1	1
Tulare	3	0	10	5	18	0	1	1	0
Tuolumne	1	5	3	9	18	1	0	2	1
Ventura	9	252	62	48	371	181	8	184	0
Yolo	2	56	14	17	89	0	0	0	0
Yuba	4	1	10	6	21	4	0	0	4
TOTALS	258	904	525	941	2628	303	53	281	30
Percentage	9.8%	34.4%	20.0%	35.8%	100.0%	117.4%*	20.5%	108.9%*	11.6%

‡Data compiled by Thad Van Bueren from query run June 2005 by OHP staff Joseph McDole.

*summaries exceeding 100% reflect eligibility under multiple criteria.

CHAPTER 6. CONCLUSION

The preceding chapters are intended to provide a framework for evaluating agricultural properties within California for eligibility to the National Register under Criterion D. This document should serve as a starting point for researchers and, it is hoped, will help in streamlining evaluations. While historical archaeologists are the primary intended audience, historians and architectural historians should find considerable information in the document that will aid their evaluations of agricultural properties under other National Register criteria. As always, the individual researcher should decide the applicability to a specific site of anything suggested herein.

Caltrans perceives this as a “living” document, that is, something to be constantly updated and improved as developments unfold in the profession of historical archaeology or our collective understanding of California’s agricultural history. Researchers are encouraged to provide feedback to Caltrans on strengths and weaknesses of this study.

In addition to the management goals of this document, Caltrans hopes it raises awareness of a rapidly disappearing element of California history. Population pressures and increasing mechanization of agriculture are altering the historic agricultural landscape and leaving the state with fewer visible reminders of its agrarian past. Raising awareness of the importance of these properties will hopefully result in more being preserved for future generations.

TOPICAL BIBLIOGRAPHY

This bibliography is intended as a tool for quickly accessing a wide range of references including selected primary and secondary source documents relating to California's agricultural history. Three general thematic categories break it up for easier use: (1) Topical Historic Overviews; (2) Harvest and Livestock by Type; and (3) Reference Works. Subfields are listed topically and then alphabetically within each of these general categories.

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