A GEOGRAPHER LOOKS AT THE SAN JOAQUIN VALLEY*

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ABSTRACT. *A lavishness of scale and an extraordinary diversity of crops, orchards, and vineyards characterize the intensively developed, irrigated agriculture of the San Joaquin Valley. The complexity of its patterns and environmental problems, its diverse ethnic groups, and the adaptations and human decisions from which it is always evolving make the valley a place of excitement, subtle beauty, and grandeur with crucial importance for the society and economy of California.*

A venerable tradition of cultural geography is the scholarly attention devoted to ordinary landscapes and regions. No theory, however, explains the magnificent heterogeneity of elements that compose a place. When cultural geographers distill and evaluate their cumulative observations of a landscape, value judgments are involved at every turn. Selectivity is necessary to avoid being completely mired in particulars. Emotion, aesthetics, and intellectual content inevitably overlap. In a manner similar to the probing of the character of an individual or a group, cultural geographers seek to know the personality of a geographical space by examining its physical form, its inhabitants, and their relationship with both the land they occupy and the world beyond, most profitably in historical perspective. The San Joaquin Valley is the region selected to demonstrate the application of this analytical approach.

For me few places are more exciting than California's San Joaquin Valley, especially on a blistering hot afternoon in late summer. It has been called "the world's richest agricultural valley," a technological miracle of productivity where dog-eat-dog competition is at its keenest. Yet even Californians tend to take this big, flat world for granted. My focus is the southern part of the Central Valley of California, that alluvium-filled structural trough between the Coast Ranges and the Sierra that stretches for more than 400 miles from Redding to the Tehachapis. The northern third of the Central Valley, drained by the Sacramento River, is smaller and better watered, more Anglo-Saxon, and much less populous than the San Joaquin portion. It lacks the landscapes of cotton fields, vineyards, orange groves, and oil fields that are so symbolic of the latter. The San Joaquin Valley, wider and much more intensively developed, includes six substantial cities, from Stockton to Bakersfield, with Fresno the regional capital.

It is easy to forget that only the northern half of the San Joaquin is drained by the river of that name. The Kings, the Kaweah, and the Tule

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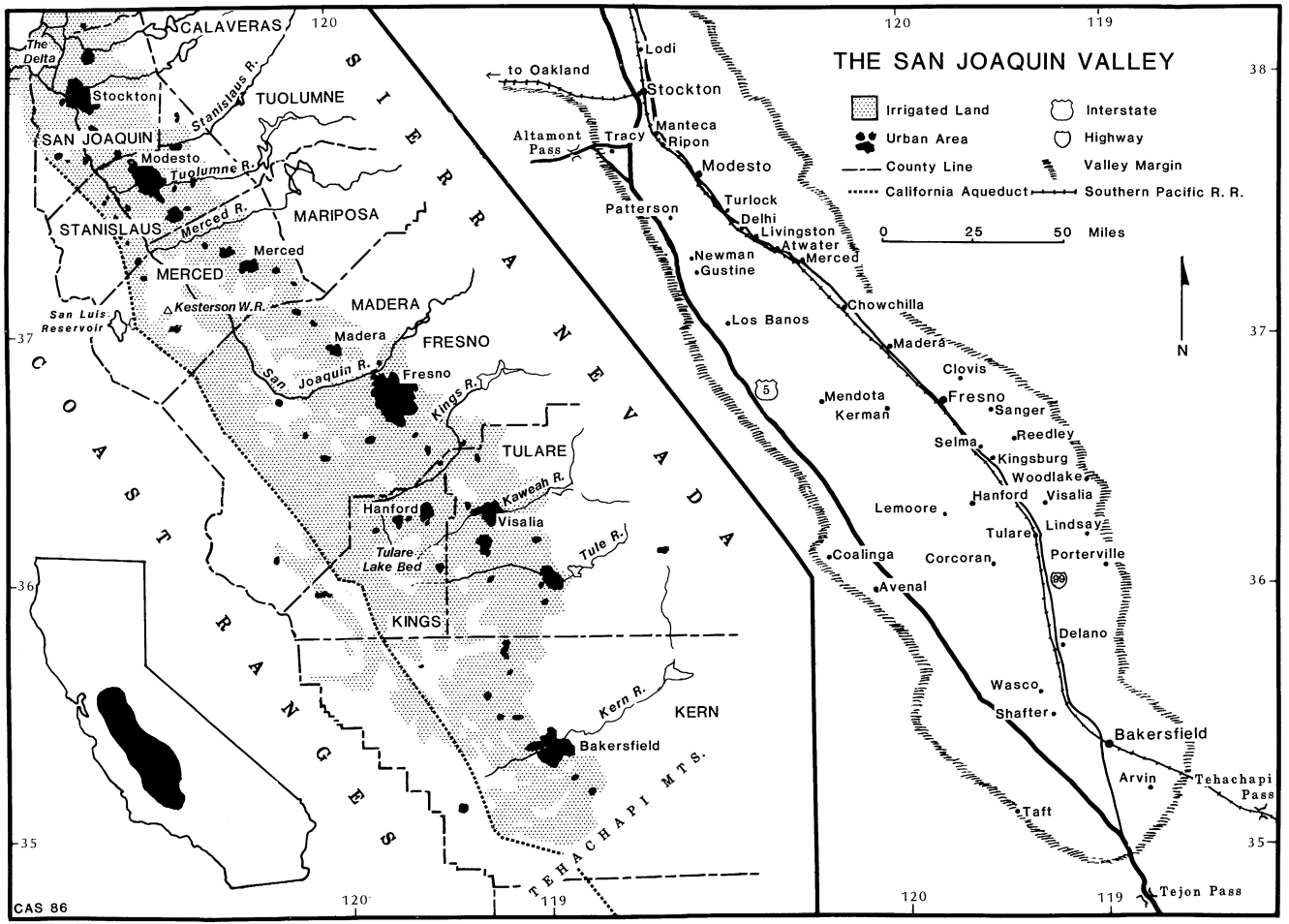

FIG. 1—San Joaquin Valley. Left: counties, landuse, rivers, and California Aqueduct. Right: principal transportation routes and urban centers.

drain into the Tulare Lake Basin, dammed off from the San Joaquin system by the fan of the Kings River. Farther south the Kern River originally terminated in two smaller lakes that today, like Tulare, have dried. The waters that fed them have long since been diverted to irrigation. Despite first appearances the valley is not flat. The fans of the Sierra streams give a marked asymmetry to its profile, shifting the low axis of the valley well to the west.

The southern part of the valley was a barren desert with scattered saltbush (*Atriplex*) when first viewed by Don Pedro Fages in 1772 from the south after coming over Tejon Pass. Beyond he could see the tule marshes, fed by streams carrying Sierra snowmelt, that for several months each year became the wintering grounds for migrating waterfowl, including Canada geese, pintails, cinnamon teal, and whistling swan. But it was and is dry country. Less than five inches of rain annually falls in southwestern Kern County, perhaps ten inches at Fresno. Pan evaporation in a summer month on the west side may measure twenty inches.

The valley's summer heat is intense but dry and so much more tolerable than the stifling humidity in a midwestern July or August. In the last thirty years air conditioning, of course, has immeasurably improved the livability of the valley. Because of the dryness of the air, even a simple "swamp cooler" is effective. The shade trees, grown tall in older parts of so many towns, have further eased the worst of the summer heat.

The most disagreeable part of the valley weather is surely the dense tule fog that shuts out the sun for days or even weeks at a time in the winter when stagnant high-pressure systems clamp down over California. The effect of the fog on valley life is far-reaching: chain pile-ups on highways, airport closures, business slowdowns, and schools on "foggy day schedules" (a unique valley institution) with buses and classes running one or two hours late. The sometimes persistent blanket of fog has at least one positive aspect. It provides protection for the citrus industry from the threat of damaging frost that clear, cold winter nights might otherwise bring.

The first Europeans found a substantial Indian population in the valley. Some historians have suggested that the density was as great as that of any nonagricultural people in any part of North America. They were village-dwelling Miwok and Yokut who were specialized hunters, fishers, and gatherers. There were salmon in the northern drainage, lesser fish, turtles, and shellfish in the southern lakes and marshes as well as roots, bulbs, and grass seeds to be gathered. The landscape was open with locally fine strands of stately valley oaks (*Quercus lobata*), especially on the fans of the Kings and Kaweah rivers and around Stockton, that were prized for their acorns. South of Tulare Lake the oaks disappeared, but there were ash, cottonwood, and black willow far into the valley along the Kern delta. The native grasses, apparently annuals to the south and bunch grasses to the north, were early replaced by introduced Mediterranean species, perhaps a response to exces-

sive grazing pressure from the large numbers of European cattle that succeeded the native elk, pronghorn antelope, and even grizzly bears.

Interpreting the Valley

There are at least three ways to look at the San Joaquin Valley. The most widespread one seems to be to ignore it, or perhaps to denigrate it as irrelevant. California is the most urbanized state in the United States. Most people are concentrated in the coastal metropolitan areas without personal ties with the agricultural interior. The 9 percent of the population of California that lives in the valley is "out there somewhere," but coastal Californians rarely cross paths with them. The landscapes of the valley are most often perceived as endlessly monotonous, something to be put behind as quickly as possible on the way to Los Angeles, the Sierra, the attractions of Nevada, or eastward. For anyone who chooses to see it thus or not to see it, the valley is a benighted land, cursed by either dank and chilling fog or relentless summer heat, by poverty and arrogant wealth, a land not understood or perhaps not worth understanding and so without redeeming features.

J. B. Jackson has observed that disdain for the dull, workaday, utilitarian countryside and for the rich men who have exploited it so effectively is part of a peculiar California environmental philosophy that sees only two significant aspects to the world—the city and the wilderness.[1] The valley, first of all, means agriculture, and that is an activity increasingly beyond the ken of modern city folk. Who needs farms, as they might say, when we have supermarkets?

Occasionally, briefly, some place or event calls the valley to our attention: an earthquake at Coalinga, a school-bus hijacking near Chowchilla, a picket line in Delano, a controversy over water or toxic-waste disposal, or the discovery of a colony of African killer bees. By and large, editors of the metropolitan press see the valley as "Dull Valley, U.S.A." In a special issue of the now-defunct *Coast* magazine several years ago not one attraction in the valley and only the elegantly refurbished state capital building in Sacramento from the entire Central Valley were included in the listing of the "100 Best Places in California." Even valley natives, especially expatriates, may adopt this cynical attitude.[2]

A second and increasingly common way of looking at the valley is as a symbol of capitalism gone rampant, of all that is bad about profit-based, large-scale, labor-intensive irrigated agriculture. Frank Norris started it by depicting the Southern Pacific Railroad as the "Octopus," dramatizing the Mussel Slough tragedy in modern Kings County when the railroad ruth-

[1] J. B. Jackson, American Space: The Centennial Years, 1865–1876 (New York: W. W. Norton, 1972), 194.

[2] Joan Didion, Slouching Towards Bethlehem (New York: Farrar, Straus and Giroux, 1968), 180–182.

lessly drove settlers off the land. Carey McWilliams and John Steinbeck continued the theme in the 1930s with "Factories in the Field" and "The Grapes of Wrath."

Current critics are as likely as not to depict grasping corporations, made fat by subsidized water, exploiting hapless immigrant fieldworkers in a system excessively dependent on agricultural chemicals, costly machinery, and the economies of scale—or getting bigger. Or they may focus on how the domination of nature, especially water supplies, can lead to the control of some people by others through abuse of irrigation laws such as acreage limitations that were never enforced.[3] Recently there has been a growing apprehensiveness about the long-term sustainability of production under conventional agricultural systems as groundwater reservoirs are mined and aqueducts reach out tentaclelike to bring in more water to irrigate land that in some cases perhaps should never have been irrigated.

Enormous environmental problems confront the San Joaquin Valley: too much or too little water, water of the wrong kind and in the wrong place, too much use of pesticides, herbicides, and excessively heavy machinery, land becoming compacted, too salty for cropping, fertile soils going irretrievably under asphalt. Nor is it news that there is an economic crisis building in the highly specialized business that is modern California farming. Shrinking export demand, slumping commodity prices, decreased land values, and overextended farm indebtedness dating from the euphoria of the 1970s are taking their toll. Hard-pressed Kern County farmers, including some of the biggest operators, are even considering selling a part of their allocations of state water to the thirsty Metropolitan Water District of Southern California, a move that could turn the operators into water brokers. These and other matters undeniably demand attention.

A third way is actually looking at the San Joaquin—at the visual, aesthetic dimensions of the built or cultural landscape and the magnificent diversity of crops yielding the bumper harvests of food and fiber that make California agriculture one of the wonders of the world. I happen to like the valley. For me there is wondrous excitement in the sweeping vistas from the new, ramped up I-5, the flatness of the horizon, the green and brown checkerboard pattern, derived from the Mount Diablo-based township-and-range survey system. I am fascinated by the contrast between the endlessly straight section-line roads and the graceful curves of the great federal and state aqueducts, by the clean geometry of the countless lesser canals and of I-5 itself with its "poppy" designating it a scenic highway, and by the vertical silhouettes of the occasional grain elevators, the cotton gins, the equipment dealers' yards full of bright-colored harvesters and tractors, the feed lots with cattle listening contentedly to recorded music and giving their

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

special aroma to the air at Harris Ranch, the stately rows of Washingtonia or Canary Island palms marking the approaches to some older ranch headquarters, the modules of cotton like great loaves of bread covered with colored tarpaulins waiting to be hauled to the gin, or the packing sheds, icing facilities and canneries huddled along the tracks in almost every valley community.

Then there are the county fairs with their Future Farmer and 4–H encampments in the animal barns, the Cinco de Mayo celebrations, the wineries and their tasting rooms, Foster Farms with its vertically integrated hatchery-to-supermarket efficiency, handling some 40 percent of the meat birds in the state, the vernacular architecture of the highway strip developments and new shopping malls, the worn and bare-boned Kern County oil fields, the machine shops and farm-service facilities characteristic of so many valley towns. And this is not to forget the color, variety, and magic of the towns themselves (at least some of them), islands of leafy green in the summer, glued to the railroad tracks that were once their lifeblood, the original plat distinguishable from the newer sections with their streets conventionally oriented to the north-south and east-west of the survey system. Even in the barrios of Mexican and Filipino farm workers, a transient population whose economic status and system of values are reflected in the untidy but honest and lived-in appearance of houses and yards, the spirit of place is somehow evoked. Most of all, the visitor is likely to be caught up with the endless procession of crops, sometimes identified by signs erected by a local service club for the benefits of city folks whose curiosities may have been aroused by the riot of almond blooms in February, of peaches in March, of orange blossoms redolent with fragrance in April, or the west side's vast reaches of snowy-white cotton bolls in September, or the bustle and movement of workers and machines at a harvest time that is different for each crop. One's senses are strained to absorb it all.

Settling the Land

Spanish interest in the San Joaquin Valley had been confined to occasional forays in search of Indians willing to be baptized. In the last years of the Mexican era several scattered ranches had been established on belatedly made land grants. Early American activity was concentrated at the northern end, near navigable waters of the bay and delta. Stockton, on the route to the Southern Mines, had a certain vitality from the early Gold Rush years; the route of the Butterfield stage passed through places like Mendota, Visalia, and Bakersfield when they were little more than posts for changing of horses.

Cattle ranching dominated landuse at first, later replaced by sheep trailed each summer to Sierra pastures, and about 1870 by bonanza wheat farming. Wheat, a quick dryland crop, required little attention and it shipped well. The principal market was Liverpool. Huge tracts of land were assembled in

that period by land speculators with names like Miller & Lux, Friedlander, and Chapman. Here and there modest amounts of water were diverted from artesian wells or Sierra streams, as on the Kern and the Kaweah deltas, but the first substantial settlement at Visalia was a determinedly ranch culture of Southerners dedicated to avoiding manual labor.[4] Confederate sympathizers, they left a lasting imprint, strongly reinforced much later by immigration from the Dust Bowl during the great depression. The southern San Joaquin Valley is still a land of chicken-fried steaks, biscuits and gravy, okra, greens, and black-eyed peas. It is also the land of drag racing, southern country music, and religious revivals. Fundamentalist Protestantism predominates. Jehovah's Witnesses alone have 105 congregations between Stockton and Bakersfield and a new gigantic assembly center outside Madera, consisting of 14 acres and 500 parking spaces to serve them.

With the arrival of the San Joaquin Valley Railroad, later the Central Pacific, in the mid-1870s, canal building and irrigated farming began to take hold. With no woodland to be cleared or heavy sod to break, it was an easy frontier for settlers. The railroad, with its extensive checkerboard landholdings, supported immigration societies and promoted town sites and land sales. The railroads opened the valley to outside markets. The link to Los Angeles via Tehachapi Pass was completed in 1876. Refrigerator cars came several years later. Swarms of immigrants from the east and from Europe were attracted by plots that were twenty and forty acres in size, either in cooperative colonies or private land-development schemes. Colony names like Scandinavian, Temperance, Nebraska, Nevada, or Alabama tell part of the story. As late as 1910, Patterson, a model community with a street pattern reminiscent of Washington, D.C., was established on the west side by such promotion. Delhi, an unsuccessful state-sponsored colony on the sandy mush soils of Merced County came even later.

Such settlements were almost always focused on intensive fruit growing. Grapes that had been accidently allowed to dry on the vines in a colony near Fresno in 1875 gave rise to an industry that soon dominated that area. Fruit cultivation encouraged family residence on the land. Towns like Selma, Reedley, Sanger, and Clovis had their roots in what came to be known as the Fresno Colony System. The last two, with Madera, were also early sawmilling centers, terminals of wooden flumes that brought logs and lumber from the Sierran forest to the east. A fence law in 1874 had made stock owners responsible for damage caused by free-grazing animals and thus acknowledged the primacy of farming. Water rights, however, remained a controversial issue. The Lux-Haggin decision of 1886, ensuring the rights of riparian landowners, was modified the next year by the Wright Act, which authorized the establishment of irrigation districts. They could sell bonds and levy assessments to finance water developments, a signal victory for

[4] Jackson, footnote 1 above.

nonriparian, smallholder interests. There are more than fifty such districts in the valley now, and they were largely responsible for the rapid agricultural developments in the early twentieth century.

The massive importation of water from the Sacramento River system since World War II, initially by the Bureau of Reclamation's Delta-Mendota Canal and later by the Central Valley Project's California Aqueduct, has brought on the most recent paroxysm of irrigation development in the valley.[5] Below-cost contracts for water delivery, covering the period when the projected urban demands of the Los Angeles basin are still developing, have made it profitable for some growers who had been dependent on costly groundwater pumping to shift to cheaper and more reliable imported sources. But the chief benefactors have been a relatively few large landowners, usually corporations, that were able to open raw land for the first time.

Ethnic Diversity

The succession of ethnic groups that have supplied the laborers began with the Chinese.[6] They were available to provide precisely the kind of seasonal labor that was needed, whether by land baron or smallholder, when railroad construction was on the wane. When anti-Chinese sentiment intensified, they drifted to the cities. The Japanese came next but in the end had the same fate, although they were the largest factor in the valley labor market as late as 1909. Today Nisei repatriates from World War II internment camps are among the most successful growers in the valley. So too are descendants of the wave of Armenian immigrants who began arriving in the Fresno area in the 1890s and took early control of the dried-fruit industry.

No ethnic group is more closely tied to one industry than the Portuguese. Dairying—the value of milk exceeds that of cotton, the number one crop in the valley for most years—is largely in the hands of Portuguese from the Azores or their descendants. Communities like Hanford, Newman, and Gustine have large Azorean minorities whose presence is identifiable by the IDES social hall. There are now more Azoreans in California than in the Azores.

Other European ethnic groups who are closely identified with certain places include Swedes at Turlock and Kingsburg, Yugoslavs at Delano, Dutch at Ripon, Germans at Reedley and Lodi, and Basques at Bakersfield. Italians and Italian-Swiss are concentrated in the wine industry and in dairying. Only a few years ago Filipinos were still the most numerous group of fieldworkers in the asparagus fields of the delta. Like the Sikhs from the Punjab, their valley base is Stockton. There are Russians in Kerman, Assyrians in Modesto and Turlock, and Japanese around Livingston. For most of these

[5] California Water Atlas (edited by William L. Kahrl; Sacramento: California Department of Water Resources, 1979); Worster, footnote 3 above.

[6] Carey McWilliams, Factories in the Field (Santa Barbara: Peregrine Smith, 1971 [originally published in 1935]); California, The Great Exception (New York: A. A. Wyn, 1949), 150–170.

ethnic groups a church or religion provides the cultural glue—Dutch Reformed, Mennonite, Old German Dunkard, Armenian Christian, Buddhist, Hindu, or Sikh.

The immigration from the Dust Bowl during the great depression was another sort—white Protestant Anglo-Saxons from Texas and Oklahoma who were refugees from drought and poverty. The Okies, immortalized by Steinbeck in his writings, came west along Highway 66 in their jalopies to look for relatives in Weed Patch and Arvin and "the water that tastes like cherry wine."[7] Their indomitable optimism, their determination to survive and to overcome, was captured in the songs of Woody Guthrie, their folk poet, and the photographer Dorothea Lange. In those days cotton was still harvested by hand, and seasonal demands for labor were large, with migrant pickers at the very bottom of the economic ladder. But mechanization and new irrigation techniques like overhead sprinklers and drip irrigation changed job patterns and brought increased demands for skills and higher wages. Today first- and second-generation Okies occupy dominant positions throughout the valley.

The black component of the Dust Bowlers—and they continued coming during World War II—is confined to the large valley cities. I know of no black rural enclaves, nor are blacks often seen doing agricultural work. A small black colonization project in Kings County was organized in 1910, but it fell victim to bad water and alkali. The area is now a state park.

It is different with the Mexican-Americans or Chicanos. Since World War II a distinctive Mexican subculture has emerged in the valley. The old-stock Hispanics, some dating back more than a century, are rarely found in the fields. The new arrivals, whether legal or undocumented, do the pruning, the planting, and the harvesting. In each valley county between 20 and 30 percent of the population is Hispanic, with Fresno at the high end of the range. The United Farm Workers Union under the charismatic Cesar Chavez has given them a new self-awareness as well as an increasing political presence. More than other ethnic groups, the Hispanics resist assimilation, because they have that minimum mass, their own language and religion, and the easy access to a supportive mother country that tend to keep them together, a culture within a culture.

The most recent migrant wave has been composed of refugee Hmong-speaking tribal people from the highlands of Laos. There may be 25,000 such hill folk—no one really knows the exact figure—mostly indigent, illiterate peasants who are a staggering welfare burden to some valley communities. The population of the city of Merced with 9,000 Southeast Asians is 15 percent Laotian, with 100 new arrivals each month. The Merced telephone directory lists more than 100 subscribers with the surname Xiong, 60 Mouas, and 35 Vangs, all apparently Laotians. Fresno has even more. Yet

[7]Walter J. Stein, California and the Dust Bowl Migration (Westport, Conn.: Greenwood Press, 1983).

there are virtually none of them in Madera, Modesto, or Bakersfield. This type of concentration is especially intriguing to cultural geographers. Most are second- or third-stage migrants who have moved to the valley after initial establishment elsewhere in the country on learning about its congenial climate, employment opportunities in farming, and the low cost of housing.

Structure of Valley Agriculture

To discuss the valley is to discuss agriculture. How could it be otherwise when five of the top ten agricultural counties in the United States are in the San Joaquin Valley, with Fresno, Kern, and Tulare ranking first, second, and third year after year?[8] This billion-dollar outdoor hothouse reputedly produces some 200 crops that are shipped in carload lots. Except for cotton no crop accounts for more than 10 percent of the total production or cropped area. But this flat, linear world of California's heartland is somehow outside the American rural farm tradition. There is no tobacco, no soybeans, or no peanuts, and relatively little corn, wheat, or sugar beets. Mixed farming, based on an integration of crops and livestock in which a farmer feeds most of his crops to fattening animals, is unknown. Pigs are a rarity, and beef cattle are largely confined to unirrigated higher ground along the valley margins and to a few feedlots. Without livestock, except in the dry-lot dairy districts, fences are unnecessary. San Joaquin agriculture is a specialty, cash-crop type of farming in which the product is often perishable and subject to violent and unpredictable market fluctuations. It is dependent on a mobile labor force, adequate irrigation water, a long growing season, and relatively rain-free summers. Rains at any time between June and October can be disastrous. Raisins, drying on trays between the vines, are especially vulnerable. Powdery mildew and brown rot have ruined many harvests of table grapes or peaches. Untimely winter rains may knock the blossoms from early-blooming varieties of fruits or nuts or slow the pollinating activities of honey bees, a special concern with almonds, which require cross-pollination.

Nothing has changed the structure of valley agriculture quite so much as mechanization. Mechanical picking of cotton was well established by 1950. Then came the tomato harvester, and now most recently the mechanical harvesting of grapes, the vines trellised to accommodate the machines. The large owners or farm-management companies are best able to afford

[8] William Preston, Vanishing Landscapes: Land and Life in the Tulare Lake Basin (Berkeley and Los Angeles: University of California Press, 1981); Guidebook to California Agriculture (edited by Anne Foley Scheuring; Berkeley and Los Angeles: University of California Press, 1983); Ellen Liebman, California Farmland: A History of Large Agricultural Holdings (Totowa, N.J.: Rowman and Allanheld, 1983); Donald J. Pisani, From Family Farm to Agribusiness: The Irrigation Crusade in California and the West, 1850–1931 (Berkeley and Los Angeles: University of California Press, 1984); Kevin Starr, Inventing the California Dream: California through the Progressive Era (New York: Oxford University Press, 1985), 128–166, 352–375.

the investments in machinery, although it is widely available as rental equipment.

No one has successfully produced a map of the specialized crop districts in the valley. Water, soils, microclimate, pests, economic and historical parameters, and the judgmental whims of individual farmers are all involved in the decision making. Some crops like almonds and alfalfa are found almost everywhere. Others like olives at Lindsay, cherries at Linden, asparagus on the delta, early potatoes around Shafter, Tokay grapes at Lodi, bareroot roses at Wasco, and sweet potatoes at Atwater are confined to restricted areas. Most of the orange groves are in a narrow thermal belt, centered on Porterville, Exeter, and Woodlake, near the mountains on the eastern side. Patterson calls itself the apricot capital of the world. Mendota is the cantaloupe city. Raisin grapes, chiefly Thompson seedless, are concentrated on the sandy soils north and south of Fresno, while table grapes predominate around Reedley, Delano, and Lodi. Cotton, covering more than a million acres, is confined to the southern two-thirds of the valley, with most of it west of the Southern Pacific–Highway 99 axis. The northernmost gins are in Merced County.

Cultivation of several crops has migrated into the valley as a result of urban land pressures in coastal metropolitan areas. Southern California orange growers moved en masse some years ago to the thermal belt at the edge of the valley in Tulare and Fresno counties. Previously walnut production had moved northward, especially to Stanislaus and San Joaquin counties, in search of a more-pronounced dormant period and winter chill. Growers of apricots left the urbanizing Santa Clara Valley for the Patterson area and reinvested the generous return on their sales in new lands, thereby driving up land prices. Whole communities have moved in response to such situations, their informational and social networks assuring them that they would again be neighbors in the new valley locations. Field crops have undergone similar recent migrations, for example, the shift of tomato planting from the Woodland-Sacramento area to western Fresno County or of garlic cultivation from the Hollister-Gilroy district to the disease-free soil and cheaper labor of Kern County. It also has been happening with dairies: many from Los Angeles and San Bernardino counties finding new sites in Tulare and Kings counties, or those from the North Bay area shifting to Stanislaus and Merced.

There is a continuing search for viable new crops. Several years ago it was safflower, the thistle that provides an edible vegetable oil. More recently it has been pistachios, persimmons, and pomegranates. There is a push at the moment for kiwis, pecans, pineapple guava, and a new tangerine as well as the wax-producing jojoba shrub and even eucalyptus. New strains of old crops and new hybrids are constantly being developed to increase yields, to counter pests and disease, to improve drought resistance, or to shorten the growing period sufficiently to permit double-cropping as with

grain sorghum and feed corn. Olive growers are seeking varieties with a reduced tendency to cyclical bearing; processing tomatoes have been developed with tough skins that are adaptable to mechanized harvesting; grape-root stocks have been found that are resistant to phylloxera. California has recently set record corn yields per acre with the development of hybrids tolerant of the relatively cool summer nights that are characteristic of the valley. Experiments with cotton at the U.S. Department of Agriculture Shafter Field Station in Kern County have brought higher yields, stronger, whiter fibers, and improved resistance to verticillium wilt, gains that have been fixed by the one-variety cotton law that has permitted only the high-quality Alcala cottons to be planted in the San Joaquin Valley since 1925.

New varieties of nectarines with improved size, flavor, and juiciness have led to a recent tripling of acreage for this crop, almost all of it in Fresno and Tulare counties. The new red flame seedless and ruby seedless varieties are creating a similar revolution in table-grape production. So is the increased frost resistance of new varieties of avocados, although smudge pots and wind machines may still be required.

Changing market conditions may also lead to rapid landuse shifts. Demand for canned fruit has declined sharply in recent years, as occurred earlier to dried fruit, with resultant reduced acreages of peaches, apricots, and figs. The emphasis on wine grapes has tilted from reds to white varieties in response to the rising popularity of white table wines and coolers. With its much warmer summers, the valley cannot compete with coastal counties in the premium table-wine market.[9] A high sugar content makes San Joaquin-grown grapes ideal for sweet wines, raisins, and table use, and in these markets the valley reigns supreme. It produces 80 percent of California's grapes and more than one-half of all the grapes grown in the United States.

Both among large-scale and small-scale farmers, nut-crop planting has soared in recent years. Much of it is on hardpan soils on older terraces, the "hog-wallow" or "red lands" along the east side, made accessible by chisel plowing and new irrigation technology. Some very large plantings in Kern and Madera counties may suggest that almonds are largely a crop of agribusiness, but the Almond Growers Exchange has 5,800 members, most with fewer than fifty acres of orchard. Every county is well represented on its roster. Almond acreage now far exceeds that of any other tree crop and is nearly half that of cotton. The spectacular increase in pistachios (now 40,000 acres), concentrated in Kern and Madera counties, has been in significant measure the result of tax-sheltering strategies of nonresident investors. Much of the planting has been speculative, on leased lands. The coincidence of the timing of the Iranian crisis and the cessation of imports from that country gave pistachios an early and unanticipated boost in the marketplace. Now imports from Iran, dyed pink to hide imperfections and with a man-

[9] Gary L. Peters, Trends in California Viticulture, *Geographical Review* 74 (1984): 455–467.

datory country-of-origin label, face a punitive tariff of more than 200 percent on value.

Increasingly other countries, especially ones with Mediterranean climates, are growing the same crops that California does and at lower costs. Brazilian orange juice, Chilean fresh fruits and wines, Mexican vegetables, both fresh and processed, and Spanish and Italian olives as well as a lengthening list of crops produced by the heavily subsidized farmers of the European Economic Community are causing valley growers to call for protective tariffs or quotas in a reversal of their traditional position in support of free trade. But each specialty crop must contend for its own market, and the influence of any one on public policy or legislation is predictively minimal.

Growers associations, processing and marketing cooperatives with names like Sunkist, Sun-Maid, or Blue Diamond that have become household words in the United States, have been a distinctive feature of California and valley agriculture. They have represented a banding together of producers to achieve what none could do separately. State and federal marketing orders permit crop advisory commissions to set standards for grades and sizes as well as the level of weekly shipments to encourage more orderly marketing conditions but coincidentally to maintain prices. These commissions or boards may also be involved in product research and publicity. Twenty-one Bay Area advertising firms were bidding recently for an $8-million Blue Diamond account to promote almond sales. Promotional expenditures by the raisin producers, faced with a recurrently glutted market, are even higher.

The agricultural labor question is always a crucial one in the valley. The social system remains reminiscent of the plantation South with a class of ethnically distinct and socially inferior manual laborers that has proved to be generally impervious to union organization. The majority of the farm workers commute from towns and cities to the fields by private car, truck, or bus, often as members of a close-knit work crew that may stay together under a Spanish-speaking labor contractor for an entire season or even longer. Wage rates are high in comparison with other parts of the country, but employment is limited for most persons to several summer months each year. Dependence on welfare and food stamps is high.

Petroleum

The valley is not all agriculture. The "kicker," especially in the far southern portion, has long been petroleum. Kern County is the leading oil-producing county in the United States and accounts for more than one-half of the production in California, even when the offshore component is included. This county alone produces more crude oil than the entire state of Oklahoma. The Kern River field came into production immediately to the north of Bakersfield in 1899, several years after wells had been opened at Coalinga. But the real boost came with the celebrated Lakeview gusher in 1911. Roustabouts by the thousands converged on southwestern Kern County

to erect a forest of derricks on the bare, rolling hills that gave rise to the giant Midway-Sunset field and to the city of Taft, named for the then occupant of the White House. Today Taft is a "Texas-type" movie-set oil town, atypical of the valley. Nearby is the Elk Hills Naval Petroleum Reserve. The Kettleman Hills anticline, the first oil-bearing structure developed under unitized, one-company management, came into production in western Fresno County in 1929.

The oil industry is currently experiencing economic difficulties. Most of the valley output is heavy, low-gravity stuff that is too thick to flow to the surface. Producers are increasingly dependent on costly secondary recovery techniques, especially the injection of super-heated steam into the subsurface structures, to coax the molasseslike crude oil toward the wellhead. Although thousands of older "stripper" wells in the valley have recently been shut down, the smell of oil and the flavor it gives to life and landscape will not soon be lost.

Oil and gas, together with the alternate 640-acre sections granted to the railroads in the nineteenth century, have had a direct casual relationship with the bigness that is associated with agriculture in the southern and western portions of the San Joaquin Valley. Much of the Southern Pacific land was sold to Standard Oil, Texaco, Shell, and other petroleum firms. When the technology for deep-well turbine pumping and then subsidized water from state and federal projects became available, the oil companies found themselves becoming farmers. Sometimes as lessors or sometimes as operators like Superior Oil and Tenneco, which absorbed the Kern County Land Company, they became dominant figures in agriculture with the capital, the technology, and other advantages that size brings. With some of the gloss off farming, these companies appear to be seeking ways to cut back or to get out.

Pressures of Urbanization

Fresno, the self-proclaimed agribusiness capital and center of the valley, is a city of 270,000 with a metropolitan area population of almost 400,000. It has been sprawling northward toward the San Joaquin River, engulfing Clovis, the state university campus, and the principal fig-growing district in the state, and giving rise to a lush commercial strip along suburban Shaw Avenue. Fresno emphasizes its centrality in promoting statewide meetings of business or governmental organizations in its big downtown convention center. The city is the regional center for the IRS with 6,000 employees, 80 percent of them women, in a structure that is the size of fourteen football fields. The state university at Fresno is one of the largest in the system. Direct air service eastward through Denver has helped end a feeling of isolation, and Los Angeles and San Francisco are only hours away by freeway or Amtrak.

For all its advantages Fresno has an image problem. It received nationwide attention in 1984, when a much-publicized rating of American cities

listed it last among a total of 277.[10] There was a storm of protest. When the author was brought to examine the city, he indeed admitted that he had erred. An average summertime daily maximum temperature of 98°F heavily had weighted the score. The publicity has had a certain positive effect by bringing a new concern about the meaning of quality of life and a commitment to improvement. Strong civic pride, perhaps born of inferiority complexes, is characteristic of virtually all communities in the San Joaquin Valley.

The other principal cities in the valley are smaller and may be growing even faster than Fresno. Stockton, the port for the valley and the regional capital of the San Joaquin-Sacramento delta area, is the most cosmopolitan of these centers. Modesto, which is expanding rapidly, is the food-processing capital with both the world's largest winery and largest cannery. Bakersfield is an oil center as well as the operational base for some of the leading farming corporations in the state. Tenneco's role as a land developer has become visually more conspicuous than its traditional one in agriculture and petroleum as it has converted Stockdale Avenue in West Bakersfield into an upgraded residential and business zone with the regional headquarters of six leading oil companies. Its centerpiece is a campus of the state university with a pivotal role reminiscent of that which UCLA and UC Irvine had in the development of Westwood and Orange County.

Recent population growth in the San Joaquin Valley has been outpacing that of the state as a whole. In-migration, not natural increase, accounts for the trend. Bakersfield has begun to receive spillover from Los Angeles, as has happened in Tracy, Manteca, Modesto, and Stockton from the Bay Area. One-half of the new house buyers in northern Modesto reportedly commute over Altamont Pass to either the Livermore Valley or the South Bay. Many new arrivals are elderly persons who are buying retirement places in the valley at a third the cost of property in their former residential areas. Newcomers talk about tradeoffs. They are no longer in the big city or near the Pacific beaches, but the Sierra is an hour drive, while the Mother Lode and the foothill reservoirs with fishing and boating attractions are even closer. To many harried city folk, the valley seems to be the last frontier of the "California Dream."

New industry is aggressively courted to offset the strong seasonal swing in agricultural employment, but few except agricultural-processing firms have located in the valley. Most new plants are in planned industrial parks on the recently annexed outskirts of cities. Important governmental facilities like the Lemoore Naval Air Station in Kings County, Castle Air Force Base in Merced County, or Defense Department depots near Tracy and Stockton employ large numbers of people. Two Kings County communities, Corcoran and Avenal, will soon have new state prisons for which they vigorously lobbied. A probusiness attitude means minimal zoning regulations and pol-

[10] Sanford Ungar, Fresno, Number 277, *Atlantic Monthly* (September 1984): 18–26.

lution controls, but for how long? An early morning veil of brown smog lays low on the Fresno horizon with increasing frequency. During rush hours air-traffic patrols direct commuters on the local radio. High ozone counts are suspected of reducing cotton yields and of damaging the lower Sierra forests. The greatest lure continues to be the availability of land. The real boom may be several years in the future.

The Matter of Size

The more recently opened lands on the west side, dominated by cotton and other row crops and sustained by costly deep-well pumping and imported federal and state water, especially bear the stamp of large-scale corporate farming.[11] The bed of former Tulare Lake is perhaps the extreme example, reclaimed by levees and drainage ditches and divided between the Boswell and the Salyer interests into endless fields of cotton, grain, and alfalfa. Here both people and farm structures are absent with field after field, squared in sections or half sections, reaching almost to the horizon. A similar landscape can be seen on the Kern County portion of I-5 or along some of the rolling terraced lands eastward of Highway 99 that new irrigation techniques have made farmable for the first time.

Life in the valley is inexorably tied to the crop calendar. A bewildering array of festivals, fairs, and queen contests fills the spring, summer, and fall months. There is movement everywhere with trucks loaded with produce of orchard, field, or dairy, shiny steel tankers carrying milk to Los Angeles or the Bay Area, wine to Modesto, and liquid fertilizer to the fields. In the winter, navel oranges are picked, and the pruning crews are busy in the vineyards and deciduous orchards. Truckloads of out-of-state bees arrive in January in time for the almond blooms. Cotton planting begins in April or as soon as the soil has warmed to 50°F.

The small farm communities often have particularly appealing freshness and authenticity. Each seems to have its own cannery or packing shed and more often than not a machine shop or two where imaginative farmers and metal workers have combined to develop specialized agricultural machinery and irrigation equipment for their needs and those of neighbors. The level of technological innovation in these shops is best displayed at the large agricultural-machinery fairs each winter at Tulare and Stockton. There is not a valley town worthy of its name that does not have one or more such shops. After all, Caterpillar Tractor got its start in Stockton, as did R. J. LeTourneau, the earth-moving equipment manufacturer. The Stockton gang plow, the Berry stream harvester, the Fresno scraper, and the Delta tule breaker were early local developments to meet specific valley conditions

[11] James J. Parsons, Corporate Farming in California, *Geographical Review* 67 (1977): 354–357; Don Villarejo, Getting Bigger: Large-Scale Farming in California, University of California, Institute for Rural Studies, Davis, 1981; Gerard Dorel, Agriculture et Grandes Entreprises aux Etats-Unis (Paris: Economica, 1985).

and needs. Later came the tomato harvester, the mechanical grape harvester, rotary orchard pruners, tree shakers and sweepers for nut gathering, the cruise stacker for alfalfa, and the countless refinements of that behemoth of the fields, the air-conditioned, four-row cotton picker.

There is much to see and to wonder at in this magnificently complex, manmade countryside of the San Joaquin Valley. Yet there may be individuals who consider the idea of studying, much less admiring, the landscapes of modern agribusiness to be repellent. There is no certain relationship between moral virtue and aesthetic values.[12] The landscape is morally neutral. Is the valley less interesting, or its color and geometry less worthy of attention, because some of its harvests enrich soulless corporations, its landscape creations of the producers of nonunion table grapes or boycotted wines?

A Production System on Trial

The San Joaquin Valley is currently a battleground where a production system is on trial. The social and economic consequences of very large-scale producing units and the huge monetary returns that so often benefit owners have long been at issue. Now it is the nature of chemical-and-energy-dependent farming that has evolved here and the question of its long-term viability. The suspicion in some circles is that the high costs of inputs may not always be balanced by returns. Is it reasonable, the question is asked, to use some of the best land in the United States to produce commodities that are not needed or that can compete in the world market only with a vast governmental subsidy?

Environmental contamination, declining soil productivity, salinization, groundwater overdraft, the losing battle to maintain levees on the delta islands, and other problems resulting from conventional agricultural practices are beginning to receive critical scrutiny. So are the continuing conversion of superior soils to urban use and the paradox of poverty and farm bankruptcies in rural communities located on some of the best cropland in the world.[13] An indication of the shift of perspective was a recent series of conferences on sustainable agriculture by the University of California, which has long been accused of farm-research strategies that favor big landowners and the chemical industry. Alternative concepts, using a new vocabulary like holistic or organic farming, agroecology, minimum tillage, or integrated pest management, will increasingly be on the agenda.

Recently another problem has emerged in valley agriculture. The key words are Kesterson and selenium.[14] On much of the newly irrigated west

[12] Peirce Lewis, Facing up to Ambiguity, *Landscape* 26, no. 1 (1982): 20–21.

[13] Eroding Choices, Emerging Issues: The Condition of California's Agricultural Land Resources (San Francisco: American Farmland Trust, 1985); Sally Lehrman and Lynn Ludlow, Harvest of Despair, *San Francisco Examiner*, 16–21 March 1986.

[14] Kenneth Tanji, André Läuchli, and Jewell Meyer, Selenium in the San Joaquin Valley, *Environment* 6 (1986): 6–11, 34–39; Selenium and Agricultural Drainage: Implications for San Francisco Bay and the California Environment, Proceedings of a Symposium Held March 23, 1985, Bay Institute, San Francisco, 1986.

side, an impermeable substratum, the Corcoran clay, keeps water from percolating normally down through the soil. When irrigated over a period of time, a perched water table or confined aquifer results that may eventually drown roots of crops. Capillary action leads to lethal surface accumulations of salts and soluble minerals, derived either from the soil itself or from the applied water. The introduction of large-scale irrigation to the high selenium soils of the Panoche Creek fan, formed by outwash from the Coast Ranges, brought the need for tile drainage and with it the first indication of a larger problem.

Migratory waterfowl, wintering at the federal Kesterson Wildlife Reserve near Los Banos, provided the evidence that things were not right. Deformities and deaths attributable to accumulations of selenium in the food chain at Kesterson began to attract nationwide attention two years ago. The source of selenium was shown to be the drainage water from the newly irrigated soils. Today the state and federal water bureaucracies are besieged with accusations of cover-ups and with demands to meet their responsibilities of public trust to protect endangered wildlife and the quality of public waters. The secretary of the interior responded with an order to plug the drains of approximately 42,000 acres in the gigantic Westlands Water District near Mendota that empty into Kesterson in apparent recognition of possible violations of treaties covering international bird migrations and the Migratory Bird Treaty Act.

The situation at Kesterson has reached a climax, because the Bay Area has refused to accept the discharge from the San Luis Drain, the axial drain that was originally planned to solve the problems of saline and toxic-waste discharge. Construction was stopped when the drain was only half completed, and the discharged waters were diverted to twelve shallow holding ponds or reservoirs in the marshy tract that had been designated a wildlife refuge. Investigations are underway to determine how to clean up Kesterson now that the drains are plugged. Most proposals either are technologically impractical or involve unacceptably burdensome costs at a time when profit margins in farming are severely depressed. The best possibility may be a sharp reduction of drainage flow by closely controlled water delivery and a shift to less water-demanding crops. Evaporation ponds, inevitably an attraction to wildlife, do not offer a viable option where selenium accumulates in toxic quantities.

Other areas ultimately will be affected by the lessons learned from Kesterson. An even larger nearby refuge and irrigation district, known as The Grasslands, also contains worrisome levels of selenium and other minerals. The transition of the valley from wilderness to technological dominance occurred in approximately a century. These newest problems will not be easily remedied.

So I return to the humanized landscape—the valley as a dynamic organism, an area to be appreciated for its own sake. The complexity of the

patterns and problems, the countless adaptations and human decisions from which it is always evolving make it a place of excitement and even of subtle beauty and grandeur, one of critical importance for the present and future society and economy of California.

Cultural geographers view humans as cultural beings in a physical landscape. Good geography sharpens awareness of environment and curiosity about it. The San Joaquin Valley is only one small piece of the gigantic tapestry that is the American land, but it is lavishly rich in scale and promise for exploration and discovery, for landscape appreciation, and for the study of changing human imprints on the earth as a form of culture history.