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Land Speculation in Southern California: The Roles of Railroads, Trolley Lines and Autos

By MICHAEL F. SHEEHAN*

ABSTRACT. Southern California's *transportation system* was subjected to *speculative manipulation* from the time of the *railroads*, through the period of the *electric interurban trolleys* and the rise of the *automobile* up until the *energy crisis* of the 1970s. The dominant underlying force in each period is shown to have been combinations of *developer-speculators* and local *politicians*. These groups, motivated by a desire for rapid development for speculative reasons, were able to exercise effective control over the provision of major infrastructural *improvements*. The argument is made that such control, and the developmental pattern resulting from it, can never be in the *public interest*.

I

Introduction

THE CALIFORNIA DEPARTMENT OF TRANSPORTATION has announced that it is reestablishing rail commuter service between San Bernardino, Riverside and Los Angeles after a 30-year hiatus.¹ Therein lies a tale which begins with the land booms of turn-of-the-century Southern California and the rise of the vast system of Red Car trolley lines controlled by the Pacific Electric, shifting during the post-war era to the proliferation of freeways and automobiles and the demise of the Red Cars, and bringing us finally to the present where resurgent fiscal conservatism and the energy crisis are shifting the margin of automobile transport inward.

It will be the concern of this paper to describe and explain the forces which created and destroyed the Red Car system and those which promoted freeways, automobiles and rapid and disorganized housing development, as well as to elaborate a critique of land speculation on the Southern California Model. This, I believe, will serve as a vehicle to demonstrate that transportation and land development controlled by speculators will rarely, if ever, be in the public interest.

The paper is divided into two parts. The first develops criteria for distinguishing socially destructive land speculation from the ordinary activities of landowners in the market. The second correlates the development of Southern California's interurban transportation system with the land development ac-

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tivities of those financiers around Henry Huntington; it describes the rise and fall of the Red Car system and the beginning of a new era of speculators and developers reliant on the automobile. A succeeding paper, which explains the impact of the energy and fiscal crises on speculators and the public, presents an analysis of the likely public impacts of, and possible responses to, the collapse in the previously rapidly expanding automobile transit margin.

II

The Ages of Land Speculation in Southern California

MASON GAFFNEY has argued that all who deal in land "speculate," and that there is little to distinguish between the land speculator and the investor, farmer, or grocery store owner in terms of the traditional understanding of speculation.² Within this broad definition, however, it is necessary to distinguish speculative activities which produce substantial negative effects on the general welfare from the ordinary activities of buying and selling of small parcels of land. Taking one approach, Gaffney defines "problem speculation" as the ability of strong speculators to bid more for land than those who could make the land most productive.³

Distinct from this category, however, are those speculators whose power to speculate successfully is based on large financial interests able to manipulate private infrastructure and public improvements so as to maximize their returns in terms of land rent.⁴ If, for example, a person were to have control over the routing of a railroad through a desirable but otherwise undeveloped area, he might with such foreknowledge buy adjacent lands beforehand and then reap the benefits of the increment in land rent which would occur with the construction of the rail line.⁵

In more recent times it has been possible for those possessing smaller amounts of capital to build in isolated areas and to manipulate local political entities into ratifying such development by providing the necessary infrastructure at a later date. Thus the rent increment falls to the developer, while the costs are borne jointly by the purchasers and existing landholders within the district.

To be successful in either of the scenarios just described, speculators have to be able to do at least one of the following: 1) buy the land very early and be willing to hold it until the other necessary preconditions to development are provided; or 2) buy land at prices reflecting a lack of services, and then deploy sufficient political influence to have those services provided.

In either situation the gains of the speculator-developers are made at the expense of the public. The loss to the public involved in the activities of

Gaffney's "Problem Speculator" is the aggregate amount of the difference in productivity, measured as diminished rent, between ownership by the speculator and by the most productive user.⁶ On the other hand, when infrastructure is controlled directly (as in the case of the Southern Pacific⁷ and the Pacific Electric⁸ railways in southern California and the Los Angeles Aqueduct in the San Fernando Valley),⁹ there are likely to be other types of losses: those which the public suffers when the infrastructure is not placed where it ought optimally to go in the public interest, and the host of public misfortunes which arise when developers come to dominate the provision of vital services and local political processes to their own ends. An example of the misplacement of the infrastructure problem would be when a railroad line is placed so as to maximize the private gains of its owners acting as speculators, rather than being located to maximize the increment to aggregate social rents.

In the case where groups of relatively small-scale speculators are able to manipulate the political process to assure themselves that local government or public utilities will bear the expense of extending the necessary infrastructure to outlying developments, public losses occur under several headings. First, the public must pay the costs of supplying new capacity to outlying developments when existing capacity is available to serve undeveloped sites within the current margin of development.¹⁰ Second, municipal planning is made substantially more difficult and risky, with increased risk in this area being equivalent to higher costs. Third, existing residents lose to the speculator the general increase in rents which would otherwise be part of the "rational", *i.e.* non-speculative, process of development. Fourth, outlying developments require that the same volume (*ceteris paribus*) of property taxes be spread over a much expanded geographic area. Other things being equal, this reduces service benefits per capita.

Finally, by acquiescing in sprawled development the public encourages excessive energy use, air and water pollution and other ecological and resource problems (*e.g.* conversion of prime agricultural lands).

III

The Fight Over Resources in Southern California

THE PREREQUISITES TO RAPID GROWTH in the greater Los Angeles area were cheap water, cheap fuel, and cheap transportation. If these could be guaranteed, climate and advertising would do the rest. Yet from the time of the abortive land boom of the 1880s it was evident that whoever could control the supply of any one or combination of these vital resources would be able to exercise a veto power over the plans of the other groups of developers.

This resulted in a series of fights with transportation and downtown newspaper interests closely allied with City Hall against 1) those holding water rights in fringe areas, 2) the Owens Valley agricultural community controlling that area's water resources, and 3) local electric power interests. In each case the Otis (L.A. Times)—Mulholland (L.A. City Engineer)—Pacific Electric interests were successful in obtaining the necessary resources through their control of the city administration. It was the city which condemned the fringe water rights; it was the city which bought out the Owens Valley water rights, 250 miles away, built the Los Angeles Aqueduct, and voted bonds to install hydro-electric facilities; and it was the city, finally, which condemned and purchased the local electric power companies.¹¹

The city was the ideal mechanism for doing these things for two reasons: first, the legal and financial power of government was required for so difficult a series of tasks; and secondly, once safely in government hands, water and power would evermore be supplied at cost. Those who controlled transportation, in the form of the Pacific Electric, would never have to fear competition from private interests controlling either water or power. In exchange for those benefits they were more than happy to put business ideology aside and allow government ownership of two of the three major factors.

IV

The Era of the Red Cars

By 1885 BOTH the Southern Pacific and the Atchison, Topeka and Santa Fe Railroads had been extended to the Los Angeles area. In 1887 a great rate war was fought between the Santa Fe and the SP which culminated in ticket prices for through passage from Kansas City, Missouri to Los Angeles falling to \$1 per passage.¹² Besides encouraging travel on the railroads per se, prospective settlers and homebuyers were encouraged to travel to Southern California, where under some circumstances their cost of passage could be applied against the purchase price of railroad land.

Other speculators were prepared to take advantage of this influx of relatively affluent visitors. New communities in such remote localities as Glendale, Azusa, Glendora, Alhambra and Garvanza, were boomed and sold by developers who had control of local interurban trolley lines and extended them to their outlying tracts in order to secure the profitability of their developments and reap the benefits of multiplied land values.¹³

During the period 1896–1911, the Los Angeles Pacific (LAP) Lines had centralized control of 205 miles of these small connector lines. In 1901 Henry Huntington founded the Pacific Electric; by 1911 it had acquired the LAP and extended its lines into a number of outlying areas,¹⁴ including the San

Fernando Valley. This latter extension is itself a good example of the second class of speculation, wherein the provision of infrastructure is under monopoly control.

In 1909 the San Fernando Valley was the home of a few dry-land farmers. Powerful financial interests in the Los Angeles area, including William Mulholland, the owners of the *Los Angeles Times*, and the Pacific Electric interests, perceived that a fortune was to be made in the Valley if two conditions could be met: 1) water needed to be provided for irrigated agriculture; and 2) cheap transportation needed to be made available for movement of produce and people.

After agreeing among themselves, the insiders undertook three initiatives. First, they bought up vast amounts of valley land at unimproved land prices. Secondly, they convinced taxpayers in the City of Los Angeles that a drought was imminent and that it was necessary to approve funding for an aqueduct to carry water 280 miles from Owens Valley on the east side of the Sierras to Los Angeles,¹⁵ the water to be stored in the hills above the San Fernando Valley until needed. Third, they extended a Pacific Electric line through their lands in the valley.¹⁶

In September, 1909, an option to purchase 47,500 acres of land in the San Fernando Valley was taken by Harry Chandler, general manager of the *Los Angeles Times*. The price tag on the land was \$2.5 million, or slightly more than \$45 per acre. A year later, water was assured and the option was exercised by the Los Angeles Suburban Homes Company, a thirty-man syndicate including Chandler and his father-in-law, Harrison Gray Otis, publisher of the *Times*; Moses H. Sherman, then serving as president of the Los Angeles Metropolitan Water District, the agency authorizing the vital aqueduct [and a director of the Pacific Electric], and Henry E. Huntington, along with other key Los Angeles financial leaders.¹⁷

With both water and transportation available, the valley land blossomed and the principals sold out for millions.

This scenario was to be repeated again and again. Its success depended upon the virtual monopoly of light interurban transport held by the interurban lines. In this era Red Car lines were extended in various directions, becoming the dominant mode of moving people and light freight in the four county area (Los Angeles, Orange, San Bernardino and Riverside). Since automobiles and highways would not begin to present serious competition to the Pacific Electric until the mid-1920s, the speculative conversion of rural lands within the huge area of potential Red Car service was dominated by

those allied to the Pacific Electric, especially during the periods of rapid expansion.

Once the rail line was in place, the land in the general vicinity tended to increase rapidly in value. Much of Henry Huntington's fortune, in fact, was to be derived not from the revenues of his interurban lines but from successful manipulation of land markets through his control of transportation in otherwise isolated areas.

Despite his (Huntington's) evident interest in expanding his electric railroad system beyond the confines of Southern California, his program capitalized on the rule that communities grew alongside rails. Huntington purchased immense amounts of land near Alhambra just as he extended lines to that city. His early real estate acquisitions also included vast acreages in what became the Oak Knoll district and the town of San Marino, both in the San Gabriel Valley where his interurban network was the thickest.¹⁸

It was also quite clear to the leaders in this movement that in order to reap the benefits of rapidly increasing land rents through their control of transport, they would have to continue to maintain transport as the limiting element of the infrastructure.¹⁹ In southern California this meant that water, electricity and to a lesser extent, natural gas, were either to be neutralized through municipal provision, or controlled directly. Huntington saw to this in his developments outside the reach of Los Angeles' municipal light and power through the creation of subsidiary companies supplying basic services.²⁰ Other developers either made similar provisions or shared their gains with private light, water or natural gas companies.

Developers outside the charmed circle of the trolley interests often had recourse to direct subsidies of "profit sharing" in order to attract a trolleyline to an area of potential development.

. . . Moses H. Sherman and Eli Clark [received] direct profits when property owners along the line to Santa Monica encouraged the builders by the gift of 225 acres of ranchland—knowing well that the remaining acreage would gain in value with improved transportation. Sherman and Clark also owned portions of the Beach Land Company, developer of Playa del Rey in a then isolated area. The investment of \$200,000 in streets and surveys plus the extension of the Los Angeles Pacific tracks to the development produced a residential area favored by settlers and profitable to the company's investors.²¹

These high times were to continue until the advent and general proliferation of the automobile, which provided a further rapid expansion of the margin of development in the 1920s.

V

Automobiles and Trolleys in the Interwar Period: 1920–1945

THE TRANSPORTATION MONOPOLY held by the interurban trolley lines hinged on the lack of a suitable alternative mode of conveyance for the masses of new immigrants to southern California. Yet by the end of the First World War this monopoly was already coming under increasing pressure from the automobile.

In the decade of the 1920s the population of southern California was increased by the arrival of almost 1.5 million new immigrants from other parts of the United States. The bulk of these new residents settled in Los Angeles and its suburban satellite towns. This pattern of suburban settlement was facilitated by the fact that a large percentage of the newcomers arrived driving their own automobiles and were therefore sufficiently mobile to be able to accommodate to settlement in new developments away from established transportation corridors.

During the period roughly from 1920 to 1927 the automobile and the trolley lines were able to exist in rough symbiosis, although automobiles registered in the four counties increased from 170,915 to 693,175. While the Pacific Electric was no longer able to exercise exclusive control over the placement of new developments (due to the flexibility of the automobile), the vast increase in population in suburban areas served by Red Car trunk lines led to large increases in the numbers of passengers carried. The emphasis on the ability of the interurbans to create rent by the judicious construction of new lines began to fade, being replaced by an anticipation that the Pacific Electric, now out of its basic construction phase, would begin to return a net profit.

However, this was not to be; the rise of the automobile had effected a revolution in the rent-making calculus. No longer could water and power supply be controlled from City Hall in Los Angeles, and no longer would the Pacific Electric management control transportation through placement of new track. The automobile meant decentralization. In the 1920s it was no longer the City of Los Angeles proper spreading out over the countryside, but new and distinct incorporated cities: South Gate, Bell, Lynwood, Torrance, Hawthorne and others, each with control over the provision of their own infrastructure.²² No longer would outlying developments have to wait upon the construction schedule of the Los Angeles Department of Water and Power. As incorporated cities they could and did develop their own supplies, and when the time was foreseen that these would be insufficient to the task of supplying new development, they would combine with Los Angeles to form the Metropolitan Water District (in 1924) to bring water from the Colorado River through an aqueduct.²³

This decentralization of decision making away from the Los Angeles–Huntington–Harriman power center was unsuccessful in its efforts to maintain control of electric power and natural gas. Besides Los Angeles' Department of Water and Power, the most important sources of electricity and natural gas were Henry Huntington's Pacific Power and Light and its subsidiary Southern California Gas Company. In 1919, however, Huntington allowed the sale of Pacific Power and Light to Southern California Edison, after the spin off of Southern California Gas Company as an independent corporation.

Seeking to maintain its hold on future markets, it was Southern California Edison that provided the major objection to federal development of Boulder Canyon on the Colorado River as a source of cheap public power for Southern California.²⁴ Private power interests were strong enough to force a compromise on the question of public distribution of the power wherein Southern California Edison received a substantial share of the cheap federal power for resale, an arrangement which has set the pattern for subsequent agreements as well, much to the chagrin of local interests.²⁵

The other critical factor in an era of automobile-dominated development was the character of the petroleum industry. Again, low fuel prices meant higher land rents; and the real estate interests had no interest in sharing rents any more than necessary with the petroleum industry.

Southern California was richly endowed with petroleum. In 1890 Union Oil and Edward Doheny were both successful in discovering major oil fields in and around Los Angeles. By 1911 however, the Rockefeller interests, through their Standard Oil in California, were the largest refiners in California.²⁶ At the same time, the Southern Pacific Railroad, through its subsidiary the Southern Pacific Land Company (even at this writing still the largest private landowner in California), gained control of the Associated Oil Company, with substantial holdings of oil lands in the San Joaquin Valley. This gave the Southern Pacific control of some 18 percent of total oil production in California.²⁷

To complement these holdings in May of 1910 the Southern Pacific Railroad, under the control of Harriman, was able to purchase the Pacific Electric and other interurban holdings from Henry Huntington.²⁸ Thus the Rockefellers, directly or through Harriman,²⁹ coordinated vast investments in land, railroads, interurbans and petroleum in southern California up until about 1928. Although they had an incentive to limit the progress of the automobile revolution because of its potential impact on revenues from trolley operations, they had a more active interest in the development of petroleum markets and investments in land. Yet petroleum, because of its abundant supply and

numerous producers, never acted as a potential brake on development, nor was it able to gain for itself a substantial share of rents until well into the 1970s.

VI

Transportation as the Limiting Resource

IF ELECTRICITY, water, natural gas and petroleum were available in sufficient quantity to serve developer interests throughout the 1920s and 30s, it was still transportation that played the role of the limiting resource. Automobiles could be used as extensions of the trolley lines to expand the margin of habitation only if roads could be made available at the public's expense. To this end a series of campaigns was begun long before the 1920s by land developers, automobile clubs and boosters in general, to obtain large state and local appropriations for the construction of a vastly expanded system of all-weather roads to extend the scope of automotive traffic. This agitation was sufficiently successful that by 1909 the California legislature partially preempted the heretofore county-based prerogative of roadbuilding to the extent of authorizing \$18 million for the initiation of a state system of all-weather roads.³⁰

The campaign was carried to Washington over the course of the succeeding years to reach first fruit in the Federal Highway Act of 1916, which provided matching funds for state programs. The state gasoline tax was invented by 1920, and with that, road building was well underway on a scale never before imagined.³¹

In this early era of automobile competition (up until 1927 or so), ridership on the trolleys and interurbans continued to grow. It was not competition from the automobile as an alternative source of movement which began to threaten the viability of the interurbans, but rather that train running times began to increase beyond competitive levels when the clear and fast rights-of-way began to be intersected on a large scale by grade-level automobile crossings. As trip times increased, passengers shifted over to automobiles which created more congestion and led to even longer trip times for the trollies.

Faced with this crisis the Pacific Electric management was willing to attempt novel solutions. To cut downtown traffic congestion and decrease trip time to Hollywood and points north, the Pacific Electric obtained permission to build a double-tracked subway from its terminal building eight-tenths of a mile to a point outside the crowded downtown area. The work was completed by the end of 1925. The venture was an immediate success, substantially cutting trip times to the west and north.³²

The problem continued to worsen, however, over most of the system and clearly something had to be done to improve conditions in downtown Los Angeles, the heart of the system and the most congested area. In response, the Pacific Electric and the three railroads serving Los Angeles, the Southern Pacific, Union Pacific and the Santa Fe, proposed the construction of a new union terminal for use by all the participating railroads plus the Pacific Electric. The novelty of the plan was that the terminal was to be connected to the main intersecting lines of the Pacific Electric by means of elevated rights-of-way over the tracks of the participating railways. The plan would have shifted 1800 daily Pacific Electric trains off downtown streets and eliminated 18,000 grade crossings per day.³³

Unfortunately the proposal ran afoul of the *Los Angeles Times'* plan for downtown redevelopment, which did not involve the "unsightly" elevated structures. After a bitter campaign in 1927 the proposal was defeated by the voters in a local referendum. Total cost of constructing the new overhead system in conjunction with the new terminal would have been \$2 million,³⁴ the entire cost of the project to be borne by Pacific Electric and the railroads.

In 1933 a last effort was made to give the Pacific Electric operating space. The Central Business District Association, afraid that the demise of the Red Car lines would result in the decline of downtown Los Angeles as a business and commercial center in favor of a series of decentralized business and shopping centers, commissioned a study which recommended "extending the Hollywood Subway to Glendale and building two more subways, each with four tracks; one would go to Pasadena and the other would serve Santa Monica. It also proposed an elevated railroad to Long Beach."³⁵

The cost of the new system was estimated at \$37 million, of which the federal government had agreed to supply \$10 million through the Works Progress Administration. The project was to be publicly financed and operated by Pacific Electric. The plan died when the City fathers could not be prevailed upon to issue the City's \$27 million share of the bonds.³⁶

VII

How Land Speculation Has Harmed Southern California

I HAVE TRIED to make two points. The first is that speculative forces have been able to control the pattern of both infrastructural and general development in southern California for the last 100 years, and that this trend has, in general, not been for the best interests of the general population. The second point is that active speculation in land is harmful in a variety of ways, affecting production, distribution, and future options adversely from the pub-

lic perspective. In the political realm as well, the lure of speculative gain, the desire to appropriate the fruits of labor of the productive members of the community, has created a milieu of corrupt, semi-corrupt and myopic political behavior which could never be in the public interest.

The object lesson to be learned from all this is that the public, while being the source, both proximate, in terms of the provision of infrastructure, and ultimate as the progenitors of social activity, of all increments in land values, has been the least gainer and the greatest loser in the struggle for their appropriation. The existence of these appropriable rents as fugitive resources has brought into existence a class of "rent hunters," with interests at odds with those of the public and often with enough clout and initiative to dominate local governments.

It has been argued above that land rent has been created in southern California out of two basic components: availability of transportation and the subsidized provision of local public services, particularly water, sewage disposal and electricity. In the automobile era transportation has been subsidized from all levels of government in the form of the public provision of roadways to municipal provision of local streets. At the local level, outlying or fringe developments have all too often been able to command the provision of local infrastructure at considerably less than the full costs of the services and facilities provided.³⁷

Notes

1. *San Bernardino Sun-Telegram*, April 11, 1980, pp. B-1 and B-5.
2. Mason Gaffney, "Land Speculation as an Obstacle to Ideal Allocation of Land," University of California Berkeley, 1956, unpublished Ph.D. dissertation, Chapter 4.
3. The 'strong' speculator is one who has a lower than average rate of time preference and is thus willing to bid more for future assets (of which land is the most future oriented) than could anyone with a higher rate of time preference.
4. In this paper "speculator" and "developer" are used interchangeably to indicate financial interests which are able to manipulate their control of private infrastructure and public improvements so as to maximize their returns in terms of land rents or capital gains from land. It will be argued that while such activities are not necessarily damaging to the general welfare, their general tendency will be to result in social and economic losses to the public.
5. If any one element of necessary infrastructure is in private hands, then the entire rent accruing to the developer who has committed himself may be extracted by the controllers of the limiting utility. Because of this, small scale developers have been careful to encourage municipal governments to own and operate local infrastructure, so as not to be at the mercy of private monopolists. The history of the progressive movement in California is, in many ways, the history of a reaction to the exercise of monopoly powers by rent gobbling, speculatively motivated railroads. The earliest and most rapacious of these was the Southern Pacific Railroad under Colis P. Huntington; while the second came to be the Pacific Electric under the control of Colis' nephew and heir, Henry Huntington.

6. For a variety of reasons, described in detail in Gaffney, the problem speculator will rarely, if ever, be the most productive user. "After a man has once or twice made by speculation a sum greater than he would be able to make by a year's diligent labor, he is no longer willing to devote himself to the actual work of farming. . . ." (Gaffney, *op. cit.*, p. 368.)
7. Oscar Lewis, *The Big Four* (New York: Knopf, 1938).
8. Vincent Ostrom, *Water and Politics: A Study of Water Policies and Administration in the Development of Los Angeles* (Los Angeles: Haynes Foundation, 1953), Chapter 3 and *passim*.
9. Ostrom, *ibid.*, *passim*.
10. Due to economies of scale in infrastructural provision, most municipal infrastructure will be constructed with excess capacity.
11. Martin Glaeser, "The Los Angeles Bureau of Power and Light: A Case Study of Public Ownership," *Journal of Land and Public Utility Economics*, Vol. 7, Feb. 1931, p. 349ff.
12. Carey McWilliams, *Southern California: An Island on the Land* (Santa Barbara: Peregrine-Smith, 1979).
13. Ostrom, *op. cit.*, p. 146.
14. Increasing its mileage by another 800 miles by 1915 (McWilliams, *op. cit.*, p. 129).
15. Which, since it was unnecessary at the time, became available by merest coincidence for irrigation of land in the San Fernando at surplus water rates. See Michael F. Sheehan, "The Theory of the Limiting Utility Applied to the Development of Natural Resources in Arid Lands," unpublished Ph.D. dissertation, University of California, Riverside, 1979, chapter 4; or Ostrom, *passim*.
16. Spencer Crump, *Ride the Big Red Cars*, (Costa Mesa, Calif.: Trans-Anglo Books, 1962), pp. 233-34.
17. Crump, *ibid.*, p. 116.
18. Crump, *op. cit.*, p. 106.
19. There are of course two ways in which rents could be extracted in a situation where the margin of habitation was controlled by the placement of the trolleylines. In the first the returns could be taken as increases in land rents. This would entail buying up surrounding lands cheaply before the announcement of the new trolleyline and then selling or renting them more dearly afterwards. If, on the other hand, such a policy was not feasible or convenient for some reason, the position of the trolleys as the *limiting utility* could be capitalized upon by raising trolley fares to the point where all or most of land rent would be eliminated.
20. Crump, *op. cit.*, p. 106.
21. *Ibid.*
22. McWilliams, *op. cit.*, p. 135.
23. Ostrom, *op. cit.*, Ch. VII. Later to be augmented by water brought from northern California via the State Water Project of the early 1960s.
24. Public power has always been supplied at much lower price in southern California than private power. This has meant that land rents are higher, *ceteris paribus*, where the supply is publicly controlled, and the margin of habitation is more extended.
25. Jeffrey Fereday, "The Meaning of the Preference Clause in Hydroelectric Power Allocation Under the Federal Reclamation Statutes." *Environmental Law*, 6 (1979), p. 647 and p. 647n; Thomas Brom, "Edison vs. Public Power: The Squeeze in California," *The Nation*, March 2, 1974, p. 269ff.
26. Bean, *op. cit.*, p. 313.
27. *Ibid.*, p. 313.
28. Crump, *op. cit.*, pp. 88-89.

29. For a description of Harriman's connections to the Rockefellers see Matthew Josephson's, *The Robber Barons*, pp. 399–401, 432–33, and *passim*.
30. Bean, *op. cit.*, p. 315.
31. *Ibid.*, p. 315–6.
32. Crump, *op. cit.*, pp. 149–51. It should be remembered that in New York the electric trolley lines had either been elevated or run underground by 1904, while London had handled the congestion problem in the same way by 1908.
33. Crump, *ibid.*, p. 166.
34. Or \$25 million if the lines could not have been piggybacked over the new railines.
35. Crump, *ibid.*, p. 198.
36. *Ibid.*, p. 198.
37. Henry J. Vaux, Jr., "Rural Land Subdividing: A Lesson From the California Desert," *Journal of the American Institute of Planners*, July 1977, pp. 217–78.

U.S. Women's Progress in Education

A PICTURE OF THE PROGRESS achieved by United States women in obtaining college degrees is presented by the National Center for Education Statistics (NCES) in a report entitled *Degree Awards to Women: 1979 Update*.

This report is based on data collected between 1971 and 1979 in NCES's Higher Education General Information Survey (HEGIS). Separate chapters are devoted to bachelor's, master's, doctoral, and first-professional degrees. Each chapter consists of: (a) an overview, (b) an examination by field of study of the percentage representation of women among degree recipients in 1979 as compared with 1971, and (c) an examination of the relative popularity of different fields of study for men and for women, and how this changed during the 9-year period.

Among the highlights of the report are:

At all four degree levels, women continued to increase, at least slightly, their percentage representation among degree recipients.

In 1979 women accounted for 48.3 percent of the bachelor's degrees, 49.1 percent of the master's degrees, 28.1 percent of the doctoral degrees, and 23.6 percent of the first-professional degrees.

At the bachelor's degree level, women now predominate in two fields which have not traditionally been regarded as women's fields. These are psychology (61.3 percent) and public affairs and services (53.5 percent).

At both the bachelor's and master's degree levels, but not at the doctoral level, women showed their greatest increases in percentage representation in those fields where they have traditionally been least represented.