

# **Rapid Settlement Diffusion: The Development of the Semi-Peripheral Region North of San Francisco, California, 1850-1880**

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## **Abstract**

This paper analyzes the rapid metamorphosis of a section of San Francisco's northern hinterland from a wilderness to a prosperous village and farming realm. The study region includes the current areas of Sonoma, Mendocino, and Lake counties, and comprises the transitional boundary between the urban core of San Francisco and the resource-dependent periphery of far northern California. After describing the area's distinct physical geography that was the stage for this growth, the paper defines a development process consisting of settlement diffusion, economic specialization, and urban hierarchy (settlement structure) stability. To explore this framework, overall changes in the settlement landscape between 1850 and 1880 are analyzed. These population shifts are placed within the context of the counties' occupational structures, using data from the censuses and county directories. The analysis shows a distinct core-periphery structure in terms of a number of important trades and industries and increasing specialization throughout the region. Other occupations were located according to local geographies and market influences. Additionally, a model derived from this analysis focusing on the spatial construction of stable city hierarchies is proposed, which can be applied to the study of the settlement geographies of other regions across the country. The research shows how quickly these northern California counties melded into the San Francisco economic region with a firmly established settlement structure.

## **Introduction: North Coast California**

Before the discovery of gold in the Sierras, San Francisco and its environs comprised a sparsely populated frontier on the edge of the old Span-

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ish realm. After the Sierra gold finds of 1848, the area rapidly transformed into a settled urban system as a tremendous influx of prospectors and settlers came to seek their fortune in California. The population grew so quickly that statehood was approved in 1850. Interrelated social and economic processes led to this very quick metamorphosis. Specifically, the development of San Francisco's northern hinterland from a wilderness into a prosperous village and farming realm provides a fitting case study to show how quickly in-migration coupled with economic diversification can establish a stable settlement structure upon the landscape.

Numerous studies concerning the geographic and economic structures of settlements have followed Walter Christaller's seminal research on the spacing and sizes of cities in 1933.<sup>1</sup> Still, the research on the actual development of settlement systems has been limited to a handful of places, leaving room for work in other locales to uncover both generalities of regional settlement development as well as individualized differences according to geography and time. Some site-specific examples include those by Earle, and Mitchell and Hofstra who explored the early settlement of parts of Virginia; Berry who spent some time on the Midwest; and Muller who concentrated on the Ohio River Valley.<sup>2</sup> These studies often focused on the process of settlement, dividing it into stages such as pioneer, primate city emergence, subsequent population growth, and the interactions of the resultant towns and villages.<sup>3</sup>

James Vance argued that Walter Christaller's central-place theory did not adequately take into account the impacts of local wholesaling, nor the function external trading connections had on the growth of regions. Further, he posited that the growth of cities in the frontier did not follow the traditional central-place structure because fewer middle-sized cities developed in some frontier regional city-systems. His explanation was that middle-sized cities were not as necessary because wholesale merchants could provide a large range of specialized goods, even with a small local population, without the need for a large retail center.<sup>4</sup> These merchants were able to prosper even with small population bases because they combined the types of goods they sold rather than specializing in one product, which would require a larger hinterland population.

Richard Walker's perspective on the role that natural resource extraction played in California's fast growth sheds light on and complements the explanatory views of Christaller and Vance.<sup>5</sup> The rush for gold and subsequent booms in natural resource industries such as logging and specialized agriculture quickly dwarfed the limited economy of ranching and Catholic missions that was extant in the region in the mid-1840s. This attracted a great infusion of both capital and people. San Francisco grew by quantum leaps, and it needed constant supplies for its growth and for its own service of the

Sierra gold fields. Settlers to its hinterland rushed to fill the needs, coming from both far distances and the near mountains as mining claims played out. Therefore, a slow development trajectory from subsistence farming to staple crop production and urbanized service centers sometimes found in other places was not the order of things in northern California. Its pattern forms a striking contrast with areas of the Old World such as England where population growth was slow and settlement development often occurred over centuries.<sup>6</sup>

Whether propelled by wholesalers or retailers, the settlement process in the Far West proceeded at an extraordinary rate, even by American standards, because of the sudden rush of new settlers.<sup>7</sup> Nowhere was this truer than in California. This paper examines how regional economic and settlement patterns developed differentially in answer to this population influx. The rapid rise of San Francisco to a regional trading metropolis (the “Instant City”<sup>8</sup>) may explain both the lack of medium sized cities in the northern California study area and the concomitant growth of the export-driven agricultural economy there.<sup>9</sup> The amazing growth in the hinterland only served to strengthen San Francisco’s influence and economic advantage.

By emphasizing this rapid evolutionary rush, this article shows how the settlement structure of the semi-peripheral area north of San Francisco developed as it became fully integrated with the wider world. The economic and spatial patterns detailed by Christaller and modified by Vance, with the addition of Walker’s concern for the underlying source of growth, form the groundwork as I outline the development of this region. I therefore highlight the evolution of the area into a system of central places that fell somewhere below the dominant metropolis of San Francisco. This study reduces the scale to just one portion of the state, but it illustrates how the inviting opportunities of the land encouraged settlers to quickly build an integrated settlement system notwithstanding some challenging environmental obstacles.

This paper does not attempt to show whether it was the outward projection of demand conceptualized by Vance or the inward self-contained demand of Christaller that drove settlement growth. I agree that it was most probably a combination of shifting factors over time as Vance mentions.<sup>10</sup> The question therefore is how both wholesale and retail trade blossomed and encouraged growth of an urban settlement hierarchy within an environment initially devoted to rural farming, logging, and mining. After analyzing the settlement geography of three counties in northern California from 1850 to 1880, I propose a general settlement development model. The model incorporates the functional perspective, or the economic employment sector mix that developed during growth, and the spatial perspective, or the speed in which population densities and employment sector patterns evolved in the region.<sup>11</sup>

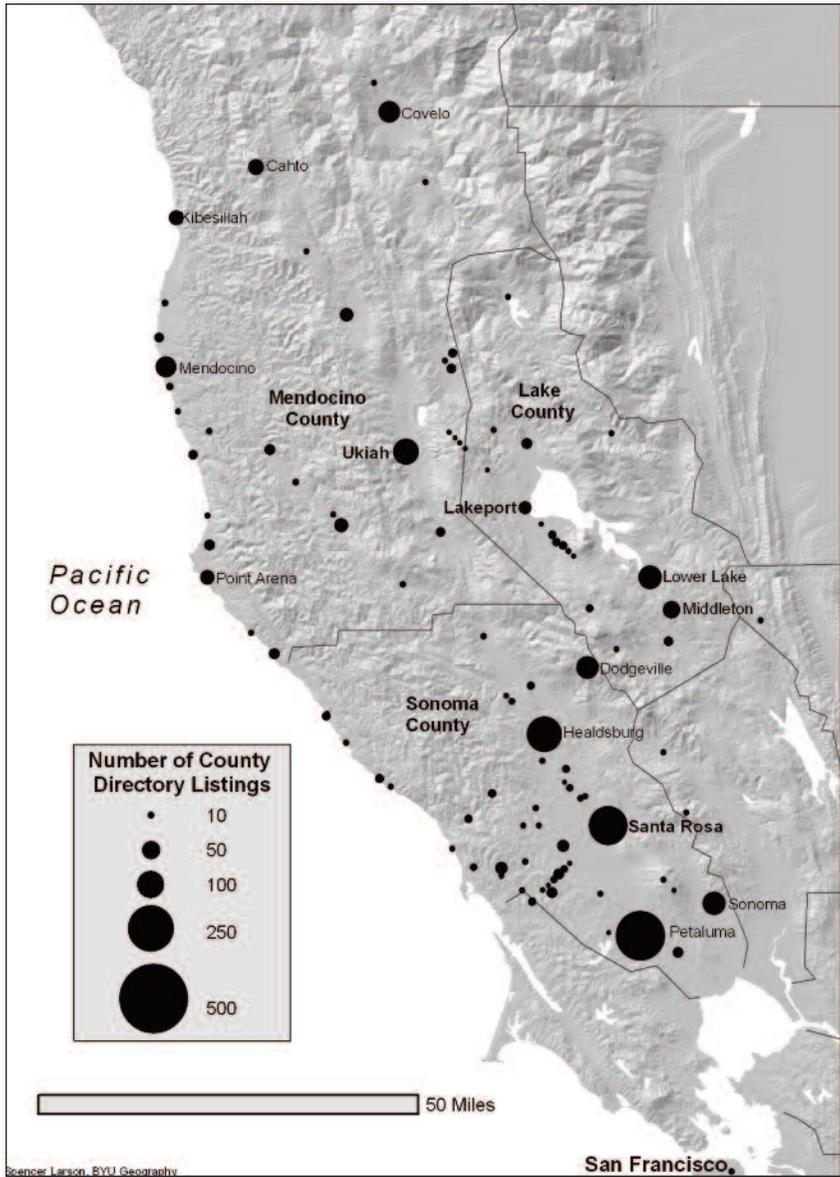
## Methods and Data: The Regional Settlement Process

The three chosen northern California counties of Sonoma, Mendocino, and Lake are excellent starting places for studying how a regional system develops beyond the core city. Historically, the area has been set between the urban center of San Francisco and the resource-dependent periphery of far northern California (Figure 1). Both core and periphery characteristics have been evident here during different time periods, making it an excellent case study for understanding the differences between urban and rural settlement structure and economic transformations over time. The counties were not known for their gold deposits and were essentially a secondary destination for settlers, but because they are in the shadow of San Francisco they still experienced rather rapid settlement.

Additionally, this example also permits the study of the process of settling a new region without having to recreate long settlement histories. The influx of settlers translated into the compressed formation of a regional structure with hierarchically differentiated cities. The good census and county directory data available for the years in question make this area easier to study than other places in the eastern United States that were settled much earlier. Finally, even though the region probably experienced more rapid development than many other parts of the country, it can serve as a test case to illustrate the processes of settlement diffusion that can then be applied to other places and times in American settlement historical geography.

My analysis of the three counties is divided into two main parts: topographical diversity and population structure from 1850 to 1880. The topographical diversity section is the background on the geographical situation or the importance of its variety of terrain and vegetation types. It highlights the settlement constraints and opportunities associated with the coastal areas, valleys, and mountains of these counties. The geographic background forms the basis for the population growth and economic structure that developed in the region.

Changes in the settlement landscape from 1850 to 1880 are discussed in the population section. The discussion includes a short analysis of the overall settlement development, or diffusion, in the three study counties plus a reference to the influence of San Francisco County. The population shifts are placed within the spatial context of their diversifying economies from 1850 to 1880 by analyzing the counties' changing occupational structure. The section will also show that as the new region grew, its settlement hierarchy not only diversified, but it also became more stable in form and function over time.



**Figure 1.** Listings of 10 or more people in *L. L. Paulson's Hand-book and Directory* in 1874 for Sonoma, Mendocino, and Lake Counties. (Map by Spencer Larson, BYU Geography)

### *County Directories and Censuses*

The prime data sources for the population analysis were *L. L. Paulson's Hand-book and Directory of Napa, Lake, Sonoma and Mendocino Counties* (1874), samples of households from the U.S. censuses from 1850 to 1880, and the 1852

census of California for Sonoma County.<sup>12</sup> *Paulson's Hand-book* includes a list of adult citizens, their occupations, places of business, residences, and names of their local post offices. It itemizes some businesses as well. Although it does not include all of the counties' adults, this directory has one advantage over the official U.S. censuses: it gives the place of residence so that it can be located on a map. This enabled the illustration of the economic pattern of each county both visually and statistically. This directory is therefore an excellent resource in addition to the basic decennial census records.

An important component of the research was mapping all of *Paulson's Hand-book* directory listings. The locations were originally written in the directory using cardinal directions and distance from a certain town (e.g., 3 miles northwest of Santa Rosa) to pinpoint a person's residence. If they actually lived in a town, the street address was given. After each of the entries was entered into a database, I converted the listed locations of each residence to latitude and longitude coordinates. These coordinates became the basic data for mapping occupations.<sup>13</sup>

I made maps to compare the types and numbers of occupations by county in order to develop a structure of the economy from core to periphery by industry.<sup>14</sup> After I located the directory entries for each listing, I plotted groups of people according to their occupation. For the purpose of this paper I first mapped all the points to show the basic spatial density of the county and then I plotted various types of occupations to show their particular patterns. This exercise proved valuable as a way to better show the place-specific distributions of the region's citizens and to underscore the hierarchical structure of economic differentiation.

### Assessing Topographical Diversity

Migrants settled Sonoma, Mendocino, and Lake counties soon after San Francisco. Before the 1850s, the Anglo-American population was very sparse in the region. The bulk of the new settlers found their way to Sonoma County, while the Lake and Mendocino areas were virtually undiscovered until after 1850. The area of Sonoma County was the most accessible and included the northernmost Spanish mission in the village of Sonoma. Additionally, the southern reach of the Russian fur trade was along the coast in future Sonoma County in the vicinity of Fort Ross, which fort was in use from 1812 to 1841.<sup>15</sup> Sonoma County's early communities included Sonoma (the town), Petaluma, and Santa Rosa, established in 1835, 1851 and 1851 respectively.<sup>16</sup> The 1850 census reported 559 people in Sonoma County, 55 in Mendocino County (mostly men), and only a few families in the area that would later become Lake County (officially created in 1861).

Although the topographic base does not determine the unfolding of

the system of inhabited places, it does provide a distinct stage on which these activities proceed. Three main divisions of the region's physical geography are recognizable: the coast, the coastal mountain ranges, and fertile river and lake valleys in the interior. The first two divisions saw fewer settlers initially, while the valleys were the prime destination for new arrivals. Additionally, even though the climate varied throughout the region, it is and was generally agreeable and was therefore an attractive selling point for new settlers.

### ***The Coast***

The northern coast of California was rugged and in many places nearly impassable. Ports along the Sonoma and Mendocino coasts were, without exception, small, possibly due to their less than ideal connections to the counties' interior. The outlets of several rivers (e.g., Russian and Noyo rivers, which emptied at Jenner and Fort Bragg respectively) and good natural harbors (such as Bodega Bay) proved to be the most promising coastal locations, but these still did not grow substantially. This is true even though the redwood logging of the late 1800s boosted shipping along the coasts for a time. Sea trade's reach inland from the coast was not far, possibly because of the rugged hills that rose directly east of the sea. One exception is that Sonoma County on the southeast adjoined the more accessible San Pablo Bay, which neighbored San Francisco Bay. That transportation advantage was vital for the future success of Sonoma County.

### ***Mountains***

Settling in the coastal mountain ranges was not an easy task. The forests were thick and the slopes extreme. Newcomers had to carve out a home site on the most level spot they could find. Sonoma County was the least rugged of the three counties, but the coastal range in this area was still difficult to traverse in many places. For even more variety in elevation one only had to look to Lake and Mendocino counties. Mountains ringed Lake County, which made it particularly difficult to reach the Clear Lake area, thus delaying settlement until good roads were constructed.<sup>17</sup> Additionally, Mendocino County had a plenitude of rugged terrain throughout. The influx of settlers therefore had to decide where they wanted to settle within this widely varying topography. The resulting uneven population distribution attested that more pioneers chose not to homestead and farm in the mountains (see Figure 1).

The three counties fell in a relatively medium range of California ruggedness and accessibility. On one side, the hills of Lake County overlooked the flat and fertile Sacramento Valley, which struck a strong contrast between two topography types. On the other hand, the Sonoma, Lake, and Mendo-

cino study region was less mountainous than the Humboldt, Trinity, and Del Norte country farther north. Additionally, Sonoma, Mendocino, and Lake counties had another important advantage over the far northern counties: they were substantially closer to San Francisco, thus inviting more economic interaction and physical linkages.

Even though the mountains generally saw fewer settlers, some economic activities were especially successful there. Logging, ranching, quicksilver mining (silver and quicksilver mining were concentrated in the mountains of southern Lake and eastern Sonoma counties for a time), and mineral springs resorts (especially in Lake County) were very successful in their day.<sup>18</sup> In this terrain, redwood logging was most noteworthy as a population lure. Just inland from the coasts from northern Sonoma County through Mendocino County and beyond, the thick redwood forests were cut at an amazing rate beginning in the 1850s.<sup>19</sup> All in all, the coastal ranges provided income to the new settlers, but it was hard fought.

### *Valleys*

Even though the coastal and mountain regions had their appeal, it was the valleys that became home to the bulk of new settlers. Early explorers found these flatter lands to be quite inviting. Moisture was adequate; temperatures were moderate; and the soils proved to be productive. When this positive word got out to people in the eastern United States and to both the successful and unsuccessful miner in the Sierras, these northern California counties became a destination for a great number of new settlers.

Some specific valleys deserve attention. The lowlands along the Russian River were a prime settlement destination in both southern Mendocino and northern Sonoma counties, with the notable towns of Ukiah, Healdsburg, and Cloverdale developing along its banks. In Lake County, flat land was limited to the area around Clear Lake (known as Big Valley) and smaller valleys between the rolling hills and mountains (e.g., Scotts Valley, Long Valley, and Clover Valley). Round and Potter Valleys of Mendocino County were harder to reach but proved to be attractive destinations because of the quality of their farmlands.

Southern Sonoma County had a particularly advantageous situation. It was large, flat, and closest to the San Francisco area. Petaluma, Santa Rosa, and Sonoma (town) grew with the farms that were nurtured in the surrounding countryside. Most significantly, agriculturists soon found this area of Sonoma County to be an excellent environment for vineyards and wine production. The fact that this southern part of the three-county study region was both close to San Francisco (easing agricultural transportation costs) and relatively flat made farming there a positive venture. Hence, by 1874 population was relatively dense in these southern towns and neighboring lands.

## **Population Analysis: Diffusion, Diversification, and Stability**

There are three interrelated issues that are addressed here. The first is the founding and growth of new settlements. The second is economic diversification and specialization and the resulting differential growth of the communities within the regional structure. Finally, the third is the evolution of the region towards settlement structure stability.

Here I argue that the spread of homesteads and towns in a new frontier, which I call settlement diffusion, follows the traditional diffusion process. At some point each tract of “wilderness” will probably experience the diffusion of villages and cities across its landscape. As with other diffusion processes, this spread can occur quite quickly or can take place over centuries. At some point diffusion saturation occurs as settlements have been founded throughout the region’s hinterland.

During settlement diffusion there is a marked place differentiation or economic specialization and diversification among places. It occurs as people continually seek the most viable uses for their land, and as they develop the manufacturing of goods or the providing of specialized services to profit from the people locally or in neighboring regions. Over time the region fills with more people, but growth is unevenly distributed. People gravitate toward areas with the most potential or greatest immediate need for labor. The process is fueled by growing retail and wholesale economic relationships (as shown by Christaller and Vance) and the existing physical geography or stage upon which this system of cities comes to be.

Settlement stability occurs when the main towns and cities in a region are not only settled, but also become firmly differentiated in terms of relative size and function. This transformation is important because it marks the point when settlement distribution and relative size remain fairly stable from that point onward. This can be seen simply by comparing relative county and city sizes over time. With the hierarchical settlement stability, there may also be a measure of functional stability in terms of employment levels in the various economic sectors. This is not definitive because this paper does not track the actual functional stability levels in the regional economy past 1880.

### ***Settlement Diffusion, 1850-1880***

Large-scale immigration into California helped speed the establishment of its settlement hierarchy. It did not take long for San Francisco to grow into one of the most densely populated counties in the nation. San Francisco received a tremendous boost from the discovery of gold in the Sierras and it became a merchandising center serving the waves of new immigrants

who came to seek their fortunes in the mines. Its greatest percentage growth was during the 1860s, but every decade from 1850 to 1880 showed the high rates of in-migration experienced by the county. The population of the city ballooned from a small community of about 500 in 1847 to over 56,000 by 1860, and nearly 150,000 in 1870.<sup>20</sup> By 1880, San Francisco had about 234,000 people with a density of 4,561 people per square mile (see Table 1). Its population dwarfed that of surrounding areas, leaving Sonoma, Mendocino, and Lake counties far behind, even though these semi-peripheral areas registered significant growth themselves.

With changing transportation methods, San Francisco was able to reach out to distant areas. Because the city is on a peninsula, most travelers going north had to ferry across the bay to Marin, Sonoma, Napa, and Solano counties. Before the construction of the large bay bridges, the ferry was a very efficient way to begin a trip to the north. Investors later constructed railroads up Napa Valley and through Sonoma County (by 1871) to quickly move San Franciscan freight and passengers arriving from the ferry ports along the bay.<sup>21</sup> These transportation connections further strengthened San Francisco's ability to connect with its hinterland. San Francisco's dominant status in the region has continued to this day.<sup>22</sup>

Sonoma County quickly became the most populous unit of the three-county study region. In terms of density, Lake and Mendocino counties followed pretty closely during this thirty-year period, with some shifting in position. In 1870, Lake and Mendocino counties both barely qualified as "settled" at over two people per square mile, while Sonoma was six times more densely populated. This trend continued with Lake and Mendocino counties growing relatively quickly in terms of percentage growth, but always trailing the absolute numbers of Sonoma County. Sonoma's importance revolved around its central role in the regional lumber, mining, service, and farming industries, as well as the transportation connections that developed from within its borders to points to the north and south.

### ***Diversification in the Economy, 1850 – 1880***

In 1850, California had just gained statehood and the bulk of new settlers were heading to the gold fields of the Sierras, the trading center of San Francisco, or places in between these two areas. Just off of this main settlement track was an area awaiting its own wave of newcomers. While Mendocino County showed its small size with all heads of households working as farmers or in lumber, Sonoma County exhibited what appeared to be a highly diversified economy for its early age with only 56.5 percent working in the primary sector including laborers (Table 2; all primary sector figures quoted here include laborers).<sup>23</sup> Just two years later Sonoma County had grown sub-

**Table 1.** Population Density per Square Mile and Total Population of Lake, Mendocino, Sonoma, and San Francisco Counties from 1850-1880 (Source: US Census)

	Lake	Mendocino	San Francisco	Sonoma
1850	<b>Density</b>	0.01		0.27
	<b>Total</b>	55	**	560
1860	<b>Density</b>	N/A	1,107.25	7.83
	<b>Total</b>	[962]*	58,802	11,867
1870	<b>Density</b>	2.36	2,913.70	13.07
	<b>Total</b>	2,969	149,473	19,819
1880	<b>Density</b>	5.23	4,560.60	17.1
	<b>Total</b>	6,596	233,959	25,926

\* Lake County did not exist until 1861. This number is the population of Clear Lake Township in Napa County, which was the population of much of the future Lake County.

\*\* Data from the 1850 Census of San Francisco was lost/destroyed.

stantially, but workers in natural resource extraction had actually grown in their share of the workforce to 71.7 percent. This curious shift could have been an aberration or it may indicate the early settlement centrality of the area, even extending back into the Spanish period.

By 1860, distinct economic patterns among and within each of the counties are evident. Sonoma County still had a majority (63.7 percent) employed in the primary sector, but the main cities of Santa Rosa and Petaluma had already become service centers in the local settlement hierarchy with 66.7 percent and 45.4 percent employed in services and 10.1 percent and 27.4 percent in the primary sector, respectively. Mendocino County had some 83 percent in natural resource extraction even with its steady growth. Finally, the area of Napa County that would later become Lake County seemed to be in an even earlier stage of settlement with over 90 percent working in agriculture and related activities (Table 2).

The next two decades saw variable growth in services and manufacturing among the counties. Sonoma County's manufacturing hovered in the range from 9.3 to 12.7 percent of total employment, while its reliance on services ranged from a low of 19.5 percent in 1870 to a high of 24.7 percent in 1880. Meanwhile, Mendocino County's manufacturing sector grew to be the largest of the three counties as its lumber mills grew in number and size within the redwood forests, accounting for 18 percent of those employed by 1880. Another 16.8 percent worked in services at that time. Lake County continued to be heavily reliant on the primary sector (mostly farming) with over 61 percent of the workers still employed in that sector in 1880, and only 21 percent in manufacturing and services combined.

### ***Specialization and Occupational Structure in 1874***

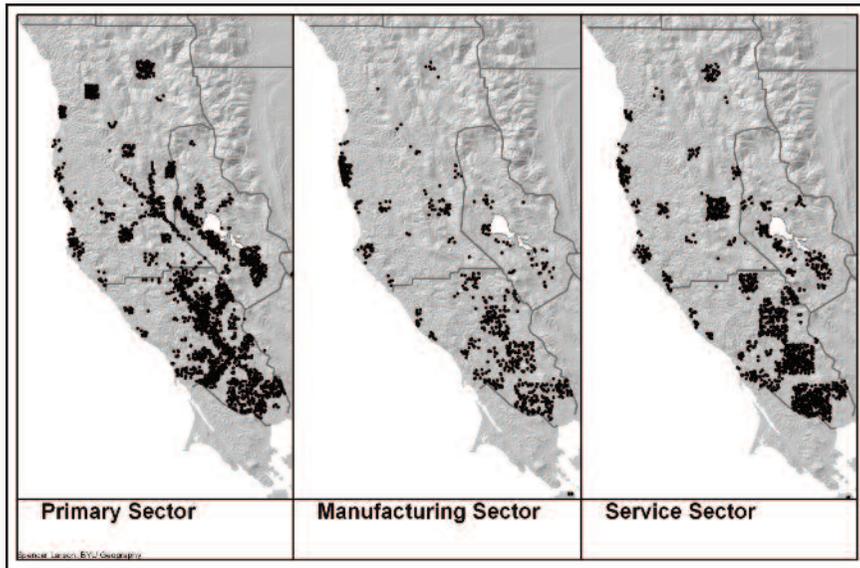
*Paulson's Hand-book* was published at a good time. It appeared in the midst of the continuing population expansion of the late nineteenth century. Opportunity continued to bring new people eager to fulfill their own California dream of economic success, which they found with varying levels of success.<sup>24</sup> Thus, the directory provides an imprint of the settlement geography at a time when the land had been thoroughly impacted by European settlers, while it still had much potential for further population growth. This source also allows a large-scale comparative analysis of the economic differentiation of three largely rural counties. It thereby shows that areas relatively far away from urban centers can still display descending levels of specialization, just as large cities themselves have been shown to exhibit differentiation in various characteristics.<sup>25</sup>

The contrast in numbers of occupations in the three counties is significant. The figures indicate the counties' relative levels of economic spe-

**Table 2.** Sonoma, Mendocino, and Lake Counties Occupational Structures, 1850-1880 (Source: US censuses, 1852 California Census, and Redwood Empire Social History Project, for Sonoma County 1852, 1860)

	Primary # %	Laborers # %	Manufact. # %	Services # %	Transport # %	Not Working # %	# of People in Sample	Total Population
<b>Sonoma</b>								
<b>1850</b>	105 46.7	22 9.8	39 17.3	57 25.3	2 0.9	0 0	225	560
<b>1852</b>	722 57.8	174 13.9	97 7.8	205 16.4	28 2.2	24 1.9	1,250	
<b>1860</b>	2084 46.4	777 17.3	417 9.3	1028 22.9	109 2.4	74 1.6	6,395	11,867
<b>1870</b>	199 53.8	17 4.6	47 12.7	72 19.5	6 1.6	29 7.8	370	19,819
<b>1880</b>	232 46.1	30 6	52 10.3	124 24.7	15 3.0	50 9.9	503	25,926
<b>Mendocino</b>								
<b>1850</b>	8 87.5	0 0	1 12.5	0 0	0 0	0 0	9	55
<b>1860</b>	119 71.7	19 11.4	13 7.8	11 6.6	3 1.8	1 0.1	166	3,967
<b>1870</b>	245 47.3	51 9.8	71 13.7	93 18	33 6.4	25 4.8	518	7,545
<b>1880</b>	280 46.6	42 7	108 18	101 16.8	29 4.8	37 6.2	601	12,800
<b>Lake</b>								
<b>1860*</b>	309 85.8	19 5.3	5 1.4	26 7.2	0 0	1 0.2	360	
<b>1870</b>	84 51.5	32 19.6	19 11.7	13 8	4 2.5	11 6.7	163	2,969
<b>1880</b>	90 46.4	43 17	24 9.8	28 11.2	9 3.6	30 12	225	6,596

\*part of Napa County in 1860



**Figure 2.** Individual Listings in Main Economic Sectors in Sonoma, Mendocino, and Lake Counties: L.L. Paulson's *Hand-book and Directory* (1874). Map, Spencer Larson, BYU Geography.

cialization. Sonoma County had 292 different occupations or types of businesses listed while Mendocino and Lake counties had 161 and 102 respectively (see Table 3).<sup>26</sup> One point of interest was that Mendocino and Lake had relatively more occupations than Sonoma in terms of total numbers of people listed in those counties. However, Sonoma's high numbers of service and manufacturing occupations shows how diversified its economy was at that early date, and its higher order in the settlement hierarchy. Jobs there ranged through the alphabet from architect, bee raiser, and brick maker, to tinsmith, undertaker and woolgrower.

Sonoma also had the smallest percentage of workers listed within the primary economic sector (including laborers: 47.8 percent), while Lake County had the most (with laborers: 63.2 percent). Mendocino had the largest share of laborers, possibly influenced by the number working in the forests. In contrast, Lake County had the lowest percentage of people employed in the secondary or manufacturing sector (6.7 percent), and Sonoma had the highest percentage of service and transportation workers (28.6 percent and 3.4 percent, respectively). Clearly, the economic landscape of the three counties had moved toward differentiation according to population size and geographic situation.

Overall population density was greatest in southern inland Sonoma County around Petaluma, Santa Rosa, and Sonoma (see Figure 1). Going northward the numbers steadily decreased through the Russian River valley

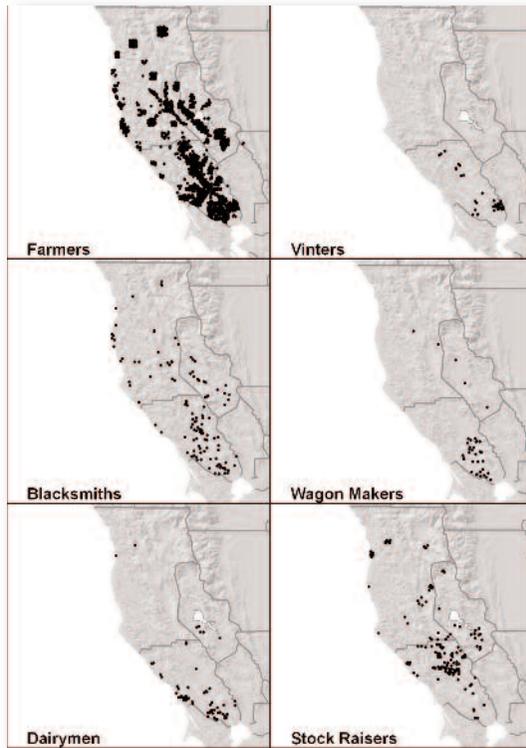
**Table 3.**

<b>Panel A.</b> Percentage of Paulson's Hand-book Listings by Major Economic Sector			
	<i>Lake</i>	<i>Mendocino</i>	<i>Sonoma</i>
Primary Sector (without Laborers) (% of total listings)	58.5	45.8	43.6
Laborers	4.7	9.0	4.2
Manufacturing	6.7	14.1	13.1
Services	22.9	24.8	28.6
Transportation	2.8	2.9	3.3
Not Specified/Not Employed	4.4	3.4	7.2
<b>TOTAL LISTINGS</b>	<b>887</b>	<b>1473</b>	<b>3343</b>
<b>Panel B.</b> Specialization by Economic Sector			
Different Primary Sector Occupations	6	9	17
Laborers (unspecified)	1	1	1
Different Manufacturing Occupations	26	45	67
Different Service Occupations	63	95	184
Different Transportation Occupations	6	11	23
<b>TOTAL DIFFERENT OCCUPATIONS</b>	<b>102</b>	<b>161</b>	<b>292</b>

and into Mendocino County, where fewer people lived, although there were greater densities along the Mendocino coast than the Sonoma coast. In Lake County, the bulk of the population lived to the south and west of Clear Lake as well as farther south in the Middletown region near Napa County.

The considerable variation in settlement density is further clarified by looking at the distribution of workers in several occupational fields (see Figure 2 and Table 2).<sup>27</sup> As expected, the primary sector of mostly farmers was most dispersed and widespread, while manufacturing was concentrated in Sonoma County and along the coast of Mendocino County where a number of sawmills were located. All three counties had a large number of listings in the service sector, with the bulk of these people residing in the towns.

Within the primary sector, farmers not differentiated by specialization made up the majority of the listings, but other occupations should be noted (see Figure 3). Dairy farmers were mostly found in southern Sonoma County near the largest population centers. Stock raisers (ranchers) were most plentiful in northern Sonoma County as well as the Middletown (Guenoc) area of



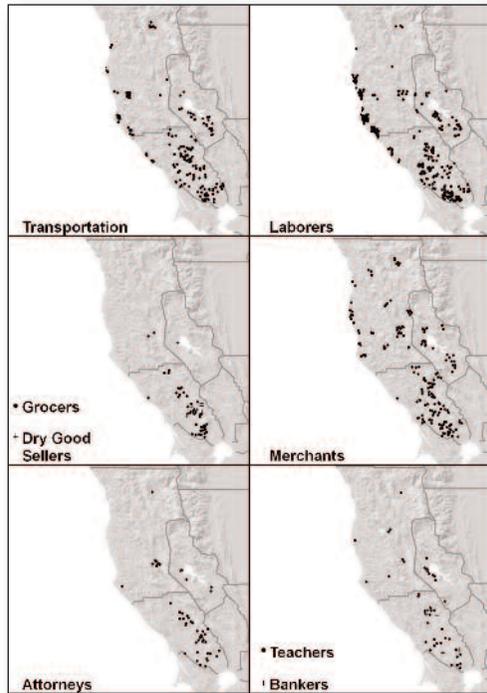
**Figure 3.** Listing Locations of Some Agricultural and Trade Occupations: *L.L. Paulson's Hand-book and Directory* (1874).

southern Lake County. The beginnings of the grape vineyards and wine-making industry could also be seen in southern Sonoma County with the large number of vintners there (vineyards have since spread throughout the valleys of all three counties). Finally, mining, mostly of quicksilver (mercury), was basically limited to the mountainous regions of northeastern Sonoma County and bordering areas of Lake County.<sup>28</sup>

Blacksmiths and carpenters were fairly ubiquitous, while the more specialized occupations of wagon and harness makers were limited in their distribution to Sonoma County and a few select locations in the other two counties (Figure 3). This pattern shows how the population differences among the three regions translated into an advantage for Sonoma County in a number of trades. The specialized trades simply had a larger population threshold, and were therefore usually found close to more densely populated areas. This location practice, still common today, allowed these businesses to be economically viable by more efficiently servicing larger numbers of people.<sup>29</sup> The specialization seen in this region helps underscore the importance of some retail functions as Christaller showed.

In contrast, the work of moving people and goods showed a pattern unlike other occupations, because those employed as teamsters and other transport workers (e.g., sailors and toll keepers) were often located away from the major towns (Figure 4). For example, the large number of teamsters in far away Round Valley (northeastern Mendocino County) departed sharply from the dearth of listings in Ukiah, the county seat. This was partly true because the teamsters were in the business of transporting things from a city, port, or railroad depot to remote communities. Many in the transportation sector apparently lived in those villages at the distant end of the line. Additionally, for the few water transport workers such as the boss lighterman at Navarro Mill, Mendocino County, their places of employ were normally away from the population centers farther inland.

The business of selling goods was very widespread, but self-proclaimed specialized grocers and dry goods proprietors were once again concentrated in Sonoma County (Figure 4). Particularly, dry goods specialists were found almost exclusively around Santa Rosa, while butchers were more dispersed, roughly paralleling the overall population distribution. These are logical locational choices. Since dry goods do not spoil, proprietors in that business could compete and distribute their goods over a large area. Conversely, the butchers had a more perishable good that needed to be sold within



**Figure 4.** Listing Locations of Laborers and Some Service Trade Occupations: L.L. Paulson's *Hand-book and Directory* (1874).

a reasonable travel distance to prevent spoiling. Merchants, as Vance would emphasize, were spread throughout the three-county region also as they could profit even with a small market. The concentration of some retail industries versus the dispersion of wholesale ones and others lends credence to both Vance's wholesale model and Christaller's central place paradigm.

Physicians, dentists, teachers, and attorneys had all made their way into the region by 1874 (Figure 4). These service occupations tended to congregate in the towns, except that more teachers lived farther out in the country in comparison with the other professionals. Once again, the larger population base of Sonoma County allowed it to garner a greater share of the professionals of the day. The line between the developing core of Sonoma County and the more peripheral status of Lake and Mendocino counties was clearly visible in this occupational area.

Saloons and ministers had a noteworthy spatial configuration. Southern Sonoma County appeared to have more than its fair share of saloons, as did Round Valley in northern Mendocino County. On the other hand, Walker Valley in central Mendocino County seemed to openly avoid alcohol (no saloons listed with six hotels though alcohol could have been sold at these hotels). If religiosity can be measured by the numbers of ministers in residence then it should be noted here, albeit somewhat facetiously, that Mendocino had nine ministers to the more populated Sonoma's ten. Furthermore, the ratio of ministers to saloons was the lowest in Sonoma County (10 ministers to 76 saloons or .13) and much higher in both Lake and Mendocino counties (.31 and .30 respectively).

The *Paulson's Hand-book* data show the tremendous diversification in the economy that had occurred just 24 years after statehood. To be sure, natural resource extraction, especially farming, still held the preeminent position in terms of total numbers employed. However, the sheer growth in numbers of occupations and their local concentration for some jobs and dispersion for others indicate that the retailing service function emphasized by Christaller and wholesaling tendencies shown by Vance and their ability to reach farther out into the hinterland were both at play in this region.

### ***Approach to Settlement Structure Stability***

It is remarkable to see how quickly the economies of these counties "settled" into a clearly implanted settlement structure, or urban hierarchy, with fairly stable employment ratios. The progression from 1850 to 1880 was quite startling. In 1850, there were only a handful of people in the Lake County area (not listed in the census), 55 in Mendocino, and 560 in Sonoma. Only thirty years later there were 6,596 in Lake County, 12,800 in Mendocino, and 25,926 in Sonoma (see Table 1). In other words, Sonoma County, followed

later by Mendocino and Lake counties, sped from a wilderness state through the frontier period to a developed farming and services structure in just thirty years. With this large population boom, there was a total transformation of the economy spurred by its original resource-extraction base.<sup>30</sup>

Although only thirty years had elapsed from statehood, this semi-peripheral area had already developed a more stable and recognizable structure. There was both an overall approach to employment sector stability as evidenced by smaller changes among economic sectors from 1850 to 1880, and a noticeable move toward regional integration of cities and townships by function and size. A Chi-square analysis comparing the amount of change between years in the relative distribution of jobs among the main employment sectors shows substantial declining volatility for all three counties (see Table 4). The Chi-square values all register significant differences between years, but the great drop in the three counties indicates that there was much less change between 1870 and 1880 than between earlier years. In terms of function, Sonoma County had emerged as the predominant county in population with the largest service sector. Mendocino County followed being second in numbers of inhabitants, while it had a similar proportion of people in the primary sector. However, it had many fewer workers in the service sector. Finally, Lake County had evolved into an agricultural and quicksilver mining center complemented by a small recreation/resort economy focused on the county's many mineral springs.

Many towns within the three counties had also grown to noteworthy size by 1880. Santa Rosa, Petaluma, Healdsburg, and Cloverdale had set themselves firmly into settlement hierarchy within Sonoma County. Ukiah in Mendocino County, and Lakeport in Lake County had developed into the most important cities of their respective counties, partly by virtue of being county seats. Even though these cities had grown substantially, they still were significantly smaller than San Francisco. Vance's explanation that middle-sized cities would have been less likely in regions where wholesaling was dominant, may be applicable in this case. Future urban growth focused on the budding cities, while some smaller towns were set to shrink.<sup>31</sup>

Further evidence of significant development during this thirty-year

**Table 4.** Chi-square of Changes in Employment Distribution between Years

	1850-1852	1852-1860	1860-1870	1870-1880
<b>Lake</b>	Insuff. data	Insuff. data	224.8	32.8
<b>Mendocino</b>	Insuff. data	Insuff. data	231.0	14.8
<b>Sonoma</b>	150.8	257.4	47.7	20.2

(Comparison between years in employee levels of laborers, primary, manufacturing sector workers, and service sector workers [including transportation]. The expected values were from the first year in each period). All significant at the .001 level.

**Table 5.** Specialization in Occupations, 1850-1880 (Sources: US censuses; 1852 California Census; Redwood Empire Social History Project, for Sonoma County 1852, 1860; and L. L. Paulson's *Hand-book and Directory*)

	Full	Full	Full	Full	Sample		
	Count	Count	Count	Direct.	Sample	Sample	Sample
	1850	1852	1860	1874	1860	1870	1880
<b>Lake County</b>							
Different Occupations				102	20	25	50
Number of People				879	360	155	259
Specialization Ratio				0.12	0.06	0.16	0.19
<b>Mendocino</b>							
Different Occupations	2			161	18	70	72
Number of People	8			1473	166	517	610
Specialization Ratio	0.22			0.11	0.11	0.14	0.12
<b>Sonoma</b>							
Different Occupations	32	99	230	292		56	82
Number of People	225	1250	4489	3343		370	503
Specialization Ratio	0.14	0.08	0.05	0.09		0.15	0.16

(Note: The specialization ratio is the ratio of different occupations to the total number of people for each year)

period was the increasing specialization and differentiation that had developed within the counties. For example, in 1860 Sonoma County the Census reported 116 different service occupations among 1028 service workers, while the 1874 *Paulson's Hand-book* indicated that Sonoma County had 184 different

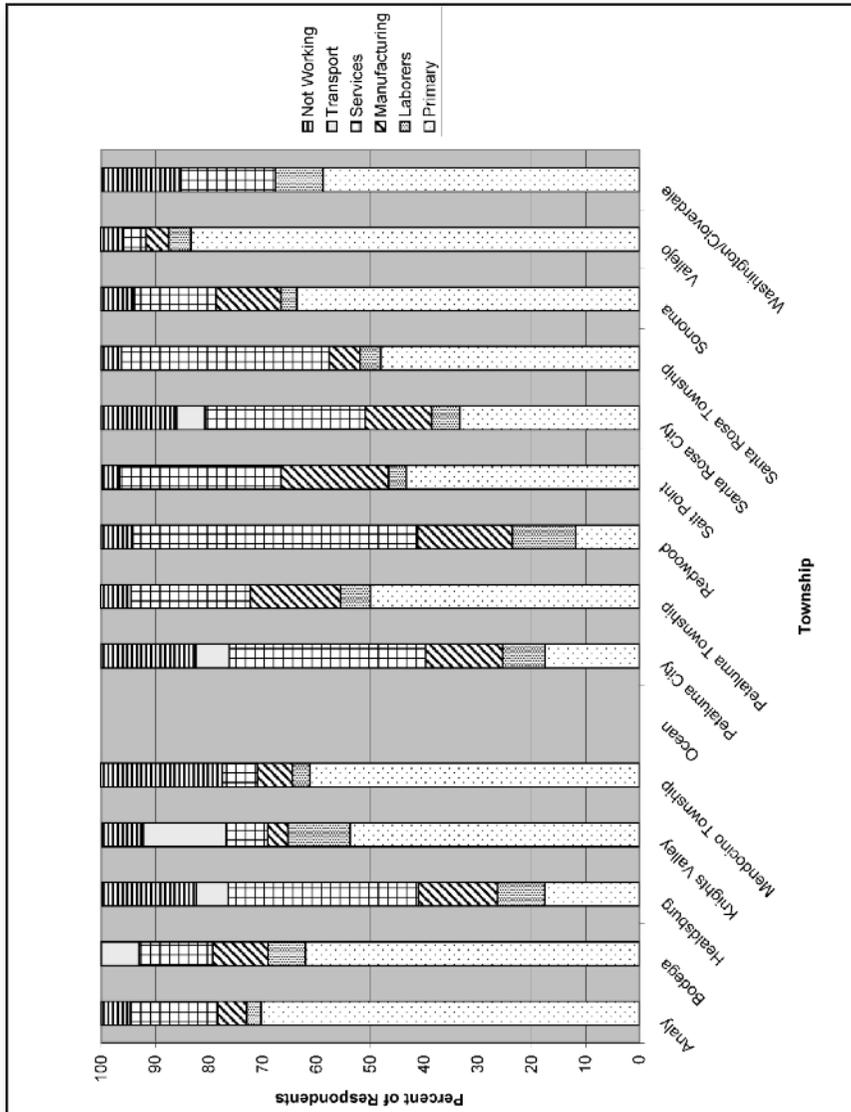
service jobs for just 955 service listings. The greater size and diversity of the service sector in Sonoma compared with the other counties suggests that the hierarchy posited by Christaller was forming in the region. Additionally, the overall ratio of occupations to total workers increased between 1860 and 1880 in Lake and Sonoma counties, pointing to more relative specialization each year (Table 5). Mendocino County showed a small drop between 1870 and 1880 using the sampled totals, and it had the lowest specialization ratio of the three counties, possibly indicating its greater reliance on services provided in Sonoma County. Finally, sub-county tabulations indicate that the townships in each county had differentiated themselves economically, with each area showing their distinctive economic structure (see for example Figure 5). Thus by 1880 the region had moved quite far toward being well established in settlement structure and function.

### A Model of Settlement Diffusion

Christaller's classical central place theory does not provide for instances when a region is not located on a flat plain, or anything approaching a level surface. However, it still can be a basis for understanding variations in the settled environment.<sup>32</sup> The settlement diffusion history of Sonoma, Mendocino, and Lake counties, with their rugged environments, shows how unevenly settlement can be imprinted on the landscape. As Davies points out, "[t]he precise relationships existing in the case study area must be the result of local circumstance."<sup>33</sup> This admission, however, does not diminish the fact that a hierarchy of settlement sizes and economic diversification diffused very early from San Francisco outward. Far-flung merchants and a lack of middle-sized cities in comparison to San Francisco helped support Vance's wholesaling perspective. Indeed, at a larger scale, distance to San Francisco was a key element in the success of new developments in Sonoma, Mendocino, and Lake counties, as locations closest and most accessible to San Francisco had distinct advantages (particularly in southern Sonoma County).

The rapid settling of northern California studied in this paper need not be seen in isolation. Thus I propose a general model derived from the specific historical geography of Sonoma, Lake, and Mendocino counties that can be applied to other places around the country. The model recognizes that the settling process has had many similarities across different regions in the country, but the rate and spatial manifestations have varied according to distinct geographic, economic, and temporal characteristics (see Figure 6).<sup>34</sup> I have illustrated one case where development growth was very fast. Other regions of the country doubtless proceeded through this same general settlement process at quite different speeds, and I hope that this model and approach may be useful to others studying historical settlement geographies in the United States.

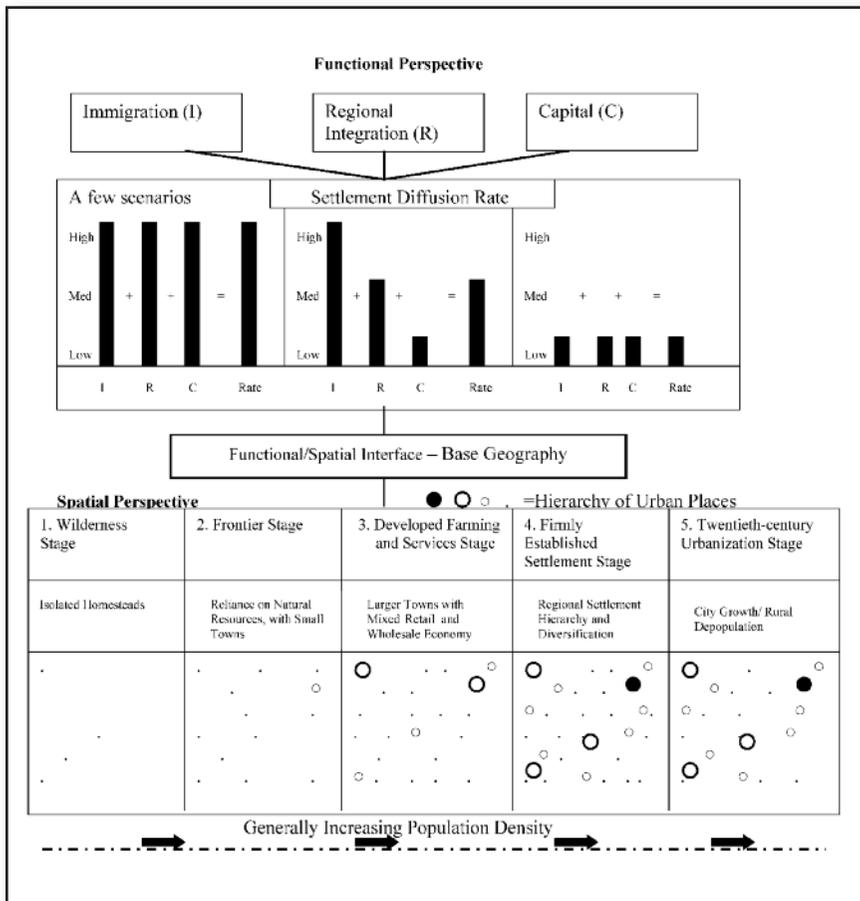
**Figure 5.** Internal Economic Differentiation in Sonoma County (Census Cities and Townships 1880): 1880 U.S. Census Sample.



There are three important parts of the model: the functional and spatial perspectives, and the connecting geographical interface between the two perspectives. Functionally, the rate of diffusion of new settlements depends on the infusion of capital, immigration, and intra- and interregional trade connections (regional integration). The interface between the functional and spatial perspectives is the geographical site and situation of the region, or base geography. The imprint of humans on the landscape, be it fast or slow, always occurs within the context of the extant geography. Spatially, the outward

reach or diffusion of settlement at first is more reliant on natural resource availability (such as arable land, harvestable forests, productive fisheries, and mineral resources). Over time the human occupancy of the land changes as the manufacturing, services, and transport sectors grow over the original landscape, and greater population densities in core cities and towns occurs.

In the spatial perspective of the model, the regional settlement system diffuses across the landscape as the population hierarchy appears and as it continues to grow differentially. The wilderness stage begins with isolated homesteads and ends with the appearance of towns. During the frontier stage reliance on farming, mining, and logging continues, but small towns sprout to service the needs of the countryside. This is a very volatile time for the settlement diffusion process. A slowdown in the establishing of new settlements leads to the developed farming and services stage. All areas, especially the core towns, exhibit greater economic diversification and specialization with



**Figure 6.** Diffusion Model of Settlement Structure Development in American Frontiers

larger portions of the population in services and industry, whether dominated by wholesaling or retailing. Finally, the arrival of the firmly established settlement stage is indicated when the hierarchy of cities and towns is set, and relative employment levels in the different economic sectors exhibit smaller changes over time. This differentiated structure of towns and farmsteads comes before the relative shift away from natural resource extraction that characterizes the twentieth-century urbanization phase, in which rural to urban migration and overall urban growth are characteristic.<sup>35</sup>

In this northern California example I focused primarily on the geographical interface and the spatial perspective of the diffusion process, with less attention to the specific impacts of capital (addressed by Walker), immigration, and regional integration. However, the importance of the droves of immigrants, the tremendous capital that was tied to the bounty of the land, and the development of regional connectivity among Sonoma, Mendocino, Lake, and San Francisco counties during the 1850 -1880 period must be acknowledged. These functional elements quickly propelled the region through the spatial stages of the model toward an ingrained regional hierarchy of cities and towns by 1880.

The distinct functional/spatial interface of its base geography helped give rise to the region's particular settlement distribution. The settlers favored the main valleys, while most rugged regions found fewer inhabitants unless the lure of redwood encouraged lumber towns. The coastal mountains and ranges surrounding Clear Lake in Lake County acted as barriers that initially hampered development until sufficient transport routes were built to diminish these barriers. Amenable climate and sea access also encouraged the settling of the three counties.

Spatially, the diffusion process essentially moved from the wilderness stage toward the developed farming and services stage by 1870. During the wilderness period that existed until about 1850 in Sonoma County and into the 1860s in Lake and Mendocino, more settlers found their way into the region and Sonoma County strengthened its role as the prime service center for the area. Sonoma had a much larger proportion of service workers compared with the other two counties, especially before 1870. In 1870 the frontier stage was already giving way to the developed farming and services phase. Most new towns had been colonized by that time and the most desirable rural areas had already been claimed.

Further development occurred by 1880. Occupational patterns of 1874, from *Paulson's Hand-book*, showed how specialized Sonoma had become as it developed into the dominant county in the region. However, Mendocino and Lake counties were not just reliant on logging and agriculture, but had grown in other economic sectors too, albeit not to the extent of Sonoma. The 1874 analysis also emphasized how particular geographies were associated

with the location of various agricultural and commercial enterprises in the counties. Data analysis of the 1880 Census showed that further diversification had occurred, but that the basic hierarchy of settlements from Sonoma County down to Lake County had experienced less change. The settlement process appeared to have moved toward the firmly established stage.

The hierarchical population patterns seen from 1850 to 1880 were reinforced over time as the region moved toward intense changes of the twentieth-century urbanization stage. Places like Santa Rosa, Petaluma, and Ukiah continued to grow, but they remained in a class far below San Francisco, which added over 100,000 people to its ranks from 1880 to 1900. The growth cemented its regional dominance, while Sonoma had made its place as the key semi-peripheral county, followed by Lake and Mendocino in their even more peripheral roles. Even today, over 130 years after L.L. Paulson printed his directory this same basic settlement structure from core to periphery is evident in the region.<sup>36</sup> Therefore, the rapid diffusion of settlements across these counties resulted in a correspondingly fast transformation of a wilderness into a firmly established hierarchical system.

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### Notes

1. Brian J. L. Berry and Allen Pred, *Central Place Studies: A Bibliography of Theory and Applications* (Philadelphia: Regional Science Research Institute, 1961); Walter Christaller, [1933] *Central Places in Southern Germany* (translated in 1966 by C. Baskin, Englewood Cliffs: Prentice Hall); Richard E. Preston, "Christaller's Research on the Geography of Administrative Areas," *Progress in Human Geography* 16 (1992): 523-39.
2. Carville Earle, *The Evolution of a Tidewater Settlement System: All Hollow's Marsh, Maryland, 1650-1783* (Chicago: University of Chicago, 1975); Robert D. Mitchell and Warren R. Hofstra, "How Do Settlement Systems Evolve? The Virginia Backcountry During the Eighteenth Century," *Journal of Historical Geography* 21 (1995): 123-47; Brian J. L. Berry, *Geography of Market Centers and Retail Distribution*, (Englewood Cliffs: Prentice Hall, 1967); Edward K. Muller, "Regional Urbanization and the Selective Growth of Towns in North American Regions," *Journal of Historical Geography* 3 (1977): 21-39.
3. Mitchell and Hofstra, "How Do Settlement Systems Evolve?"
4. James E. Vance, Jr., *The Merchant's World: The Geography of Wholesaling* (Englewood Cliffs, NJ: Prentice-Hall, 1970). See pages 81-101.

5. Richard A. Walker, "California's Golden Road to Riches: Natural Resources and Regional Capitalism, 1848-1940," *Annals of the Association of American Geographers* 91(2001): 167-199.
6. John A. Everson and Brian P. FitzGerald, *Settlement Patterns* (London: Longman Group, 1969). See also Walter T. Nugent, *Structures of American Social History* (Bloomington: Indiana University Press, 1981): 20-23; Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York, The Modern Library, 1965): 531-532 (book IV, chapter VII, part second).
7. Jeanne Kay Guelke and David Hornbeck, "The Far West, 1840-1920," in Thomas F. McIlwraith and Edward K. Muller, eds., *North America: The Historical Geography of a Changing Continent* (Lanham, MD: Rowman and Littlefield, 2001): 261-84.
8. Gunther Barth, *Instant Cities: Urbanization and the Rise of San Francisco and Denver* (New York: Oxford University Press, 1975); Lawrence H. Larsen, *The Urban West at the End of the Frontier* (Lawrence, KS: The Regents Press, 1978).
9. Vance, *The Merchant's World*: 83.
10. *Ibid.*: 165. Particularly, Vance's points 4, 5, and 6 seem to apply to northern California with San Francisco as the core.
11. Lawrence A. Brown, *Innovation Diffusion: A New Perspective* (London: Methuen & Co. Ltd, 1981). I took the concepts of functional and spatial perspectives from pages 40-45.
12. L. L. Paulson, *Hand-book and Directory of Napa, Lake, Sonoma, and Mendocino Counties* (San Francisco: Francis & Valentine, 1874); Dennis E. Harris, Director, *Redwood Empire Social History Project* [California State Census -1852, US Census 1860] (Santa Rosa: Sonoma County, 1983, 1992). See the following for examples of geographers who have used similar types of directories to do historical geography research: Michael P. Conzen and Kathleen N. Conzen, "Geographical Structure in Nineteenth-century Urban Retailing: Milwaukee, 1836-90," *Journal of Historical Geography* 5 (1979): 45-66; Michael P. Conzen, "State Business Directories in Historical and Geographical Research," *Historical Geography Newsletter* 2 (1972): 1-8; Susan W. Hardwick, "Using City Directories to Teach Geography," *Journal of Geography* 89 (1990): 266-271.
13. Getting reliable map coordinates proved to be challenging for two main reasons. First, a number of the listed towns no longer exist and so they were difficult or impossible to find. Forgotten places like Hermitage and Glenmark in Mendocino County and Clairville in Sonoma County have faded from most modern maps (see Figure 1 for the locations of many of the towns mentioned in the *Paulson's Hand-book*). Second, the directory lists many residences at the exact same spot (e.g., 9 miles N. of Ukiah), so many original mapped points overlapped. I addressed this problem by either using graduated circles for locations with multiple entries, or in the case of some of the maps, by offsetting multiple entries slightly from their listed locations.
14. The core in any settlement system is the area of greater population density and hence more important and central economic influence (the core). Farther out in the hinterland the areas that have lower population densities, less economic power, and that rely on services provided in the core is known as the periphery. This idea of a core/periphery structure has been used from the world scale (e.g., Immanuel Wallerstein, *World-Systems Analysis: An Introduction* (Durham, NC: Duke University Press, 2004)) down to more regional scales (for a Chinese example see G. William Skinner, "Cities and the Hierarchy of Local Systems," in G. William Skinner, ed., *The City in Late Imperial China* (Stanford, CA: Stanford University Press, 1977): 275-351). This conceptual framework is important here because it helps explain the economic patterns between the core in Sonoma County to the more peripheral areas of Lake and Mendocino counties.
15. Erwin G. Gudde, *California Place Names: A Geographical Dictionary* (Berkeley: University of California Press, 1949): 119. A brief history of Fort Ross is also found in Harvey J. Hansen

- and Jeanne T. Miller, *Wild Oats in Eden: Sonoma County in the 19<sup>th</sup> Century* (Santa Rosa, CA: Hooper Printing and Lithograph Company, 1962): 15-19.
16. Gudde, *California Place Names*: 339, 259, 318.
  17. Frederick J. Simoons, "Development of Transportation Routes in the Clear Lake Area," *California Historical Quarterly* 32 (1953): 363-71; Samuel M. Otterstrom, "The Influences of Transportation and Geography on the Settlement and Development of Lake County, California," *Journal of the West* 42(2) (2003): 34-44.
  18. Lyman L. Palmer, *History of Napa and Lake Counties, California* [1881], reprinted as *History of Lake County 1881* (Fresno, CA: Word Dancer Press, 1995).
  19. *Paulson's Hand-book* of 1874 showed that the bulk of the workers in the lumber business were found in these northern Sonoma and Mendocino areas. A large number of mill hands were listed on the central coast working at the Big River Mill near Mendocino City, the J.G. Jackson mill in Caspar, and the Coombs & Perkins mill near Mendocino/Little River. Most of the employees of the other working mills did not make it into *Paulson's Hand-book*, even though there were many mills operating throughout the area (see Lyman L. Palmer, *History of Mendocino County, California* (San Francisco: Alley, Bowen & Co., 1880): 141).
  20. Rand Richards, *Historic San Francisco: A Concise History and Guide* (San Francisco, CA: Heritage House Publishers, 1991): 43. The 1860 and 1870 figures are from the U.S. Census.
  21. Hansen and Miller, *Wild Oats in Eden*: 48. Some distinctive economic activities encouraged interregional relations. Direct shipping between the redwood mills along the northern Sonoma and Mendocino coasts and San Francisco provided a strong tie between the north and the south. Following Sonoma County, Mendocino County (after 1871) received the railroad to facilitate trade from south to north. However, Lake County never had that transportation connection. Fortunately for that county, the many mineral springs and resorts that sprouted around Clear Lake helped it attract commerce and visitors from San Francisco, even though people had to travel a rugged stretch by stagecoach to get there (see Otterstrom, "Influences of Transportation and Geography;" Palmer, *History of Napa and Lake Counties*; Hansen and Miller, *Wild Oats in Eden*; and Palmer, *History of Mendocino County*).
  22. James E. Vance, Jr., *Geography and Urban Evolution in the San Francisco Bay Area* (Berkeley, CA: Institute of Governmental Studies, University of California, 1964).
  23. Within both the censuses and county directories there were numerous people who reported working as laborers. They are summarized here as working in the primary sector, because in the actual censuses it appeared that a large number of them lived in rural farming areas. This does not discount the fact that many others probably worked in the wood milling industry (see for example the Laborer panel in Figure 4. This 1874 map shows some clustering along the Mendocino coast). Therefore, since these people could not be definitively separated out, "laborers" are kept separate in the tables and maps.
  24. Robert A. Burchell, "Opportunity and the Frontier: Wealth-Holding in Twenty-Six Northern Californian Counties 1848-1880," *Western Historical Quarterly* 18 (1987): 177-96.
  25. Leslie Kish, "Differentiation in Metropolitan Areas," *American Sociological Review* 19 (1954): 388-98.
  26. Effort was made to combine as one all occupations that had different names but that were essentially the same type of work. However there are most probably a small number of duplicates still, and so these occupation totals might be slightly high.
  27. Figures 2 – 4 include some business operation locations that were in *Paulson's Hand-book* in addition to the listings of individual people (e.g., "Caldwell & Read," a dental office in Sonoma County). There are 99 of these in Sonoma County, 26 in Mendocino County, and 7 in Lake County, the majority of which were in the service sector. The related statistical tables (i.e., Tables 3 and 5) do not include these businesses in their total figures, as

- they appear to duplicate individual listings.
28. Palmer, *History of Napa and Lake Counties*.
  29. Christaller, *Central Places in Southern Germany*.
  30. Richard A. Walker, "California's Golden Road to Riches." For a study of how the hierarchical structure of an urbanizing area in Canada evolved over a century, see Lorne H. Russwurm and Baleshwar Thakur, "Hierarchical and Functional Stability and Change in a Strongly Urbanizing Area of Southwestern Ontario, 1871-1971," *Canadian Geographer* 25 (1981): 149-66.
  31. Vance, *The Merchant's World*.
  32. See for example Keith S. O. Beavon, *Central Place Theory: A Reinterpretation* (New York: Longman, 1977) and Skinner, "Cities and the Hierarchy of Local Systems."
  33. Wayne K. D. Davies, "Centrality and the Central Place Hierarchy," *Urban Studies* 4 (1967): 77.
  34. This model is loosely based on the concepts and models of others including Brown, *Innovation Diffusion*; Muller, "Regional Urbanization"; Walker, "California's Golden Road"; David R. Meyer, "A Dynamic Model of the Integration of Frontier Urban Places into the United States System of Cities," *Economic Geography* 56 (1980): 120-140; Douglass C. North, "Location Theory and Regional Economic Growth," *Journal of Political Economy* 63 (1955): 243-258. For a related three-stage conceptual framework that focuses on how competition between central places affects their growth see Martyn J. Bowden, Bruce L. LaRose, and Brian Mishara, "The Development of Competition Between Central Places on the Frontier: Vermont, 1790-1930," *Proceedings of the Association of American Geographers* 3 (1971): 32-8. There is also a tie here to Frederick Jackson Turner's thesis concerning the centrality of the settling of the frontier to the social development of America. See Turner, *The Frontier in American History* (New York: Henry Holt & Company, 1953).
  35. Although I did not measure them directly, I also hypothesize that the population concentration trajectories (or relative distribution of people) would first show dispersion tendencies as settlers rushed to inhabit the countryside. Later, there would be a shift to higher concentration as the urban places in each county grew and the hierarchical system became firmly established. In the firmly established settlement stage continued migration to urban areas would help reverse the trend of regional population distribution toward concentration. Rural depopulation in the new century and international immigration translate into larger cities and even higher population concentration levels in the twentieth-century urbanization phase.
  36. By way of comparison, the 2000 Census reflected the tremendous growth of the counties. San Francisco was by far the most densely populated, followed by Sonoma, Mendocino, and Lake. Sonoma, in particular has grown quickly over the past few decades, but it is not close to the 625,000 predicted by Baruth when he called for integrated planning of the rapidly growing greater San Francisco region four decades ago. These four counties have therefore continued to experience similar relative population levels and growth patterns that started before 1900. It is noteworthy, however, that Lake County's population density is actually almost twice that of Mendocino. This stems from the fact that Lake County has been able to take advantage of its attraction as a resort and retirement destination, while Mendocino has been constrained at times by the ups and downs in the lumber industry. See Jeff R. Crump, "Finding a Place in the Country: Exurban and Suburban Development in Sonoma County, California," *Environment and Behavior* 35 (2003): 187-202.; Karl H. Baruth, *The Northern California Metropolis* (Palo Alto: The National Press, 1960).