California's Golden Road to Riches: Natural Resources and Regional Capitalism, 1848–1940

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California presents an important case of regional capitalism grounded in the wealth of nature. It belies the received wisdom that natural resource extraction is an anachronistic and inferior road to economic development. Prior to World War II, California's economy rested squarely on minerals, agriculture, timber, and fisheries, yet this was consonant with high income, capital accumulation, development of manufacturing, and a high rate of technical innovation. Indeed, the latter were crucial to an extraordinarily rapid rate of discovery and plunder of resources for over a century. With due regard to the gifts of nature, the secret of California's success is to be found in its social relations of production, especially open property rights and a syncretic class system, rapid capital accumulation, and a redoubtable state based firmly on the capitalist society that crafted it. *Key Words: natural resources, California, regions, economic development, industrialization, capitalism.*

Natural resource exploitation has been central to the story of capitalist development. Many of the richest countries in the world—such as the United States, Norway, and Australia—have followed resource-intensive paths, and some of the fastest-growing nations of recent years, such as Brazil and Indonesia, rely heavily on the plunder of nature. Yet, as Paul David and Gavin Wright (1997, 203) observe, "Resource development is a neglected topic in economic history." For economists, modernization is a long march out of primary extraction through manufacturing into high-tech futures, where today's research is concentrated (cf. Wright 1990). Geographers ought to be less prone to such thinking, given the centrality of nature-society relations to the discipline. Yet economic geographers have distanced themselves from theories of location, trade, and development that give priority to resource endowments. Years ago, the field broke with natural determination to emphasize the endogenous dynamics of city systems, industrial districts, and advanced regions. Despite complaints that this has meant neglect of the rural and agrarian, the bias toward the urban and industrial continues (FitzSimmons 1986; Page 1996).

Urban-environmental geographers have done better. William Cronon (1991) put the political economy of natural resources back on the map in dramatic fashion. In his magnificent panorama, Chicago serves as the vortex of regional commodity circulation, profiting off the flux of wheat, lumber, and meat out of the countryside. Similarly, in a devastating portrait of San Francisco, Gray Brechin (1999) takes mining as the foundation of urban wealth and the plunder of nature as the city's *modus vivendi*. Yet neither author takes economic analysis very far. They do not reveal the long-term basis for development once the plunder is over, why nature makes some places rich and others poor, or what makes resource regions distinctive.

California is a compelling case of resource-led development. Its expansion to the present trillion-dollar economy was jump-started by a gold rush, maintained by a succession of silver and oil strikes, and sustained by long-term extractions from farm, fishery, and forest. Not until the middle of the twentieth century did the balance shift away from land-based activities. Today, the region stands at the leading edge of the global industrial, scientific, and information economy. If the world's high-tech capital and one of the richest spots on earth followed a resource-intensive road, then perhaps the contribution of nature to economic growth is a topic worthy of serious consideration—even if never mentioned by the preeminent geographers of modern California (e.g., Soja 1989; Scott 1993; Saxenian 1994).

Why was California such an astonishing success? Plundered it was but it grew fabulously for all that. The ability to turn dross into gold is surely related to the nature of capitalism, installed virtually overnight. In Carey McWilliams's ([1949] 1976, 25) striking image, ". . . the lights went on all at once, in a blaze, and they have never been dimmed." Yet the failure of the capitalist juggernaut to bring prosperity to every place it touches shows that

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there is nothing inevitable about its triumph over local conditions, or about subsequent economic progress. The trick, therefore, is to specify the kind of capitalist order that arose in California, and why it spurred both rapid exploitation of nature *and* long-term growth.[1]

Taking California's economic history seriously means engaging three key debates in economics and geography: natural versus social causes; the transformation of growth into social welfare; and the specification of local difference. The opening section lays out these debates. The second section makes the numerical case for resource riches in California's meteoric rise. The four sections following delineate, as historical narrative, the four principal components of California's high road to development. These are, in order of importance: the property regime, capital accumulation, industrialization, and state promotion. Property and class formation establish access to resources and motivation for their discovery. Regional capital accumulation and reinvestment pave the resource road to growth. Industrialization and technical innovation provide the means for extraction on an ever-ascending scale. And the state builds the legal and political integument that knits the institutional fabric of property, finance, and industry together.

The Resource Road to Capitalism

How does nature's plenitude figure in regional growth and prosperity? There are three steps to answering this. The first concerns nature's input to economic development, the second concerns the translation of the wealth from nature into social prosperity, and the third concerns the geographic locus of these relations. The argument here emphasizes the reciprocity of resources and economies, social relations of production, and specificity of regional capitalisms.

Nature and Nurture

In economics there has long been a falling out over which matters most, the natural basis of economic activity or the ability of economies to convert nature into things of human value. For the first political economists, from William Petty to the Physiocrats and Adam Smith, agriculture was the natural basis of the wealth of nations; this is not surprising, as they were writing from the experience of the British agrarian revolution (McNally 1988). Even David Ricardo, the first industrial economist, built his theory of trade around natural endowments and his theory of growth around a (Malthusian) fear of the natural limits to expansion. Stanley Jevons carried this idea forward into the neoclassical era, making natural scarcity a bedrock of marginalist theory.[2]

By the turn of twentieth century, however, Alfred Marshall and Leon Walras had put a sunnier outlook on economic prospects, letting constant returns to scale prevail over diminishing returns. Advances in industry seemed to render moot the question of natural limits, while market allocation triumphed over questions of growth and distribution. International trade theory gave solace to those places lacking industry, whose primary products offered the best hope of comparative advantage. A dynamic version of this, export-led growth, saw staples as a platform from which to leap onto the train of progress.[3] Nonetheless, the "stages of growth" model carried the day, equating agriculture with backwardness and modernization with heavy industry (Rostow 1961).

Outside the neoclassical mainstream, the liberating potential of cities and manufactures has been more appealing than rural development or natural limits. Karl Marx thought that the forces of production unleashed by capitalism overcame natural restraints and was emphatic about the *social* limits on accumulation through falling profits and class struggle.[4] Joseph Schumpeter's position was an optimistic variant of diminishing returns: he argued that capitalist growth repeatedly shot ahead through technological progress (nature's secrets unlocked by human wit), then slowed as waves of innovation petered out. John Maynard Keynes, on the other hand, diagnosed stagnation as a wholly unnatural failure of capitalist spirits and government policy that could be easily cured (Walker 1995a).

Geographers have jousted over much the same ground. Natural causes weighed heavily among the views of the discipline's pioneers, in Friedrich Ratzel's natural laws of territorial expansion, Halford Mackinder's geographical pivot of history, and Walter Christaller's agrarian Central Places. Against such environmental determinism, the dominance of the cultural landscape was stressed by Otto Schlüter, Vidal de la Blache and, most importantly, Carl Sauer. Sauer's cultural turn emphasized human influences transforming the earth and natural resources as the products of social evaluation (Thomas 1956). Yet, given its strenuous antimodernism, the members of the Berkeley School, like de la Blache, fell back on a kind of natural economy of land and life (Livingstone 1992, 264–303).

Postwar economic geographers and regional scientists broke with naturalized views of landscape in favor of Walter Isard's rational space-economy, a product of purely economic forces of markets and distance costs. David Harvey made a parallel leap to social abstraction, but on the opposing side. He used Marxian economics to construct a theory of the capitalist landscape, determinedly burying Smithian optimization, Walrasian equilibrium, and Ricardian scarcity (Harvey 1974, 1982). Neil Smith went even farther in his pursuit of the social production of nature and the uneven workings of capital (Smith 1984; cf. Casttee 1995). Subsequently, New Industrial Geography tackled the formation of the economic landscape from a more productionist angle than that of either Isard or Harvey, with a classical sense of dynamic change through industrialization and technical advance (Storper and Walker 1989). Resources got short shrift again.

In the rural realms, Gilbert White and the Natural Hazards School brought back unframed nature, but their thin cultural analysis of risk was superseded by Political Ecology, which looked at the social origins of exposure to natural disasters (Watts 1983; Blaikie 1985). Political ecologists have drawn a web of connections between natural conditions and social arrangements, knitting together property rights, households, gender relations, and states. Their analysis builds from an eclectic mix of Marxian, world systems, Weberian and feminist ideas and has been rooted in studies of the Third World (Peet and Watts 1996). Similarly, Cronon's (1991) version of nature's economy in North America draws freely on Harvey's theory of capital circulation, while dismissing Marxist value theory of value for ignoring nature's contribution to the wealth of places.[5] In so doing, however, it fails to grasp the nettle of industrialization: the rising productive powers of labor across the Midwest—not just mercantile exchange—lay behind the enormous flux of resource commodities (Page and Walker 1991, 1994).[6]

Restated, the first economic-geographic puzzle is this: do natural resources provide a viable foundation for economic growth, if industrialization is the heart and soul of modern development? This puzzle has been hard to solve because the two sides of the equation are intertwined, not independent. Resource extraction feeds commodities and wealth into the vortex of industrial expansion. It is not a primitive stage that occurs before manufacturing's takeoff; there is no Rostovian great leap forward. Conversely, natural resources are not simply "gifts of nature"; they are an *endogenous* factor of economic progress, in much the same sense as is technology. Capitalist modernization raises the level of resource extraction and throughput at the same time as it raises aggregate output and income. Nature's bounty is both input to *and* output of economic growth (David and Wright 1997).

As we shall see, California's resource bonanzas were not passive withdrawals from the earth; they were the dynamic consequence of advances in economic development. Better extractive technology, infrastructure, and methods of finance all contributed to the ability to take materials out of the ground, while improved resource processing and new manufactured products meant one could do more with the minerals, timber, or foodstuffs. This argument remains too abstract, however, as long as it rests on overly universalized notions of "modernization" and the "economy." It needs further specification of the social relations of production to fit the case of California.

Spinning Dross into Gold

The economic order of California is without question a capitalist one. This includes more than markets and exchange; capitalism is a social order of private property, unequal classes, extraction of surplus value, investment for monetary profit, and competition. Together, these features drive capitalists to rationalize production, introduce new products, and raise productivity over time. In the classic Marxian view, this makes capitalist economies highly dynamic, the driving force behind industrialization (Marx [1863] 1967; Brenner 1976, 1986; Harvey 1982). Capitalism must thus be the prime cause of the extraction of large quantities of natural resources in modern times.

The analysis cannot stop there, however. Despite capitalism's global expansion, there is a widespread legacy of economic failures around the world. This is particularly acute in the arena of natural resource extraction, as shown by a host of cases where resource-rich places have suffered disappointment, despair, and disillusion in the attempt to join the Euro-American march to prosperity. Any simple equation of the capitalist mode of production and successful development through natural resource extraction runs into three objections.

The first points to instances where land-owning renters suck the veins of production dry, take the money, and run. This "radical Ricardian" critique virtually began in California, with Henry George's (1871, 1879) attack on the landed empires acquired during the 1860s and 70s;[7] it is revisited in Brechin's (1999) infernal view of miners and other plunderers. Yet this scenario requires that landed or mining elites operate as consumers of the wealth of nature, not as capitalists reinvesting in industry and commerce. This has been the case in many corners of the world, where landowners have actively opposed capitalist development (Gerschenkron 1943; Moore 1966; Samatar 1999).[8] In California there was no such class, however. Rent-seeking was a form of capitalist enterprise and incentive to discovery; most such rents were ploughed back into productive enterprise, not frittered away. California ran forward on two legs of earned and unearned wealth.

The second objection is an anti-Ricardian one, made

popular by Canadian Harold Innis (1933), Maoist-Marxist Paul Baran (1957), and the Latin American Dependency School (Palma 1978), which says that trade necessarily works against places that specialize in primary products (staples). Regions thus consigned to the short end of the international division of labor lose out to the manufacturing centers through falling terms of trade, leakage of surplus, and failure to diversify. Here again, many studies show how this has happened to poor regions around the world (e.g., Bunker 1985; Frickel and Freudenberg 1996). Some observers of the American West, from Bernard DeVoto (1934) to William Robbins (1994), have argued that it was a "plundered province" in this manner. Yet California profitably exported silver, wheat, and mercury to the world, held onto the surplus, and multiplied its economic resources. Capital circulated within the region in a virtuous circle of development and accumulation.

A third barrier to successful resource capitalism is said to be the rapid exhaustion of nature by get-rich-quick extraction. Local abundance has repeatedly triggered resource rushes and boom and bust cycles that Innis (1933) called "cyclonic" in their speed and fury. The end result is very often ghost-town landscapes, littered with wreckage and having no long-term staying power (Markusen 1987; Brechin 1999). The western United States is well-stocked with such places, from the forests of British Columbia to the copper districts of Arizona (Nadeau 1990). Yet despoliation at the microgeographic scale has not translated into overall regional failure in California, as resource rushes followed each other in dizzying succession. The developing forces of production in manufacturing, transport, and science were the magic keys to the natural kingdom, whose bounty expanded as fast as it was exhausted.

The prime reason for this successful model of resource-intensive capitalism is undoubtedly the social distribution of the wealth of nature, beginning with property rights and direct access to the profits of extraction. As shall be seen, California maintained a particularly open structure of opportunity, a well-populated mode of plunder that shared the wealth to a considerable degree. Far from being bound by feudal legatees or dissolute rentiers, it was propelled forward by a raucous crowd of petty bourgeois owners and aspirants, some of whom made it into the ranks of big business. Big capital was itself thoroughly devoted to regional development as a way to making more money. Another cause of California's good fortune was the geography of trade and finance, which made San Francisco into a major pole of capital accumulation and investment. It was not just the victim of "urban elites," however execrable they may have been.

Regional Capitalisms

To compare the success and failure of capitalism in different places raises difficulties for the universalist approach. While one can extract key characteristics of the system and identify the abstract logic of its development from specific times and places, the reverse is not true. That is, capitalism is not operative equally everywhere, nor does it advance the forces of production evenly in all places. The debate over the generality of capitalism is as old as political economy. Smith's confidence in British agrarian capitalism can be contrasted with the physiocrats' unease over France's ability to break out of the mercantilist straitjacket (McNally 1988). Similarly, Ricardo's faith in the benefits of trade was opposed by Friedrich List's insistence on protection for Germany's nascent industries (Deane 1978). Today we see the same argument carried out between neoliberal free traders and advocates of national competitive advantage. The latter have highlighted differences in the performance of national economies because of divergent technologies, business organization, state structures, financial systems, and labor markets (Chandler 1990; Porter 1990; Nelson 1993). Similar distinctions may be found at the regional level, though boundaries are harder to draw.

On the left, the debate over uneven development has raged for a century, beginning with disputes over the spread of capitalism to Russia and the driving forces behind imperialism before World War I (Lenin [1899] 1967; Luxemburg [1915] 1972). After World War II, socialists and nationalists questioned the virtues of the capitalist road and insertion into the world market (Baran 1957). Following this line, world systems theory (Wallerstein 1979) gestures grandly about centers and peripheries but does not go very far toward spelling out the social origins of geographic difference (Brenner 1977).[9] This tendency is opposed by those left scholars for whom the heating up of rivalries among the advanced economies has stimulated inquiry into divergent national forms of capitalism (Tabb 1995; Coates 1999).

Since Vidal, Sauer, and especially Richard Hartshorne, geography has frequently laid claim to regional studies as a defining province of the discipline (Livingstone 1992). Yet postwar geographers turned away from regionalism to the search for universals. David Harvey's critical attention to the spatiality of capitalism comes with a curious diffidence toward the peculiarities of place. While convinced that uneven development is a necessary part of capitalism, Harvey argues that this is so much a *present and continuous* process that past legacies are overwhelmed (Harvey 2000, 78; cf. Smith 1984).[10] This leaves little causal role for the kind of sedimented histo-

ries of place emphasized by Doreen Massey (1994), or the multiple capitalisms of Pred and Watts (1992). The antagonism of Harvey (1997) and N. Smith (1987) to locality research has left a revived regionalism in geography largely outside the Marxian pale.

The radical tradition that attends most closely to the deep-seated origins of geographic difference is the literature on "transitions to capitalism." Robert Brenner's (1976) classic on the origins of agrarian capitalism explains the divergent trajectories of eastern and western Europe on the basis of class struggles. Barrington Moore (1966) looks outside Europe in making the case for disparate transitions and the key role of agrarian classes in them. The critique of neoliberalism in East Asia and postcommunist Eastern Europe has revived the notion of alternative transitions (Amsden 1989; Evans 1995; Pickles and Smith 1998).[11] Contemporary political ecologists likewise demand careful analysis of local property relations, gender divisions, and social conflicts in the entry of peripheral regions into the world economy (Peet and Watts 1996).

The idea of "roads to capitalism" dovetails with the current emphasis among economic geographers on development paths and industrial trajectories. Both speak to the importance of initial conditions, key turning points, cumulative causation, and persistent habits in the economic histories of firms, sectors, and places. Yet the New Regionalists have been preoccupied with industrial clusters, network analysis, and local institutions of governance (Scott and Storper 1992; Storper 1997), while skirting the larger questions raised by classical political economy and agrarian theory about classes, distribution, political conflict, and state action in establishing distinct capitalist roads (Hart 1998).

Why do theories of nature's role in economic growth and prosperity fail to account for California's experience? This occurs because they do not specify the regional road to capitalism, with its distinct social relations of production, not to mention institutional forms and local practices. At the gold rush, California made a leap to a form of agrarian capitalism well in advance of that known to the classical political economists. It was more than just another "white settler colony," however, or broadly Anglo-American, or typically American.[12] The United States has strong regional differences, long mooted by geographers and historians. The New Western History has raised the challenge once more to specify just what, beyond culture legacies, is different about a place like California (Limerick 1987; Worster 1992; Klein 1997). This article is only one step toward such a comparative analysis.[13] For present purposes, it must be assumed that California functions as a region in a meaningful sense. Although it cannot be argued out here, distance, statehood, an urban core, and settlement density—among other things—have helped constitute for California an enduring regional entity.[14]

California's economic order may be called "resource capitalism" or "prospector capitalism." How to characterize it? In a path-breaking treatment of mineral abundance in the United States, David and Wright (1997, 203) ascribe it to four things: "intensity of search; new technologies of extraction, refining and utilization; market development and transportation investments"; and "legal, institutional, and political structures affecting all of these." These can be reformulated in more classical terms as: property regime, industrialization, accumulation, and the state. The role of physical geography, while significant, is secondary to these. Below, I analyze California's golden road to growth under these four categories.[15]

A Model of Resource Capitalism

This treatment of California's resource economy has as its goal to demonstrate the three propositions derived from the preceding theoretical debates, to wit: resource extraction and economic development were reciprocal; the gains from resource extraction created prosperity within the region; and the regional social-spatial order was such as to maintain these conditions. To guide the reader through an extended argument, the main variables and relations may be formalized, not as strict equations but as statements of connection and causation in the manner of Marx's presentation of the circuits of capital.[16]

The four statements (and corollaries) below correspond to the four dimensions of the capitalist economy just enunciated: property, capital, industry, and the state. To make things clear, the only symbols used are + (combination), ≈ (creates), and ∂ (increase); each statement is annotated.

1. *Nature* + *Property* ≈ *Resources*
   1a. *Resources* + *Labor* ≈ *Materials* + *Value*

(1) nature is appropriated by a system of property, and thus converted into "resources," or nature staked, claimed, and commodified.

(1a) labor extracts raw materials from nature, and creates value.

2. *Surplus Value* ≈ *Capital*
   2a. *Capital* ≈ ∂*[Resources]*
   2b. *Capital* ≈ ∂*[Materials* + *Value]*

(2) surplus value (not paid to labor or for land) is turned into capital.

(2a) capital is reinvested in discovery and purchase of further resources (or in transportation access to resources).

(2b) capital applied to extraction raises the level of output.

3. *Materials + Industry ≈ Goods + Value (∂Capital)*
   3a. Goods (K) ≈ ∂[Resources + Materials + Value]
   3b. Goods (K) + Capital ≈ ∂ Industry
(3) raw materials extracted from the earth are processed by industry into final goods, as well as yielding more value and surplus value (hence more capital).
   (3a) capital goods, or equipment, produced by industry are applied to discovery and extraction to increase the output in primary production (1 and 1a).
   (3b) capital goods and capital are used to build up industry further (including transportation and circulation).

4. *State ≈ rules of [Property + Capital + Industry]*
   4a. State ≈ ∂ [Property + Capital + Industry]
   4b. ∂[Property + Capital + Industry] ≈ ∂State
(4) the state establishes the basic rules of property, finance and industry (trade).
   (4a) the state also supports and promotes the development of the economic system.
   (4b) the growing and changing economy modifies the workings and policies of the state.

Clearly, this model is simplified for ease of comprehension; it will necessarily be modified and enriched in the narrative sections below. For example, the property regime includes the distributional share going to labor; capital needs a financial structure and credit system; industry includes both manufacturing and commercial trade, as well as the development of technology; and the state has a life of its own which fits the economy only imperfectly, and is subject to intense class struggles.

The model should be seen as historical in two senses. One is that it places the transition to resource capitalism in California squarely in the gold rush era, when the basic property regime and state apparatus were installed. The other is that it allows for feedback and renewal. The core feedback is economic in the sense of ongoing resource bonanzas, capital accumulation, and industrialization. However, there is an encompassing feedback loop of social relations through the replay of social entry, small property and personal enrichment, as well as new waves of large enterprise and big fortunes. Political conflict and state intervention policed this social order, with the apptopriate modification of rights, institutions, and class relations in light of the new projects of every epoch.

Finally, one should be aware of the weave of facts and values in such modeling exercises (Kearns 1998). Yet taking a strong position on the character of California capitalism does not preclude a careful treatment of theory and evidence that might alter the main propositions. My model is meant as a provocation to further debate. Nor is the moral and political stance of the social theorist (aka "historical geographer") absent, although I am most likely to be taken as a advocate of capitalist development because in the California case it undoubtedly has worked. Neither the rape of the land, the oppression of labor, virulent racism, nor the political madness of California's history are treated here, in otder to keep an already complex argument focused.

The Wealth of Nature: Mining California

Gold, silver, copper, and petroleum provided spectacular bursts of wealth that propelled California's expansion along the fast track of capitalist development. As McWilliams ([1949] 1976, 25) puts it, "the discovery of gold got California off to a flying start, and set in motion its chain-reaction, explosive, self-generating pattern of development."[17] Wave after wave of resource accumulation figured in the state's rapid growth: gold, silver, wheat, citrus, timbet, copper, hydropower, petroleum, sardines. One must, therefore, begin the account of California's economic development with the wealth that kept gushing from the earth, providing the fundamental flows of value into the wider system of capital accumulation, industrialization, and state finance.

Resource Bonanzas

California (plus Nevada) was the world's premier mining district during the second half of the nineteenth century (Smith 1943; Paul 1947).[18] Under the shadow of mining, considerable plunder of forests and streams took place (Brechin 1999). Simultaneously, river fishes and ocean mammals were stripped from the waters (Busch 1985; Black 1995; Yoshiyama 1999). Beginning with the great wheat boom, the economy shifted toward agriculture, and California led the nation in value of output from farming and agro-processing from 1900 to 1950 (Paul 1958; Liebman 1983; Olmstead and Rhode 1997). At the turn of the century, a "Black Gold Rush" took place in the Southern California oil fields, which became the world's greatest oil district and remained thus up to 1930 (White 1962, 1970; Quam-Wickam 1994). Northern California led the way with the world's first industrial fishery complex, which raised the state's proportion of U.S. fisheries' output close to one third in the 1920s and 30s (McEvoy 1986). In timber, the state was one of the top three producing states circa

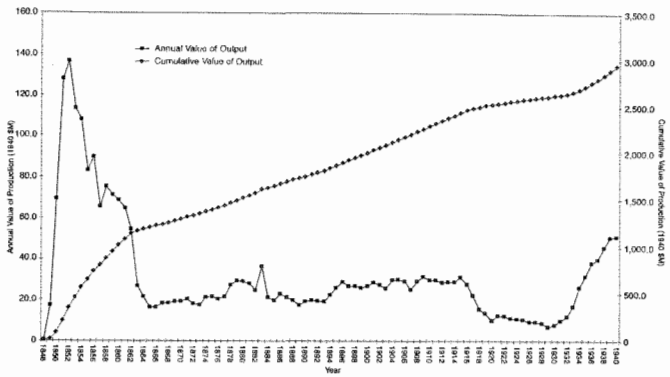

Figure 1. California gold, 1848–1940. All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Data from California State Division of Mines (1941).

1900–1950 (Cox 1974; Hutchinson 1974). Finally, California became the world's leader in water storage, transfer, and hydropower, and intensive agriculture through irrigation (Worster 1985; Hundley 1992; Williams 1997).

Here are the absolute figures on value of output for major natural resources (in 1940 dollars):[19]

- *Gold*: $1 billion by 1860 and $3 billion by 1940. Up to 1900, California produced one-fifth of the world's gold and more than the monetary gold stock of the United States (*San Francisco Chronicle* 23 January 1898) (Figure 1).
- *Silver*: $360 million total, so glutting the world silver supply that the U.S. and Europe went onto the gold standard.[20]
- *Quicksilver (mercury)*: $100 million by 1895 and $140 million by 1917, or half the world supply, 1850–1890.[21]
- *Oil*: $1.7 billion by 1920 and $6.3 billion by 1940. Oil nearly doubled gold and silver riches in about half the time. California was the world's leading producer, 1905–1930 (Figure 2).
- *Natural gas*: the equivalent of about one-fifth of oil BTUs from 1920 to 1940 (Williams 1997, 360), or roughly $900 million.
- *Other minerals*: The cumulative value of minerals other than gold and petroleum was quite large: $1 billion by 1920, $2.25 billion by 1940. $500 million of this was due to silver and quicksilver and almost $1 billion to natural gas; the balance was contributed by two dozen other minerals. Clay and stone, mineral water, and borates were prominent in the nineteenth century; in the twentieth it was copper, cement, salt, zinc, tungsten, and chromite, with bursts of potash and magnesite (Figure 3).
- *Agriculture*: Cumulative output worth about $5 billion by 1905, over $20 billion by 1940. California quickly became one of the top wheat and barley growing states, and then shifted into high gear with fruits and vegetables. By the 1920s it was the largest producer of farm products in the United States (Figure 4).
- *Timber and lumber*: $1 billion by 1912, $2.5 billion by 1940 (an underestimate, since much timber went directly into railroad ties and mine supports). California ranked eleventh in state output in 1899, seventh in 1909 (Figure 5).
- *Fish*: Salmon products $15–25 million, 1850–1910; sardines a total of perhaps $875 million, 1915–1952.[22] California was the nation's leading commercial fishery for several years in the 1920s.
- *Furs*: About $25 million, 1850–1900, by the end of which time stocks were exhausted.[23]
- *Hydro*: The equivalent of about one-tenth of oil output in BTUs from 1905 to 1940 (Williams 1997, 360), or roughly $600 million. California led the world in hydroelectic generation and use through 1920, and probably up to 1940.

The plunder is staggering, yet often underrated even by California historians. Stories of gold and silver abound in the north, but other resources are less appreciated. In the south, the prevailing wisdom is that real estate specula-

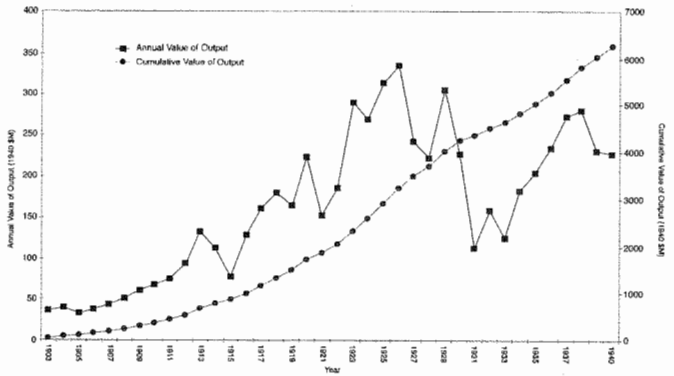

Figure 2. California crude oil, 1903–1940. All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Data on output from Conservation Committee of California Oil Producers (1990). Data on average per barrel price at well from Dodd and Dodd (1976) and U.S. Bureau of the Census (1981).

tion and aircraft created Los Angeles, not oil and oranges (McWilliams [1946] 1973; Soja 1989; Davis 1990; Scott 1993).[24]

Contribution to the State Economy

More significant than figures on value of resources extracted is the relative weight of natural resource extraction in the whole California economy. This is shown in four ways: share of employment, share of output (income), value relative to capital accumulation, and role in manufacturing. The proportions are striking:

- *Share of employment*: Direct natural resource extraction was roughly 33 percent of total state employment in 1880, falling to 17 percent by 1940. A more comprehensive definition of resource-related employment, however, yields figures close to 40 percent of state employment in 1880 *and* 1940[25] (Table 1).
- *Share of income*: Value-added in natural resource extraction constituted over one-fifth of state income in 1880, one-sixth in 1940. An expanded definition of the resource-dependent economy jumps the share to nearly 30 percent, with no significant decline by 1940 (Table 2).
- *Share of manufacturing*: In every census of manufactures up to 1940, resource processing sectors feature prominently among the top ten industries (Table 3).
- *Contribution to savings*: For the early twentieth century, the value of oil alone outran the growth of bank deposits (Figure 6).

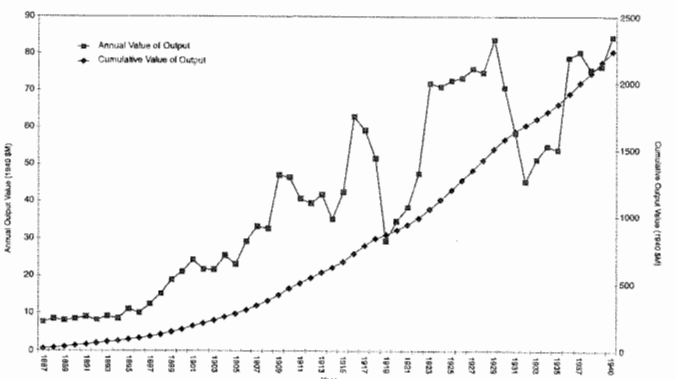

Figure 3. California's minerals other than oil and gold, 1887–1940. All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Data calculated from California Division of Mines (1941) (total mineral output less oil and gold).

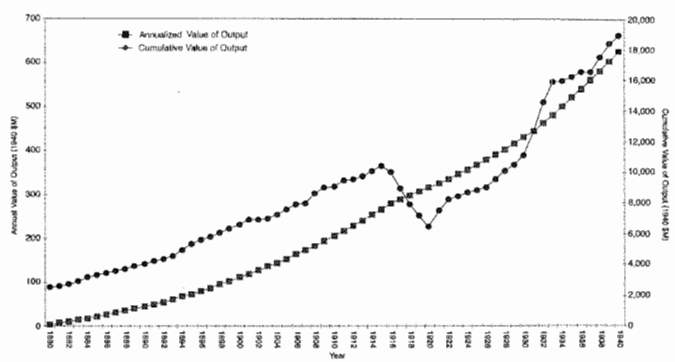

Figure 4. California agriculture, 1860–1940. Yearly figures derived using estimated annual growth between census years. All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Data from U.S. Bureau of the Census, *Census of Agriculture* (1860 through 1940).

Looking at employment and value-added, extractive activities constitute a large share of the economic base up to 1940. There is the kind of fall-off expected in resource-to-manufacturing transitions, as the state

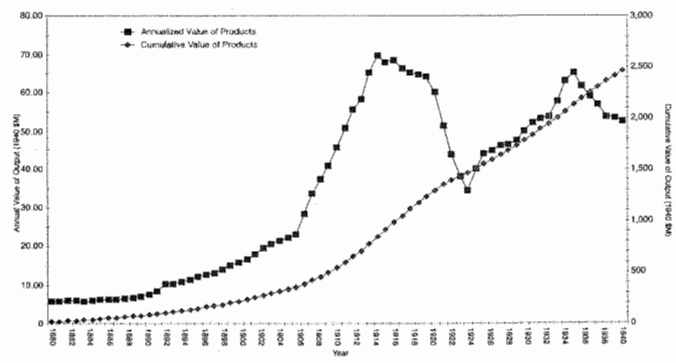

Figure 5. California timber and lumber, 1880–1940. Annual figures derived from estimated average growth rates between census years. All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Data from U.S. Bureau of the Census, *Census of Agriculture* (1870 through 1940).

Table 1. California Employment Shares

Industry Category	1879 Employment	1879 %	1919 Employment	1919 %	1939 Employment	1939 %
Natural resource industries	156,958	41.69	423,366	27.99	715,319	37.83
Extraction & cultivation	124,767	33.14	298,303	19.72	323,408	17.10
Materials processing	15,641	4.15	56,783	3.75	298,106	15.76
Inputs (capital goods)	24	0.01	837	0.06	2,260	0.12
Utilities[a]	184	0.05	5,019	0.33	40,478	2.14
Transportation[a]	16,342	4.34	62,424	4.13	51,067	2.70
Other manufacturing	55,848	14.83	373,382	24.68	305,579	16.16
All employment	376,505		1,512,760		1,891,017	

Source: U.S. Bureau of the Census, *Census of Manufacturers, 1880, 1925,* and *1947.*
Notes: Extraction & cultivation: all mining, quarrying, farming, ranching, lumbering, fishing; Materials processing: includes first stage processing only, e.g., canning, lumber, tanning, drying, smelting; Inputs: includes machinery and supplies clearly targeted to extractive industries; Utilities: gas, electricity, water; Transportation: rail, water, and wagon travel.
[a] Estimates proportionate to percentage of extraction and processing in total state employment.

industrialized rapidly (especially after 1900). Yet looking deeper into the manufacturing data reveals the profound linkages between extraction and resource processing, shipping, and equipment. A comprehensive definition of the resource sectors that includes closely linked activities yields a much more robust contribution from the resource economy. The figures stay high right through to 1940. Surprisingly, manufacturing value-added exceeded extraction in 1880, but fell behind by 1920 (regardless of where resource processing is placed) and remained behind in 1940 (if processing is counted as part of the resource sectors). Manufacturing not related to resources reaches only 24 percent in 1920 and dips lower than simple extraction again by 1940. The importance of resource processing activities is readily apparent in the list of top ten industries, from wood products to malt liquors. Comparing oil to bank deposits is a crude measure, but indicates the relative size of the Black Gold surplus to financial accumulation.[26]

Table 2. Value-Added Share of California Resource Industries

	1879		1899		1919		1939	
	1940 $M	%	1940 $M	%	1940 $M	%	1940 $M	%
Natural resources (NR)	71.979	12.76	329.546	72.92	742.723	30.28	1090.010	29.30
Extraction & cultivation	53.633	9.51	267.983	59.3	521.739	21.27	634.960	17.07
Materials processing	16.378	2.90	56.954	12.6	213.700	8.71	420.915	11.32
Inputs (capital goods)	1.968	0.35	4.609	1.02	7.283	0.30	34.135	0.92
Non-NR manufacturing	77.370	13.72	274.859	60.82	305.638	12.46	677.275	18.21
Income, all industries and trade[a]	563.996							
Total personal income[b]			451.92[c]					
Total state income[d]					2452.593		3719.93	

Notes: All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Extraction & cultivation: all mining, quarrying, farming, ranching, lumbering, fishing; Materials processing: includes first stage processing only, e.g., canning, lumber, tanning, drying, smelting; Inputs: includes machinery and supplies clearly targeted to extractive industries; Utilities: gas, electricity, water; Transportation: rail, water, and wagon travel.
[a] Data from U.S. Bureau of the Census, *Census of Manufacturers, 1880.* Includes personal income from all commodity production and distribution; excludes finance, insurance, real estate, personal & business services, and government.
[b] Estimate by Easterlin (1968, 104, Tables A2 & A3). Personal income (no business net profits, depreciation, indirect taxes).
[c] Income less than sectoral totals; estimate suspect.
[d] Data from U.S. Bureau of the Census (1981). Personal income plus corporate net income (no allowance for depreciation, indirect taxes, etc.). Based on tax returns.

Physical Endowments: An Assessment

California does not fit the image of scarcity in the American West evoked by environmental historian Donald Worster (1992), who sees aridity as the region's defining feature. Aridity implies absence and hardship, when in fact California enjoyed an abundance of natural

Table 3. California's Top Ten Industries, by Value-Added

	1869	1889	1909	1929
1	Lumber, sawed	Printing and publishing	Lumber and wood products	Petroleum refining
2	Flour and grist mills	Foundary and machine shops	Printing and publishing	Canning
3	Boots and shoes	Lumber and timber products	Foundary and machine shops	Newspapers
4	Tobacco, cigars	Wood planing mills	Canning and preserving	Foundary and machine shops
5	Newspapers	Liquor, malt	Bread and bakery products	Motor vehicles
6	Machinery–steam engines	Canning and preserving	Liquor, malt	Lumber and timber products
7	Machinery, all others	Shipbuilding	Slaughtering and meat packing	Bread and bakery products
8	Liquor, malt	Flour and grist mills	Sugar, beet	Printing and publishing
9	Carriages and wagons	Tobacco, cigars, and cigarettes	Printing and publishing	Furniture
10	Quicksilver, smelted	Bread and bakery products	Liquors, distilled	Rubber tires

Source: U.S. Bureau of Census, *Census of Manufacturers,* 1870, 1890, 1910, 1930.
Note: If smelting were counted separately from mining, it would surely have appeared high on the list before 1900.

gifts that shaped its economic history. Moreover, the defining element of nineteenth-century California and the West was mining, not farming as in Worster's Kansas. The natural terrain of mountains and deserts made farming difficult, while tectonic pressures and uplift left significant deposits of metals and petroleum.[27]

If California seems the picture of abundance, it must be due to the natural blessings of physical geography. It hosts extensive montane and coastal forests, a jumbled and mineral-rich geology, well-watered valley lands for farming and a long growing season, dashing streams for hydropower, and a long coastline with rich upwellings to feed the creatures of the sea (Parsons 1955; Bakker 1971; Schoenherr 1992; Hill 1999). One can go overboard in praising the "natural" wealth of California, however (e.g., Cronise 1868). Its gold was mostly dispersed in low-grade gravel deposits; oil was asphaltic and hard to refine, rivers small and rainfall erratic, coal deposits puny, and so on. Most of its famous specialty crops could be grown just as easily elsewhere (Stoll 1998, 71). Conversely, most of its resource stocks were rapidly exhausted: placer gold lasted seven years, the Comstock Lode fifteen; otters and sea lions maybe thirty; Sacramento salmon two ten-year bursts; sardines forty; redwoods one hundred.[28] And most of California's discoveries were surpassed later: South African and Russian gold, Texan and Arabian oil, Peruvian anchovies, and Alaskan salmon. This gives one pause before exaggerating the role of natural abundance. Evidently, something happened to push California ahead of the pack, to make for rapid search and withdrawal even where nature was not supremely bounteous.

What drove this mad dash for earthly goods? Might it have been a peculiar "ecological mode of production," in Worster's terms? (1992) No, it was a capitalist mode of production: private property, generalized markets, wage labor, money capital, and the rest. But it was a capitalism with a sharp eye for the land and the wealth of nature.[29] Worster is right to flag the possible influence of nature on the social relations of production—not an environmen-

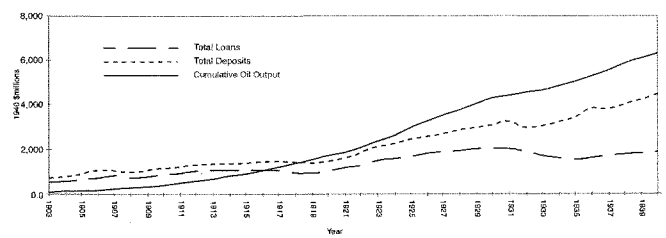

Figure 6. Value of oil versus bank deposits and loans in California, 1903–1956. All values converted to 1940 dollars using the Bureau of Labor Statistics Consumer Price Index. Data for oil, output from Conservation Committee of California Oil Producers. Data on average per barrel price at well from Dodd and Dodd (1976) and U.S. Bureau of the Census (1981). Bank deposit and loan data from Doti and Schweikart (1994).

tal determinism, to be sure, but an adaptation of the rules of the game to the specifics of place and environment. The "forces of nature" have significant effects on what is possible and likely (cf. Mann and Dickinson 1978). That is, the qualities of natural materials, biological life, thermodynamics, and so forth, help give shape to divergent practices of production. Minerals, petroleum, timber, fishing, and other extractive sectors are structured by natural variations in occurrence, plenitude, and behavior of ores, deposits, and species. Of course, environmental determination is full of pitfalls, but it cannot be set aside blithely for a social constructionism that ignores natural forces (Castree 1995; Soper 1995).

Thus, we shall see that the property regime was reinvented in the mining era, financial institutions were created in pursuit of resources, technologies arose to pry the wealth out of nature, and the state lent the "full force and majesty of the law" to such efforts. California after 1848 was therefore decidedly a "prospector capitalism," a regional form whose *differens specifica* was a twist toward discovery and extraction. However, the emphasis has to remain on the capitalist order if we are not to lapse into naive environmental determinism or a romance of the argonauts. To this otder we now turn.

The Property Regime: Prospector California

The United States showed a special genius for the manic pursuit of nature's endowments in the nineteenth and early twentieth century. David and Wright (1997) refer to "the ethos of discovery" to explain how rapidly Americans searched for nature's resources; but this "can-do" ideology of prospecting needs to be placed in the context of tbe U.S. system of property and enterprise. As Sara Berry (1989) and political ecologists have argued, the "property regime" is absolutely central in determining conditions of access, motivation, and reward in the use of nature.[30]

The expropriation of private property in land keyed Marx's ([1863] 1967) notion of "primitive accumulation," or establishment of the preconditions for capitalism. In California and the American West, the process unfolded quite differently than it had in Britain, with its enclosnres of commons, seizure of church lands, and displacement of peasant farmers. On the western frontier, private property was established in a radically modern way. The policy of the U.S. government throughout the nineteenth century was to turn the public domain into private property as fast as possible, by sale, scrip, grant, or homestead (Carstensen 1962; Robbins 1976). The cadastral survey made disposal easy, and no preexisting lords or peasants stood in the way of untrammeled settlement, exploitation, and speculation (Johnson 1976; Limerick 1987; White 1991).

The chief obstacle to capitalist penetration was occupancy of the land by the indigenous nations, who had to be brutally dispossessed of a continent; in California, half a million people were reduced to 10,000 within a century (Forbes 1982; Huttado 1988). California and the Southwest were also inconveniently under the suzerainty of Mexico, and had to be seized in the trumped-up war of 1846–1848; Mexican propetty, recognized by treaty, slipped away to the invading Yankees within a few years (Almaguer 1994). Anglo-Americans carried out this conquest under the banners of Manifest Destiny and White Supremacy (Horsman 1981). A regime of fee simple, free labor, and competitive markets would unfold behind the walls of a White Republic, and the dark races would be kept subordinate (Saxton 1971, 1991; Rogin 1975; Almaguer 1994). California at the gold rush would, in fact, be the last hurrah of the classic Republican era.[31]

Nevertheless, conquest, racism, and masculinity alone do not specify the nature of the peculiar capitalist property regime. It remains to detail the distribution of land and resources among the conquering hordes, emphasizing the role of the *petit bourgeois* actors.

Resource Prospecting

The American West was a riot of small property, with mass access to natural resources as millions of settlers laid hold of land and claims to minerals, forests, and waters. Small property owners were not a marginal peasantry, but a robust class that played a key role in conquest and settlement of the continent (Gates 1960; Fite 1966; Williams 1966). They vigorously enjoined the government to clear out the Indians and privatize the public domain. Disposal of the public domain had as much to do with aggressive squatting by the westering masses as it did with capitalist propriety (limited access and pricing were impossible to enforce). *Contra* Karl Polanyi (1944), westerners willingly cried out for naked commercial relations, the less restrained the better (cf. Cochran 1981). This went for California especially, with its munificent bounty of rents accruing to land.

The small property class is usually identified with farmers, small merchants, manufacturers, and shop owners (cf. Atack 1986; Scranton 1997). Nonetheless, in California a significant proportion of this class was made up of independent explorers, speculators and operators variously known as prospectors and sourdoughs, wildcatters and gyppos," ranchers, horticulturalists, and dairymen, fishermen, huntets and shrimpers. Their version of property was not always fee-simple ownership and often turned on open access to the public domain; from there it sought leasehold, toehold, and the infinite possibility of new beginnings in an ever-changing frontier of exploration and exploitation (cf. McCarthy 1999).

California's 49ers set the tone for the property regime. The gold rush was a mass squat on public land, out of which some order was brought by the miners themselves. McWilliams ([1949] 1976, 27) called it "the poor man's gold rush."[32] The most open discovery and claim system in the world was forged in the camps of the Mother Lode (Ellison 1968; Umbeck 1977; Clay and Wright 1998). The miners also adapted the law of prior appropriation of water from Spanish tradition to replace English riparian law, and this, too, spread to the rest of the western states (Hutchins 1956; Dunbar 1983; Hundley 1992). Thanks to this freewheeling system of appropriation, the placer miners extracted $500 million before the diggings ran out (Figure 1).

Nor did the gold rush experience end in California; tens of thousands of 49ers fled the Golden State for greener pastures in Nevada, Colorado, Montana, and Alaska, opening up the rest of the western mining frontier (Paul 1947; Greever 1963; Zanjani 1997). The mythic figure of the sourdough is more than dime-novel romance; the miners established a pattern of "permanent impermanence" in the movements of enterprising young men. Moreovet, the 49ers were consummate Modernists—men who measured everything and everyone in terms of money, seized the state and created their own government, and swept aside all whose traditions stood in the way (Halliday 1981; Rohrbaugh 1997).

Prospecting and small property were not exclusive to mining. Oil exploration in California was a wide open affair, with a host of wildcatters turning prospective fields into bristling landscapes of drilling rigs. As one observer has said of the southwest generally, "It is the thousands of American wildcatters—thousands of independent venture-minded managements, corporate and individual—who have made possible discovery at the rate required" (Rister 1949, ix). All one needed was a piece of land large enough to set up a rig and a team of skilled workmen (who considered themselves wildcatters as well). In Los Angeles, this frequently occurred on "town lots" already subdivided for housing (e.g., Alamitos Hills at Seal Beach); in Ventura County it took place on farms, where oil was paying half the property taxes in 1950 (Sinclair 1927; Getty 1963). After World War II, thousands of small firms were still roaming the state for oil pockets, even offshore (Quam-Wickam 1994; Sabin 2000).[33]

Humboldt County, the heart of California lumbering, is another case in point. Although most of the redwoods were claimed by 1890, the industry remained vertically disintegrated right up to World War II (there was no Weyerhaeuser in California) (Prudham 1999). Most nineteenth-century redwood mills were partnerships, such as Dolbeer and Carson and J. Russ, usually with one partner an experienced woodsman and the other a merchant. At the turn of the century, there was a wave of consolidation under a group of outside entrants, such as Andrew Hammond and the Murphy family, but small companies survived through a series of shifting alliances and combines such as the California Redwood Agency and Redwood Sales Company (Melendy 1952; Cox 1974; Carranco 1982). And, while the big milling companies had crews working the best of the woodlands, there remained hundreds of lesser sawmills with their own crews and many more gyppos working on contract; in the Douglas fir zones, as much as half of logging was done by gyppos in the early twentieth century (Gibbons 1918).[34]

Small farmers proliferated from the 1880s to the 1920s, as large wheat and cattle holdings were broken up for intensive fruit culture and dairying (Liebman 1983). The number of farms roughly doubled in that era, to 136,000 in 1925, blurring the picture of "factories in the fields" drawn by McWilliams (1939; Vaught 1999). California's prosperous fruit farmers were famously urban and modernizing (Tobey and Wetherell 1995) and their success gave a huge boost to petit bourgeois aspirations up and down the state (Henderson 1998). There were 3,000 fishermen in California in 1880, almost all immigrants, and small fishermen prospered right through the great sardine boom; "Their work was a model of independent, small-scale frontier enterprise" (McEvoy 1986, 70).[35] An overlooked type of prospector and rent-farmer was the small developer and real estate shark, the urban equivalent of the sourdough; armies of such town-lot speculators roamed the state for quick riches, and many realized their hopes (McWilliams [1946] 1973; Weiss 1987).

Unproletarian Workers

Petit bourgeois aspirations extended deep into the California working class, which was more skilled, better paid, and freer of obligations, on average, than the working class almost anywhere else for a century after the gold rush. The proletariat in California (and the West) was not created out of an expropriation of a peasantry, but by waves of in-migration. These were rarely the desperate poor. Rather, they were young, ambitious, male, and predominantly middle-class in origins. The first true

wotking class in the state was assembled in the 1860s from Irish, Germans, and Chinese, and they were followed by successive waves of Italians, Scandinavians, Japanese, Iowans, Louisianans, and Okies, among othets (McWilliams [1946] 1973; Issel and Cherny 1986). New arrivals poured in with every economic upswing, expecting to find a better life and usually being rewarded with one (Gordon 1954). A typical commentary on California workers is that of Will Kortum, a lumber clerk in the 1880s, about his fellow yardmen: they "were of a much more refined and educated class of people [than in Chicago]. Nearly all wear good clothes and stiff collars to work, leaving their overalls and boots in the yards" (quoted in Buckley 2000, 322).

Average wages and incomes went sky-high during the gold rush and, while declining over time, stayed well above the U.S. average up to 1940 (Gordon 1954, 72; Rhode 1990). High wages and salaries were possible chiefly because of California's natutal wealth, which contributed both to high revenues (ability to pay) for employers and high productivity (value-added) for labor (Gordon 1954, 72; Rhode 1990). Labor scarcity, thanks to California's relative isolation, contributed to high wages, and so did class struggles (cf. Marchak 1983). California workers were quick to form unions and teadily joined political movements like the Workingmen's Party and IWW, both to limit competition from Chinese labor and to strike back at the big capitalists (Saxton 1971; McWilliams [1949] 1976; Kazin 1987). This was as true in the fat-flung mines and lumber camps as in the city (Dubofsky 1969; Lingenfelter 1974).

California workers were fiercely independent and footloose, moving from place to place and between city and countryside, making themselves scarce when conditions were not to their liking (Woriol 1992; Cornford 1995; Groth 1994; Mitchell 1996). They also moved in and out of jobs and industries: a lumberman in the woods might become a mill worker in Eureka, then a seaman on a coastal schooner, and finally a dock worker in San Francisco (Nelson 1989, 62–64). This was not simply a condition of unstable employment; the resistance to settled lives of quiet desperation came from a strong ideology of tefusal toward "wage-slavery," as well as from being disproportionately male and unattached (Schwantes 1987).

Crucially, many wotkets were craftsmen who could turn their skills to advantage, earning a highet wage, buying a home, and entering the ranks of the middle class (Walker 1995b; Hise 1997). A great many tried their hand as independent business owners (Ttice 1955; Decker 1978; Issel and Cherny 1986). Some did even better: Peter Donohue, founder of Union Iron Works, was San Francisco's greatest nineteenth-century industrialist, while young Will Kottum went on to become a lumbet capitalist himself. The successful capitalization of "intellectual property" among skilled wotkers long precedes Silicon Valley.

Of course, many jobs were dirty, dangerous, and underpaid. Terrible tales of failure and ruin are legion. Workers of color regularly suffered extreme rates of exploitation, especially in agriculture and constnuction, and the extra surplus value eatned off their backs undoubtedly helped prop up the prosperity of white California (McWilliams 1939; Barreta 1979; Chan 1986). All the same, the dark side of California labor does not negate the thesis that many workets there were better off than almost anywhere else.[36]

Big Capital and Small Property

Lest this be thought a celebration of the petit boutgeoisie, the weight of large property in California brings the mythos quickly back to earth. The aggrandizement of a few enormous landholders, such as the railroad, wheat, timber and cattle barons, jump-started the formation of big capital in the West (Puter 1908; Lewis [1938] 1966; Liebman 1983; Igler 2001). The untegulated opening of the public domain allowed the creation of far-flung dominions in every field of resource enterprise. San Francisco capitalists gobbled up California in seven-league strides in the 1860s and 70s, thanks especially to the fortunes made from the Comstock (Brechin 1999). At the turn of the century, a new generation of capitalists repeated the process, putting together hydropower rights into huge combines like Great Western Power and oil leases into conglomerates such as General Petroleum (Issel and Cherny 1986). This phenomenal concenttation of land struck everyone from George to Marx, and has seemed to many California critics to be the essence of the regional propetty regime (George 1871; McWilliams [1949] 1976; Mann 1982; Gates 1991).

No doubt the arrival of big property and big capital posed a thteat to the empire of small property, and the halcyon days of the gold rush could never be recovered. Yet small property did not crumble before the onslaught, and has continued to hold sway over a major portion of the California landscape. Prospecting and the petit boutgeois moment have stubbornly refused to leave the stage of history, because they have been tepeatedly reinvigorated by new bonanzas. So this is not a simple picture of big capital triumphant. Neither is it one of natural hatmony between big and little property. Rather, it has been a vigorous sttuggle for supremacy in which big capital always held the best cards, but small property had the numbers to keep economy and political relations unsettled, from the placer miners of the 1850s to the oil antimonopolists of the 1930s. This dialectic of big and small property has been the source of much of California's dynamism.

The minions of small property cannot be dismissed as mere stalking horses for capital. They were willing, eager, and ready to partake of the great feast of plundering and conquering, building and inventing, working and investing, speculating and profiting from the wealth of nature. Fishermen wanted to become cannery owners; wildcatters all thought they'd be the next J. P. Getty (Getty 1963; Davis forthcoming). Taking small property seriously does not mean falling prey to the agrarian myth of unencumbered freeholders or the ideology of the all-encompassing Middle Class (Smith 1950; Parker 1972). It *does* mean taking the class base and motivational power of small property seriously. It also means not consigning primitive accumulation and small commodity production to the dustbin of history as soon as big capital appears.[37] Small property has repeatedly served as the jumping-off place for new rounds of capital accumulation in the industrial era (cf. Scranton 1997). Such waves of primitive accumulation have had a permanent doppler effect on the class spectrum of California, making it a triumphantly petit bourgeois state. Silicon Valley's thousands of start-ups and instant millionaires are only the latest opening of this golden flower of narcissus (Saxenian 1994).

Nonetheless, the property regime only goes so far in specifying the anatomy of capitalist economies. From the social base of property, small and large, capital gathers strength and circulates, modern industry takes root and expands, and government and political life take shape. As they develop, these other facets of capitalism constitute a wider domain of the social relations and forces of production, with evolving histories and geographies of innovation, conflict, and change. To these we now turn.

Regional Accumulation: Money, Circulation, and Finance

As the wealth of nature pouted forth, it turned California into a financial center of global significance and the western pole of the national economy. The West was both colony and empire in the nineteenth century, with its own imperial center in San Francisco and peripheries ftom the Black Hills to the Aleutians, from Zacatecas to Hawai'i (Pomeroy 1965; Hutchinson 1969; Brechin 1999). In the twentieth century, California added a new center of accumulation, Los Angeles, whose wellsprings of growth lay as close as Orange County and Signal Hill (Gordon 1954, 98). In this part of our story, nature and landed property move to the background and money steps out to strut and fret its hour, to circulate in time and space in search of profit. Resoutce plunder and small property have been repeatedly eclipsed by the force they help set loose: capital accumulation on a majestic scale. Yet, nonetheless, there was a recurrent dialectic of prospecting/development, speculative claims/long-term investment, and tent/profit played out with every new resource bonanza. California's build-up of capital had three moments: resource wealth turning to money in local hands; money piling up into big capital stocks; and capital investment swirling back into the economy.

Sticky Hands

The first component of regional accumulation is the way resource wealth stuck around in California, rather than being carried away to distant cities and foreign powers. This was capitalism springing up from the roots—or rather, the rollout sod of Anglo-American conquest. A few players in the gilded lottery, like Oakland founder Horace Carpentier and future meat packer Phillip Armour, took their winnings and moved back East; but most stayed on to participate in regional growth, because they had a good chance of making more money.

The biggest number of "sticky hands" belonged to the prospector class. While some 49ers went home empty-handed, many—especially early arrivals—made money out of the diggings, even if they did not get rich (Holliday 1981; Rohrbaugh 1999). This pumped gold into the veins of the trading and urban system and primed other enterprise. Many adventurers found better digging in farmlands, timberlands, and fisheries, where quick returns were to be had. In Southern California, waves of resource strikes played out in a similar way. After the cattle debacle of the 1860s, silver from the southern Sierra rebuilt a ruined economy (Cleland and Putnam 1965). After 1880, the citrus economy enriched a multitude of small growers and eager migtants with a yen for a piece of Atcadia (Tobey and Wetherell 1995). By 1900, black gold was boiling up from the earth, greasing the palms of many a wildcatter, lessot, and real esrate promoter (Sinclair 1927; Viehe 1981; Tygiel 1994). Tuna and sardines, milk and strawberries, construction and retail all paid off to small entrepreneurs.

A class of big capitalists repeatedly arose from the fields of dreams around California. Deep mining concentrated wealth faster than placer mining, but it also created bonanza kings out of a few men with wits, determination, and luck (including the world's first Irish millionaires, James Fair and James Mackay) (Lewis 1947; Peterson 1991). Mining was not the only road to such bonanzas. Henty Miller went from German butcher to Cattle King, lord of over one million acres (Igler 2001).

Lewis Gerstle, Gustave Neibaum, and Louis Sloss turned a fortune from the extermination of otters and seals (Brechin 1993). Robert Dollar started with a sawmill on the Russian River and parlayed lumber schooners into the American President Line. Mill-owner William Carson's fantastic Victorian house hovered over Euteka (Buckley 2000). Francis "Borax" Smith went from Death Valley alkali miner to Oakland's premier capitalist (Hildebrand 1981), while Joe Knowland made money in lumber and mining long before he owned the Oakland *Tribune*. L.A.'s first bonanza king was Edward Doheny, who struck oil in a hand-dug well west of the city center. Oil millionaires multiplied rapidly after that, including William Keck, Alfonso Bell, and John Paul Getty (1963). The Central Valley had its own titans, such as the DiGorgio family in fruit-growing and merchandising (Teiser 1983).

Another branch of capitalists sprang up away from the mines and fields. The easiest money in the gold rush was made by the city merchants, such as William Coleman, who built San Francisco while the argonauts headed for the hills (Decker 1978; Issel and Cherny 1986). The wheat boom created another set of merchant fortunes (e.g., that of Isaac Friedlander), timber another (e.g., John Dolbeer), and so on. Most of these men started small and waxed fat on resource prosperity, though some had come with capital from New York, Boston, or Valparaiso. Merchants like William Tecumseh Sherman and John Downey moved easily into banking, joining hundreds of nineteenth-century businessmen who created financial institutions on a wish and a prayer. Most banks operated in the speculator-prospector mode of the West and did not sutvive the next financial crisis, but a few outlasted their founders, like James Tobin's Hibernia Bank and Isaias Hellman's Merchants and Farmers Bank (Cross 1927; Cleland and Putnam 1965; Doti and Schweikart 1994). In the twentieth century, merchant capital has more often meant retailers, springing up from modest beginnings to preside over jewelry, clothing or automobile emporia. Department store moguls such as Hale Brothers and Bullock capture this brand of urban capitalist.

There could nevet have been such sticky hands without widespread property rights to the fruits of earth and labor, or absent a quick-rising sourdough of commerce. It was not necessary that everyone become fabulously rich in the resource rushes, only that a great deal of money touch many hands and be injected into the veins of the commercial economy. There it could accumulate into great fortunes and pile up inside the vaults of a thousand banks, large and small, so that big capital might step forth.

Capital Piles Up

The second step in California's accumulation process was for large concentrations of capital to rise out of the vortex of tesource extraction and commerce. As Marx observed at the time, "California is vety important . . . because nowhere else has the upheaval most shamelessly caused by capitalist centralization taken place with such speed" (Marx to Fredrich A. Sorge, 5 November 1880, in Marx and Engels 1953). Acquisition, business alliances, urban real estate, banking, and securities speculation all played parts in this. A vital geographic aspect of the commercial and financial patterns of the West was that capital piled up in San Francisco in the early years and Los Angeles later on, giving California its own poles of accnmulation free of the imperial diversions felt east of the Rockies in those places falling under the suzerainty of Chicago, Minneapolis, and St. Louis (Willis 1937; Borchert 1978; Reed 1981).

Those who made money in the first wave of a bonanza usually expanded by annexing an ever-larger resource base. George Hearst bought the Homestake Mine in South Dakota and mines, timber, and range lands from Montana to Mexico (Brechin 1999). Henry Miller expanded his range lands from the Bay Area into the San Joaquin Valley, and then to Oregon and Arizona (Igler 2001). William Chapman and John Bidwell acquired tens of thousands of Central Valley acres during the wheat boom (Gates 1991). California timber and paper companies moved into Washington state (Cox 1974). Later, Union Oil expanded its oil lands and drilling rights from Ventura to Kern County and then into the L.A. basin (Taylor and Welty 1950). William Bourne grabbed water rights up and down the Sierra Rivers as he developed the hydropower empire of Pacific Gas & Electric (PG&E) (Coleman 1952). Such expansion inevitably involved fraud, theft, and power plays, but much of it was based on sound business expansion.

The new *bourgeoisie* soon discovered how to attract investors and rationalize operations through partnerships and incorporation. The Central Pacific bound together a team of aspiring merchants into the Big Four, with Colis Huntington keeping a firm hand on the controls (Lewis [1938] 1966). Miller and Charles Lux, a banker, joined forces and built up their holdings systematically to serve the San Francisco market, becoming the country's first modern agribusiness company (Igler 2001). Neibaum, Gerstle, and Sloss operated as the Alaska Commercial Company. William Randolph Hearst turned his father's mines into the first modern media empire under the Hearst Corporation (Swanberg 1961). Borax Smith joined with master broket Frank Havens to cteate the Realty Syndicate, one of the nation's largest housing developers (Hildebrand 1981).

Urban real estate promotions were a major avenue for amplifying one's riches without extracting anything except rents. Indeed, real estate speculation has been synonymous with California's mode of expansion. All the leading families, from the Hearsts, Crockers, DeYoungs, and Stanfords of the north to the Chandlers, Slausons, and Huntingtons of the south, multiplied their money by means of well-heeled promotions around Golden Gate Park, the San Fernando Valley, and Lake Merritt (Dumke 1944; Brechin 1999). Bankers of every stripe took eagerly to real estate lending in the nineteenth century, while a common route to riches in the twentieth was to found a savings and loan (Davis 1990; Doti and Schweikart 1991, 60).

California quickly became a major banking center (Cross 1927; Doti and Schweikart 1991, 1994). Its bank system was built on savings and profits from resource sectors, and its bankers proved aggressively developmental. The pivotal figure in early San Francisco was Billy Ralston, who filled the Bank of California's coffers with silver by financing companies working the Comstock (Dana 1937). The Silver Kings established the Bank of Nevada in order to counter the powet of "the Ralston ring" (Lewis 1947), and Charles Crocker did the same with his railroad fortune. Hellman's bank and Henry Robinson's First National Bank in Los Angeles worked the same magic, putting the savings from silver, citrus, real estate, and oil in a capital fund for Southern California (Cleland and Putnam 1965). In the early twentieth century, A. P. Giannini wrought a revolution in branch banking, buying up small-town unit banks in the agricultural areas and creating the largest bank in the United States within twenty years (Nash 1992).

California's resource bonanzas gave rise to two astounding securities speculations, both of which served to concentrate capital wonderfully. The San Francisco Mining Exchange grew up to float stocks for a thousand oversold claims in the Comstock Lode, serving as the eye of the vortex of accumulation after the Civil Wat. For a few wild years, before the speculations collapsed and the silver ran out, it was the largest stock exchange in the world (Carlson 1942).[38] Robert Louis Stevenson (1966, 186) called the 'Change "the heart of San Francisco: a great pump, we might call it, continually pumping the savings of the lower quarters into the pockets of the millionaires . . ." Many a modest investor played along, including miners themselves (Lingenfelter 1974). Even Henry George speculated and lost his shirt, although, curiously, he turned his venom against landed property rather than finance capital.

Fifty years later, Southern California repeated the process of centtalization through a tornado of speculation, as stocks were issued in vast numbers to raise capital for oil drilling, refining, and distribution companies. Thousands of small investors were swept into Ponzi schemes that extruded a few very wealthy men. The Julien Petroleum scandal is the most famous example of this mass investment mania (Tygiel 1994). As a result, San Ftancisco's early reputation as a place where people would sell their birthright for a fast buck was tepeated in the Los Angeles of the 1920s—the days of the locust (McWilliams [1946] 1973). After the storm had passed and many a person had been ruined, capital had accumulated further in the hands of large banks and oil operatots.

Reinvestment

The third dimension of the spitaling circulation of capital in California was the rapid return of profits into new enterprise. This was developmental investment that went beyond resource grabs, rapid extraction, and self-aggrandizement. It marks a decisive moment of capitalism emergent and triumphant: using the wealth of nature as a lever to raise the level of productivity and widen the base of expansion. The transition from primitive accumulation to accumulation *tout court* was almost instantaneous, given the willingness of regional boosters to hurl capital back at the earth for new rounds of exttaction and cultivation. California very quickly jumped to near the top of state rankings in total propetty value and per capita wealth (physical assets and land).[39]

The outlets were of three principal kinds: deepening of extractive activities, expansion of the commercial network, and diversification into every manner of industrial pursuit. First came a deepening of capital investment in resource extraction. In mining, capital went deep into the earth with the help of elevators, pumps, and compressots. In oil, it pushed the limits of drilling to over a mile down. In timber, it went deeper into the mountains with steam-powered drag lines (Melendy 1952; Cox 1974). In cattle, it built ditches to irrigate pastute for summer feeding (Igler 2001). In fishing, it sent out gas-engine boats with bigger nets to capture whole schools of fish (McEvoy 1986). In farming, it drained swampland, constructed levees, and pumped groundwater while planting trees and vines (Preston 1981; Kelley 1989). In electricity, it built higher and wider dams for storage, bigger turbines for generation, and longer transmission lines (Williams 1997). As McWilliams ([1949] 1976, 36) observed, "Resources have not been developed in California on a piecemeal basis but in wholes . . . [making] forced growth the rule, almost, one might say, a necessity of production."

Another spur to California resource development was steady improvement in the commercial and transportation infrastructure: railways, telegraph, and merchant agents all improved access to and withdrawal of resources. These were major outlets for capital, particularly merchants in pursuit of commercial expansion. The preeminent example is the Big Four, Sacramento merchants who shot to the top of the ranks of the capitalist class by forming the Central Pacific Railroad (Lewis [1938] 1966). However, it is important not to put the cart before the horse: infrastructure grew alongside exploitation of the region, not ahead of it.[40] As Albert Fishlow (1965) has shown, transport systems in the nineteenth-century United States were built mostly out of accumulated capital, except across the scantily peopled Great Plains and Rocky Mountains. San Francisco was like Boston, where a network of canals and railways fanned out steadily from the center to connect up the whole region and cement the city's mercantile empire (Vance 1964). Moreover, the commercial-extractive network was at the same time an urban system, with towns developing in tandem with investment and trade. Many town sites were established as part of programs of settlement by railroad, mining, timber, and cattle companies (Buckley 2000; Igler 2001).

Successful capitalists and financiers also diversified into new lines, often making second and third fortunes along the way. Talk about flexible accumulation! San Francisco's leading businessmen enthusiastically backed every kind of enterprise, from machine shops to gunpowder works, leading to the multiplication of industry (Trusk 1960; Issel and Cherny 1986; Dori and Schweikart 1991, 28–29, 66). Ralston was the most flamboyant of these capitalist polymaths, ultimately to his ruin (Dana 1937; Brechin 1999). Crocker and Leland Stanford went on to invest in any number of ancillary schemes, from timber to grapes (Lewis [1938] 1966). Gerstle and Sloss branched out into mining, banking, and transportation, while Francis Smith used his borax fortune to build Oakland transit and housing (Hildebrand 1981). Claus Spreckels turned sugar profits into just about anything, including shipping, railroads, gas and electric power, and oil production and refining (Cordray 1935). After the turn of the century, the action shifted to Los Angeles, where a similar kind of promiscuous investment was undertaken by *nouveau riches* such as Jonathan Slausen, Cameron Tom, and Edward Doheny. Expansion of local manufacturing followed hard on the heels of the citrus boom and oil bonanza.[41]

Finally, the circuits of capital were amplified and sped along by means of credit (Harvey 1982; Henderson 1998). The first wave came in the 1860s and 70s, when the 'Change and Ralston were at their height. There was ample borrowing for resource development projects such as mine shafts, levees, canals, and even oil wildcatting. The subsequent flameout made investors more cautious, with banks demanding higher interest on loans and bonds being more difficult to float. Savings banks were prohibited from investing in mining stocks and so turned increasingly to the finance of agriculture, helping account for the upswing of farming in the 1880s (Rhode 1995; Henderson 1998). As San Francisco financiers grew more circumspect, however, wild-eyed speculation moved to the fast-growing peripheries of Southern California; three-quarters of bank failures in the 1893 panic were in the West (Dori and Schweikert 1991).

A great revival of credit came after the turn of the century with the expansion of the bond market (especially Treasury bills) and investment banking. Banking also revived across the West, with a sharp increase in deposits thanks to new federally chartered banks, the Federal Reserve system, specialized savings (mortgage) banks, and branch banking (Dori and Schweikert 1991). San Francisco's position as the nation's second biggest financial center was secured (Willis 1937; Borchert 1978). Credit became the chief lever of growth in the burgeoning agricultural sector, promoted vigotously by Bank of Italy. Giannini's system did not just provide capital; it was also a brilliant device for overcoming space-time discontinuities in agricultural production and marketing (Henderson 1998). Finance thus figures as a critical if invisible part of the infrastructure of circulation and the extractive geography of California.

Resource Industrialization: Manufacturing Nature

U.S. resource extraction was minor in the early years of the Republic and only took off after the Civil War—*after* California's entry into the union (David and Wright 1997). Since the commercial and property systems of capitalism were well-established before that, property and accumulation alone cannot altogether explain the dramatic change. What David and Wright (1997) fail to emphasize is the leverage provided by industrialization which, more than anything, set the whole economy to work digging up, grinding down, and spitting out the materials of the earth.

Curiously, many of those who argue that California (and the West) was a resource-dependent region up until World War II fail to see that it was also industrializing at a rapid clip before the age of aircraft and electronics (e.g., Parsons 1949; Nash 1985; Robbins 1994). California joined the capitalist party at the height of Gilded Age industrialization, and was not backward in industry, urbanism, or business organization (Rhode 1994; Igler 2000). Nor was the state's industrialization a product of Eastern branch plants' belated arrival (Trice 1955).[42] California had 55,000 manufacturing workers in 1880, 15 percent of its total employees, and had more manufacturing than all the other Far West states combined until 1910 (Willis 1937).

In California there was a symbiotic relation between industry and extraction throughout a century of development. Just as Charles Post (1982) has argued for a specifically American road to capitalism built on "agro-industrialization" (cf. Page and Walker 1991), one could say that California took off down a broad path of *resource industrialization*. Such complementarity of rural extraction and industry within regions has been little studied (Chandler 1972; Lindstrom 1978) compared to urban industrial districts (Scott and Storper 1992; Saxenian 1994; Storper 1997). As in the latter, large-scale territorial synergy involves an expanding division of labor, economies of scale and scope, dense networks of interaction, and technical learning.[43] I will delineate four such facets of interaction: natural resource processing, equipment supply for extraction, secondary demand for resource products, and technical innovation.

Resource Processing

Processing is necessary to making useful products out of natural materials. Mining does not end with digging up ores, but continues through grinding, sluicing, smelting, and pouring. Timbering does not finish with downed trees, but includes sawing, milling, and paper making. Fish are not just caught, but canned, smoked, frozen, and rendered. Farm grains are milled, brewed, or cooked, while fruits and vegetables are canned, dried, or frozen. Animals are slaughtered for meat, leather, and glue. Oil is refined into a myriad of products. Minerals are converted to chemicals, fertilizers, and pesticides. For a century after the gold rush, the post-extractive steps in resource processing made up a large portion of what was labeled "manufactures" in California. Processing sectors are among the top sectors in every census of manufactures (see Figure 6; cf. Rhode 1990, 1995). The largest factories of the mining era were smelters, powder works, and flour mills. In the next quarter century, they were joined by sugar mills, lumber mills, and fish canneries. After 1900 came the fruit canneries, packinghouses, and oil refineries. In 1880 and 1920, resource processing constituted 4 percent of total employment; in 1940, it made up an astonishing 16 percent (see Table 1).

Machinery and Equipment

All mining, milling, drilling, pumping, plowing, and the like depend on modern tools, fixtures, and machinery produced by manufacturing industries. As equipment increased and improved, so did the efficiency of extraction. Not surprisingly, mining, farm, and oil equipment predominated in California's machinery manufacture until the heyday of filmmaking, vehicles, and aircraft after World War I. However, the figures for employment in supplier sectors are lower than those for processing (Table 1). In part this is an illusion of aggregate data: it would require company-level records to identify output sold to resource extraction as opposed to other manufacturers or final consumers. However, a modest amount of machinery and equipment can also make an enormous difference in productivity. Nonetheless, we know that two outstanding machinery complexes sprang up with resource rushes, one in the north and one in the south.

The first great manufacturing industry of California was San Francisco's machinery and metalworking complex (Boyden 1988; Bailey 1996; Walker 2001). In the 1880s it employed close to 35,000 men, working on every manner of machine. Most important of these were machines for mining: stamp mills, pumps, elevators, dredges, and so on. Mining equipment literally forced gold, silver, and other metals out of the earth. Most of the machine works branched out quickly as the resource economy diversified to make such things as harvesters, seed drills, irrigation pumps, river dredges, sawmills, and flour mills. Here, too, large and improved machinery helped drag the riches out of the soils, forests, and waters of the state. This was a highly specific relation, and if California machine works invented something that found a mass market, like the Caterpillar tractor, they tended to move back to the Midwest; those that remained were specialists in the resource economy (Rhode 1990).

When manufacturing took off in Los Angeles after the turn of the century, it included a machine and metalworking sector devoted to oil drilling and processing equipment, with hundreds of small firms providing equipment, drilling, engineering, pumps, pipe, and so forth. Kern and Ventura Counties also developed large petro-industrial complexes. Oil was not a fully integrated industry by any means. The big companies controlled the best fields, but the small producers survived on lesser ones; small refineries were common, and supplier niches existed in profusion. Some supplier firms, like Hughes Tool, became quite large and diversified, and some big construction companies, such as Bechtel and Fluor, moved into building refineries.[44]

Secondary Demand

Resource industries consumed large quantities of other resources, and this was frequently a stimulus to ancillary extractive industries. Timber is an obvious case. The miners devoured whole forests in short order, first to build flumes and check dams and later to hold up mountains as they bored into the earth. Placer diggings were denuded of timber for miles around. Contemporary Dan DeQuille ([1876] 1947, 174) called the Comstock mines "the tomb of the forests of the Sierras"; Grant Smith (1943, 247) judged that, "[t]he Sierras were devastated for a length of nearly 100 miles to provide the 600,000,000 feet of lumber that went into the Comstock mines, and the 2,000,000 cords of firewood consumed by the mines and mills up to the year 1880." The railroads were gargantuan consumers of wood for ties and snowsheds. In the twentieth century, oil derricks swallowed millions of board feet per year, most of it 16 × 16 inch redwood timbers (Quam-Wickam 1994). Water was another resource consumed at the root: hydraulic mining was the biggest mobilizer of water in the nineteenth century, agriculture the biggest mobilizer in the twentieth (Hundley 1992). Agriculture was the chief market for fishmeal and slurry during the sardine boom of the 1920s (Davis forthcoming).

The greatest demand for earthly goods piled up in the cities and towns, crucibles of modern consumerism. As San Francisco, Sacramento, and gold country towns grew, they created a "home market" for consumer goods based on natural resources. Early San Francisco factories turned out masses of blankets, shoes, jeans, whiskey, and cigars, and shipped their commodities throughout the West (Issel and Cherny 1986; Walker 2001). California cities provided the base of demand for much of the state's agriculture, including wine, beef, milk, and fresh vegetables, and high average wages amplified this effect. This stimulating effect was repeated in Los Angeles a half century later, as new arrivals sought a state of grace, sunshine, and real estate. Local consumer industries jumped up to meet the need, whether wood furniture, smoked ham, or gasoline.

Construction was the biggest industry after mining and oil, employing up to 20 percent of the workforce in boom years.[45] It deserves consideration in its own right as a "resource extraction sector," both because it turns raw land into urban space and because of the way it absorbs raw materials. The cities' houses and buildings swallowed whole forests, just as the mines had (Buckley 2000). A San Franciscan observed in the 1860s that "our houses are built of lumber, our streets are planked with lumber, our fields are fenced with lumber, and our flumes and sluices are made of lumber" (Hittell 1863, 306). Construction also stimulated the brick and stone, cement, steel, and hardware sectors, not to mention finance and transportation.

Technology and Innovation

A major force in the development of California has been rapid technical innovation. As McWilliams ([1949] 1976, 36) observed, "Most of California's resources are of a character which have required a high level of technology to unlock." After the easy pickings of placer gold, schools of seals, coastal timber, artesian wells, valley bottoms, and oil seeps, things got difficult. This did not slow the resource juggernaut, however. Problems posed by a recalcitrant nature were solved in rapid order, and extraction went ahead with increasing sophistication. McWilliams ([1949] 1976, 88) again: "California was both new and difficult. Its difficulties consisted not in a meagerness of resources but in the fact that its resources could be unlocked only by untried, freshly devised methods." Every resource sector has its own rich story of dominion over nature. Together with the infrastructure of transport and cities, this constituted a massive engineering of the natural landscape of California and the West (Brechin 1999; Igler 2000).

Gold was buried in tertiary fluvial deposits or deep within mountainsides, and the richest silver was thousands of feet down, where mines quickly filled with water; this required innovations in explosives, elevators, timbering, and pumps. Oil was tucked deep beneath a convoluted geology, often mixed with brine, and it flowed poorly. This required innovation in drilling, maintaining holes, pressure control, and stopping blowouts, and in pipes, pumps, and ships. California was the first place where offshore drilling was undertaken. Timber had its own quirks, such as the size of trees, access to mountain reaches, and the movement of logs down steep terrain. Water had to be moved long distances for hydraulic mining and power generation, floods had to be stanched and swamps drained for farming, and irrigation systems had to be built to feed dry lands. These meant advances in flumes, pipes, turbines, dams, concrete, earth-moving, and hydrology. As farmers abandoned wheat for tree and truck crops, they had to experiment with varieties of crops, soils and slopes, fertilization and irrigation, storage and preservation.

The state's extractive technologies led the world in several key domains. California mining equipment was exported widely in the late nineteenth and early twentieth centuries, and its mining engineers were leading lights of their trade from Australia to South Africa (DeWaal 1985; Bailey 1996; Brechin 1999). As the state's machine shops branched out into other fields, the Bay Area became known in the trade as "the graduate school of mechanics" (Boyden 1988). California petroleum followed the same pattern, its geologists and engineers opening up global oil resources from Venezuela to Arabia and its equipment designs being followed in everything from combination drills and cracking towers to vapor locks (White 1962, 1970; Walker 1996). This leadership continued into the era of offshore drilling, in diving, wave control, handling metal fatigue, and in-hole cameras (Beamish 1999).

In timber, the double-bitted ax was a West Coast invention, and California lumberjacks first used the Dolbeer engine in the 1880s and better drag-lines along with it. In 1869, Eureka millwright David Evans invented the treble circular saw to cut through huge redwood logs, and soon thereafter automatic carriages and beltways were introduced to speed logs through the mills; kiln drying was in use by the 1890s (Bonner 1884; Bancroft 1890, vii, 77; Holbrook 1938, 180–86). California's system of industrial fishing and packing jumped to Peru and thence around the globe (McEvoy 1986). California farming was a leader in soil science, mechanization, plant breeding, and irrigation (Jenny 1961; Olmstead and Rhode 1988). In hydroelectricity, California's Pelton water wheel became the basic design for modern turbines, and the state pioneered in long-distance electric transmission systems (Williams 1997). In water management, Californians invented hydraulic mining, high-pressure water transfer, long distance aqueducts, and the concrete dam; high-arch concrete dams, first constructed at Boulder Canyon, are now universal (Jackson 1995; McCully 1996; Brechin 1999). The world's first long-distance telephone line was installed in Nevada County, and the first radio station in San Jose.

This record confirms that peripheries of the world system can be as much hearths of innovation as traditional centers of industry and commerce (cf. Storper and Walker 1989; Grove 1994). It also confirms the idea of spatial variation in technology and technical change. This has usually been confined to discussions of "national systems of innovation" (Lundvall 1992; Freeman and Foray 1993; Nelson 1993), but one can just as well speak of *regional* systems of innovation. As David Rigby has shown, there are persistent and significant differences in the technologic character of regions in the United States (Rigby and Essletzbichler 1997; cf. Scranton 1997). Annalee Saxenian (1994) provides a famous comparison of Silicon Valley and Route 128 that probes contrasting regional systems of management, work, and interaction, but she does not explore how the electronics industry bears the stamp of a deeper historical divergence between California and New England.

The California system of innovation is based first in the property regime of prospector capitalism that threw large numbers of young, ambitious, skilled, and educated people together in a boiling mixture of enterprise, greed, and speculative enthusiasm based on relative open access and dispersed reward. This heady brew helped unlock the creative powers of those seeking better methods of working with nature. It was a "learning region" *par excellence* (Storper 1997). Innovative efforts were quickly followed up by battalions of capital that could finance bigger machines, deeper wells or larger flumes—an excellent one-two punch. The knockout blow came from industry supplying improved machinery for extraction and processing; many of the key extractive technologies were invented and developed in machine shops, iron works, mills, and canneries (cf. Rosenberg 1976). In turn, mining, oil drilling and agriculture spurred advances in electrification, pumping, metalworking, and water storage.[46] In manufacturing, incentives for entry and innovation by enterprising newcomers and problem solvers were ample, because the same property regime operated; as a result, California consistently had more and smaller firms across the board than the rest of the country (Trice 1955; Walker 2001). In addition, high wages for skilled labor have drawn an astonishing pool of talent, from the machine shops of San Francisco to today's high-tech clusters, while high wages put a premium on technologies that improved labor productivity.[47]

The Prospector State: Government and Politics

California was not by chance an open field for small property, big capital, and entrepreneurial zeal. That social order was carefully pieced together by the construction of supportive institutions, vigorous politicking, and—above all—the strong arm of the state. The state has played a central part in building up the region and its peculiarly forceful brand of resource-capitalism. And this is not just any state, but the specific form of American federalism—local, regional, and national—that Californians used and shaped to be the vessel of their ambitions.

A State is Born

California came forth like Athena from the head of Zeus, a ministate within the nation-state. The U.S. government granted instant statehood in 1850. Most of the powers of government were thus conferred on the youthful argonauts. Californians suffered no period of territorial apprenticeship, but took the reins of government and began rewriting the rules of the game forthwith (Nash

1964; Pomeroy 1965). This habit of reinventing government would continue throughout the next century, giving birth to several hybrid offspring of American Federalism, such as the city-county, special districts, and government by initiative. Californians developed a sense of political economic autonomy and a sophisticated political acumen about the selective use of state powers in an otherwise laissez-faire polity (i.e., a fundamentally conservative, business-friendly, and Republican party state) (Putnam 1992).

The first function of the nineteenth-century American state was to grant access to land and the resource base, which California did with alacrity. This began with the dispossession of the native peoples, carried out with stunning brutality even by U.S. standards: the new state government provided subsidies for private military ventures, legalized indentured servitude for native children, and refused to accept federal reservations (the U.S. government capitulated on all fronts) (Forbes 1982; Almaguer 1994). The state then turned to legalization of the radically populist system of mining claims in the Civil Practice Act (1851) (Nash 1964). Here, too, the Federal government tried feebly to assert control and collect fees, but gave up the ghost in the face of opposition from California led by the placer miners (Ellison 1968). Not only did the federal government abrogate its tight to allocate minerals on the public domain, it adopted California mining law as national policy in 1872 (Cray and Wright 1998). The state also waived all taxes on "white" miners, while levying a steep Foreign Miner's Tax (1850) on Chinese and Latins. As Nash (1964, 40) concludes: "The thousands who squatted in the mining regions therefore could shape government policy to accord with their own interests."

Direct land disposal picked up in the 1860s with the generosity of the State Lands Office, the open-palmed policies of which facilitated the first great wave of concentration (George 1871; Liebman 1983; Gates 1991). The federal lands were given away first to the Central Pacific (at the behest of California, which eagerly promoted the railroad) and then to the well-capitalized public in the 1870s. These were wheat and cattle lands in the first instance, followed by timber claims through the 1880s. The feds also generously granted rights to fur seals on the Pribalof Islands to the Alaska Commercial Company (Busch 1985). In the twentieth century, the state of California oversaw a wide-open oil discovery system following the "rule of capture" developed in Pennsylvania. Surface landowners or lessees had exclusive rights to drill below their property, but competed with everyone else to lay claim to subsurface oil without regard to common pools (Williamson 1959, 758ff; Sabin 2000).

Securing water was another necessary starting point for private enterprise in mining, agriculture, forestry, and urban land development. The state legislature (in 1851) and courts (in 1855) quickly approved the miner's practice of "appropriative rights" to water in the gold country (while riparian rights held elsewhere, creating endless confusion). Again, the U.S. government ceded control of water to the state and adopted California practices on federal lands in 1866. A state engineer, William Hammond Hall, was appointed in 1878, but his recommendation for centralized control met hostility from every front, large and small owners, miners and cattlemen, and the office was abolished ten years later. A State Water Board was created in the sweep of Progressive reform in 1911, but only helped untie the worst knots into which courts and claimants had tied water law. Groundwater, vital to irrigation after 1900, was left wide open to exploitation by all comers in the same manner as oil (Hutchins 1956; Pisani 1984; Hundley 1992).

Meanwhile, floodplain agriculture demanded and got the state Swampland Reclamation Act (1861 and 1868), which allowed landowners to create a new kind of locally controlled governmental body, a reclamation district (Preston 1981; Kelley 1989). This new level of government was expanded by the Wright Act (1876, revised in 1911), which created irrigation districts with the power to tax, condemn land and issue bonds. In the twentieth century, a deluge of special district acts followed that created urban water agencies such as East Bay Municipal Utility District, the Santa Clara Valley Water District, and the Metropolitan Water District of Southern California. Every California interest clamored for government promotion of irrigation, winning the federal Reclamation Act (1902).

Government Promotions

Direct government promotion and subsidy, particularly in the arena of infrastructure, has benefited California's economic development in no small measure. A glaring case is the money that poured into the coffers of the Central Pacific in the 1860s from all three levels of government. Without that injection of cash, the Big Four would have failed miserably in crossing the mountains, a move crucial to subsequent development of national markets for California fruit (Lewis [1938] 1966). Governor Stanford saw no contradiction in signing a subsidy act in 1863 in support of the company of which he was president (Nash 1964, 58). A less well known but critical subsidy is harbor dredging, which the state began in the 1860s in San Francisco and which the Army Corps of Engineers used to open up San Pedro, Oakland, and Sacramento to modern shipping beginning in the 1880s. In the twentieth century California became an aggressive builder of highways, starting with the 500-mile El Camino Real (1915)—carefully coated with asphalt from the state's petroleum—and the gasoline tax (1916). Federal military spending on Pacific coast fortifications and supply bases was also most helpful, as was the Navy's switch to oil-burning ships (White 1970; Lotchin 1992).

One notorious arena of promotion involved the use of city, state, and federal governments to build gargantuan water projects. The Hetch Hetchy and Owens Valley projects required massive capital outlays and political muscle by the cities of San Francisco and Los Angeles, acting as a coordinating committee for city capitalists and real estate interests, with the U.S. Department of the Interior playing handmaiden (Kahtl 1982; Brechin 1999). This pattern would be repeated later with the huge fedetal water ptojects on the Colorado and Sacramento Rivers (Taylor 1975; Worster 1985).

Government-sponsored explotation and scientific training comprised two vital supports for resource extraction (David and Wright 1997). The federal government sent teams of explorers, cartographers, geologists, and botanists to survey the potential resources of the West (White 1991). California came under their purview in the 1840s with the Coastal Survey by George Davidson and Army Corps of Topographic Engineers under John C. Frémont, and this effort intensified after gold was discovered.[48] The Army Corps laid out the Pacific railway route in the early 1850s, and the California Geological Survey, launched in 1860, surveyed the whole of the state under the leadership of Josiah Whitney, Davidson, and Clarence King (M. Smith 1987). Science and enterprise parted ways, however, when Whitney's office was closed in 1874 by politicians unhappy about his unwillingness to participate in their mineral speculations (Nash 1964, 103). A State Bureau of Mines, formed in 1880, fared bettet, dispensing useful information on mineral prospects, machinery and output, while completing the state geological survey. (An umbrella Department of Natural Resources was created in 1927.)

Training a corps of scientists and engineers to advise the resource exploiters was equally important. The University of California established a College of Agriculture in 1871, led by one of the world's first soil scientists, E. W. Hilgard (Jenny 1961), and Experiment Stations at Davis and Riverside (Sawyer 1996). By 1900, Berkeley had the world's largest school of mines (Read 1941; Spence 1967), and a geology department under Andrew Lawson that advised the petroleum industry on the complexities of California's subsurface formations (White 1970). A School of Forestry, established in 1914 under Walter Mumford, provided some of the initial ideas in forest biometry. Professor Harold Bryant, of the College of Agriculture, directed the research bureau of the Fish and Game Commission, begun in 1914 (Nash 1964).

Agriculture was a key area of promotion, and "growers were not averse to using the government for their own purposes" (Vaught 1999, 131). Like miners, farmers went untaxed in the 1850s, and during the Civil War they were awarded bounties for new crops. A State Agricultural Society (1854) was funded by the legislature to disseminate information, principally to wheat growers. The *Pacific Rural Press*, clarion of the industry, was edited for decades by Edward Wickson of the University of California College of Agriculture. The state vigorously advertised itself to stimulate immigration, especially of farmers (Orsi 1973). The wool tariff of 1867, lobbied for by Californians, sustained a booming sheep economy (Liebman 1983, 14). A State Horticultural Commission was created in 1883 "by and for orchardists and vineyardists" to combat pests (Vaught 1999, 49, 131), followed by a Horticultural Commissioner in 1903 and a system of county commissioners to aid the growers (placed under a Department of Agriculture in 1919). Growers called on these agents and on the College of Agriculture for assistance in eradication and quarantines. A Board of Viticulture was established in 1880 to combat *phylloxera*, support research, and promote wine drinking (Nash 1964).[49]

When California agriculture started moving toward cooperative marketing and production control, it did so hand in hand with government. Beginning in the 1880s, the Horticultural Commission organized grower conventions, information exchanges, and efforts to gain legislative relief. The crucially important Commission Marketing Act of 1915 created the office of State Marketing Director, filled by Harris Weinstock of the co-op movement. This was followed by the Standardization Act of 1917, which gave the state powers of inspection and quality control in accord with the co-op model, and finally the Fruit Standards Act of 1927, which empowered grower-run marketing boards for every major crop (Nash 1964; Sawyer 1996; Stoll 1998). The dairy industry got its own State Dairy Bureau and a Pure Milk Act to assure quality and limit competition.

The Public Interest

At the opposite pole, the state threw up few barriers to unrestrained exploitation of California's landscape, despite a long history of government regulation (Pincetl 1999). The state stepped in to take over the management of San Francisco's waterfront in 1863, after land speculators had left it a shambles (Nash 1964); elsewhere, municipal ownership did the job of maintaining and promoting harbors. The most remarkable instance of

state action to halt resource plunder was the Sawyet Decision (1884), which ended hydraulic mining in the Mother Lode (Kelley 1959). The widespread fraud in claiming the last public redwood lands, triggered by the Timber and Stone Act of 1878, was curbed by the federal government in the mid-1880s (Puter 1908). Timbering came under nominal control by the State Forestry Board after 1885, but its strictures were very modest; it started nurseries, made inventories, mapped timber stands, and promoted fire-fighting, but efforts to halt violations of timber laws were notably unpopular (Nash 1964). A Fish Commission was set up as early as 1870 (renamed Fish and Game in 1912), but salmon and sardines were still fished out by 1910 and 1950, respectively; the Commission opened hatcheries, introduced new species, issued licenses, and set seasons, but its only regulatory "success" was closing down the Chinese shrimp fishery (McEvoy 1986; Davis forthcoming). Despite repeated debates over unlimited drilling and overproduction of petroleum, and consequent waste and depletion of stocks, nothing was done until the U.S. government stepped in during the Great Depression (Sabin 2000).

In every one of these cases, property struggles were the key, not environmental protection or the public weal. Downstream farmers filed the suits that stopped the hydraulickers, just as they had already won fencing laws against the cattlemen—a sign of fruit growers' rising star. The first Fish Commission similarly derived from the collateral damage done to the rivers by hydraulic sediments. Timberlands fraud was controversial because it struck at freedom of access by small operators (Buckley 2000). Southern Pacific and the big landowners were the principal targets of the worker-farmer alliance that called the Constitutional Convention of 1879, but most alliance members were businessmen on hard times, not anticapitalists. Water wars were settled by giving something to everyone (Pisani 1984). Regulation of fisheries and oil depletion failed because small operators raised a hue and cry against "monopoly" power and no one in the extraction business ever fully trusted the scientists employed by the state (McEvoy 1986; Sabin 2000; Davis forthcoming).

Of course, some of the achievements of the prospector state were "public spirited" in a meaningful sense. Certain of the rich were moved by capacious visions of science and learning, as in the creation of the California Academy of Sciences, James Lick's gift for an observatory on Mt. Hamilton, E. W. Scripps's endowment of a marine research center at La Jolla, and Stanford's founding of a university (M. Smith 1987). These occurred in the spirit of both scientific enlightenment and more rational exploitation of the land and waters.[50] California capitalists were great modernizers who saw themselves rising above the past and "static" competitors around the world. Meanwhile, the petit bourgeoisie had their own regard for knowledge, which in Republican political thought was seen as an essential public property, elemental to freedom itself, and a birthright of the people. Thus, just as the small owner class thought of the continent's lands as theirs for the taking, so they regarded the stock of knowledge needed to make the land yield its benefits as theirs for the asking, and a basic responsibility of government.

As the last best hope of saving the old democracy from civil war and industrialism, California also gave birth to a singular political culture in which parties were weak, nonpartisanship strong, and government by direct ballot enthroned (Rogin and Shover 1970; Putnam 1992). When the Progressive Republicans elected Hiram Johnson in 1911, twenty-three constitutional amendments passed in the most sweeping victory for Progressivism anywhere in the country. The nonpartisan ideal went back to the Vigilantes of the 1850s, which served as California's declaration of independence from the North-South obsessions of eastern party politics (Ethington 1994).[51] And, while the Progressives and Vigilantes were mostly businessmen and professionals, the Workingmen's Party and the EPIC movement of the 1930s took up the cudgels against established parties with equal vigor. Despite the hue and cry about corruption of politics and evils of monopoly, the vast majority of Californians liked their government by business, for business, and of business. Commerce was their unifying political religion, in which growth was God, income the Child, and nonpartisanship the Holy Ghost. California politics and government served resource extraction well for its first century of statehood, giving force to the appellation "the prospector state."

Conclusion

California is an ideal place in which to observe the way natural abundance and social relations intersect under capitalism to yield both natural wealth and a wealth of natural resources. This is not a matter of choosing between nature and society as the singular cause behind economic development, but of trying to weigh the balance of forces. We have seen how much the growth of California—one of the largest regional economies in the world—has depended on the wealth of nature. The gifts of nature can only explain so much, however. After all, California's regional capitalism was a mighty engine of resource discovery, extraction, cultivation, and plunder that left no stone unturned in its efforts to wrest the maximum reward from the land.

In this article, I have broken down the motor of natural resource development into four components: the property regime, capital accumulation, resource industrialization, and the prospector state. Under these headings, I have probed into such questions as class structure, circuits of capital, industrial technology, and political culture. This is not a neoinstitutional approach, even though I share the view that the build-up of local practices holds a regional production system together in some kind of structured coherence. Rather, I hope to have made a case for a modified Marxist political economy that makes compelling use of the profound abstractions of class, capital, industry, and the state. In so doing, I hope to speak to a wider audience of students of comparative development, economic geography, and political ecology.

California distinctiveness is rooted in the gold rush, when its road to capitalism was laid down by the conquering Americans. The contrast before and after that epochal social transition could not be more striking. The incipient bourgeois order of independent Mexico, while not inert as believed by imperious Yankees, fell far short of the totalizing commercial and entrepreneurial culture of the Anglos. And while Mexican sovereignty was cut brutally short, one cannot dismiss the evidence from the laggard development of Southern California *after* 1848, where the Mexican social order held up until swept away by the cattle disasters of the 1860s. By the 1870s the Anglo capitalist regime was in place there, too, and Los Angeles never looked back.

California stands in equally telling contrast with the rest of the western United States. Why did the other states of the Far West not develop as hugely as California? William Robbins (1994) argues that they were more like colonies, but why? Natural endowments cannot account for the difference, given the vast mines, forests, fisheries, and waters of so many western places. Nor can spatial isolation from the east, since California can equally lay claim to vast distance and scale.

One natural key was that there was less placer gold for the taking elsewhere, and thus less of a mass installation of small property and diffusion of wealth. Concentrated ownership and external control of western resources were therefore more common outside California, and more rents/profits were siphoned away. Another advantage California had was timing: its gold and silver monetized the Victorian world-economy, its fresh fruit hit the market when oranges were still a luxury and Florida a swamp, and its oil lubricated development before the East Texas fields could drive down prices. Timing meant that San Francisco got the jump on other western cities as a pole of commerce and accumulation, and could throw its capital back into California promotions. Furthermore, California was the last gasp of Jacksonian Democracy and the Revolutions of 1848, as well as the El Dorado of the Victorians, which drew thousands of young libertines to seek their destiny beyond the Golden Gate. In politics, timing is evetything, and Califotnia had the good fortune to have instant statehood bestowed upon it, thanks to the bteakaway Texas Republic that preceded the Beat Flag Rebellion and to antebellum political competition between North and South. Other western states remained territoties longer.

Beyond the big-bang of California origins, moreover, the state bred success out of success. The prospector-petit bourgeois class structute was repeatedly revived by new resource rushes. Capital remained in the state to be reinvested in further domains of enterprise, and was multiplied by a creative financial apparatus. Industry grew and continually innovated, thanks to the creative genius of skilled labor backed by lots of money and robust regional markets. The state gave capitalist profligacy a free hand, periodically reformed its grossest excesses, then stepped back to give business a free hand once again. All along the way, California's resource economy walked forward on two legs: natural wealth and social production, industry and extraction, big business and small ptopetty, city and country, state and private enterprise, capital and skilled labor (not to mention highly exploited labor), safe bets and wild speculations.

It has been a bold and brassy tale of success, often told and much boasted: the California Dream Economy. What has always been missing is sufficient recognition that it was built on impressive material foundations of nature's abundance and a very pure assay of capitalism, with just enough regional exceptionalism to keep the mythos alive for every succeeding generation after 1849.

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Notes

1. I do not imagine capitalism to be an all-encompassing system, but an invasive and dominating element of social life. In California, however, it has been about as far-reaching as anywhere.
2. Jevons was obsessessed with "naturalizing" economics in response to critiques of classical political economy (Mirowski 1984).
3. Significantly, export-led growth theory was drawn from the

experience of Canada and the Pacific Northwest (North 1955).

4. Marxist neglect of nature has been rectified in recent years, but only partly so. James O'Connor (1998) tries to redeem an "ecological Marxism," but has little to say about development as opposed to destruction.
5. I cannot take up value debates here, and will use "wealth" and "value" rather loosely. Yet I would argue that classical value theory need not be blind to nature. After all, Adam Smith comfortably joined labor value to an agricultural foundation, while Marx argued that natural riches contribute rents to the social surplus and raise the productivity of labor applied to the land (rate of surplus value). It may even be possible to construct a unified labor-nature theory of value (as seems to have been the intent at times of Petty and Smith). Marx's purpose in using value theory was to argue that value was objective and the root of money, that value was generated in production, not through exchange, and that producers were exploited despite the appearance of equal exchange. All these principles can be extended to nature.
6. While Cronon (1991) argues against this idea as an archaic Marxist "productionism," his "circulationist" model is even more anachronistic, deriving from the Physiocrats and Smith.
7. George was a Californian who became known throughout the world for his critical views on land rent, views that harkened back to Ricardo and the Physiocrats.
8. Such political and economic blockage is usually less a matter of rent-seeking than of relations of production on the land, such as slavery or share-cropping, that put ruling classes at odds with a developmental capitalism. The twentieth-century version of the fear pertains to multinational corporations sucking out profits and not reinvesting.
9. Cronon (1991) applies a model of the commodity frontier that is in the same family of "circulationist" theory.
10. Harvey rightly calls for a dialectical interweaving of local and global in political movements, in opposition to either enervating globalism or a fetish of culture difference; but he is uninterested in the question of the regional origins of economic difference. This leaves him calling for a utopian leap beyond militant particularism into universal revolution, without any clear direction on how this might come about.
11. Alexander Gerschenkron (1943) is another figure much evoked in the literature on transitions.
12. Or, as McWilliams ([1949] 1976, 63–64) put it, "[Californians] are more like the Americans than the Americans themselves." Englishman James Bryce (1889, 2:385, 697) declared that the Far West was "the most American part of America, the part where those features which distinguish America from Europe come out in strongest relief." He added, "What America is to Europe, what western America is to eastern, that California is to the other Western states." (Thanks to John Findlay for locating the quotations.) Bryce is often quoted by California scholars unaware of his links to Mackinder and the racialized geography of empire (Livingstone 1992, 224).
13. See, e.g., Finn (1998) for a transnational comparison of mining regions.
14. See McWilliams ([1946] 1973, [1949] 1976), Pomeroy (1965), Ethington (1994), and Walker (1996) for contending positions on the exceptionalism of California. Obviously, a naive regional approach begs questions of coherence, boundaries, and scale of critical concern to geographers (Smith 1984, Livingstone 1992), but these issues cannot be taken up here.
15. This is in preference to the four elements—time, technology, competition, and linkage—invoked by Frickel and Freudenberg (1996).
16. No attempt is made at a rigorous mathematical formulation, because there is no clear way to test such a model numerically.
17. California in the Mexican era was also resource-intensive (furs, hide and tallow, and mining) but the scale was miniscule by comparison.
18. Spreading quickly to the rest of the Far West (Greever 1963; Paul 1963). Nevada was a tributary of San Francisco in the nineteenth century (Ostrander 1966).
19. Value-added measures would be better, but these are impossible to obtain in most cases. The difference is probably small in precious metals, oil, gas, and hydropower, but significant in the cases of agriculture, fisheries, and timber.
20. The Comstock Lode alone yielded $216 million in silver and $170 million in gold (1940$), about the same amount as the gold rush of 1848–1855 (Shinn 1901, Smith 1943).
21. Quicksilver was used to extract gold and silver from ores until the 1890s, when it was replaced by cyanide. New Almaden was the biggest single mine in California (St. Claire 1994).
22. Salmon estimate by Yoshiyama (1999, 222). Sardine estimate by Kathryn Davis, personal communication to author, June 2000.
23. Compiled from data on fur and elephant seals, sea lions, and otters in Busch (1985, 109, 111, 184–85, 202, 204). Whale oil and bone totals are unknown.
24. An exception is the work of Tobey and Wetherell (1999) on citrus, but even they ignore oil. Gordon (1954, 98–104) had it right in her classic economic history of California, little cited today.
25. For definitions, see notes on figures. Thanks to Paul Rhode for advice on these estimates.
26. There are no figures for bank assets before 1880 to compare to those for gold and silver output.
27. See Limerick (1987). Contrast Neel's (1994) theory of the West as a "land of extremes."
28. Capitalism ravaged California's environment, as well (Brechin and Dawson 1998), a subject too great to be taken up here.
29. Intensified resource extraction began in early modern Central Europe, swept through Britain in the eighteenth century, and leapt to the United States in the 1830s; perfected in California, it then spread around the world (Rickard 1938; Harvey and Press 1990). As David and Wright (1997, 203) observe, "The California gold rush was only the largest and most spectacular of a series of mineral discoveries and rushes that occurred in almost every part of the country and accelerated over the course of the nineteenth century." The Americans became the rock hounds of the globe, while the British were comparatively poor at uncovering the natural wealth of their colonies.
30. On property, access, and incentives, see Ostrom, Gardner, and Walker (1994), Rose (1994), MacPherson (1962), and Clay and Wright (1998).
31. The West was also an overwhelmingly male domain in the nineteenth century (Gullett 2000). Race and gender are critical to the constitution of California capitalism, but the subject is too large to be dealt with here except by assertion.
32. The gold rush was prefigured by the Preemption Acts and evasion of federal controls in the lead districts of the Midwest (Robbins 1976).
33. Small operators declined in the late 1920s as a result of mounting drilling costs, scientific prospecting, pipelining, and more sophisticated refining, but they refused to go away altogether. See Goodwyn (1997) and Franks (1980) on Texas and Oklahoma.
34. Accounts of gyppos are mostly for the Northwest and for later periods (e.g., Holbrook 1938; Anderson 1951; Elley 1963; Robbins 1988, 110–115).
35. This is certainly true for Monterey, where Sicilian and Japanese fishermen flourished and perhaps 30 percent of the canneries were owned by fishermen (Davis forthcoming).
36. Some would argue that the transfer of surplus value from highly exploited labor was more important than that from natural resources, but no one has attempted such a measurement.
37. The role of small property has mostly been debated in dealing with the "agrarian question." Lenin ([1899] 1964) thought that capitalism would sweep everything out of its path and that the small peasantry could not survive. The agrarian populist Chayanov (1923) countered that by self-exploitation the peasant could hold on against the odds. Kautsky ([1902] 1988) was closest to the mark in observing that capitalism tends to create new peasants ("family farmers") and allows them to prosper for a time. However, even he underestimated the ongoing vitality of small owners within the bosom of capitalism. For a review of Kautsky's work, see Watts (1996).
38. Value of Securities Traded in S.F. Mining Exchange

Year	1940 $M
1863	17.6
1864	23.1
1865	44.9
1866	31.3
1867	66.3
1868	121.7
1869	72.5
1870	56.6
1871	149.2
1872	220.7
1873	170.8
1874	321.8
1875	280.3
1876	296.3
1877	157.1
Total	2,030.3

Source: Carlson (1942, 70)

39. The amassing of real property in California was astounding. In 1912, California had a total property value of $8.464 billion, putting it fourth behind New York, Pennsylvania, and Illinois. Per capita wealth rankings from 1870 to 1912 are as follows (in nominal dollars):

1870		1880	
New York	1,483	Wyoming	2,596
Massachusetts	1,463	Nevada	2,506
Connecticut	1,441	California	1,553
Rhode Island	1,366	Massachusetts	1,471
California	1,140	Rhode Island	1,447
	780		870
1900		**1912**	
Nevada	4,503	Nevada	5,038
Wyoming	3,041	Iowa	3,529
Montana	2,523	North Dakota	3,374
California	2,167	California	3,284
Arizona	2,140	Nebraska	3,110
	1,165		1,965

Source: U.S. Bureau of the Census (1915)

40. This was shown clearly by the failure of railroad schemes during the recession of 1855–1860 (Lewis [1938] 1966).
41. Little is known of early Los Angeles manufacturing investors, but see Dumke (1944), McWilliams ([1946] 1973) (Greg Hise and Paul Rhode, personal communication to author, July 1999).
42. California manufacturing ran a trade deficit against eastern imports for a century, but balanced its payments with gold and silver, tourism, and in-migrant savings (Willis 1937).
43. The geographers' model of territorial interaction is superior to several close alternatives: international trade theory (growth through a global division of labor), the new growth theory of Paul Romer (1986, 1990) (increasing returns to scale and endogenous technical change), and the agroindustrial model of Goodman, Sorj, and Wilkinson (1987) (replacement of farm-based production by manufacturing).
44. The oil equipment industry has been little researched, but see Rhode (1990), Quam-Wickam (1994), and Feagin (1990).
45. Construction peaked at 18.5 percent of state employment in 1880 (urban and railroad), but still accounted for 8 percent in 1920 and 1940. In L.A. County it accounted for nearly 10 percent in 1920.
46. For example:

> The power business in California had its beginning in the mining business. Miners pioneered the path of the hydro-electric engineers of today. Their methods of construction, the manner in which they moved heavy machinery and material into rocky, remote regions, their designs for flumes, dams, and ditches, their tangential water-wheel, all left a lesson to be learned . . . None know the story better than the PG and E . . . .Ten of the company's twenty-eight water-power plants were originally initiated to provide energy for mining operations. Nine of its plants were installed on canals dug to supply water for mines. Out of that same hunt for gold came ten of the company's reservoirs. (PG&E 1924, 2).

47. One has to cull stories of skilled workmen and innovation from sectoral histories. I am more confident that this relation holds after discussions with Paul Rhode, Nancy Quam-Wickam, and Bill Robbins.
48. The official discovery came only nine days after a peace treaty was signed with Mexico. The conquering Americans

understood that California had gold and other valuable resources (Bunje 1983).

49. Viticulture and the state had an uneasy relationship. The industry suffered a major setback in 1863 when the legislature rebuffed one of its leaders, Agoston Haraszthy, because of his Southern sympathies. Another setback occurred at the falling out between the industry and E. W. Hilgard that led to the demise of the first board of viticulture, and a third at Prohibition in 1917, although a second Viticulture Commission established in 1913 helped the growers shift to table grapes.
50. For example, Stanford's William Dudley became a leading advocate of scientific forestry, while Harris Ryan did pioneering work on long-distance electric transmission.
51. Yet even Ethington is too quick to return California to the national fold by the Progressive era. Thanks to Kathy Johnson for a lesson in the origins of eastern party politics. In her view, the most significant thing about California's political history is that the area was a city before it was a state.

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