PROJECTING CAPITALISM

A History of the Internationalization of the Construction Industry

Marc Linder

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Multinational Construction Firms as Agents of Penetration of the Third World

Many of Morrison's...jobs are in primitive, undeveloped countries, where M-K's giant power shovels and 18-ton bulldozers are as much a source of wonder as the iron horse was to the Indians a century ago.¹

In 1954, secure in the worldwide military-economic preeminence that the United States had been projecting for a decade, *Time* celebrated the contribution of U.S. construction firms to the establishment and perpetuation of that hegemony. In a cover story on Morrison-Knudsen's controlling owner at the apogee of the American Century, *Time* both captured and helped engender the multidimensionally chauvinist *Zeitgeist* inherent in "helping backward people help themselves":

U.S. earth movers have shown the world that man need not be a prisoner of his surroundings.... He can change much of the unproductive land to suit his needs. Part of this change is due to the new machinery: the clanking bulldozers that knock down forests, the great draglines that claw house-sized holes at a single scoop, the cranes, jumbos, earth movers, power shovels, trenchers and dozens of other mechanical giants.... But the biggest part of the change is the revolution in construction thinking; today, there is almost no project too big to tackle, no reasonable limit to reshaping the earth to make it more productive.²

International construction firms have always operated at the cutting edge of this enterprise designed to realize the dream of subordinating nature to, and recreating it in the image of, infinitely self-expanding economic value. To be sure, they are wont to characterize the mammoth changes they have wrought in the physical environment, especially in the former colonies, as humanitarian acts—'Subduing nature for the weal of man.''³ Yet in their attachment to projects in developing countries with abundant natural resources, multinational construction firms' microeconomic self-interest drives and is, in turn, impelled by a certain view of the periphery's role in the world division of labor insofar as ''the exploitation of mineral as well as agricultural products...would demand the expansion of infrastructures, such as roads, rail, ports, storage facilities required for the transport of these resources for export.''⁴

[&]quot;"The Earth Mover," Time, May 3, 1954, at 86.

²Id.

[&]quot;In Memoriam I. K. Brunel," 17 Builder 664 (1859).

⁴Roland Neo, International Construction Contracting: A Critical Investigation into Certain Aspects of Financing, Capital Planning and Cash Flow Effects 96 (1975).

International Development Aid as a Means of Penetration of the Third World and a Subsidy to U.S. Construction Firms

The weakening of European capital and colonial powers and the concomitant hegemony of U.S. capital and its state brought about by World War II also entailed a new set of relationships with the colonized populations in Africa and Asia, many of which were in rebellion. Britain, for example, was vitally interested in expanding colonial production in order to increase exports to the United States and thus to offset its dollar deficit. "The full exploitation of African minerals," however, depended on an adequate transportation system, which was "the single biggest bottleneck in the drive to tap the Dark Continent's resources."⁵

The power that the United States was able to bring to bear through the Marshall Plan⁶ prompted "a growing realization in Europe that African territories are not exclusive, but should be the responsibility (and the opportunity) of the world as a whole."⁷ In other words, under the new structure of international relations, "American companies and American private capital will be free to participate on exactly the same terms as British investors."⁸ As integration and equal access became the guiding imperialist policy, it finally dawned on the colonial powers that the colonial transportation system had become dysfunctional for the exploiting firms and states because "it is nearly impossible to go from the outer reaches of one colony to another without first going to the coast, taking ship [sic], and reaching the outlet of another railroad or road."⁹

The large capital-intensive infrastructure projects in the Third World, which were prerequisites for the development of profitable industrial investments but not in themselves attractive to investors, came during the 1950s and 1960s to be financed in large part by the International Bank for Reconstruction and Development (IBRD). In addition to examining the engineering feasibility and long-term economic viability of proposed "social overhead capital" projects.¹⁰ the World Bank also maintained a vigilant ideological stance by taking into consideration the borrowing "government's attitude toward private enterprise." This intervention by the IBRD, the bulk of whose loans financed the construction in the Third World of dams, power stations, highways, and ports by First World firms, made it possible for large European and U.S. construction firms to be "Building a Better World—At a Profit."¹¹ "Because of the World Bank," for example, "Morrison-Knudsen is building a cement plant in Indonesia...."¹²

In particular, however, the World Bank enabled U.S. firms—which had even resorted to building a "loss leader to break into the domination of European companies" in such places as Iraq¹³—to penetrate colonial areas that had largely

⁷Frederick Brewster, "Colonial Powers Discuss African Transport Integration," ENR, Mar. 22, 1951, at 36, 37.

⁹Brewster, "Colonial Powers" at 36.

¹⁰Social overhead capital "can be operationally defined as comprising those activities for the financing of which the International Bank for Reconstruction and Development shows a pronounced preference, just as the behavioral sciences have been said to comprise all those endeavors which manage to obtain financial support from the Ford Foundation." Albert Hirschman, *The Strategy of Economic Development* 83 (1960 [1958]).

¹¹¹¹Building a Better World—At a Profit,'' ENR, Jan. 17, 1957, at 21, 23. Morrison-Knudsen and Raymond, for example, built 2,000 miles of highways in Colombia with World Bank financing. Forest Green, ''Colombia Modernizes Its Highway System,'' ENR, July 8, 1954, at 30-36.

¹²"Building a Better World" at 23.

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¹³"U.S. Contractors Go Global," BW, Apr. 14, 1956, at 139, 142.

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⁵ENR, Oct. 7, 1948, at 8.

⁶See generally Fred Block, The Origins of International Economic Disorder: A Study of United States International Monetary Policy from World War II to the Present 70-108 (1978 [1977]).

^BENR, Oct. 7, 1948, at 8.

been protected preserves of British and French construction firms.¹⁴ From 1947 to 1955, almost three-fifths of World Bank disbursements (\$1 billion) were spent in the United States for capital equipment and services. Although this share fell by the latter half of the 1950s, it still exceeded the U.S. share of IBRD financing, while the absolute amount spent in the United States rose from \$240 million to \$280 million.¹⁵ Thus U.S. firms built dams in Ghana and Pakistan in the 1960s while British firms such as Taylor & Woodrow and George Wimpey continued to excel at harbor works in Africa and Europe and Cleveland Bridge and Dorman, Long built bridges throughout the world.¹⁶

Whereas the World Bank lent only to member governments, the U.S. Export-Import Bank could make loans to private borrowers—both foreign buyers and U.S. suppliers—as well. A very large share of the hundreds of millions of dollars that the Ex-Im Bank had lent for the export of construction equipment and services by the mid-1950s redounded to the benefit of U.S. construction firms such as Morrison-Knudsen. The most important center of Ex-Im Bank lending was Latin America, which was designated a "natural market—wide open for...the U.S. construction industry...."¹⁷ The Third World focus of U.S. construction firms was crystallized in the fact that in the 1950s projects in Western Europe accounted for only 17 per cent of their income generated overseas, whereas Latin America alone accounted for 38 per cent.¹⁸

The U.S. International Cooperation Administration, operated by the Department of State to provide "civilian" defense support to friendly nations, enabling them to devote more resources to military expenditures, was partial to U.S. firms in its program to improve "internal transport facilities throughout the free world."¹⁹ Utah Construction, for example, received \$25 million to build a hydroelectric facility in Pakistan in the mid-1950s.²⁰ Morrison-Knudsen, Raymond, Brown & Root, and other firms, supported by the U.S. Economic Cooperation Administration, U.S. Department of State Development Loan Fund, Mutual Security Program, and international funds, and frequently supervised by the U.S. Army Corps of Engineers,²¹ began early in the postwar period to build airports, highways, dams, and hydroelectric projects in Afghanistan, Thailand, Pakistan, Turkey, Iran, Iraq, the Philippines, and other military client states in order to open up regions to industrial development "in which American private capital

¹⁴See The World Bank, IDA and IFC, Policies and Operations viii, 39 (1971); The World Bank, The Construction Industry: Issues and Strategies in Developing Countries 19 (1986 [1984]); Marc Linder, 4 Der Anti-Samuelson: Kritik eines repräsentativen Lehrbuchs der bürgerlichen Ökonomie 112-15 (1974).

¹⁵Edward Mason & Robert Asher, *The World Bank Since Bretton Woods*, tab. G-1 at 862 (1973); "World Bank Creating Market for U.S. Construction Goods," *ENR*, Sept. 17, 1953, at 60; "Share of World Bank Work Down, Volume Up," *ENR*, Mar. 5, 1959, at 24.

¹⁶See e.g., C. Tupholme, "Akosombo: Key to a Stable Future," *IC*, Apr. 1966, at 2 (Kaiser Engineering); "Mangla Dam Scheme—The Largest Water Development Ever Undertaken: Part I," *id.*, Jan. 1968, at 2 (Guy F. Atkinson Co.); *ENR*, Aug. 18, 1949, at 54 (Taylor Woodrow builds harbor in Gold Coast); "World-Wide Dock Service of British Engineers," *ENR*, Sept. 14, 1950, at 54; "Ghana's New £ 26 Million Harbor," *IC*, Sept. 1962, at 2 (Taylor & Woodrow and Wimpey); "New Ore Handling Pier for Sierra Leone," *id.*, Aug. 1964, at 2 (Taylor & Woodrow); *ENR*, June 8, 1950, at 52 (bridge in Siam).

¹⁷ This Bank Exports U.S. Construction," ENR, June 13, 1957, at 35, 36.

¹⁸Calculated according to data in U.S. Office of Business Economics, Balance of Payments Statistical Supplement: A Supplement to the Survey of Current Business tab. 37 at 145 (rev. ed., n.d. [ca. 1961]).

¹⁹"U.S. Money Aids Foreign Transportation," *ENR*, Mar. 7, 1957, at 61; "Competition Tightens Overseas," *ENR*, Nov. 14, 1957, at 25, 27; Charles Kindleberger, *International Economics* 479-81 (3d ed. 1967 [1953]).

²⁰Neill Wilson & Frank Taylor, The Earth Changers 115-16 (1957).

²¹See e.g., Lewis McBride & William Tatum, "Two International Civil Airports Under Construction by U.S. Army's Corps of Engineers," *CE*, Sept. 1960, at 45 (Morrison-Knudsen and Kaiser in Iran and Pakistan); *CE*, Oct. 1961, at 103 (Morrison-Knudsen, Jones, and Kiewit build \$40 million highway in Afghanistan with International Cooperation Agency funds).

has been invited to participate on favorable terms."²² The view from the receiving countries was typically less promising. Turkey, for example, in burdening itself with speculative loans, "has not hesitated to mortgage its future by borrowing, paying excessively for the privilege if necessary."²³

Morrison-Knudsen was also in the forefront of a state-private capital program in which "[f]or probably the first time in history, a group of U.S. engineering firms" advised "an admittedly backward nation" on the kinds and amounts of infrastructure it should pay U.S. (and European) construction firms to build for it.²⁴ In Iran, where even a landlord-dominated government was impelled from below to institute change, since "the United States was largely responsible for stabilizing the postwar Iranian government, it was natural to turn to an American firm for development aid."²⁵ Iran thus commissioned a report from Morrison-Knudsen shortly after World War II on how to spend an estimated \$650 million. Other large U.S. construction firms with a tradition of international activities going back to the turn of the century such as Stone & Webster, Ebasco, and J. G. White Engineering, were represented in another group, Overseas Consultants, Inc., which was supported by the U.S. government's Point Four program in its mission of exporting U.S. know-how assisted by American "venture capital to undeveloped lands."²⁶

Neo-Colonial Infrastructure Projects

The cost of building dams is always underestimated.... There are benefits, of course, which may be countable, but which Have a tendency to fall into the pockets of the rich, While the costs are apt to fall upon the shoulders of the poor. So cost-benefit anaylsis is nearly always sure, To justify the building of a solid concrete fact, While the Ecologic Truth is left behind in the Abstract.²⁷

Multinational firms building pharaonic works in the Third World have transferred the same model of the domination of nature that they have sought for decades to implement in the First World. The great dams, for example, that Bechtel, Kaiser, Utah, and Morrison-Knudsen built during the depression were designed to transform the western rivers of the United States into literal regional industrial dynamos. Thus appropriated and put to work, a river was "constrained to flow against its nature in some rigid, utilitarian straitjacket...abstracted ruthlessly from its dense ecological pattern to become a single abstract commodity having nothing but a cash value."²⁸

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²²"Thompson-Starrett Co. to Build Big Turkish Dam," *ENR*, Mar. 27, 1952, at 88. See also Ernie Hood, "Putting a New Face on Old Afghanistan is One of Morrison-Knudsen's Projects," *ENR*, Feb. 21, 1952, at 45, 46; *ENR*, Jan. 15, 1953, at 79; "Foreign Aid: New Look Needed?" *ENR*, July 31, 1958, at 21; Waldo Bowman, "Thailand Sets the Pace for Southeast Asia," *ENR*, Jan. 19, 1961, at 30; *idem*, "Iran Pushes Hard for Development and Defense," *ENR*, Mar. 9, 1961, at 36; *idem*, "Iran's Two Big Dams Promise a Better Life," *ENR*, Mar. 16, 1961, at 38 (Morrison-Knudsen and Impresit).

²³Waldo Bowman, "Hydro Paces Turkey's Construction Boom," ENR, Oct. 10, 1957, at 34.

²⁴"U.S. Engineering Group to Advise Iran on Economics of Stabilization Scheme," *ENR*, Oct. 28, 1948, at 73. For a dissenting view, see Heshmat Ala'i, "How Not to Develop a Backward Country," *Fortune*, Aug. 1948, at 76.

²⁵Nikkie Keddie, Roots of Revolution: An Interpretive History of Modern Iran 130 (1981).

²⁶"Rebuilding a Nation," *ENR*, Nov. 3, 1949, at 34. See also R. Larkin, "Overseas Consultants Wins Contract for \$650-Million Iran Development," *ENR*, Oct. 20, 1949, at 25; "State [Department] Enters Iran Point Four Picture, But Private Consultants Stay," *ENR*, Nov. 9, 1950, at 25.

²⁷Kenneth Boulding, "A Ballad of Ecological Awareness," in *The Careless Technology: Ecology and International Development* 157 (M. Farvar & John Milton ed., 1972).

²⁸Donald Worster, Rivers of Empire: Water, Aridity, and the Growth of the American West 331-32 (1992

The immediate benefits of these environmentally often destructive interventions accrue differentially.²⁹ Where, for example, a hydroelectric dam is built primarily for the U.S., British, and South African firms owning mines in Rhodesia, but 50,000 to 100,000 indigenous people are dispossessed and resettled,³⁰ "[m]assive technological development hurts." Because owners and constructors "do not think of themselves as paying...the social costs," they do not count them. This kind of cost accounting is exacerbated when the groups that are forced "to make enormous sacrifices" must do so for the good of groups with which they do not identify themselves.³¹ Despite the huge sums spent on irrigation projects, such as gravity dams, in the Third World that have radically altered the environment, lenders have found their impact on agricultural output "disappointing" in part because of the waterlogging and increased salinity that they have caused.³²

In describing the Cabora Bassa dam and hydro-electric plant that it jointly built with other firms in Mozambique in the 1970s, the German company Hochtief contends that "only yesterday denounced as being the last instrument of colonialism, although it is is indeed only a purely technological enterprise to control the wildest river in Africa, [Cabora Bassa] has by now escaped from the vicious circle of ideology...and now serves, independent from any political interest. as was planned [sic] from the beginning, the people who live in this country.' Yet the Portuguese colonial regime originally conceived the project as part of its strategy of retaining control over the colony by forging an "economic enclave of white-dominated African states'' out of South Africa, Rhodesia, and the Portuguese colonies in order to block African independence.³⁴ Economically Cabora Bassa was designed as a means of securing foreign exchange by selling "the cheapest power in the world" to South Africa: only an insignificant supply of energy was available for whatever industrialization plans the Portuguese government harbored for the colony.³⁵ Even after Mozambique became independent, it remained clear that, since all the project's earnings flowed to the banks and companies that had provided the \$400 million in financing, it would be years "before Mozambique gets anything out of this deal."

Large-scale infrastructure projects in the Third World have typically accommodated the traditional model of semi-colonial capital investments. Illustrative in this regard is the Volta River Project in Ghana. Before that

¹²Vernon Ruttan, "Assistance to Expand Agricultural Production," 14:1 WD 39-42 (1986).

³³Hochtief 1875-1975, at 18 (n.d. [ca. 1975]).

^{[1985]).}

²⁹See e.g., Peter Bolton, "Mozambique's Cabora Bassa Project: An Environmental Assessment," in 2 The Social and Environmental Effects of Large Dams: Case Studies 156-67 (Edward Goldsmith & Nicholas Hildyard ed., 1986).

¹⁰See David Brokensha & Thayer Scudder, "Resettlement," in *Dams in Africa: An Interdisciplinary Study of Man-Made Lakes in Africa* 20 (Neville Rubin & William Warren ed., 1968); David Howarth, *The Shadow of the Dam* (1961).

¹¹Elizabeth Colson, The Social Consequences of Resettlement: The Impact of the Kariba Resettlement upon the Gwembe Tonga 1, 3 (1971).

³⁴"Portuguese Hydro Project Will Put Zambezi to Work," *ENR*, Oct. 12, 1967, at 30. See generally Keith Middlemas, *Cabora Bassa: Engineering and Politics in Southern Africa* (1975); Georg Schreyögg & Horst Steinmann, "Corporate Morality Called in Question: The Case of Cabora Bassa," 8 *JBE* 677, 678 (1989).

³⁵Ray Vicker, "Portuguese Are Building Big Dam in Mozambique, But Black Nationalists Call It a Colonialist Ploy," *WSJ*, Aug. 7, 1972, at 20, col. 1 (quotation); Nicholas Woodsworth, "Mozambique Rebels Keep Energy Giant Asleep," *FT*, Aug. 25, 1989, § I, at 3 (Nexis); "Plane für mehrere Industrievorhaben in Mozambique," *FAZ: Blick durch die Wirtschaft*, Apr. 9, 1974, at 2.

³⁶David Ottaway, "Southern Africa: History, Money Tie Odd Couple," WPost, Dec. 26, 1977, at A12 (Nexis).

country's independence, the British colonial power saw the project as a means of guaranteeing the United Kingdom a supply of aluminum from a sterling-area, that is, a captive, quasi-domestic source free of the political-economic rigors of the world market. The project was reconceived by the newly independent Ghana in the 1950s and 1960s as a means of initiating a planned process of national economic development rather than as a "simple commercial venture."³⁷ It failed to do so, however, because Kaiser Aluminum and Reynolds Aluminum succeeded in narrowing the purpose of the hydroelectric dam, which was built by an Italian consortium but which Kaiser Engineers and Constructors, Inc. designed, prepared, and inspected, to the provision of cheap electricity for Kaiser's aluminum smelter.³⁸

Not only did Ghana not benefit from the industrial linkages associated with aluminum production in the advanced capitalist countries, but Kaiser chose not even to develop Ghana's abundant bauxite reserves from which to recover the aluminum oxide. Instead, Kaiser, which like the other metropolitan aluminum oligopolists is constantly in search of the cheapest power for an energy-intensive industry, imported the alumina from the Western Hemisphere for smelting.³⁹ That the Volta River Project achieved the most profitable possible production of aluminum with as little impact on Ghana as possible⁴⁰ was a great irony since it confirmed the view of Ghana's then-president, Nkrumah, that the hallmark of neo-colonialism in Africa was the absence of an integrated processing or manufacturing industry for any of its numerous raw materials.⁴¹

The ample loan provided by the World Bank to Ghana⁴² supposedly fit the pattern for infrastructure projects in the developing world insofar as the hydroelectric dam was "less attractive to private capital, either because of the size of the investment required, or the smallness or uncertainty of the returns, or the prospect of government intervention or control."⁴³ Yet as a virtually single-purpose power generator designed to be used by and to profit one U.S. enterprise, this particular hydroelectric facility scarcely conformed to any meaningful notion of infrastructure as a general condition of production or social overhead capital: its monopoly status contradicted the essence of infrastructure as a public good characterized by indivisibility. In spite of the enormous advantages accruing to Kaiser, the U.S. government delayed funding the project until the last possible moment so that it could answer the vital question: "Is Ghana truly a neutral country?"

That the World Bank extended its theretofore largest loan for the construction of the Kariba hydroelectric dam in Rhodesia in the mid-1950s likewise had more to do with the fact that the copper fields to be served produced oneeighth "of the free world's supply" of the metal than with promoting indigenous

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³⁷ The Volta River Scheme," 5 WP 26 (1953); "The Volta River Project," 8 WP 366 (1956) (quotation).

³⁸See "Ghana Gambles on Aluminum," BW, May 2, 1959, at 75.

¹⁹See Robert Steel, "The Volta Dam: Its Prospects and Problems," in Dams in Africa at 63; James Moxon, Volta: Man's Greatest Lake (1969); Irving Kaplan et al., Area Handbook for Ghana 323 (2d ed. 1971); "For Aluminum, a Shift Overseas," BW, Dec. 8, 1980, at 108; Ronald Graham, The Aluminum Industry and the Third World: Multinational Corporations and Underdevelopment (1982); idem, "Ghana's Volta Resettlement Scheme," in 2 The Social and Environmental Effects of Large Dams at 131-39.

⁴⁶Thomas Balogh, The Economics of Poverty 283-92 (1964 [1956]).

⁴¹Kwame Nkrumah, Neo-Colonialism: The Last Stage of Imperialism (1965).

⁴²International Bank for Reconstruction and Development, Seventeenth Annual Report 1961-1962, at 17 (1962).

⁴¹International Bank for Reconstruction and Development, *Third Annual Report 1947-1948*, at 18 (1948).

^{44.} Mission Gives 'Hard Look' at Aid to Volta Project," ENR, Nov. 2, 1961, at 26.

development.⁴⁵ In the end, then, such internationally organized neo-colonial infrastructural development aid recapitulated nineteenth-century colonialism, in which railways "mushroomed...without rhyme or reason, wherever new industries arose." In the post-World War II period, when "[c]heap power and lots of it is needed" for bauxite, copper, and ferro-chrome processing in Africa, hydroelectric plants replaced railways as the centerpiece of infrastructure built by metropolitan firms.⁴⁶

Within two decades, African dams dislocated hundreds of thousands of native people. In addition to producing an irreversible loss of land, the stagnant waters of the gigantic reservoirs necessitated by large dams also generated a large increase in disease, especially of schistosomiasis.⁴⁷ In Africa, as elsewhere, large dams also destroy ecological systems, bring about salinization of cropland and siltation behind the dams, and destroy subsistence agriculture, replacing it with cash crops that cannot feed local populations.⁴⁸ Perversely, the production of chemical fertilizer needed to maintain the fertility of soil that has been deprived of the silt that dams, which prevent seasonal flooding, hold back, may consume a significant proportion of the power output of those very hydroelectric dams.⁴⁹

In Africa, few inhabitants of rural areas receive the benefits of electrification while the major industrial demand for hydroelectric power derives from foreignowned mining enterprises—the products of which are exported.⁵⁰ Thus hydroelectric projects in the periphery designed to promote the interests of metropolitan extraction industries are a prime example of a "fundamental conflict": they generate adverse environmental effects for the local population while conferring the benefits of cheap power on far-removed persons and firms.⁵¹ If, despite all these severe defects of large hydroelectric projects as instruments of economic development, the World Bank and other international lenders have continued to lavish loans on them, one major reason has been that countries in the periphery must use much of the money to buy "generators, turbines, transmission facilities, and engineering services from major corporations in the developed world." Because the electricity rates are set low precisely in order to attract energy-intensive firms, the underdeveloped world "derives little immediate economic return" from such projects.⁵²

These post-colonial dams are functionally homologous to those built during the era of formal colonial empires. Instructive in this regard is the Sennar Dam, which Weetman Pearson's firm and 20,000 Egyptian and Sudanese laborers built in the Anglo-Egyptian Sudan from 1922 to 1925. The Lancashire cotton industry,

⁴⁹Daniel Deudney, Rivers of Energy: The Hydropower Potential 16 (Worldwatch Paper 44, 1981).

³⁰For good overview, see J. Lazenby, "The Future Role of Hydroelectricity in Sub-Saharan Africa," *IWPDC*, Mar. 1991, at 12.

^{\$1}Robert Stein & Brian Johnson, Banking on the Biosphere' Environmental Procedures and Practices of Nine Multinational Development Agencies 97 (1979).

³²Deudney, *Rivers of Energy* at 27-28. A series of smaller and environmentally less destructive hydrodams can also produce cheaper electricity. See Nicholas Kristof, "China Breaks Ground for World's Largest Dam," *NYT*, June 22, 1993, at B5, col. 2, B6, col. 1 (nat. ed.).

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⁴⁵: 400-Ft-High Arch Goes Up Across 1800-Ft Kariba Gorge," *ENR*, Sept. 6, 1956, at 71; *ENR*, Mar. 26, 1953, at 78 (quotation): International Bank for Reconstruction and Development, *Eleventh Annual Report 1955-1956*, at 40 (1956).

⁴⁶ENR, Oct. 7, 1948, at 8.

⁴⁷See Letitia Obeng, "Should Dams Be Built? The Volta Lake Example," 6 Ambio 46, 47, 49 (1977); idem, "Environmental Impacts of Four African Impoundments," in Environmental Impacts of International Civil Engineering Projects and Practices 29-43 (Charles Gunnerson & John Kalbermattem ed., 1978).

⁴¹Philip Shabecoff, "Actual Price of High Dams Includes Social Costs," NYT, July 10, 1983, sect. 4, at 22, col. 1 (Nexis); A. Biswas & M. Biswas, "Hydropower and the Environment," *IWPDC*, May 1976, at 40. For a comprehensive cataloging of the adverse impact of large dams, see Man-Made Lakes: Their Problems and Environmental Effects (W. Ackerman et al. ed., 1973).

which had been world leaders until the turn of the century, became subject to severe competition from Germany, the United States, and China for markets and raw materials. British firms adapted to this new constellation by shifting to the production of the finer cotton textiles. Such a market strategy, however, required access to a finer raw material-long staple cotton-which was grown chiefly in The British Cotton Growers' Association, which, like its German Egypt. counterpart, was simultaneously promoting imperial cotton growing zones in West Africa insulated from the U.S.-dominated world market, successfully urged the British government to initiate construction of the requisite hydrotechnical infrastructure in the Sudan for a vast expansion in cotton production there. The Sennar Dam thus finally enabled British cotton manufacturers to achieve their longheld objective of bringing an additional 300,000 acres of cotton onto a monopsonized imperial market. The externalities of disease (schistosomiasis, malaria, and yellow fever) and economic disaster which Sennar Dam imposed on the people of the Sudan were not entered into the ledger books of S. Pearson & Son, the cotton capitalists, or the colonial government.

Even in a Newly Industrializing Country such as Brazil, which has attained a sufficient degree of autonomous industrialization to enable its own national firms to build hydroelectric plants, such projects may still be driven by world market compulsions if not more directly by decisions made by metropolitan capitals and their states. The results therefore frequently replicate those just outlined for the most dependent Third World countries.⁵⁴ By authorizing non-Brazilian firms to operate only where local firms lack the capacity to undertake projects and preserving the internal market for indigenous firms, the Brazilian state has fostered the development of domestic construction capital.⁵⁵ Brazilian (and Paraguayan) firms, for example, built Itaipú, the world's largest dam, although Morrison-Knudsen prepared the engineering plans.⁵⁶ Yet Brazil's hydroelectric plants merely reproduce on a higher level of technological development the nineteenthcentury pattern of supplying infrastructure to world-market resource extractors. Brazil's dams in effect subsidize the electricity for U.S., European, and Japaneseowned energy-intensive aluminum plants which produce exports for the world market. Brazil is therefore indirectly exporting this energy consumed in the process of producing such raw materials.⁵⁷ And like the less-developed periphery, Brazil is therefore also constrained to degrade its own environment to pay the

⁵³"The Soudan Railway," 15 Engineering 149, 176 (1873) (report by engineer John Fowler recommending railway as promoting cotton); Oswalde Prowde, "The Gezira Irrigation Scheme, including the Sennar Dam on the Blue Nile," 222 MPICE 81, 82 (1927); J. Spender, Weetman Pearson First Viscount Cowdray 1856-1927, at 251-59 (1930); Robert Middlemas, The Master Builders: Thomas Brassey; Sir John Aird; Lord Cowdray; Sir John Norton-Griffiths 242-44 (1963); Tony Barnett, "The Gezira Scheme: Production of Cotton and Reproduction of Underdevelopment," in Beyond the Sociology of Development: Economy and Society in Latin America and Africa 183, 187-89 (Ivar Oxaal et al. ed., 1975); John Waterbury, Hydropolitics of the Nile Valley 64-67 (1979); Nigel Pollard, "The Gezira Scheme—A Study in Failure," Ecologist, Jan.-Feb. 1981, at 21, 22-26.

⁵⁴See also Henry Kamm, "Dam Project Brings Little Gain for Sumatra's People," NYT, Oct. 2, 1980, at A2, col. 3 (Nexis) (describing a Japanese aluminum smelter built in Sumatra to make use of a hydroelectric plant).

¹¹"Brazil Forcing Foreigners Out," ENR, Aug. 26, 1982, at 26 (Nexis); Josmar Verillo, "Brazil," in The Global Construction Industry: Strategies for Entry, Growth and Survival 180, 181, 185-86, 196 (W. Strassmann & Jill Wells ed., 1988).

⁵⁶ Itaipu Dam Readied for Filling, "*ENR*, Aug. 12, 1982, at 29; Peter Kilborn, "Brazil's Hydroelectric Project," *NYT*, Nov. 14, 1983, at D9, col. 1 (Nexis).

³⁷See Warren Hoge, "Brazil Taps Amazon Aluminum," NYT, Sept. 29, 1980, at D1, col. 3 (Nexis); Joan Todd, "Brazil Goes on Stream with First-Phase Alumina-Aluminum Capacity at Alumar," Engineering & Mining Journal, Sept. 1984, at 17 (Nexis); "Brazilian Debt Crisis Threatens Large Projects," ENR, Jan. 22, 1987, at 29 (Nexis); Luiz Rosa & Roberto Schaeffer, "Brazilian Energy Policy," in Hydroelectric Dams on Brazil's Xingu River and Indigenous Peoples 47, 48 (Leinad Ayer de O. Santos & Lúcia M. M. de Andrade ed., 1990).

Third World's largest foreign debt.⁵⁸ Yet promotion of less world market- and energy-dependent industries would not only create employment but also avoid the flooding of enormous areas of agriculturally and environmentally vital land including rain forests and the expulsion and wrenching "resettlement" of tens of thousands of indigenous people—whose small cash compensation often has made it impossible for them to purchase land elsewhere—associated with the creation of huge dam reservoirs.⁵⁹

Multinational Construction Firms as Transferors of Technology

If there was one thing that distinguished man and gave him almost Divine attributes it was when he conquered Nature to his own uses, and made her power minister to his own wants. Among the most marvellous of his conquests was his ablity [sic] to make the very globe he trod upon minister to his happiness, and if by his art and science he could do away with the difficulties which the formation of the world threw in his way he was placed in a position almost divine.⁶⁰

Unlike the traditional model of foreign direct investment by firms from advanced capitalist countries in underdeveloped countries, which is associated with unilateral economic control by the former, so-called new forms of international investment stop short of majority ownership. These operations run the gamut from joint ventures, licensing agreements, franchising, management contracts, turnkey contracts, and production-sharing contracts, to subcontracting. Multinational firms have adopted such methods in part as a reaction to political assertions of sovereignty by Third World countries. In part they also represent accommodations to the autochthonous development of capitalism.⁶¹ This process encompasses the proletarianization of peasants and artisans, leading to the formation of an urban wage-labor force; the emergence of a political-economically potent domestic bourgeoisie dedicated to investment in and management of surplus-producing enterprises; and the growth of a national market for consumer goods and industrial inputs.

Although multinational firms may not always be able to impose their preferred form of investment on Third World countries, wholly owned operations may no longer necessarily be their first choice. Whether the motivation is to shift the responsibility for suppressing labor unrest and containing demands for wage

³⁴See Marlise Simons, "Dam's Threat to Rain Forest Spurs Quarrels in the Amazon," NYT, Sept. 6, 1987, § 1, at 18, col. 1 (Nexis); Stephen Bunker, Underdeveloping the Amazon: Extraction, Unequal Exchange and the Failure of the Modern State 84-89 (1988 [1985]); Elmar Altvater, Sachzwang Wellmarkt: Verschuldungskrise, blockierte Industrialisierung und okologische Gefährdung: Der Fall Brasilien 292-304 (1987). For a similar process in Mexico, see Enrique Peters, "Bye Bye Weltmarkt? Freihandel oder Regionalisierung des Weltmarktes: Das Freihandelsabkommen zwischen Kanada, Mexiko und den USA," Prokla, No. 90, Mar. 1993, at 129. See generally World Commission on Environment and Development, Our Common Future 74-75 (1990 [1987])

⁵⁹See Paul Aspelin & Silvio Coelho dos Santos, Indian Areas Threatened by Hydroelectric Projects in Brazil (1981); E. Monosowski, "The Tucuruí Experience," IWPDC, July 1983, at 11, 12; Gerd Kohlhepp, Itaipü: Basic Geopolitical and Energy Situation 55-78 (1987); Samuel Florman, "Hegel and the Amazon Basin," TR, Oct. 1989, at 19; E. Monosowski, "Lessons from the Tucuruí Experience," IWPDC, Feb. 1990, at 29, 33; Hydroelectric Dams on Brazil's Xingu River and Indigenous Peoples; Nicholas Lenssen, "Providing Energy in Developing Countries," in State of the World 1993: A Worldwatch Institute Report on Progress Toward a Sustainable Society 101, 108, 112 (Lester Brown ed., 1993).

⁶⁰150 PD (3d ser.) 1362 (1858) (speech by the Radical John Roebuck in support of his resolution proposing that the British government not oppose construction of the Suez Canal).

⁶¹Precisely when a settler colony becomes political-economically independent is difficult to determine. When an English firm was selected in the 1920s to build the world's largest arch bridge in Australia, *ENR* observed that: "An English concern will build it, the older community thus becoming the servant of the newer and providing the material response to the dreams and initiative of the South Sea continent." "Australia to Set a Record," 92 *ENR* 433 (1924) (editorial).

increases to "local partners, who are often more efficient in these tasks than even the most ruthless expatriate manager could hope to be," or to avoid the risks of world market overcapacity by entering into agreements that tap into Third World countries' ability to pay that is independent of the profitability of the project in question, multinational producers may prefer to avoid full and direct ownership of new facilities.⁶²

Contemporary implantation of capital-intensive technologies is typically a bifurcated process involving both producer and construction-engineering firms. Vertical integration in the form of construction-engineering subsidiaries of large process owners is not uncommon in Europe (Hoechst-Uhde, ENI-SNAM Progetti, and IFP-Technip), and Japan (Mitsui Toatsu Chemicals-Toyo Engineering), but the largest and dominant U.S. firms do not follow this pattern.⁶ Nevertheless, producers' in-house engineering divisions still accounted for approximately twofifths of the value of hydrocarbon processing facilities built in the 1980s.⁶⁴ This specialization of function, which is associated with the growing scale and complexity of plants characterized by large capital investment, complex technologies, and "the need to make large numbers of project-specific adaptations to the core processes used," is common to petrochemical, steel, nonferrous metals, continuous process industries such as oil, chemicals, and paper, as well as mining and power generation.⁶⁵ Although construction firms as owners of process technologies may transfer them in their own right, they also act as agents of producers in the transfer process.⁶

Producers' and constructors' interests may conflict to the extent that the builders' sole purpose in developing technologies is to sell them in "as large and as packaged a product as possible," whereas producers may impose restrictions on technology transfers in order to avoid depressing world market prices and to protect their worldwide profits and market shares. One such restriction is a limitation on production volume, which implicitly restrains exports since the inability to make use of economies of plant size precludes production at world market competitive prices. Moreover, producers "are under no particular constraint to license their technology" if it is more profitable for them to engage in direct investment and production.⁶⁷

Because the constructors' interests "are served by an increasing output of

⁶⁴"U.S. Engineering Firms Losing Global Business," CEN, Sept. 14, 1981, at 17.

⁶⁵Cortes & Bocock, North-South Technology Transfer at 18-19.

⁶⁶For examples of one large multinational firm's proprietary processes in petrochemical, chemical, and refinery plants, see ABB Lummus Crest, 'Technology, Project Management, Engineering, Procurement, and Construction Services for Today's Process Industries'' (n.d. [ca. 1992]); *idem*, 'Lummus Olefins Technology for Today's Ethylene Plants'' (n.d. [ca. 1992]); *idem*, ''ABB Lummus Crest: Process Technologies and Full-Scope Services'' (n.d. [ca. 1992]).

⁶⁷Charles Oman, New Forms of Investment in Developing Country Industries: Mining, Petrochemicals, Automobiles, Textiles, Food 91, 92 (OECD, 1989) (chapter written by François Chesnais) (quotations); Cortes & Bocock, North-South Technology Transfer at 8, 11, 22, 24-28, 50, 64; Robert Stobaugh, Innovation and Competition: The Global Management of Petrochemical Products 79, 82-87 (1988); idem, "Channels for Technology Transfer: The Petrochemical Industry," in Technology Crossing Borders: The Choice, Transfer, and Management of International Technology Flows 157, 165-65 (Robert Stobaugh & Louis Wells, Jr. ed., 1984); Scott McMurray & James McGregor, "Asia Targets Chemicals for the Next Assault on Western Industry," WSJ, Aug. 4, 1993, at A1, col. 6, at A4, col. 2.

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⁶²Charles Oman, New Forms of International Investment in Developing Countries 11-21, 71-79 (OECD 1984).

⁶³Mariluz Cortes & Peter Bocock, North-South Technology Transfer: A Case Study of Petrochemicals in Latin America 25-26, 65 n.5 (1984); C. Freeman, "Chemical Process Plant: Innovation and the World Market," NIER, No. 45, Aug. 1968, at 29, 36, 38-39. One seeming exception to the pattern mentioned in the text is Kellogg, which is currently owned by Dresser Industries, which provides oilfield and petroleum services; this acquisition, however, did not take place until 1988—almost ninety years after Kellogg's founding. M.W. Kellogg, "The M.W. Kellogg Company: Service to the Industry Worldwide Since the Turn of the Century," [no pagination (at 6)] (n.d. [1992]).

petrochemicals...they will do what they can to assist potential buyers to obtain the necessary finance from sources such as the World Bank."¹⁰⁸ Multinational construction firms may also be indifferent as to whether they build a plant in the Third World for a First World multinational producer such as Mobil in Singapore, a local (often state-owned) firm such as Petroleos Mexicanos, or a joint venture between the two such as Petronas and Shell in Malaysia.⁶⁹ By the same token, even where construction-engineering firms might wish to resist demands by Third World countries for technology transfers, they may lack the bargaining power of multinational producers, which "are incomparably larger and more powerful financially than even the largest engineering firms."⁷⁰

Deviations from the model of direct investment in the periphery are not, however, synonymous with relinquishment of controls by core-economy firms. Thus when construction-engineering firms introduce First World technologies on a turnkey basis, the local economies may still have to "forego the opportunity of deriving potentially considerable external economies from planning and building the project using local engineers" who are more likely to adopt solutions appropriate to the physical and socioeconomic conditions prevailing in the locality. With multinational construction firms operating as transmission belts of the First World process and production firms, the latter dominate the process of technological transfer by limiting "the free transmissability of know-how and data on process and product within the recipient country." Consequently, developing countries may be required to "accept contractual or proprietorial relationships embodying this domination on a virtually permanent basis...."⁷¹ Such restraints are reinforced where turnkey petrochemical, electric power, and manufacturing plants are financed by First World states in the form of aid tied to purchases of equipment and materials from firms in the "home country."⁷²

The diffusion of these new forms of less direct investment in the Third World does not mean, however, that the profitability of multinational construction firms is determined solely by free competitive forces of the world market. In one of the possible brave new world (dis)orders, the nation-state with the most explosive destruction industry can create privileged access for the largest firms of its construction industry to the periodic processes of reconstruction. U.S. wars in the Third World have frequently provided such opportunities: "No sooner had the shooting stopped in Korea, than some 170 Bechtel men took the field and soon had 900 Koreans putting up the structures that would supply extra kilowatts to revive the country's economy."⁷³ Although the war in Vietnam failed to fulfill such

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⁶⁴John Dunning, *Multinationals, Technology and Competitiveness* 163 (1988). According to a recent calculation, the significance of World Bank loans for multinational construction firms has diminished in large part because three-quarters of the civil works projects are executed by local firms. Consequently only 3 per cent of multinational construction in the Third World is financed by the World Bank. "Conclusion: Comparison and Analysis," in *The Global Construction Industry* at 211, 246-47. This reasoning appears inconsistent with the claim that "under the pressure of the World Bank...to give more freedom to the main international contractors," Third World government agencies have relaxed their own requirement that multinational firms subcontract certain sections of their projects. Ridha Ferchiou, "Tunisia," in *The Global Construction Industry* at 198, 204-205.

⁶⁹See "Big One for Badger," *ENR*, May 13, 1991, at 23); "Mexico: A Tough Nut to Crack, But," *ENR*, June 4, 1981, at 30; "Gas Spurs Malaysian Boom," *ENR*, Aug. 12, 1982, at 32.

⁷⁰Oman, New Forms of Investment in Developing Country Industries at 92.

⁷¹John Roberts, "Engineering Consultancy, Industrialization and Development," in Science, Technology and Development: The Political Economy of Technical Advance in Underdeveloped Countries 39, 45, 49-50 (Charles Cooper ed., 1973).

¹²On the role of the U.S. Export-Import Bank, see e.g. U.S. House of Representatives, Ways and Means Committee, 102d Cong., 1st Sess., *Overview and Compilation of U.S. Trade Statutes* 138 (1991 ed.); Peter Behr, "Bechtel Bridging Financing Gap: Builder Forced to Wear Banker's Hat," *WPost*, Oct. 21, 1984, at K1 (Nexis); See also OECD, *Globalisation of Industrial Activities: Four Case Studies: Auto Parts, Chemicals, Construction and Semiconductors* 112-13 (1992).

⁷³Wilson & Taylor, Earth Changers at 264.

hopes,⁷⁴ subsequent U.S. military destruction proved much more constructive. Thus when the U.S. Navy destroyed an Iranian oil production platform, a U.S. firm (McDermott International) received a large contract to reconstruct it.⁷⁵ For a conglomerate corporation, such as Raytheon, which combines subsidiaries of destruction (missiles) and war-zone petrochemical construction (Badger Company), the connection may even become direct.⁷⁶

State-capital cooperation can also operate on a much grander and more systematic scale:

While B-52s of the U.S. Air Force pound Iraqi Republican Guard positions along the Iraq-Kuwaiti border, another branch of the U.S. armed forces [the Army Corps of Engineers] is quietly doing work that could mean billions of dollars for U.S. companies. ... Even as the U.S., Britain, and France cooperate on the Desert Storm battlefield, cutthroat competition is breaking out over who will reap the commercial spoils.⁷⁷

In turn, the profits derived from Bechtel's \$2.5 billion firefighting and reconstruction contract with the Kuwait Oil Company may, for example, "enable the Bechtel board, unimpeded by snoopy stockholders, to amass...slush funds" to finance the election of other regimes sympathetic to its interests.⁷⁸

Such state intervention may enable U.S. firms to retain their leading role in servicing multinational petrochemical companies—projects that account for one-third of the world construction market—at "'locations that offer advantages such as an abundant supply of workers, lax environmental controls or labor pricing."'⁷⁹ Acquisition by multinational firms of the largest Third World firms—such as Fluor's purchase in Mexico—offers another way of circumventing potential local competition.⁸⁰ The penetration by the new international division of labor of the refining, chemical, and petrochemical industries "has opened the world market, particularly in industrialized countries, to producers with access to cheap feedstocks, advantageous geographic location and a cheap pool of local labor."⁸¹ Consequently, Asian countries such as Indonesia, Malaysia, and Thailand have become "even more attractive to investors." These and other Pacific Rim economies are the projected sites of plant construction by Bechtel, Kellogg, Foster Wheeler, Stone & Webster, and others valued at tens of billions of dollars—if these countries' world market-driven ""staggering national debt"" does not thwart their

¹⁰By buying 49 per cent of Empresa ICA Sociedad Controladora S.A. de C.V. Mexico, Fluor has become the largest construction engineering firm in Mexico. *ENR*, May 24, 1993, at 5.

¹¹Walter Vergara & Donald Brown, The New Face of the World Petrochemical Sector: Implications for Developing Countries 69 (World Bank Technical Paper No. 84, 1988).

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⁷⁴See e.g., "Vietnam Starts the Long Journey Back," CW, Feb. 7, 1973, at 34.

⁷⁵James Tanner, "Iran's Oil Production Is Soaring, With Help from American Firms," WSJ, Nov. 25, 1992, at A1, col. 6, A9, col. 4.

⁷⁶See Raytheon Company, 1991 Annual Report 5, 9-13, 23-27 (1992); Badger, Lubricating Oil and Wax Production 5, 18, 19, 24, 26 (n.d. [ca. 1990]).

⁷⁷⁴ To the Victor Go the Spoils," *BW*, Feb. 18, 1991, at 50. See also "US Leads Charge as Allies Fight for Kuwaiti Contracts," *FT*, Feb. 27, 1992, § I, at 4 (Nexis); U.S. General Accounting Office, *Persian Gulf: U.S. Business Participation in the Reconstruction of Kuwait* (NSIAD-93-69, 1992).

⁷¹. Bechtel Leaves Kuwait, Oil Capacity Restored, " ENR, Sept. 6, 1993, at 12; Joe Stork, "The Gulf War and the Arab World," 8 WPJ 365, 373 (1991) (quotation).

⁷⁹''The Top 400 Contractors,'' *ENR*, May 24, 1990, at 38 (quoting vice president of ABB Lummus Crest); "The Top 250 International Contractors,'' *ENR*, July 22, 1991, at 35; "The Top 400 Contractors,'' *ENR*, May 25, 1992, at 55. See also Lakdasa Wijetilleke & Anthony Ody, *World Refinery Industry: Need* for Restructuring 200-208 (World Bank Technical Paper No. 32, 1984). On U.S. firms' preeminence in the construction of (petro-)chemical plants, see Hugh Hambleton, "The Saudi Petrochemical Industry in the 1980s," in *Saudi Arabia: Energy, Developmental Planning, and Industrialization* 51, 52, 54, 59 (Ragaei El Mallakh & Dorothea Mallakh ed. 1982); "The Top International Contractors," *ENR*, July 15, 1982, at 77; Howard Seymour, *The Multinational Construction Industry* 170 (1987).

programs.82

More important, however, for the future contours of the world than the national identity of the dominant multinational construction firms is the character of the economic development programs pursued by the Third World. If those countries choose, for example, to promote "export processing zones," "conceived...as a physical, economic and even social enclave," they will continue to discourage horizontal internal linkages that could galvanize more balanced national economic development. By providing not only the infrastructure but even standardized factory buildings for the exporting firms in these zones, international construction firms and their Third World customer-states create a "grotesque" contrast with the surrounding nonextraterritorial areas.⁸³ This kind of internal unbalanced development is exacerbated by the fact that Third World infrastructure projects such as roads, harbors, and airports are typically financed by redistributions from surpluses created in agriculture and extractive industries, which fail to create a horizontally integrated broad base of production.84 These programs reproduce the same forms of underdevelopment that nineteenth-century British infrastructural colonialism engendered with the consequence, for example, that by the middle of the twentieth century India possessed one of the world's longest railway systems without having created the corresponding productive forces.⁸⁵ Under such circunstances, the populations of the Third World live in another economic world despite sharing the territory in which First World capital valorizes itself.86

As major political-economic actors not only operating in their own world market but producing the fixed capital of many other global industries, the multinational construction firms face a future dependent in large part on the life-expectancy of the prevailing fossil-fuel-driven international Fordism and especially of the latter's hold on the newly industrializing dependent nations.⁸⁷ The U.S. Agency for International Development advances precisely such an agenda when, for example, it gives a grant to Bechtel to help Morocco, Bangladesh, Costa Rica, Jamaica, and the Economic Community of Western African States to develop their own fossil-fuel energy resources.⁸⁸ And even if Bechtel and other companies cannot build fossil-fuel projects, they can still profit from "cleaning up problems" at the nuclear power and weapons plants the construction of which they once monopolized.⁸⁹

The hopes attached to China's emergence as the new center for mega-

¹¹WSJ, Jan. 28, 1982, at 48, col. 6.

¹⁹See G. Zachary & Susan Faludi, "Bechtel, Hurt By Slide in Heavy Construction, Re-Engineers Itself," *WSJ*, May 28, 1991, at A1, col. 6, A16, col. 1; Victor Zonana, "Megabuilder Bechtel Tries to Stay on Top By Being Aggressive," *WSJ*, Oct. 16, 1984, at 1, col. 6, at 25, col. 1.

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¹²Stone & Webster, "Burgeoning Workload in the Pacific Rim" (n.d.); Lewis Koflowitz, "A New World Order," *Chemical Marketing Reporter*, July 8, 1991, at S10 (Westlaw-Dialog); Herb Short, "Tough Conditions Shape Plans of Engineering Firms," *ChE*, Nov. 28, 1983, at 26 (Nexis) (quoting Bechtel official); Walter Vergara & Dominique Babelon, *The Petrochemical Industry in Developing Asia: A Review of the Current Situation and Prospects for Development in the 1990s* (World Bank Technical Paper No. 113, 1990); Frank Warren, Jr., "International Construction Markets Hindered by Nations in Debt," *Constructor*, Jan., 1986, at 28 (author is Jones Construction executive).

⁴³International Labour Organisation, Economic and Social Effects of Multinational Enterprises in Export Processing Zones 109 (1988); Folker Fröbel, Jürgen Heinrichs, & Otto Kreye, Umbruch in der Weltwirtschaft 439-41 (1986).

⁴⁴See Folker Fröbel, Jürgen Heinrichs, & Otto Kreye, Die neue internationale Arbeitsteilung 568-69, 577, 501-502 (1977); Wolfgang Schoeller, Weltmarkt und Reproduktion des Kapitals 186-87 (1976).

¹³Daniel Thorner, "Great Britain and the Development of India's Railways," 11 JEH 389, 400-402 (1951).

¹⁶Rolf Knieper, Nationale Souveranität 143-44 (1991).

¹⁷See generally Elmar Altvater, Der Preis des Wohlstands oder Umweltplünderung und neue Welt(un)ordnung (1992).

projects and the potential integration of a sizable segment of the one-seventh of world construction formerly performed in the centrally planned Comecon states into the world market have also reignited belief in the sustainability of a perpetually rebuilt environment.⁹⁰ Thus expectations of an enormous building boom in East Germany are already said to have West German construction firms "salivating."⁹¹ Hochtief, for example, has already acquired East German and Polish construction firms.

Finally, and most portentously, many developing countries, constrained by their debt-driven entanglement in the world market, have reproduced the model of systematic environmental degradation that arose in the advanced capitalist countries in the nineteenth and twentieth centuries. In order, for example, to supply the Weyerhaeusers and final consumers of the First World with the volume of wood products that the depletion of the forests of the Northern Hemisphere (replicating the history of the international petroleum industry) can no longer satisfy, or to conquer Asian markets by driving Japanese and Korean producers out of business, Third World producers and states have embarked on the destruction of the ecologically vital and non-renewable rain forests. Building local pulp mills and massive dams propels the accumulation process for multinational construction firms while impoverishing the Third World's and the whole world's ecosystems.⁹³ In "waging the equivalent of thermonuclear war upon their own territories,"94 the former colonialized societies may yet externalize the ultimate costs of exploitation onto what has become one ecologically doomed capitalist world.

⁸⁰See Behr, "Bechtel Bridging Financing Gap"; M.W. Kellogg, "The M.W. Kellogg Company" [no pagination (4, 6)]; "Industry Heads East," *ENR*, Feb. 1, 1990, at 27; "Czechoslovakia Moves to Be European Hub," *ENR*, Aug. 19, 1991, at 65; William Krizan, "Low-Octane Domestic Markets Stall Out U.S. Contractors," *ENR*, May 24, 1993, at 36 (Parsons forms joint-stock company with Russian organizations to build infrastructure in Russia).

⁹¹John Kosowatz & Peter Reina, "Germany Begins the Costly Reconstruction of Its New States," ENR, Apr. 27, 1992, at 24. See also "Brown & Root Goes East," ENR, Feb. 1, 1993, at 5.

⁹² "Hochtief Acquires East German Firm," ENR, Apr. 22, 1991, at 5; Die Baubude, No. 139, Apr. 1993, at 3 (Hochtief acquires 40 per cent share of Budokor).

⁹¹[Brown & Root], Brownbuilder, No. 2, 1992, at 8-9 (characterizing the use of the rain forest in Indonesia to supply a new pulp mill as "environmentally sound"); World Bank, Indonesia: Sustainable Development of Forests, Land, and Water 4 (1990) (deforestation also threatens Indonesia's economic objectives); "Nathaniel Nash, "Bolivia's Rain Forest Falls to Relentless Exploiters," NYT, June 21, 1993, at A1, col. 2, A6, col. 3-4 (nat. ed.) ("almost limitless demand" for mahogany in the United States). For critiques, see Dan Morgan, "'Slash and Burn' Risks Disaster in Tropical Forests," WPost, Nov. 27, 1978, at A1 (Nexis); Val Plumwood & Richard Routley, "World Rainforest Destruction—The Social Factors," Ecologist No. 1, 1982, at 4, 11-17; Michael Vatikiotis, "Tug-of-War Over Trees," FEER, Jan. 12, 1989, at 41; "A Saw Point for Forestry," FEER, Apr. 19, 1990; "Lost in the Forest," Economist, Aug. 31, 1991, at 30; Adam Schwarz & Jonathan Friedland, "Green Fingers," FEER, Mar. 12, 1992, at 42; "Shades of Green," Economist, Apr. 18, 1992, at 34; Adam Schwarz, "Timber is the Test," FEER, July 23, 1992, at 36. On the reasons for Weyerhaeuser's withdrawal from Indonesia, see WSJ, Oct. 23, 1981, at 41 (Westlaw-Dialog); id., Apr. 11, 1984, at 361; Richard Robison, Indonesia. The Rise of Capital 187-88 (Westlaw-Dialog); id., Apr. 11, 1984, at 361; Richard Robison, Indonesia: The Rise of Capital 187-88 (1986).

⁹⁴Nicholas Guppy, "Tropical Deforestation: A Global View," FA, Spring 1984, at 928, 943.