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EXTRACTIVE REGIONS IN DEVELOPED COUNTRIES

A Comparative Analysis of the *Oil Capitals*, Houston and Aberdeen

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In this article extraction economies in less developed countries are compared to extraction economies in developed countries – to the Houston, Texas, and Aberdeen, Scotland, petroleum regions. The following questions are addressed: (1) What are the differences in Houston's and Aberdeen's development as petroleum regions? (2) How has their extractive development differed from that in less developed countries? (3) What is the relationship of early layers of development to later extractive investments? (4) How have capital timing and scale shaped Houston's and Aberdeen's development as urban regions? The historical timing of oil discoveries greatly affects the way oil capital builds up and exfoliates relationally in urban regions.

Two principal regions in the world oil and gas system are the areas adjacent to Houston, Texas, and Aberdeen, Scotland, urban regions called the *oil capitals* of the United States and Western Europe. Aberdeen is the economic and political center for the Grampian Region of northeastern Scotland, an area of 3,400 square miles with a population of one-half million in the mid-1980s. Metropolitan Houston, with a population of about three million in the 1980s, is the economic center for the western Gulf Coast. In this article I will first review the literature on development and extractive regions in underdeveloped countries and then examine the relevance of this and other research for assessing the development of extractive regions in core countries.

EXTRACTIVE ECONOMIES AND UNDERDEVELOPMENT

ADVANTAGES OF BACKWARDNESS?

A number of ideas in the literature on underdeveloped countries can be weighed against the development of extractive regions in developed coun-

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tries. Gerschenkron (1962) argued that there are major “advantages of backwardness,” advantages that accrue to a “backward” country because of its late development. Belated industrialization often is promising because of the “backlog of technological innovations which the backward country could take over from the more advanced country” (p. 8). Moreover, mainstream stages-of-growth development theorists (for example, Friedmann, 1966) have assumed that traditional economic sectors in less developed countries could be replaced by more dynamic industrial sectors through a beneficial integration into the capitalist world-system.

Dependency theory has challenged this sanguine view. Working in the tradition of Andre Gunder Frank, Slater (1975: 168) demonstrated how integration into the world-system has disintegrated Third World economies by putting key economic positions in the hands of foreign multinationals and forcing local urban growth where it facilitates multinational-dominated economies. Frank (1969) noted the use of foreign investment to create primary extraction oriented to supplying developed countries. Recently some scholars (Weede and Tieffenbach, 1981) have argued that their data on countries show no relationship between a dependence on raw materials exports and economic underdevelopment, but others (Stokes and Jaffee, 1982) have found underdevelopment linked to a dependence on unprocessed exports.

In his important work on extractive systems, Bunker (1984: 1017-1025) distinguished clearly between *extraction* and *industrial* production, stating that the “economic models of industrial production neglect the physical dependence of industrial production on resource extraction” (p. 1017). Multinational location decisions involving extraction are limited severely by the geologically random distribution of resources. Extractive commodities are different from processed commodities in that they come “as they are” in terms of location and physical character. These commodities are extracted by multinationals, such as by mining in the Amazon, for immediate export to service manufacturing production in advanced countries. Bunker (1984: 1018) suggested that “the relative underdevelopment of regions from which matter and energy are extracted is best explained as a consequence of internal dynamics and the external trade relations of their economies.” The extreme dependency of extractive regions and their nodal cities in developing countries is linked, among other things, to substantial external investment in materials extraction and in the removal infrastructure, which has meant heavy dependency on multinationals headquartered in the cities of core countries.

Jaffee and Stokes (1986: 533-546) corroborated earlier research on coal by demonstrating that multinational investment in the petroleum-extractive sector in underdeveloped countries has created trade dependence on core countries. Nemeth and Smith (1988) demonstrated that the international trade matrix has two dimensions, the capital-intensity and extractive/processive dimensions. Moreover, unequal exchange between core and peripheral countries is usually discussed in terms of labor and capital intensity, but Nemeth and Smith (1988: 237) argued that it could as well be discussed in terms of the "environmental degradation, which results from economies dependent on extraction." They were elaborating a point that Bunker (1984) developed. He argued that the development of extractive economies involves the export of environmentally secured energy such as coal. This depletes the local ecosystem and undermines downstream economic developments. If the extractive capitalists are unwilling to put large investments back into the ecosystem, negative environmental effects can be so serious as to discourage diversified industrial development in the area.

EXTRACTIVE ECONOMIES IN THE CORE

COMPARISONS WITH EXTRACTION IN THE PERIPHERY

Although most development scholars have neglected extraction in core countries, the literature does provide concepts and theoretical suggestions useful in examining raw materials economies in core countries. Jacobs (1984) underscored the importance of downplaying nations and accenting urban regions—such as the extractive regions of Houston and Aberdeen—as the basic units for macroeconomic analysis. Gerschenkron (1962) suggested that backwardness should have benefited the late-developing extractive economy of the Aberdeen area, as compared with the earlier developing Houston area. Moreover, in his 1940s work on the early development of industrialized countries such as Canada, Innis (1940: 508) argued, in contrast to more recent dependency research, that the centrality of staples-exports development had been beneficial for a country's long-term development.

Bunker (1984) and others have made it clear that corporate location decisions for extractive operations are different from those for manufacturing operations. The determinative character of extraction has been neglected in location theory. Theorists of corporate location have "always concentrated on manufacturing industry" (Chapman and Walker, 1987: 2). Some scholars

(such as Losch, 1954; Greenhut, 1956; Harvey, 1985) skew the discussion of corporate location toward manufacturing operations and thus downplay geological and geographical factors in favor of labor (and other) costs and market-demand factors at a location, investment circuits, and managerial-interaction factors. Although extractive commodities are often in remote areas of core or underdeveloped countries, there are important examples of primary commodity discoveries near already-developed cities in the core.

THE MULTILAYERED ECONOMY

Often in an underdeveloped country there is no preexisting industrial economy prior to the development of a new extractive region. In *The Spatial Division of Labor*, Massey (1984) suggested that the structure of a given local economy in a developed country is composed of economic layers representing successive rounds of investment within an international market. Extractive regions and their nodal cities in developed countries often have a multilayered economic system and have more socioeconomic depth than Third World extractive areas do.

However, even with layers of previous industrial or commercial development, the depletion of an extractive commodity can create serious problems, particularly when the primary resource has been depleted without significant generative investments in other sectors such as manufacturing (Corden and Neary, 1982: 825-827). Some have termed such a condition the *Dutch disease* because of the situation in the Netherlands, a major North Sea producer of gas in the 1960s and 1970s. Dutch production was the first to peak among the North Sea producers; by 1977 new investment was low, unemployment was high, and manufacturing was falling. Major multinational firms had made substantial profits, and a temporary extractive boom had occurred. Yet there was no major spin-off of downstream gas-related industries and no modernization program for the nonpetroleum sector (Ellman, 1977: 281-290). The problem was not necessarily the environmental degradation, which Bunker (1984) underscored as being the case in the less developed countries, but the multinationals' unwillingness to invest in downstream industries in this particular place.

MULTINATIONALS AND EXTRACTION ECONOMIES

The dependency literature demonstrates that the timing and character of multinational capital investment has been critical to extractive growth in the Third World. These findings in turn suggest questions about the timing and

character of multinational intervention in core extractive development. Mandel (1978: 310-316) argued that the multinational company has become the central organizational form of capital in late capitalism, in both the core and the periphery. Most authors writing about multinationals (for example, Taylor and Thrift, 1982) have neglected those engaged in the energy industry. Some authors have touched on multinational involvement in U.S. extraction, including Gaventa (1980) in his research on British multinational investment in Appalachian coal mining. In the literature on the oil and gas industry, scholars have explored a limited range of questions, such as price gouging (Sherrill, 1983), country production and monopolization (Chapman, 1983), politics (Rand, 1975; Odell and Vallenilla, 1978), investment in developing countries (Jaffee and Stokes, 1986), offshore boomtowns (Gramling and Brabant, 1986), the Dutch gas decline (Ellman, 1977; Corden and Neary, 1982), and international oil politics (Odell, 1963; Rees and Odell, 1987).

Many of these authors target the oil and gas multinationals. Indeed, the development of ever-larger corporations with concentrated capital control has characterized the history of the petroleum industry in core and underdeveloped countries. Particularly after World War II, large oil firms produced so much with automated refining and petrochemical production that they required expanding worldwide markets for both raw materials and finished products, and this extractive/processive expansion drew the Houston and Aberdeen regions more deeply into global oil production relations. In turn, the fortunes of oil capital altered the material and spatial life conditions of Houston and Aberdeen, but not in even or homogeneous ways. In contrast to some extraction industries, the petroleum industry has become increasingly capital intensive, at least since the 1920s. By the 1940s, if not before, the increasing scale of capital required had become a major barrier to entry into petroleum production and marketing by small and middle-sized firms with local capital resources. In U.S. petroleum regions prior to the 1940s, it was easier to develop new oil and gas companies because of the lesser scale of capital required. Smaller firms and the modest scale of capital were sometimes compatible with the extraction of numerous onshore deposits. Within a few decades, however, large multinationals became necessary to provide the capital for much of the onshore drilling and most offshore drilling. The average cost of drilling a U.S. onshore well increased from \$27,600 in 1936, to \$49,000 in 1959, and to \$231,912 in 1986; the average cost of an offshore well increased from \$320,704 in 1959 to \$3,126,096 in 1986 (Engineer Publishing Company, 1947: D-72; American Petroleum Institute, 1977: Section 3, Tables 8-9; American Petroleum Institute, 1988: Section 3, Tables 9a and 10a). The timing of oil discoveries and the extant scale of capital also

have been critical to the development of downstream processing industries, such as refining and petrochemicals, in particular oil regions.

Not only the size and global expansion of the petroleum multinationals but also their internal organizational structures have affected urban regions across the world-system (see Chase-Dunn, 1984). Hymer (1979: 157-163) probed the relationship of the internal structure of large corporations to the character and growth of particular cities. He developed a typology suggesting that large global companies locate their distinctive functional levels in three different levels of cities: top management functions in world-class cities, the field management functions in national cities, and day-to-day operations in lesser cities around the world. This worldwide organizational distribution across cities can be seen in the oil and gas industry. In addition, the dominance of large oil corporations with weak attachments to regional cities has affected location decisions; multinationals can abandon a city more easily than can local companies.

The important relationship between facilitating *governments* and extractive development by multinationals in Third World countries has been noted by development scholars (for example, Bunker, 1984). In core countries the state also has developed an array of relationships with the oil and gas industry. In some cases, such as Norway, oil and gas development has been placed mostly under the direct control of the state in order to ensure, at least in theory, greater public control of, and benefits from, resource depletion. In other cases, such as Great Britain and the United States, governments have left oil and gas extraction primarily in the hands of the private sector; in these countries private oil interests have gained great economic and political power, including dramatic tax advantages. Moreover, although governments have been important in providing supportive subsidies for private extractive enterprises in Great Britain and in the United States, that support has varied with the timing of a region's oil-related developments.

Drawing on this diverse literature on development, extraction, and multinationals, I suggest as a guide through the case-study materials the following research questions: (1) What are the similarities and differences in development of the Houston and Aberdeen petroleum regions? (2) How has the development of extractive economies in the core countries differed from that in underdeveloped countries? (3) What is the relationship between early layers of economic development and later extractive investment? (4) How have the historical timing of oil development and the varying scale of capital influenced the emergence and character of the Houston and Aberdeen regions? A central thread running through the answers to these questions is that the historical timing of oil discoveries is of great significance in the way oil

capital builds up and exfoliates relationally — economically and politically — in cities and surrounding extractive regions.

INCORPORATION OF THE HOUSTON AND ABERDEEN AREAS INTO THE WORLD OIL AND GAS SYSTEM

One of the most important primary commodity markets in the capitalist world-system is centered on oil. The fugitive and hidden character of oil accounts for its pursuit being perhaps the “quintessential venture of risk-taking capitalism” (Solberg, 1976: 4). Between 1901 and the present, major capital investments in oil-gas discovery, extraction, and processing were made in the Houston and Aberdeen regions. The chance discovery in 1901 of oil at Spindletop, 90 miles east of Houston, and in the North Sea east of Aberdeen in the late 1960s brought both cities into the world oil and gas system and introduced a new era of boom-bust economic development for both metropolitan areas. How was extraction-related development in Houston similar to, and different from, development in Aberdeen? Why were Houston and Aberdeen areas chosen as sites for the operations offices and manufacturing plants of oil and gas corporations?

THE TIMING AND CHARACTER OF EXTRACTIVE DEVELOPMENT: THE HOUSTON AREA

A major difference between the Houston and Aberdeen regions lies in the timing of initial oil development. Houston had the earlier development. The discovery of onshore oil east of Houston in 1901 and subsequent discoveries closer to the city set the stage for this city to become a major oil center. By 1919 three quarters of Gulf Coast oil was coming from fields in the Houston area (Williamson et al., 1963: 22). By the mid-1930s Houstonians were proudly labeling their city the “oil capital of the world.” Even in the months between January 1932 and March 1933, the nadir of the Great Depression, hundreds of companies opened for business, including 113 oil-related firms (*Houston*, 1933: 3). Half the world’s oil production was then located within 600 miles of Houston, a city with thousands of miles of pipeline linking it to hundreds of oil fields (Wharton, 1930: 9). Even during the Great Depression, Houston continued to grow because of its expanding oil base. By 1940 about three-quarters of the oil produced in the midcontinent area was controlled by companies tied to Houston. More than half of all U.S. oil flowed through the Houston-Gulf Coast economy. Texas had the nation’s most productive oil

field, that in East Texas, as well as 56% of proven oil reserves in the United States (Feagin, 1988: 52-67).

Between the 1940s and the early 1980s prosperity continued in the greater Houston area. There was substantial development of downstream industries linked to oil exploration and production, including refineries, oil tools and services, and petrochemical plants. The value of foreign trade through the Port of Houston increased tenfold between 1970 and 1980. By the 1960s Houston had evolved into the oil-technology distribution center for many fields across the globe (Taylor, 1983). In the early 1980s about 35% of the jobs in the area were connected directly to the oil and gas industry; another fifth were greatly dependent on the industry. Fully 70% of the large plants in Houston were part of the oil and gas industry.

THE MULTILAYERED ECONOMY OF HOUSTON

Why and how did Houston become the oil capital of the Gulf Coast? Just before the petroleum discoveries, Houston, with an 1890 population of only 27,000, was the eighteenth largest city in the South and was smaller than its sister city, Galveston, Texas. In contrast, the city's competitors, Galveston and Beaumont, confronted major barriers to becoming the oil and gas center. A hurricane destroyed Galveston in 1900; oil-related companies seeking an urban center began to avoid that exposed coastal location. Beaumont, a town closer to the first fields than was Houston, did not have the requisite infrastructure of banks, law firms, and railroads (Pratt, 1980: 53-55).

Metropolitan Houston's economic structure is multilayered. Beginning with agricultural production and marketing, the region's economy expanded in the 1870s and 1880s and soon became the heart of a major railroad network in the Southwest. Large-scale cotton and other agricultural production created Houston as a commercial city serving a large agricultural hinterland, a city with a full range of transport, banking, and legal firms. By the 1910s the local ship channel had been dredged deeply enough for large ships, and the city was used as a center by 17 railroads. Houston was becoming a major port. Texas was producing two-thirds of all cotton in the United States, much of which was shipped through Houston, which also had major cottonseed-processing mills. The local population, predominantly white but with a large and poor black minority, was heavily employed in agricultural processing and shipping activities.

With the discovery of oil and the location of firms in Houston in the 1910s and 1920s, a new economic sector was added to the local economy, substan-

tially because of the infrastructure laid down during the agricultural commerce period (Sibley, 1968: 133-135; McComb, 1981: 65-67). The existing infrastructure served as a magnet in the logistical choices made by the petroleum firms in the selection of office and manufacturing locations. Houston had become the key metropolis on the Texas Gulf Coast just before the arrival of oil and gas. Moreover, by the late 1920s and 1930s the economic foundation of the upstream oil exploration and production activities attracted the development of an array of downstream oil-gas processing and manufacturing industries, including the oil-tool, refining, and petrochemical industries. By 1940 Houston had become a major port for the export of extracted crude oil, which attracted increasingly large shipping corporations to the port area. Three decades later, prior layers of infrastructure development again became significant. During the early 1970s several large oil corporations centralized major facilities in the city, shifting subsidiaries from elsewhere. Shell (U.S.) relocated its U.S. administrative headquarters from New York to Houston, and Texaco, Gulf, and Exxon consolidated principal domestic operations there. One reason for this relocation was the already thick palimpsest of infrastructure and oil-related facilities. In addition, the low oil price in this era encouraged multinational cost cutting and consolidation (Taylor, 1983; *Business Week*, 1970: 16).

TIMING AND CHARACTER OF EXTRACTIVE DEVELOPMENT: ABERDEEN

Oil-related development in the Aberdeen region began six decades later than in Houston. Although Houston was a growing agricultural center at the time of the oil discoveries in the late 1960s, Aberdeen was in a distressed economic condition. During the 1960s the Aberdeen economy was depressed compared to the rest of Scotland and Britain. Wage levels were lower than in other Scottish cities, which resulted in the highest rate of out-migration of any area in Britain. Even the fishing and textile industries were in decline. In 1964 the British government issued the first licenses authorizing firms to explore for North Sea oil and gas. An offshore oil boom resulted. The first offshore commercial find was the Montrose field in 1969; the first oil from the North Sea was brought by pipeline to the Scottish mainland in 1975. By the late 1970s many of the world's international oil corporations were involved in development of 16 fields in the U.K. sector of the North Sea, and by the late 1980s, 40 oil fields were in production or being developed. Oil production increased from 12 million tonnes in 1976 to 110 million tonnes in 1983 (Grampian Regional Council, 1981).

Offshore oil and gas discoveries spurred onshore development in the coastal towns and cities of northeast Scotland in the form of services and supply facilities, administrative offices, and, to a lesser extent, oil-related manufacturing. Transporting the oil involved the preparation of pipe systems, terminals, and storage tanks. Processing activities required facilities for the separation of oil and gas. The world's largest natural gas treatment plant was built by British Gas at St. Fergus, north of Aberdeen (Scottish Office, 1987). By the early 1980s numerous major oil firms and oil service firms had set up operational offices in Aberdeen. The exploration and development of the oil and gas fields and the proliferation of associated service industries brought many jobs. In June 1984 about 64,000 people in Scotland were employed in firms wholly involved in the oil and gas industry (Scottish Office, 1987). From 1970 until the decline in the oil price in 1985-1986, the number of oil-related jobs and population grew steadily in the Aberdeen area; oil-related employment grew from 1,000 in 1971 to 51,000 in 1985 (Grampian Regional Council, 1986: 3). The oil boom lowered the unemployment rate in the Aberdeen area.

In the early 1980s many experts in northeast Scotland expected the oil and gas boom to bring unparalleled prosperity for at least the next two decades (Grampian Regional Council, 1981). Optimistic projections by the director of physical planning for the Grampian Regional Council suggested that by 2001, 83 commercial fields would be under development, with 25,000 offshore employees and another 33,000 onshore employees in oil-related jobs in the northern North Sea area (Spratt, 1986).

THE MULTILAYERED ECONOMY OF ABERDEEN

In the Aberdeen case the commonly expressed reasons for the oil-gas multinationals' location choices have included weather permitting year-round operations, proximity to European markets, the Conservative party heading the central government, and a location close to the North Sea fields. But a few other Scottish cities in the northern North Sea area also had these features. Perhaps more fundamentally, as in the Houston case, the urban location choice was affected by the preexisting infrastructure of the port, hotels, insurance firms, and banks in Aberdeen, an infrastructure resulting from advanced agricultural, fishing, and other commercial operations. Of course, when oil came to the Aberdeen area, it was a larger and more diverse urban region than Houston had been in the early 1900s. In the late 1960s the greater Aberdeen area had a population of more than 400,000.

The first recorded reference to the port of Aberdeen, Scotland, dates from A.D. 1136; by the 1600s much publicly subsidized work was being done to improve the harbor—improvements that in turn stimulated commerce throughout the growing town. In the 1880s the steam-trawling industry came to Aberdeen, establishing the basis for the development of a new and increasingly prosperous fishing industry. Although the city suffered some damage from German bombing raids during World War II, after the war it prospered not only as a fishing center but also as the regional center of governmental and financial services. Like the area of Texas near Houston, the hinterland of Aberdeen, called the Grampian region, is a major agricultural region; it is the principal producer of beef, pork, and barley in Scotland. More than half of the fish landed in Scotland and one-quarter of the timber produced in Scotland come from the region. Aberdeen was prosperous early in its history from agriculture, forestry, and fishing. Because of the agricultural and raw-materials economic layers, a small manufacturing sector developed in textiles, paper, and shipping-related engineering. Food processing and shipbuilding, engineering, and other facilities servicing the fishing industry contributed to its economic base (Bonney, 1987). Extractive commodities require commercial services somewhat different from those for manufacturing, including port, banking, and legal services. Raw-materials extraction was an economic layer on which were built large governmental services and commercial retailing and banking sectors. Prior to oil development the region's economy was already a multilayered palimpsest. In an early assessment of the impact of the oil and gas industry, MacKay and Moir (1980) argued that the choice of Aberdeen as the headquarters for the North Sea oil-gas industry was not inevitable but resulted from Aberdeen's superior infrastructure and active solicitation by local business and political authorities.

Thus both the Houston and Aberdeen cases demonstrate the importance of economic layering in the evolution of regional and urban economies. Earlier development grounded in developed agriculture and commerce had created a first-rate infrastructure that became the major reason for the location of the oil and gas multinationals in specific cities. There is rarely such an economic palimpsest in the Third World cases.

THE IMPACT OF MULTINATIONALS ON HOUSTON AND ABERDEEN

Houston and Aberdeen have multilayered economies now dominated by the oil and gas industry, but the character of these economies has varied

because of the historical timing of oil development, the variation in scale of capital required, and the decision-making and organizational structure of the multinational oil corporations.

SMALL FIRMS AND MULTATIONALS: THE IMPACT ON HOUSTON

Not long after the discovery of oil near Houston, several oil companies organizing production in the new fields opened headquarters in, or moved them to, the city. Between 1908 and 1916 the newly formed companies called the Texas Company (later Texaco) and the Gulf Company came to Houston. Moreover, the early timing of these oil discoveries and the accessibility of much of the oil meant that for the first few years a significant amount of exploration and production could be carried out by smaller firms. They were able to finance the limited research and development necessary, and much technological development came by trial and error. The relatively small amount of capital required enabled many local companies to participate in organizing production in the Texas oil fields. Gradually, however, the scale of the capital required increased; over the next two decades the increase in capital requirements, together with cutthroat competition, meant that large outside corporations would dominate many sectors of the Texas oil industry. By the 1930s fully 70% of Texas production was controlled by 20 big companies. The large firms moved into new oil fields and directly or indirectly drove smaller companies out of business; they expanded vertically by adding subsidiaries covering all aspects of the business from research to refining and marketing. The borrowing of outside capital by the southeast Texas oil firms came early. Historians Larson and Porter (1959: 72-104) noted that in the early decades of the 1900s, the larger companies of Texas origin developed "with the aid of capital from the Northeast," and in the next few decades, several placed their "headquarters in New York, Philadelphia, or Pittsburgh." By 1920 Standard Oil, formerly excluded by local government action from Texas fields, had bought a controlling share in Houston's local Humble Oil and Refining Company, which eventually became the largest producer of crude oil in the United States.

Building on the extractive base, the big oil corporations invested capital in a number of downstream processing facilities in Houston in the 1920s and 1930s. Numerous refineries and other oil-related facilities were built using the area's raw materials, not only oil and gas but also sulfur and salt water. By 1941 the Gulf Coast was the dominant refining region, with more than one-third of total U.S. capacity. The refineries became central to the anchor-

ing of the integrated multinational companies in the area (Pratt, 1980: 64-68; Ridley, 1930: 18). The development of oil extraction and refinery capabilities in turn spurred massive capital investments in the petrochemical industry. By the late 1930s and 1940s a significant spurt in petrochemical industrialization had occurred that was linked substantially to World War II and to millions in federal government subsidies to the oil majors' and other large firms' petrochemical plants. Much private capital also flowed into chemical facilities; by the early 1980s large multinationals in the greater Houston-Gulf Coast area produced 40% of U.S.-produced petrochemicals (*Chase Manhattan Bank Petroleum Situation Newsletter*, 1983: 1-3). During and after World War II, companies like Gulf, Mobil, Texaco, Exxon, and Shell solidified the domination of large multinational corporations in the Houston-Gulf Coast region by locating new facilities and subsidiaries there. Because they operate internationally, such companies have had greater sources of capital and labor than local firms, and the expanding market for their products has long been international (Pratt, 1980: 8-9). By the 1960s and 1970s metropolitan Houston's role in the world oil economy had become central in research and operations in exploration, production, refining, and marketing. No fewer than 34 of the 35 largest oil companies had major office and plant facilities in the Houston region. At least 400 other major oil-gas companies also were located in the metropolitan area, together with hundreds of geological firms, drilling contractors, tools and supply companies, law firms, and other oil-related service companies (Taylor, 1983).

Interestingly, in the 1980s an article appeared in *Texas Monthly* in which the author (Burka, 1983: 109) asserted that "Houston has shoved New York aside to become the center of the international oil business." This assertion is only partially accurate. Although the oil majors have important subsidiaries in Houston, most of these are dependent to some extent on the outside headquarters for highest-level management, planning, and investment decisions. Thus Exxon, the world's largest integrated oil company, has its international headquarters in New York. Yet this fact does not reveal the true significance of Houston: Exxon has four major division and subsidiary offices there.

Although the oil majors are not headquartered there, all but one of the chief industrial corporations with headquarters in the city are in the oil and gas business—and most are international leaders in the gas industry or oil tools and services. For example, in 1984 Houston was the site of the headquarters of several Fortune 500 industrial corporations: Shell-U.S. (ranked 13th nationally), Tenneco (19th), Coastal Corporation (55th), Pennzoil

(147th), Cooper Industries (180th), Anderson Clayton (233rd), Mitchell Energy & Development (315th), Big Three Industries (360th), and Cameron Iron Works (457th) (Houston Chamber of Commerce, n.d., circa 1985). Oil tools and supply companies have been central to the international role of Houston. By the late 1970s there were about 100 Houston companies, mostly oil-gas tools and services firms, working in the North Sea fields, a sign of the major relationship between the two extraction areas (Taylor, 1983). By 1980 nearly \$7 billion in engineering and related contracts were in effect between Houston and other U.S. oil support companies and enterprises in the Middle Eastern oil fields. The important exceptions to East Coast corporate *headquarters* dominance of the Houston petroleum industry have been these international oil tools firms and the gas industry companies on the same list. Although much gas extraction has been controlled by the majors, a few Houston-based corporations on the list, including Tenneco and Coastal, as well as other large companies such as Transco and Texas Eastern, have played a major role in the gas extraction and gas transmission businesses (Moskowitz et al., 1980: 848-850).

MULTINATIONAL CAPITAL AND ABERDEEN

Aberdeen is considered the oil capital of Europe because there are more than 800 oil-related firms in the general area. Greater Aberdeen has become the focal region for the North Sea oil and gas industry in Britain and has the greatest concentration of the multinational oil business in Europe. The coming of the oil and gas industry changed the local economy from one dominated by a large number of locally owned firms to one dominated by large oil and gas multinationals headquartered in the United States, London, and elsewhere in Europe. Neither the production firms nor the offshore oil supply firms are headquartered in this oil capital. Decisions made in the London (and other) headquarters of multinational corporations and in OPEC offices have been determining forces: "Clearly the major influences determining the scale and scope of opportunities in the offshore oil industry lie far away from Aberdeen" (Bonney, 1986: 5).

The offshore oil development has been carried out by large multinational corporations; those with operational centers in the area in the late 1980s included Amoco, British Petroleum (BP), Britoil, Chevron, Conoco, Marathon, Mobil, Occidental, Phillips, Shell Expro (with Exxon), Texaco, Total, and Union Oil. The decision-making scope of the operations offices has for the most part been limited to the North Sea and Scotland. Subsidiaries and affiliates of non-Scottish firms are characteristic in the Aberdeen oil and gas

industry. Deidre Hunt, researcher at Aberdeen's Gordon Institute, studied the local impact of the oil and gas industry; in a survey of 241 area firms she found that 70% were affiliates, subsidiaries, or branches of outside parent companies—that is, not locally owned. Among the affiliates and subsidiaries that were 100% oil related, half were owned by British parent corporations and half by overseas corporations—two-thirds of which were North American. Interestingly, the North American affiliates were the first to arrive in the area; some were Houston firms. Local papers celebrated the entry of Houston firms, accenting their “modernity and sophistication.” Oil-related Houstonians were pictured as the first major immigrants “since the Vikings” (Hunt, 1987). The dependence on Houston's tools and services corporations has persisted. Thus when, on July 6, 1988, a gas-fueled explosion on a North Sea oil platform owned by Occidental took 166 lives in the world's worst offshore disaster, the man called upon to cap and save the burning wells on the burned-out platform was Houston's Red Adair, whose company specializes in putting out oil field fires around the world (*Austin American-Statesman*, 1988: A6).

The global dynamics of the oil supply industry “does not favor any permanent single supply base. Rather, the industry follows the oil majors as they locate and relocate in new offshore oil provinces” (Hallwood, 1986: 6). The supply firms have delivered services on site as needed by the major production firms, and their supplies of machinery and tools have come from distant manufacturing sites mostly in the United States. Outside companies operating in the North Sea have come there to exploit the oil potential and to sell equipment made elsewhere. This ingress did increase employment significantly, but much of this is likely to be transitory. There have been few long-term career possibilities. Even most of the training and education were continued elsewhere, and few local personnel have been employed in research and development (Hunt, 1987).

Aberdeen University researchers Lloyd and Newlands (1987: I2-I3) have pointed out that although the involvement of the oil and gas multinationals brought 50,000 jobs, new investment and technology, and a major extractive industry, the multinationals' headquarters were located elsewhere; therefore, most profits from the oil and gas operations flow out of the Aberdeen area. Many affiliates in the area have been “relatively *unimportant* within their parent's ownership group (as measured by the affiliate's contribution to group employment and sales)” (Hallwood, 1986: 5). This means that affiliates can be closed by parent companies without seriously endangering the performance of the parent group. Short-run exploitation of an extraction area can

take place, not just in underdeveloped countries, but also in industrialized countries.

CONTRASTS IN INVESTMENT AND FIRM DOMINANCE

The Houston Case

Although the Houston and Aberdeen regions contrast dramatically with Third World extraction areas, particularly in the palimpsest aspect, there are major differences in these core cases. The two cities developed at different times during the growth of the capitalist world-system and its oil and gas industry component. Barriers to generating sufficient capital for local company creation were not as great in southeast Texas in the 1910s and 1920s as in northeast Scotland in the 1970s and 1980s. In the earliest period the Texas oil industry was not as dominated by concentrated and centralized capital as later, so local oil entrepreneurs in production, tools, and services in the Houston-Gulf Coast area could sustain themselves in ways not possible later in Aberdeen. The oil discoveries near Houston preceded the establishment of a truly international oil and gas market system; the Houston area in effect grew up with and shaped, and was shaped by, that expanding system.

Another benefit flowing to extractive corporations operating in the Houston area was political. Unlike the Aberdeen extractive economy, the Houston economy grew up with the national government. That government supported the newly developing Sunbelt industry. Responding during World War I to the claims of small oil (and other raw materials) producers that they took great risks to extract a commodity that was rapidly depleted, in 1918 U.S. government officials created a huge tax benefit, called the oil depletion allowance, that permitted oil firms to shield about 28% of their gross income from taxes. This *tax expenditure* benefited not only the small wildcatters but also (primarily) the big oil corporations (Solberg, 1976: 73-78). Beginning in the 1930s, Houston had a lot of powerful friends in Washington, D.C. John Nance Garner, as House member and vice president, had represented Texas for decades. A Texas senator was chair of the Senate military affairs committee, and Texas House members chaired the judiciary, agriculture, and rivers and harbors committees. Between the 1930s and the 1960s there were many direct links between Houston's business leadership and the federal government. During the first decades of this period an important politician associated with the Houston business elite was House Majority Leader and Speaker of the House Sam Rayburn. During the 1930s and 1940s the powerful Houstonian Jesse Jones served President Roosevelt as head of the Recon-

struction Finance Corporation (RFC), as Federal Loan Administrator, and as Secretary of Commerce. Under the guidance of this leading banker, the RFC became the state banker and stockpiler for war production, investing billions in industrial facilities. The Defense Plant Corporation (DPC), a subsidiary of the RFC, provided loans and leased, purchased, and built war production plants. Between 1940 and 1945 DPC financed 2,300 projects in 46 states, altogether about \$9.2 billion in factories, mills, and machinery. Together with other Texas politicians in Washington, D.C., Jones saw to it that Houston got a very substantial share of the war production funds, which helped to stimulate the aviation fuel, synthetic rubber, and petrochemical industries in the Houston area (Jones, 1951: 200-399). Because of these early political advantages, Houston's oil-gas development differed from Aberdeen's.

The Aberdeen Case

By the time of the discovery of oil and gas near Aberdeen, much more capital was required, especially for offshore development. I noted earlier the sharp increase in the cost of drilling U.S. onshore and offshore wells between the 1930s and the 1980s; the increase was particularly dramatic offshore, from about \$320,000 per well in the late 1950s to more than \$3 million per well in 1986. This increase was reflected in drilling wells in many offshore areas. Offshore development requires the kind of capital that the multinationals have, so offshore oil could not be developed so easily without them, particularly in difficult waters such as the North Sea. Aberdeen's development was centered around an offshore oil-gas industry, and the lateness of that development meant that the largest multinational corporations in the world dominated extraction there from the beginning. Mandel's (1978) argument about the scale of capital as an increasing barrier to entry in late capitalism applies to this lack of development of local exploration and production firms during the Aberdeen boom and explains the absence of major local oil tools and supply firms.

In addition, there are some significant differences in political linkages. Oil and gas development in the North Sea was facilitated through a favorable taxing regime provided by central government to stimulate oil and gas development in those difficult waters. Unlike the Houston case, however, it was the *foreign* multinational corporations, not the national (British) corporations, that mostly benefited from this governmental tax largess from the beginning. The government-owned British National Oil Corporation (BNOC) was not given much opportunity to participate in North Sea joint ventures, and the production subsidiary of BNOC was sold to private individuals. The

British government left North Sea development largely in the hands of the subsidiaries of foreign multinational corporations (Harris et al., n.d.: 30-31). Moreover, unlike Houston from the 1920s to the 1950s, Aberdeen and the Grampian region in the 1960s and 1970s were not represented by a coterie of powerful politicians in the national capital to guarantee that the local city and region would receive significant state capital investments or that local firms would receive a significant share of the state benefits. Of course, the divergent political systems and the effect of the historical timing of the acceleration of the flow of state capital investments during World War II in the Houston case should not be underestimated in contrasting the differences in political linkages.

Gerschenkron (1962) argued that there are advantages to later development. However, when compared to oil and gas development in Houston, late petroleum development was not an advantage in Aberdeen. Houston was better off economically, in terms of local firm development, because it developed early. Indeed, numerous world-class tools and services corporations came from Houston to Aberdeen to support the operations of the international oil corporations. The large multiplier effects of capital-intensive resource exploitation are apparent in both cities, but the breadth of the multiplier effects are different. The palimpsest layering has thickened more in the Houston case than in the Aberdeen case. Although some development of oil and gas separation facilities has occurred in the Aberdeen region, as yet there has been little investment of multinational capital in the more sophisticated technological layers of manufacturing, refining, and petrochemical plants. Aberdeen has developed only two local, medium-sized manufacturing firms linked to the new oil and gas industry (Hallwood, 1986: 7-9). The historical timing of capital centralization and patterns of investment were critical. The discovery of oil near Houston coincided with increased automobile usage and industrial growth that amplified the demand for processed petroleum products in the United States and thus created a need for refining and petrochemical capacity, much of which was provided by large corporations in the Houston-Gulf Coast area. The North Sea bonanza developed late in the history of multinational development of worldwide refining and petrochemical facilities. Ironically, North Sea oil developments coincided with a decline in the relative significance of oil in the European energy economy, which had already adjusted to the post-1973 OPEC price increases with conservation and a reduction in the use of some oil and oil products. In these circumstances, refining capacity in the United Kingdom and western Europe has fallen since the discovery of North Sea oil; there has

been no demand for new refining capacity to handle offshore production. For this and other reasons, and in contrast to the Houston case, there has been little national government aid for downstream petrochemical development in contemporary Britain.

THE INTERNATIONAL OPERATIONS SUBSIDIARY CITY

Hymer (1979) linked three corporate function levels to different types and levels of cities, with the top management function in world-class cities, the field management function in national cities, and the day-to-day operations in lesser cities. Cities like Houston and Aberdeen, in spite of their images as oil capitals, at first glance seem to fit into Hymer's category of field-office management because of their lack of headquarters facilities for major oil firms and because of the dominance of operations subsidiaries and affiliates. Aberdeen most clearly falls into the field management category. In regard to its passive extractive economy, Aberdeen responds to "forces unloosed in distant cities" (Jacobs, 1984: 34).

Houston is more central to the world petroleum economy and more diversified than Aberdeen. Houston falls into a separate category missed by Hymer: the international operations subsidiary city. Houston is a specialized command city, without leading international oil firm headquarters but with substantial control over the oil industry beyond the regional or field-office level. Although the Houston metropolis does not house the executives who make the highest-level, companywide investment decisions for major integrated oil multinationals, more organizational units of oil- and gas-related corporations, from the largest multinationals to the smaller "independents," are concentrated there than in any other world city. The offices of the leading multinationals' operations subsidiaries are located in the metropolitan area. As previously mentioned in the example of Exxon, these are more than regionalized "field offices"—they often control oil operations across the United States and across portions of the globe. In addition to housing the subsidiary offices of the oil majors, Houston is the site of the headquarters (and subsidiary) offices and plants of (1) substantial international oil corporations (for example, Pennzoil), (2) the largest oil tools and services companies, and (3) major gas transmission companies. Thus Houston, as the more diversified oil-gas area, with more backward and forward linkages, has become the leading metropolitan area on the Gulf Coast, whereas Aberdeen, in contrast, has remained less important as a metropolis in Scotland than Glasgow or Edinburgh.

TYPES OF DECLINE AFTER EXTRACTIVE BOOMS

The cycles of economic boom and bust in extraction economies are somewhat different from those in industrial production economies. Several scholars (Bunker, 1984; Jaffee and Stokes, 1986: 533-546) have noted at least two types of economic crises for extraction systems in underdeveloped countries: the temporary downturn crises created by supply-and-demand factors (such as a sharp drop in the price of an extractive commodity) and the usually more serious crises created by the depletion of the extracted commodities. In contrast to most manufacturing sectors, increased productivity and efficiency in extraction economies accelerate depletion and the ultimate abandonment crisis. Moreover, each type of crisis affects extraction regions and cities within underdeveloped and developed countries.

SUPPLY CRISIS AND CORE EXTRACTION ECONOMIES

In the 1980s global energy conservation and the substitution of non-oil-based fuels, as well the inability of OPEC and non-OPEC oil-producing countries to agree on enforceable production quotas, increased supply in relationship to demand and significantly reduced oil prices. The consequent changes in petroleum multinationals' investment strategies brought major recessions to the Houston and Aberdeen areas. Houston's oil-gas economy had buttressed the city against all twentieth-century recessions until the 1980s, but this unparalleled prosperity was followed by the most serious economic downturn in the city's history. Neither Houston's leaders nor its citizenry were prepared for the crisis with its high levels of unemployment, bankruptcies, and corporate restructuring. Between 1981 and 1986 Houston lost more than 100,000 energy-related industrial jobs. The unemployment rate grew more rapidly in Houston than in the nation, hitting 9.7% in 1983, up sharply from previous years. In 1985 there was a brief resurgence in Houston's economy, but late in 1986 the Chamber of Commerce estimated that the unemployment rate was nearly 11%; there were continuing and heavy job losses in manufacturing, oil-mining, and construction (Eisenberg, 1986: 5). However, the city's business leaders saw the downturn as temporary, and although they might have been too optimistic about the area's early recovery, it did seem probable that a decrease in world oil supplies eventually would bring a substantial Houston resurgence. The short-run problem lay not so much in this urban region's underlying extractive and processive realities but in the oversupply in the international oil market.

The Aberdeen area experienced an extractive boom for only 15 years before a major downturn. The sharp drop in North Sea oil prices between 1980 (\$40 a barrel) and 1986 (\$9.50 barrel) paralleled that in the U.S. fields, except that the price at first declined more slowly in Europe. Initially the drop in oil prices did not slow production much but did sharply reduce exploration activity from 36 rigs in summer 1985 to 13 rigs a year later (Grampian Regional Council, 1987). Heavy losses were taken in the offshore-drilling segment, as was indicated by the bankruptcy of Global Marine, the second-largest offshore-drilling participant. In 1986-1987 alone major oil firms reduced their capital outlays for exploration by 50% (Standard and Poor's Corporation, 1987: 75-99). Soon exploration and production cutbacks included those of major U.S. corporations, including Conoco, Phillips, Occidental, Exxon, Chevron, Texaco, and Mobil; there were also British cutbacks by Shell, Britoil, and BP. Oil firm profits fell from about £4 billion in the third quarter of 1985 to £1.5 billion a year later (Lloyd and Newlands, 1987: 3-4). Cutbacks in the supply and service industries also occurred; fabrication yards and engineering firms laid off employees. By 1986 the Wood Group, a local supply firm, had laid off 500 of the 2,100 employees working in 1985 (Duncan, 1987). The drop in price had a significant effect on workers, businesses, and real estate developers. Aberdeen's unemployment rate increased from 6.3% in April 1985 to 9% in April 1987. The region lost 12,500 of its 52,000 oil industry jobs between mid-1985 and 1987. By late 1987 optimistic observers were arguing that the oil and gas industry had hit bottom; they noted that only 50 of the 800 firms in the area had pulled out. Like Houston, the Aberdeen area was expected to recover in the short term (Cockhead, 1987).

Although the Houston and the Aberdeen regions experienced serious job losses, housing foreclosures, increasing office vacancy rates, and out-migration in the 1980s recession, as of 1988 the comprehensive impact of this particular supply-driven decline appears to have been more severe in Houston than in Aberdeen. One important factor is the offshore, high-tech character of most of the oil and gas development off northeast Scotland. As Gramling and Brabant (1986: 177-201) have shown for Louisiana, offshore exploration and production allows workers to commute from a number of different urban areas, rather than having to relocate to one city, thereby reducing population growth in the principal city and the later negative costs of decline there. The lack of extensive downstream oil tools, refining, and petrochemical facilities in northeast Scotland also has meant fewer negative multiplier effects from the price decline. Another explanation for the differ-

ence in the recession's impact on the two regions lies in the local planning and other governmental restrictions that in Aberdeen slowed development in housing and office construction during the extractive boom period and thus reduced office vacancy rates and housing foreclosures in the downturn. Houston, in contrast, is the prototypical "free enterprise" city with no zoning and little planning; it experienced extraordinary growth in the built environment and the consequent effects of overbuilding. In addition, the British welfare state, though weakened by the Conservative party government, provided a more extensive safety net than that in Texas, one that relieved some negative effects of the decline.

THE *DUTCH DISEASE*: DEPLETION PROBLEMS IN EXTRACTIVE ECONOMIES

Longer-term environmental problems confront extractive sectors in core and Third World countries. I cited earlier the point that Bunker (1984) made about the degradation of the ecosystem caused by extraction such as strip mining. However, the environmental impact of oil and gas development in the Houston and Aberdeen areas has been somewhat different. Onshore oil drilling in the Houston area did not create ecosystem damage sufficient to drive off investors in downstream industries, investors who came in relatively soon after the discovery of oil. In addition, petrochemical and refining investment had greater support from the state than equivalent downstream industries have had in less developed countries. In the Aberdeen case the oil and gas development has been entirely offshore, and the potential environmental degradation, such as oil spills, has not been the major reason for the slow arrival of diversified economic activities.

In the core countries, however, there is still the problem of resource depletion — the problem of the *Dutch disease*. As noted earlier, multinational corporations were important in making the Netherlands a major producer of North Sea area gas, but Dutch production was the first to peak. During the boom period multinational corporations saw a substantial increase in profits, and some knowledge was gained by a few firms in gas technology, but no major development of downstream gas-related industries and little capital spin-off into nongas industries occurred (Ellman, 1977: 281-290). The boom in gas had come at a time when downstream industries were well developed, even overdeveloped, in Europe. So when the boom was over, the Netherlands' economy suffered a major setback. Will the Houston and Aberdeen regions face the same consequences when the extractive resources are depleted?

The Houston area and the rest of the Texas "oil province" face a probable long-term crisis because of the reduction in regional oil reserves. In the 1972-1983 period approximately 6 billion barrels of oil reserves were discovered in Texas, but this was much less than the 10.6 billion barrels produced in those years. In the 1970s oil reserves declined 8% annually. During the 1980s recession that rate of decline slowed to 1%-2% a year, but that loss rate has increased with the late-1980s economic recovery in the United States. By the mid-1980s Texas oil reserves were only half what they had been in 1952 (Jankowski, 1986: 27-29). New reserves may be discovered, but the Houston-Gulf Coast area does face a probable long-run decline. Oil depletion already has had a severe impact on certain Gulf Coast areas of the adjacent state of Louisiana, which has been second to Texas in U.S. oil production. In an article in the *Wall Street Journal* (1984: 1) a reporter wrote that the Cajun communities dependent on oil extraction in southern Louisiana have faced severe economic and cultural problems because of the decline in the oil industry.

North Sea oil production may have peaked. When much of the North Sea oil is gone, probably in the first decades of the next century, the economic base in the greater Aberdeen area will decline rapidly. As one local scholar noted, "The first major recession in the industry after 15 years of growth and expansion marks the onset of a mature phase in the industry's development. The largest and most profitable fields have been developed, production and revenues have peaked but much activity remains" (Bonney, 1986: 5). In the 1986 *Scottish Petroleum Annual* (p. 5) an author asserted that "it appears that UK North Sea oil production has peaked and started a long decline . . . already in some quarters there is pre-occupation with field abandonment costs." This industry assessment argued for expanded local education, training, and research as ways of reducing the negative consequences of the oil and gas decline. By 1987 a major issue for Great Britain (and adjacent Norway) was the dismantling of the 200-plus North Sea production platforms. When the oil and fields begin to peter out in the decades after the year 2000, this will become a \$10 billion problem. The eventual decline of the oil industry in the North Sea also will mean a decline in the oil services and supply industry in metropolitan Aberdeen, because most British and multinational corporations have equivalent operations elsewhere (Harris et al., n.d.: 32-35). Little local manufacturing spin-off has resulted from the extraction boom, and little of the profits and capital generated for local non-oil-manufacturing industries has been utilized. The potential for the Dutch disease to hit Scotland and the rest of Great Britain was anticipated as early as 1976. In a *Lloyds Bank Review* article, Kahn (1976: 12) stated that

there is a danger that we shall export less and less, and import more and more, manufactured goods. The production and refining of oil, and the production of petrochemicals, provide little employment. As our industries wither away — as a result of our failure to be competitive — unemployment will become greater and greater. It will not be Keynesian unemployment, due to lack of demand. It will be unemployment which is the result of the lack of productive equipment. And when the flow of North Sea oil and gas begin to diminish, about the turn of the century, our island will become desolate.

Oil economist James McKie (1986: 9) has asked if Houston also is “in a danger zone of dependence, since there are really only two significant activities in Houston: energy, and building Houston.” A critical difference between Houston and Aberdeen exists. The Houston area has a far more extensive and diversified oil and gas industry, with more affiliates, divisions, headquarters facilities, and operational facilities. With many downstream and upstream linkages, Houston is far more significant as an administrative center for worldwide operations and thus may be less affected by local resource depletion. In Aberdeen one sees extraction with short-run regional development; in Houston one views extraction with more sophisticated and longer-run development. Houston’s hierarchical position in the world oil and gas system and its upstream and downstream economic layers give it greater potential for protection against local depletion shocks than Aberdeen, which is lower in the hierarchy of the world oil and gas system and which has fewer layers of industrial buffering. Houston is beginning to face the decline in regional petroleum reserves and also some worldwide restructuring in the world’s refining and petrochemical industries. Nonetheless, Houston probably will remain significant globally as long as the multinational oil corporations that have headquarters and subsidiary operations offices there continue to be important.

EXTRACTIVE CITIES IN DEVELOPED COUNTRIES

The importance of primary extractive systems, underscored in the work of a number of scholars researching underdeveloped countries, has been shown for the United States and Great Britain. I have explored research questions about these extractive economies, and the answers can now be summarized. In regard to the question about the differences between Third World extractive regions and core regions, certain locational similarities have been noted. In both underdeveloped and developed countries, extractive economic systems tend to be fixed in regional location because of linkage to natural resources. But in contrast to extractive regions in underdeveloped

countries, extractive areas in core countries are more likely to have developed prior economic layers sufficiently advanced to provide the infrastructure facilitating later advanced industrial development. In the developed countries enclave extraction economies are more likely to generate downstream manufacturing sectors.

The question about similarities and differences in Houston and Aberdeen was answered as I explored the importance of the palimpsest and historical timing in each region's development (Questions 3 and 4). Oil and gas firms chose Houston and Aberdeen as major command cities for the emerging oil and gas regions because in both coastal cities much infrastructure — such as the port, transport facilities, and banks — was substantially developed prior to the coming of the oil and gas industry. The historical differences in the scale of capital, in capital centralization, also have shaped the divergent characters of these core regions. Both Houston and Aberdeen have been greatly influenced by the investment decisions made by the multinational oil and gas corporations dominating the world oil and gas system. Expectations of continuing dominance are illustrated in a recent Exxon (1985: 32) report, which contained the statement that whatever happens in the governmental or OPEC spheres,

by virtue of their financial resources, worldwide facilities and technical and managerial know-how, multinational energy companies like Exxon will continue to play a vital role in meeting world energy needs.

Yet Aberdeen's later development, oriented to an offshore industry, resulted in large-firm dominance from the beginning, whereas Houston's initial development was substantially dependent on smaller oil and oil tools and supply firms, some of which survived and grew. As a result, Houston developed considerably more oil- and gas-related firms with international scope than did Aberdeen. Early development, contra Gerschenkron (1962) and some other development analysts, was better. The metropolitan areas of Houston and Aberdeen now occupy different positions in the world oil and gas system. Aberdeen is an example of a field-office management city, whereas Houston is an international operations subsidiary city, one without the majors' headquarters but with operations control over the oil and gas industry beyond the regional office level. I also have documented the hierarchical linkage between dependent Aberdeen and Houston; numerous Houston oil tools and services corporations came to Aberdeen to support the operations of the international oil corporations.

Also important in differentiating the two regions is the early development in Houston of important downstream manufacturing and processing components of the oil and gas industry. Substantial downstream development has

not occurred in Aberdeen. To paraphrase a University of Aberdeen sociologist (Moore, 1987), the local people in Aberdeen did not understand what was going on. They did not understand that Aberdeen had become a branch plant of the international multinationals. Local people had big ideas about what would happen. People felt that bringing oil was bringing industrialization; they had the imagery of men hitting metal and of big manufacturing plants. The people of Scotland were aware that they were providing oil for Britain, but they did not understand that the multinational profits often would not benefit Scotland. Their "oil brings industry" view was wrong.

I have identified a number of reasons why this downstream development did not come to the Aberdeen area. Central here is the lateness of Aberdeen's development, because multinationals' refining and petrochemical capacities were overdeveloped around the globe when the North Sea fields came on line. The North Sea oil-gas boom developed late in the history of the world oil industry and of multinational centralization and concentration.

I also have demonstrated how the differing orientations of the American and British governments toward the oil firms has been important to the growth of the Houston and Aberdeen economies. Unlike Aberdeen, Houston and the oil-related firms located there developed along with the national state. At a relatively early period in the city's growth, powerful Texan politicians represented Houston in Washington, D.C. These oil politicians got huge concessions for the local and multinational oil and gas corporations, including the oil depletion allowance and the massive federal capital investments in the downstream development of the petrochemical industry. Men like Jesse Jones and Sam Rayburn were pivotal in these efforts. Sunbelt politicians linked to the oil companies have remained influential to the present day.

Aberdeen suffered the consequences of later development, politically as well as economically. Aberdeen has been more of a peripheral political area exploited by the national government; because of the differences in political systems and in historical timing, the local politicians have played a small role at the national government level in regard to oil development. In Britain the concessions to the oil multinationals came, but primarily because of oil firm power at the national level; a relatively favorable taxing regime was provided by the very southern (London-oriented) and conservative central government to stimulate North Sea production. However, unlike the Norwegian government, which controls the development in its eastern North Sea fields in the public interest and has become directly involved in extraction, the Conservative government in Britain left North Sea development largely under the dominance of foreign multinational corporations.

REFERENCES

- American Petroleum Institute (1977) *Basic Petroleum Data Book*. Washington, DC: Author.
- American Petroleum Institute (1988) *Basic Petroleum Data Book*. Washington, DC: Author.
- Austin American-Statesman (1988) "Adair surveys burned-out oil rig." July 10: A6.
- BONNEY, N. (1986) "Explaining development in Scotland's North East: a working paper." Presented at Development Studies Association, Scottish Study Group, Stirling University, England, June 6-7.
- BONNEY, N. (1987) Personal communication (June 12).
- BUNKER, S. G. (1984) "Modes of extraction, unequal exchange, and the progressive underdevelopment of an extreme periphery: the Brazilian Amazon, 1600-1980." *Amer. J. of Sociology* 89 (March): 1017-1064.
- BURKA, P. (1983) "The year everything changed." *Texas Monthly* 11 (February): 109.
- Business Week (1970) "Shell's \$25-million trip to Houston." September 19: 16.
- CHAPMAN, D. (1983) *Energy Resources and Energy Corporations*. Ithaca, NY: Cornell Univ. Press.
- CHAPMAN, K. and D. WALKER (1987) *Industrial Location*. London: Basil Blackwell.
- CHASE-DUNN, C. (1984) "Urbanization in the world-system," pp. 111-120 in M. P. Smith (ed.) *Cities in Transformation*. Beverly Hills, CA: Sage.
- Chase Manhattan Bank Petroleum Situation Newsletter (1983) "Petrochemicals and petrochemical feedstocks." March: 1-3.
- COCKHEAD, P. (1987) Personal communication (June 16).
- CORDEN, W. M. and J. P. NEARY (1982) "Booming sector and de-industrialization in a small open economy." *Econ. J.* 92 (December): 825-848.
- DUNCAN, H. (1987) Personal communication (June 17).
- EISENBERG, N. (1986) "Economic newsletter." *Houston* 57 (August): 5.
- ELLMAN, M. (1977) "Report from Holland: the economics of North Sea hydrocarbons." *Cambridge J. of Economics* 1 (September): 281-290.
- Engineer Publishing Company. (1947) *Petroleum Data Book*. Dallas: Author.
- Exxon Corporation (1985) *This Is Exxon*. New York: Author.
- FEAGIN, J. R. (1988) *Free Enterprise City: Houston in Political-Economic Perspective*. New Brunswick, NJ: Rutgers Univ. Press.
- FRANK, A. G. (1969) *Latin America: Underdevelopment or Revolution*. New York: Doubleday.
- FRIEDMANN, J. (1966) *Regional Development Policy: A Case Study of Development in Venezuela*. Cambridge, MA: MIT Press.
- GAVENTA, J. (1980) *Power and Powerlessness: Quiescence and Rebellion in an Appalachian Valley*. Urbana: Univ. of Illinois Press.
- GERSCHENKRON, A. (1962) *Economic Backwardness in Historical Perspective*. Cambridge, MA: Harvard Univ. Press.
- GRAMLING, B. and S. BRABANT (1986) "Boomtowns and offshore energy impact assessment." *Soc. Perspectives* 29 (April): 177-201.
- Grampian Regional Council (1981) *The Impact of Northern Oil in the Grampian Region*. Aberdeen: Author.
- Grampian Regional Council (1986) *Report of Survey: Grampian Region Structure Plan, Aberdeen Area Review*. Aberdeen: Author.
- Grampian Regional Council (1987) "Impact of lower oil prices since January 1986 upon Grampian Region." (unpublished)

- GREENHUT, M. (1956) *Plant Location in Theory and Practice*. Chapel Hill: Univ. of North Carolina Press.
- HALLWOOD, P. (1986) "The offshore oil supply industry in Aberdeen: the affiliates—their characteristics and importance." North Sea Study Occasional Paper no. 23. Aberdeen: University of Aberdeen.
- HARRIS, T., G. LLOYD, A. MCGUIRE, and D. NEULANDS (n.d.) "The management of change: local government in Aberdeen." Department of Political Economy, University of Aberdeen. (unpublished)
- HARVEY, D. (1985) *The Urbanization of Capital*. Baltimore: Johns Hopkins Univ. Press.
- Houston (1933) "They still want to 'buy' Houston." Vol. 4 (March): 3.
- Houston Chamber of Commerce (n.d., circa 1985) (untitled printed brochure.) Houston: Author.
- HUNT, D. (1987) Personal communication (June).
- HYMER, S. H. (1979) *The Multinational Corporation: A Radical Approach*. Cambridge: Cambridge Univ. Press.
- INNIS, H. (1940) *The Cod Fisheries: The History of an International Economy*. New Haven, CT: Yale Univ. Press.
- JACOBS, J. (1984) *Cities and the Wealth of Nations*. New York: Random House.
- JAFFEE, D. and R. STOKES (1986) "Foreign investment and trade dependence." *Soc. Q.* 27 (4): 533-546.
- JANKOWSKI, P. (1986) "What's the status of Texas' reserves." *Houston* 57 (April): 27-29.
- JONES, J. (1951) *Eighty Billion Dollars: My Thirteen Years with the RFC (1932-1945)*. New York: Macmillan.
- KAHN, R. (1976) "Mr. Eltis and the Keynesians." *Lloyds Bank Rev.* 124: 12.
- LARSON, H. M. and K. W. PORTER (1959) *History of Humble Oil and Refining Company*. New York: Harper & Row.
- LLOYD, M. G. and D. NEULANDS (1987) "Aberdeen." University of Aberdeen. (unpublished)
- LOSCH, A. (1954) *The Economics of Location*. New Haven, CT: Yale Univ. Press.
- MacKAY, G. A. and A. MOIR (1980) *North Sea Oil and the Aberdeen Economy*. London: Social Science Research Council.
- MANDEL, E. (1978) *Late Capitalism*. London: Verso.
- MASSEY, D. (1984) *Spatial Divisions of Labor*. New York: Methuen.
- MCCOMB, D. (1981) *Houston: A History*. Austin: Univ. of Texas Press.
- McKIE, J. (1986) "The impact of Spindletop on Texas." University of Texas. (unpublished)
- MOORE, R. (1987) Personal communication (June 12).
- MOSKOWITZ, M., M. KATZ, and R. LEVERING [eds.] (1980) "Tenneco," pp. 848-850 in *Everybody's Business: An Almanac*. San Francisco: Harper & Row.
- NEMETH, R. J. and D. A. SMITH (1988) "An empirical analysis of commodity exchange in the international economy: 1965-1980." *Int. Studies Q.* 32 (2): 227-240.
- ODELL, P. R. (1963) *An Economic Geography of Oil*. Westport, CT: Greenwood.
- ODELL, P. R. and L. VALLENILLA (1978) *The Pressures of Oil*. New York: Harper & Row.
- PRATT, J. A. (1980) *The Growth of a Refining Region*. Greenwich, CT: JAI Press.
- RAND, C. T. (1975) *Making Democracy Safe for Oil*. Boston: Little, Brown.
- REES, J. and P. ODELL [eds.] (1987) *The International Oil Industry*. New York: St. Martin's Press.
- RIDLEY, J. K. (1930) "Petroleum Refining." *Houston* 1 (June): 18.
- Scottish Office (1987) *North Sea Oil and Gas* [pamphlet]. Edinburgh, Scotland: Author.
- Scottish Petroleum Annual (1986) "Keys to the future—education, training research, imagination, courage, vision," p. 5. Aberdeen: Aberdeen Petroleum Publishing.

- SHERRILL, R. (1983) *The Oil Follies of 1970-1980*. Garden City, NJ: Anchor.
- SIBLEY, M. M. (1968) *The Port of Houston*. Austin: Univ. of Texas Press.
- SLATER, D. (1975) "Underdevelopment and spatial inequality: approaches to the problem of regional planning in the Third World." *Progress in Planning* 4 (Pt. 2): 137-168.
- SOLBERG, C. (1976) *Oil Power*. New York: Mason/Charter.
- SPROTT, T. F. (n.d., circa 1986) "Impact of Oil upon Grampian Region: The First Fifteen Years." Grampian Regional Council, Aberdeen. (unpublished)
- Standard and Poor's Corporation (1987) *Industry Surveys: Oil-Gas Drilling and Services Basic Analysis*. New York: McGraw-Hill.
- STOKES, R. and D. JAFFEE (1982) "The export of raw materials and export growth." *Amer. Soc. Rev.* 47 (June): 402-407.
- TAYLOR, J. L. (1983) Personal communication (May).
- TAYLOR, M. and N. THRIFT [eds.] (1982) *The Geography of Multinationals*. New York: St. Martin's Press.
- Wall Street Journal (1984) "In Louisiana oil rush, one thing depleted was culture of Cajuns." October 25: 1, 22.
- WEEDE, E. and H. TIEFFENBACH (1981) "Three dependency explanations of economic growth." *European J. of Pol. Research* 9: 391-406.
- WHARTON, C. R. (1930) "South Texas is resourceful." *Houston* 1 (June): 9.
- WILLIAMSON, H. F., R. ANDREANO, A. DAUM, and G. CLOSE (1963) *The American Petroleum Industry: The Age of Energy, 1899-1950*. Evanston, IL: Northwestern Univ. Press.

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