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Multiples of Six: The Six Companies and West Coast Industrialization, 1930–1945

CHRISTOPHER JAMES TASSAVA

In this article I explore the protean organizational forms used by the Kaiser and Bechtel construction companies between 1930 and 1950. Kaiser and Bechtel prospered during the Depression and World War II because, as members of the Six Companies consortium of construction firms, they refused to adopt a “best practice” model of corporate organization drawn from the diversified manufacturing and distribution sectors. Instead, Kaiser and Bechtel used a variety of organizational forms to win numerous government contracts for public works and defense production, transforming themselves from small regional firms into substantial national and global corporations. I contribute to modern academic debate over the historical forms of business enterprise and the conjunction of state consumption and private production.

Scholars rightly consider the period between the onset of the Great Depression and the end of World War II a critical phase in the history of American political economy. For business historians the period raises questions relating to firms’ strategic responses to the federal government’s growing economic role as a consumer. Rather than asking such questions about the big businesses whose travails and

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successes dominate the scholarly literature, in this article I consider the fortunes of two heavy-engineering and construction firms in the so-called Six Companies consortium, which played a large part in the industrialization of the American West during the Depression and the war. I argue that particular forms of firm organization, especially the joint venture, provided the Six Companies members with an exceptionally useful means for surviving the tumult of Depression and war and for exploiting opportunities that larger, more conventional enterprises could not.

Rather than exhaustively tracing out the history of the Six Companies (actually eight firms) between 1930 and 1945, I consider just two, the construction firms run by the Kaiser and Bechtel families. In addition, I focus on three key aspects of the Six Companies' history: the successful pursuit of giant public works projects in the 1930s, the entry into shipbuilding during World War II, and the experience of postwar reconversion. These periods have historical importance in that each compelled the Six Companies partners, especially Kaiser and Bechtel, to adapt to dramatically changing conditions, and they have analytical importance in that each shows the viability of an alternative to the classic Chandlerian model of business development.

By now it is nearly a cliché for business historians to highlight some aspect of American business history that Alfred Chandler does not directly address in one of his monumental studies.¹ In a recent examination of the academic impact of *The Visible Hand*, Richard John labels as “skeptics” a group of scholars who enlarge the identification of omissions into a school of historiography “intent on rewriting the history of the rise of the modern business enterprise in the United States as a tale of missed chances and possibilities foreclosed.”² This seems not quite right, for “skeptics” such as Philip Scranton and Jonathan Zeitlin, whose empirically and theoretically important works inform this article, address not opportunities lost but opportunities *taken*—albeit often away from the big business center and with recourse to unusual forms of business organization.³

1. These works include Alfred D. Chandler, Jr., *Strategy and Structure: Chapters in the History of the Industrial Enterprise* (Cambridge, Mass., 1962); *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977); and *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass., 1990).

2. Richard R. John, “Elaborations, Revisions, Dissents: Alfred D. Chandler, Jr.’s *The Visible Hand* after Twenty Years,” *Business History Review* 71 (Summer 1997): 193.

3. For instance, see Philip Scranton, “None-Too-Porous Boundaries: Labor History and the History of Technology,” *Technology and Culture* 29 (Oct. 1988): 722–43; Scranton, “The Politics of Production: Technology, Markets, and the Two

The passage of the Six Companies firms through the Great Depression and World War II highlights not an abandoned path of business development but a well-traveled road that mostly paralleled (and occasionally intersected) the Chandlerian highway. The construction industry, despite its foundational place in modern America, does not appear in Chandler's work precisely because, at least until well after the rise of big business, construction firms did not exhibit the key characteristics of American capitalism, such as the existence of an elaborate managerial hierarchy, dependence on the coordinating role of professional middle managers, the clear demarcation of ownership and administration, and an emphasis on mass production and mass distribution.⁴ In fact, Chandler mentions construction firms only to say that by 1900 "they were not yet full-fledged modern business enterprises."⁵

But Chandler's taxonomy of corporate governance does accommodate the Six Companies firms (all of which were founded around the turn of the century), midway between the "personal enterprise" run by an entrepreneur without an elaborate managerial staff and the "entrepreneurial or family-controlled enterprise" run by a founder-centered coterie and a limited staff of professional managers.⁶ In form, the Six Companies firms closely resembled one another. A small cadre of men, with a founding entrepreneur at the center, owned each firm and executed all important administrative functions. Strategically, they decided whether to pursue or reject new opportunities, how to run accepted projects, and, crucially, whether to relate to other firms in the same business through competition, cooperation, collusion, or disregard. Tactically, the managerial coterie made an important fraction of the day-to-day decisions regarding particular projects. Instead of hiring disinterested professional managers to oversee their projects (a practice that characterizes a critical stage in Chandler's evolutionary schema for American capitalism), executives tended to assign present or prospective members of their own cadre to project management posts or to use such posi-

Cultures of American Industry," *Science in Context* 8 (Summer 1995): 369–95; Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865–1925* (Princeton, N.J., 1997); Charles Sabel and Jonathan Zeitlin, "Historical Alternatives to Mass Production: Politics, Markets, and Technology in Nineteenth-Century Industrialization," *Past and Present* 108 (Aug. 1985): 133–76; Sabel and Zeitlin, *Worlds of Possibility: Flexibility and Mass Production in Western Industrialization* (New York, 1997); and Zeitlin, *Between Flexibility and Mass Production: Strategic Debate and Industrial Reorganization in British Engineering, 1830–1990* (forthcoming).

4. For one summation of these traits, see Chandler, *The Visible Hand*, 485–86.

5. *Ibid.*, 94.

6. Chandler, *Scale and Scope*, 240.

tions as proving grounds for long-term employees ascending to the executive group. (Exceptions proved the rule: the eldest Bechtel son spent his career in the field, ceding the boardroom to his two brothers.)

In situations where, as Chandler puts it, “owners managed and managers owned their enterprises,” entrepreneurs tended to prefer the partnership to other forms of organization.⁷ The firms constituting the Six Companies, each of which exhibited considerable overlap or even identity between ownership and management, preferred yet another alternative organizational form: the joint venture.

Historian Glenn Bugos explains: “Before 1950, joint ventures were rare. Companies thought to use them only when merger was prohibited” by regulation or another insurmountable difficulty—at least until structural changes in the American economy facilitated a rapid growth in the quantity and quality of joint ventures.⁸ Bugos substantiates this point with statistical data drawn from the manufacturing sector and with an extended examination of the construction of the Bay Area Rapid Transit system around San Francisco—a project in which Bechtel played a leading role.

But well before the commencement of the joint venture boom in the 1950s, Bechtel, Kaiser, and their ilk promiscuously engaged one another through the loose organizational form of the joint venture, forming numerous new semiautonomous and avowedly temporary enterprises dedicated to the execution of single projects and grounded in shared resources such as capital and technical skill. For the Six Companies firms, joint ventures offered a way to use formal mechanisms of cross-investment and governance to bar unwelcome parties such as bankers eyeing the bottom line (if not the executive suite) and, worse, meddlesome outside stockholders. Thus, if Bechtel and Kaiser trailed behind the main line of corporate development by failing to emulate the putative norm of the divisionalized corporation until after World War II, in the decade preceding the war they actually pioneered the development of the joint venture, a partly complementary and partly alternative organizational form.⁹

7. Chandler, *The Visible Hand*, 36, 45, quotation at p. 37.

8. Glenn Bugos, “System Reshapes the Corporation: Joint Ventures in the Bay Area Rapid Transit System, 1962–1972,” in *Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After*, ed. Agatha C. Hughes and Thomas P. Hughes (Cambridge, Mass., 2000), 113.

9. Readers should not view this article as a brief for an “organizational determinism” that endows business structure with the power to somehow “cause” success. Rather, I seek to foreground the choices of the Six Companies firms with respect to business structure while still attending to such important factors as the entrepreneurial and managerial abilities (and incapacities) of businesspeople like Henry Kaiser, technical innovation on the job site and in the shipyard, and espe-

Depression: 1930–1940

The Six Companies consortium formed in the confluence of two opposing streams of interwar American political economy: the rapid rise after World War I and the precipitous decline in the late 1920s of the American construction industry and the eager application of public monies to enormous and enormously expensive internal-improvement public works projects during the 1930s. By 1930 the eight firms that eventually composed the Six Companies had accomplished scores of road, pipeline, railroad, and bridge projects throughout the American West, often in durable two- and three-company combinations.

In 1930, when the federal government called for bids for the construction of Hoover Dam, a long-awaited structure on the Colorado River near Las Vegas, contractors all over the United States began studying a project whose physical size, incredible cost, and Depression-era context discouraged idle interest.¹⁰ Even accomplished dam builders like Utah Construction Company and Morrison-Knudsen Corporation (M-K), two frequent allies, recognized that the dam would exceed their accumulated skills.¹¹ Putting \$1.5 million toward an estimated \$5 million fund of earnest money, Utah and M-K recruited a Los Angeles pipe-and-tunnel contractor and a bridge-building firm from Portland, Oregon, each of which added \$500,000 in capital, and then looked for more participants.¹²

San Francisco seemed the best place to find more prospective partners for the nascent consortium. A banker and friend of President Herbert Hoover brought Utah and M-K to MacDonald & Kahn, which chipped in a million dollars and attracted the attention of Bechtel and Kaiser, two Bay Area firms that had already begun a separate evaluation of the dam.¹³ The longtime alliance between the two companies' founders, Warren "Dad" Bechtel and Henry Kaiser, rested on shared history and philosophy: both started on the east side of the Rockies before moving West, both found success in middle age, both intended to pass their firms to their sons, and both

cially the Six Companies partners' peerless facility in using the federal government as both customer and financier.

10. Joseph E. Stevens, *Hoover Dam: An American Adventure* (Norman, Okla., 1988), stands out as the best study of the dam project.

11. Utah's tightly knit executive staff included Marriner Eccles, a brilliant numbers man who divided his energies between the construction firm and a banking empire that launched him toward the presidency of the Federal Reserve. See Jonathan Hughes, *The Vital Few: The Entrepreneur and American Economic Progress* (New York, 1986), 504–57.

12. "The Earth Movers I," *Fortune* 28 (Aug. 1943): 104.

13. *Ibid.*, 105.

beat project deadlines by supplementing rigorous scheduling with intensive use of heavy machinery (Bechtel may have used tracked heavy equipment before any other company).¹⁴ In addition, Bechtel and Kaiser valued informality in all matters, from jointly ventured industrial insurance companies to actual construction contracts. According to Kaiser, “Dad” Bechtel always sought gentlemen’s agreements and fifty-fifty profit splits and considered other, less equitable or more formal arrangements dishonest and greedy. Too many parties had already joined the dam project to keep it that simple, but Bechtel and Kaiser (along with a Boston-based ally) nonetheless joined the consortium and added the last \$1.5 million.¹⁵

As the bidding deadline for the \$50 million project approached, the syndicate prepared three cost estimates whose trivial differences only confirmed the companies’ like-mindedness. Needing a name under which to make the bid, the eight partners demonstrated a perverse sense of humor in choosing Six Companies, Incorporated, a name that not only defied arithmetic but that also had originally been applied to a quasi-judicial institution for resolving disputes within Chinese crime families in San Francisco. The new consortium used its \$5 million to obtain a required good-faith bond (scrambling at the last moment when some partners could not come up with the sums they had pledged) and then bid \$48.9 million (a figure that included a generous 25 percent profit) on the Hoover Dam project.¹⁶

When the Bureau of Reclamation opened the bids in March 1931, the Six Companies’ bid came out well below the other two acceptable bids (both submitted by giant eastern firms), and the consortium members were instantly transformed from regional contractors into firms with what the middle Bechtel son, Steve, called “a prime position as being big-time, real thinkers.”¹⁷ The *San Francisco Chronicle*

14. Robert L. Ingram, *A Builder and His Family, 1898–1948* (San Francisco, 1961), 22, 34; Bechtel Corporation, *Building a Century, 1898–1998* (Kansas City, Mo., 1998), 14, 16, 36–37; Mark Foster, *Henry J. Kaiser: Builder in the Modern American West* (Austin, Texas, 1989), 36–37; Donald E. Wolf, *Big Dams and Other Dreams: The Six Companies Story* (Norman, Okla., 1996), 25–29; Stephen B. Adams, *Mr. Kaiser Goes to Washington: The Rise of a Government Entrepreneur* (Chapel Hill, N.C., 1997), 20–21. Foster quotes a pioneering equipment builder regarding Kaiser: He “was the first contractor I had ever met who didn’t look upon my machines as trick instruments to do small jobs faster. He saw them as instruments to make big jobs small” (p. 37). Foster’s work stands as the definitive biography of Kaiser; Adams’, as a tightly focused study of the man’s considerable success at attaching himself to the federal bureaucracy.

15. “Earth Movers I,” 105–6; Foster, *Henry J. Kaiser*, 46.

16. “Earth Movers I,” 99, 106–7; Stevens, *Hoover Dam*, 44.

17. Two unacceptable submissions both lacked the required surety bond and made inappropriate bids, one for “\$80,000 less than the lowest bid you get” and

announced the win with a banner headline, claiming the Six Companies as the city's own and bragging that the "bid is the largest in the history of American construction" and that "the project itself is second only . . . to the Panama Canal."¹⁸ San Francisco's mayor proclaimed the city "proud of the world-wide distinction . . . [and] happy because of what it will mean in a financial and an industrial way"—in other words, it was a counterattack on the mounting Depression, spearheaded by the vendors who soon began arriving to do business with the Six Companies firms.¹⁹

Eager to start making money, the Six Companies partners used their capital to push the project as far as possible in the first year, clearing a path to the sizable bonus for beating the overall project deadline. By 1933, in fact, Bechtel and Kaiser both had recouped \$5 million of working capital and begun collecting pure profit.²⁰ That early progress began slowing after "Dad" Bechtel died suddenly on a trip to the Soviet Union and the surviving partners began meddling in daily operations at the dam. Unhappy with the now confused lines of authority, the project superintendent demanded a change, and the directors named four of their own, including "Dad" Bechtel's son Stephen and, as chairman, Henry Kaiser, to a function-oriented executive committee positioned between the superintendent and the other partners.²¹

Beginning at Hoover, this scheme of corporate governance and project management evolved into a system of "sponsorship" that vested executive control of each job in one member of the syndicate

the other for either the unbelievably high figure of \$200 million or cost plus 10 percent. Bechtel Corporation, *Building a Century*, 26, 29. See also "Earth Movers I," 107, and Stevens, *Hoover Dam*, 45–46. The massive sum of capital required to make a legitimate bid on the dam project, much less execute it, narrows the theoretical gap between construction and manufacturing, the classic Chandlerian enterprise. In general, the two sectors differ markedly, with manufacturing imposing high fixed costs and high barriers to prospective entrants and construction exhibiting, conversely, relatively low fixed costs and low barriers to entry. However, because it required enormous physical and financial capital in the forms of credit, cash, and especially equipment (trucks and earthmoving machinery, for instance)—not to mention a deep and expensive fund of human capital such as engineers and skilled laborers—the heavy construction work of the Six Companies firms during the 1930s looked much more like a major new manufacturing enterprise than like a construction job on the scale of a house, office building, railroad, or bridge.

18. *San Francisco Chronicle*, 5 March 1931, p. 1.

19. *San Francisco Chronicle*, 8 March 1931, pp. 3–4; see also Wolf, *Big Dams and Other Dreams*, 25–29.

20. "Earth Movers I," 214.

21. *Ibid.*, 210.



Henry J. Kaiser (second from left) and Stephen D. Bechtel (at right), along with other principals of the Six Companies, at the Hoover Dam, c. 1935. Reproduced courtesy of the Bancroft Library, University of California, Berkeley.

and left the others to furnish employees, equipment, and capital.²² The sponsor system had several advantages. First, it allowed the most experienced or interested partner to assume more responsibil-

22. For details about the Hoover construction project, see “Earth Movers I,” 212; “The Earth Movers II,” *Fortune* 28 (Sept. 1943): 226; Albert Heiner, *Henry J. Kaiser: Western Colossus* (San Francisco, 1991), 56–57; Bechtel Corporation,

ity than his peers but still limited his firm's portion of project revenues to a strictly proportional share.²³ The sponsor received no premium for filling that role. Second, the system allowed partners to calibrate their participation by openly contributing substantial resources to a project, silently supplying capital, or even staying out entirely.²⁴ In practice, sponsorship allowed ambitious firms like Kaiser to enlarge their roles in the consortium and to move toward long-range goals such as diversifying into industrial production.

During the dam project Henry Kaiser emerged as an expert political operator. In 1932 he wheedled a large deficiency appropriation from the Hoover administration, a considerable feat given the collapsing economy.²⁵ Later, Kaiser used his high-level contacts to persuade Harold Ickes, Secretary of the Interior under President Franklin D. Roosevelt, to reduce a massive fine for violating eight-hour-day laws, to convince the government to accept the dam in March 1936 (two years ahead of schedule), and to pay a \$2.5 million completion bonus, part of a \$10 million profit distributed according to the partners' up-front interest in Six Companies.²⁶

Though successful, the Hoover Dam project did not meld the partners into a single organization. In fact, the eight firms never again worked all together on a single project. Working on the big dam did strengthen lines of interfirm affiliation, however, and encouraged a kind of recombinant organizing that proved immensely useful on the giant projects that followed Hoover. Always as interested in the next job as in the present one, Kaiser had prepared his partners to bid in 1934 on two Columbia River dams.²⁷

The first, Bonneville, presented several technical and organizational challenges that ultimately split the Six Companies into two separate units: two partners joined a new firm to win the contract to build the dam's power plant, while the remaining partners took the contract to erect the dam itself. Taking the sponsor's role, Henry Kaiser maneuvered his eldest son, 25-year-old Edgar, into the "project manager" position and another young protégé into the superintendency. This talented pair completed Bonneville Dam a year ahead of schedule and made \$3 million in profit.²⁸

Building a Century, 32, 142. Stevens, *Hoover Dam*, offers a long, detailed study of the entire dam project.

23. "Earth Movers II," 121.

24. Foster, *Henry J. Kaiser*, 62.

25. *Ibid.*, 58.

26. "Earth Movers I," 214.

27. "Earth Movers II," 120, 219.

28. Heiner, *Henry J. Kaiser*, 59–61; Foster, *Henry J. Kaiser*, 62–63; "Earth Movers II," 120.

Just after winning Bonneville, the Six Companies partners reassembled to bid on the biggest dam of them all, Grand Coulee, which some predicted would cost more than the Panama Canal and use three times the concrete of Hoover.²⁹ When the government opened the bids in June 1934, another consortium underbid the swaggering Six Companies by \$5 million and won the contract.³⁰ Three years later several of the Six Companies partners reconstituted themselves as Consolidated Builders to win the separate \$40.8 million contract for the dam spillway. The Bonneville project management team moved up the river, where they completed the spillway eighteen months ahead of schedule, collecting \$7.2 million in profit.³¹

The Six Companies firms sought other kinds of work as well. In 1932 Kaiser, Bechtel, two other Hoover partners, and two new firms formed Bridge Builders, Incorporated, and won the contract to build the north and south approaches to the Golden Gate Bridge. In 1933 the same joint venture won a contract to sink piers for one span of the San Francisco–Oakland Bay Bridge, while another set of Six Companies partners won a contract for the other span.³²

The Six Companies, with Kaiser and Bechtel in the vanguard, also sought work beyond their core domain of heavy construction. In June 1938, after losing the contract to build Shasta Dam in northern California, Henry Kaiser won auxiliary contracts to furnish sand, gravel, and cement for the dam. Kaiser first built a miles-long conveyor belt to haul gravel to the dam site, saving millions of dollars in railroad freight, and then erected a giant cement plant south of San Francisco, an enterprise blessed by Harold Ickes as a means to break the West Coast cement-making oligopoly. Kaiser produced so much cheap cement that he bought two steamships to carry it to Hawaii, where the United States Navy needed every ton for its massive construction projects. One of these freighters, unloading at Pearl Harbor when the Japanese attacked, diverted its load to port reconstruction, making Kaiser perhaps the first industrialist to join the formal war effort.³³

In 1937 the Bechtels, too, turned toward basic industry by establishing a new company, Bechtel-McCone-Parsons (BMP), to design and build oil refineries. Though initially focused on projects in the

29. Richard Neuberger, “The Biggest Thing on Earth,” *Harper’s Monthly Magazine* (Feb. 1937), 247; Foster, *Henry J. Kaiser*, 63.

30. “Earth Movers II,” 120.

31. *Ibid.*, 121; Heiner, *Henry J. Kaiser*, 63–64.

32. Ingram, *A Builder*, 9; Bechtel Corporation, *Building a Century*, 31–32.

33. “Earth Movers II,” 121, 220, 222; Foster, *Henry J. Kaiser*, 64–67; Heiner, *Henry J. Kaiser*, 67–68, 72; “Notes taken 6/22/43 of meeting . . .” 1–2, folder 26, carton 21, Henry J. Kaiser Papers [hereafter HJK Papers], Bancroft Library, University of California, Berkeley.

American West, BMP soon accepted work in Venezuela and Saudi Arabia—work that convinced the partners of the need to expand American oil-shipping capacity.³⁴ A careful study of American shipbuilding and shipping, authorized by Stephen Bechtel and his partner John McCone, forecast imminent government-driven growth and the possibility of excellent profits. Steve Bechtel recommended forming a separate corporation for shipbuilding enterprises, including “not only immediate requirements, but also the forward looking broadened program covering probably a number of years.”³⁵ Chary of diversification, most of the Six Companies partners ignored the idea, but an interested Henry Kaiser met with government officials about shipbuilding contracts.

As the consortium members began diversifying, the Six Companies’ several joint ventures suffered from one major flaw: competing claims to leadership and control. The sponsorship model developed at Hoover and used on other projects partially resolved this problem by allowing active and interested parties, especially Kaiser, to assume a leadership role, but sponsorship simultaneously planted the seeds of future problems. Ambitious partners such as Henry Kaiser accumulated expertise and made increasingly grand plans; less ambitious partners could not easily acquire comparable expertise and found such plans worrisomely far afield. Worse, since the Six Companies’ joint ventures returned profits strictly proportional to the partners’ initial investments, sponsors earned no special reward except the lesson that making money commensurate to a larger role seemed to require breaking away from the joint-venture model and establishing wholly separate enterprises.

In 1939, however, these problems had not yet fully emerged, and three advantages of the joint venture still outweighed them. First, the joint venture distributed the risk of massive projects such as dams across many firms, reducing the likelihood that one partner’s failings of capital or constitution would doom the entire project or, conversely, that unforeseen difficulties would cripple one or several of the companies. Second, the joint venture facilitated the combination of very different areas of institutional expertise, such as Bechtel’s mastery of materials flow and Kaiser’s skill in dealing with bureaucrats, into an administratively coherent organization. Third, crucial for new projects such as dams, the joint venture helped the partners

34. Bechtel Corporation, *Building a Century*, 32, 35; “Earth Movers I,” 107; “Earth Movers II,” 222.

35. SDB [Stephen D. Bechtel] to K[enneth] K. Bechtel and John A. McCone, “Shipbuilding,” 7 Dec. 1938, “Memo File 1/1/37–12/30/38” folder, carton 3, Marinship Corporation Records [hereafter MCR], Bancroft Library, University of California, Berkeley; Bechtel Corporation, *Building a Century*, 35.

find and engage new experts, thus allowing them to create instantly viable enterprises in harsh physical environments like the desert outside Las Vegas or the Columbia River basin or in altogether new industries such as merchant shipbuilding.

These three advantages of the joint venture actually helped Kaiser and Bechtel negotiate the treacherous transition from heavy engineering and construction to manufacturing, when any number of strategic choices and operational challenges might well have threatened the Six Companies' survival. Entrepreneurial overreach certainly worried the more conservative partners, who did not like the idea of building shipyards, and much less that of building ships.

Kaiser and Bechtel, however, viewed the joint venture form less as a mechanism for rearranging the constituents of the Six Companies than as a means to align them with new, expert outsiders—much as the various Hoover Dam contractors had assembled themselves into a viable enterprise in 1931. Attracted perhaps by the Six Companies' prowess at tapping public capital and prosecuting complex construction projects, these experts could mesh their knowledge with that of Kaiser and Bechtel to create new enterprise-oriented joint ventures that, like the Six Companies in 1931, could do far more together than the constituent firms could alone or in smaller combinations. Of course, a firm could not simply revoke expertise or skills it had transferred to a joint-venture partner, and that made the form especially useful as a way station for the ambitious.

Conceptually, Kaiser and Bechtel considered “government work” as all of a piece: winning contracts to erect a dam, throw up a shipyard, or build a ship depended on the same entrepreneurial skills and on a relatively stable set of relationships with federal bureaucrats. By 1940 the Six Companies constituted a known quantity to those bureaucrats; the consortium had a hard-won reputation for completing its projects on time and on budget and, perhaps more important, a proven ability to convert public capital into western development. In addition, the Six Companies firms did not share what historian Gerald D. Nash calls the “somber and cautious . . . mood of limited expectations” that pervaded the American West throughout the 1930s.³⁶ Rather, Kaiser and Bechtel saw almost unlimited opportunities in front of them, opportunities that existed by dint of their ties to the government and that seemed attainable because of the firms' history of reorganizing to go in new directions.

36. Gerald D. Nash, *The American West Transformed: The Impact of the Second World War* (Lincoln, Nebr., 1985), 14. See also Gerald D. Nash, *World War II and the West: Reshaping the Economy* (Lincoln, Nebr., 1990).

War: 1940–1945

This supple quality of the joint venture became most evident when the Six Companies decided to pursue shipbuilding fully. In 1937 the United States Maritime Commission, a new federal agency charged with reconstructing the American merchant marine, had begun revitalizing and expanding American commercial shipyards.³⁷ After the partners rejected the idea of a stand-alone shipbuilding enterprise, Henry Kaiser and Steve Bechtel decided to create a joint venture with a well-established firm, Todd Shipyards. Todd operated ship construction and repair yards across the nation but lacked the capital needed to improve its plants enough for the Maritime Commission to consider the firm for contracts. Encouraged by the combination of Six Companies capital and Todd shipbuilding experience (and by the outbreak of war in Europe), the Maritime Commission awarded the new company a \$9 million contract for five small cargo ships.³⁸ For the commission, the contract offered an inexpensive way to ready Todd for future work. For the partners, the contract presented an excellent opportunity to improve their firms: Todd managers observed how Six Companies engineering and construction crews erected the new shipyard in Washington, and then Six Companies personnel studied how Todd's shipbuilders actually built the ships.³⁹

Though immediately successful, the Todd–Six Companies syndicate's performance attracted little attention from the Maritime Commission. In fact, only a fortuitous coincidence allowed the group to take its next step into shipbuilding. In late 1940 British agents arrived stateside to order scores of large, standardized freighters from American shipyards. President Roosevelt delegated the matter to the Maritime Commission. When he heard of the British order, Steve Bechtel brashly asked for the entire British contract on the theory that “size can work to your advantage if you think big” and that one should “just recognize it and move the decimal point over.” The Maritime Commission dismissed this idea but decided in late 1940 to split the British contract between two facilities under the Todd

37. Frederic Lane, with Blanche D. Coll, Gerald J. Fischer, and David B. Tyler, *Ships for Victory: A History of Shipbuilding under the U.S. Maritime Commission in World War II* (Baltimore, Md., 1951), 1–71.

38. For details on the Six Companies–Todd partnership and the 1939 increase in the long-range program, see three articles in *Fortune*: “The No. 1 Bottleneck Now Is Lack of Ships,” *Fortune* 25 (May 1942): 69; “Biggest Splash,” *Fortune* 24 (July 1941): 122; and “Earth Movers II,” 222.

39. “Earth Movers II,” 222; Bechtel Corporation, *Building a Century*, 40.

aegeis, including a new yard at Richmond, California, which Kaiser eagerly agreed to sponsor on a \$7.1 million facilities contract and a \$120 million ship construction contract.⁴⁰

These contracts had special value to heavy-construction firms like Kaiser and Bechtel, for they not only provided capital for building the yard, but also advanced public funds toward ship construction. Those funds created a buffer period in which the companies could rapidly teach themselves how to adapt their experience building giant, essentially custom projects like dams to the new endeavor of shipbuilding—for which they had few preconceptions of “proper” practice. Just as the joint-venture form had facilitated the assembly of several firms with disparate experience into a coherent enterprise at Hoover Dam, so the form allowed Kaiser and Bechtel to link up with Todd and to draw on that company’s technical knowledge for their own long-term interests in shipbuilding. The joint-venture form provided a framework that became sturdier and more useful as it combined complementary firms such as the original Six Companies members or Kaiser, Bechtel, and Todd.

The freighter contract accelerated the development of defense-oriented industry on San Francisco Bay and the West Coast.⁴¹ Gerald Nash writes that “as no other single event in the history of the West, the war stimulated economic growth,” chiefly by injecting the economy with \$40 billion of public funds.⁴² More specifically, California became a giant producer of defense goods, especially aircraft in Southern California and ships in Los Angeles and San Francisco.⁴³

Between 1940 and 1943 the Maritime Commission underwrote a massive expansion of American shipbuilding. The agency’s goals rose from 50 ships a year for a decade in 1940 to 460 ships between 1941 and 1944. Under President Roosevelt’s May 1941 order, the quota climbed to five million deadweight tons of cargo shipping in 1942 (standardized Liberty ships making up 60 percent of that total) and seven million tons in 1943.⁴⁴ After the attack on Pearl Harbor

40. “Earth Movers II,” 222; Bechtel Corporation, *Building a Century*, 40 (quote); “Biggest Splash,” 121; Lane, *Ships for Victory*, 39, 42 and n3; *Fore ‘n’ Aft* 4 (14 April 1944): 4.

41. Lane, *Ships for Victory*, 35. For more on California and the West in the emerging “military-industrial complex,” see Roger W. Lotchin, “The City and the Sword: San Francisco and the Rise of the Metropolitan-Military Complex, 1919–1941,” *Journal of American History* 65 (March 1979): 996–1020; Lotchin, ed., *The Martial Metropolis: U.S. Cities in War and Peace* (New York, 1984); and Lotchin, *Fortress California, 1910–1961: From Warfare to Welfare* (New York, 1992).

42. Nash, *The American West Transformed*, 17.

43. *Ibid.*, 25–26.

44. Lane, *Ships for Victory*, 40–43, 61–63, 73–74, 138; “Bottleneck No. 1,” 70.

the commission upped the program totals to eight million tons in 1942 and to ten million in 1943.⁴⁵

These massive totals—constituting by far the largest shipbuilding program in history—required a rapid expansion of American shipbuilding capacity. Henry Kaiser's organization took on a disproportionate load of contracts, eventually adding six shipyards to the original Richmond facility sponsored by Kaiser as part of the joint venture with Todd. For its part, Bechtel sponsored a giant yard at Los Angeles and the smaller Marinship yard at Sausalito, on San Francisco Bay. Marinship and Kaiser's two largest yards at Richmond, prosaically named Shipyard No. 1 and Shipyard No. 2, all built the famous Liberty ships before shifting to other vessels—Marinship to a standardized tanker and the two Richmond yards to the faster Victory cargo ship.⁴⁶

Kaiser used the commission's appetite for ships methodically to put shipbuilding at the center of his burgeoning industrial empire, unfettered by joint ventures and other interference. Kaiser considered the joint venture with Todd a temporary expedient to that end—and a valuable one, since Six Companies analysts predicted that Todd stood to make about \$8 million in profits over the year ending in March 1941 and encouraged the Six Companies firms to invest even more deeply in their partner.⁴⁷ By 1942, however, Kaiser began to view Todd as a burden, not least when its executives, worried about Kaiser's plans to diversify, demanded the right to place a Todd observer at every meeting of Kaiser's board of directors.⁴⁸

This insulting check on his freedom confirmed Kaiser's desire to separate from Todd and, when the final wave of shipbuilding expansion hit in early 1942, Kaiser accepted contracts, brokered by the Maritime Commission but growing from the military's logistical needs, for big, fast troopships and a new shipyard at Richmond. This new yard would feature giant dry dock–like shipbuilding basins that would ease ship assembly but, more important, also provide Kaiser with substantial capacity for ship repair, a significant business as war-damaged vessels began calling at San Francisco Bay.⁴⁹ Even

45. "No. 1 Bottleneck," 70; Lane, *Ships for Victory*, 139.

46. For details on the Liberty ship, see Lane, *Ships for Victory*, 43–45, 72–89. For details on the Maritime Commission's expansion of American shipbuilding, see *ibid.*, chaps. 2 and 5.

47. John A. McCone to K[enneth] K. Bechtel, 29 May 1941, "KKB Memos-5/1/41- 8/30/41" folder, carton 3, MCR.

48. "Earth Movers II," 225; "Earth Movers III," *Fortune* 28 (Oct. 1943): 193; Foster, *Henry J. Kaiser*, 83.

49. *Fore 'n' Aft* 4 (14 April 1944): 8–9.

worse, Kaiser had placed the new shipyard within a firm wholly controlled by the Kaiser family. Having ignored this strategic port for years, Todd now found itself cut off from its rapid, lucrative growth. Kaiser used the joint venture with Todd to enter shipbuilding independently and to compete with Todd rather than to cross-invest with peers.⁵⁰ Outmaneuvered, Todd chose to withdraw from the joint venture, leaving Kaiser and the Six Companies in control of several new yards in California and Oregon.⁵¹

At that point in their respective wartime careers, Bechtel and Kaiser had contributed roughly equivalent capital to their joint-venture enterprises. Kaiser stood to earn an estimated \$1.3 million in profit from Bechtel-run operations, whereas Bechtel expected to earn just \$480,680 from Kaiser-run operations. This differential existed primarily because Kaiser had pledged \$642,000 from his main business, the Permanente Metals Corporation, to the federal government as a guarantee on a giant loan for his new magnesium-processing venture. Bechtel expected this enterprise to lose \$250,000.⁵² Kaiser's partners disliked his penchant for risky ventures such as processing magnesium and for tricky accounting, such as using sure profits from one business to underwrite another more dubious activity. In fact, the magnesium project had precipitated Todd's original dissent. In this case, the Six Companies firms guessed right: though Kaiser engineers developed the incendiary "goop" used in the firebomb raids on Japan, the magnesium plant never became an important part of Kaiser's operations.⁵³

Kaiser never quite understood his partners' wariness. At a board meeting soon after the attack on Pearl Harbor, he tried to persuade them to join his steel and rubber enterprises by making one company's name more "impersonal" to draw public attention away from himself, while at the same time bragging about his leading role in extending the partners' activities. The meeting ended badly, with one Bechtel confidant reporting that Kaiser felt "disappointed and bitter" over the partners' lack of enthusiasm.⁵⁴ Kaiser tried again a

50. "Earth Movers II," 222; "Biggest Splash," 225.

51. "Earth Movers II," 225.

52. W. A. Bechtel Co., "Comparison of Bechtel & Kaiser Participations from February 20, 1939, to February 28, 1942," 20 May 1942, p. 1, "Summary," and p. 3, "Bechtel Participation in Kaiser Sponsored Operations . . ." both in "KKB's Memos 1/1/42-" folder, carton 3, MCR.

53. For a brief account of the early history of the magnesium plant, see "Earth Movers III," 139-42, 193. See also "Kaiser Aluminum—Henry J.'s Marvelous Mistake," *Fortune* 54 (July 1956): 81.

54. John A. McCone to S. D. Bechtel and K. K. Bechtel, 27 Feb. 1942 (quotes on 2, 4), "KKB's Memos 1/1/42-" folder, carton 3, MCR.

few months later, at the time of the break with Todd, by proposing a new joint venture. He would sponsor and own the single largest share, but all of the Six Companies partners would have stakes in the new business, which would use government financing for new steel and rubber plants and broaden the Six Companies' industrial base. Kaiser called the scheme off when scrutiny revealed that it would cost more than \$500,000.⁵⁵

These problems aside, Bechtel remained Kaiser's most loyal ally. In April 1942, when Bechtel accepted a contract from the Maritime Commission to build and operate a shipyard at Sausalito, California, company executives drew up a complex joint venture to distribute ownership over a large group of managers, two different Bechtel companies, and three of the Six Companies firms.⁵⁶ Bechtel lobbied hard, but Kaiser turned down the offer, claiming that "conditions at this time are such that we do not believe it advisable for us to accept this participation," but perhaps motivated by the previous months' conflicts with Bechtel and other Six Companies partners over reorganization and diversification plans.⁵⁷

A year later Bechtel asked if the Kaiser organization would renew its "sub-joint-venture" interest in an incongruous shipyard in Indiana, a Byzantine enterprise involving eleven different firms in three interlocking joint ventures.⁵⁸ Including that shipyard, and despite the previous year's strife, Kaiser and Bechtel then shared fifteen joint-venture projects, ranging from small industrial insurance companies with net values well under \$500,000 to multimillion-dollar shipbuilding companies. Kaiser held a larger share in the complete roster of enterprises, with \$8.3 million of their \$39.3 million total value to Bechtel's \$5.3 million stake. Five shipbuilding-related joint ventures accounted for \$15.9 million, or just over half of the total (again Kaiser controlled slightly more, \$3.1 million to Bechtel's nearly \$3.0 million), and a shipbuilding enterprise represented each organization's single most valuable holding: estimates put Bechtel's 30 percent interest in the Calship yard in Los Angeles at a value of \$1.4

55. S. D. Bechtel to K. K. Bechtel and John A. McCone, 2 March 1942, 1-2, "KKB's Memos 1/1/42-1" folder, carton 3, MCR.

56. K. K. Bechtel to Henry J. Kaiser, 16 April 1942, folder 46, carton 11, HJK Papers.

57. K. K. Bechtel to Henry J. Kaiser, 16 April 1942; President, Henry J. Kaiser Company, to K. K. Bechtel, 17 April 1942, both in folder 46, carton 11, HJK Papers; S. D. Bechtel to John A. McCone, 5 March 1942, "KKB's Memos 1/1/42-" folder, carton 3, MCR.

58. S. D. Bechtel to Henry J. Kaiser Co. and the Kaiser Co., 20 May 1943, folder 17, carton 16, HJK Papers.

million and Kaiser's 23 percent interest in the Permanente Metals (which operated Richmond Shipyards Nos. 1 and 2) at \$1.05 million (see Table 1).⁵⁹

These contracts gave the Maritime Commission great leverage over its contractors' operations and firm structure. The commission took some pride in this power and in its stringent concern to assure maximum production and to safeguard public funds; its chair told Congress in February 1942, "I think we have the toughest contract put out by any branch of the government."⁶⁰ Most wartime shipyards first received a "facilities contract," which funneled funds from the government to the contractor for the limited purpose of building or improving a shipyard, and which expressly covered only the cost of shipyard construction. A contractor like Kaiser (by the war's end, the country's biggest and most successful shipbuilder) could not earn money by building shipyards. By paying for and banning profits on facility construction, the commission retained unquestioned ownership of its shipyards, thus maintaining a strong position, though the commission did guarantee the contractor's right to build ships in the new yard for the duration of the war and explicitly agreed not to charge rent for the shipyard.

In these ways facilities contracts embodied two assumptions about the war effort: first, contractors should not profit from building up capacity necessary for the war but sure to glut the market afterward, and, second, most new shipyards would close immediately after the war to prevent war-born shipbuilders from competing with already established companies.⁶¹ Henry Kaiser, among others, did not share the assumption that most new shipyards would close after the war, but the commission eventually used its title to the shipyards to slash American merchant shipbuilding capacity between 1945 and 1947 and to eject Kaiser from the industry.

The Maritime Commission's ownership of shipbuilding facilities provided a formidable means of influencing corporate governance. Public title ensured that few contractors would pay out of pocket to improve yards they neither owned nor seemed likely to own, or to modify their company structures to meet indeterminate future challenges. Instead, the facilities contracts, as well as the commission's propensity to disallow expenditures beyond those absolutely neces-

59. "Bechtel and Kaiser Joint Interests, Estimated Values, March 31, 1943," "KKB - Memos 1/1/1943" folder, carton 3, MCR. For more on the firms' interrelationships, see "Earth Movers II," 225; "Earth Movers III," 140-41.

60. As quoted in Lane, *Ships for Victory*, 120 (original source: House of Representatives, *Fifth Supplemental National Defense Appropriation Bill for 1942*, Hearings, 77th Cong., 2d sess., p. 101).

61. See Lane, *Ships for Victory*, 107-17.

Table 1 Kaiser and Bechtel Interests in Various Joint-Venture Enterprises, March 31, 1943

Enterprise and Venture	Estimated Net Worth	Bechtel Interests	Percentage of Total	Kaiser Interests	Percentage of Total	Business
Industrial insurance						
Industrial Underwriters, Inc.	\$138,400	\$43,000	31.07	\$43,000	31.07	Construction projects
Industrial Underwriters	\$391,400	\$121,800	31.12	\$121,800	31.12	Construction projects
Industrial Indemnity Co.	\$580,900	\$180,800	31.12	\$180,800	31.12	Workman's compensation
All insurance ventures	\$1,110,700	\$345,600	31.12	\$345,600	31.12	
Construction equipment and services						
Industrial Equipment Co.	\$268,000	\$134,000	50.00	\$134,000	50.00	Machinery sales/rentals
Industrial Engineering Co.	\$380,000	\$162,800	42.84	\$108,600	28.58	Project engineering
Bechtel-Kaiser Rock	\$28,400	\$14,200	50.00	\$14,200	50.00	Sand and gravel supplier
Columbia Construction Co.	\$1,222,000	\$275,000	22.50	\$275,000	22.50	Dam building
Columbia Construction Co., Inc.	\$323,500	\$53,900	16.66	\$129,400	40.00	Dam building
Panama Constructors, Inc.	\$4,082,000	\$183,700	4.50	\$612,300	15.00	Construction
Permanente Cement Co.	\$4,314,000	\$15,530	0.36	\$977,800	22.67	Cement and shipping
All construction ventures	\$10,617,900	\$839,130	7.90	\$2,251,300	21.20	
Shipbuilding						
Joshua Hendy (Sunnyvale, California)	\$1,200,000	\$90,000	7.50	\$90,000	7.50	Marine engines
Permanente Metals (West Coast)	\$4,463,000	\$879,000	19.70	\$1,053,700	23.61	Shipbuilding, magnesium
California Shipbuilding (Los Angeles)	\$4,516,000	\$1,355,000	30.00	\$711,000	15.74	Calship
Consolidated Builders (Portland, Oregon)	\$4,308,200	\$370,500	8.60	\$979,000	22.72	Oregon Ship
Evanship (Evansville, Indiana)	\$1,393,700	\$278,700	20.00	\$278,700	20.00	Evanship
All shipbuilding ventures	\$15,880,900	\$2,973,200	18.72	\$3,112,400	19.60	
Totals						
All joint-venture enterprises	\$39,338,100	\$5,342,660	13.58	\$8,306,200	21.11	
Shipbuilding's share of total	40%	56%		37%		

Source: "Bechtel and Kaiser Joint Interests, Estimated Values, March 31, 1943," "KKB—Memos 1/1/1943" folder, carton 3, Marinship Corporation Records, Bancroft Library, University of California, Berkeley.

sary, pushed Kaiser and Bechtel simply to maintain the organizational status quo even when new corporate structures might have better served the interests of war production. The commission thus indirectly but effectively oriented its contractors toward its own conception of war production.⁶²

In addition to the facilities contracts, the commission used several kinds of “vessels contracts” to underwrite the actual production of ships.⁶³ All the vessels contracts allowed the contractor to earn a profit, though none, contrary to the conventional narrative of war production, “guaranteed” profits. Rather, the contracts allowed for a range of possible profits, with the largest sums going to fast, innovative shipbuilders like Kaiser. Even then, the commission and the government reserved the right to limit profit through heavy taxation and “renegotiation” and “recapture,” processes through which government auditors calculated a war contractor’s “excess” profits; the contracting agency then either asked for a refund or took the overage back by reducing future fees.⁶⁴

Partly a brake on capital accumulation, partly an economizing strategy, profit limitation measures curtailed organizational innovation by contractors in two ways. Positively, profit limitation measures provided a morally charged check on entrepreneurs’ inclination to seek profit over production and gave government agencies like the Maritime Commission a ready means to dampen critics’ charges that the stunning success of shipbuilders like Kaiser proved the existence of waste and profiteering. Negatively, profit limitation measures discouraged corporate reorganizations that, though perhaps intended to improve productive abilities, also facilitated capital accumulation. (Profit limitation measures had little effect on techni-

62. Marinship unsuccessfully prodded the commission to reimburse the yard for shipyard training films that, the yard claimed, allowed “the saving of thousands of hours of trainees’ wages.” Robert Digges to Regional Director of Construction, 29 June 1943, 2, “C. W. Flesher 1943” folder, carton 1, MCR; Robert Digges to Carl Flesher, 6 Dec. 1943, 1, “U.S.M.C.—Industrial Advisor 1943” folder, carton 1, MCR; Malcolm Baird to Paige Mailliard, 13 March 1943, folder 1, carton 1, MCR.

63. See Lane, *Ships for Victory*, 101–37.

64. See *ibid.*, 777–78. For example, the Maritime Commission’s last vessel contract with Marinship (dated 1 March 1945) allowed \$8.8 million of profit on a total contract price of \$132 million, but an addendum of 2 Oct. 1945 set the profit to exactly \$7,552,920 and explicitly required the company to refund any profit over that amount, a sum equivalent to 6.5 percent of the \$116.9 million price for completed ships and still subject to war-profit taxes, as well as further “recapture” actions by the government. See Contract No. Mcc-33456, 1 March 1945, pp. 5, 8; and Addendum No. 1, Contract No. Mcc-33456, 2 Oct. 1945, pp. 2, 4 (covered by Robert Digges to various, 20 Nov. 1945), all in folder “Tanker Contr. #33456,” carton 1, MCR.

cal innovation: talented contractors such as Kaiser and Bechtel squeezed efficiencies from the production process, partly for the glory of doing so.)

An example from late 1943 bears this out. Ken Bechtel, the operating executive at Marinship, recommended the liquidation of the chief Bechtel company and the distribution of its \$1.8 million value to shareholders.⁶⁵ Concern about the appearance of profiteering prevented this action, but, when Marinship and the Maritime Commission finally closed out their first ship contract in June 1944, company officials did replace the Marinship joint venture with a corporation.⁶⁶ According to one shipyard alumnus, Ken Bechtel backed this move because the corporation offered a superior organizational form for both wartime production and postwar work.⁶⁷ Incorporating the shipyard certainly seemed to improve the bottom line: December 1946 calculations estimated the shipyard's net surplus income since its inception in September 1942 at \$2.4 million, a tiny fraction of the \$174.6 million in revenues from the yard's ten contracts.⁶⁸

Neither Kaiser nor Bechtel fits the "concentration thesis" of wartime political economy, which holds that a corporate elite dominated war production and used its war-earned profits to launch itself toward prime places in the postwar economy.⁶⁹ Rather, the firms illustrate the important role of smaller companies. A March 1940 balance sheet put Bechtel's net worth at just over \$500,000.⁷⁰ May 1942 estimates put the profits from Bechtel's eight directly performed con-

65. "Memorandum—K. K. B.," 25 Aug. 1943, "KKB's Memos 1/1/42—" folder, carton 3, MCR.

66. George Walling to K. K. Bechtel (copied to others), 28 June 1944, unlabeled folder, carton 1, MCR.

67. Mr. Fred Drexler, Mill Valley, Calif., telephone interview with author, 22 Oct. 2000. See also K. K. Bechtel to George Walling and Robert Digges, 30 June 1944, unlabeled folder, carton 1, MCR.

68. The costs of building ships—buying steel, paying workers, and so forth—ran to \$159.8 million, 91 percent of the total. Marinship Corporation, exhibit B: "Statement of Income," 31 Dec. 1946, unlabeled folder, carton 3, MCR. The surplus did not account for all the company's profit; key personnel had already received \$1.16 million through a profit-sharing plan, and other employees had received \$412,850 in salaries. Salaries and profit sharing represented the two largest corporate expenses over Marinship's existence and were important techniques for tying key employees to the organization. Marinship Corporation, schedule 1: "Corporate Expenses," 31 Dec. 1946, unlabeled folder, carton 3, MCR.

69. John Morton Blum states that a hundred giant corporations held almost three quarters of the mobilization contracts (by value) in 1943. See Blum, *V Was for Victory: Politics and American Culture During World War II* (New York, 1976), 123; Thomas K. McCraw asserts that just ten companies controlled 30 percent of the \$175 billion in war contracts in late 1944; Thomas K. McCraw, *American Business, 1920–2000: How It Worked* (Wheeling, Ill., 2000), 94.

70. W. A. Bechtel Co., "Balance Sheet," 31 March 1940, "Memo File 4/1/40–5/31" folder, carton 3, MCR.

struction jobs and thirteen joint ventures, including several shipyards, at just \$173,125 after taxes: about 1 percent of the company's \$1.3 billion in contracted work, 99.7 percent of which the government had awarded.⁷¹ A few months later the situation had improved significantly; a new estimate predicted \$1.4 million in pretax income by December 15, 1943, with shipbuilding enterprises such as Marinship accounting for nearly half.⁷²

In April 1945, with the war's imminent end promising the cancellation of many ship contracts, Kaiser and Bechtel swapped the shares they held in the shipbuilding enterprises controlled by the other, freeing the parent firms for independent activity in the postwar world.⁷³ Marinship's board of directors decided in October 1945 to "wind up its affairs and complete its obligations," preferably after acquiring some of the yard's heavy equipment through a fire sale for which the directors planned to argue "from the standpoint of rendering [the] service" of shortening the government's inventory of surplus goods. Steve Bechtel briefly tilted the board toward considering postwar operations at the yard, but in May 1946, after the Maritime Commission insisted on taking "full possession and control" of the yard, Ken Bechtel announced that "all of the activities of the corporation within the State of California had been concluded."⁷⁴ Another full year passed before the corporation and the government concluded the parallel processes of contract settlement and excess-profit renegotiation, forging "very favorable" agreements that reduced the company's total amount owed to the commission to about \$800,000 and left Marinship with a net worth of \$2.171 million—four times the 1940 figures.⁷⁵

71. Pretax income amounted to \$576,325, but a 70 percent tax levy sent most of that sum to the government. 2 May 1942, "W. A. Bechtel Co. Statement of Estimated Net Income for the Year Ending February 28, 1943," 1, "KKB's Memos 1/1/42-" folder, carton 3, MCR. As of May 1942, Bechtel held all or part of contracts worth \$1.3 billion, with the government accounting for 84 percent of the company's \$28.5 million in directly held work and for 100 percent of its \$1.015 billion in "syndicated work." For full details of Bechtel's workload in May 1942, see "W. A. Bechtel Co. Contracts Held" and "W. A. Bechtel Co.—Participation in Syndicated Work," 30 May 1942, both in "KKB's Memos 1/1/42-" folder, carton 3, MCR.

72. "W. A. Bechtel Co. Income Forecast" [25 Aug. 1943] (covered by "Memorandum—K. K. B.," 25 Aug. 1943), "KKB's Memos 1/1/42-" folder., carton 3, MCR.

73. Lane, *Ships for Victory*, 809.

74. Minutes of a Meeting of the Board of Directors of Marinship Corporation, 18 Oct. 1945, 1–2, "Minute Book 1942–1952" folder, carton 2, MCR.

75. Robert Digges to Marinship Corporation Board of Directors, 20 Nov. 1947, "Marinship Corp. Financial Stmt, 8/31/47" folder, carton 4, MCR; Marinship Corporation, exhibit A: "Balance Sheet," 31 Dec. 1946, unlabeled folder, carton 3, MCR.

Peace: 1945 and After

By the end of World War II the Six Companies firms haltingly began a shift toward the nominal end point of the publicly held multidivisional corporation. Kaiser followed this course to that end, notably in automobiles and aluminum. The Kaiser-Frazer Corporation briefly challenged the Big Three automakers, but the uneasy partnership with an industry insider created conflicts that ended only when the company failed in 1954.⁷⁶ Kaiser found considerably more success in the aluminum business, which he and three of the Six Companies partners entered in 1946 by buying war-surplus plants and meeting the rapidly rising demand for aluminum by the government and aircraft companies.⁷⁷

In 1956 the Kaiser conglomerate created what Chandlerians recognize as a modern organizational form by developing a new publicly offered holding company to shelter businesses including the rapidly growing aluminum company, the war-born steel plant, the jeep maker Willys Motors, an engineering practice, and even a throwback sand and gravel division.⁷⁸ Although Kaiser thus assumed the highest postwar profile of the Six Companies firms, the corporation faltered in the great industrial shakeout of the 1970s, voluntarily liquidating some assets and leaving the steel and aluminum businesses to fend for themselves.⁷⁹

Bechtel proved much more durable and successful, partly because it maintained its traditional role and structure. Still closely held and family run, Bechtel ranked at the end of the twentieth century as one of the world's largest engineering firms and privately held companies.⁸⁰ After World War II Bechtel assumed a quasi-multidivisional

76. Richard Langworth, *Kaiser-Frazer: The Last Onslaught on Detroit* (Princeton, N.J., 1975).

77. On the Kaiser organization after World War II, see Heiner, *Henry J. Kaiser*, especially chaps. 9–10, and Foster, *Henry J. Kaiser*, especially chaps. 9–12. In addition, see the many useful articles in *Fortune* magazine: “Adventures of Henry and Joe in Autoland,” *Fortune* 33 (March 1946): 96–103, 228–38; “Aluminum Reborn,” *Fortune* 33 (May 1946): 102–9, 212–18; “The Arrival of Henry Kaiser,” *Fortune* 44 (July 1951): 68–73, 141–54; “Kaiser-Frazer: The Roughest Thing We Ever Tackled,” *Fortune* 44 (July 1951): 74–77, 154–62; “Kaiser Aluminum—Henry J.’s Marvelous Mistake,” *Fortune* 54 (July 1956): 78–85, 174–76; Walter Guzzardi, Jr., “The Optimistic World of Edgar Kaiser,” *Fortune* 67 (April 1963): 91–97, 214–19.

78. “What Cooks with Kaiser—across the Country, and around the World,” *Fortune* 54 (July 1956): 82–83. See also “The Optimistic World of Edgar Kaiser,” *Fortune* 61 (April 1963): 91–97, 214–19.

79. Susie Gharib Kazem, “When Kaiser Played Cheshire Cat, the Stockholders Smiled,” *Fortune* 97 (8 May 1978): 274.

80 *Forbes* magazine listed Bechtel as the sixth-largest privately held American company, with year 2000 revenues of \$14.3 billion. See “Forbes 500 Largest

form better to take on projects at home and abroad. Although the organization never neglected basic work like road building, Bechtel concentrated heavily on sophisticated energy infrastructures. War-time refinery projects in the Middle East helped Bechtel become indispensable to local governments and foreign firms like Aramco, the American consortium that held the key Saudi Arabian oil concession and that in 1947 hired Bechtel to form a joint venture to build a pipeline between the Persian Gulf and the Mediterranean Sea. This project inaugurated fifty years of lucrative work throughout the Middle East, especially in Saudi Arabia.⁸¹

Simultaneously, Bechtel built electrical power infrastructures around the world, including conventional power plants in postwar California and Washington, and in South Korea after the war there.⁸² In 1954 Bechtel spearheaded the development of commercial nuclear power by joining several major utilities and General Electric to design a viable nuclear power plant. This enterprise came to fruition

Private Companies,” viewed 27 March 2002. URL: <http://www.forbes.com/finance/lists/setters/listHomeSetter.jhtml?passListId=21>. *Forbes* maintains separate lists for the United States and the rest of the world, making it difficult to rank Bechtel against all world companies, but Bechtel would rank as approximately the fifteenth-largest privately held firm in the world and as one of the five hundred largest companies by revenue in the world. See the “Global 50 Private Companies” list (viewed 27 March 2002; URL: <http://www.forbes.com/global/2001/1126/073tab.html>) and the “Forbes International 500” list (viewed 27 March 2002; URL: <http://www.forbes.com/finance/lists/setters/listHomeSetter.jhtml?passListId=17>). In 2000 the construction industry’s trade publication, *Engineering News-Record*, listed Bechtel as the largest American construction contractor and the third-largest global construction contractor, with \$12.39 billion in revenues for 2000 (\$5.579 billion, domestic; \$6.811 billion, foreign). See “2001 ENR Top 400 Contractors” list (viewed 27 March 2002; URL: <http://www.enr.com/dbase/2001con1to50.asp>) and “2001 ENR Top 225 International Contractors” (viewed 27 March 2002; URL: <http://www.enr.com/dbase/2001tic.asp>).

81. Laton McCartney, *Friends in High Places: The Bechtel Story: The Most Secret Corporation and How It Engineered the World* (New York, 1988), 84; Wolf, *Big Dams and Other Dreams*, 188; Bechtel Corporation, *Building a Century*, 55, 156, 159. One of the joint-venture partners, Morrison-Knudsen, had joined Bechtel on Hoover Dam and other prewar construction, while a second had participated in a wartime pipeline project and a third had invested in Marinship. Bechtel enthusiastically continues to use joint ventures as an entrée to foreign operations and chooses reliable partners again and again. In Asia Minor and the Balkans, for instance, Bechtel relied on a Turkish construction firm as a joint-venture partner on road-building projects. For press release information on Bechtel’s joint ventures in Asia Minor and the Balkans, see “Ankara-Gerede Highway” (viewed 27 March 2002; URL: <http://www.bechtel.com/sphwy.html>) and “Road to the Future,” *Bechtel Briefs*, Dec. 2001, 14–16 (viewed 27 March 2002; URL: <http://www.bechtel.com/pdf/brief1201.pdf>).

82. For the company’s own history of its postwar accomplishments, see Ingram, *A Builder and His Family*, 19–70; Bechtel, *Building a Century*, 50–66. More recently, Bechtel shared the ill-fated power plant in Dabhol, India, with the American firm Enron.

in 1959 when Bechtel completed Dresden I near Morris, Illinois, the first privately owned nuclear power plant in the country.⁸³

Conclusion

The protean forms of administration and organization used by Kaiser and Bechtel between 1930 and 1945 proved, by the end of that period, to have allowed them to develop from relatively small, regionally based heavy-construction contractors into substantial companies with diverse business interests all over the United States and the world. In fact, Kaiser and Bechtel prospered during the Great Depression and World War II precisely because they refused to adopt a single model of corporate governance or, indeed, other “best practices” of modern American capitalism drawn (in contemporary practice and historical scholarship) from the diversified manufacturing and distribution sectors and characterized by an intricate managerial hierarchy, dependence on the coordinating role of professional middle managers, the clear separation of enterprise administration from enterprise ownership, and a stress on the mass production and mass distribution of goods. Strategically, the Six Companies firms chose modes of governance suited quite well, if not always perfectly, to the technical demands of the endeavors they undertook.

83. Thomas Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm* (New York, 1989), 422; Bechtel, *Building a Century*, 63–64; Wolf, *Big Dams and Other Dreams*, 199. A nuclear energy plant in Pennsylvania had begun providing electrical energy in December 1957, but, unlike the case with Dresden, the Atomic Energy Commission retained ownership while a private utility operated it (Hughes, *American Genesis*, 437–38).

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