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The decline of gold mining in California in the 1860's left a great number of Chinese laborers in search of alternate futures. Between 1863 and 1867, the Central Pacific Railroad absorbed a large portion of this labor force. After 1867, reclamation and irrigation projects were undertaken primarily with Chinese labor. In addition, the Chinese began to provide California farmers with manual labor for a variety of agricultural crops. These activities, particularly land reclamation and agricultural labor, brought the Chinese into various areas of the Sacramento-San Joaquin Delta. They became firmly established in river Chinatowns in the Delta during the twentieth century, and relics of this early occupation are found in the Delta country today.

The Chinese movement to and occupation of the Delta is in many ways reflective of the greater history of the Chinese in California. The hearth area in Southeast China from which most Chinese emigrated was principally a rural landscape. In most cases, however, Chinese immigrants arriving in the host environment settled in the urban centers of the Pacific west coast. For many, the urban center acted as a home base from which they departed to participate in rural labor projects, returning to the city at the close of a job. Between 1850 and 1882, the Chinese were seen throughout California, working in the countryside in

*Mr. Arreola has an M.A. degree from California State University, Hayward, and is presently a Ph.D. candidate at the University of California at Los Angeles.
small migrant camps. Many of the Chinese bonded into local concentrations and eventually occupied distinct quarters in various California rural communities.

The immigration of Chinese to California was closely associated with district ties in heart areas of Southeast China. Lyman has characterized this process as "group immigration," that is, Chinese immigrants arriving in California were representative of particular village districts in Kwangtung, China. The two districts in Kwangtung from which most of the Chinese in the Delta emigrated were Sze Yup and Chungshan. Sze Yup refers to the people of the "Four Districts" of Sunwui, Sunning (Toishan), Hoiping and Yanping who are bound by a link of common dialect. Chungshan refers to the people of Chungshan district who speak a dialect which closely resembles standard Cantonese, but which is practically unintelligible to the Sze Yup. In California, the majority of Chinese immigrants have always been Sze Yup. With the decision to reclaim the swamplands of the Delta during the 1850's and 1860's, Chinese, both Sze Yup and Chungshan, were attracted to the area as laborers.

RECLAMATION

The first recorded efforts at reclamation of the Delta were in 1851 when individual settlers attempted small-scale projects in selected areas. In 1852, California Governor McDougal requested that settlers be given the opportunity to secure land on the condition that they reclaim it within a certain period. A new policy of reclamation was embarked upon in 1861, and for the first time, the state became responsible for reclamation which had previously been conducted by individual landowners. During the period of state control, reclaimed areas were designated reclamation districts and an acreage limit (first 320 acres, later 640 acres) was imposed on individual ownership of reclaimed lands. In 1868, however, the responsibility of handling reclamation matters was transferred to county governments and the acreage limits set down earlier by the state were then dropped.
The removal of acreage limits in 1868 prompted a new period in the reclamation process. Large tracts of swampland rapidly came under the control of land agents and corporations. The Tide Land Reclamation Company, under the direction of George D. Roberts, for example, acquired 250,000 acres between 1868 and 1871. Reclamation became the primary concern of the corporations whose existence depended on the availability of laborers willing to work in the swamps for small wages. The Chinese met these requirements.

**Chinese laborers**

While some East Indian and Hawaiian labor was used in Delta reclamation, the majority of the labor used in early work was Chinese. Driven from the gold mines of the Mother Lode and attracted by the prospect of work, Chinese began to move into the Delta as laborers in reclamation projects. During the 1870's, Ratzel noted that Chinese were widely employed in the reclamation of the "tule lands" of the Delta. In 1876, Brooks commented on the role of the Chinese in such projects.

"Chinamen reclaim these lands; they build levees; they patiently work in the mud and water where whitemen will not; and as a rule it may be said they "create" wealth for they do that work which but for them would not be done at all."

Besides being numerous, the Chinese worked under a contract system for Chinese bosses. Recruiting of individuals by the reclamation corporations was unnecessary since the employer negotiated directly with the bosses who did all of the hiring, paying and firing. Labor gangs of up to a thousand men were distributed throughout the Delta, using shovels and wheelbarrows provided by employers to dam sloughs, cut drainage ditches, build floodgates and pile levees. Rates paid to the Chinese bosses ranged from $.09 to $.25 per cubic yard of material emplaced in levee construction. This amounted to a daily wage of approximately $1, or $25-30 per month for the Chinese laborers. Finally, the Chinese gathered in their own makeshift camps to eat and sleep, further reducing the contractors' expenses.
Levee construction and land preparation

Artificial levees were superimposed on the outer edges of the natural levees. Early construction relied on island tule sod which was highly organic and shrank when dried and set into blocks for fill.

The sod was removed from the ditch with a great spade, locally a "tule cutter" or "tule knife," and used to face one or both sides of the proposed levee. The material underlying the ditch was tramped into place between the sod block rows or on the inside of the single sod wall. Sometimes the sod blocks were placed in the levees as soon as cut and at other times the blocks were permitted to dry on the ground first. In either case, they were forked into wheelbarrows and taken along planked paths to the levee, where they were fitted or tramped into a firm embankment.

Cracks and surface irregularities developed on the early levees, and wave erosion eventually discouraged the use of this material. Later, mixtures of mineral and organic soils were used. A typical finished levee measured thirteen feet at the base, five feet at the crown and three feet in height.

By the late 1879's, manual and horse power were nearing the limit of practicable employment and alternate means of construction were sought. One continual problem had been the small structure of the early levees. Owing to the methods of construction, early levees were little more than fragile retaining walls which often gave way during the season's first flood. Dredges were introduced in 1870, but were not put to general use until 1876. The clamshell dredger, devised in the early twentieth century, proved the ultimate in levee construction and was capable of moving fill at a cost of $.03 per cubic yard, or one-third to one-eighth the cost of earlier methods. With the use of dredges, river bottom clay became popular as a surface material on levees. Sand was also obtained with clay to give a more protective surface which did not crack or leak like clay or peat, and it retarded rodent penetration. Dredging also allowed for the construction of massive levees which measured as much as 200 feet at the base and 30 feet high, and which functioned more effectively than earlier works.
Once the land had been reclaimed, the costly and troublesome clearing of tules (*Scirpus lacustris*) and breaking of virgin organic or mineral-organic soils was necessary. Here again, Chinese labor gained widespread use. Fire was considered the cheapest method of removing tule and was often utilized in the fall after the tules had dried through the summer. Chinese laborers were also used to set fire to peat soil by digging holes in the turf and dropping straw in the holes which was then ignited.27 Usually a soil depth of three to five inches at a time was fired. This not only helped clear tule and kill pests, but it also liberated potash, adding to the fertility of the soil.28 Burning of the peat, like burning tule, was a common practice and was justified as a necessary step in bringing the land to cultivation.

Between 1860 and 1920, fully ninety percent of the Delta had been reclaimed.29 The Chinese had been instrumental in the early reclamation and construction efforts, but by the 1880's they had been replaced by mechanical operations which were cheaper and more efficient. However, reclamation had been undertaken with the intention of leasing reclaimed land. From the earliest days of reclamation, tenant farming developed, and later this was accompanied by crop specialization. The Chinese became very active in the farming process. In addition, the Chinese contract labor system shifted into agriculture and thus ensured the continued presence of the Chinese in the Delta.

**AGRICULTURE**

The role of the Chinese in early California agriculture is a story of migrant labor and farm tenancy. Brace, in travelling California in 1867, frequently saw Chinese laborers working fruit orchards, and Loomis similarly observed Chinese harvesting hops, strawberries and small fruit.30 Bowen has noted that during the feverish growth of the Vacaville district in the 1880's and 1890's, gangs of Chinese laborers excavated extensive orchard terraces throughout the English Hills.31 Coolidge has also remarked that
... many immigrants who came directly from farms in China and were not skilled in handicrafts, went directly to the country to engage in vegetable raising, orchard work and general farm work.32

Chinese workers began to drift into agricultural districts throughout California at a time when growers were beginning to demand a large supply of cheap labor to work in fields and harvest crops. By 1886, the Chinese comprised over seventy-five percent of the state's agricultural laborers.33

Chinese agriculturalists in the Delta

Of those Chinese who lingered in the Delta after reclamation, some were farmers who came with the intention of buying and tilling small tracts of land such as they had known at home.45 However, there had never been any widespread interest on the part of Delta landowners in subdividing and selling. Rather, owners chose to rent, lease on shares, or assign the land to managers. This proved more convenient and profitable for the landowners, who had no desire to live in the Delta.35

Land tenancy on a sharecropping basis became an institution in the Delta. At the turn of the century, seventy-five percent of the farmed land in the Delta was tenant farmed and seventy-five percent of the tenant farmers were Orientals.36 Most of the Chinese who leased land were sharecroppers. Aside from attending the gardens or orchards, the Delta Chinese cut and stored hay, drained water, made boxes or baskets for fruit and performed numerous other services and duties on the farm. The Chinese tenants usually received one-half of the proceeds of the vegetables and two-fifths of the return on the fruit harvested on the leased land.37

Small-scale farming and vegetable gardening

Delta agriculture prior to 1900 was considered primarily small-scale farming and vegetable gardening, and not until the twentieth century did it become large-scale, specialized field agriculture.38 The Chinese were an important part of the farming and gardening process as it evolved in the Delta (Tables 1 and 2).
Table 1
Chinese Farmers in Sacramento County, 1860-1880

<table>
<thead>
<tr>
<th>Year</th>
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<tr>
<td>1860</td>
<td>3</td>
</tr>
<tr>
<td>1870</td>
<td>37</td>
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<tr>
<td>1880*</td>
<td>558</td>
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</tbody>
</table>

* The figure for 1880 includes farm laborers who worked on farms operated by the Chinese.

Table 2
Chinese Vegetable Gardeners in Sacramento County, 1860-1880

<table>
<thead>
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<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>120</td>
</tr>
<tr>
<td>1870</td>
<td>72</td>
</tr>
<tr>
<td>1880</td>
<td>184</td>
</tr>
</tbody>
</table>

Source: Chiu (1963), p. 76.

George D. Roberts commented, in 1881, on Chinese farming in the Delta.

There is a disposition among them [Chinese] to turn their attention to farming. They think it is a more quiet life; they get out of the excitement of the city. Many of them have rented patches and are paying $25 and $30 a year per acre for lands.39

In the 1880's, there were sixty-four Chinese-operated farms in Sacramento County, forty-eight of which were owned and operated on a partnership basis, with two to thirteen partners each.40 Many other Chinese were involved in vegetable gardening. Smaller in size than Chinese-operated farms, Chinese vegetable gardens, between 1850 and 1860, lined the east bank of the Sacramento River from the city of Sacramento to opposite Rio Vista.41 Crops grown
included sweet potatoes, maize, melons, squash, peanuts and celery. In addition, Chinese vegetables such as tubers, greens, beans, bean sprouts and water chestnuts were cultivated. Vegetable gardens were considerably smaller than farms with only one to five persons working each garden. Gardeners maintained outlets for their produce in San Francisco and Sacramento, which were reached by rivercraft that moved along the Sacramento River daily. Annual incomes from these plots were small and most were valued at $500 or less.

Orchard work

In the 1870's, the 9,000-acre Pierson district between Walnut Grove and Courtland was one of the only tracts in the Delta which was completely reclaimed and farmed. Tree crops were the principal land use along the river, with stone fruit such as peaches, apricots, cherries, figs, nectarines, grapes and apples covering the landscape near the levees. The Chinese operated some of these fruit orchards along the Sacramento River, the land being rented from Caucasian landowners. Most of the Chinese orchards were valued at less than $800, but four, owned in partnership, were assessed at over $1,000. Usually from fifteen to twenty workers labored in each orchard, with each laborer receiving $10-$16 per month plus board. Also, in the 1870's, Cone found Chinese employed extensively on Caucasian-owned fruit ranches along the Sacramento River. Ranches employed six to ten Chinese year-around, and twice that labor force during the harvest. In winter, the Chinese plowed, pruned, grafted and transplanted. The workers were organized under a Chinese foreman and each worker received $28-$30 a month without board.

In the 1880's, stone fruit orchards along the Sacramento River declined as a result of water seepage through the levees. Pears (Bartlett variety) quickly assumed importance since they were better adapted to existing edaphic conditions than other deciduous fruits. Also, a prime market for pears began to develop on the East Coast. Returns on pear orchards in the vicinity of Courtland
and Walnut Grove were $200 per acre in the 1890's, $350 in 1906, $500-$1,000 in the 1920's. The Chinese also worked these fruit orchards, and again under the contract labor system, provided orchard operators with the majority of the labor necessary to prune and harvest.

**Ethnic specialization and population concentration**

Delta agriculture was characterized from its beginnings by ethnic groups who were identified with particular types of husbandry. Thus, Chinese, Italians and Portuguese were vegetable gardeners, whereas American-born settlers were involved in grain and livestock activities. The Chinese took this specialization one step further: Chungshan Chinese specialized in orchard work, whereas Sze Yup concentrated on potato and onion farming. This ethnic crop association had its antecedents in Southeastern China where Sze Yup had previously been engaged in potato farming and Chungshan had been occupied predominantly with mulberry and other orchard work.

This tendency toward crop specialization was, in turn, reflected in the local concentrations of Chinese in the Delta. By the 1880's, the Chungshan Chinese were localized up the Sacramento River in the fruit district with Courtland at its center. Further downstream, near Rio Vista, the Sze Yup maintained potato patches.

In the 1870's, waterside Chinatowns were scattered along the levees of the Sacramento River (Figure 1). Courtland, founded in 1870, contained a Chinese quarter which burned in 1879 just before its inhabitants had intended to open a clothing factory in the area. After the fire, a new quarter was rebuilt. Also, in 1885, Elliott Village, a Chinatown which had been located on the Sacramento River just north of Courtland, was completely burned. Many of the Chinese from Elliott Village reestablished themselves in villages on the Deming Ranch near Courtland and at Paintersville between Courtland and Walnut Grove. Rio Vista, settled in 1857, had Chinese as early as the 1880's, and Isleton, founded in 1874, contained concentrations of Chinese during the 1890's.
Figure 1. Chinatowns in the Delta.

Source: Data compiled by author, 1974.
One of the first Chinatowns in the Delta had been established on the North Fork of the Mokelumne River at a point about six miles south of Walnut Grove. This village was also destroyed by fire in 1885, and the Chinese from this area then located in Walnut Grove.55 Shortly after the turn of the century, Locke, a new and independent Chinese town, was founded and built just north of Walnut Grove along the Sacramento River.56

Chinese exclusion

Between 1850 and 1880, the Chinese were scattered up and down the Sacramento River, laboring in reclamation crews, working vegetable gardens and fruit orchards, and residing in Chinese quarters in various small river communities. However, an economic depression which hit California during the 1870's fostered a sense of discontent with Chinese agricultural labor.57 Unemployment among the general population and the Chinese presence as cheap laborers aggravated the problem and soon resentment against the Chinese turned to terrorism and violence.

Growing fear among the Chinese was reflected in a drop in the Chinese population in the state between 1890 (71,066) and 1900 (40,262).58 Those who could afford to, returned to China, many others departed for the East Coast, while still others sought refuge in the crowded settlements of the large cities of Central California. In Sacramento County, the Chinese population of the time mirrored this statewide decline and gave evidence of the situation in the Delta region in general. In 1890, the Chinese population of Sacramento County numbered 4,371 and by 1900, this total had fallen to 3,254.59 With the increase in anti-Chinese attitudes and the passage of the Exclusion Act of 1882, Chinese farm laborers in Sacramento County fell from 668 in 1870 to 218 by 1880.60

Although the number of Chinese immigrants allowed into California had dropped and many of those who had lived and worked in the Delta began to move away from the area, a small number of Delta Chinese persisted. They began to concentrate in the small
river communities about halfway between Sacramento and Antioch. At the turn of the century, a new phase of agricultural activity focused on asparagus production became widespread throughout the Sacramento River area of the Delta. This new period marked the passing of the early Chinese occupancy of the Delta and ushered in a period of bustling activity based on the river Chinatowns of the region.

SUMMARY

During the mid-nineteenth century, many Chinese immigrants found work as laborers in the reclamation of the Sacramento-San Joaquin Delta. Between 1850 and 1880, the Chinese as laborers and tenant farmers, were primary agents in the molding of the early cultural landscape of the Delta. Although Chinese exclusion in the 1880's forced many Delta Chinese from the region, some persisted and collected in a number of small Sacramento River communities. These communities became the basis of the Chinatowns which flourished during the twentieth century as the Chinese influence in the Delta passed into a new phase of activity.

NOTES


8 Chu (1970), p. 27.


18 Nordhoff (1974), pp. 130, 143-144.


21 Chiu (1963), p. 72.

22 Nee and Nee (1972), p. 20.

31 Loomis (1869), pp. 233-235.
35 Roberts (1951), p. 51.
38 Chiu (1963), p. 78.
40 Seward (1881), p. 60.
41 Chiu (1963), p. 73.
44 Chiu (1963), p. 75.
45 Chiu (1963), p. 77.
46 Mary Cone, Two Years in California (Chicago: S.C. Griggs and Company, 1876), p. 140.
49 Chu (1970), p. 27.
52 Thompson and West (1880), p. 220.
60 Chiu (1963), p. 82.
THE CLASSIFICATION AND REGIONALIZATION
OF CALIFORNIA POLITICS

Robert M. Pierce and Stanley D. Brunn

The quest for orderliness (in California politics) has tempted many able scholars to undertake huge, solemn, and painstaking chronological recitations in the hope that the political symmetry somehow would appear out of the fog. It seldom does.

Herbert Phillips

Regionalizing and classifying phenomena have been and continue to be major objectives of geographical research. Whether such attempts consider social or physical phenomena in single or multifactor regions, the objective is to group units expressing similar characteristics or behavior. Quantitative methods of analysis have allowed geographers to develop classificatory and grouping techniques designed to tease out salient patterns that identify distinct regional clusterings. One such technique is discriminant analysis which is based on determining the best group or class for an individual observation.1 By considering a variety of pieces of information about each observation, and then establishing some a priori grouping, discriminant analysis minimizes the variance among the groups and maximizes the variance between groups. In this way not only can we determine whether we can actually discriminate between those groups we have established, but of equal importance we will find if the observations are included into the best group. Although discriminant analysis has been used primarily by economic and urban geographers in

*Professor Pierce is Assistant Professor in the Department of Geography, State University College, Cortland, New York and Professor Brunn is Associate Professor, Department of Geography, Michigan State University, East Lansing, Michigan. A version of this paper was presented at the West Lakes Division Meeting, Association of American Geographers, Ball State University, Muncie, Indiana, October 1974.
classifying regions and cities, it can be adopted just as readily to identify and classify political regions.  

In California, distinct political regions, the northern "liberal" and the southern "conservative," already have been identified by historians and political scientists. The Tehachapi Mountains are generally accepted as dividing these two regions. The perceived regional distinctiveness and the perpetual dynamism of the state's politics have even been considered barometers of national political development.

Sectional conflict

Contemporary political regions within a state or nation have their roots in previous cultures and settlement patterns. For more than a century contrasting regional political philosophies have characterized California. The northern part of the state, settled by New England and Middle West farmers and businessmen, has long been the center of a progressive philosophy that has contrasted sharply with the more traditional thought associated with southern California, an area populated by Deep and Border South migrants. The conflict was apparent as early as the 1850's when proslavery sympathy in southern California prompted its desire to form a separate state. However, the larger population in the north dominated the state's politics and the outbreak of the Civil War prevented the conflict from widening. These regional differences were apparent, for example, in Lincoln's electoral support in 1864, but they also persisted even during the Hiram Johnson Progressive-Republican era from 1900-1920 (Figure 1). Most of Johnson's strength in running for governor and senator was concentrated in the north, and the eventual defeat of his party and supporters was engineered by southern Californians who by then outnumbered northern voters. The difference in north-south political views was reflected in the support for the national Democratic party under Roosevelt in 1932 (Figure 1). The state Democratic party barely existed until 1958, when cross-filing (the opportunity to vote for any party's candidate) in primaries was finally eliminated. From 1910-1958 only one Democratic governor was elected.
The development of contemporary politics in California began following Earl Warren's appointment to the U.S. Supreme Court. Three times elected governor (1942-1953) and even winning primaries in both parties, Warren weakened the conservative opposition within the state Republican party. His departure from state politics coupled with the end of cross-filing not only contributed to open philosophical conflicts within the Republican party but led to the reemergence of a solid Democratic party. Thus, 1958 marks the beginning of the modern competitive two-party system in California. Prominent names in the state's history have reflected this rivalry, viz., Knight, Knowland, Nixon, Kuchel, Reagen, Murphy, Brown, Yorty, Cranston, and Tunney. Since 1958, voters have consistently been given a choice between a conservative Republican and a liberal Democratic candidate in all senatorial and gubernatorial elections save the Kuchel (R) vs. Richards (D) senate race in 1962 and the gubernatorial race in 1974. The terms "liberal" and "conservative" are relative to each election, but in each the voters have had a distinct philosophical choice.
Patterns in electoral geography

To date, laypersons and political scientists recognize the Techachapis as a reliable measure for delimiting northern "liberal" and southern "conservative" California. However, it is questioned at this juncture whether this physical feature is indeed an appropriate measure for dividing the state into political regions (Figure 2). In view of the fact that all but three counties have a Democratic registration majority, this is not considered a valid measure for identifying regional political contrasts.

In representing the results of recent elections, the distinctiveness in regional voting as well as philosophical orientation is apparent (Figure 3). These maps show counties where liberal support was greater than the average for the state. The relative consistency in voting pattern during this fourteen-year span is striking as is the similarity to Lincoln's and FDR's support.
Delimiting political regions

County data on eleven recent state-wide elections are used to determine whether distinct political regions exist (Table 1). State issues and candidates were considered a better measure for identifying political regions than recent presidential elections, because the results of state elections are not confounded by national issues and candidates. These voting data, tabulated in percent liberal for each election and each county, were first subjected to a factor analysis. Three factors emerged which altogether explained 79 percent of the total variance. The first was labeled a Republican primary factor as it grouped voting results of primary elections. The second dimension that emerged grouped general election results. The third factor grouped the propositions included in the data set. Thus, the three factors identified distinct groupings of elections.

Table 1
Variables Used to Delineate California's Political Regions

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>Gubernatorial Election</td>
<td>Brown Vote</td>
</tr>
<tr>
<td>1962</td>
<td>Gubernatorial Election</td>
<td>Brown Vote</td>
</tr>
<tr>
<td>1962</td>
<td>Republican Senatorial Primary</td>
<td>Kuchel Vote</td>
</tr>
<tr>
<td>1964</td>
<td>&quot;No&quot; Vote on Proposition 14</td>
<td>Open Housing</td>
</tr>
<tr>
<td>1964</td>
<td>Senate Election</td>
<td>Salinger Vote</td>
</tr>
<tr>
<td>1966</td>
<td>Democratic Gubernatorial Primary</td>
<td>Brown Vote</td>
</tr>
<tr>
<td>1966</td>
<td>Gubernatorial Election</td>
<td>Brown Vote</td>
</tr>
<tr>
<td>1968</td>
<td>Republican Senatorial Primary</td>
<td>Kuchel Vote</td>
</tr>
<tr>
<td>1968</td>
<td>Senate Election</td>
<td>Cranston Vote</td>
</tr>
<tr>
<td>1968</td>
<td>&quot;Yes&quot; Vote on Proposition 3</td>
<td>College Bonds</td>
</tr>
</tbody>
</table>

When the factor scores for each county on each factor were mapped on Cartesian coordinates, several distinctive clusterings or groupings became apparent. Some groupings could be identified easily as being more "liberal" or "conservative" than others. Instead of arbitrarily using the clusters of counties that appeared on the graph paper as a basis for delimiting California's political
regions, three models using discriminant analysis were designed. Factor scores were used for counties on the above three factors. The purpose of testing these statistical models was to determine the most accurate way to delimit the state's voting regions.

The first analysis tested the accuracy and appropriateness of the Techachapis for politically delimiting northern from southern California. All counties that were north of the mountains were included in one group. The other group included counties south of the mountain range. The discriminant analysis model for this grouping was not highly accurate as eight counties geographically included in "liberal" north had voting patterns like those classified in the "conservative" south. Likewise, a number of other counties had probabilities barely surpassing the 0.5000 cutoff for inclusion in the north or south. This indicated the need for a much finer classification.

A second classification, based on voting behavior rather than geographic location, grouped counties into three classes: those consistently deviating in a liberal direction, those deviating in a conservative direction, and those classified as transitional, that is, having no consistent pattern. Results from this discriminant analysis like the first indicated a larger number than expected in the middle or transitional region. This again necessitated a classification that had more than three groups.

In view of the lack of success in dividing the regionalizing the state into broad categories, we used a third model to divide the state into five groups, from consistently liberal to consistently conservative in voting. This grouping was the most successful in that only two counties, San Joaquin and Glenn, were misclassified (Table 2). In these five regions, the highest coefficients, that is, those variables that best discriminated the political regions, were the 1958 gubernatorial election, the 1964 Open Housing proposition, and the 1966 Democratic gubernatorial primary. When the counties in each of these five regions are mapped, it is readily apparent that physical features, party registration, and geographic location are all unacceptable criteria
Table 2
Discriminant Analysis Classification Matrix
California's Political Regions

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th></th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal</td>
<td>26</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Leaning Liberal</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Transition</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Leaning Conservative</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Conservative</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Calculated by authors.

for delimiting regions (Figure 4). While recognizable portions of the state are consistently liberal and consistently conservative, the regions are not always neat and compact nor are they always contiguous. For example, the conservative voting in the northern Sacramento Valley is similar to voting in the southern part of the state.

As we have seen, Californians have traditionally been able to vote for candidates at opposing ends of the political spectrum. The results of elections pitting a conservative against a liberal candidate have demonstrated a marked regional consistency throughout the state's recent history. Liberal and conservative voting regions identified through cartographic and multivariate statistical techniques are more irregular when candidates with similar ideological views are nominated. This situation appeared most recently in the 1974 election for governor.
During the 1974 elections, in which Watergate influences and personalities became a factor in state as well as national politics, an analysis of most elections for statewide offices showed the established regional voting patterns were reinforced. Conservative Republican H.L. Richardson won his party's senatorial primary by sweeping the populous counties of "conservative" California while John L. Harmer did the same by winning the party race for lieutenant governor. In the same 1974 primary "liberal" Republican Houston Flournoy defeated conservative candidate (then Lieutenant Governor) Edward Reinecke for the governor's race. This primary marked the first time the Republicans had nominated a liberal for that post since Earl Warren.

With liberal Edmund G. Brown, Jr. nominated by the democrats and liberal Republican Flournoy by the Republicans, Californians were asked to choose between liberal personalities, a marked change from previous elections. The final vote revealed Brown won with 50.2 percent and Flournoy 47.3 percent, a very narrow Democratic victory considering a ten percentage point spread in some pre-election polls. As a liberal Flournoy made significant inroads into the traditional populous counties of "liberal" California by carrying Napa, Marin, and Contra Costa in the Bay Area and several counties in the Sacramento Valley. Brown counterbalanced this altering of the state's voting regions by receiving some support in southern California; he carried populous Los Angeles County. This reversal in the state's electoral geography, plus the turnout of registered voters being less than the state average in several large southern counties that usually vote conservative, insured Brown's narrow election victory.

Conclusion

Multivariate quantitative techniques such as discriminant analysis have utility in political geography research when regionalization and classification are called for. A classification technique such as discriminant analysis, when used in conjunction with maps and an understanding of political and social history, is useful in analyzing regional politics as in the case of California.
Given the dynamic population changes occurring in the urban South and Southwest, ample opportunities exist for additional research using aggregate voting data and investigating regional changes. The large scale immigration of Northeast, Middle West, and Southern residents to Florida, Texas, Arizona and California is certain either to sharpen existing political regional cleavages, as is apparent in California, or to alter them substantially. The spatial facets of this problem are numerous and the political geographer with proper field, cartographic, and quantitative skills can contribute to its understanding.

NOTES


7Wolfinger and Greenstein, op. cit., reference 3, p. 74.
A sequence frequently heard or mouthed by anyone watching the urbanization of the United States includes mention of the disappearance of agricultural land from within or adjacent to expanding city landscapes. Notwithstanding the fact that criteria for agricultural excellence such as levelness, ease of access to market, reliable water source and—to a lesser degree—reliability of a labor source continue to be operative in the decision for farming, traditional farming operations just cannot compete with alternative commercial and residential land uses that thrive under the same conditions. Farms, therefore, shatter and disappear like ice on a spring lake before the flow of man's urban land use needs. Even the few communities that have tried to maintain agricultural zoning within urban bounds have had to impose such a heavy tax burden that the farms that do remain become true factories in the fields.

There is, however, a potential exception to this pattern of urban eclipse of agricultural land in a landscape of factories, housing tracts, freeways and commercial development. There are areas that do persist as fingers of green pointing out strips of land that have been left untouched by urban man. These belts may course directly through the heart of the city; they may run along the edges of major home and shopping center developments; they may wind from factory margin through to river edge. In virtually all cases, they run adjacent to land that is valued at ten times to a hundred times the rental cost of this relic farmland. The only common feature to all of this anomalous agriculture is that power

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lines march through and above this agricultural expression. This farming under the transmission lines on utility company right of ways may ultimately be one of the last chances that urban Americans have to smell, feel, see, and experience agriculture at close range.

Southern California Edison Company (SCE) is one utility company that has launched an ambitious licensing program for secondary land use on its right of way lands. This short paper is concerned with one category of such new land use programs—the agricultural uses being made of such zones in Los Angeles.

In the initial creation of the right of ways for the high voltage transmission lines of the Southern California Edison Company, California did not allow—nor did SCE desire—secondary land use beneath the lines. These belts of land were set aside from any use and served only as maintenance corridors through urban and non-urban land in the service area of the power company. However, as Los Angeles began to expand rapidly following the Second World War, there did develop new concerns about space available for all of the commercial, residential, industrial and continuing agricultural needs such a vast and growing metropolitan area would need.

By the early 1960's there was enough interest in the productive use of this open land to prompt the California State Legislature to modify the constraints on secondary land use on public utility right of ways. On September 10, 1963 a new General Order (No. 69-B) was signed into law which allowed public utilities to grant licenses for "...agricultural purposes, or other limited uses of their several properties without further special authorization...".¹

Our concern is the use agriculturalists have made of these strips of land. As noted above, the customary removal or elimination of agricultural land from within city boundaries is an inexorable process because of the tax burdens placed on such land as it develops new potential for alternative, higher value uses. However, with the return to usefulness of these ribbons of marginal
land, agriculture is staging a comeback because of the benefits such use can bring to SCE, as well as to the farmer.

For SCE, the benefits of agriculture as secondary land use are two-fold. There is revenue generated by the rental charges on the land, as well as economies made by SCE because agricultural land use means that the power company need not pay for brush and weed clearance on this land. The other positive aspect is the visual improvement made by nursery lots or row crops or Christmas trees as opposed to raw, weedy land. In this area of increased concern for image in the public's eye, SCE finds this modified landscape to be worth a great deal.

For the farmer, the benefits are obvious. The land costs only $450.00 per acre per year; it is oftentimes fenced, and it is often level and generally has easy access to water and power needs for farming operations. While the section below on legal aspects of this secondary land use points out the constraints on the farming of this land, it still appears to be a prime agricultural opportunity.

**Legalities**

The legal constraints imposed by the SCE upon licensees of right of way property are generally quite minimal. Indeed, the license given pursuant to the authority and subject to the conditions prescribed by General Order No. 69-B tends to be more permissive than restrictive.

Specifically, the nontransferrable license, entered into for an average of five years, stipulates that the licensee shall not interfere with the right of the SCE to construct, maintain, operate, repair, replace and/or inspect the property at any time in connection with its transmission of electricity.²

The licensee must agree to keep the property, and parkway and sidewalk areas adjacent to the property, free from weeds, brush, rubbish, debris, and all accumulation of flammable material and growth. All growing crops must be cut and removed from the premises upon reaching maturity. Restrictions are also placed
upon the planting of any tree or shrub that will exceed fifteen feet in height. The licensee must, of course, comply with all rules and regulations of State and County authorities in regard to the eradication and control of insect and animal pests, plant diseases, and noxious weeds.

Only commercial types of fertilizer that are free of weeds, fly and other injurious insect larvae are permitted, and storage of any fertilizer is prohibited. Raw fertilizer must be treated against fly and other insect larvae prior to spreading. Because of the potential for negative public response to the order of chemical and organic fertilizers, they must be immediately plowed into the land so as to be completely covered.

The licensee cannot construct or place any building or structure, sign, signboard or other form of outdoor advertising on the property without the prior written approval of the SCE. The rather loosely enforced license further prohibits the parking of any motor vehicles on the property.

All pumping equipment, irrigation pipelines and appurtenances installed on the premises by the licensee immediately becomes the property of the SCE and must be surrendered with the premises upon termination of the license. The occupant of the right of way must pay all charges and assessments for water, electric current or other utilities, as well as all taxes and assessments which may be levied upon crops grown, placed, or maintained on the premises. SCE pays the actual property taxes on the land. The licensee must further agree to the purchase of a liability insurance policy with a Combined Single Limit of not less than $100,000.

Lastly, it should be noted that the SCE may terminate or cancel the license at any time prior to the expiration of the term by giving thirty days previous notice in writing for that purpose to the licensee. One of the ironies of this clause is that a number of the farmers holding land on these licenses told us in interviews that they felt more secure than they would renting land on the open market in Los Angeles. Land uses have changed so rapidly in the city's growth that agricultural leases have been hard to count on for renewal.
Secondary uses of the right of way land

There is a broad range of activities that has been introduced to these right of way lands in Los Angeles County. Although the acreage totals for county secondary land use are estimated at only 1,589 acres (1974) there are thought to be between 10,000 and 12,000 acres given over to alternative uses in the entire Southern California Edison Company system. In Los Angeles County the use pattern is shown in Table 1.

<table>
<thead>
<tr>
<th>Tenant</th>
<th>Tenants</th>
<th>Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery Stock</td>
<td>144</td>
<td>772</td>
</tr>
<tr>
<td>Raw Crops, Turf and Seed</td>
<td>31</td>
<td>378</td>
</tr>
<tr>
<td>Christmas Tree Farms</td>
<td>24</td>
<td>132</td>
</tr>
<tr>
<td>Landscape and Beautification</td>
<td>77</td>
<td>52</td>
</tr>
<tr>
<td>Pasture and Grazing (horse stables)</td>
<td>40</td>
<td>120</td>
</tr>
<tr>
<td>Parks (city or county)</td>
<td>15</td>
<td>135</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>331</strong></td>
<td><strong>1,589</strong></td>
</tr>
</tbody>
</table>

These approximations really give only the broadest outline of the secondary land use activity in Los Angeles County. SCE is in the midst of a computer change-over in its record keeping system, and the true breakdown of license holders and their activities is certain to exceed these rather modest estimates. In addition, with the continued pressure for small parcels of level land within or nearly adjacent the city for intensive agriculture, SCE can anticipate increasing interest in its program of licensing for such agricultural uses.

Discussed below are four of the categories of agricultural land use, as well as some of the non-agricultural uses that also play a distinctive role in the Los Angeles landscape.
Strawberries: High risk crop in the rocks

One of the most graphic landscapes created by this pattern of secondary land use beneath the power lines is the twenty-seven acre wedge of strawberries of the Little Lake Berry Farm in El Monte. To the west of this fully irrigated parcel of no-longer-marginal land lies the dry wash of the San Gabriel River with its massive Corps of Engineers stone and concrete flood control dams and levees; to the east runs the eight lane 605 San Gabriel River Freeway. To the north and south are other rock piles and broken land lying in the right of way of the transmission lines. The entire landscape is dominated by the huge conveyor belts, milling sheds, and storage piles of several large-scale quarry operations. It is an unlikely place for man to think of farming.

The berry farm is the product of a second generation Japanese farming family, Kenneth and Tak Murata. In 1971 these two brothers, with the assistance of the two sons of Ken Murata, came to this land and began an attempt to create a level parcel from the sliver of uneven, boulder-strewn, unwatered land. Not only was there a problem of a three-to-four foot relief within the leased right of way, but the size of the boulders was such that special equipment had to be called in to shift, remove and bury much of the initial landcover. Even when the $26,000 levelling job was done, the soil that remained—or had been created—on this rocky base was too porous to accommodate the furrow irrigation traditionally given to strawberries in Los Angeles County agriculture. This called for still additional extraordinary investment before the realization of any return from this marginal land.

First, a 350 foot well was sunk at a cost of approximately $24,000. This steady source of fresh water gave the Muratas a resource base for the initial twenty acre parcel, as well as allowing them the latitude to consider expansion of this berry operation, should they be successful in the initial stages. The porosity problem in this sandy soil was solved by use of an innovation that was just becoming accepted in citrus lands in Southern
California. It is drip irrigation—the process of emitting water from slightly buried plastic pipe at such slow rates that evaporation and loss through excessive downward percolation are virtually eliminated. Such a process affords the most efficient means of irrigation yet found for the strawberries during the maturation and fruiting season, although when the plants are first put in the ground in late October, preliminary irrigation is done with portable aluminum 4-inch pipe and rainbirds.

Hence, with the use of typical road making machinery to move and remove rocks and boulders, with the sinking of a 350' well, and with the seasonal installation of a complicated network of valves, lines, emitters, and pressure regulators all characteristic of a drip irrigation system, the Murata brothers were able to create a base for the productive growth of strawberries. The initial twenty acre parcel licensed by Southern California Edison to the family was expanded by seven acres in the second year and now negotiations have begun to acquire still more right of way land adjacent to this El Monte parcel in order to expand the operation.

Although the land at the outset was clearly marginal, the process of reclamation has been so successful that the operation has now become one of the most productive berry operations in Los Angeles County. For example, by solving the irrigation problem with drip irrigation rather than traditional furrow irrigation, the Muratas are able to increase their plant density by approximately 35 percent per acre with no loss in per plant yield. The drip irrigation also diminishes the problem of weed development in the traditionally wet furrows of furrow irrigation. This dry furrow also facilitates the periodic harvesting operations. There is also the obvious additional saving of water afforded by the more efficient drip system.

The product that this land produces is of adequate quality to all flow into the fresh berry market. The first harvest is made in late February and flown directly to West Germany where the berries from this rocky river margin bring top price. Then, as
competition emerges from other areas, these berries are marketed in New York City, Chicago, and finally the Midwestern States. None of these berries stays in the local market. Even with an approximate cost of $4,000 per acre preparation and planting costs, the Murata Little Lake Berry Farm is doing very well under the power lines.

Christmas trees

One somewhat peripheral, although valid form of agriculture that continues to expand on right of way acreage in Los Angeles is the growing of Christmas trees. The cultivation of local, plantation grown Christmas trees affords the grower a number of comparative advantages over the traditional Southern California pattern of importation of northern grown grees. Perhaps the major advantage is elimination of the tremendous speculation involved in ordering, be it over or under demand. Concomitantly, the number of low quality, non-marketable trees is significantly reduced. Also, Christmas trees grown on right of ways, which often pass through highly populated residential, and commercial areas, further benefit from ideal locations for retail outlets.

Typical of the fifty or so Christmas tree operations currently located on SCE rights of way in Los Angeles County is Green Acres Christmas Trees. Located on eighteen acres in suburban Alhambra and Rosemead, Christmas trees were first planted on Green Acres in 1965 under the ownership of Don Perry, a laundryman turned silviculturist. The single species of Christmas tree grown at Green Acres is Monterey Pine (*Pinus radiata*). This fast growing pine reaches the desirable market size of eight to ten feet in four years. Beginning on the first Saturday after November 28, yuletide shoppers wander through this linear urban forest and are permitted to "choose-and-cut" the tree of their choice. Trees range in price from $10.00 to $15.00, based upon height and quality; which is an estimated 30 per cent cheaper than other "imported" species of comparable size and quality. Each Christmas season Mr. Perry sells approximately one-fourth of his stock. Advertising and the
subsequent marketing of Green Acres Christmas trees is greatly facilitated by frontage on both sides of a string street, and the juxtaposition of a shopping center parking lot on one side.

In January and extending into early February, approximately 1,800 seedlings per acre are hand-planted directly into the soil to replace the stock sold. Although the percentage of seedling failure varies from year to year, depending upon weather conditions, it averages about 25 percent. Green Acres requires a year-round crew of one part-time and two full-time employees to handle such ongoing activities as planting, and the almost continuous process of pruning the tops of the trees every second month for "leader control." Furthermore, the trees must be sheared into symmetrical conical "Christmas tree" shapes every six to twelve months. The trees are irrigated about once a month using an overhead sprinkler system. In general, the total expenditure per tree for the four-year marketing period averages just over $3.00.

Thus, Christmas tree production represents not only an economically viable form of right of way agriculture, but unlike more traditional forms of agriculture, the woodsy fragrance and generally aesthetically pleasing appearance of Christmas trees makes it a compatible form of urban land use.

Nursery stock

This is the prime use of the right of way land, according to the Right of Way Division Personnel of Southern California Edison. No other land use does so much to improve the landscape, benefits so clearly from the urban locations, and requires so little managerial involvement by the SCE field men. The more than 700 tenants who use utility lands in Los Angeles county for the raising, storing and selling of ornamental plants, shrubs, trees and bulbs are characterized as being the most ideal user population. Unlike some of the tenants who have taken advantage of the new availability of licenses for the right of way land, the nurserymen have generally had prior experience in horticulture. They also are keenly aware of the financial benefits realized by
being in these urban locations, so they are particularly conscious of handling their properties in as satisfactory a way as possible. This benefits the nurserymen, SCE and the Angelenos who drive through and around these miles of power line corridors in the county.

The nursery stock operations are primarily wholesale. They consist of an average set-up cost of $30,000 per acre for the plants, containers, earth and fertilizers. Water supply costs may push this figure up even higher. Such an initial outlay means that these lands have been licensed mostly by already productive nursery companies who have seen these areas as prime expansion grounds. Since an established nursery will already have a market network—and because the demand for ornamental plants and shrubs in Southern California and the southwest has been growing at between 8-15 percent annually for the past four or five years—many nurserymen have sought spillover land. The right of way lands have been ideally suited to serve this need.

If the parcels have chainlink fence already constructed, then there is no set order for the organization of the overall nursery stock lot. If, however, no fencing has been put up, then the large potted trees (palms, tree ferns, philodendron) are put on the outer margins of the 200' to 300' wide right of way. The interior of the lot is filled with the smaller plants, finally coming to the gallon cans of fuschias, margaritas and hundreds of other introduced ornamentals. A dirt or gravel road is left open in the middle, in addition to an open staging area for truck loading and unloading. The sheds that are required for equipment, fertilizers, containers and small office are put on the far edges of the right of ways so that no structures lie directly beneath the wires. In accordance with the terms of the licenses granted by Southern California Edison, there are no permanent structures built on these lands. The sheds (with notable exceptions) are akin to job site construction sheds that can be dismantled or directly slid up onto a flat bed truck. The most permanent-looking aspect of the nurseryman's use of these lands is the irrigation
system that weaves through corridors, topped with rainbirds and faucet outlets. Even these systems look more and more temporary as plastic pipe (PVC) replaces galvanized pipe in these waterworks.

Many of these nursery operations--like the Little Lake Berry Farm described above--sell to non-local markets. The market area for Los Angeles nurseries is not only Southern California, but also the adjacent states of Nevada, Utah, Arizona, New Mexico and even Oregon. Second and third generation Japanese are the most successful in these horticultural operations and they compose the great majority of the tenants in this nursery stock use of the right of ways. Since the Los Angeles retail nursery stock network is also run primarily by Japanese nurserymen, these wholesaling activities just continue the elaboration of the Japanese involvement and control of the ornamental plant market in Southern California.

The reasons that nursery stock land use is so appealing to SCE is that there is a continual canopy of greenness created by these swaths of house and yard plants. They are also all in containers so that should there need to be line servicing, space can be quickly gained by the temporary relocation of some of the lighter stock. This is another reason why the gallon can plants are placed nearest the power pylons while the heaviest plants are set on the outer margins of the parcels. Also, the nurserymen are not as inclined to use pungent fertilizers, as are the row crop farmers. Finally, the steady sprinkling of the stock in containers even works to cool the general area of the power line right of way. It had been unheard of for a utility company to receive phone calls complimenting it on the appearance of its right of ways; SCE has received such calls in reference to some of the nursery stock tenants.

This particular land use is likely to be the one most expanded in the secondary use program. It is one of those extraordinary patterns of land use that is appealing to the tenant for reasons of economy; to SCE for minimal maintenance; and to the public because it enhances the appearance of the urban landscape.
**Row crops**

The paramount consideration in allocation of utility right of way land is that all secondary land uses be compatible with adjoining property. Whereas horticultural and Christmas tree production have been found to be compatible with the urban mode, such is not the case for more traditional forms of agriculture. Indeed, for the most part, field, truck, and orchard crops are restricted to relatively isolated areas, such as the pockets of land between freeways and other non-housing areas, especially flood control sites. Furthermore, due to the existing tax structure and other relevant political factors, even on right of ways, traditional agriculture in metropolitan Los Angeles has been essentially eliminated, with the minor exception of scattered parcels of high value, high risk crops such as strawberries and other specialty crops.

One of the more interesting specialty crops, and a pioneer in agricultural utilization of SCE right of way lands, is the case of a 127 acre mustard greens farm. Nestled between the Long Beach Freeway and the Los Angeles River, the farm has been operative in its current location for almost 20 years. Other than simply its location in an unencroachable area for housing, the farm has persisted largely on the basis of its single crop specialization expedient marketing procedures.

At any particular time of the year, the farm may grow as many as eight to twelve species of the mustard (*Brassica*) group. The mustard seeds are machine planted every fourth day in a rotational sequence to permit year-round, seven-day-a-week harvesting. The growth period of greens, from planting to harvesting, ranges from 30 days during the summer to a maximum of 70 days in winter. Although the fields are never in fallow, the loam soil is lightly fertilized at each planting with chicken manure, and occasionally ammonium nitrate. Prior to every second planting, the just-harvested fields are plowed using a 24 inch disc with a seven foot six inch offset, showing that even narrow fields can accommodate large farming machinery. The crop is irrigated every four to
seven days with well water using portable overhead sprinklers. Maintenance of the field necessitates daily manual weeding. For all phases of the operation, the labor intensive business requires a full-time, year-round crew in excess of twenty men.

Following the manual harvesting of the crop, the daily post-harvesting activities of cutting, washing, bunching, and packing with ice are all conducted in a structure located on the farm. Seven days a week the greens are delivered at the rate of 400 to 500 crates per day, depending upon the season, directly to a number of chain stores within Los Angeles. The marketing locations are predominantly areas with a relatively large Black population, who are the primary consumers. Mr. Louis DeMartini, owner of the farm, feels that the key to the financial survival of his farm is based in large measure on his ability to bypass the middleman, and market directly to the individual stores. The many advantages realized by the mustard greens farm, from right of way occupancy to direct marketing, certainly are extraordinary for most farms in the contemporary urban agricultural scene of Los Angeles.

Non-agricultural uses

For cities caught up in the maelstrom of suburbanization, these swaths of heretofore unused, often eyesore land, may very well exist as a rather fortuitous stalemate to that process. The number of varied, secondary, non-agricultural land uses currently found on SCE right of way land in Los Angeles amply illustrates the exciting possibilities that exist. A short list of these alternate land uses include parks, recreation areas, riding and boarding stables, worm ranching, auto parking lots, equipment and vehicle storage areas, earth storage and removal areas, water transport and storage areas, bikeways, hikeaways, and miniature golf courses.

Conclusions

Perhaps the primary thrust for future utilization should focus upon people and community-serving developments. In urban
areas, which are sorely in need of readily accessible parks and recreation areas, regardless of their particular shape or geography, the potential value of these areas for such use has all too often been understated or completely neglected. The example of Los Angeles in this regard, which has developed over seventy such parks, in one case involving the expenditure of over one million dollars, is indeed encouraging and refreshing. It should be further noted that with even less expensive outlays, hiking trails, bikeways, and just green spaces could be provided that would go a long way in beautifying these areas, as well as providing a recreational outlet for the urban populace.

Thus, for cities in search of relatively cheap, accessible areas for recreation and other land uses, perhaps it is time for tightened utilization of "marginal" urban land, and to think long and narrow, short and wide, rather than just big.

NOTES


2 There is a four page License Agreement that Southern California Edison Company has drawn up for secondary land use on its right of ways. The agreement has twenty-six clauses that outline very clearly the responsibilities of the licensee to SCE. The most recent license was revised in June, 1974, reflecting the increasing interest in this pioneer program of SCE.

3 Personal communication, Mr. P.B. Peecook, Manager, Right of Way and Land Department, Southern California Edison Company. August 9, 1974.

LOCAL PUBLIC POLICY AS A CAUSATIVE FACTOR IN SUBURBAN BLIGHT

W. T. Dagodag*

It is recognized that public policies are often critical determinants of land use, and the widespread failure to learn from experience in public policy-making, emphasizes a need, as Dror has observed, for "an explicit audit of a policy's result."¹ This recommendation is most appropriate in an era of increasingly assertive governmental land use policies. In this paper, an "explicit policy audit" is undertaken to review the specific antecedents of a low-grade subdivision, and account for its evolutionary course towards blight. As an adjunct to this primary objective attention is directed to wider consideration of the suburban land conversion and blight formation process.

At the outset it is acknowledged that the term blight merits some reexamination; however, to avoid any unnecessarily protracted discussion, the operational definition provided by Chapin will be adhered to. Here Chapin identified two categories of blight, simple and complex, which are consistent with widely accepted and understood connotations.² Accordingly, blight in its simple form includes physical, economic, and social characteristics, such as structural deterioration, lack of maintenance, vacancies, lowered property values, and welfare enrollments. Complex forms, on the other hand, involve design and locational characteristics which reflect obsolescence, hazardous and unhealthy conditions. Residential land use quality may readily be evaluated and classified by applying such a rudimentary checklist of structural and environmental conditions.³

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Under what circumstances, then, may blight and public policies be related? A suburban setting provided an opportunity to examine the postulated relationship because of several factors. Firstly, suburban land conversion has generally been a recent occurrence in which the number of actors is often reduced to a landowner/developer and a public agency.\(^4\) Such a limited number of participants enhances any analysis of the land conversion process. Secondly, extension of required services to peripheral areas under conversion cannot be attained without the overt support or capitulation of local government. Marginal public and commercial services, and a paucity of recreational amenities in suburban areas are hallmarks of essentially negative urban expansion policies. Where these policies are so demonstrably weak some evaluation is warranted. Lastly, blight in suburban areas has not been analyzed in any great detail. Nevertheless, suburban blight may be identified and even distinguished as to type: blight encompassing older settlements, formerly discontiguous, but now located on the periphery due to lateral expansion from an urban center; and, blight encountered in suburban areas of recent vintage. Deterioration in these latter areas cannot be explained solely by conventional attributes of age or obsolescence. In advancing the central argument of public policy-making as a blight causing mechanism, a case study of a Southern California subdivision is undertaken.

**Thousand Oaks, California:**
*A case study of suburban blight*

Thousand Oaks, in Ventura County California (Map 1) possesses housing characteristics which rendered it suitable for the analysis of housing decay and public policies. A new city, incorporated in 1964, Thousand Oaks is located 45 miles northwest of Los Angeles astride a major coastal transportation corridor. Although a settlement nucleus dates from the turn of the century, it has been only within the last 15 years that marked urban growth occurred. This recent urban expansion during the 1960's, a by-product of urban spill-over from adjacent Los Angeles County, was
witnessed in Ventura County's ranking as one of the nation's fastest growing Standard Metropolitan Statistical Areas.

As indicated in Map 1, the bulk of the housing within the city is relatively new. With the exception of one tract (71--the settlement nucleus), virtually all housing was built after 1950. Furthermore, this map reveals that almost half of the tracts had at least 60 per cent of their housing built between 1960 and 1969. This new housing is predominantly single-family, of high-median values, and accompanied by high levels of owner occupancy (Maps 2, 3, and 4). In combination these city-wide characteristics make the presence of blight somewhat unexpected. Yet, by examining housing data, one may discern a departure from these general circumstances in a few tracts.
Figure 2. Percent Single Family Dwelling

Blight as it exists within the city, is concentrated in a single tract, number 65. Here housing, originally intended for the middle-income market ($15,450 in 1959) exhibited all of the simple forms of blight enumerated by Chapin; accumulation of trash, structural deterioration, vacancies, and social and economic problems. Complex forms of blight, related to incompatible land uses or poor design are not obvious, however, physical location and soil characteristics bear directly upon both forms of blight. Map 5 shows various units of the Park Oaks subdivision which generally conform to limits of census tract 65. Several types of housing features, units for sale, vacant units, and blighted units according to Chapin's definition, were recorded and mapped. Of the 1,063 dwelling units in the census tract, 1,001 were single family units. For the tract as a whole, a vacancy rate of
11.3 per cent was registered which, in keeping with generally accepted housing standards, is abnormally high. Moreover, field observations showed that simple blight affected 7.2 per cent of these single-family units. As will be demonstrated subsequently, complex blight resulting from structurally unsound buildings affects a much higher percentage of the housing.

Causes of blight

The presence of blighted housing in Thousand Oaks is, on the surface, anomalous in view of housing age, city-wide housing values, tenure characteristics, and the predominance of single-family units. Nonetheless, blight encountered, vacancy rate, and number of units for sale (68), are directly related to public policy. Fundamentally, a housing problem arises in the failure
of local building and land development policies to recognize soil properties and mitigate inherent hazards in constructing housing.

As shown in Map 6, heavy and expansive soils cover the northwestern quadrant of the city. Tract 65 with 96 per cent of its housing constructed between 1950 and 1964 is located well within the zone of these clay soils. Construction of housing in this tract was accompanied by a high rate of cracking in concrete slab floors resulting from moisture, contraction and expansion of the soil. Structural deterioration may ultimately be credited with forcing abandonment or rental of dwelling units at below market value since conventional resale financing was unobtainable and FHA or VA financing was not available unless the slabs were repaired.
It is suggested here that public policies made development of housing under hazardous physical conditions possible and that ensuing structural damage was the initial stage in blight formation. Moreover, a continuum of neglectful local policies is confirmed in documentation from two separate State Agencies. Upon completion of the subdivision, the State Division of Real Estate admonished potential Park Oaks home buyers to "make further inquiry of the subdivider or local government," regarding soil properties. In spite of this somewhat tenuous recognition of edaphic characteristics no action was undertaken by local government to develop or apply codes sufficiently stringent or comprehensive to deal with the problem. Even where applicable codes were later devised, dereliction in setting or administering local public policies was not uncommon as is noted in the Division of Mines', *Urban Geology*
The principal reason that newly built structures sustain damage attributable to expansive soils is that not all local governments apply existing codes and regulations effectively.

Some ten years after construction of the Park Oaks subdivision, structural damage to housing continues to be associated with soil conditions and ineffectual administration of building codes and subdivision laws throughout the state.

From a technical standpoint, housing in Park Oaks was substandard to begin with, nonetheless, houses were sold and occupied. The cracking and splitting of slabs noted by new homeowners was further exacerbated by grading techniques involving fill and compaction. In all units of the subdivision, fill depth...
was confined to a range of 9 to 15 feet. Yet, interviews with builders familiar with the tract during construction confirmed that fill limits were often exceeded by as much as 15 feet.

Another factor which contributed to housing decay was the cost of repairing a cracked slab. Repair procedures, consisting of removing houses from slabs, and laying a six inch sand moisture barrier, and nine inches of concrete on steel reinforcing rods, amounted to costs in excess of $5,000. Consequently, few homes in Park Oaks have been restored, although creation of a similarly blighted subdivision was later averted through a class action civil suit brought against builders, financial institutions, and the local government officials involved with approval and construction.

As for the current number of unsound structures in Park Oaks, only building department and sample-based estimates are available since entry into all houses for inspection purposes was unfeasible. Accordingly, building inspectors report that 85 percent of the structures rest on cracked slabs. Where entry into houses repossessed by the Federal Housing Administration was practical, all units examined (20) were found to have split or cracked slabs. Given the presence of these structural deficiencies, housing values recorced on Map 4 are not surprising. Lower than average market values associated with Park Oaks are consistently witnessed in local real estate advertisements such as the following:

Fixer-upper. This fine three bedroom, two bath house with a repairable cracked slab offers a lot of comfort for a very low price. Has a beautifully planted yard with covered patio .... Where can you beat it?

At this juncture blight information may be summarized in the following steps: (1) a failure on the part of private entrepreneurs and public officials to recognize a basic environmental hazard; (2) local governmental permission to build, and actual construction of, housing under hazardous conditions; (3) structural failure of the housing; (4) a general failure to repair structural damage associated with financial hardship; (5) abandonment, sale at
lower than market values, or free-occupancy of housing; (6) low levels of maintenance which may be linked to tenure characteristics and unwillingness or inability to make capital improvements. Explicitness encountered in the process described here does not stem from any oversimplification, but rather, from those temporal and spatial qualities bearing on recentness of construction, peripheral location, and concern with the terminal stage of land conversion involving developer/builders and public officials. While the process described appears to be relatively clear-cut, a number of theoretical or interpretive considerations arise.

Implications of public policy as a blight-causing mechanism

Firstly, the creation of blighted housing from the outset, through the vehicle of low-grade or substandard subdivisions, indicates that developer/builders exert a great influence on the quality of suburban land conversion. By the same token, public officials or local government has not assumed a reciprocal role but merely a responsive one. In the instance of Thousand Oaks, character of land use and its inherent quality may be seen as a by-product of a select group of private actors who influence public policy.

Secondly, patterns of profitability ensuing from low-grade subdivisions denote other theoretical implications affecting the direction and form of urban growth. Costs incurred by local government through its participation in the land conversion process can be measured in terms of remedial actions, lowered tax bases, and disincentives to investment. Here only the latter cost warrants elaboration since it may be linked to later development in the environs of Park Oaks.

Substandard housing definitely constitutes an anti-growth pole within the structure of urban places. Under most circumstances rents are depressed or there is a reticence to make substantial capital improvements in blighted or contiguous areas. In commenting on substandard housing and its effect on continued
investments Rothenberg notes: ¹³

The existence of spots of low-quality occupancy in an otherwise higher-quality neighborhood is more likely to depress occupancy levels downward than is the existence of high-quality occupancy spots in an otherwise low-quality area to raise levels. This is because the minority spots are a nuisance calling for majority adjustment in the former but not in the latter.

Implications observed here are witnessed in the immediate area of Park Oaks where the only major investment to date has been the construction of a low- to moderate-income housing project (Section 236). By itself, the presence of a housing project in Park Oaks suggests a compliance, on the part of local decision-makers, with a nation-wide tendency to locate such housing in declining or decay-prone areas.

Thirdly, while the causes of blight are certainly varied in origin and spatial attributes, the case study undertaken confirms a negative governmental role in land conversion. Local government in Thousand Oaks has assumed a role closely resembling that of the federal government in abetting central city ghetto formation. ¹⁴ Coupled with a failure to prevent further deterioration of dwellings in Park Oaks was local government's participation in the allocation of scarce federal housing resources to an area already containing a disproportionate share of bad housing.

Lastly, as Yearwood notes, low grade subdivisions resulting from substandard construction serve "invariably [as] a harbinger of future blight." ¹⁵ Disillusionment, inability to obtain conventional financing for repairs, and other reasons dictate blight formation in suburban areas. As a corollary, these pockets of blighted housing, with their commensurate inability to command higher rents, result in low-income occupancy in which minority groups are prominent. In the Thousand Oaks example, as demonstrated in 1970 Spanish-surname census data, a conspicuous enclave of Mexican-Americans exists in Park Oaks. ¹⁶
Conclusion

Although specific antecedents of suburban blight have been recognized as inherent in local public policies, a final comment must be made regarding legitimacy of those policies, subsequent appraisal and formulation of new policies. Skepticism about the legitimacy of housing policies in Thousand Oaks is based on apparent failure to identify and consider on-site physical hazards to construction and to formulate remedial programs designed to inhibit housing decay and resultant concentration of an ethnic population. Likewise, legitimacy implies the digestion of information and the effective feedback of learning experience associated with unsatisfactory results of housing policies. Unfortunately, however, amplification of blight in the Park Oaks tract lends much credence to Jones' contention that public policy "evaluation processes in government today operate on relatively low levels of information." Rather, it is suggested here that relevant modifications of building codes and subdivision ordinances originate in civil lawsuits.

NOTES

4See Weiss, Shirley F. et al., Residential Developer Decisions: A Focused View of the Urban Growth Process (Chapel Hill: University of North
Carolina, Center for Urban and Regional Studies, Institute for Research in Social Studies, April, 1966).


7 California, Division of Real Estate, Final Subdivision Reports, Park Oaks Units (1959-1965).


9 Ibid.


11 City of Thousand Oaks, Building Department.


AGRICULTURE IN HISPANIC CALIFORNIA, 1850

David Hornbeck and Mary Tucey*

An integral part of Western frontier settlement in North America during the nineteenth century was the set of agricultural institutions that were employed to occupy the land. In most instances, these were successful institutions transferred from previously settled areas and usually required few modifications to fit the new environment. In California, the American pioneer encountered a radically different frontier in which traditional agricultural methods were not immediately applicable. In that new land, the Anglo was confronted with unfamiliar problems associated with a Mediterranean climate, a spiraling demand for food after the discovery of gold, uncertainties regarding land titles, and most importantly, an established agricultural system. Spanish agriculture, organized around the mission, had made impressive accomplishments as reflected in the many orchards, gardens, vineyards and irrigation works located along the California coast from San Diego to San Francisco. With the advent of the hide and tallow trade, intensive agriculture was replaced by the vast cattle ranchos of the Mexican period. As a whole, the Hispanic model encountered by the recent Anglo arrival in California in the late 1840's held few similarities with previous agricultural experience.

With annexation of California by the United States in 1848 and subsequent immigration, there occurred an inevitable conflict between Hispanic and Anglo agricultural systems. The resultant clash and resolution of differences between these two points of

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view resulted in a unique landscape reflecting characteristics of both Hispanic and Anglo agriculture. This compromise, however, was not immediate but was a gradual transition in which many new avenues were explored, some accepted and others rejected. The initial stage of transition began shortly before 1850 and continued well into the decade of the 1870's. To gain insights into the transition, this paper investigates briefly the general agricultural patterns of Hispanic California in 1850 in order to provide a foundation for understanding the impact of Anglo immigration and landscape change in Hispanic California.

Background information

Data for this study were gathered from the 1850 manuscript census of agriculture for California. The manuscript census lists 46 individual farm characteristics for each farmer and, in addition, groups farmers according to county of residence. Although eleven coastal counties were contained in the study area in 1850, the manuscript census provides data for only eight of them. Data for three counties, San Francisco, Contra Costa, and Santa Clara, are not available because the census schedules were accidentally destroyed or lost. Another problem arises from the fact that the agricultural census of 1850 was not the most accurate for recording Hispanic agriculture. The census was designed to enumerate livestock and crops normally encountered in other sections of the United States and not the extensive livestock ranchos of California organized to produce hides and tallow for barter and the few acres of crops grown for local consumption. Regardless of these short-comings, the 1850 census is the best data source available for a study of agriculture in early California.

Data for the eight Hispanic counties were coded and tabulated by computer. The number of farmers listed by the manuscript census as residing within the study area in 1850 totaled 612, with 249 indicating Anglo surnames and 383 reporting Spanish surnames. Although 46 farm characteristics were to be enumerated, only 26 were reported as occurring in the study area. Because of
space limitations, only the 16 most important agricultural characteristics are presented and discussed in this paper.

Agricultural patterns of Hispanic California, 1850

Figures 1 and 2 depict the distribution of selected farm characteristics of Hispanic California as enumerated in the manuscript census. In general, both maps illustrate the continuance of the narrow agricultural base developed during the Mexican period. Extensive farming was by far the dominant agricultural activity, with beef and grain comprising the major pursuits. The pattern as illustrated by the maps, however, is somewhat misleading in that not all of the 612 farmers in the study area reported every agricultural activity. Horses, for example, were reported most often, specifically by 453 farmers, and among grains, barley was mentioned least often, by only 18 farmers. The varying number of farmers reporting given activities suggests that the grain and livestock pattern, although important, varied by farmer and that some degree of specialization was occurring.

Crops and livestock may have varied by farmer, but interestingly, the overall distribution was somewhat consistent throughout the study area. Except for swine and potatoes, the general pattern reflected a heavier concentration of agriculture in the South, declining somewhat towards the North. This trend, however, may be a result of losing the data for San Francisco, Santa Clara, and Contra Costa counties. Along with this decline, there was a corresponding reduction in farm size and productivity. Farms decreased from an average of 12,000 acres in the southern part of the study area to an average of 8,500 acres in the northern part, huge by American standards but common by Mexican standards. Cattle declined from an average of 1,000 head per farm in the South to less than 500 head per farm in the North. The lesser importance of cattle in the North was offset by an increase in the raising of swine. Horses and sheep, on the other hand, were reared somewhat consistently throughout the study area, with an average per farm of 92 and 147, respectively. An interesting point regarding sheep
Figure 1. Agriculture in Hispanic California, Animals.
Figure 2. Agriculture in Hispanic California, Crops.
is that no farmer reported wool. Wheat and corn were primarily southern crops, averaging 240 and 131 bushels per farm, respectively in the South, whereas very few farmers reported wheat or corn in the North. In fact, in the latter area both wheat and corn seemed to be replaced by potatoes.

Although California's population surged from 14,000 in 1848 to over 92,000 in 1850 as a result of the Gold Rush, there is no evidence of a corresponding shift to intensive agriculture as might be expected. Despite the fact that the major part of this population increase consisted of immigrants from elsewhere in the United States, agriculture in the study area in 1850 reflected few of the Anglo farming characteristics usually associated with other frontier settlements in the United States. Rather, large farms often reaching 20,000 acres in extent and emphasizing livestock formed the basic farming units and stood in contrast to those farms in previously settled frontier areas. Surprisingly, few intensive crops were grown for the expanding commercial market in the northern part of the study area. In effect, the inability of the agricultural system in Hispanic California to keep pace with rising demand forced importation of food from Oregon, Hawaii, and Chile.

The lack of an intensive agricultural sector is striking considering the number and distribution of Anglo surnames—farmers who would be expected to engage in agricultural activities that reflected their Eastern background. Although 41 per cent of the farmers reported Anglo surnames in the 1850 census schedules, not all of these were recent arrivals to Hispanic California. For instance, 43 per cent of the Anglo surname farmers had actually arrived in California before 1848. Many had come in the early 1840's and had accepted land from the Mexican regime in hopes of participating in the profitable hide and tallow trade. The remaining 57 per cent had been engaged in farming less than two years, hardly enough time to establish well-organized and productive farms considering the hectic circumstances. It should be stressed, however, that these recent Anglo arrivals constituted
only 17 per cent of the total population of both Anglo and Spanish surname farmers. Thus the relatively little change in the agricultural system can possibly be attributed to the small proportion of new farmers and to an insatiable market which paid high prices for almost any commodity produced.

Conclusions

This paper has offered a brief investigation of the general agricultural patterns of Hispanic California in an attempt to understand the impact of Anglo immigration in 1850. From the census data a number of tentative conclusions are suggested. Although farm size, type of crop, crop productivity, and in particular farmers by surname varied somewhat throughout the study area, the overall agricultural pattern did not exhibit a similar variation. In addition, there was surprisingly little difference between the agricultural pursuits of Anglo surnamed farmers and Spanish surnamed farmers, with both groups of farmers engaged in extensive activities. Considering the large population in 1850, the study area reflected a smaller than expected intensive agricultural sector. In general, it can be suggested that the agricultural base of Hispanic California in 1850 reflected a continuance of crops and livestock usually associated with Hispanic agriculture. Although culture contact between Anglo and Mexican set in motion a series of changes that eventually resulted in a significant alteration in the character of California's rural landscape, it would seem that the impact of Anglo immigration on the landscape of Hispanic California had yet to become important by 1850.

Acknowledgements

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NOTES

SMOG MONITORING AND CONTROL IN THE LOS ANGELES AREA
SOME FACTS AND SOME IMPLICATIONS

Warren R. Bland*

In the Los Angeles Area, as in many other parts of the nation, air pollution monitoring and control has been primarily a local responsibility. As smog spread into neighboring counties in the 1950's and 1960's, the pioneering Air Pollution Control District of Los Angeles County was joined by similar districts in the nearby counties of Orange, Riverside, and San Bernardino. In this paper, evidence will be presented to substantiate the intuitive notion that because smog is no respecter of county boundaries, it should be monitored and controlled on a regional basis.

In a recent paper¹ the writer described seasonal variations in air pollution in Los Angeles County via maps of principal atmospheric contaminants and a summary air pollution index. It was noted that "any air pollution index is only as sound as the air quality standards on which it is based."² It could have been argued further that development of meaningful air quality standards requires the availability of accurate and comparable air quality data so that accurate correlations between observed toxic effects and exposure to particular contaminant levels might be calculated. Unfortunately, the implicit assumption that the Los Angeles County Air Pollution Control District oxidant data, upon which the U.S. Environmental Protection Agency and the California Air Resources Board developed their oxidant air quality standards, are accurate and comparable to those of other pollution control agencies, is in doubt.

The accuracy and/or comparability problem arises from the differing techniques utilized by various authorities to calibrate

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oxidant monitoring instruments. The Los Angeles County A.P.C.D. utilizes one, the Environmental Protection Agency, California Air Resources Board, and California counties other than Los Angeles, use another. Which method is correct is not yet certain but it is clear that oxidant readings taken at the same site by identical instruments calibrated by two techniques differ by 20 to 30 percent.³ This, in the words of James N. Pitts, Director of the University of California at Riverside Statewide Air Pollution Research Center, "has a lot of implications."⁴

One obvious implication is that the Environmental Protection Agency's air quality standards developed with reference to Los Angeles County oxidant data are meaningful only in Los Angeles County. In other locations they should be adjusted by a factor of 20 to 30 percent to bring them into line with the Los Angeles oxidant values upon which they are based. An adjustment of 25 percent has already been made by the California Air Resources Board. Under its authority,

Health advisories for photochemical oxidant, including ozone, will be issued by the Los Angeles County APCD at hourly averages of 0.20 ppm (Stage 1), 0.40 ppm (Stage 2) and 0.60 ppm (Stage 3). APCD's in surrounding counties will issue advisories when levels reach 0.25, 0.50 and 0.75 ppm.⁵

A related implication is that past comparisons between oxidant levels in Los Angeles and neighboring counties were inaccurate because true oxidant levels in Los Angeles were understated by approximately 25 percent or those in neighboring counties were overstated by approximately 25 percent, depending on which calibration technique proves most accurate. Thus it may well be that the identification of the inland cities of San Bernardino and Riverside as summer "smog capitals," with markedly worse oxidant pollution than is experienced in inland valley areas of Los Angeles County, is based not on reality but on the non-comparability of data described above. Such is the hypothesis of the writer.

This hypothesis was tested by summarizing 1973 oxidant data recorded at county and Air Resources Board air monitoring
stations in Southern California (Fig. 1). To avoid the conundrum of which data to adjust up and which down to attain "absolute" oxidant values, the writer followed the example of the California Air Resources Board and adjusted upward by 25 percent the federal air quality standard for oxidant in the counties surrounding Los Angeles. Los Angeles oxidant readings were then mapped as a percentage of the unadjusted oxidant standard of 0.08 ppm, whereas oxidant readings from surrounding counties were mapped as a percentage of the adjusted oxidant standard, that is 0.10 ppm. The isoline map provides a macro view of the spatial distribution of oxidant in the study area.

Figure 1. Los Angeles and Vicinity Air Monitoring Stations

SPATIAL PATTERNS OF OXIDANT IN 1973

Like the previous two summers, the summer of 1973 was a season of relatively light air pollution in Southern California. Conditions had been worse in the late 1950's and early 1960's, before California's program to control automotive emissions was implemented. Even so, the federal oxidant standard of 0.08 ppm (one hour average) or 0.10 ppm (adjusted one hour average), to be exceeded on nor more than one day per year, was surpassed on the
average summer day in 1973 in all but coastal sections of the Los Angeles Basin (Fig. 2). Conditions were much worse inland; oxidant averages 2 to 2.5 times the oxidant standard were recorded in the San Gabriel and San Bernardino valleys. As hypothesized, oxidant levels were no worse (indeed were slightly lower) in the cities of San Bernardino and Riverside than in much of Los Angeles County's San Gabriel Valley. Farther inland, atmospheric dispersion of contaminants resulted in somewhat lower readings at monitoring stations; however, the areal enormity of Southern California's photochemical smog problem is underlined by the fact that even the desert communities of Lancaster and Palm Springs, respectively 45 and 100 miles from central Los Angeles, had average oxidant readings equal to those of downtown Los Angeles.

![Figure 2. Oxidant Concentrations as a Percentage of U.S. Oxidant Air Quality Standard, Summer (May 1-Oct. 31) 1973.](image)

It is worth noting the lack of congruency between areas of peak emissions of the raw materials of smog, hydrocarbons and oxides of nitrogen, and areas of peak oxidant concentrations. Highest emissions of hydrocarbons and oxides of nitrogen occur in central and western parts of Los Angeles and Orange counties, where
population densities, automobile traffic, and industrialization are greatest. However, several hours pass between the time heavy emissions of hydrocarbons and oxides of nitrogen are injected into the air mass above coastal and central Los Angeles by morning rush-hour traffic, and the time maximum oxidant concentrations accumulate. During this time span the sea breeze ventilates coastal areas of Los Angeles with relatively clean marine air, and carries the contaminant cloud inland. Consequently, oxidant levels are relatively low in coastal and central Los Angeles in summer and relatively high in inland "receptor areas" even though emission levels are considerably lower inland. It is sad but true that residents of otherwise pleasant small inland cities such as Pomona, San Bernardino, and Riverside are literally choking on aerial effluents not of their own creation but delivered by the sea breeze from metropolitan Los Angeles.

CONCLUSION

This study has shown that serious oxidant air pollution is a widespread phenomenon in Southern California, shrouding contiguous areas of five counties in eye-stinging haze on the average summer day. In this context and because the daily sea breeze typically spreads smog effects from peak emissions source areas in coastal areas of Los Angeles and Orange counties far inland to receptor areas in neighboring counties, the present political fragmentation of Southern California into several county-operated air pollution control districts is undesirable. Because each district can declare pollution alerts and request remedial actions, such as reduced driving, only for its own territory, the effectiveness of the alert system is reduced. An oxidant advisory called in Riverside at 5 p.m. is a result of emissions occurring in Los Angeles or Orange counties eight or nine hours earlier. Any request for reduced driving in Riverside would have little effect on local oxidant levels. If meteorological conditions favored repetition of the "smog episode" in Riverside the next day, the
action needed would be reduced driving not in Riverside but in emission source areas in Los Angeles and Orange counties. Unfortunately, until the several local county air pollution control districts are replaced by one with responsibility for air quality in the entire South Coast Air Basin, such emergency emission control action is difficult if not impossible to implement. For that reason, and to rationalize operations in general, the autonomous air pollution control districts of Southern California should be amalgamated.

NOTES


2 Ibid., p. 278.

3 Larry Pryor, "L.A. Smog Gauges Wrong, Scientists Say: State Upheld," Los Angeles Times, September 5, 1974, Part 2, p. 5. The accuracy of Pryor's article was confirmed by Mel Zeldin, Air Pollution Analyst for the San Bernardino County A.P.C.D., and by William Falkner, Public Information Officer of the Los Angeles County A.P.C.D., in personal communications with the writer.

4 Ibid.


6 Unadjusted oxidant data were obtained from: California, Air Resources Board, Air Quality Data, Vol. 5, 1973.

7 For a discussion of the technique of macro-scale mapping of air pollution and its limitations, see: Bland (1974), pp. 278-279.


THE LAMOIDS OF SOUTH AMERICA:  
A SEARCH FOR TRUTH

John C. Archbold

This paper examines literature concerning the llama, alpaca, vicuña, and guanaco (collectively known as lamoids) from two perspectives: a recent survey of text and other reference materials available to elementary school students and a search for current data about the range and in some cases numbers of individual species. As an outcome of the investigation it is possible to formulate teaching suggestions based upon what is known concerning the ecological, economic, and cultural niche of the animals. [Ed. Note: With the introduction of the "new" social studies many school districts now have only two social studies units with a geography focus. They are "California" and "Latin America" in the fourth and sixth grades respectively.]

Unfortunately, the text and reference materials survey revealed much misinformation about lamoids—the hornless, humpless, cloven-footed ruminants that are South American members of the camel family. As a result, misconceptions about the animals show up (often pictorially) in student reports. The writer became aware of a problem concerning available lamoid information when he made the following assignment in a sixth grade California classroom:

The committee report on lamoids should emphasize their physical characteristics, distribution or range, and usefulness to man. The committee is to prepare three large visuals and may rely entirely upon reference material found in the classroom.

Rather startling visuals resulted. Invariably prepared to emphasize the concept of usefulness to man, they included rural and

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urban scenes of llamas being ridden, milked, hitched to a plow, or arranged in teams pulling heavily laden wagons through town. In response to the query, "Did you find a picture of this in your sources?" the student is apt to reply, "No, but I read about it." Both written and audio-visual sources contain information that would amaze a biogeographer or anyone familiar with the altiplano and other areas where lamoids are found.

CORRECTING THE MYTHS

Table 1 enumerates some of the myths and misconceptions found in classroom references. A study by Daniel W. Gade dealt with lamoid myths found in the general literature. The myths commonly presented as fact in the cited classroom references and the actual facts are summarized in Table 1.

The domesticated llama (*Lama glama*) lives in the high Andes of Peru, Bolivia, Chile, and Argentina, and in the Ecuadorian Highlands, usually at elevations above 9,000 feet (2,743 meters). It is not found, as stated in one source, all along the Andes, which would include Colombian and Venezuelan regions in its range.\(^1\) Quechua and Aymara women are skilled in making garments from the yarn of llama fleece, but the natural fleece is so coarse that it is best marketed—if at all—as a pelt.\(^2\) The Indians make rope or rough cloth from the fleece, but it is not a quality wool as one source indicates.\(^3\) It is true that the llama produces milk, but neither modern nor ancient people have had any specific use for it. The literature indicates that the llama is regularly milked like the Old World cow or goat.\(^4\)

The male llama has traditionally been used as a pack animal on the altiplano (Fig. 1).\(^5\) Its size and weight (4 ft., 250 lbs.—1.37 meters, 113.40 kg.) suggests its value as a mount or draft animal would be limited, and it is widely reported that the maximum burden a llama will carry is approximately 100 pounds (45.36 kg.). However, students would assume substantial use of the llama as a mount from accounts available to them.\(^6\)
Figure 1. The male llama is utilized as a pack animal.
Table 1
The Lamoids—Myth Resolved

<table>
<thead>
<tr>
<th>Myth</th>
<th>Footnote Reference</th>
<th>Information Derived from a Research Article*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of the llama as a mount.</td>
<td>6</td>
<td>Gade states (p. 342) that the llama has never been systematically used as a mount.</td>
</tr>
<tr>
<td>Llama wool is of high quality.</td>
<td>3</td>
<td>Although useful, it is usually used as a pelt, for rope, or for rough textiles, because it is coarse (p. 342).</td>
</tr>
<tr>
<td>Llamas are milked; the milk is utilized as a native food.</td>
<td>4</td>
<td>No evidence exists that the llama has ever been used as a source of milk for human consumption.</td>
</tr>
<tr>
<td>Lamoids are found throughout the Andes range.</td>
<td>1</td>
<td>Their distribution does not include any of the extensive Andes range north-east of the Ecuadorian Highlands (p. 341).</td>
</tr>
<tr>
<td>Domesticated lamoids are found as far south as the tip of Argentina.</td>
<td>7</td>
<td>No domesticated lamoids are found south of 27 degrees South Latitude (p. 341).</td>
</tr>
</tbody>
</table>


The range of the domesticated lamoids (llama and alpaca) includes portions of five countries (Fig. 2). Domesticated lamoids are not raised as far south as the tip of Argentina (as indicated in one source), although the wild guanaco (*Lama guanaco*) is found well into Patagonia.⁷

Vicuñas (*Lama vicugna*) are experimentally kept on large estates and interbred with the domesticated alpaca (*Lama pacos*) to produce a hybrid paco-vicuña. The fleece of the hybrid is more abundant than that of the vicuña, yet retains the quality and value of the vicuña wool. Until recently the vicuña was hunted for its pelt, but not the alpaca, which is no longer found in the wild state as suggested by Ford.⁸ A comparison of the characteristics
Distribution of Lamoids

Figure 2. Range of the lamoids (New World Camels) in South America.
Figure 3. The alpaca, paco-vicuña, and vicuña, of the parent stocks will indicate which traits the paco-vicuña inherited from each parent (Fig. 3).

**ECONOMIC AND CULTURAL SIGNIFICANCE**

The lamoids are useful to the Highland and Patagonian natives of South America in many ways. Although the Old World donkey is a better pack animal at moderate elevations (where it is in fact replacing the llama), the llama is still used to carry burdens at very high elevations where roads are poor. It does not have to be provided with fodder, even in the dry season, as it can make do by grazing wild grasses, sedges, and mosses. The female is not used as a beast of burden, but does provide the natives
with a useful hide and occasional table meat which is sun dried (charqui). Llama dung (taquia) is used for fuel in areas above the timber line. Ritual slaughter of animals is practiced at various times during the agricultural cycle and to commemorate economic, religious, and cultural events.\textsuperscript{10}

The alpaca is raised commercially at very high elevations (usually above 14,000 feet or 4,267.2 meters) and its fleece finds a ready market. Vicuña wool is even more valuable and has sold for as high as $25 per pound ($55 per kg.), although since the days of the Inca this fleece has served only a highly specialized market.\textsuperscript{11} Because of its valuable fleece, cultural uses, and declining range, a population that once may have numbered 1,000,000 today probably does not exceed some 15,000.\textsuperscript{12}

The guanaco runs in wild packs throughout much of llama territory, and far to the south into remote regions of Argentina's Patagonia. It may be taken legally as a game animal and is valued for its meat and its hide.

\textbf{ENDANGERED SPECIES?}

Whereas Gade points to decreased numbers and relative importance of llamas that could lead to its becoming extinct in its natural setting within the next 100 years, Stouse feels that it is "too well integrated into the economy and culture of the Bolivian altiplano" to become extinct.\textsuperscript{13} Other sources treat of the wild vicuña and guanaco. Curry-Lindahl warns that the guanaco "is still in imminent danger of extinction due to hunting," while Fitter says that the vicuña "may soon have to be included" in the \textit{Red Data Book}--a listing of animal species and subspecies in danger of extinction published by the International Union for Conservation of Nature and Natural Resources.\textsuperscript{14}
TEACHING SUGGESTIONS

Large visuals produced by students can effectively portray the lamoids in a natural setting. Figures 1 and 3 were created by sixth grade students. It is possible that raw llama and alpaca wool could be obtained for display, along with finished products made from the wool. The fact that the native Quechua and Aymara Indians of the Highlands use the pelts and hides of lamoids for clothing should be emphasized. It would be appropriate for vocabulary study to point out that "jerky" as a term used to refer to dried beef of the American West is in fact an alternant of charqui, the proper term for dried animal meat. Students also should be aware that the llama is "the most efficient converter of altiplano vegetation to live animal weight." In this respect it might be compared to the new hybrid "beefalo," that cross between feeder cattle and the American bison that some agronomists believe may be a bonanza due to its ability to convert grass to live animal weight. The South American llama is purchased on the hoof and slaughtered for hides and fresh meat in rural areas of the altiplano.

The llama has long been used by the Indian. According to Zeuner, the animal was domesticated as early as 2550 to 1250 B.C. It is probable that it was used at much lower elevations in the past, no doubt because it was the only available beast of burden. Systematically organized, facts and ideas presented in this paper (including the distribution map, Fig. 2) may prove helpful in the preparation of student reports.

CONCLUSION

Factual information about the lamoids is found in the professional literature, and much that is truly helpful is found in the classroom sources cited. Perhaps it is only fair to point out that travel accounts of the early Spanish period were embellished with fanciful impressions of the lamoids, so that Old World
readers would be suitably impressed with the merits of these exotic animals. Nevertheless, too much of our Latin American text material is romanticized. Today's elementary student is better off without source materials that emphasize romanticized anecdotes concerning the lamoids.

The ultimate survival of the animals in their natural habitat will depend upon factors that have been treated or suggested in this paper. Conveying accurate knowledge about these animals may help conservation efforts directed toward their survival. It is likely that guanacos may survive on a decreasing range, and recent laws of the United States and Britain prohibiting import of vicuña products at least recognize the current plight of these endangered animals.

NOTES


10. Ibid.


12. Ibid., p. 77.

13. Gade, op. cit., p. 343 (source cited for Table 1); Stouse, "The Distribution of Llamas in Bolivia," op. cit., p. 139.


GEOGRAPHY AS A CATALYST IN SPECIAL EDUCATION

James L. Johnston*

There is a slight possibility that the people writing the California Education Administrative Code were amateurs. It is also possible that it was thrown together hodge-podge to try to satisfy a number of pressure groups. I prefer to believe that well informed conscientious educators wrote it. By now you are probably wondering what that has to do with the subject of this paper. Let me quote from Paragraph 228,

Curriculum Content: Emphasis shall be placed upon the fundamental school subjects, including reading, writing, arithmetic, spelling, English, history, and geography. Adaptation in such prescribed courses may be made, as the learning characteristics of the minors in the program make necessary.¹

You will notice that the subjects are even listed in the correct order. When mixing ingredients to make something, a person measures each item in specified amounts and in prescribed order, puts them in the pot. When he is ready for "the happening" he dumps in the geography and stirs like ----. If the task is properly done, like the Sorcerer's Apprentice, he gets "a happening."

Geography, being spatial, encompasses all of the other subjects listed above. That statement looks hard to defend, but reading is little more than the recognition of the spatial arrangement of letters which are associated with sound and meaning. Letters themselves are identified because each occupies a definite space. Writing and spelling are orderly and meaningful arrangement of letters and words, again in space. It may seem facetious to apply such a statement to English, yet, the

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movements and amalgamations that developed the English language are geography. The historians will no doubt take violent objection but history is only the record of a space in time, of a space in the universe, and, therefore, geography. Try to solve an arithmetic problem without consideration of the spatial arrangement of the numbers and you are guaranteed an incorrect answer. I know that this is oversimplification and a slight puffing of the wares, but if it will cause a little controversy and induce a lot of thinking then I will accept the barbs.

Now let's get down to cases. How do we use geography as the catalyst in special education? Dr. Edward Fry, in Reading Instructions for Classroom and Clinic² states,

Diagnosis might provide some insights but basically I have concentrated on a more positive goal of just accepting the child "where he is" and then moving him towards the goal of just becoming an effective reader.

He goes on to explain the steps in teaching reading. Under the general heading "Tricks of the Trade," and the sub-title "Interest," he says,

Children are poor actors when it comes to feigning interest. Learn to recognize the signs of fatigue and lack of interest, such as losing the place in oral reading, daydreaming, fiddling with objects and so forth.

Discipline will not make boring lessons good lessons. The teacher must be skillful enough to present lessons that are easy enough to provide success, but difficult enough to provide challenge and growth. Try to find reading materials that have natural interest for the child. Turn some of your drills into competitive games, again keeping in mind that each child must experience some success.

Dr. Fry also says to teach the "instant words," those which are commonest in the English language, arranged in order of frequency of occurrence in reading material and in children's writing. A child, he says, should learn to recognize them instantly for ease in reading because they occur so often. They correspond roughly to the reading difficulty level of materials. Groups marked I are
approximately first grade. Groups marked II are second grade, and so on.

Let's look at the difference in teaching the instant words in the traditional manner and doing it geographically.

The traditional teacher says, "I have written our words for the week on the chalkboard. Copy them. Now, we will all say them together. During the week we will also learn their meanings and how to spell each of them." The following is on the board:

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I YOU WANT FROM BLOCKS
TO AND FIND HOME SCHOOL
IS THE LIVE YOUR WHERE
IT HOW THIS HOUSE MANY
ON MAP
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The students all copy, some finish quickly and become restless. All finish. Now, who can say the first word? Susie! "I," all repeat, etc., etc. Incidentally, they read down the columns instead of stressing left to right across the line.

Using geography as a catalyst, the teacher would hand each student a map of the school area. She would have on the chalkboard the following directions: I want you to find the school and the house where you live on this map. How many blocks is it from your home to school? Naturally, a short course in map reading follows. Words like north, south, east, west, top, bottom, lines, and others are introduced as a bonus. Students go to their study groups and work on completing the assignment. Each group is required to use the dictionary and write the meaning of each word. Each student is required to write five sentences using different words from the list in each sentence. The search for school and homes, using words and counting blocks, will continue through that period and students will take the results home. Those finishing first can start the crossword puzzle made with the words, work the word jumble made of the words, or play an anagram game using the words. With this kind of class assignment the teacher is free to move about helping individuals and groups as required. Yet, she has used the exact same words.
When asked by the Minister of Education in Australia the most important thing that could be taught to students with learning problems, the Minister of Labor said in a letter dated September 17, 1971, "Teach them to move independently from home to work and to shopping and social areas. This will be the greatest help. Let industry teach them their duties." Activities like the one above is the first step in doing just that. It also introduces the students to the concept of representing space on paper and a general idea of the concept of scale.

I think that every book on teaching the learning disabled devotes several paragraphs and/or chapters to "interest and changing behavior." I have observed that every child with a learning disability will, by the time he or she completes the sixth grade, develop a unique behavior that will mask both the real child and the disability. Dr. William Glasser\(^3\) says, and I agree, that before you can effectively teach a child both you and the student must come to know the real child. Let me tell you that it is easy to get acquainted with two pairs of hands in the mud while building a relief map. I wonder if you realize the amount of math and the vocabulary that can be taught building a relief map? Units of measurement, scale, elevation, and slope are a few of the words and concepts that are much easier to explain here than on a chalkboard. Learning the necessary math becomes a means of doing something instead of a recitation chore.

When a student says "I wonder," an alert teacher will jump to it. I can remember a time we were going to do a plant and animal profile, starting at the river listing all the plants and animals there, then moving away from the river to the irrigated farm areas and doing the same, and then a final move to the dry bush which would complete the profile when combined. The field work was to take three days, one in each area. This was not a science project but a vocabulary building and writing exercise. Let me also explain that this was a seventh grade educationally handicapped class of 23 students, in Western New South Wales. As we arrived at the river someone said the magic words, "I wonder
how deep the water is?" Someone else, "I wonder how fast the water is going?" "How wide is it?" "Is it cold?" There were probably a dozen "I wonders" before I said, "I don't know but we could find out." The cry was, how could we?

We sat in a circle under a big gum tree and began to speculate (brainstorm) about the questions and ways to find the answers. We decided to answer the following questions:

a. How wide is the river at this point?
b. How fast is the water moving?
c. Does the water at the top and bottom of the river flow at the same rate?
d. What is the temperature of the water at 10 AM and 2 PM daily?
e. What would a cross section of the river look like?
f. What life forms exist in a cubic foot of river water? Here I got the science teacher involved.
g. How much water would go past this point in 10 minutes?

We devised our own instruments and methods of both, estimating and getting good close answers, timing a floating object over a measured distance to get flow rate. We tied a partially filled bottle that would sink near to the bottom to one that would stay on the surface and observed them as they were carried downstream to solve question c. We also spent a half day every day, except the two when it rained, for the next three weeks in our swim trunks at, in, and under the river. The students took turns acting as safety officers and as directors of individual projects as well as workers. I can't begin to describe in this paper all the learning that took place, or the joy of the group when an experiment was successful. When something we tried didn't work for the first time the members of the class were able to accept failure as only an experience that could be tried in another way. As an added bonus, the two members of the class who could not swim learned to do so. If you are going to try to repeat this, be sure to select a slow-moving, not-too-deep stream.

Here are some additional words of advice to teachers. Not all of these kinds of lessons work out as you plan them, so be able to accept a little failure yourself. You might save yourself
If you want to teach children to use language then let them use it. Plan your program so that they will have to use language, both oral and written, in planning theirs. After some short one-day trips planned by the students with my help, they wanted to go for a long one. I said, "I am too busy; if you can organize this on your own, we will go. You may have up to six periods a week to plan this, provided your other studies are kept current." There was a little grumbling but they knew me well enough to know that I would help. It was policy that everyone in the class would attempt everything; if plans called for a letter, then every student would write the proposed letter. Each was read to the class and discussed. The adjudged best parts of several letters were then combined into the official class letter. The following written language items were completed while planning this trip:

a. Letter to the principal requesting permission to make the trip and an outline of the educational benefits we expected from the trip. It also included an estimated cost and proposals to raise the funds.

b. Letter to the bus company to find the cost.

c. Letter to the bus company scheduling the bus.

d. Letter to the manager of each of five places of interest we wanted to visit.

e. Letter to superintendent of each of three public camping areas we intended to use.

f. Letter to the hotel owners where we intended to stay the third night.

g. Plan for travel timetable.

h. Menus for meals to be cooked with quantities and cost.

i. List of personal gear and clothing to be taken.

j. List of group gear to be taken.

k. Justification by each student of the amount of spending money each planned to take.

l. Plan to raise the money.

m. A plan for a special study from each student.

n. Letter to parents outlining plan and requesting their permission and assistance.

o. Total cost breakdown and per-capita figure.
p. A duty schedule.
q. A safety and a personal conduct code.
r. A proposed form of thank you letter to be sent to those giving assistance.

We started planning this trip when it began getting cold in May and finally took it when it warmed up the second week in November. I don't believe it is necessary to point out the specific things that were learned by the group. I will point out that the trip was a great success, not because the students enjoyed it but because of the things they learned in planning it.

Other examples could be recited but at the risk of redundancy. One can use geography as the catalyst in special education. I used it as such and the evaluation by my principal didn't say, "He is a good or bad geography teacher." It stated, "by innovation and application of sound educational techniques, all of his students have reached an acceptable level of literacy and personal behavior."

NOTES

1California Statutes, Educational Code, Article 1, Section 6750, 1973.
CARL SAUER: MEMORIES ABOUT A TEACHER

J. E. Spencer

My undergraduate training in geography was at the old Southern Branch, University of California, and I cannot react as an undergraduate to Dr. Sauer as a teacher. But I arrived in Berkeley as a raw beginning graduate student, and I recall that some of my early reactions to him were akin to my undergraduate feelings toward imposing characters. For most of a year I stood in considerable awe of his personality, mannerisms, and quietly cryptic comments. Dr. Sauer was not the jovial and friendly extrovert who skillfully manipulated techniques of getting students to like him, or who smoothly popularized his message to all who would listen. He never became really popular with course enrollees, but he won a following among students, who recognized that through the courses he offered one could learn from him. There was a quiet integrity and authority in his slightly distant reserve, and it was not easy to approach him on a casual basis. But undergraduate students did approach him, and when they did he was receptive and responded gently but appropriately.

In an undergraduate lecture course it was Dr. Sauer's habit, at least in the 1930's, to enter the classroom about one minute prior to the time for the class to begin. He usually sat on a stool in a corner, whittling on a match with a penknife, ignoring everyone and everything. The time for a class to begin passed and he still sat silently. Then, perhaps in another minute, he would begin to speak, slowly, almost hesitantly, silences breaking sentences in two. By the time fifteen minutes had passed, however, the tempo had picked up to the point that it was hard to

*Dr. Spencer is Professor Emeritus at U.C.L.A. and presents this item in memory of the late Professor Sauer at the invitation of the editor.
get down a full set of notes. By the end of the hour a listener was aware that, with no notes whatever, Dr. Sauer had quietly given a polished lecture that put new light on an old subject. I had been through a course on North America previously, but auditing Sauer's course presented a new and more challenging North America to me.

Sauer was concerned that the undergraduate program in geography be well arranged, and he participated in that program at all levels. His chief concern, however, lay with the graduates. With them he was always quiet, somewhat cryptic, and at times in the presence of students did not seem to be listening, but to be immersed in his own thoughts. Silences interspersed his remarks. Individuals not yet well acquainted with his manner sometimes felt a lack of attention, as though no real concern existed for contact and communication on the personal level. He often seemed to ignore passive individuals. Occasionally a new graduate student went through a semester without himself approaching Dr. Sauer, to find that he had never been spoken to. Such individuals usually left Berkeley, without ceremony. Those with initiative who approached him with an issue that, hopefully, might catch his interest, were treated to questions and assertions, briefly put, that raised new aspects. One of the common experiences of those who had established a pattern of contact with Sauer was to have him, during a discussion, gently ask: "You don't think that...?" and thus put the issue in a way in which the student had never thought at all.

If, then, a pattern of contact had been established, the student followed up the leads, focused on the questions, and maintained his technique of approach, the pattern could continue until the educational training of a student had been achieved. Sauer wanted his students to learn to think critically, to reject the obvious, and to search beyond the obvious for answers to questions that concerned them, but he made little effort to orient those interests, and he really cared little as to exactly what those questions were. I have often been asked whether I had
trouble, in a department oriented toward Latin America, in choosing a dissertation topic in southern Utah and in going off to China, after having been in the field in Mexico with Sauer. He accepted my decision without questioning it at all, but he persistently asked questions that made me more sharply focus my own concerns in both matters. His concern was not that students follow his interests and region of specialization, but that they learn to become discerning and thoughtful students of a human living system operating in a living landscape. He often pointed up the difference between "distinctive" and "distinguishing" in any analysis. And, as he once put it: "You help a student get started just as you plant a good sapling well and set it straight in the ground. Then you let it grow the way it wants to grow." Eventually, by dint of hard work and persistent sensitive action, one could come to terms with Dr. Sauer. Thereafter, on occasion, one could find that he had been far more observant, aware, and concerned than one had suspected, and that there was a warm and strong affection, a depth of feeling, and a deep humanity behind the reserved and cryptic front.

Three items out of my memories as a student in the department offer illustration of Sauer's effective method of handling students.

1. One morning in the spring of 1930 several of us, graduates all, were sitting in the large room in the basement of old South Hall that then served the department as a hallway, a cartography lab, a conference room, and a library. We were actively arguing the nature and content of cultural geography when Dr. Sauer came quietly in the door. He stopped to listen for a moment, as he often did. He took a couple of puffs on his pipe and spoke briefly, as he often did. That time it was: "How can you fellows argue the nature of cultural geography when you do not yet know much about the nature of culture?" He then turned toward his own office. The issue had been dealt with, and it was up to the discerning student after that.
2. On an early Saturday morning, out with the field course for the first trip of the semester with a class made up of both undergraduates and graduates, Dr. Sauer stopped his car and got out, crossed the road into a field, and sat down on the hillside overlooking San Francisco Bay. We all followed him and sat down, each doing something on his own during the long silence that followed. After about five minutes, Sauer turned to a student (not me) and asked: "What do you see that interests you?" There was no answer. Sauer got up and walked back to the car. At the next stop every member of the class examined everything within range of vision, searching for something that could be discussed.

3. One evening in that large room in the basement of South Hall, after the termination of a seminar meeting in the main Library seminar wing, coffee had been brewed and poured, and the topic of conversation again turned to the processes responsible for creating the interesting landforms of the Berkeley Hills. Most of the graduates participated, while Dr. Sauer sat quietly, only occasionally inserting a remark into the discussion. As midnight approached, Sauer put his pipe in his pocket, put down his coffee cup, stood up, remarked: "The process of slumping is best examined in the field a few days after a good rain," and walked out the door on his way home.

In his own way Carl Sauer employed a very effective teaching method. It did not work equally well on everyone but, for those who could take it, who could learn to meet him in his own way, and who would follow the leads, those students could achieve an education and a manner of operating that would stay with them. As he grew older, the pattern gradually mellowed and softened, but the essential method remained to the end. I had a last letter from him a few weeks before his death, in response to questions I had put to him. He answered by putting questions back to me, interspersed by brief assertive statements. The scholar, productive, alert, knowledgeable, inquiring for eighty-five years, has left his imprint on geography and on many geographers--the Sauer stamp--as a continuing search for the answers to old but ever new questions.
TWENTY-NINTH ANNUAL MEETING, CCGE
California State University, Chico
May 9-10, 1975

The Chico meeting, hosted by the Geography Department at C.S.U Chico, emphasized the last letter of our organization's call letters. Geographic education continues to be critical to the survival of the geographic profession. The Friday program included teaching workshops; department chairmen's meetings, graduate advisors' meetings, and executive board meetings. After so many meetings a picnic and informal reception were enjoyed by all.

Saturday's program featured field trips, concurrent program sessions, a luncheon, the annual business meeting, a cocktail party and banquet. The luncheon speaker was Bill Elam, Executive Director of NCGE; and Robert McNeel, Director of the American Geographic Society, was the featured speaker at the banquet.

PAPERS AND PRESENTATIONS

Tim Bell, Sonoma State College, "The Most Happy Valley: A Study of Settlement and Land Use in the Napa Valley."

Thomas D. Best, California State University, Los Angeles, and Sonia Seeman, Research Consultant, "Place, Position, Policy: Key Elements in Coastal Development."

James Blick, San Diego State University, "Environmental Perception as a Classroom Experience."

Howard Botts, California State University, Northridge, "Nativity Patterns of Anglo-Immigrants, 1950: A Preliminary Investigation of Monterey and Los Angeles Counties."

Michael Bowery, California State College, Bakersfield, "Soil Tests in a Southern San Joaquin Problem Drainage Area."

William F. Collins, *California State University, Chico, "Regional Addressing Systems in Northern California: A Proposal for Butte County."


G. David Dalton, *California State University, Northridge, "A Multiple Regression Analysis of Interstate Migration."

Brian Devonshire, *Southwestern College, "Recent Developments in Senior Geography in New Zealand Post-Primary Schools with Special Emphasis on Fieldwork."

Loretta Dunn, *Enterprise Elementary School District, "Geography in Elementary Schools."

Bob Freeman, *Denoyer-Geppert, "Map Skills for Grades K-6."

Jo Ann Gibeon, Formerly, *Southern Oregon University, "The Evolution of Mobilehome Parks in Butte County."

James Goggin, George Nolte and Associates, "Prelude to Urbanization: Coyote Valley, California."


David Hendrickson, Panel Chairman, *Fresno City College, "Fullbright Teaching Opportunities in Geography."

David Hornbeck, *California State University, Northridge, "Literary Images of California 1850-1900" (a slide tape presentation).


Peter F. Mason, Bechtel Corporation, "Patterns of Urban Development in the Tucson Metropolitan Area, Arizona between 1930 and 1970."

Lawrence G. Miller, University of California, Los Angeles, and Mark Pahuta, University of California, Los Angeles, "Cinematography for Geographic Education."

Edward Myles, California State University, Chico, "Geographic Inputs to a Bicycle System for Chico, California."

George Nasse, California State University, Fresno, "Historic Preservation in Berat, Albania."

George Nemetz, Project RISE, "Project RISE Workshop for Grades 7-12."

Clement Padick, California State University, Los Angeles, "California in Satellite Imagery."

John B. Passerello, California Coastal Zone Conservation Commission, "The California Coastal Plan."

Allan V. Patton, California State University, Chico, "The Computer as a Geographic Tool: Water Balance Models for Northern California."

Nedra F. Peace, California State College, Bakersfield, "Yellowstone: Man's Impact on a Dynamic Ecosystem."

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