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FARM LABOR AND THE INTEGRATION OF
SPECIALTY CROP PRODUCTION

by

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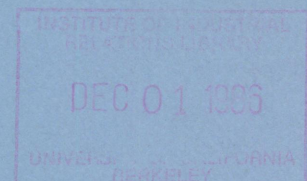
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The 'new industrial geography' represents a topical and theoretical shift away from prior themes in economic geography. In place of abstract location models which assume continuity of the essential components of the economy -- the firm, the labor force, the business environment, even the product -- this approach examines the practices, institutions and social relations of economic activity as complexly determined in social form, time and space.

Though proponents of this perspective are committed to sectoral comparisons, most empirical work has been clustered about the traditional manufacturing industries of the American Snow Belt and the English Midlands and the insurgent 'high-technology' industries of the U.S. Southwest and English south [4, 11, 41, 48]. This is a consequence of the recent decline of the old regions and the explosive growth of new industrial zones. These situations draw attention to circumstances of crisis on which the old theories were silent. However, study of a few specific industries and circumstances carries substantial theoretical risks, of "essentialism" through the formalization of time- and place-bound observations as general laws or tendencies [58] or of misidentification of necessary and contingent causes [51].

In this paper I apply certain concepts of the new economic geography to agriculture, an industry regularly overlooked in work from this perspective. This neglect may stem from a recent decline in interest in agriculture among theoretically-oriented economic

geographers. Though agriculture stimulated numerous VonThunen models and studies of innovation diffusion into the early 1960s [9, 31], geographers subsequently seem to have concluded that international markets had reworked the spatial organization of farming to the point where modern spatial patterns were the product of varying environmental parameters, of physical variations in comparative advantage as Baker had earlier suggested [1]. This presumption depends on what the rural sociologists Friedland and Thomas [22] call 'agricultural exceptionalism,' the assumption that, though we now understand manufacturing and the service sector to be more complexly structured, agriculture is composed of myriad small producers in near-perfect competition. If perfect competition reigns and environmental factors dominate agricultural geography, the agricultural sector is straightforwardly organized and in constant near-equilibrium, and there is little to interest contemporary economic geographers.

But in fact agriculture is not characterized by simple competition among similar firms. In the last fifty years specialization in agriculture has proceeded until the sector is best treated not as a homogeneous whole but as a complex set of specialized subsectors organized by commodity groups. Control of production of most commodities is now concentrated in large agricultural corporations as producers, processors and distributors. This concentration of control has integrated farms into the world economy and broken down local systems, making smaller producers more vulnerable to national and international perturbations in interest rates, foreign trade conditions, and the price of inputs. In many areas the role and

circumstances of farm workers and the environmental consequences of farm activities are also matters of concern. At the same time, this increased systemic vulnerability is offset somewhat by a more fluid and elaborate differentiation of a complex production space within which regions are constantly both distinguished and integrated.

Moreover, agriculture is also in crisis. In much of the United States farm foreclosures have increased to a level equalled only during the Depression. Even major creditors -- banks, insurance companies and the semi-public farm credit system -- find it difficult to absorb the results of such dislocation. The effects of this restructuring are differentially distributed by region and subsector, but appear likely to multiply throughout the agricultural economy.

In this paper I treat the differences between agriculture and manufacture observed historically as related to the uneven development of production organization in these two sectors of economic activity. I address three questions which might be applied to agriculture from within the theoretical structures of the new industrial geography: How and to what degree has industrial agriculture come to resemble manufacturing? What forms do the processes of vertical integration and disintegration take in agriculture? and What might study of the primary sector offer to the general theoretical development of the new industrial geography? Primary data for the paper is drawn from an extended study of the Salinas Valley of California, one of the richest farm regions in the United States [21]. I refer to other agricultural production systems where appropriate and discuss some of the paths which subsectoral differentiation has proceeded in agriculture.

The Industrialization of Agriculture

To assess the industrialization of agriculture, 'industrialization' must be defined. In the literature the term is often untheorized, used chaotically to acknowledge change in the structure of agricultural production which add up to the end of 'agricultural exceptionalism.' Changes noted include increased labor productivity, purchased farm inputs and machines, crop specialization, land reorganization, huge irrigation works, international markets, complex output processing, and the appearance of large corporations.

The social forces underlying these changes are a source of disagreement among scholars. In the neoclassical view, industrialization is driven by technological change as firms prepared to implement advances in agricultural production technology displace now-inefficient marginal firms [46]. To agrarian populists, industrialization results from political and financial power, not increased efficiency [26, 42, 49, 64]. Marxist studies of industrialization in agriculture emphasize the transformation from petty commodity production to capitalist production, with a shift to wage labor, increasing capital investment and intensified competition leading to rapid agglomeration of enterprises [3, 15, 16]. In fact, in the United States true petty commodity production -- farms owned and worked by family members alone -- has been an ideal type, always uncommon and now largely limited to particular commodity subsectors where it may be a transitory form.

I treat industrialization as a resolution of certain distinctions

in the circumstances of production and accumulation which formerly appeared between agriculture and manufacture. These distinctions were well described by Karl Marx, an acute nineteenth-century observer.

The differences between agriculture and manufacture:

Marx [35, 36, 37, 38, 39, 40] saw production in agriculture as differing from manufacturing because agriculture was more restricted by particular constraints: in the **productivity of labor**, in the difference between **production time** and necessary labor time, in the circumstances of **circulation** and the realization of value, and in the peculiar importance of private property in **land**. Together, Marx suggested, these constraints disadvantaged investment in agriculture in the rate of appropriation and accumulation of surplus value (in money terms, profit) and in the allocation of this surplus.

The productivity of labor increased more slowly in agriculture than in manufacture. In part this resulted from slower growth of scientific knowledge to control the natural processes involved [39, p. 110]. Agriculture depends on chemistry and biology to a greater degree than did early manufacturing and knowledge developed more slowly in these sciences than in mechanical engineering. So, technological changes in agriculture were long limited to physical manipulation of the soil and the harvestable product. Manufacturers could intensify production through extension of the working day, through an elaborated and articulated division of labor, and through the use of supplemental 'labor-saving' machinery. Without effective control over biological and chemical factors -- crop genetics, plant nutrition, and disease and pest control -- farmers could not accelerate or standardize

agricultural production.

Production time in agriculture differs substantially from the direct labor time required. The pace of farm production is largely determined by environmental and biological factors, the seasons and the particular characteristics of the crop. From soil preparation through harvest, storage and processing, labor is required only occasionally. Since farmworkers must be paid wages which support them throughout the year but they may not be working continuously, the rate of profit is reduced. Traditional diversified farming systems accommodated this interrupted labor process by temporal integration of production tasks for various products. When expanding markets intensified competition, encouraging specialization by farm and region, farmers were driven to one of two solutions: heavy investment in machines used episodically by a stable labor force, or complex regional social forms which provide casual labor in large numbers as needed. Both strategies resolve this difficulty only partially, however, since capital invested in heavy farm implements is employed only periodically and casual labor systems, however regionally integrated, carry heavy transaction costs for both workers and employers.

The problem posed by investment in farm machinery is a special case of a more general problem of investment. The long period required for the production of most crops presents what Marx referred to as a problem of circulation and the realization of value. In many crops investment is made at the beginning of the crop year and profits are realized at the end, often only one production cycle each year. Farmers become particularly dependent on annual loan rollovers for operating

capital, funds available directly to moderate-sized farmers only against equity in land and equipment. Profits realized cannot be reinvested as quickly as in manufacture, restricting the cumulative annual rate of profit on the original investment. Land and machinery investments are large-scale investments which must be amortized over long periods, making it difficult for farmers to respond to "market signals." This intensifies cycles of under- and over-production of particular commodities which strongly affect profits and greatly increase investment risk. Though in the United States farm operators, unlike manufacturers, are permitted to join together to moderate production, this has had limited effect in stabilizing wholesale product prices given economic and environmental variability.

Finally, farming is more dependent on land than is manufacture. For all farmers, land is a means of production for which there are no substitutes, an inescapable cost of production whose price is influenced by not just area and location in reference to a generalized rent surface but also by fertility and climate. Further, land markets are complex, localized, affected by demands arising outside the agricultural sector, and relatively 'sticky' in response to economic fluctuations. Farmers who own or lease land cannot rapidly reduce or expand this investment as other conditions change. Fertility can be exhausted by farming and competitive pressures make it hard for farmers to avoid such resource extraction.

Marx anticipated that these distinctions between agriculture and manufacture might disappear: they were moments in a historical process of uneven development of two sectors of necessary productive activity,

under capitalism.

Capitalist production completely tears asunder the old bond of union which held together agriculture and manufacture in their infancy. But at the same times it creates the material conditions for a higher synthesis in the future, viz., the union of agriculture and industry on the basis of the more perfected forms they have acquired during their temporary separation. [35, p. 504]

Tracing this reintegration of agriculture and manufacture, the 'higher synthesis' which Marx foresaw, requires an analysis of the farm sector which looks both within and beyond the farm enterprise itself. This conception of agricultural industrialization is substantially different from those which look at on-farm increases in capital investment [27, 28, 29], changes in scale and ownership [64], or shifts in management practices, technological change, and changes in factor prices [2]. As used in this paper, industrialization refers to changes in the labor process and in the relation between capital and labor not only within the firm but by industry subsector and region. Full discussion of the forms that this has taken in each of the whole set of agricultural commodities is beyond the scope of this paper, so I present one detailed example, that of the specialty crop systems of California's Salinas Valley.

Industrial Agriculture in the Salinas Valley

Since the Mexican revolution of 1821 California agriculture has been largely oriented toward commodity production. Both Mexican and American land grant systems concentrated landownership, leaving a large wage labor force available to farmers. The hide and tallow trade of the Mexican period was followed by bonanza wheat farms exporting to European urban markets and then by an increasingly complex system of

specialty crop production. In the Salinas Valley, which runs for a hundred miles along the central California coast, sugar beets succeeded wheat, and the large landholdings were broken up to make use of the family labor of tenants and smallholders whose crops were contracted to the local sugar-processing corporation [34].

In the early twentieth century, Salinas Valley farmers who could escape the control of the sugar processors began to diversify their crops, adding head lettuce, artichokes and other fresh market vegetables as refrigerated rail transport opened eastern urban markets. For field and harvest labor they drew on migrant workers: Japanese, Mexicans and Mexican-Americans and -- by the 1930s --displaced Dustbowl farm families [42]. Crops were marketed through growers' cooperatives and by specialty shipping. Individual growers hedged against the substantial risks of fresh vegetables by also planting sugar beets and dry beans, which provided a dependable but small return [34].

At the end of World War II, the Salinas Valley was a well-developed agricultural region made up largely of moderate-sized farms. In 1945, 1,911 Salinas Valley farms sold \$37,152,571 worth of truck crops, sugar beets, dry farmed barley and beans, or dairy products [63], with half of this total from vegetable crops. That year farmers paid \$11,115,240 to hired farm workers, only 3,247 of whom were regular employees; most were temporary Mexican migrants in work gangs hired through labor contractors to cultivate or harvest. The farmers themselves owned more than half the farmland. Most sold their crops through growers' cooperatives and independent shippers to Eastern markets.

By 1978, this diversified system had been transformed. Multi-national corporations (Coca-Cola, Castle & Cooke, United Brands and others) dominated the valley economy, leasing the land they farmed and marketing the crops of smaller growers whose every decision was specified in the marketing contracts. Specialty crops (fresh vegetables, wine grapes, and nursery and seed crops) made up 90% of the total sales of \$581,377,000 and occupied 85% of the harvested land. Eighty percent of the more than 18,000 casual workers were members of the United Farm Workers or another union, and total farm labor costs had grown to \$125,821,000. Many workers lived in the Valley for at least six months every year, often leaving at the end of the season to work for the same employers in other regions throughout the Southwest.

The transformation of Salinas Valley agriculture was driven by the resolution of the distinctions Marx had seen between agriculture and manufacture. This transformation had two phases: intensification of the production system, and restructuring of the regional agricultural economy. Competition among Valley farmers and between the Salinas Valley and other regions was significant, but this competition did not follow the form envisioned by the adherents of 'agricultural exceptionalism.' Change was not driven by technological developments. Instead, it involved the social organization of production: reorganizing the labor process, redefining the pool of desired workers, reworking the relationship between farmers and hired workers, a new role for marketing firms in coordinating and consolidating farming activities within and without the Valley, further integration of Valley agriculture into national and international markets for capital and

products, and extensively modifying the natural environment.

Though traces of the overall process of restructuring can be found in the early post-war years, the process as it occurred in the Salinas Valley fell roughly into two periods: first, from 1945 to 1964, a period of intensification of the production process itself within existing firms; and subsequently, from 1964 to 1978, a process of reorganization of the composition of the various social actors-- farmworkers, farmers, marketing firms -- and of their relative roles.

Intensification of Production:

Intensification had three aspects: A shift to more investment-intensive crops, including increased investment in irrigation to support truck crops and permanent plantings of artichokes and, later, wine grapes; intensified planting, requiring an increase in the labor pool and in the number of workdays per acre; and a transformation of the labor process which increased the productivity of labor.

The post-war economic recovery stimulated a stable and growing market for fresh vegetables and salad crops. Valley farmers shifted from field crops (sugar beets, beans and barley) to truck crops (lettuce, artichokes and other vegetables) at an average rate of 3000 acres a year from 1946 to 1965 and more rapidly (almost 5000 acres/year) thereafter. This greatly changed the land use patterns of the Valley (Figure 1 A-C); where in 1945 truck crops were restricted to the lower reaches of the Valley and the rest of the land was dry-farmed, in 1963 truck crops were found along the entire course of the river and by 1976 the entire alluvial basin was in truck crops, wine grapes or artichokes, all irrigated. Most growers farm small

fields throughout the valley area, using local variations in microclimate to adjust planting and harvest dates, thereby spreading production activities over the season to employ their resources and optimize their profits from wildly fluctuating wholesale prices. To support extended irrigation in the mid-1950s Valley farmers set up a new local agency, the Monterey County Flood Control and Water Conservation District, which issued bonds to dam two tributaries of the Salinas River, metering river flow to maximize infiltration into groundwater and replenish the expanding well fields. This is capital intensification on both an individual and a common, regional scale.

Yields per acre increased rapidly (Figure 2), though production remained variable. Increased truck crop production required a rapid expansion of the casual labor pool (Figure 3). The bracero program, permitting growers to bring in casual workers from Mexico, opened a large labor pool on which growers could draw without increasing wages. Braceros replaced residents in the fields (Figure 3 - dark area represents braceros); growers and shippers shifted produce packing to the fields to avoid union organizers in the packing sheds. Most labor increase was in harvesting due to increased acreage and yields and field packing; only a small portion was in preharvest cultivation and thinning (Figure 4), done by hand by with a short hoe or by crawling down the fields. Workdays per acre harvested grew rapidly (Figure 5); the use of casual labor intensified but the labor process itself was not changed.

Termination of the bracero program in 1964 led to an immediate increase in labor productivity (Figure 6). Braceros were an

undifferentiated workforce moved from task to task in gangs whose membership was unstable. The resident (citizen and documented migrant) workers who replaced them formed stable crews with internal work discipline and a formal division of labor. Crews increased average productivity greatly under the incentive of group piece-work rates; skill levels increased as crews found more regular employment due to the growing concentration of production and marketing. The rising cost and scarcity of casual labor also led farm operators to substitute herbicides for hand-weeding and cultivation.

Intensification caused severe pressure on the Valley's environment. Growers increased their use of irrigation, fertilizers and pesticides in attempts to standardize and control variable production and reduce labor requirements. The land grant universities and local Agricultural Extension Service, seeking to protect growers against workers' demands for wage increases at the end of the bracero program, developed new cultural methods and new crop varieties and certified agricultural chemicals. Salt-water intrusion along the coastal zone increased despite increased groundwater recharge from managed river flow. Clean cultivation of the hill-slopes caused severe soil erosion (Figure 7): topsoil is lost to wind and water at from 20 to 40 tons/acre/year in the indicated areas. Accumulated groundwater concentrations of nitrates (Figure 8) are high enough to meet the fertilizer needs of many crops, but from 100 to 500 pounds of nitrogen per acre are still applied yearly [19]. Pesticides and herbicides are accumulating in the soil, the Salinas River (Figure 9), and Monterey Bay; in 1976 2,273,612 pounds of pesticides were applied to about

250,000 acres of cropland.

As intensification proceeded and restructuring began, farm operators found it more difficult to moderate the negative environmental effects of their farming practices. Small and medium-sized growers lost control of production decisions to shippers through 'forward contracting,' marketing agreements which specified crop, variety, planting date, cultural practices and harvest payment. Leasing land became predominant and, though the market value of land kept pace with increased farm value (Figure 10), landowners no longer controlled the use to which their land was put. Until the mid-1950s, customary leases in the Salinas Valley required fallowing and green-manuring--since 1960, control over lease conditions has shifted from landowner to grower, and rents no longer meet the current costs of land purchase; land is held by the heirs of former farmers or by investors seeking tax benefits [43]. Smaller local firms became unable to meet the additional costs of good cultural practices and the large grower-shippers who came to dominate the Valley economy had little or no investment in Salinas Valley land and wide spread interests elsewhere, reducing their need to preserve the resource base.

Restructuring the Regional Economy:

From 1945 to 1964 the number of farms in the Salinas Valley fell precipitously but not uniquely; this reduction (41.6%) corresponds to the national figure (42.4%) [13], for the same period (Figure 11). At first the greatest reduction was among large (Census Class I - the highest gross sales category) and small farms, leading to an increased share for farms of moderate size (Figure 12). After 1959 this trend

was reversed: in 1978 the 450 farms in the top census class (of 1264 total farms) had 97% of gross sales and an estimated average income of \$1,259,098.

This change in the distribution of farm income occurred in a highly unstable market climate (Figure 13). High specialty crop prices in the immediate post-war years encouraged shifts to these crops and some fragmentation of larger dry-farms: the number of vegetable farms fell from 1945 to 1964 by only 21% (compare to the 41% overall rate). The greater labor costs of truck farming required more operating capital. For farmers who worked leased land or wanted to risk on truck crops more than the banks would support, 'forward contracts' committed the crop to a shipper under one of several advance sale arrangements. Smaller farms were at a significant comparative disadvantage in negotiating these contracts [45].

Some larger growers shipped their own produce and that of other farmers contracted to them. With assets in land and shipping facilities to support borrowing at lower interest from banks and with control over the timing of harvest and sale of their own and others' produce under constant price shifts, these firms occupied a favorable competitive position with regard to both capital and product markets (Figure 14 A&B). By the early 1960s, large grower-shippers had effective control over Valley production of truck crops. Acting both as growers and as brokers, these firms now controlled the timing of planting, cultural practices, harvest and farm-gate price, passing on the risks of a highly uncertain market to their clients and reserving secure and profitable sales to themselves.

Subsequent national and international integration of Valley agriculture took two paths, one geographical and one structural. Geographical integration began as firms grew throughout the Valley. Later, the largest Valley grower-shippers, facing seasonal competition from producers in other U.S. regions (note compressed production season in Figure 4, p. 7), invested in those regions, spreading administrative and marketing costs over the year. By 1972 the 10 largest grower-shippers in the Salinas Valley sold 65% of all Salinas Valley lettuce, 29.7% of Imperial Valley lettuce, 23% from the Salt River in Arizona, and 41.8% of all other Arizona lettuce [18]. One firm, Bud Antle, set up vegetable plantations in Chad for export by air to Europe.

Structural integration of the largest firms arose through external investment, changing the position of the largest Valley grower-shippers with respect to external capital and product markets. The opportunity to market vegetables in volume through the year attracted investment from outside the Valley, from a number of firms with established marketing links to the large supermarket chains. In 1967 United Fruits (later United Brands) and other international firms bought and consolidated Valley grower-shippers. In 1978 Bud Antle was purchased by Castle & Cooke. In 1972 Bud Antle and United Brands' subsidiary InterHarvest together marketed more than 50% of all U.S. head lettuce, contracting to supply lettuce throughout the year from their operations in the Salinas Valley and from elsewhere in California, Arizona and New Mexico. When the tax advantages of new vineyards attracted extensive tax-loss investment in the 1970s,

Coca-Cola followed the same strategy, taking over Monterey Vineyards, to which much of the grape harvest was contracted and marketing its new wine products with its existing soft-drink likes to markets, restaurants, and liquor and convenience stores.

The central market position of the largest firms enabled them to pass on rising labor costs, where marginal growers could not. During the late 1960s, farmworkers had formed the United Farm Workers union, winning contracts with United Brands and other large grower-shippers. These contracts set the standard wage for the Valley, which other growers had to meet. Since shippers provided harvest labor to their clients, rising labor costs drove more small farmers to contract with the largest shippers or leave farming. The success of the UFW in the Salinas Valley may have resulted from the large firms' concentration of control of production as much as from the militancy of Valley workers.

The synthesis of agriculture and manufacture:

In this fashion, agriculture in the Salinas Valley began to resolve the various impediments to profit Marx had noticed. The problem of the productivity of labor in agriculture was addressed not by mechanization of the labor process but by employing a subordinated labor force who themselves reorganized the labor process and internalized labor discipline. The distinction between production time and necessary labor time was countered by regional and inter-regional integration, moving workers (and machinery) from field to field and from firm to firm in a complex pattern supervised by the largest firms, who dominate both production and marketing. The problem of circulation and the realization of value was addressed in part by complex forward-

contracting, of the grower to the shipper and of the shipper to the retailer or wholesale market. This issue was also resolved with the entry of external capital, multinational firms able to negotiate in national and international capital markets and capable of internal self-financing of operating expenses and of funding research to further standardize the production process and reduce product variability. Finally, the role of private property in land was minimized by the extension of leasehold in circumstances where market power lay with the lessee and where the landowner expected his return through long-term speculative gains or short-term tax advantages.

This restructuring of Valley production reworked the social structure and spatial organization of the agricultural economy, breaking down the autonomy of the farmers themselves and giving rise to a complex articulation of local, regional, national and multinational firms. One result of this was a simultaneous development of vertical integration and disintegration through subcontracting.

Vertical Integration and Disintegration in Agriculture

Vertical integration refers to the linear consolidation of the entire production process under the control of single firms. Both conventional and Marxist economists and geographers have tended to treat vertical integration of production as a theoretically-unproblematic process driven, from the neoclassical perspective, by economies of scale and the reduction of transaction costs or, from the Marxist view, by the centralizing tendencies of capitalist

accumulation. In recent work, however, the assumption of vertical integration as the normal tendency has come into question: both theoretical and empirical studies suggest that vertical integration of production within firms and commodity sectors is not inevitable and that complexly articulated subordinate firms may occupy an important structural position [33, 50, 52, 53, 54, 55, 56, 61].

In a thorough review and resynthesis of the literature on production subcontracting, Holmes [33] suggests that specific patterns of interaction of firms interlocked in production may be better described as lying somewhere along a gradient of control (as below) from fully internal to fully external decisions and that in fact, given market uncertainties and inequalities, firm linkages often are not of the pure types represented by the extremes.

FULLY INTERNAL			FULLY EXTERNAL		
Internal Production		Subsidiary or Affiliate		Subcontracting	
				Monopsony	
				Free Market Transactions	

Further, Holmes suggests, patterns of integration of primary and secondary firms are a consequence of the specific conditions of production of the commodities in question and are associated with patterns of subcontracting and vertical disintegration characteristic of particular dynamic aspects of capital, product and labor markets. Subcontracting, as a way of controlling instabilities in product markets, indivisibilities in production technology, and issues of labor supply and control, takes several forms. Capacity subcontracting occurs where firms make up shortfalls in production capability against

variable demand by 'farming out' supplemental production to subcontractors under product specifications set by the primary firm. Specialization subcontracting occurs where firms contract with subordinate firms to perform various specialized tasks within the production process, tasks which the primary firm cannot undertake efficiently.

In Salinas Valley agriculture, vertical integration and disintegration through subcontracting proceeded simultaneously. Integration resulted from a substantial shift in economic power toward the largest firms, which were both direct producers themselves and the only market available for the products of most of the remaining independent farmers. At the same time, disintegration occurred through a complex articulation and partitioning of segments of the production process, now split off to producers' service firms.

The Shift from Independent Farmer to Capacity Subcontractor:

Moderate-sized farmers, independent producers in a sense, had earlier encountered monopsony (or oligopsony) in selling their crops. Potential retail and wholesale markets were accessible only through intermediaries: shippers, processors, grower-shippers or growers' cooperatives (Figure 14A). As production intensified with the shift to high-value, high risk crops, new transaction patterns for labor, land and product markets reallocated both risk and profit in line with the unequal power growers and shippers brought to contract negotiations. Marginal independent growers, dependent on shippers for operating funds (Figure 14B), were forced to accept much of the risk of variable prices and yields [45].

This internal reorganization was accelerated by the uncertainty of return to investment in fresh vegetable production. Demand for these products (like most foodstuffs) is relatively price-inelastic. Yields varied greatly despite attempts to standardize production while average production per acre continued to increase (Figure 2). Increased aggregate yields fluctuating against inelastic demand set up substantial weekly and annual product price variation (Figure 13), while production costs grew. Small growers, who harvested only a few crops each year, lost money two years out of three. The insupportable risk of bad years forced small producers into market contracts which lost them the profits of good years. As marginal firms disappeared, others were forced to the margin.

Firms which were both growers and shippers could use marketing contracts to maximize returns to their own production activities, in effect converting their contractees from clients to capacity subcontractors. This involved a substantial loss of autonomy in production decisions for the smaller growers; the overall pattern of production became dominated by decisions taken by the largest firms, in their own internal production and in contract terms, and subcontracting replaced monopsony as the dominant form of linkage between shippers and independent growers. Shippers could control the production process almost completely, specifying in forward contracts the whole set of production decisions formerly left to the client farmer. Shippers, who provided harvest labor as part of the contract, even gained the right to decide whether to harvest or abandon the client's crop.

Vertical integration of Salinas Valley agriculture was stimulated

both internally and externally. Overall production increases were sustained by national improvements in living standards as fresh vegetables, formerly luxury goods, became wage goods. Particular marketing linkages were important in this process. The largest shippers had a further advantage as the retail market for fresh produce became segmented and stratified (Figure 14A). Rapid consolidation of food retailing in a small number of supermarket firms provided these growers with secure long term volume contracts, beneficial to the supermarkets in ensuring supply and quality and to the growers in guaranteeing them a central market position. To meet contract terms dominant firms invested throughout the Southwest, integrating Valley production with production activities elsewhere and consolidating control over the lettuce industry across the country [18].

External investment also accelerated integration. Firms developed various special extended relationships outside the Valley.* A few

* Footnote: One local grower-shipper, Bud Antle Incorporated, grew rapidly in the early 1960s aided by favorable relationships with two external actors: the Teamsters Union, which made a large pension-fund loan to the firm which had signed a favored-son contract with the Union; and Dow Chemical, at one point owner of 5% of the firm's shares and a major defense contractor at the time that Antle won a Defense Department contract at well above the going market price.

firms grew large enough to make substantial external investments; others were taken over by external firms and run as wholly-owned subsidiaries. Though large firms dominated production decisions and marketing for almost all Valley commodities, they were direct producers primarily in lettuce and fresh vegetables; smaller growers and outside investors seeking tax advantages remained the norm in direct production

of artichokes and wine grapes, since both perennial crops required fixed investment in land, discouraging leasehold.

The large grower-shippers redefined and reworked the production process, in competition over product quality as well as yields. With internal self-financing from parent firms or direct connections to national and international capital markets, the largest produce firms built refrigeration and storage facilities to hold perishable crops against short-term price fluctuations. They also, through the forward contracts, imposed product standards and cultural practices on their client producers, who could not meet these requirements by internal investment. In this way, production standards set through the growing practice of capacity subcontracting led directly to a second form, specialization subcontracting.

Specialization Subcontracting for Producer Services:

Intensification and articulation of produce production led to a growing market for producer services in tasks such as soil testing, precision soil preparation and planting, pest and weed control, well drilling, and irrigation system development and maintenance. Each new subcontracting specialty involved substantial capital investment and particular labor skills, production costs too great to be borne internally by any but the largest producers. Each also partitioned technical knowledge in the production process and segmented the labor force, often along lines of ethnicity (Filipinos, earlier members of the casual labor pool, often became irrigators and irrigation technicians) or residency status (state licenses were required of pest control operators). The largest producers developed these services

internally, but others resorted to producers' service firms.

The independent farmer's role in production was thus substantially diminished. Shippers, through forward contracting, provided marketing and financial management services and often also managed the casual harvest labor force. To meet their quality specifications, farmers had to contract with specialty subcontractors who prescribed and provided soil preparation and fertilization or designed pest-control protocols and applied pest- and herbicides. As the role of the farm operator in production decisions became limited and the autonomy and income of the independent farmer constrained, some farmers themselves began providing specialization subcontracting services to other farm operations. (This reached a high in 1974, when 69 farm operators reported \$2,959,000 in income from custom services provided to other farmers.)

In the wine grape industry, the direct role of the farm owner was even more limited. Major vintners began planting grapes in the Valley in the mid-1960s, but most of the 37,000 acres of varietal wine grapes in place in 1978 were planted after 1970 in small vineyards developed as tax-loss investments as a financial service to small non-resident professional investors, such as doctors and lawyers. Though vineyard ownership was highly fragmented, vineyard management was relatively concentrated in a set of vineyard service firms who managed land preparation and planting and then offered the full set of production services, on a contract basis, to the landowners. Some management firms also marketed grapes for their clients; in other cases volume vintners provided production and harvest services within the terms of wine grape marketing contracts.

Integration, Disintegration and Labor Control:

The rationale of subcontracting was introduced, above, as a response to market instability, technological indivisibilities, and labor control. In the Salinas Valley, capacity subcontracting serves to moderate instabilities in product markets (though it should be noted that here these are instabilities of supply, not of demand like those observed in other industry studies [33, 54]). For smaller producers, specialization subcontracting resolves technological indivisibilities. Both forms of subcontracting, with ongoing integration of production, have had important effects on labor control and on the well-being of farm workers.

Farm workers have long made up a classic 'contingent' labor force. The historical development of specialty agriculture, of 'factories in the fields,' has been wholly dependent on large numbers of poorly-paid migrant workers seasonally available for very-short-term employment [42, 61]. I suggest above that this pattern, supported by historically developed regional social and juridical forms, represents a particular adaptation to the problem of the difference between production time and socially necessary labor time in agriculture.

Farmworkers have never been entirely unskilled, but until recently employers were satisfied if casual workers had skill-levels which were industry- rather than firm- or task-specific [10]. In fresh produce production in the early 1960s, various factors combined to reduce this satisfaction. Among these were rising non-labor costs in production, increasing yields, growing consolidation of the harvest labor process, a shift from price to product-quality competition, and anticipated

labor shortages following the potential termination of the bracero program. The combined effect of the first four were sufficient that larger growers did not oppose ending the bracero program, preferring to risk potential labor shortages in order to shift hiring toward a more stable labor force and employment relation.

The period from 1964, when the bracero program ended, through the early 1970s was one of negotiation of what Clark [11] would call a new 'class bargain' between employers and harvest workers. Employers and workers (the latter supported by public concern, the civil rights movement, and a few progressive industrial unions) negotiated a reconstituted labor pool of resident minority workers and newly 'documented' former braceros. With the rise of the United Farm Workers, the social organization of agricultural employment took on a new hybrid form, still contingent and segmented by ethnicity, residency status and gender but now more closely resembling national socially-established industrial norms.

For the workers, this meant improved wages and increased work continuity; for employers a stabilized and reconstructed labor force who could develop firm- and task-related skills. Reorganization of the labor process, which is manifested in the growth of both capacity and specialization subcontracting, supported a substantial increase in both labor productivity (Figure 6) and managerial control. Employers carried over the traditional form of task organization of harvest labor -- the labor crew -- substituting the crew foreman for the labor contractor as work supervisor [62]. But this traditional form, familiar to workers and incorporating informal labor recruitment and

culturally established role expectations, disguises a substantial increase in firm- and task-related skill levels arising with stabilized crew membership and continued employment of the same crews by the major shippers.

The new production tasks which appear in specialization subcontracting also increased both managerial control over the labor process and the well-being of workers. Farmworkers with good work records could be offered promotion into semi-skilled positions as irrigators, pest-control applicators, equipment operators and so on. The prospect of such promotion encouraged workers to submit to the harsh work-discipline of the harvest crews but also offered new upward mobility for workers, who cannot sustain strenuous harvest work past their mid-thirties. Large shippers offered on-the-job training in these new work skills and workers with experience could then, if they chose, move into alternate employment with producers' service subcontractors in the Valley or elsewhere. By 1984, employment in agriculture in Monterey County had increased to over twenty-two thousand workers, with an additional more than nine thousand employed in agricultural services (producer services and processing) [8]. Furthermore, semi-skilled specialty workers were more likely to gain year-round employment, to move with the shift in production activities to a firm's other operations throughout the Southwest.

Reorganizing labor relations did not proceed without struggle. This struggle appeared not only, as might be expected, between workers and employers but among various employers and between two alternative unions. The United Farm Workers fought to win contracts from those

largest shippers whose workers had not already been induced to join a Teamsters affiliate. Contracts won included both higher hourly base pay and union grievance and seniority provisions. These contracts set the new wage structure for the region as a whole; smaller employers, forced to meet pay increases but unable to pass on labor costs due to their marginal position, fell further behind. At the same time shippers with Teamsters contracts paid a wage differential over the UFW contracts, keeping the UFW out and avoiding loss of control over work discipline and work stoppages.

In this way the reorganization of work permuted throughout the regional sectoral economy, following in many ways the complexly structured and determined process of region-wide adjustment which Clark, Gertler and Whiteman [12] suggest. Vertical integration and disintegration proceeded simultaneously and in complementary modes. The cumulative effect of this was empowerment of the largest grower-shippers and, to some degree, of the labor force, and a substantial reduction in the autonomy of the farmer (traditionally defined). Moreover, regional restructuring, which concentrated power over Valley agriculture in a few firms, had effects -- because of the increasing national power of these strengthened firms -- which have been widely propagated beyond the region in which they first appeared.

Holmes states that "to understand the nature of a particular class of linkages we must understand the conjuncture of processes and circumstances which have generated these linkages [33, p. 83]". The restructuring of the agricultural economy of the Salinas Valley involved more complex conjunctures and processes than geographers could

have encountered through the neoclassical theoretical lens which informed and eventually closed off studies in agricultural geography in the early 1960s. In fact, the social and spatial organization of agriculture is not determined by market distance or by variation in external, environmental conditions under conditions of simple competition; it is elaborately developed as a consequence of intricate historical forces and contingencies.

Conclusion: The Primary Sector and
The 'New Industrial Geography'

The theoretical developments of the 'new industrial geography' open to examination the dynamics of what geographers and economists have too often treated as undifferentiated productive sectors. Empirical work to date has been clustered around particular manufacturing and service subsectors, perhaps because the primary sector is perceived to be resource-dependent and simply structured. In fact, the social organization of production in agriculture, in the case reviewed here, exhibits the same complexities others have found in manufacture and services.

Further work from this perspective on other agricultural commodity systems should be profitable. Agriculture is not a homogeneous sector; regions and subsectoral production systems vary widely and have followed complex historical paths. Recent work by rural sociologists and historians [14, 47] has begun to apply a sectoral approach, opening up complex questions of regional development and accommodation.

Agriculture offers a pertinent comparison to the historical processes of development in manufacture because, as Marx observed,

capital in agriculture has encountered constraints to which manufacture has not been equally subject. These impediments include problems in increasing the productivity of labor; an initial distinction between production time and socially necessary labor time; particular problems in the circulation and realization of value; and the peculiar role of land and of private property in land. The effects of these constraints deserve further study.

What Marx observed of agriculture can be applied to the primary sector as a whole. Capital in forestry, fishing and mining encounters the same constraints to varying degrees and in different forms. We are concerned now with the forces of geographical uneven development; we ought not overlook the uneven development which distinguishes urban and rural economic forms.

Study of the primary sector should help to preserve theoretical development of the new economic geography from an unforeseen source of 'essentialism,' generalizations which arise through testing theory against observations of the urban manufacturing and service sectors and which are taken, unexamined, to be valid for all forms of productive activity. Analysis of the primary sector may also aid in understanding phenomena which have long been of particular interest to geographers: the social construction of space, and the particular forms of human-environment relation.

This is so because production within the primary sector encounters space, land and nature in ways which differ from urban economic activity. Here, primary firms may operate diffusely and secondary firms in a space highly nucleated by the need to make deals.

Similarly, in the primary sector land markets are complicated not just by the complex spatiality of the practices, institutions and social relations of economic activity on a featureless plain, but by the features of the plain itself.

It may be that, in a new examination of the primary sector, we will re-encounter nature and find it too theoretically problematic. We have seen a long separation, in geography, between the two traditions. Engaged with the influences of productive activity in the production of space, we have lost the insight geographers once had into what Neil Smith has called 'the production of nature' [57]. Certainly, the spatially uneven distribution of resources is both physically and socially defined, as resources themselves are identified within complex systems of economic tendencies and contingencies. Addressing the primary sector may lead the 'new industrial geography' more effectively into an understanding of the geographical uneven development with which we are all concerned.

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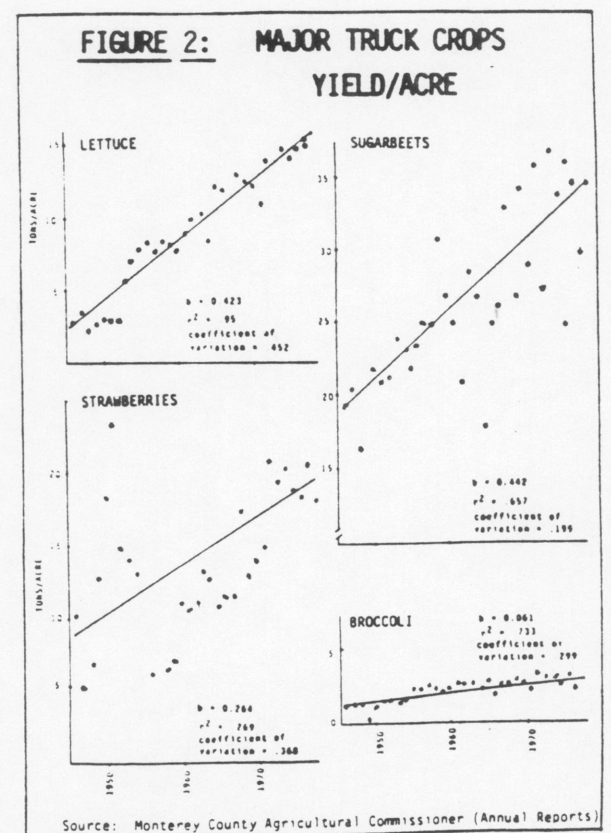
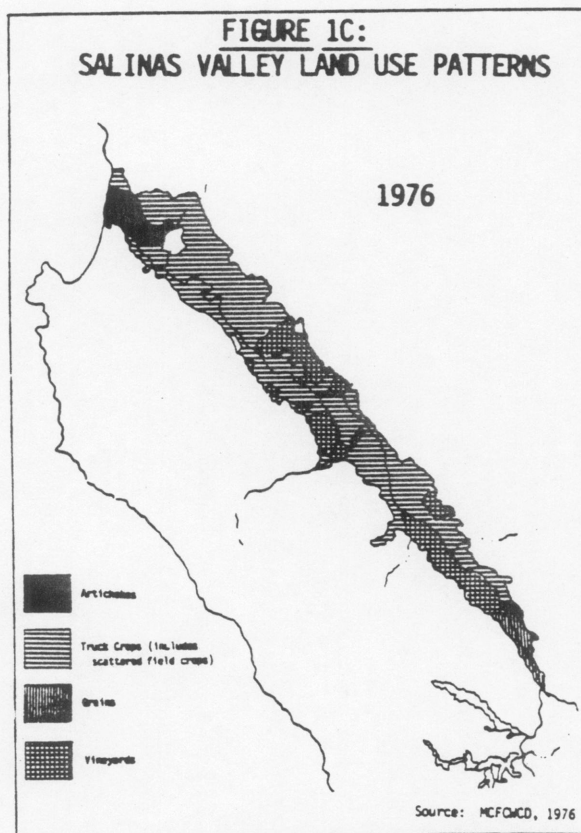
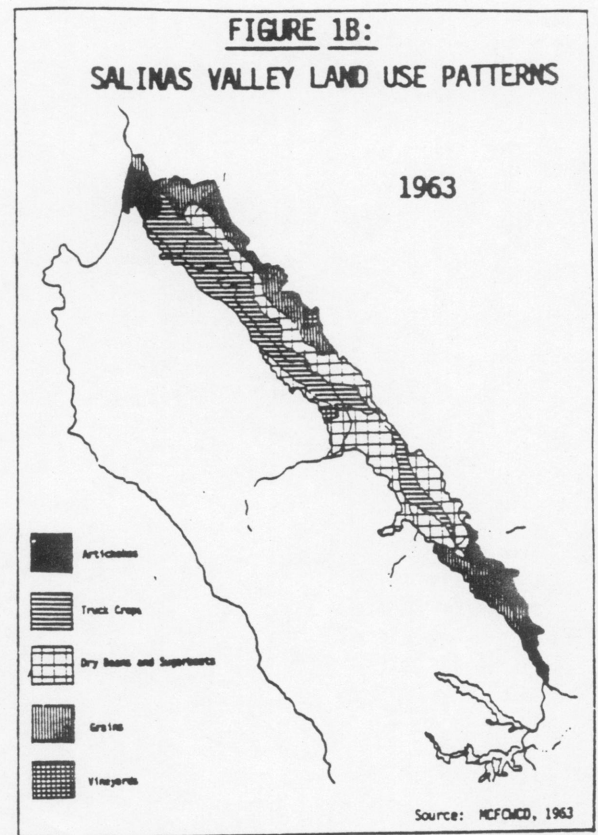
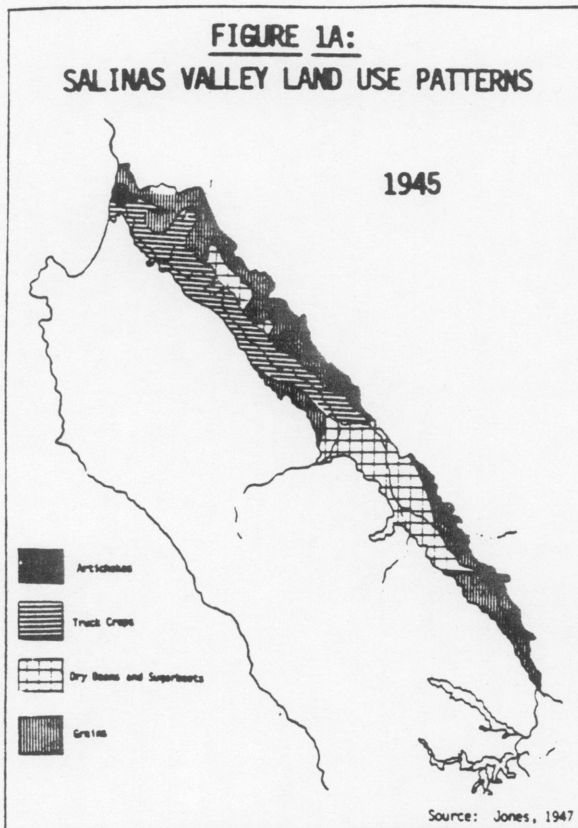
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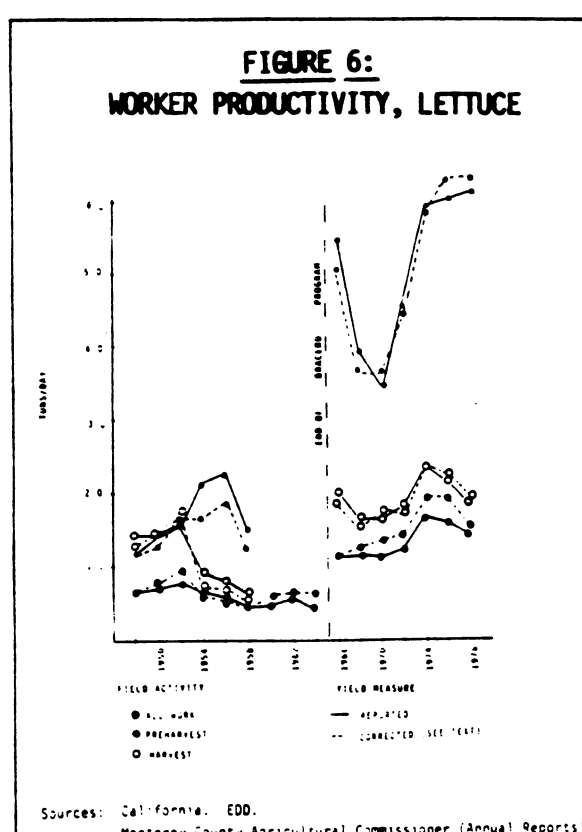
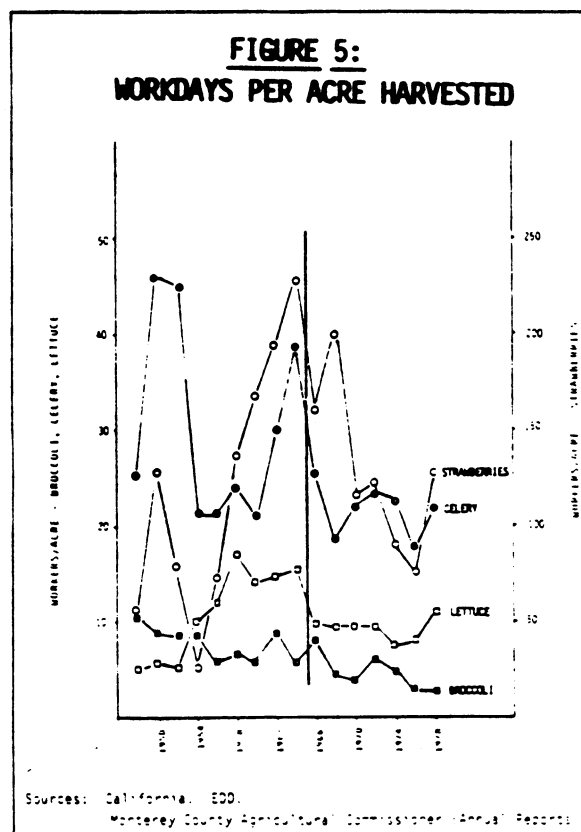
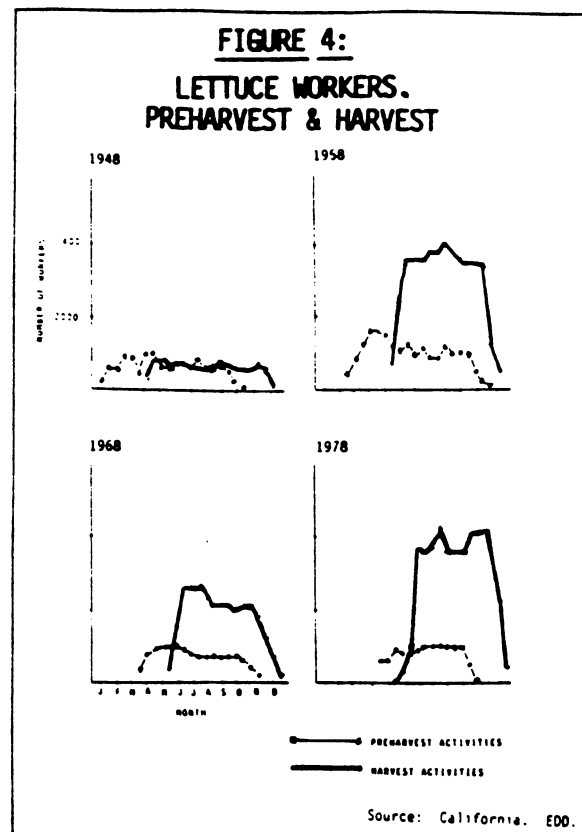
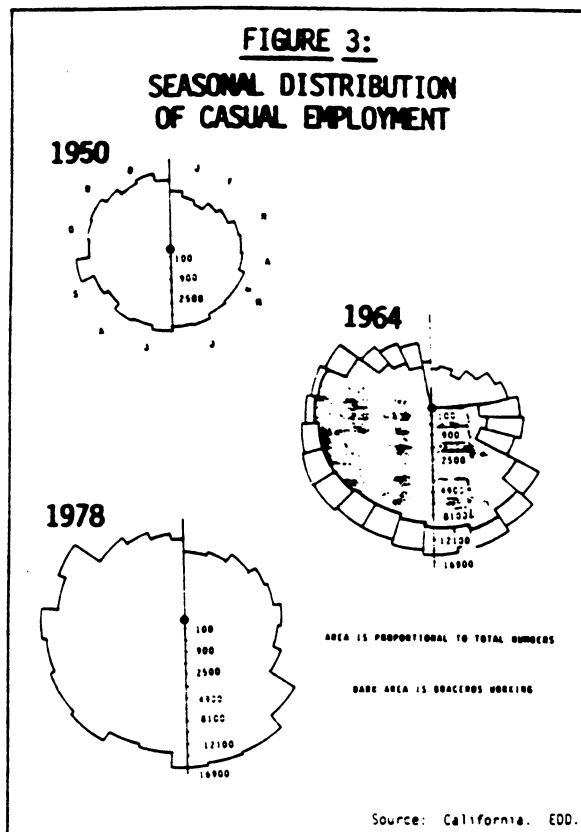


FIGURE 7:
AREAS OF SEVERE SOIL EROSION

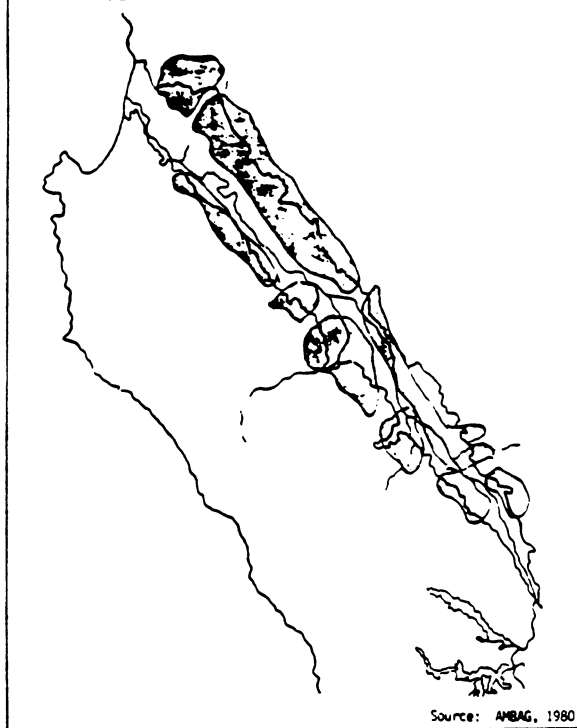


FIGURE 8:
HIGH NITRATE AREAS OF SALINAS VALLEY GROUNDWATER

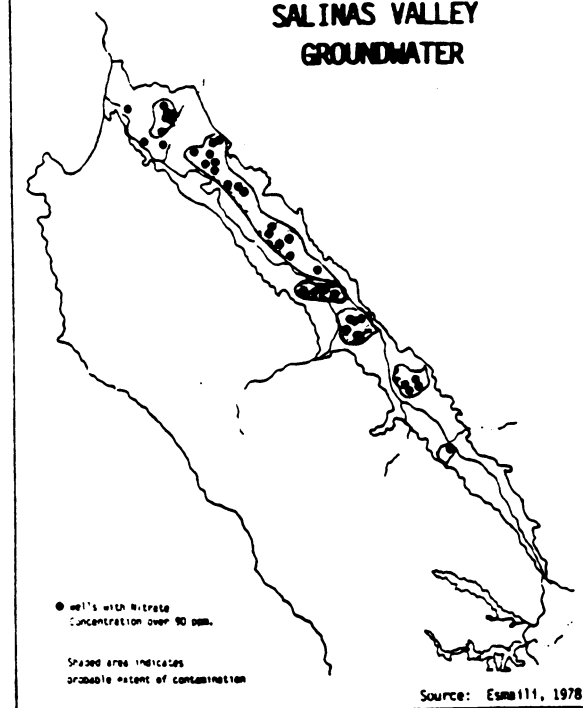


FIGURE 9: PESTICIDES IN SALINAS RIVER WATER & SEDIMENTS

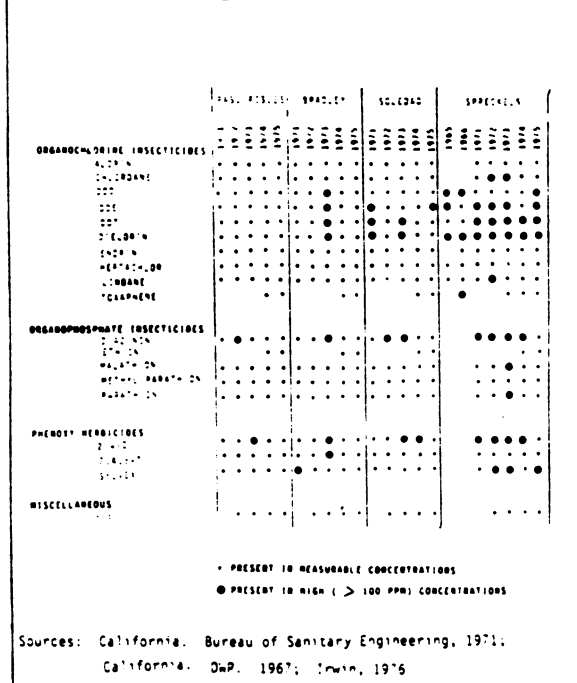


FIGURE 10:
VALUE OF AVERAGE FARM AND AVERAGE ACRE OF FARMLAND

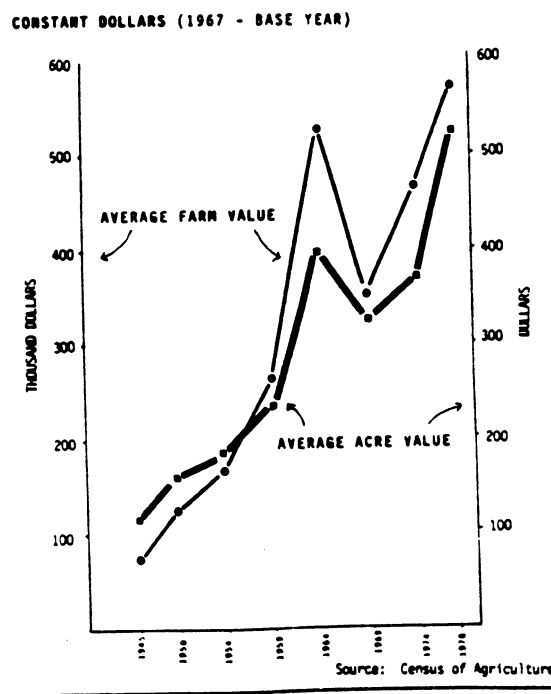
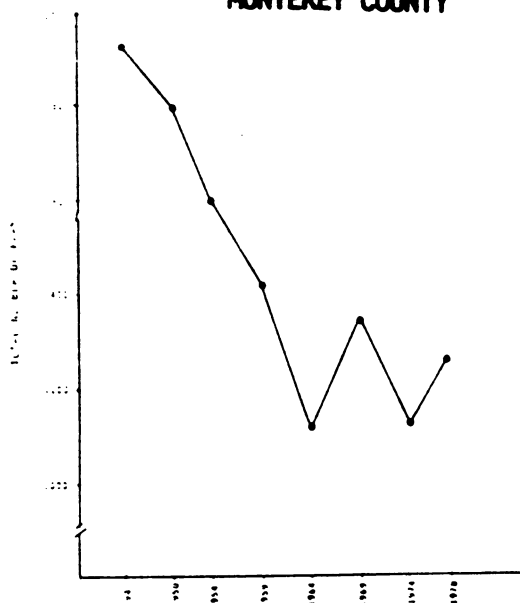
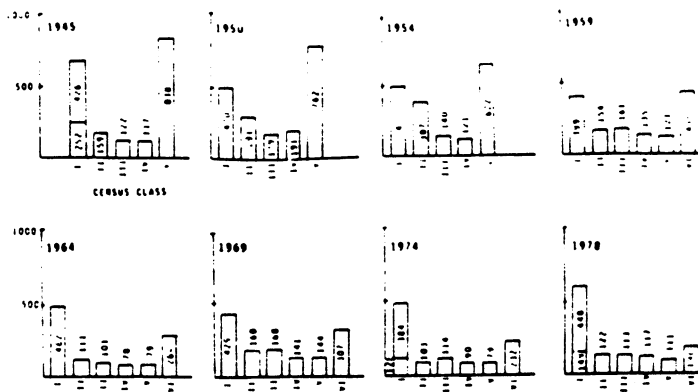


FIGURE 11:
NUMBER OF FARMS,
MONTEREY COUNTY



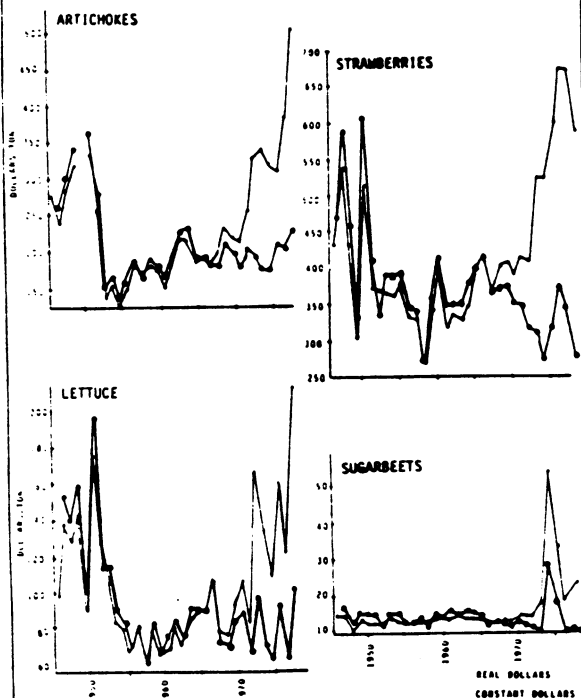
Source: Census of Agriculture

FIGURE 12:
DISTRIBUTION OF FARMS BY CENSUS CLASS



Source: Census of Agriculture

FIGURE 13 MAJOR CROP PRICES -
REAL AND CONSTANT DOLLARS



Sources: Monterey County Agricultural Commissioner;
U.S. Department of Commerce

FIGURE 14A: ACCESS TO MARKETS

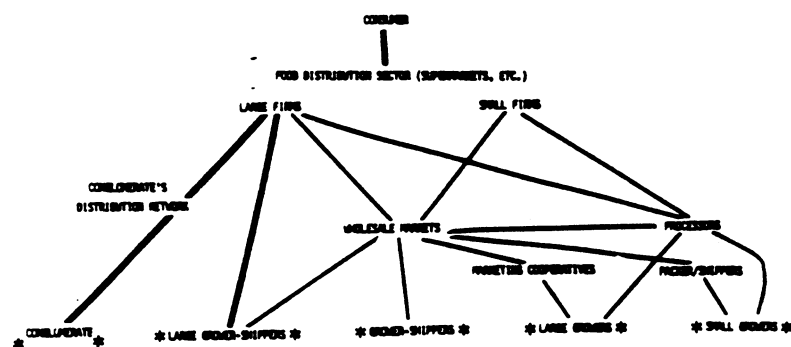


FIGURE 14B: ACCESS TO FINANCE CAPITAL

