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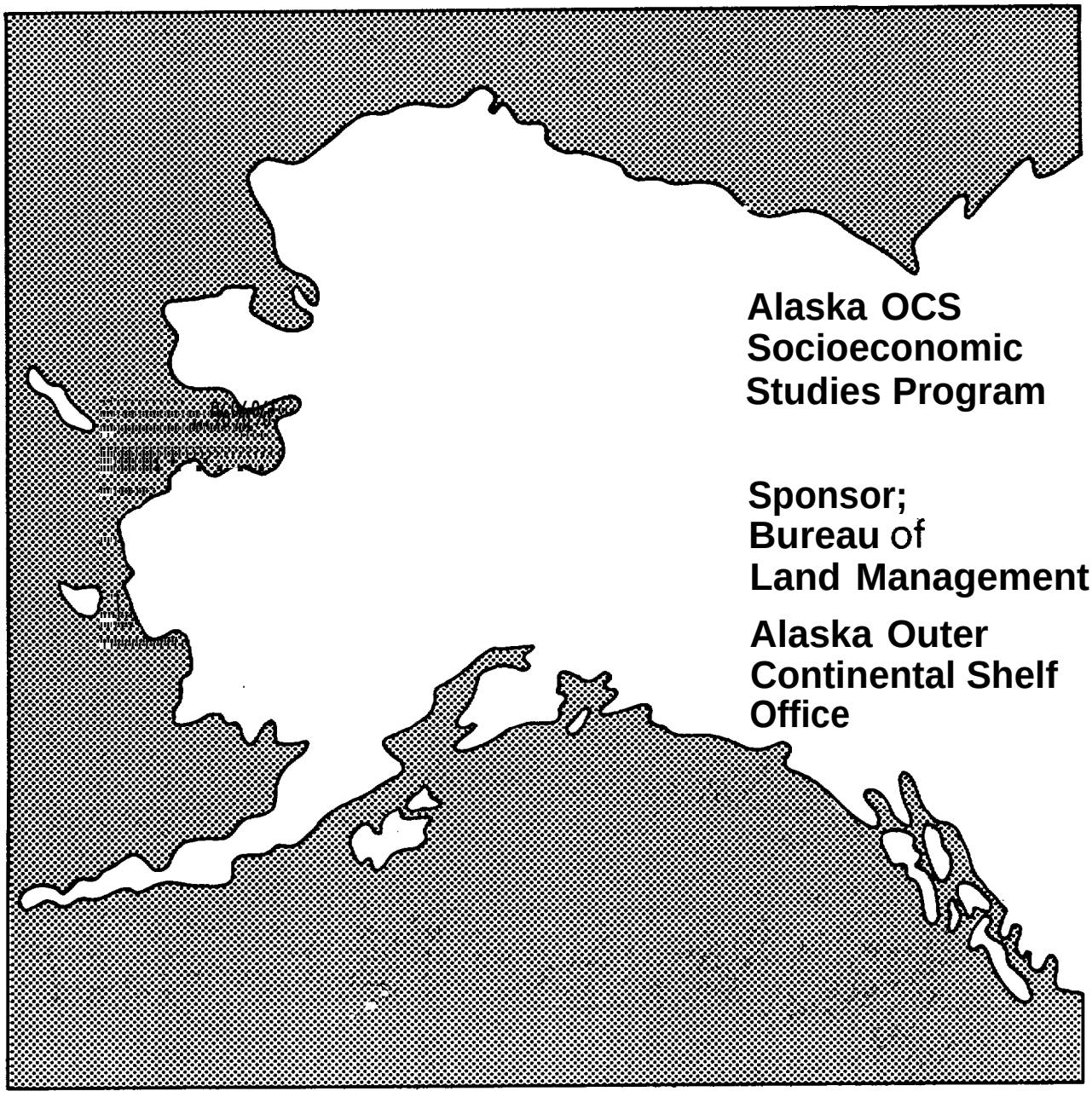

Alaska OCS Socioeconomic Studies Program

Sponsor; Bureau of Land Management

Alaska Outer Continental Shelf Office

Socioeconomic Impacts of Selected Foreign OCS Developments

The United States Department of the Interior was designated by the Outer Continental Shelf (OCS) Lands Act of 1953 to carry out the majority of the Act's provisions for administering the mineral leasing and development of offshore areas of the United States under federal jurisdiction. Within the Department, the Bureau of Land Management (BLM) has the responsibility to meet requirements of the National Environmental Policy Act of 1969 (NEPA) as well as other legislation and regulations dealing with the effects of offshore development. In Alaska, unique cultural differences and climatic conditions create a need for developing additional socioeconomic and environmental information to improve OCS decision making at all governmental levels. In fulfillment of its federal responsibilities and with an awareness of these additional information needs, the BLM has initiated several investigative programs, one of which is the Alaska OCS Socioeconomic Studies Program.

The Alaska OCS Socioeconomic Studies Program is a multi-year research effort which attempts to predict and evaluate the effects of Alaska OCS Petroleum Development upon the physical, social, and economic environments within the state. The analysis addresses the differing effects among various geographic units: the State of Alaska as a whole, the several regions within which oil and gas development is likely to take place, and within these regions, the various communities.

The overall research method is multidisciplinary in nature and is based on the preparation of three research components. In the first research component, the internal nature, structure, and essential processes of these various geographic units and interactions among them are documented. In the second research component, alternative sets of assumptions regarding the location, nature, and timing of future OCS petroleum development events and related activities are prepared. In the third research component, future oil and gas development events are translated into quantities and forces acting on the various geographic units. The predicted consequences of these events are evaluated in relation to present goals, values, and expectations.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decision making. In addition to making reports available through the National Technical Information Service, the BLM is providing an information service through the Alaska OCS Office. Inquiries for information should be directed to: Program Coordinator (COAR), Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

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Alaska OCS Socioeconomic Studies Program

SOCIOECONOMIC IMPACT OF SELECTED FOREIGN OCS DEVELOPMENTS

Prepared For

Bureau of Land Management

Alaska Outer Continental Shelf Office

April 30, 1979

NOTICE

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Alaska OCS Socioeconomic Studies Program
Socioeconomic Impacts of Selected Foreign OCS Development

Prepared by
Habitat North, Inc.

April 1979

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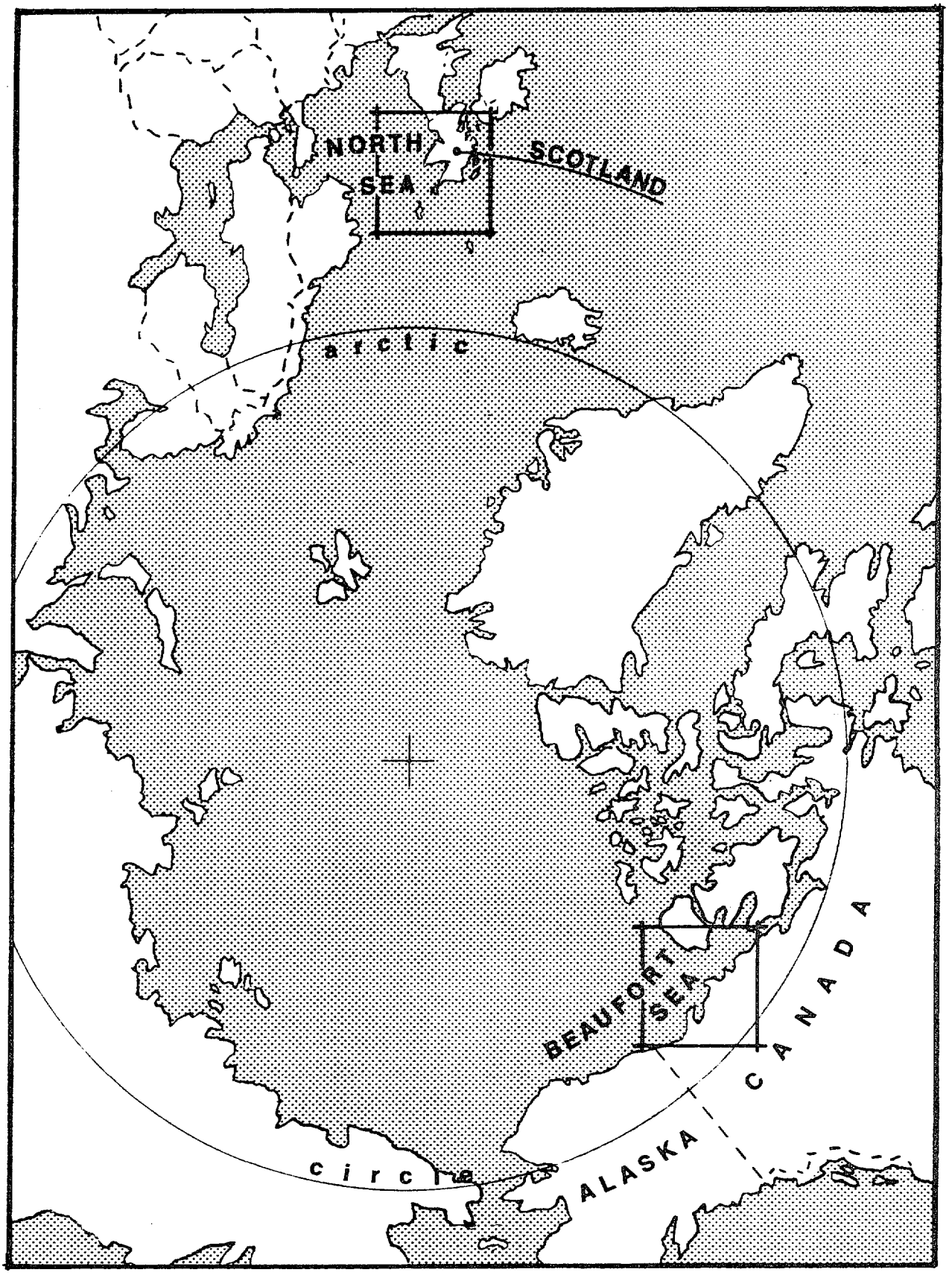


Map i World Context

PART ONE

NORTH SEA EXPERIENCE

CAPSULE HISTORY

Major natural gas discoveries in the southern North Sea in the mid-1960s led to initial development of the offshore energy industry in the United Kingdom. These fields, located in British and Dutch portions of the area (see Map 1.1.3, page 27) have been producing gas for over ten years.

Exploration for oil and gas reserves in the northern North Sea progressed from the late 1960s into the 1970s. The first major discovery was in the Ekofisk field in Norwegian waters, followed by British Petroleum's discovery of the large Forties field in Scottish waters at Latitude 58° N in October 1970. Since then, a continuous pattern of new field discoveries has occurred, with deposits clustered along the U.K.-Norway median line and especially in the so-called "East Shetland Basin" at Latitude 61° N. Exploration activities have been undertaken all around the Scottish coast, and major new fields have been discovered in the inner Moray Firth and in the "West Shetland Basin" in the north Atlantic Ocean. Exploration is now contemplated in Scottish and Norwegian waters north of Latitude 62° N, and in further tracts in the north Atlantic.

A number of fields have been developed, the majority using steel jacket platforms for production phases. The fabrication of these paltforms has taken place in several locations on the British mainland. In deeper waters (up to 200m/650 ft) concrete gravity platforms have been uti l ized. These have also been fabricated in Scotland as well as Norway. Oil reserves are brought ashore by five submarine pipeline systems; two additional systems presently bring associated natural gas ashore, and more gas lines are under

development. In some cases oil is transferred directly to tankers at sea by means of buoy moorages.

Servicing of North Sea fields has been undertaken from a number of Scottish locations; in particular from Aberdeen, Montrose, Peterhead and Dundee on the Scottish east coast. Other service bases have been established in the Shetland islands, and on a temporary basis from the Orkney islands. Separation and drying facilities have been constructed at pipeline landfalls on the Scottish mainland (at St. Fergus and Cruden Bay on the Grampian coast) and at Flotta in the Orkney islands and Sullom Voe in the Shetland islands. Major expansion has occurred at the principal Scottish refining and petrochemical complex at Grangemouth; overland pipelines have been constructed from northern landfalls to this and other locations. Transshipment of crude oil from Orkney and Shetland to British, European, and North American destinations has occurred. New refining and processing complexes have been planned in a number of locations in Britain.

As further exploration is continuing, no estimate of ceiling reserves for North Sea fields can be made with great reliability. The lifespan of reserves discovered thus far is generally regarded to extend beyond the turn of the century. Manufacturing in Scotland associated with development-phase activities will probably keep pace with new discoveries, though not at the rapid pace experienced in the early 1970s.

The principal impacts on Scotland from offshore activities have been generated in the areas of:

- Offshore servicing of exploration- and production-phase installations (rigs, platforms, etc.);
- Fabrication of offshore installations;
- Submarine pipe-coating and pipelaying;
- Oil industry management and engineering;
- Increased petrochemical and processing activities.

These activities have tended to be concentrated in coastal areas, especially in East Scotland, and have led to the social and economic impacts discussed in this paper.

INTRODUCTION AND SYNTHESIS OF FINDINGS

Chapters I-III discuss various aspects of socioeconomic change in Scotland brought on by exploration and development of offshore hydrocarbon reserves in the British sector of the North Sea, insofar as they may be helpful in planning for OCS oil activities off the coast of Alaska. While important and careful research has been conducted by Norwegians into North Sea oil impacts in that country, there is very little English-language material dealing with Norway available. The lack of this information source is unfortunate but unavoidable.

Subsequent sections are grouped by economic, social, administrative, political, and fishing-related topics. Several points should be raised regarding this approach.

First and most importantly, the approach requires an artificial division of highly integrated impacts. The advent of oil-related activity in coastal areas is generally complex, and like any development phenomena it is viewed locally in comprehensive terms. Thus, by selecting or categorizing impact one encounters risk at several levels. For example, analysis of secondary-level employment changes which might possibly be attributable to oil can be an instructive approach to economists and sociologists alike. Therefore the data having to do with these employment changes may be cited twice or more, adding undue emphasis to the "real" effect of the change. Similarly, one incident (say a controversial planning inquiry) may illustrate multiple trends, the sum of which may suggest more conflict than the whole, judged by eyewitnesses.

A second limitation must also be mentioned: the North Sea's oil development history is still very dynamic. For this reason any "conclusions" one draws must be viewed with suspicion, as shown eloquently by the degree of error in domestic forecasts in the U.K. British analysts were quickly on the scene as oil's influences in Scotland first appeared. An overview of the resultant literature reveals considerable, and very understandable, uncertainty and anxiety over oil's overall impact, uncertainty which still continues. If any aspect of the oil industry can be clearly seen from Scottish experience, it is the industry's volatility, and, unfortunately, a similar volatility on the part of analysts. Comprehensive retrospective analysis of North Sea oil will have to wait until the industry's rundown, so work on these lines simply does not yet exist. Attempts at overall modelling, while instructive, have quickly been outpaced by developments.

A third qualifying factor rests in the original data. Research directed to oil-related developments in the U.K. has generally been supported by the British government, who have understandably been most concerned about the macroeconomic impact of the country's new-found and enormous oil wealth. Where regional issues have been examined, the minimum level of reliable data has often (and conveniently) rested with sources (e.g., local government) which themselves have combined various local data. The risk here is that very important local effects are concealed in an avalanche of skewing information. This has been the case in reports from Highland Region, for example, where the principal socioeconomic impacts have been highly localized, and where relative population movement figures may disguise significant trends at the smallest scale. As this paper

rests on secondary-source information, control for these sorts of problems has been difficult.

Finally, one major group of researchers is badly under-represented in the available data. This is the “industry” itself. (The term “industry” is recurrent in discussions of oil impacts. It is a misleading device, since, it seems, there is little clear overall leadership or anything but tactical synchronization of effort among operators, suppliers, or service components of the “industry”.) Without stretching the imagination too far, one can speculate that the multinational firms involved in petroleum are themselves the true comparative planners, the only group possessing the required overview and track record to make real use of comparative studies. That the relative silence may in fact be a conscious tactic of the “industry” does not reduce the gap in available literature, and the absence of this point of view can only be regarded as lamentable.

SYNTHESIS AND SUMMARY OF FINDINGS

The overall impact of North Sea oil on Scotland should not be underestimated. In virtually every arena of national life, oil developments and their attendant economic and social impacts, have led to major changes in baseline characteristics of the country. Some listing of these changes may be illustrative, if only to demonstrate the breadth and depth of oil’s influence:

- Oil has enhanced centrifugal nationalism in Scotland and has assisted the likely formation of a quasi-federal system for the first time in the United Kingdom’s history.

- Oil has probably reversed out-migration from Scotland as a whole, and especially from some traditionally migration-prone areas.
- Oil has single-handedly reversed the U.K.'s balance of payments posture, has assisted in the reduction of Britain's inflation rate, strengthened Sterling, and has moved the country towards the privileged ranks of energy exporting states.
- Oil has contributed to the establishment of an entirely new offshore industry in Scotland, now moving into export markets previously dominated by other countries.
- Oil has exacerbated previously-existing regional disparities in Scotland because of its localized nature;
- Oil has led to increased central pre-emption of local control over planning and the environment;
- Oil has forced new "cultural accounting" in previously self-confident rural areas;
- Oil has led to rapidly raised and lowered expectations of economic growth in traditional elements of Scottish society;
- Oil has raised fears over possible conflict between users of marine and coastal environments.

Such a list could go on at some length; however, three areas of synthesis are worthy of brief discussion prior to the reader's investigations into more detailed aspects of offshore oil's impact on Scotland.

Convergence of Economic and Physical Planning

Britain has long perceived the links between economic planning and environmental control , and has instituted a series of far-reaching, if experimental, attempts to harness both fields of public involvement. Starting with pre-war attempts to reduce London's growth rate and thereby to stimulate investment in depressed regions (including Scotland), British government moved into new towns development, which had as main driving forces theories of the benefits of clustered economic growth and infrastructure efficiency. Postwar policy was consistently aimed at economic and environmental support for depressed, hence population-losing, regions, at defusing rapid, unbalanced growth in southeast England, and in establishing "counterdrift" policies to attract and anchor industrial activities in economically marginal areas.

The areas traditionally most "marginal" have been south Wales, Northern Ireland, the north of England, including the Tyne and Mersey metropolitan areas, and, above all, Scotland. Scotland's problems have been rooted in a circle of economic decline: her heavy industries, mainly steelworking and shipbuilding, by and large remained intact after the war, that is, retained their prewar and ultimately obsolescent natures, while other countries with the same industries saw new capital and technology transfers helping their efficiency. Only now is massive new investment in these industries being felt, although Scottish shipbuilding remains uncompetitive and possibly moribund.

Scotland's rural areas, including some of those now experiencing oil-

related impact, tended to decline apace with her heavy industry. Where feasible, agriculture was "modernized," i.e., was subjected to capitalization, thereby reducing its labor demands further. Scotland's traditional modes of agriculture and linked industry, such as sheep-rearing and knitting, came under increasing pressure from foreign competition. Fishing did fairly well, at least through the 1960's, although stocks began to decline under foreign fleet pressures.

Central government's response was to combine centralized economic planning with physical planning programs, culminating in "Development Areas" and "Special Development Areas" where such benefits as advance-factory building, direction of national"ized industries' investment policies, investment and labor credits to new employers, etc., were made available. In the north, a "Highlands and Islands Development Board" was also established to encourage, through equity participation if necessary, industrial growth in the Highland region all aimed at arresting the out-migration resulting from the lack of adequate employment opportunities.

By the late 1960's enough data was available to suggest these steps, by and large, were not working very well. Those parts of Scotland, notably the north and west, which showed the highest degrees of economic malaise continued to do so. Thus, when oil was discovered off Shetland and along the Norway-U.K. median line, it must have appeared as a godsend to economic-physical planners, because a high-value, state-of-the-art industry suddenly appeared with nowhere else to go.

The prospect of intense shore-based industrial use dovetailed well with "counterdrift" policies: here was a real opportunity to designate population and industrial "holding points" and make them work.

To date, this discovery of a convenient link between regional economic and physical planning has had a mixed track record. The controlling factors in its success appear to have been the technological nature of any particular arriving industry rather than its manpower demands or physical requirements. With benefit of hindsight, it can be asserted that an uncritical acceptance of very temporary and highly volatile components of the offshore industry have led to a simple postponement of an ultimately continuing pattern of regional decline in many of the oil areas.

Social Impact and Politicization

By the late 1960's Scotland's politics were in transition from classic Labour Party dominance to a more pluralistic system. Opinion as to the generating forces varies, but a general disillusionment with Labour's abilities to reverse Scotland's economic woes undoubtedly played some role. By 1967 the Scottish National Party, advocating ultimate political independence, had won Parliamentary representation, and adoption of "emergent nations" rhetoric was a fact of political life in the country. Oil intruded into this dynamic situation dramatically and provided a convenient symbol to the SNP of Westminster's continuing exploitation of Scottish resources to the benefit of other elements of British society. The SNP pursued this line of propaganda relentlessly, and quickly broadened its symbolic content to embrace all dealings between London and Scotland.

While oil, or more exactly, the disposition of its revenues, still plays a major role in Scottish politics, the image of oil wealth passing through socially deprived Scotland has lessened somewhat, in light of the country's acceptance of its presence offshore and the undeniable, if temporary, beneficial effect oil has had on the British economy. The SNP'S slogan "Rich Scots or Poor Britons?" now probably lacks the political impact it had five years ago, but the trend it set off has abated only slightly.

In its most dramatic form, it has nearly resulted in establishment of a new layer of representative democracy in Scotland, as "independence" was transformed to "devolution" in the political process. The centrifugal force of nationalism in Scotland, driven in part by the image of great oil wealth, has led to possible creation of a new system of government in the country, indeed in Britain as a whole, as a Scottish Assembly may be formed, and as demands of equivalent treatment rise from depressed English regions.

Within Scotland itself, the rapid politicization associated with oil has had its regional components. Shetland, forced to deal independently with major oil concerns, has developed a high degree of political self-confidence in its dealings with London. Shetland voted in the negative on the Assembly's enabling referendum, fearing the loss of its new-found influence in Westminster. A local joke goes that if it's "Scotland's Oil", then surely it's "Shetland's Oil", while some in the islands argue it must actually be "Unst's Oil", reflecting a) the location of proven reserves, and b) the cynicism with which the SNP's slogan is now viewed in Shetland. More serious, however, is Shetland's persistent analysis of

its overall constitutional relationship with the rest of the U.K. Some support is now evident for "evolution" to a Faroese model of semi-independence. Oil has set off major trends of political alignment and changing perspectives in some of the regions of Scotland.

Anticipation and Planning,

Scottish experience suggests that detailed planning for oil activities is only marginally successful. Anticipation, however, progresses regardless of actual development, and it may be argued that the high degree of anticipation of oil developments experienced there has had positive as well as negative influences.

In one section in the following text, a quoted author speculates that the most important cultural accounting, or affirmation of uniqueness, which takes place in a society faced with rapid development occurs when the possibility of that development is first discussed. In other words, the very prospect of change, whether or not it subsequently materializes, is enough to set off sociocultural change. The author quoted limits his analysis along these lines to a small population; but one may see some of the same forces across Scottish society as a whole. Rapid change, only partly controllable, leads to an assessment of "where we've been and where we're going" which is amply evident in post-oil Scottish literature.

It must be borne in mind continually that chief among Scotland's pre-occupations since the war has been its struggling economy and resulting population loss. Oil has represented by far the largest single deviation

from the continuing pattern of economic depression. The national anticipation of change associated with oil has had a highly stimulating effect on Scottish self-awareness and self-examination. This can only be regarded as a positive effect of oil on Scottish society, one which hopefully will have a parallel in Alaska.

SCOTLAND-ALASKA COMPARABILITY

Each section in the following text concludes with a recap of the salient points covered and with a discussion as to their applicability to Alaskan conditions. Many of these comparisons are still only potential, given the absence of major OCS oil activities in Alaskan waters.

Similarities

The basis of present comparability must rest with Alaskan conditions which are or were similar to Scottish baseline conditions, to common aspects of the offshore oil industry, or to elements of Alaskan social life which have Scottish counterparts. These are significant:

- Both areas are maritime. Fishing and marine subsistence activities have a long history in both regions.
- Alaska and Scotland are both regarded as remote and peripheral by many elements in their respective larger societies. Their populations, and their resultant influence over national affairs, are small in proportion to national totals.
- There are regions both in Scotland and Alaska with relatively traditional social structures still evident. While the economic

structures of these areas differ widely, they are distinguishable from the “metropolitan” culture by factors of language, cultural history, land use and tenure, race (Alaska), religion (parts of Scotland), and numerous other factors. Thus the impact of major non-traditional industrial activities has significant cultural as well as economic dimensions.

- The conditions faced by offshore oil and gas operators are frequently, but not always, similar. Factors of distance from corporate centers (say Houston or London) or from government centers, are in play as well as simple distances from suppliers or shore support. The marine environments are also occasionally similar--deep water, high seas, unreliable weather, awkward transport and staging conditions, remote landfalls, etc.

There may be more disputable similarities, too, which nevertheless might hold some potential importance to comparative analysis. One is a feeling of "apartness" which separates--psychological ly--Scotland and Alaska from their larger political units. There are feelings expressed in both areas that Scottish or Alaskan interests are not well regarded by English or Lower 48 authorities respectively. In Scotland these feelings are manifested in the form of pub jokes, but extend all the way to massive voter support for an avowedly pro-independence political party. In Alaska they are not normally demonstrated as strongly; nevertheless a combative stance against “outside” interests is occasionally taken, graphically illustrated in the recent controversy over public lands designation. Oil has played some role in both instances, through publicity over its discovery, debate over disposition of its revenues, or concern over its environmental

impact.

Many Alaskans and Scots see themselves as residents of small political units suddenly confronted with one of the largest-scale economic enterprises in the world--multinational oil. U.S. and U.K. policies in both cases have dictated rapid exploitation of the resource, and it is unlikely that objections to rapid development raised in Scotland or Alaska would significantly alter these national priorities. Instead, development of oil reserves is a given, and the bulk of debate inside Scotland or Alaska has tended to be directed at means of modifying or reducing oil's impacts rather than halting the process altogether. These modifications have centered on protecting the cultural and environmental integrity of areas near oil developments to the greatest extent practicable, and on how royalties, lease sale income, user fees or taxes, can best be used to build a stable post-oil economic base.

Both Scotland and Alaska have strong regional differences within their boundaries, and these are not always fully recognized by outsiders. In Alaska the town-bush dichotomy is well perceived in the state but possibly less so in other parts of the U.S. The cultural and environmental differences between arctic Alaska and, say, the southeast of the state are profound, and the advent of offshore oil near one of these areas may have entirely different implications in economic or social terms than it would near the other. The same applies to the southwest, northwest, or south-central regions of Alaska.

A similar situation prevails in Scotland. Economically and culturally, Shetland is very far removed from Glasgow. Edinburgh and the Western Isles are arguably as relatively remote from one another as Anchorage and Barrow.

Oil's locational characteristics in Scotland have clearly established "have" and "have-not" regions in that country, and indeed, within particular "have" regions, there are "have-not" locales. Scotland has (as yet) no political forum save the U.K. Parliament where conflicts resulting from these discrepancies, if any, could be worked out. Alaska has a regionally-representative Legislature and a number of regional Boroughs capable of conflict resolution should the need arise. As experience with the energy industry grows, and as the regional implications of major energy projects are realized (e.g., the proposed gas line), the possibility of inter-regional debate over mixed costs and benefits cannot be ruled out.

Dissimilarities

In view of some of these similarities between Alaska and Scotland, it is also very important to note the dissimilarities, too. These are also significant:

- Scotland's population is ten times larger than Alaska's. Her political and economic institutions are correspondingly larger and more complex.
- Scotland was an organized independent European state a thousand years ago and took its present political structure--as one of the "united" kingdoms of the British isles--three hundred years ago.

Scotland's system of laws is based on Roman practice, and many of the country's institutions are ancient. Alaska's political history is infinitesimal by comparison.

- Scotland has a long tradition of international commerce and social contact. Some of her regions, e.g., Shetland, became Scottish only in medieval times, and successful accommodation of international influences is a long-standing tradition.
- Scotland operates within a unitary, not federal, political system. Parliament has exclusive control over nation-wide laws, and no system of power-sharing with a subordinate Scottish legislature exists, unlike the situation which prevails between Washington, D.C. and Juneau.
- Scotland's percapita income in recent years has been among the lowest in Europe; its unemployment rates among the highest; its rate of population growth negative. It has not experienced the same degree of "boom and bust" cycles as Alaska; instead it has (before oil) tended to experience general , gradual economic decline throughout the 20th century.
- Scotland's main industries have been manufacturing and agriculture, owing to relatively favorable climate and resources. The spinning and steam components of the "industrial revolution" originated in Scotland. Steel, shipbuilding, whisky and textiles have long dominated Scotland's economy These industries and their sociological implications have no Alaskan counterparts.

A final, but very important difference may lay with internal learning in the offshore oil ndustry itself. The North Sea has undoubtedly been a

valuable proving ground in a number of technological areas: deep-water offshore installations and servicing, long submarine pipelines, all-weather operations, long logistics lines, etc., in much the same way as Prudhoe Bay's development must have pioneered cold-weather operations. It therefore cannot be automatically assumed that the detailed historical characteristics of North Sea operations can be translated wholesale to Alaska. This has direct socioeconomic implications since, as the following sections attempt to show, many of the localized difficulties which arose from North Sea oil were related to uncertainty, the high speed of development, lack of coordination between offshore operators, business, and government, and the changing technologies employed offshore. These problems may ultimately be experienced in Alaska, but, since many of the oil companies (and personnel) are the same, it is questionable if the difficulties will be experienced to the same degree in cases where the marine and coastal environments are similar. This is clearly to Alaska's relative benefit: someone else has done the experimenting.

I. ECONOMIC AND SOCIAL ISSUES

This chapter seeks to describe and analyze a number of economic and social issues arising from North Sea oil developments. Many of the distinctions drawn between "economic" and "social" impacts are somewhat artificial; Scotland's social ills are usually ascribed to the country's chronic economic problems. Oil has therefore represented first and foremost a chance to overcome poor economic conditions in Scotland and Britain as a whole, and improvements in Scotland's social life are seen as a consequence of these steps.

At the U.K. level, the revenues from oil and drastic improvements in the balance of payments resulting from a new domestic energy source have been the most striking benefits from North Sea oil. Like the U.S., Britain possesses large coal deposits, but these were not exploited to the maximum during the period of cheap foreign oil. It was fortunate that development of the North Sea oilfields largely coincided with the 1973 rise in the world price of oil: without this new resource, Britain's already shaky economy would certainly have been severely damaged by increased oil import costs. Even before North Sea oil came onstream, its projected revenues had leveraged major fiscal assistance to the U.K. government: oil revenues were used as collateral for International Monetary Fund advances to stabilize the value of Sterling in the mid 1970s.

These macroeconomic benefits are noteworthy and their impact has been felt throughout Britain. In Scotland, an additional, more direct, impact of oil was the creation of a number of jobs in oil-related manufac-

turing and servicing, and an additional number of jobs resulting from the "multiplier" effects of the new industry. Estimates of the total number of jobs directly attributable to oil vary, but have recently levelled off at approximately 60,000 [167] of which 15,000-20,000 are estimated to be long-term, that is, not related to construction or other temporary activities. These longer-term jobs--in oil terminals, servicing, direct offshore employment, administration, etc.--constitute about 1% of Scotland's workforce. When employment multiplier effects are added in, the total may be as large as 2-3%. At the peak of the construction "boom" it was estimated as much as 6-8% of the country's jobs were somehow related to oil's influences [58]. These smaller figures do not constitute a transformation of the country's employment picture but it certainly is a significant factor in a traditionally high-unemployment country.

However, the overall economic benefits of oil are not well spread-out across Scotland's regions. Areas physically closest to the North Sea fields, particularly northeast Scotland, the Cromarty Firth region, and the Orkney and Shetland islands, have felt the most pronounced economic impacts of direct oil employment. This employment has been grouped in four main areas: direct offshore employment--on rigs, platforms, pipeline laybarges, etc.; servicing, including direct and ancillary logistical support; administration and techincal support; and most of all, oil-related construction.

These activities have occasionally co-located, with, for example, Aberdeen being involved in administration and servicing, or Shetland being involved

in servicing and terminal construction. Other areas, notably the Moray Firth region, have experienced only one aspect of oil activities (construction of platforms and pipe-coating). In these instances a very small number of firms account for a large percentage of local oil-related employment, a situation which has led to some difficulties, as discussed in the following sections.

Scotland's "central belt" region--from Glasgow to Edinburgh--has also felt the economic impact of oil developments. Glasgow, Scotland's aging industrial center, has experienced very little relative expansion as a result of North Sea oil. The city retains its high incidence of unemployment, poverty and social malaise, and its continuing pattern of population decline. Edinburgh, the country's government and financial center, has benefitted from oil chiefly in these sectors. Despite its east coast location, the Edinburgh metropolitan region's direct physical involvement with oil has been limited to a pipe-coating operation, and development of a nearby oil transshipment terminal. The Firth (estuary) of Forth may, however, experience relatively long-term involvement in oil-related industry, as nearby petrochemical industries are developed.

It yet other areas, oil's impact has been nil or at best relatively isolated. On Scotland's remote west coast, a number of enclave developments have occurred, generally related to construction activities (especially concrete platform fabrication) requiring the deep water offered by the Atlantic sea lochs. Despite their location, the northern Highlands have been largely exempt from direct activities. South and south-west Scotland have experienced some speculative development, but

no long-term involvement has materialized. The Western Isles (the Outer Hebrides) experienced major but temporary impact from oil-related activities.

Issues related to the economic impact of North Sea oil can be grouped into three main interconnected areas (which may be discussed variously through the following text):

- Planning and anticipation. Economic and employment forecasting has been difficult, and filtered effects of forecasting errors have hampered local and national planning efforts:
- Regional variance. The mixed regional impact of oil has been a cause for concern. Scotland is a country greatly sensitive to relative regional performance within its boundaries.
- Employment creation and distribution. The employment requirements of oil developments have led to shifts and dislocations in the Scottish workforce.

These economic issues have contributed to impacts on the social and cultural environment of Scotland. Rapid but localized economic growth has resulted in population movement, occasional increases in social problems (housing shortages, crime, etc.) and changes in perceptions of regional identity. Again, social and cultural impact issues can be grouped:

- Migration and population movements. The type, as well as the size, of population movement is a central issue in Scottish oil planning. Many of the regions affected by oil developments are traditional population-losers, and reversal of this situation is a significant change in the status quo.

- Social problems. Rapid buildup (or shutdown) of oil activities have led to worries over crime, health, and family problems. Empirical evaluation of these problems has been attempted only haphazardly.
- Perceptions of change. An area's perceptions of possible or actual change caused by oil may relate strongly to its history or traditional economic base. Its vulnerability to adverse impact may be closely tied to these perceptions.
- Duration of impact. Questions can be raised regarding the local implications of temporary activities: should temporary construction workforces be integrated into ongoing community life or isolated in camps? What planning, if any, has been directed to the socio-economic aftermath of oil activities?

Comparability of these issues to Alaskan circumstances is discussed at the end of each of the following sections. References cited in brackets [] refer to entries in the North Sea bibliography located at the end of Chapter III. Statistical information is quoted only where absolutely necessary; absolute or relative numerical data has little applicability from Scotland to Alaska. The dynamic processes of oil's economic and social impact on Scotland are more comparable, since many of the processes are related to offshore oil operations in similar circumstances.

1.1 LOCALIZED AND VARIABLE BENEFITS

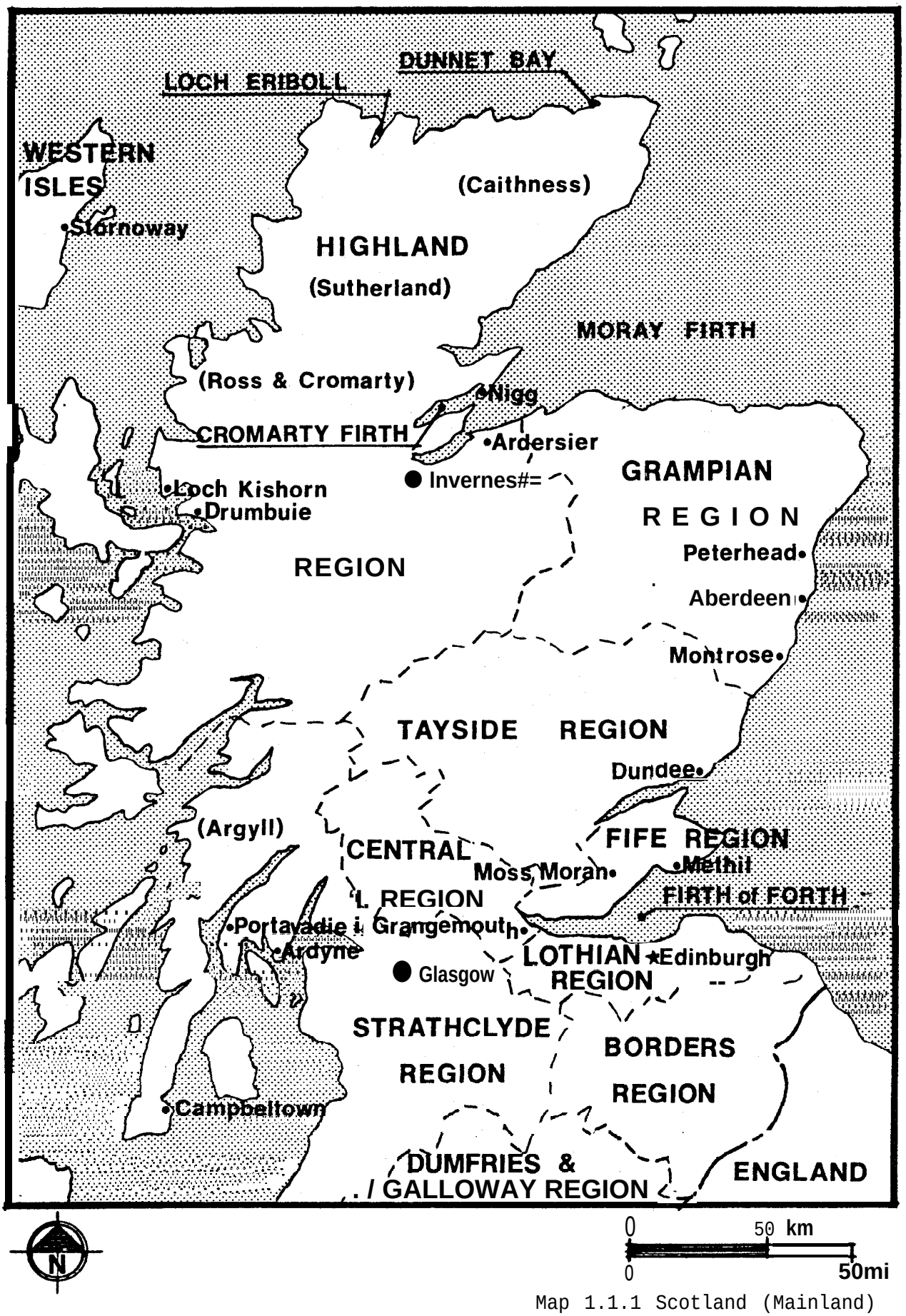
General

Oil's entry into the Scottish scene was viewed as a way out of the "regional decline" cycle described in the Introduction, but oil's influences have been relatively localized, insofar as employment and business investment are concerned. In general, those areas physically closest to oil-related activities have experienced major economic growth, possibly at the expense of their subregional hinterlands [175]. By comparison to other regions, Scotland's traditional industrial areas, especially greater Glasgow, have seen their economies expand by a comparatively small degree from North Sea operations, despite elaborate established infrastructure, available labor, and a tradition of marine-oriented heavy industry. Geography obviously has had some influence on the location of industrial activities related to North Sea operations: Glasgow is traditionally oriented to Atlantic transport routes rather than the North Sea.

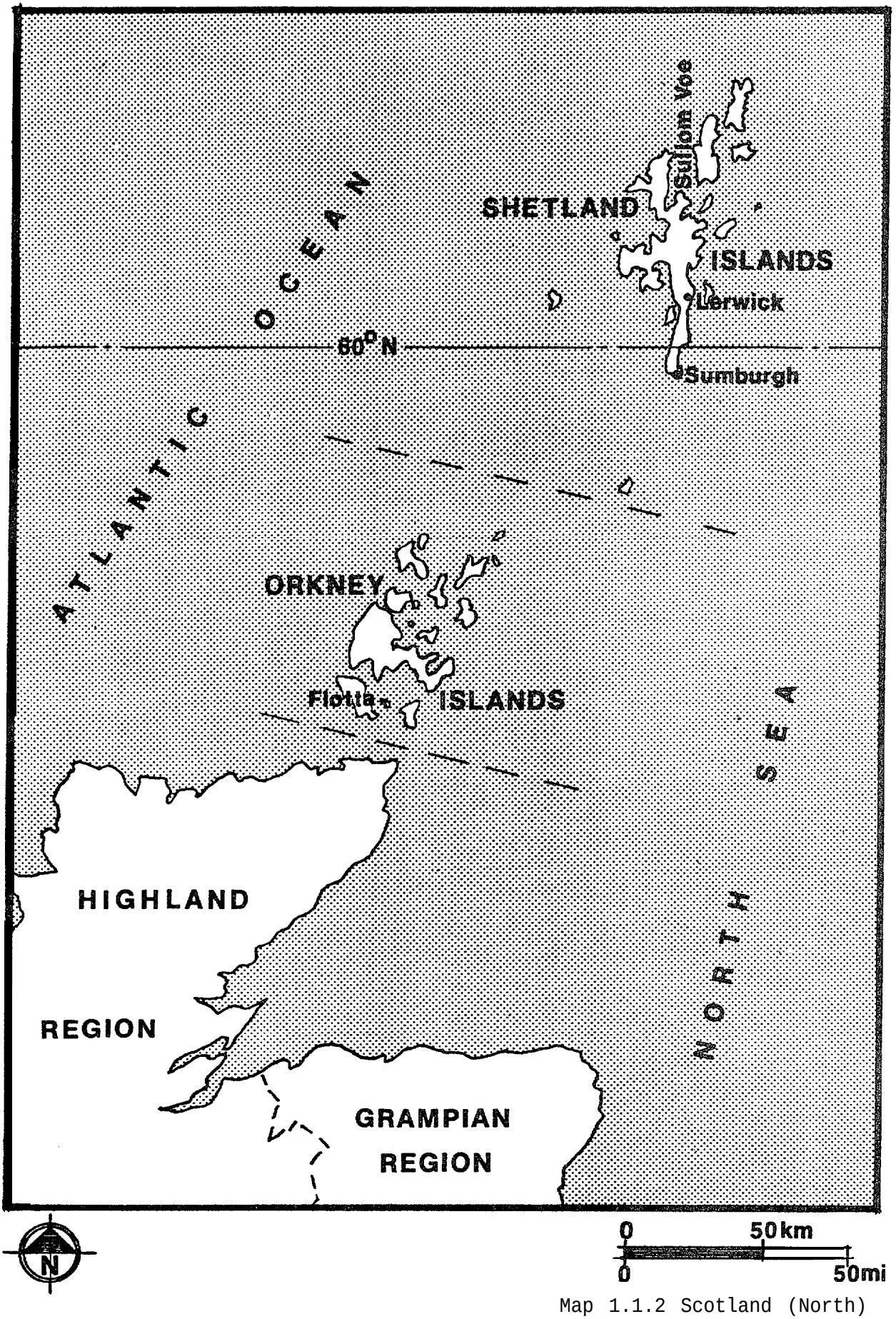
In areas with substantial direct North Sea activity, the net impact of oil work on local communities appears quite variable. The two operating Atlantic coast concrete platform yards, for example, have evidently influenced adjacent villages only to a minor degree. The yards (at Ardyne Point in Argyll and Kishorn in Wester Ross) have relied largely on daily commuters and encamped workers respectively. Unfortunately, data on West Coast regional or subregional employment levels or on secondary employment generated is unavailable, but there are suggestions that

economic multipliers are small , owing to marine provisioning and the specialized technologies employed at both yards. Discussed in Section 1.7, an important element in "camp" developments has been the temporary nature of much of the workforce, as, consistent with the general pattern of construction activity in Britain, a large portion of employees are so-called "traveling men," or itinerant laborers.

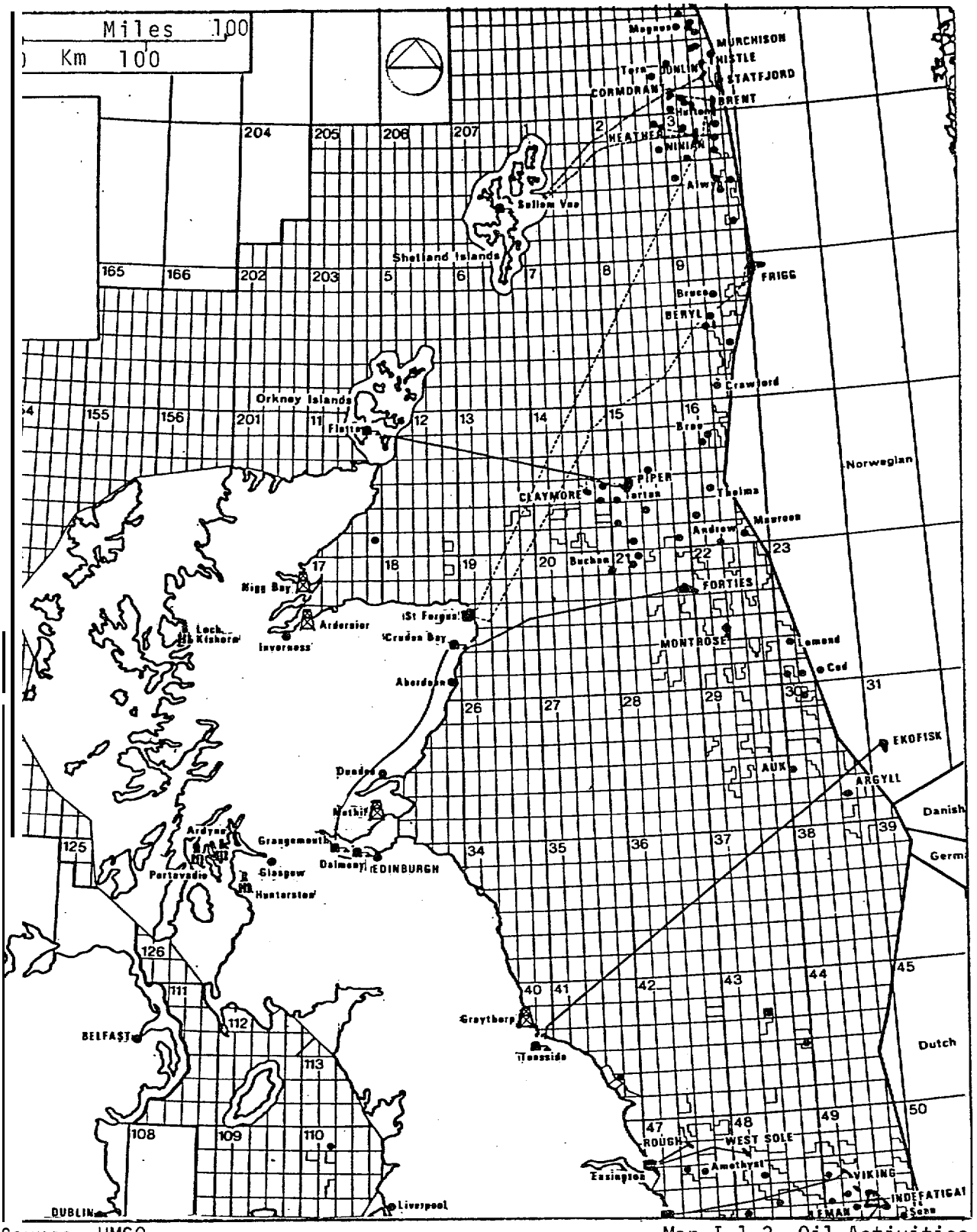
In the northern islands, the presence of huge labor forces for oil terminal construction has temporarily unbalanced local economies [177], but the long-term picture appears more stable and favorable as the terminals become operational and as offshore servicing operations continue fairly strong (due partly to continuing exploration activities). Both in the northern islands and in northeast Scotland (the Aberdeen area in particular) very rapid local economic expansion evidently occurred in the first three to five years following the announcement of finds, followed by establishment of conditions approaching equilibrium, albeit at significantly higher levels of activity than prevailed pre-oil. Importantly, those economic reversals that have been experienced in the northeast (especially Peterhead) have tended to be oriented to non-starting construction activities, including petrochemical developments. This may represent the failure of the newly-adjusted subregional economy to continue expanding, rather than the drastic fall in activity which can be expected in, say, the Moray Firth and west coast areas as temporary construction projects wind down.



Map 1.1.1 Scotland (Mainland)



Map 1.1.2 Scotland (North)



Source: HMSO

Map I.1.3 Oil Activities

Inter-regional Effects

Analyses of inter-regional economic shifts in Scotland due to oil have been unfortunately few. Instead researchers have concentrated on describing impacts in Scotland as a whole or in given localities. This is consistent with the national economic context of the early to mid-70's, when Britain's overall economic performance was faltering badly. At the national level, the direct economic impact of oil developments was seen in terms of improved balances of payments and in direct royalties.

Indirectly related to this issue of priorities, but possibly an important factor holding up inter-regional analysis both in Scotland and Alaska, is the simple issue of regional statistical reporting. National-level (i.e., U.K.) reporting of various indicators of economic performance has historically tended to ignore inter-regional factors within Scotland; that is, Scotland as a whole was treated as a "region" in the U.K. context, much as Alaska is treated as a unit in many federal statistical reports. This could inhibit inter-regional analysis through the lack of an appropriate statistical vehicle, (Since regionalization of local government in Scotland--see Section 11.1--more comprehensive reporting at the regional level has been instituted.)

Viewed from this perspective, oils' direct employment component probably has not been regarded as the major element to consider in Britain's or Scotland's economic recovery [105].

Local Variations

Smith, Hogg and Hutcheson ["180] suggest one reason for oil's dramatic effect on the smaller economies of many "forward" communities: their size permits little diversification without disruption, while the size of more urban economies is predicated just upon continuing diversification. However, production-phase oil operations, aside from platform construction, rely on fairly fixed and predictable labor demands, thus it has not always been possible to direct oil employment to under-utilized regional labor supplies in areas with high unemployment, where continuing growth is a major priority. Therefore, two aspects of the industry may work together to govern its relative impact on a given community or sub-region. In one instance, a large, established industrial area may experience some initial heavy involvement with oil, but the industry's continuing demands quickly taper off to a plateau, which, while possibly employing a relatively large number of workers on a few sites, shows static (or perhaps even negative) growth rates over time. On the other hand, a small, non-industrial area will not possess the flexibility to respond to short-term demands of, say, the servicing industry, without employment sector shifts or "poaching" of established industry. These two cases are visible in Scotland, in the form of the Glasgow area and the Highland region respectively.

Examination of available recent regional economic indicators, especially employment data, confirms the relatively unbalanced impact of oil on Scotland's regional economies. The British government's publication Trade and Industry cites, in a May 1976 issue [133] that oil economic

spill over into Glasgow and vicinity had been greater than expected, but probably only redeploying an existing workforce which might otherwise have been idle, i.e., postponing further growth in the unemployment rate. While magnitudes are not important from an Alaskan viewpoint, Gaskin and MacKay's oil-related employment 1974-76 figures [58] for the popu Ous, Glasgow-dominated Strathclyde Region (which include some platform workers on the remote west coast) show over 27% of the entire Scottish oi related workforce in that area. (Strathclyde holds 48% of Scotland's population.)

However, Trade and Industry's Winter 1977 edition reports a static picture at best, with only a 1% increase in Strathclyde's oil jobs over the period 1974-76 (compared with 96% and 47% respectively for the north-east and Highland/Island areas, and an overall 28% increase for Scotland).

This may be interpreted as suggesting that some extra capacity in Glasgow's traditional industrial base, steelmaking and shipbuilding, was initially taken up, but that oil's influence over the longer term has been less dynamic. Strathclyde's position relative to the rest of the country has not improved; on the contrary, the Region's unemployment was at a higher level--and growing faster--than any other Scottish area in the period 1974-76 [171]. (Tayside Region, dominated by industrial Dundee, returned roughly similar unemployment rates for the period. While Tayside's industrial base is traditionally more agricultural than Strathclyde's, Dundee has suffered from many of the same industrial problems, including dwindling overseas markets and outmoded capital plant.) The British government has attempted to deal with this problem by directing

that the British National Oil Corporation's new headquarters be established in Glasgow, but the area's weakness is still recorded by various authorities [38, 133].

Oil's direct economic benefits to the front-line rural regions of Scotland have been quite isolated, similar to conditions in post-pipeline Alaska. The problem may go deeper, but is unfortunately poorly documented, insofar as intra- or sub-regional imbalances are concerned. An often-cited example is the District of Sutherland, immediately to the north of the East Ross oil industrial area. Sutherland has experienced no oil-related development to date, and has probably been a net exporter of manpower to the Cromarty Firth developments. As it only started with a total population base of roughly 13,000, any significant outflow of skilled or semi-skilled young adults is potentially disastrous to indigenous agriculture-based industry in Sutherland.

Relation to Regional Economic Theory

The implications to Alaska relate to basic regional economic theory. North Scotland is experiencing a large de facto experiment in "growth pol e" regional planning; that is, the concept that major, possibly government-supported, industrial developments in peripheral areas are necessary in order to develop economies of scale large enough to be self-sustaining; to create adequate linkages with other regional (say agricultural) sectors; and a large enough service sector to permit local diversification into other activities. This is suggestive of the "regional center" village expansion concept of the 1960's in Alaska,

where certain key communities, e.g. , Bethel, Nome, were selected as medical , educational, and government service centers, each with a large regional catchment to justify scale economies in these services.

In Alaska the injection of industrial uses was probably not contemplated, but the principle is basically the same as that used in Scotland, and indeed in many other countries with more centralized economic planning. (In essence it becomes a population location policy which assumes a certain minimum size of population is necessary before major economic growth can occur In sparsely populated regions setting the process going often invo" ves a choice between a) encouraging the relocation of existing populat· on, or b) providing an industrial "magnet" to attract in-migrants or some combination of the two.)

Prior to the advent of North Sea oil, two noteworthy regional economic development agencies had been established in north Scotland, whose policies addressed this concept to some degree. These agencies were the Highlands and Islands Development Board (HIDB), and the Northeast Scotland Development Authority (NESDA). Their role in directing or exploiting North Sea oil developments in their respective regions has not been central, but is possibly instructive to Alaska, where native regional corporations may form a very rough analog to these agencies.

The HIDB, faced with a large region with poor communications and a small population opted in the 1960's basically for a "growth pole" attack on regional decline. This meant the HIDB acted to encourage major industrial activities in particular locations, such as the Cromarty Firth,

hoping a) for service and vendor industries to congregate into more nationally competitive economic collections, and b) for backward linkages, i.e., use of locally-produced raw or semi-finished materials, to develop the hinterland. It was hoped this approach would lead to what the HIDB called "counterdrift," arresting and ultimately reversing the region's historic net outmigration. For example, the HIDB convinced British Aluminium to locate a major smelter on the Cromarty Firth, later the scene of oil developments, in the 1960's.

The Firth had been the scene of major military staging activities during World War II, but its industrial role had slipped through the 1950's. Locating the smelter in this region was intended to soak up considerable numbers of unemployed locals, to boost the economies of the small communities on the Firth, and to take advantage of the favorable government aid available in "development areas" (the areas for special government benefits, described in the Introduction). The smelter's history and relationship to its region may have provided a preview of subsequent oil-related activities, and there may be areas of wider applicability--even to Alaska:

- Distance from raw materials. The smelter imports alumina (the raw material) from foreign sources; electrical power, required in huge amounts for aluminum reduction, was also brought in from some distance. No strong links with existing local primary industry were therefore established. The same was basically true of the local oil-related industry: its raw (or semi-finished) materials, such as steel, pipes, pipecoating compounds, etc., were all produced outside the area.

- Distance from markets. Although the Cromarty Firth is an arm of the North Sea, its principal asset to the oil industry is its deep, sheltered water, bordered by relatively flat land. Like the smelter, the oil industry's market is some distance away. While the Firth's platform and pipe yards produce finished products, the likelihood of their local use is understandably small; the smelter produces only bulk or semi-finished goods, which are then exported to areas closer to metropolitan markets (for rolling, extrusion or further manufacture.) In both cases the opportunity for local use of the goods produced ("forward linkages") is small, so no distribution, servicing, or merchandising jobs are present.

- Composition of labor force. The smelter was designed as a "state of the art" facility, which means it is highly automated and can increase its production greatly without extensively increasing its workforce. The range of skills involved is fairly narrow, like in the oil yards, and management functions constitute a fairly small percentage of the workforce.

- Vulnerability to market shifts. Neither the oil-related facilities nor the smelter are very diversified in their product lines, and both are highly vulnerable to fluctuations in national or world markets for their products. Long-term planning therefore becomes difficult, a fact demonstrated (see Section 1.2) by the oil industry in the North Sea.

The HIDB probably saw a good opportunity to capitalize on the scale of North Sea oil's industrial requirements rather than the composition of those requirements [69], consistent with a "growth pole" concept requiring a major population component.

NESDA, on the other hand, evidently has tended to encourage the modernization and expansion of existing industrial and service activities, with considerable attention paid to fishing and food processing. Regarding oil, NESDA appears to have aimed its attentions more at oil field suppliers, service and light engineering interests, and at an information interchange role. Unfortunately, this tendency or de facto policy has not been well-documented in the available literature, but can be inferred by reference to various documents [e.g., 73, 80, 82, 186] and indicators of regional economic performance in the Grampian region. Grampian includes Aberdeen, of course, the administrative center of the North Sea industry [45, 58, etc.].

Both the HIDB and NESDA have strong regional promotion roles, so isolating their direct influence--perhaps as represented by direct financial aid--from more diffuse effects on their existence, is impossible. If, however, one assumes the distinction in emphasis is genuine, the following conclusions from northeast Scotland may apply to Alaska:

- Dispersed economic benefits. The relatively fractured nature and the complexity of the oil service industry (see Section 1.4) combined with direct access to offshore installations through local service bases, has enforced the relatively small-scale pattern of indigenous industry in the Grampian region, and has

therefore assisted in spreading the economic benefits of oil development across a wider cross-section of the workforce.

- Relative invulnerability. Because of the greater spread and larger number of firms involved in the industry, more reliance on services with established lines of support, distribution, and marketing patterns has been fostered. While many new firms evidently may have been established [82, 83], others have simply expanded or diversified, without abandoning their previous (hence secure) markets. They are therefore less vulnerable to short-term changes in the offshore industry, insofar as major reversals might force more specialized oil vendors to close.

These issues are discussed in other sections of this paper, but are mentioned here to illustrate that regional economic discrepancies arising from oil developments may reflect the result of conscious regional economic planning policies rather than their absence.

It is noteworthy that the 1970's have seen the establishment of two central government agencies in Scotland, the Scottish Economic Planning Department (SEPD) and the Scottish Development Agency (SDA) to oversee and to stimulate economic growth respectively. Milligan [123] foresaw the need for a national-level balancing force to guard against regional imbalances; the SDA's creation (it operates in much the same way as the HIDB, but with a nationwide territory) may have come too late to permit deep involvement in the oil industry, and in any event no body of literature exists describing its role or successes in dealing with oil activities

Summary and Alaskan Relevance

Factors including timing, site requirements, and industrial backup characteristics of the offshore industry have resulted in a variable pattern of economic benefit from oil activities. Oil has failed to reverse industrial depression and high unemployment in Scotland's traditional heavy industrial areas. On the other hand, it has resulted in a mixed picture in some rural areas closer to offshore oil fields, relating perhaps to differing emphasis (or even philosophy) in regional economic planning policies.

The following points may apply to potential Alaskan OCS developments insofar as they rely on common elements between the two areas:

- Diversification vs. specialization. Scottish experience suggests those communities with an inherently more diverse economy may be better able to capitalize on oil's advent without severe intermediate disruption, or the threat of catastrophic collapse if a large but specialized use fails. Put into Alaskan terms this truism means larger communities will be better able to cope with oil than smaller ones, although some small coastal communities with established industry (say fishing) may be able to accommodate modest oil-related growth since it will constitute a diversification from an already-established economic base.

- Inter-regional balance. While Alaska has no official regional development authorities comparable to the HIDB or NESDA, the the establishment of native regional corporations may form a

framework for regional economic planning, at least in that they may constitute a point for information exchange and regional promotion. They may therefore face the same regional development strategy alternatives faced in Scotland. At the state level, it is not inconceivable that such an agency as the Industrial Development Authority or the Department of Community and Regional Affairs could take some lead in anticipating, if not controlling, inter-regional impact balances, much as the SDA may take on this role in Scotland.

- Reliance on external economies. Scotland has been better poised to capitalize on the industrial requirements of offshore oil, due to its established industrial base, than Alaska. Nevertheless, Scottish industry's success in getting major primary supply contracts has been limited. Fabrication of externally-produced goods (e.g., coating of Japanese pipe) has been the major activity in the manufacturing sector, with platform construction dominating. While the idea of platform construction has been mentioned in Alaska, (a concrete platform yard in the Prince William Sound area) Alaska, if anything, will be subject to external economies even to a greater extent. This makes the need for "linked" industries (especially those tied to production, rather than development stages) all the greater, if local economies are to benefit from major oil development's in any but temporary or minor ways.

1.2 ECONOMIC FORECASTS

Economic development forecasts of oil influences have been unreliable. Four factors probably have played a role in contributing to unreliability: the source of the forecast, its time horizon, the degree of known factors included in the forecast, and, importantly, the forecasted item's susceptibility to outside influences. Of these, the second and fourth factors appear to have caused most problems in the North Sea.

Timing

The best example surrounds prediction of numbers of (and consequent planning for) offshore platforms. In 1975, Mackay and Trimble [112] predicted between 52 and 64 offshore production platforms would be required during the 1975-80 period, or between 10 and 13 per year. In actuality, only six orders were placed in 1975, and none at all in 1976. In 1977 Mackay [113] revised the figures downward, showing a cumulative number of installations by end of 1980 of 38. In both cases, Mackay's figures were less than comparable government estimates.

Mackay blames two factors for the overestimates. First, deepwater oil technology is undergoing quite a learning period (with the North Sea providing most of the on-the-job-training) and new platform types are still appearing, each with its own characteristics. An apparent infatuation with concrete gravity structures now appears to have waned [113] due to cost and delivery requirements; however, steel jacket structures are also very costly and somewhat depth-limited. Research and develop-

ment of tension structures or permanent semi-submersibles continues, as does prototypical work on various subsea well completion systems.

It is possible that offshore installation technologies have not kept pace with the ability of the construction industry to deliver units since there was an early proliferation of platform yards. Moreover, the platform order slowdown occurred during a period of policy adjustments by the British government regarding taxation and direct government participation in actual developments [58] which undoubtedly played a part in the industry's investment policies. Described by Kemp [95] and others, the introduction of Petroleum Revenue Tax and modifications to various corporate income tax formulae have led to quite different cost-feasibility pictures for any given reservoir regarding extraction rates, transport methods, and so on. During the period of uncertainty surrounding adoption of new legal and fiscal policies, the industry tended to hold up on new platform investments. The upshot was that platform orders and consequent employment dried up in Scotland, despite forecasts and planning to the contrary.

External Influences

The other factor is probably more relevant to Alaska. Platform-building (like terminal-building or exploration itself) is highly vulnerable to external factors, often of global scale. These include the companies' development prospects in other countries, market share trends, levels of European versus North American consumption and product mix, host-country taxation policies (somewhat volatile in Britain), the cost of borrowed money, vendor's planning, labor relations, and so on. Government fore-

casts either take all these factors into consideration, or lose reliability proportionately. As in the case of Prudhoe Bay, the development phase of North Sea operations was interrupted by the OPEC price increase of 1973, a factor which further complicated the international planning processes of the major North Sea operators, most of whom have substantial mideast holdings. The cost-to-earnings ratios of established mideast reservoirs changed abruptly following the OPEC decision, which clearly must have influenced exploration and development in the more risky North Sea arena. Also, undeveloped North Sea fields became more financially feasible following the price rise, but the resulting fall in demand for petroleum products in Western Europe and North America may have lent to consideration of further "banking" of suspected North Sea reserves. Discussed in Section 11.13, one response of the U.K. government was to promote increased exploration through its own intervention, adding a further degree of unpredictability to forecasts.

Forecast Reliability and Resolution

In Britain, medium-term economic forecasts at an aggregated level appear to have had some degree of reliability. As they are disaggregated into local or elemental units (e.g., numbers employed in Shetland, number of platform orders) they have tended to lose robustness and reliability. A similar picture is suggested in Alaska, with Gulf of Alaska forecasts (hence local anticipation or anxiety) variable over time. This may be an unavoidable result of any forecasting process, but its implications to interested front-line communities is quite important.

This is not to say all attempts at economic forecasting in Scotland have been wasted: quite the contrary. Mackay [113] suggests instead the lessons are clear: it is better to minimize the number of impacted areas from two points of view. One is that with fewer sites (say for platform building) each site can look to a corresponding longer lifespan, and not fluctuate through as many boom-bust cycles. Second, minimizing sites minimizes the locales of adverse impacts, such as overheated local economies, heavy infrastructure investment, and social disruption. While the Scottish experience suggests the overall levels of social disruption in impacted communities may have been initially overestimated, one benefit of reducing the number of locations may be in allowing a more focused attack on those problems which do appear, especially in areas (like rural Alaska or Highland Scotland) with small and dispersed social service delivery systems. Like McNicoll [120], Mackay suggests a more concentrated distribution of offshore-related developments may assist in ultimately raising regional economic multipliers, by providing the time for regional economic links (see Section I.1) to develop.

Even this point has not meant the limited number of established coastal industrial uses have been exempt from short (or longer} term fluctuations. As this is written, one of the three remaining steel jacket platform yards, at Ardersier on the Moray Firth, has announced a major contraction, laying off about 20% of its 2,500-person workforce. (A recent attempt at exporting a 550-foot steel jacket to Brazil from Ardersier met with misfortune [28] when the barge carrying the structure capsized in heavy seas, sending the £9 million platform to the bottom off the north English coast. The layoffs at Ardersier may be temporary after al 1.)

Monitoring local economic impacts of oil developments has therefore been stepped up so that a more reliable data base can be available upon which to measure actual or anticipated economic changes. In Shetland, this has led to formation of a "Joint Employment Monitoring Group" which reports quarterly [89] on itemized employment levels, both in the oil sector and in indigenous industries subject to oil influences and labor competition. It is not known if any other local areas of Scotland are subject to similar reporting and analysis measures.

Summary and Alaskan Relevance

Forecasts of economic growth from oil developments have been hampered in Scotland due to the interplay of changing technologies, changing government policies, and the international characteristics of the oil industry itself. A proposed or possibly de facto method of coping with the problem may be in limiting the number of involved locations, so that major fluctuations can be isolated if not accommodated. Generalized forecasts have been somewhat accurate, but have lost some reliability when translated to local terms: they may have highly unpleasant effects on the communities involved.

Alaska has experienced comparatively little OCS development-stage activity as yet, so circumstances directly comparable to the North Sea have yet to appear in quantities sufficient to permit generalization. Some lessons may be drawn from the Prudhoe Bay fields, however, especially in that production rates--and consequent cash flow to the state--have fluctuated according to external factors (such as foreign trade restrictions,

pipeline infrastructure in the Lower 48 states, etc.). One can surmise that inaccurate predictions in economic growth rates resulting from OCS oil developments will have results similar to those involving existing reservoirs, although perhaps bringing a new group of Alaskan communities into the game.

1.3 SHORT-TERM ECONOMIC OVER-EXPANSION

Excessive short-term economic expansion has been experienced in some oil development areas. This is well illustrated by rises in the price of development land in northeast Scotland. In 1973, the median price for an acre of residential land in Aberdeen was f3,678 ($7,400); in 1975 the median price was f20,305 ($41,000), an increase of about 500% [167]. In Aberdeen county, the amount of residential acreage purchased in 1971 was 15.1 acres; in 1972 this figure increased to 176.2; in 1973, to 527.1 [167], Meanwhile, land prices in Ross and Cromarty increased only by about 25% over the period 1973-76, closer to the national average, despite that District's involvement in platform building and pipe-coating. (Equivalent data is not available for the northern islands. However, it may be expected very large increases in land costs occurred in Shetland, at least until the passage of the Zetland County Council Act--see Section 11.12--increased the local government's ability to control development-prone land.)

MacKay and Mackay [105] record economic growth strains in most areas of north Scotland impacted by oil developments. In their discussion of oil's influences on northeast Scotland, they point out two important characteristics of oil's advent in the established local economies, one of which (at least) is possibly applicable to Alaska:

- A number of oil developers arrived in northeast Scotland at about the same time as a national wages and prices policy had been instituted by the British government. Under the terms of this policy, established firms were highly constrained in increasing

the wages of their employees. Newly established firms were not constrained, however, and Mac Kay and Mackay suggest this not only damaged indigenous industry's ability to hold skilled employees, but that it may have led to a more rapid upgrading of local wages to oil's levels after the government restrictions were lifted. It is significant that the major inflationary pressures experienced in Aberdeen occurred after the lifting of the wages policy in 1974.

- The employment structure of indigenous industries in the area, particularly the fishing and food processing industries, proved vulnerable to "poaching" in the skilled trades area. This is discussed more fully in Section 1.5, but may have applicability to Alaskan coastal communities with similar employment structures.

Regional Examples

In the Cromarty Firth area, the problem was most sharply illustrated by a housing shortage, exacerbated by an unwillingness of construction workers to give up high-paying oil related jobs to go back to house building, a point reinforced sharply by Grigor [66]. Large, if temporary, increases in rental and purchase house prices occurred; however, the more common effect was for patterns of commuting to emerge. A short-term solution in the Cromarty Firth area was the use of dormitory ships for single men employed at the Nigg platform yard.

Rosie [138], in his acute account of oil developments on the Cromarty Firth, asks how much more development the area can take while keeping its existing industry intact and cost of living low enough for non-oil workers to continue to live. In Shetland, Dowle [30] calls the new economic status quo a "materialist nirvana" sharply out of tune with the traditional fishing dominated Shetland economy.

There may be some unrealism in these fears, too: oil's advent in some areas, for example, Orkney, has resulted in enlarged and improved infrastructure. Increased competitiveness among indigenous commercial interests (to the benefit of consumers) also cannot be discounted as a possibility . This point is indirectly referred to by Hunt [83] in her discussion of changing business practices in Aberdeen, dicussed in Section 1.4.

In regional studies undertaken by the University of Aberdeen, Mackay [111] and Mackay and Marr [108] regard economic "overheating" problems as temporary, related to the size and working pace of major construction projects such as the Sullom Voe terminal in Shetland and the various major construction projects (some non-oil-related) in northeast Scotland. Writing in 1975-76 they record that some corrective actions already underway are sensible (mainly through increased house building and, in Shetland, some isolation of construction workforces from the local economy). Reliable current economic data from areas which experienced the most intense early growth rates are not available, so contrasting the highest "boom" point from the preceding and present conditions is not possible. In Shetland, the boom's peak probably has passed only within the past

year, if at all [89].

A longer-term problem for the area around Aberdeen is its recent loss of Development Area status [140]. The status, described in the Introduction, involves government financial assistance to would-be developers proposing to bring new jobs into an area, or to existing employers wishing to expand. Aberdeen's aggregate (i.e., including oil's influence) economic performance relative to Scotland (and Britain) as a whole, by summer 1978, was viewed as sufficiently favorable to lead to removal of development status: Aberdeen is now the only area in Scotland without such status.

The principal objections to this loss of status are heard from the agriculture and tourism sectors, with few direct links to oil activities. A local industrialist quoted in the press [140] said:

> For the traditional industry interests in our group, the loss of primary development status, added to the inevitable adverse effects of a boom situation, has simply made us uncompetitive nationally and internationally, and we are now forced to look outside the Aberdeen area if we are to maintain our participation in these traditional industries.

Similar sentiments are heard from the region's volatile tourist industry, which a propsective parliamentary candidate described as "clobbered". The price structure of each industry's products is set by larger, even world, markets, and the question of "peripheralism" arises. Northeast Scotland is at best an unusual tourist destination, and its agriculture, while relatively prosperous, is heavily weighted towards low-value crops (potatoes, barley, etc.) aimed at the domestic Scottish market. Fishing, the other major indigenous industry in the region, is undergoing major

contraction owing to fishery closures and industry rationalization. Thus the area's local industries are already at the limit of their British or European competitiveness (or beyond), allowing little leeway for wage pressures from the oil industry. The influence of oil on the region's overall economy has possibly harmed the ability of its indigenous industry to grow, or at least to optimize its use of government aid.

These problems suggest once again the timing and pace of oil developments are probably more to blame than any other particular facet of the industry's activities. Adequate lead time between startup and peaking of oil activities may permit established local industry to prepare itself for eventual labor shortages. This is perhaps the case experience in Shetland with the long planning period for the Sullom Voe terminal. However, a housing shortage persists in Shetland, reported by the JEMG [89] as one of the principal causes of the remaining job vacancy rates in non-oil sectors. The problem is therefore multi-faceted, and shows that economic planning needs to be linked to many other decisions, including infrastructure and housing provision, or else it will be hampered correspondingly. It seems ironic that regional economic recovery or expansion backfires so predictably; the Scottish experience suggests even well-organized government monitoring and control systems may be comparatively powerless in offsetting "boom" conditions.

Summary and Alaskan Relevance

Several effects have accompanied excessive oil-related economic growth in areas of Scotland:

- Land and housing prices have escalated rapidly as a result of increased population and/or competition for existing resources.
- At the same time, the construction industry, normally able to respond to this situation, has itself been unable to hold key workers in the face of higher wages in the oil service industry.
- Legal constraints on local wages at a key point in the history of North Sea developments may have hampered the ability of indigenous local industries to respond in a deliberate manner to oil employment impacts.
- Fear of even worse long-term effects may have proven unrealistic in retrospect, related to the timing, rather than inherent nature, of oil developments.

The solution possibly most applicable to Alaskan conditions is that proposed by Mackay [1 09]: isolation of the boom to select communities through development containment policies available to government agencies, most notably through physical planning decisions. There is the resultant risk of setting up “have” and “have not” conditions, a possibility which must be weighed against the chance of problems spreading over a wider area. Alaskan conditions may in fact almost mandate Mackay’s approach: the number of localities suitable for major oil-related growth, while not negligible, is fairly small. It should also be noted that the location of the most severe “overheating” effects in Scotland is Aberdeen, where,

in addition to some offshore servicing, the principal North Sea operators have established their administrative centers. In Alaska these functions were placed in Anchorage and Fairbanks for the Prudhoe Bay and pipeline development projects, and presumably adequate office (and residential) capacity still exists in those cities to accommodate any marginal increases OCS developments might bring.

1.4 IMPACT ON LOCAL BUSINESS

Behavioral or structural aspects of the oil industry may have aided business formation, but with associated costs. House [80] records some of the operating characteristics of oil companies moving into areas without oil experience. He refers to the companies' reliance on "incorporation" rather than "exploitation" methods, in forming linkages into the local economy. Speaking of Aberdeen, House notes a coincidence of motives of incomer oil companies and local populations: the locals want jobs, the companies want to minimize local disruption and to keep to a minimum time-consuming long-distance lines of support. Additionally, House reports, one of the major characteristics of the oil industry, especially in exploration and envelopment phases, is suspected significant reliance on relatively small-scale engineering, vendor and servicing interests who are able to respond creatively to offshore operators' demands with minimal lag time.

Preliminary evidence may soon be available [82] which suggests the combination of these factors has led to considerable new, and some reoriented, business development, especially in Aberdeen. Aberdeen is the most likely location for this because of its administrative headquarters role for North Sea operations (like Anchorage) and the direct access it offers (through its service bases) to offshore activities. The quick-response priority motive discussed by House combined with the industry's suspected tendency to fragmentation at the engineering level [80] has led to this role for Aberdeen.

Hunt [82] provides the most direct discussion of oil spinoffs impacting on local business formation, referring specifically to Aberdeen. Hunt states a pre-oil situation prevailed which was characterized by a high degree of local ownership, a traditionally informal workplace hierarchy, and a closely interlocked business elite (through marriage, etc.) The initial response of this local economic structure to oil developments was negative, based mainly on a lack of history of comparable impact upon which to base projections. Fears of a temporary "boom" followed by a permanent "bust" were heard, along with anxiety over "asset-strippers" and the alien roots (i.e., Texas) of incomers.

In a later paper, Hunt [83] raised concern over the penetration by outside interests of established local industries, too. It appears the bulk of incomer firms are immigrants to Aberdeen and do not constitute redeployment or reorganization of established industries (unlike Glasgow) except in cases where established marine-oriented firms (e.g., survival gear manufacturers) continue to offer their established lines to oil operators.

On the cost side, Hunt suggests that the old methods of personnel relationships are probably gone, and, importantly, that the Aberdonian ruling economic elite has been submerged by the influx of outsiders with high-tempo American-style management practices. She also raises, significantly, the question of oil's impact on the availability and cost of venture capital in Northeast Scotland to non-oil firms. No specific data is offered, unfortunately. to confirm that venture capital is harder to come by than before oil.

The question of longevity of incomer firms is important from Alaska's as well as Aberdeen's point of view, and the available evidence is still inconclusive. Certainly one aspect in Aberdeen's favor is Britain's Common Market membership: foreign (i.e., American) firms with a foothold and a legal presence in Scotland will be able to service the whole European marketplace under much more favorable circumstances than if they were based in the U.S. Thus, notwithstanding the duration of North Sea (or north Atlantic) operations, Aberdeen's oil-based industry may be more robust than first anticipated. However, Gaskin and MacKay [58] report that much oil-servicing employment (and new business formation) in Aberdeen has been mainly of a "store front" variety. Businesses involved in supply of material to offshore installations (e.g., drill fluid compounds) have retained their processing operations elsewhere and use their Aberdeen offices only as sales and logistic coordination points.

It is important to note that spinoff industrial activity at the small, specialist level experienced in Aberdeen is evidently isolated largely to that community. The key to light industrial development in a coastal community appears again to be linked to that community's detailed role: servicing vs. platforms, administrative vs. construction. Proximity to decision-makers, as in other business ventures, is crucial.

A brief theoretical treatment of this, of considerable interest to Alaska, is offered in Lewis and McNicoll [99]. They appear to be optimistic about the long-term technological benefits to the more isolated Highlands to be derived from the creation of oil employment. (Like a number of authors, Lewis and McNicoll refer to theories of economic development and under-

development for their socioeconomic modeling methods. See Subsection 1.8)

Their analysis focuses on four sets of factors influencing technology transfer in the Highlands. These include changes in local relative prices, forward and backward "linkages," and changes in locally avaiable management or industrial techniques. Regarding local prices, the authors note that local prevailing wages have risen because of oil influences, while the cost of borrowed capital has not (because there is, like in Alaska, no source of capital to speak of in relatively remote areas--the banks are far away). This has the possible effect of adding incentive to entrepreneurs to increase the capital-intensity of their operations, i.e., change the mix of capital and labor components in their firms in favor of capital, with consequent increases in efficiency. Lewis and McNicoll, unfortunately, are unable to offer empirical data to back up this speculation.

Backward linkages (local purchases) by the oil industry have predictably been most heavily weighted towards the service sector. In the case of wholesaling, some increase in available facilities has occurred, but a major change appears to have centered on modernized inventory practices. Echoing House [80], Lewis and McNicoll report that local availability of oilfield supplies has been much more important than price, reflecting the quick-reaction needs of the industry.

Forward linkages (local sales) have been, understandably, few. However, the authors speculate that improved marine service facilities and upgraded roads and docks may ultimately lead to some opportunity for post-

oil benefits, most probably to the fishing industry. This appears questionable in light of the mixed performance of the Scottish fishing industry in recent years; but the longer-range possibilities of fishing use of oil-related coastal installations cannot be discounted. This represents less a forward linkage than an after-the-fact reuse, of course.

Improvements in locally available management or industrial techniques may have to wait until oil rundown stages, as personnel (local or in-migrant) released from the oil industry, carry their new skills to the non-oil sector. This may be of interest when read in the context of the migration typology suggested by Sewel and Birks [175] discussed in Section 1.7.

Summary and Alaskan Relevance

The possible characteristics of the oil industry which have led to new or expanded businesses (particularly in Aberdeen) may be summarized as:

- a policy of co-optation and use of local enterprise to minimize long-distance logistics and to present a good local public image;
- a relatively fragmented pattern among specialist vendor firms providing oilfield equipment or services;
- a need for quick reaction times to offshore operators' demands, where speed of delivery may be more important than price.

Possibilities for spinoff benefits from these characteristics may be seen, in that wage competition may lead to capital plant modernization; more efficient managerial practices might be introduced into an area by the

oil industry, leading to more general acceptance of these practices; and infrastructure built or upgraded for oil uses may have subsequent beneficial use.

The implications of this to Alaska are fairly noteworthy, especially in cases where OCS exploration may result in some use of medium-sized coastal settlements with a slightly diversified local economic structure. One may speculate that improved regional economic conditions and improved local technology may in fact be positively correlated with remoteness. That is, the ability of any community to improve its business techniques or expand its services to permit more diversification in oil activities may be directly related to the community's distance, hence its inconvenience, from Anchorage or lower 48 suppliers and services. Communities effected by OCS oil activities in the Bering Sea, for example, may be able to capitalize on this point, recalling that Aberdeen's almost exclusive role in supplying ancillary services may partly be a function of its closeness to the fields (through its service bases), an attribute not shared by Anchorage.

1.5 EMPLOYMENT SECTOR SHIFTS

Employment shifts related to oil have been felt most acutely at second or third-tier levels, especially in traditional industries. Approximately 30,000 persons in Scotland are employed by firms whose work is "wholly related" to North Sea oil activities [171]. At the end of 1976 it was estimated, counting associated workers, that between 56,000 and 65,000 persons overall were involved in oil-related employment in Scotland, or about 3% of the country's workforce.

From about zero in 1970, this represents a large adjustment to Scotland's base employment picture; however, the total number of employed persons in the country has hardly shifted from pre-oil levels. Two factors must account for this: either a redeployment of existing labor from other activities to oil, or a nearly balanced pattern of out- and in-migration, with in-migrants accounting for the oil increases.

Both factors are probably in play. For the last sixty years, Scotland has been an out-migrant country, with major losses from the declining west central industrial belt. There is additionally some evidence of shifts in the domestic workforce to account for direct oil employment.

Considerable speculation and concern has centered on North Sea oil's impact on employment in indigenous industries in the areas closest to developments, and some concern appears justified. MacKay and Mackay [105] say that small numbers of persons have been involved in inter-sector shifts; however, the overall size of the "sending" sectors, especially

in the thinly-populated rural areas, must be recognized. Gaskin and MacKay [58] later attempted to pose the situation as follows:

- The traditional industries in most of the so-called "oil areas" are farming, food processing, fishing and knitting. (In the Highlands and Islands a form of land tenure called "crofting" frequently implies a combination of subsistence agriculture and casual wage employment. Statistical portrayal of crofters' employment is made a little difficult accordingly.)
- Each of these industries is closely linked and intertwined with the overall regional economy, with, for example, knitters buying wool from farmers, fisherman working part-time on farms; farmers' wives working seasonally in fish processing, and so on. Multiple or seasonal employment is fairly common (as in areas of the Alaska bush), and circulation in the system is relatively closed.
- While skilled trades are used in the traditional industries, the number of skilled workers as a portion of the total workforce is very small. The total workforce itself is very small compared to other parts of the country.
- Under these conditions, the vulnerability of local industry to severe damage from the "poaching" of skilled workers by oil interests is greater than in more open or larger regional economies. For example, if the "poached" employee is a knitting machine maintenance specialist, the entire factory may be jeopardized. JEMG [89] reports from Shetland indicate a fairly high level of job vacancies in the skilled trades, with employees in some trades simply not being available in the islands.

Aside from major training programs, especially in steel platform yards, the principal demand from oil operators or support firms appears to have been for skilled labor, especially in the metal trades (mechanics, welders, etc.). The total number of such skills in an economy of8,000 or 10,000 economically active is likely to be quite small, so the potential relative impact is likely to be quite large.

The picture is not altogether simple, however, and has a somewhat variable face depending on the region studied. In Shetland, for example, Mackay [111] concluded in 1975 that oil would be a welcome diversification to the economy because the traditional industries, especially knitting, needed rationalization and modernization (to cope better with foreign competition). It is noteworthy that there has been an apparent recent sharp falloff in demand for Shetland knitwear, possibly confirming Mackay's point and also skewing analysis of oil's direct impact on knitting. Similar findings have been made relative to Orkney [110], and, albeit qualified, for some rural areas of northeast Scotland [108].

However, Gaskin and MacKay [58] voice concern about "backwash" effects, e.g. daily commuting from depressed East Sutherland to the platform yard at Nigg, leading ultimately to a further net population decline in an already-declining area. Dowle records similar concerns from Shetland's outer islands [31], demonstrating that intra-regional shifts, hard to record, have also taken place. In the fishing industry, there have been suspicions that only the least-effective skippers have lost crew to oil concerns, a sort of natural selection in favor of overall industrial improvements since the total catch to be divided has fallen sharply.

The same effects apparently are being experienced in Norway. In one of the (unfortunately) few Norwegian papers on socioeconomic impacts from oil, Kjølv Egeland [34] reports on very similar industrial and employment reorganization, this time in a fairly prosperous pre-oil situation. Like British observers, Egeland suggests that the filtering effect of employment shifts is the most important, if hardest to identify, factor in oil's employment impact. This means, basically, that high oil wages initiate a general upgrading of wages which filters throughout the local employment market. Two outcomes are possible: net employment increases (good); or firms with price and wage structures tied to wider markets, e.g., farmers competing with European counterparts, are made marginal, uncompetitive, or go under (bad). In Scotland there is evidence both things have happened.

Regarding wage rates, however, it is interesting to note findings made by Gaskin and MacKay [58] in their review of impacts of oil activities on regional wage structures. Citing 1975 data from Grampian region (the Aberdeen area), they report that wages have remained below both Scottish and U.K. norms, and in fact that 1974-75 changes record a relative worsening of the region's rates relative to the U.K. as a whole. This is sharply at odds with the region's net employment performance, which of course has recorded a major drop in unemployment levels. Gaskin and MaKay say the discrepancy arises from an inability of local trades to match oil industry demands. They call the local labor supply "segmented," in that the personnel needs of the oil industry cannot be met by locally available talent in adequate numbers from the traditional industries, for reasons of "location, aptitudes, skills, or attitudes" which render the

region's mobile labor force unwilling or unable to compete for oil jobs. (Another factor may be the penetration of Grampian's workforce by labor unions: it is traditionally a more resistant area to unionism than other parts of Scotland, and relatively low wage rates may reflect this.)

Gaskin and MacKay's findings conflict with Lewis' and McNicolls' speculations [99] and clearly a longer baseline period for analysis would be necessary before more reliable trends could be suggested. Gaskin and MacKay believe that the construction sectors are exempt from these findings. That is, wage rates in non-oil construction have probably had to keep pace with oil-related activities.

Summary and Alaskan Relevance

While oil-related employment in Scotland has grown from nil to approximately 60,000 jobs, the total number of employed persons in Scotland has shifted only slightly from pre-oil levels. Either a redeployment of workers has occurred, or patterns of oil-related in-migration have merely balanced continuing out-migration in other employment sectors.

The greatest vulnerability to oil influences has been seen on the part of traditional industries in rural or semi-rural areas, where a limited number of skilled employees has felt the most acute pressure to change to oil employment. This may have had an effect on the "losing" industries out of proportion to the actual numbers of employees moving, since skilled workers may be employed in critical capacities. Further, oil employment may initiate a pattern of wage increases effecting firms in other

sectors, where market and price structures are not sufficiently flexible to permit increased costs.

As oil exploration and/or development activities move into more economically active areas of Alaska, especially areas with established primary industry, similar trends might be expected. Of particular concern is Alaskan local industry's vulnerability to "poaching" of the kind experienced in Scotland. One such industry may be fish processing, which is also closely linked to its environment, is of small scale in any one location, and which relies on large numbers of (usually imported and temporary) unskilled labor. Like Scotland, modern fish processing installations in Alaska tend to have relatively small numbers of skilled workers, especially in crucial maintenance and floor management areas. Also like Scotland, fish prices tend to be governed to some degree by markets outside the influence of Alaskan interests, so the price flexibility of the industry is not great, and its ability to enter major wage "auctions" is questionable.

One possible upshot of such a scenario might be an even greater reliance of processors on seasonal, imported labor, thereby further reducing already small local and statewide employment multiplier effects. This might appear to conflict with likely desires on the State's part to avoid these conditions. Scottish experience is possibly ominous in this respect.

I.6 EMPLOYMENT FORECASTING

General

In the context of sustained growth, detailed local or job sector estimates of employment arising from North Sea oil have been unreliable to some extent. At an aggregated level, however, there appears to be consensus that approximately 55,000-60,000 persons are employed in jobs somehow related to oil; the British government estimated that 25,000-28,000 jobs were "wholly" related to oil in 1977 [171]. Of these, approximately 12,000 were employed in oil-related construction, according to Gaskin and MacKay [58]. These overall figures are remarkably close to MacKay's"earlier estimates [103], and confirm that direct "production"-related jobs, which MacKay classifies as actual production, plus construction of offshore facilities, servicing, and processing--but not the construction of permanent facilities like terminals or refineries--have tended to generate service and construction sector jobs at about 1:1 ratio in Scotland, Oil-related employment "peakout" has generally been expected in the late 1970's or early 1980's; however, there is no recent data to confirm these estimates. Continuing new discoveries or development of new fields, such as the Beatrice Field in the inner Moray Firth, or possible North Atlantic fields in the West Shetland Basin, may clearly be expected to influence these estimates to some degree. However, employment in the most directly-related sectors to new fields, particularly platform or pipeline construction, may be at stable or optimal levels at present, and the direct impact of new orders may be to extend, rather than expand, employment in these areas.

The controlling variable in employment forecasts is clearly the pace of offshore activities, and there are several contributing factors evident in the setting of the industry's pace.

- Reservoir economies. The North Sea has been developed during a period of rapid change in world oil prices and U.K. taxation and extraction policies. Several "revenue regimes" may have applied to known oilfields prior to and during their development.
- Offshore technology. This has been the source of most uncertainty in the oil-related construction industry. Steel, concrete, and semisubmersible offshore installations have come into fashion and gone out; buoy moorages or subsea completion systems may be used in lieu of fixed structures, depending on the detailed size or locational characteristics of offshore fields. New discoveries therefore do not guarantee a continuation of existing construction yards.
- Government policy. There has evidently been some measure of confusion at the government level as to optimum extraction rates, and how best to stage new fields coming onstream.
- Receiving-end infrastructure. The major BP refinery complex at Grangemouth has been obligated to increase its throughput considerably to handle North Sea crude. While this may have only a slight employment impact on Scotland, under-built processing infrastructure may have filtered effects throughout the industry.

Given that Scottish researchers, notably at the University of Aberdeen, have worked to establish statistical measures to translate offshore reser-

ves and activities into onshore job requirements, aggregated employment forecast levels have been fairly accurate, since overall extraction rates and reserves have been known to some degree of detail. However, the localized components of these forecasts have been much more volatile, owing mainly to the high degree of product specialization in particular communities. For example, a community like Methil in Fife, which has specialized in steel platforms, may be highly vulnerable to a falloff in this particular product as technologies change. The slack may be taken up at Ardyne, confirming aggregated projections of construction employment, but not helping Methil very much. The dangers of breakdowns in detailed forecasting have been recognized, and have led to a fair degree of uncertainty at the regional or local level.

Regional Effects

At the regional or subregional level this uncertainty has been inconvenient at best or catastrophic at worst. Available literature suggests, for example, that much anxiety in East Ross over overbuilt housing or infrastructure may have been unnecessary as Beatrice comes on stream and as new steel platform orders are place at Nigg. However, the other Moray Firth steel platform yard, at Ardersier, has recently layed off a large portion of its labor force due to order falloffs [28]. At Peterhead, employment forecasts centering on petrochemical activities were dealt a severe blow when Shell/Esso announced the movement of their proposed gas processing facilities to Fife. The Moss Moran plant will employ about the same number of workers (300) as it would have in Peterhead, 160 km (100 mi.) away.

Most dramatically, uncertain forecasting has resulted in disaster for the community of Stornoway, indeed for the whole Outer Hebredian island of Lewis, with the closure of Lewis Offshore Limited. Gaskin and MacKay [58] cite government forecasts for Lewis' oil-related employment at 200 for 1976, 400 for 1981, and back to 200 by 1986. In April 1978, however, the steel module yard at Stornoway closed, laying off about 300 workers, or one-third of manufacturing employment in the whole region [147]. Lewis Offshore, a subsidiary of a Norwegian shipbuilding firm, had received no new orders, hence the redundancies. The opening of the yard had been predicated on the employer's estimates of 200-400 jobs for 25 years [35], and an air of local good will had been established through the owner's assurance that no Sunday working would occur in Sabbath-observing Stornoway. Acute disappointment at the yard's closure has been felt throughout the community, and concerns are now expressed that movement of workers to the yard from other parts of the region may have initiated an irreversible urbanization trend in the Western Isles, at the expense of the tweed and crofting industries [35]. As elsewhere, considerable local public investment has gone into new housing and infrastructure [168] in Stornoway to serve the anticipated population growth, estimated at upwards of 1000. See Section II.9.

Information Sources

There evidently has been a tendency to rely on employers for employment forecasts. This procedure clearly is risky, especially in light of some of the operating characteristics and the internal structure of the offshore industry, as discussed elsewhere (see Sections 1.4 and 11.7). As

most onshore employment in Scotland has been in the servicing and construction aspects of offshore development, usually involving contractors rather than the operators themselves, the entire employment complement associated with the industry is a patchwork of private, competitive, independent planning. It seems quite conceivable that in this kind of environment any competitive edge, including favorable employment forecasts, might be used by would-be developers, when in fact their workload is highly volatile and largely beyond their control.

The Stornoway experience suggests the importance of accurate employment forecasting at the smallest level possible, undertaken by neutral parties. The lack of such forecasting has proved crucial in Scottish areas like the Western Isles because while the total number of oil-related employers is small, their share of the region's total industrial workforce is disproportionately high. Similar situations can be imagined in Alaska, or in Canadian Beaufort operations heavily dependant on one employer at one stage of operations.

Summary and Alaskan Relevance

While aggregated oil-related employment forecasts in Scotland have been fairly accurate, they have been subject to a number of variables, most associated with the pace of offshore developments. Detailed or local implications of these forecasts have been less reliable, and have resulted in cases of unnecessary anxiety or major disappointment as employment sources that were expected to either disappear or last for a long time have done the opposite.

Nearly half the "wholly-oil-related" jobs in Scotland have been in the construction sector, notably in platform fabrication. While the chances of this particular activity occurring in Alaska cannot be ruled out, it may be surmised it probably will not represent relatively as great a portion of the total activity as it has in Scotland. However, this does not necessarily negate the main points: the pace of development of offshore fields is the controlling factor; and estimates provided by potential employers may involve more optimism than realism.

Early uncertainty in Scotland over ceiling employment rates may have been a function of duplication of services over a number of sites, for example as competitive platform yards proliferated. Again, the probability of this problem occurring in Alaska must be regarded as small. If platform fabrication does not occur in Alaska, the construction sector's role may be limited to housing or infrastructure (including port infrastructure) development, or possibly terminal building. Since distances between potential Alaskan OCS oil provinces are great, it may be that employment will tend to be located more efficiently in a few service centers. The high costs of operating in Alaska OCS waters and limited coastal infrastructure will undoubtedly discourage unnecessary duplication of coastal installations, so it may also be that the detailed local forecasting errors recorded in Scotland may not occur again.

1.7 MIGRATION

Inter- and intra-regional migration levels and rates may have been strongly altered by oil developments. No census has been held in Scotland since 1971; however, estimates [171] strongly suggest considerable population movements have followed oil developments. Highland Region recorded a 6% population increase (an additional 11,000) between 1971 and 1976; Shetland's population increased by nearly 10% (to 19,000); larger Grampian Region's 3 1/2% increase represented an additional 15,200 persons. Orkney's increase of 600 persons also represented a 3 1/2% increase. By comparison, Strathclyde lost 3.4% of its population, or 86,900 persons. The Western Isles recorded a very minor drop (200 persons) which may conceal more significant intra-regional migration from the outer isles to Stornoway's oil developments. Scotland as a whole lost 23,900 persons over the period [171].

The context is significant: all the "oil areas", meaning the Highland, Island and coastal northeast regions of Scotland are traditional population losers. In every case this long-term situation has been sharply reversed in the years since oil discoveries.

One can imagine that one of the principal impacts of these population changes is the psychological one, given the tradition of out-migration in the involved areas. Out-migration has traditionally been chosen by young skilled and semi-skilled workers, reflecting a complex pattern of land tenure, local economy and other socio-cultural conditions. A lack of employment opportunities in north and northeast Scotland has provided

the major impetus to out-migration.

Bell and Kirwan [8] have attempted to model return migration on a whole-Scotland basis; their conclusions are that through the 1960's returning migrants to Scotland did so due to declines in the English labor market, not due to any increased Scottish prosperity. They speculate this may not continue to be the reason as Scotland's performance relative to the rest of the U.K. continues strong.

The relatively positive population changes associated with oil are composed of a number of migration components, some of which are interesting from an Alaskan point of view. Sewel and Birks [175] have attempted to model oil-influenced population change into a typology. Its elements are return migrants, long distance commuters, local or internal migrants, and incomers. Each of these categories contains regional and subregional socioeconomic implications.

- Sewel and Birks distinguish between four types of return migrants: those that return only because of employment opportunities which coincidentally happen to exist in their home areas; those for whom oil employment was merely an enabling factor for an already-planned return to kinfolk and known circumstances; those who move to an area or a community with which they have no previous experience (but who are nevertheless statistically classified as "returnees"); and those who return unwillingly only because of poor conditions in their newly-adopted home areas. Sewel and Birks criticize a commonly-held belief that returning migrants constitute a homogeneous group. They suggest that returnees in the first,

third and fourth groups are relatively prone to move again if conditions deteriorate.

- The issue of long-distance commuting is a disturbing one in Scotland, since large oil developments have been concentrated into a few locations. Estimates exist that up to 300 persons daily commute the 50+ arduous miles from east Sutherland to the East Ross developments, around the Dornoch Firth on a highway ill-prepared for such traffic. (The A9 highway is being improved for much of its length south from East Ross, but the pattern of commuting from east Sutherland does not benefit from these improvements.) Again, Sewel and Birks subdivide commuters into three groups: income supplementers, likely to return to their first vocation (e.g., crofting) in the event of oil rundowns; potential out-migrants, who see oil as a stop-gap to leaving the area altogether; and those who would like to move closer to their oil-related job but who can't because of housing supply problems at the receiving end. In the second and third cases, potential migrants are conceivably only temporarily kept from leaving; a rundown in employment or an improvement in local housing conditions might turn their commuting into relocation.
- Sewel and Birks save their greatest concern for the third major group, "local" or intra-regional migrants. Like the case with overall economic impact, analysis of local population shifts tends to suggest a continuation of much the same rural depopulation trend established before oil's advent. In the rural northern Highlands, especially West Ross, Sutherland and the Hebrides, these trends have previously resulted in complete village disap-

pearances, as population levels fell below the point justifying postal service, transport links, or schools. The population simply moved away. Similar conditons hve been experienced in Alaska bush areas. Sewel and Birks suggest a hypothesis that once a family has moved intra-regionally it has been initiated into the ranks of migrant households, and may continue, with future employment reversals, to keep moving, eventually out of the region or out of the country.

A parallel may exist between north Scotland and the Alaska bush, with unknown ultimate consequences to migration patterns. High school students from more distant areas of north Scotland, e.g., West Ross, west and north Sutherland, Orkney and Shetland, were boarded at distant, occasionally remote, mainland schools, not unlike a BIA policy for relocating students from bush villages in Alaska, which was common in the postwar years. A pattern of temporary intra-regional migration was thereby established as a normal and everyday event, and large numbers of both Alaskans and Scots may have been effected at a psychological level by this pattern.

- Incomers are categorized into two groups by Sewel and Birks: itinerants who simply follow job opportunities around the U.K., and "new locals" who attempt to reside in oil-impacted areas permanently. There are clear public investment and social implications from each group, and experience suggests a rough division of incomers based on the type of oil-related development present in a given

community. Platform and construction yards have tended to attract single "traveling men" while family relocations have tended to result from longer-term activities (or at least those perceived to be so).

Sewel and Birks conclude with a warning that oil may merely delay out-migration for the period of oil activities. On the other hand, they speculated some in-migrant oil employees may remain after their oil employment ends, out of a desire to establish permanent residency, i.e., to leave the ranks of migrants.

Data sufficient to support any statistical conclusions on these points is as yet unavailable, although Grieco [64] in 1978 announced her intent to provide a deeper statistical analysis of population movements than that undertaken by Sewel and Birks.

Summary and Alaskan Relevance

A migration typology is suggested in the case of north Scotland which suggests that oil-related population movements have several components:

- Return migrants, who may return to their original home area either for reasons of desire, convenience, lack of work elsewhere, or who "return" only in the sense that they return to the same statistical area but not to their home towns;
- Commuters, including those who may endure commuting so as to supplement their incomes, those who commute to prevent (or postpone) out-migration, or those who would move but who can't because

of a lack of housing at the receiving end;

- Local migrants, who relocated within a given region (and who leave their home communities smaller and economically weaker);
- New residents with no prior experience in an area.

A recurrent question regarding migrants is the permanence of their move, or whether or not oil-related developments, particularly those involving large but temporary activities (e.g., platform or terminal construction) will merely delay out-migration rather than preventing it.

The only potentially applicable Alaskan counterparts to these phenomena relate to the Trans-Alaska Pipeline experience, and three mitigating factors may inhibit direct comparison. First, much of the construction activity associated with the pipeline (and development of the Prudhoe fields) occurred in areas very distant from established population centers/ While these centers (notably Fairbanks) underwent major population growth, much pipeline activity was based out of temporary construction camps. The major cities acted mainly as staging, recreational, and administrative centers. Some commuting occurred from Fairbanks, but was based from the Ft. Wainwright camp (although some commuting from Fairbanks proper to the Ft. Wainwright "bus stop" occurred).

Second, Alaska underwent a major overall population increase during the pipeline period, so while some redeployment, hence intra-Alaska relocation of resident labor may have occurred (like in Scotland), its amount as a proportion of the total probably was not great.

Third, the major role played by labor unions in Alaska has little Scottish equivalent; indeed, union organization of Scottish platform yards has progressed erratically at best. In Alaska, hiring was most often accomplished through union hiring halls in Anchorage and Fairbanks, further leading to the "clearinghouse" roles of those cities.

As Alaskan coastal communities become involved in oil exploration or development activities, this pattern may change. Presumably the linear nature of the pipeline will be absent, so its relative logistical efficiency will also be missing. This may lead to a more dispersed service and support pattern, with consequent replications for employment and population movements. If Alaskan OCS developments lead to centers of development, the possibility of some local migration certainly exists. The Scottish experience cannot be discounted in this regard, that is, the possibility that selective intra-regional migration may harm the "sending" communities more than it helps the receiving ones.

1.8 EMPIRICAL SOCIAL ANALYSIS

General

Empirical social impact analysis has been limited, but severe social disruption from oil appears to have been avoided. The benchmark document on North Sea oil's social impact on a small community was undertaken in 1973-74 by John Francis and Norman Swan for the Church of Scotland. This document, "Scotland's Pipe Dream," now out of print, recorded sharp increases in various social pathologies in Peterhead, including increased crime, school dropouts, problems of alcoholism and prostitution, and so on. (It should be noted that Peterhead has been the scene not only of oil developments: expansion of a nearby prison and development of a major new power station largely coincided with oil impacts, so isolating oil's direct influences from others is impossible.) Francis and Swan's findings appear to apply to most instances of large construction activity in small communities rather than applying specifically to the range of oil-related activities present in Peterhead at the time. These included a service base, and nearby gas and oil piepline landfalls.

Rose [138] and Currie [19] record the socioeconomic impact of developments on the Cromarty Firth area, concentrating somewhat on issues of land speculation and local anxiety over the uncertain lifespan of oil activities. Both comment at length on Highland Fabricators' use of obsolete cruise liners for temporary accommodation of platform yard workers, and discount to a degree the (then-prevalent) rumors of disruption caused by this. (As an aside, use of a liner recently started Sullom Voe in

Shetland, following the Island Council's desires for workforce encampment rather than integration. See Section 1.10.) Rosie's small book in particular shows a balanced view of Cromarty Firth developments, demonstrating the highly subjective nature of social impact assessment. A more recent Shetland equivalent, Button (Ed.) [14], consists of individual essays on various Shetland impacts, concentrating on the political/administrative consequences of the Zetland County Council Act.

Empirical Research

A recent attempt at comprehensive empirical anlysis of socioeconomic conditions and perceptions can be found in Sphere Consultants' Beatrice Field survey [184], part of that company's overall impact analysis for this newly-discovered field. Beatrice is located in the inner Moray Firth and could potentially conflict with inshore fishing operations in that area. It could also bring the first physical evidence of North Sea oil development to the east Sutherland/Caithness shore, although this now appears doubtful.

Sphere comments on the different social environments prevailing at the area's two. platform yard sites, caused presumably by different recruitment policies. At Nigg, a very rapid build-up led to considerable importing of labor from Scotland's industrial central belt; at Ardersier, a more leisurely build-up allowed the redeployment of indigenous labor, thus evidently reducing the level of social disruption.

In 1977, the Scottish Office attempted [149] to model indicators of social change in two oil-impacted areas, Peterhead and Stornoway, as a pilot approach to social auditing or a social impact statement. Those indicators employed in the SDD study were: housing, education, social work referrals, law and order, health services, "behavioral changes" and the cost of living. "Behavioral changes" included information extracted from the social work, law and order, and educational information categories. As suggested earlier by Francis and Swan, a sharp increase in crime occurred, dominated by theft, housebreaking and breach of the peace. The rates were anywhere from three to twenty times the national average, although most remained below urban Scottish averages, which are dominated by heavy crime rates in the Glasgow area. Other indicators showed a very mixed picture, with mental health referrals, entry into vocational education, and other categories showing improved or static patterns from pre-oil levels. No further similar work has been commissioned, and dissatisfaction with the use of indicators has been voiced. Criticism centered on the reliability of base data and the ranking of these indicators: compiled by local authorities, the analysis tended to use "off-the-shelf" data.

Based on this limited empirical evidence several trends useful from an Alaskan viewpoint are suggested:

- A different social impact pattern results from each type of shore based activity. There may be a positive correlation between the number of construction workers brought into a job and an increased level of negative social indicators. This appears axiomatic, and relates to the migration typology suggested by Sewel and Birks

[175], where single "traveling men" constitute a major element in construction workforces. Other shore-based activities, e.g. service bases and operational terminals employ relatively few persons following construction, these mainly in skilled areas, and so generate comparatively few negative socioeconomic influences. (This may be related to these facilities' longer lifespans, as well.) Most service centers on the North Sea have had major historical roles as transport hubs, so there is reason to believe, but little empirical evidence, that many offshore employees (i.e., workers on platforms or rigs) have not domiciled in north Scotland but instead have capitalized on the offshore shift-work system to live elsewhere. Terminals, of course, are highly automated: the Flotta terminal in Orkney, and Sullom Voe in Shetland, represent long-term employment for a relatively small, albeit skilled, workforce [111].

- The principal negative influence of oil-related developments results from their temporary nature, and the "boom-bust" economic conditions and uncertainty. Coping with social pathologies is made much more difficult in a continually changing population picture.where a large workforce grows or turns over.
- High wages offered by oil-related activities can lead to some increase in "victimless" crime, with alcohol and vice offenses predominating. longer-term evidence from Nigg, Peterhead, and Kishorn suggests there may have been some' initial over-reaction to these problems, both by researchers and by local authorities. Crime incidence may have fallen off sharply as soon as the possibility of fluctuating employment levels was perceived by the

workforce, leading to more conservative money management habits. Additionally, a large portion of oil construction workers are "traveling men" accustomed to temporary stationing and camp environments, and often with dependents in other parts of the U.K. (or, frequently, Ireland) . They may have sent the bulk of their wages home.

- Little evidence of profound cultural displacement exists. This may be due to the relatively small number of oil development cases in the more traditional western Highlands; in Shetland (see Section 1.10), a degree of cultural displacement is evident [30] but not as high as first feared. (See House [80] for a discussion of the "integration" powers of the oil companies.) In the outer Hebrides, considerable attention was paid to the operators' potential cultural impact prior to approval of Lewis Offshore's application to open a steel module yard (now closed) in Stornoway. Particular weight was given to Lewis Offshore's promise to ban work on Sundays out of respect to local religious practice. Stornoway, it might be noted, was the scene of one of the Scottish Development Department's social impact monitoring experiments.
- The concentrated nature of oil developments has possibly enforced existing selective outmigration patterns from rural areas (see Section 1.7).

The Sphere study [184] mentioned earlier is the only recent large-scale public survey undertaken in a major Scottish oil area. While its findings are varied and interesting (and discussed in Section 1.9), it applies to an area with a limited history in oil activities (heavy construction), and

translation of its findings to other Scottish regions would be questionable. This is unfortunate, since a large share of Scottish academic research in the areas of social and anthropological impacts of oil has tended to be theoretical [122, 124, 135, etc.]. Mackay [106] has criticized this, and Crofts [18] has called for researchers to "pull together" to concentrate on areas of direct applicability.

Summary and Alaskan Relevance

Empirical research into social impacts in Scotland has been limited, but has tended to confirm that rapid oil developments may lead to increased rates of social pathologies, especially in cases of large-scale, temporary construction projects. However, the rates and/or magnitudes of negative indicators may not have been as severe as initially feared. Data used in confirming trends may be questionable because of its age or source, pending the outcome of the 1981 census now planned. British academic analysis of the social impact of oil has tended to be theoretical, and major areawide direct surveys have not been undertaken except in one instance.

Application of Scottish findings in the area of direct social impact of oil to Alaskan situations is probably unwise, except in terms of categories and possible causal relationships. It can be argued that rates of social change and particular characteristics of change are almost totally irrelevant, since they are functions of baseline characteristics and a social structure quite different from Alaska. Scottish and Alaskan legal, health care, transport, communications, manpower, and welfare

delivery systems, while confronting many common problems, are organized on different lines, so the therapeutic measures which may be taken will diverge accordingly.

Scottish experience in the social impact of oil suggests that a rough conceptual parallel may exist to Alaska, one which must necessarily ignore the details but address generalities instead:

- Anxiety over oil developments is a function more of uncertain timing rather than the actual nature of the impact;
- Increased social distrubance (as defined by indicators of health, crime, etc.) may be expected in rough proportion to the degree of temporary in-migrant construction workforces;
- A period of unsettlement in local social relations may pass relatively quickly, and indeed may lead to a redefinition of "normal" or "baseline" conditions which includes an oil-related socioeconomic component.

The considerable degree of pre-oil socioeconomic analysis to which Alaska regions are being subjected has no Scottish equivalent, so many of the unexpected impacts of oil experienced in Scotland may not occur in Alaska. Instead, a key factor in Alaskan scenarios is the cultural disparity which prevails between urban and bush regions of the state. While certainly there are areas of Scotland which portray elements of highly traditional societies, the degree of divergence of these areas from metropolitan British society is only a fraction of the Alaskan analog. It would be misleading to suggest otherwise.

1.9 PERCEPTIONS OF CHANGE

Local perceptions of oil-induced disruption have moderated as experience grows. The Sphere Consultants attitude survey [184] of the area potentially affected by development of the Beatrice field showed 88% of the large sample either approved or accepted the idea of North Sea oil development in their area. In July 1978, by contrast, graffiti appeared on the base of a nearby statue of the first Duke of Sutherland (a symbol of the infamous Highland Clearances) demanding, in Gaelic, “the Highlands for the Highlanders” [7], reminiscent of McGrath’s early musical warning of oil’s ultimate despoiling role [118]. Local attitudes to oil development in Scotland are obviously still mixed, but the general tone of recent literature suggests the levels of both optimism and anxiety experienced in early years have moderated.

The Sphere survey involved a sample of several thousand respondents in a number of locations potentially effected by Beatrice’s development. It recorded, for example:

- a great majority of respondents desired improved employment opportunity in the region;
- jobs were regarded as the main benefit of oil developments;
- possible environmental damage, especially to the fishing industry, was seen as the main disadvantage of increased oil activities;
- Sutherland (which has no oil-related industry at present) approved of the field’s development more than any other region.

The Sphere survey is especially significant in that its sample is undoubtedly familiar on a first-person basis with many of the details of oil developments in the region. It must therefore be regarded as a fair, if area-biased assessment of present perceptions.

Views of Prior Residents

Apart from the Sphere study, no large attempt to profile local perceptions of oil development has been undertaken. Instead, a number of single community-based observations have been made, particularly dealing with Shetland. Of these, Cohen's papers on community identity [16, 17] are the most instructive and readable, because they comment on the highly integrated pattern of folkways and traditional economic modes into which oil was injected.

An important conclusion Cohen draws, and one of some use in Alaska, is that the main impact of oil on "traditional" Shetland has been its acculturizing influence. "By forceably making people aware of others, they are made aware of themselves." [16] Cohen notes that the real impact on Shetlanders' self-perceptions was made not by the terminal nor by the first service base activities, but by the prospect of these things, what he terms "the traumatic and irrevocable induction into the realization that the familiar may not, after all, be permanent. .." [16].

Equally applicable to Alaska is Cohen's assessment of baseline conditions in Shetland leading to the peculiarly self-reliant reputation of the place. With a local economy dominated by fishing in very adverse marine

conditions, ".. . the very achievement of enduring, of surviving and routinizing crisis itself helped to establish the popularly propagated collective self-identity of Shetland." With other factors, most especially the physical and economic isolation of the islands, the baseline Shetland condition was one of extreme community self-reliance (reminiscent of traditional Alaskan coastal settlements). Oil, says Cohen, intruded into this social environment specifically because of its apparent disregard of logistic conditions, and has led to "the need for a renewed cultural account."

The process of self-awareness and cultural affirmation Cohen records has had a clear politicizing effect. For example, Shetland's participation in British and European debates over fisheries management issues, especially the impending EEC Common Fisehries Policy, is at a previously unheard-of level. And, on a larger scale, Shetland's self-congratulatory attitude towards the Zetland Act [77] is further confirmation of oil's enforcement of long-held Shetland concepts of resourcefulness and know-how in awkward conditions, suggesting a parallel to Alaskan native self--confidence (especially in Inupiat areas) after ANCSA and whaling confrontations.

However, in a series of press articles in 1978, Dowle [31, 32, 33] painted a more divided picture of Shetland's perceptions of oil, with pro-oil opinions voiced (not surprisingly) by small businessmen and developers, and concern over "shattered" community life in certain areas expressed by local government officials. The apparent motivation for these concerns is anxiety over oil developments' influence on near water and shellfish

fisheries; a combination of access loss and potential spills getting a lot of attention. Despite its more cautionary tone, Dowle's analysis tends to confirm Cohen's earlier thesis, i.e., that oil has had a unifying and self-confidence generating impact on Shetland which may have a greater magnitude than the social dislocation felt in the front line communities.

Views of Incomers

An entirely different perspective is given in House's documentation of incoming oil workers' perceptions of life in Aberdeen [80]. House starts by discussing some general operating characteristics of the major multinational oil companies and their implications for individual employee and corporate behavior in the field. The operating characteristics include a great regard for efficiency and flexibility of workers and vendor firms, whose Scottish operations have been plagued by labor difficulties and changing government policies. House suggests that a commonly-held Scottish perception of oil companies as greedy exploiters of labor is really a confused response to the importance of efficiency and flexibility within the industry.

He asserts that another characteristic of incoming oil firms is an inclination where possible to integrate quickly with the host society and to dispel any sense of "apartness" caused by their arrival. This may be manifested by the use of local services, encouraging the placement of employees' children in local schools, and so on. (We should note that this diverges from oil companies' behavior in such areas as the middle

east, where isolation of their employees in expatriate communities, e.g., Dhahran in Saudi Arabia, is common.) The general theme appears to be a desire to avoid an expected hostile welcome by either co-opting, or blending into, the established community elite.

Aberdeen was evidently seen as less an alien society to (American) oil incomers than most other locales, so integration was pushed forward. House says this was less successful than anticipated; the surface similarities of Scottish and American life concealed major differences in attitude and social structure. Middle-term adjustments (e.g., the opening of an American school) were made, and, if we are to believe Hunt [83], a move to "integration" of American business practices with Aberdonian became a trend toward dominance.

Perceptions of Reversal Situations

No empirical evidence is available regarding attitudinal changes in cases of major employment rundown or yard closures, or in the cases of communities (like Peterhead) where greatly anticipated developments have not materialized. This is clearly a very fruitful area for further research, one especially relevant to Alaska. Since the major employment reversals in Scotland have occurred since 1977, research in Scotland, if any, probably has not yet been completed.

Summary and Alaskan Relevance

Perceptions of change associated with oil developments in local areas are poorly recorded in Scotland, with only one sample attitudinal survey having been conducted in recent years. This survey showed a general acceptance of the inevitability of oil development, and a guarded welcome of the economic benefits accruing from them. At the local level, narrative accounts from Shetland suggest that the major preceptual impact arising from offshore activities occurs when they are first perceived as possible. The potential departure from "normal" conditions they imply leads to a "social accounting", or affirmation of the unique and treasured characterisitics of the host community.

A different perspective is gained by analysis of the views and adaptations of international oil companies' employees to Scotland. In this case the surface similarities of Scottish and American society led to a (possibly unconscious) policy of integration and co-optation by the companies. By stressing efficiency and flexibility as important traits among workers and subcontractors, the companies may have precipitated a hostile reaction from conservative northeast Scots, who misread these goals as greed and antipathy.

Analyses of perceptions associated with rundown or non-starting situations, i.e., where anticipated benefits failed to materialize, have not yet become available. They constitute important areas for further research, however.

The first and third categories of perceptions are more relevant to Alaska than the second, as they involve questions of anticipatory change. The Shetland example may suggest oil may have a unifying and strengthening role, by leading to a common assessment of the aspects of the local society worth protecting. Care must be taken in making cross-cultural assumptions, of course, but traditional, small, isolated maritime communities may have similarities which transcend superficial differences. In other words, the relatively optimistic view from Shetland may have direct Alaskan implications.

1.10 INTEGRATION OF TEMPORARY WORKFORCES

Major oil-related industrial activities, usually construction projects with large workforces, have been established in large, small, remote and metropolitan areas of Scotland. A recurring issue has concerned the physical location of these workforces, that is, whether they should be isolated in camp situations; or allowed to reside in, and integrate into, established local communities. There are economic, social, and public investment implications of the choice taken, and, while the available literature unfortunately does not confront the issue directly, a number of implications useful to Alaska may be identified:

- The economic costs of physical integration of oil-related workforces into local economies may outweigh the resultant revenues. Grigor [66], Grieco [64], Rosie [138] and others have discussed the costs of increased housing infrastructure and public services to meet oil-related demands. In an Alaskan context, a suitable question to ask might be whether the oil-related development (and its resultant local economic multipliers) will outlive the debt or the bonds floated to pay for improved services. The pay-back horizon for many public improvements, and almost always in the case of housing development, is likely to exceed the optimal oil activity period. This is especially so in cases of rapid build-ups associated with exploration, or development phases of offshore operations. A common assumption is that a greatly augmented housing and infrastructure stock, useful for post-oil population, can justify major local investment during oil's runup. However, the local post-oil economy, especially in areas where temporary

construction activities have constituted the major impact, may often rely on the same base that prevailed before oil's advent. In most oil areas in Scotland the local economy was fairly marginal before the industry's arrival, and the prevalent population pattern one of decline. Thus it appears problematic that newly-built community facilities may find post-oil uses adequate to service the debt associated with them.

- Alternatively, physical integration of oil workforces may trigger local economic growth beyond the "takeoff" point. Among the controlling factors may be the baseline economic diversity of the affected community, the flexibility of labor supply, and the potential for local investment. Lewis and McNicoll's work [99] offers some guidance here. Most encampment situations in Scotland have relied on provisioning by the sea (as in the case of Kishorn, where it was a precondition to planning approval), so opportunities for local economic spinoffs, through the linkages described by Lewis and McNicoll, have been minimal. In these cases, only certain service sector enterprises have benefitted locally (like bars or transport services). Aberdeen, on the other hand, through its size and innate diversity, probably has maximized oil's spinoff influences precisely because of integration of the workforce, which, of course, contains a healthy technical and professional component.
- Encampment is not the same as isolation. Fraser's narrative on Kishorn [45] is instructive, as is the body of work on Shetland's experience with encampment at Sullom Voe [30, 65]. While, in economic terms, isolation of temporary workforces may bring few

benefits to indigenous industry, in social terms some interaction is inevitable. The problems of increased social pathologies in Peterhead [149] and Nigg [19, 128] probably occurred independently of the workforce accommodation options chosen. It is also important to keep in mind the frequently tiny scale of "indigenous" economies and societies in some oil-impacted areas. In the case of West Ross (and discussed a little in the Drumbuie inquiry, see Section 11.2) the population is very small indeed, its employment fairly seasonal, and its social structure delicate--even a very few cases of, say, crime related to oil workers, may represent a very major impact.

- No case of encampment vs. integration is altogether black or white: in the case of Ardyne Point, even in the case of the non-starting platform yard at Portavadie, some locals were employed at the yards, despite avowed policies of encampment at both locations. (Ardyne Point is an interesting case: the nearest road-connected community is Dunoon, a tourism-based town which was subjected to great adaptive pressure in the 1960's as a result of the U.S. Navy's decision to locate its north European Polaris submarine service base in the nearby Holy Loch. The U.S. Navy, unlike McAlpine's oil platform yard, chose an integration policy instead of isolation; evidence suggests this policy has been well-received in the subregion.)
- Temporary isolation may help long-term integration. Expansion of the housing stock in the Shetland villages of Firth, Ness, and Brae has been undertaken to accommodate managerial personnel associated with construction of the Sullom Voe terminal; the

housing will ultimately be turned over to permanent terminal employees. Here a clear positive dovetailing of temporary and permanent objectives has been achieved.

Summary and Alaskan Relevance

The benefits and costs of camp versus integration approaches to accommodation of temporary workforces have social as well as economic and financial dimensions. Both approaches have been used in Scotland; the results are inconclusive but point to a number of possibilities relevant to Alaska:

- The public costs (including public debt) of additional infrastructure and housing for temporary workforces may take longer to retire than the length of oil-related employment in the community, leaving an overbuilt situation;
- In more diversified situations, the marginal effect of oil workforces' integration into the local economy may trigger growth which survives oil's ultimate departure;
- Even in cases of encampment, some contact between workers and locals is inevitable, so while the chance of unfavorable social impacts is reduced, it is not removed.
- Opportunities may exist for re-use of some camp components or for sequential use of housing built for temporary workers. Impacted communities may be able to harness the physical expansion required by oil activities into their general physical growth plans.

To the extent that some of the most dramatic Scottish camp vs. integration situations developed around platform yards, which are highly volatile and temporary, those situations have little Alaskan comparability. The Sullom Voe terminal is roughly comparable to Valdez, and similar approaches were taken in both locations. Of course, camps were used almost exclusively in the building of the trans-Alaska pipeline; such an area as the Copper River basin may provide some indication as to how smaller and more traditional Alaskan communities responded to nearby major industrial encampment.

Demands for major camp establishments probably will come only during development and production phases of Alaska OCS activities. Smaller coastal communities may more likely face the experience of Yakutat, i.e., a "pass through" role (where offshore crews are shuffled back and forth between the offshore rig or platform and more distant points) and possibly some relatively small-scale offshore servicing. In these cases camps will probably be unnecessary, except that some stand-by facilities may permit occasional overnighting in cases of transport difficulties.

It is worth noting Canadian Beaufort Sea OCS explorations in the Northwest Territories, based from Tuktoyaktuk, have relied on a major camp near that village to reduce the impact on the local community. This may be relevant to areas of arctic Alaska, where smaller drillships, with limited on-board crew accommodations, may be the general rule in exploratory operations. In this instance a larger shore-based impact during the exploration phase can be anticipated.

1.11 RUNDOWN PLANNING

Little planning appears evident for eventual rundown of oil-related developments. It can only be regarded as ironic that, despite the elaborateness of the Scottish public planning mechanism, so little attention has been directed at the inevitability of rundown. Only recently has any concern been aimed at these issues, so this section must simply set out where some of this concern might be directed. The implications of rundown are economic, social, political and physical:

- Economic. Mackay and Sewel [107] in 1978 proposed a major research project into the socio-economic aspects of employment falloff in oil areas; it is unknown if this proposal has received government support. Their study would involve analyses of leaving employees, the community-wide impact of reductions, and attempts made to redeploy extra labor within local or regional markets. In addition, they proposed to conduct a socio-political element on these lines, attempting to model attitudes, community conflicts, expectations and status alterations resulting from layoffs and/or closures.
- Social. No specific research has looked too closely at the social and attitudinal consequences of rundown, probably because only very recently has rundown been experienced in communities which opted for an integration policy of temporary workforces. Cases for in-depth study are suggested: Stornoway, following closure of Lewis Offshore Ltd., Ardersier, which has experienced recent layoffs at the McDermott steel platform yard due to order rundowns, and Peterhead after Shell/Esso's announcement moving their pro-

posed petrochemical plant to Moss Moran. Some indirect evidence is suggested from Shetland, where the Shetland County Council's insistence on a "disturbance fund" from the oil companies akin to Alaska's Permanent Fund was a clear case of planning for run-down by getting together a savings account for the inevitable rainy day.

- Political. Oil's eventual disappearance, and the consequent need for long-term economic diversification, has not been lost on politicians. In a way, Scotland (perhaps like postwar Alaska) has already experienced a series of severe industrial rundowns, as its shipbuilding and steelmaking industries became increasingly uncompetitive after the war. Because of this, the "dark at the end of the tunnel" is a well-known element in Scottish political rhetoric. It was adopted in reference to oil by the Scottish National Party, who argued that a slowdown in extraction would give a longer lead time for post-oil economic plans.
- Physical. Afteruse studies have been undertaken only haphazardly, and have concerned mainly the use of platform yards after orders cease. These yards are mainly large excavated holes below tidal high water with considerable leveled land adjacent, possibly with temporary structures remaining. Infrastructure and road service may be quite good, but locations are typically remote. A fairly predictable range of uses has been proposed, e.g., marinas, research establishments, restoration to agricultural use, etc. Only one major yard, at Portavadie on Loch Fyne, has been developed but has not received an order; government ownership of the yard was undertaken so that an order might be secured (perhaps

by the new British National Oil Corporation). Proposed afteruses for the Portavadie site [161] will have to wait for a final government declaration of redundancy; it is not known how long this might take. Another non-starter yard was partly developed at the massive new Hunterston industrial complex near Glasgow, hoping to capitalize on nearby new steelmaking and transport infrastructure. The British government's apparent subsequent policy of concentration of North Sea oil in pre-existing yards has probably played a role in Hunterston's lack of orders.

One of the mitigating factors in rundown planning is the ongoing level of new discoveries in British waters. Experience through the 70's has been that slowdowns were the result of external political and economic forces, such as the "oil glut," changing taxation pictures, etc., which were perceived as temporary. As peak production of proven North Sea fields will not occur until the mid to late 1980's, rundown of terminals and processing facilities is quite far off.

Some attention has been paid to international markets now available to proven Scottish enterprise, with deepwater platform technology frequently cited as an emerging area of Scottish expertise. Some export of platforms is occurring, but one of the factors leading to the establishment of coastal yards in Scotland was their proximity to the fields; it is likely that this might be an important factor in platform building for other oil areas. More likely would be the export, perhaps on license, of offshore technologies themselves. This might help the "invisible export" balance sheet but would have little moderating effect on unemployment

rates in Scotland.

Shetland has heard worries over oil "addiction" arising from an excessive economic and/or psychological reliance on continuing oil-related growth. This is a familiar point in Alaska, and one which must be taken seriously. Perhaps middle-eastern models are more instructive here than European. There, diversification of local social and eocnomic conditions is seen as a mandatory step in getting ready for post-oil existence. Adoption of this attitude by Scottish or American decision-makers, while late, is now probably underway.

Summary and Alaskan Relevance

Anticipation and research is only now starting to be directed to questions of post-oil conditions in oil areas in Scotland. Its lateness is a function mainly of continuing new discoveries, although non-starting situations and some platform yard closures have been noticed. Some preparations in economic, social, political and physical areas have been taken, however.

In the absence of hard information from Scotland little anticipation of comparabilities to potential Alaskan circumstances is possible.

II. ADMINISTRATIVE AND POLITICAL ISSUES

This chapter sets out and discusses some of the administrative and political issues arising from the discovery and development of North Sea oil reserves. These issues fall into several categories:

- impacts on the local government and planning systems in force in Scotland;
- attempts to control oil developments at the national level;
- housing and infrastructure provision;
- oil developments' influences on local government finance;
- political change in Scotland and its regions arising from oil;
- extension of central government involvement into the oil industry itself.

The administrative and political institutions of Scotland and Britain were the first to feel the real impact of North Sea oil, in the forms of offshore licensing rounds and the consequent demand for shore-based sites from which to conduct exploratory and development-phase operations. It appears neither central nor local government was prepared for the scale or pace of these operations, and, since government at one level or another is normally involved in the control or provision of the sorts of facilities required by the industry, the first real disruption caused by offshore oil in Scotland occurred at the government level.

The ensuing period of uncertainty and confusion led to increasingly direct involvement on the part of central government agencies in matters of planning and infrastructure provision in the "oil areas." For a time central

government attempted to control oil and gas developments much as it would any other form of large industry. However, the pace and the speculative nature of the industry mitigated against this approach, and its temporariness soon became evident as shore-based facilities were built and closed, or never started following approval. Problems in these areas led to increasing central government involvement in "national" scale planning, an area it had been reluctant to become entangled in in the past

The implementation details of oil plans, however, remained for local government to work out. Rapid build-up of infrastructure and housing stocks was required as population started returning to areas which had been experiencing out-migration for decades. Since many of the types of workers required to build new facilities were already working for oil developers, shortages and rising costs became more frequent. Again, the temporary nature of much of the oil industry may have worked to make the long-term usefulness of new housing or infrastructure questionable, and the possibility of "overbuilt" situations continues to worry some local authorities. The same local authorities may also find it difficult to plan their own finances effectively, as revenues anticipated from oil-related activities are delayed because of technical difficulties offshore.

Meanwhile, oil has spurred nationalist sentiments in Scotland to a major degree, and, while fruition of these feelings in a new national Assembly is not yet guaranteed, the process of self-awareness oil set off has not abated. It has also been manifested at the local level, as isolated local authorities have perceived their strategic value to the offshore industry

and have used this advantage to leverage special financial and legal concessions.

The British government has attempted to do the same, and has elected to become involved in the oil industry at the producer level. This it has done by the establishment of a new nationalized oil company and by more tightly controlling the operations of established firms in the North Sea.

In comparing Scottish experience to Alaskan conditions, it is clear that many of the British institutions discussed have no Alaskan counterparts. However, many of the challenges faced by government and politicians in Scotland have been, or may be, confronted in Alaska. How the public sector in one country, with similar objectives--economic growth, efficient operations, environmental and social protection--copes with a common set of circumstances that may be faced in another, can only be a useful record. And, in fact, there are a number of direct parallels that can be drawn between the two oil producing areas. These have to do with public involvement in major industrial development; the "planning" process; the mixture of public and private initiative in planning for oil, the impact of oil wealth on a small and isolated economy, and how differing levels of representative government view the arrival of oil in "their" territory. Some of these questions are universal, and others are directly related to petroleum production. It is important to remember that many of the oil companies operating in Alaska and Scotland are the same. These companies are undoubtedly aware of the differences in administrative and political institutions and climates between the two areas.

11.1 LOCAL GOVERNMENT AND PLANNING MODIFICATIONS

Two linked trends in local government organization and statutory land-use planning combined and culminated in Parliament mandating a new local government structure for Scotland, with new local authorities exercising new planning powers. This coincided with the beginning of oil activities in the early 1970's, and there is reason to believe the handling of oil-related questions influenced the nature of the new insititutions and in turn was influenced by them.

Local Government Reorganization

It is generally assumed that planning questions--of scale, type, and contents of plans-- led through the 1960's to pressures for a new system of local government in Scotland. Prior to 1975, Scottish local authorities consisted of Counties, "Counties of Cities" (meaning the largest cities), Large Burghs (medium-sized towns) and Small Burghs. Additionally, small rural district councils occasionally exercised minor executive powers. This led to considerable duplication of administrative powers and municipal services over relatively small areas, and generated demands for rationalization and scale economies in local government services. Following parallel trends in the more densely-populated counties of England and Wales, Parliament enacted comprehensive legislation reorganizing Scottish local government and establishing a new hierarchy of powers and executive roles.

Since this legislation was enacted in 1975, Scotland has operated (with regional variations, such as Shetland) under a two-tier local government system, composed for twelve Regional Councils (including three omnibus Islands councils) overlaying a large number of small District Councils. Voters elect representatives to both councils, and in the partisan metropolitan areas Regional and District councils may have different political makeups, with, say, Labour dominating the Regional council while Conservatives (or Scottish Nationalists) control one or more District councils. In isolated cases, the same individual may serve both as District and Regional Councillor, although this may ultimately be prohibited.

The new structure was designed to keep local issues out of the more strategic regional sphere, and to offer a forum for more general issues to be resolved or managed on a more efficient areawide basis. (This is very reminiscent of the Borough system in Alaska.) Local government powers are divided among the two levels roughly on the lines of local relevance. In practice the following divisions (with slight region-by-region variations) are made:

- Regions: Education; Environmental and Flood Protection; Highways; Law Enforcement and Fire Protection; Water and Sewer Development and Management; Public Transportation; Harbors; Social Work; Libraries, Museums, etc.; Births, Deaths, and Marriages Registration; Regional Planning.
- Districts: Housing; Building (inspections, codes, permits); Parks and Recreation; Weights and Measures; Occupational Safety and Public Health; Cemeteries; Local Planning.

Regarding oil developments, the following point is worth noting: planning for major developments (especially those with regional employment ramifications) is vested in Regional authorities. Similarly, the ability to provide transport, harbor, and infrastructure facilities is also a regional function. However, housing provision for incomers is a District function. This may have led to some problems in oil development areas, discussed in Section 11.3, and reflects on the new system of planning which was established alongside local government reorganization. In other words, the ability to plan strategically for oil did not necessarily mean scattered implementation powers would be synchronized on the ground.

Reformed Planning System

Although the local government reform process was underway prior to oil's main arrival, the sort of "strategic" reorientation of planning related well to oil's perceived demands. Indeed, in the two or three years immediately preceding local government reorganization, when initial onshore impacts were first being felt, the problem of splintered regional planning control had been experienced, with outgoing local authorities engaged nearly in an auction for onshore facilities.

Areas initially experiencing oil-related demands were arguably unprepared to cope with them. Early exploration activities' impacts tended to be limited to greatly increased transport movements, some onshore storage of supplies, and development of basic service bases at key centers. Only after fields were proven did planning for major onshore development really begin. This took the form of applications for planning permission which

local authorities handled largely with their standard "development control" methods. Put at its simplest, this set of procedures assesses an application for planning permission against already-established development plans, operating with the force of law. In a similar manner to procedures in most U.S. states, a would-be developer asks if his proposed development is consistent with the locally adopted (and centrally-approved) plan; if so, he is given permission to proceed. If not, he must either revise his plans to meet conditions, ask for a variance (he "appeals" the decision) or develop a site elsewhere.

Two factors appear to have mitigated against this method working very well. First, unlike other (longer-term) industrial land uses, onshore facilities for offshore oil, except terminals, tend to be temporary single-purpose affairs, normally oriented to one particular stage of a temporary industry. Their lifespan can be very short, so planning methods oriented to permanent industrial uses are perhaps too ponderous to cope with such uses as platform yards, pipecoating yards, material stockpiles, etc.

Second and probably more importantly, a connecting thread running throughout the oil industry's structure may be a fixation on quick reaction time [80]. A platform yard must be ready and poised to start work on an order, a steel mill must be able to produce quality submarine pipe at once. (A major criticism of Britain's poor response to oil has been directed not at its industry's technical capabilities, but at its slow response rate to offshore industrial demands [38].) In terms of planning control, the implications are clear: a maximum amount of land control and planning

approval before activities begin is seen as a key advantage by would-be developers.

Planning control need not be the same as ownership. Outline planning permission can be obtained by a third party (e.g., an oil service company) with only the acquiescence of the property owner, much in the same way as an option is obtained on the land itself. Thus developers may obtain planning permission on a purely speculative basis, and may simply walk away if actual development is not justified. The resultant review work-land on local authority planners therefore peaks very early in the process (and long before increased property tax revenues might help offset the expense).

Scotland's standard pre-1975 development control-based planning system could charitably have been termed leisurely. Local planning departments were under-staffed [138] and in several crucial circumstances no statutory (since 1947) Development Plan had ever been prepared. Industrial development applications of such scale, pace and character were quite unknown in rural Scotland; the only really comparable events were either pre-war or had been affected by such "statutory undertakers" (largely exempt from planning controls) as the nationalized forestry or electrification industries.

The reformed planning system which accompanied local government reorganization involved a move to more strategic planning, called "structure" planning, which would set out general areas for growth and development without being too specific. This, it was hoped, would provide the basis

of communications between Regional and District planning roles: the Region would identify approximate (strategic) goals; the Districts would be concerned with their translation into more specific terms and schedules.

The first step to this process consisted of "regional reports," in which each Regional authority recorded its baseline conditions and stated general goals for attacking the physical, social and economic problems identified in the survey. Preparation of structure plans would go on alongside this reconnaissance, while development control processes would continue as usual.

Thus local authority planners, old and new, were faced with a variety of changing conditions simultaneous with major oil-related proposals. Further, the new planning system would take some time to reach full efficiency, while the executive powers of the new authorities would be in place very quickly. (These new executive powers, it will be recalled, included a Regional responsibility for road and infrastructure provision: while District planners might feel obliged to articulate regional goals into local conditions, the District authorities had few implementation powers.)

Central Government Intervention

The combination of new planning requirements, relative inexperience, the large scale and rapid pace of oil developments, often mitigated against concentrated decision-making by local authorities. The upshot was the use by central government of its "call-in" powers for planning applications.

Under this aspect of British planning law the Scottish Development Department, acting for the Secretary of State for Scotland, can require that local planning authorities hand over planning responsibility for a given project to central government. This effectively removes control from the local level (where impacts will fall nevertehless), because of a perceived "national interest. "

The call-in procedure was not used in every instance, but the SDD required in 1973 that a local authority facing oil-related development notify the Secretary of State in the case of each planning application received [164].

Following local government reorganization, the Secretary of State continued to call in the majority of major oil-related applications. This was accomplished in spite of considerable planning depth in most Regional authorities, themselves given "call-in" power over subordinate District planning departments. This situation still prevails, and must represent a tacit admission by the British government that oil related proposals, albeit limited in local physical, social or economic impact, are extra-regional in their implications. The economic stakes are clearly perceived as so high as to require national-level intervention in local administrative procedures.

A further dimension of central government control resulted from passage of the Offshore Petroleum Development (Scotland) Act which permitted the U.K. government (the Department of Energy) to take over ownership of platform yards and other onshore developments. Government-owned land, of

course, is exempt from planning control. At least one unused platform site in Scotland, at Portavadie, is now in government ownership. This is discussed at more length in Section 11.6

Environmental Impact Assessment

Another departure from the normal Scottish planning approach met with somewhat temporary fortunes. Procedures akin to the American Environmental Impact Statement have not traditionally been used in the U.K., owing to the relatively pervasive and long-standing system of local long-range development planning, and the Secretary of State's call-in procedures. However, North Sea oil developments in Scotland were of such a scale and speed that the Scottish Office undertook in 1975 to examine the applicability of environmental assessment techniques to what it termed "large industrial applications."

This effort was soon combined with the Department of the Environment's concurrent investigation in England and Wales and resulted in 1976 with the issuance of a manual to local authorities [15]. This document sets out various technical procedures which may be used in the appraisal of indsutrial development proposals, mainly concentrating on environmental impact aspects, not unlike the EIS procedure in the U.S. No method of social auditing of impacts is proposed.

The Manual for Project Appraisal, like a number of earlier documents, e.g., [154, 155] represents at best a temporary effort by central planning authorities in Britain to guide local authorities in coping with big

demands. Since use of the techniques contained in the Manual was never mandated, the extent of its application to actual projects is unknown. Since the Scottish Office has called-in most oil-related applications, the Manual's usefulness in this respect can be questioned. And, in a number of crucial cases, the "public inquiry" format has superseded such technical assessments. If it is safe to say that the economic and social consequences of onshore oil developments have outweighed the environmental consequences in Scotland (at least so far), the project appraisal techniques proposed in the DOE/SDD Manual do not really address the most relevant factors. More recently, a method of performing environmental assessments of oil developments has been promoted by the Scottish office through its release of Planning Advice Notes [158, 159] which set out likely land use and infrastructure consequences of various oil-related facilities.

The general pattern, then, is one of increasing central government control over planning matters ostensibly subject to local control. Two somewhat conflicting objectives in Scottish planning are suggested: one implies a greater degree of local control through a restructured and effective system of local government; another which indicates prima facie distrust by central government as to the objectivity or detachment of subordinate planning authorities.

Summary and Alaskan Relevance

Oil-related planning in Scotland began during a period of major change in the country's local government system and a simultaneous restructuring

of the statutory planning process governing land use and development.

In terms of local government structure, the changes generally instituted a dual system of local control, with new Regional authorities exercising wide powers over large areas, and new District authorities exercising more limited powers locally. The statutory planning system was amended at about the same time to add new strategic planning requirements to the pre-reorganization system of development planning.

Under the former systems, some local authorities lacked basic statutory plans, were understaffed, and faced oil-related development applications which were speculative in nature. As the advent of the new local government system approached, this situation did not improve, so central government, through the Scottish Development Department, exercised increasing control over local planning, especially where oil development questions were concerned.

There are no real Alaskan equivalents to the various levels of government now prevailing in Scotland, although some degree of dual control exists in cases of incorporated cities within Borough boundaries. And, while Boroughs are commonly charged with areawide planning powers, the Scottish "call-in" procedures used by superior planning levels over subordinate ones have no Alaskan analogs. This might change with the establishment of (limited-purpose) "regional" planning responsiblities under the Coastal Zone Management program, but in the Unorganized Borough for the moment planning powers are reserved to the State.

The dual-control system prevailing in Alaska (and especially relevant to OCS oil and gas developments) is the federal-state relationship. A lesson from the Scottish experience may concern the role of local communities, incorporated or not: in the absence of clear, established means of local control, decisions over oil questions will tend to be made by increasingly higher levels of government, each more distant from the effected communities. Given the strategic nature of the resource, overall development questions, such as whether to develop a reservoir or not, will probably be decided upon well away from the local scene. The details of local impact, however, will need to be worked out locally, as the Yakutat example suggests. In the event of a developable field, the speculative land-control problem cited in Scotland may occur, further enforcing a need for local planning controls.

Borough formation in Alaska may have major revenue implications where oil development occur within Borough boundaries, a point mentioned in Section 11.9. However, another advantage in Borough formation in oil-impact areas may be in the gaining of areawide planning powers. This may forestall local communities facing situations where speculative developers tie up important land in advance of a full awareness of the implications by local residents. This is precisely what occurred in Shetland, and there the local county council felt obliged to go all the way to Parliament to secure adequate powers to deal with the speculative situation (see Section 11.12). Unprepared local communities in rural Alaska, without benefit of comparable experience, or political power, may not be successful in similar reactive situations.

11.2 PLANNING INQUIRIES

Planning inquiries have been used to assess public reaction to oil-related developments. In "called-in" planning cases, the Secretary of State may, at his discretion, call for a public inquiry to analyze the merits or demerits of a given planning application. The atmosphere at these inquiries is quasi-judicial: the Scottish Office appoints a Reporter, who hears prepared testimony and makes, after deliberations, a recommendation to the Secretary of State, either to approve, reject, or approve with conditions the application in question. The Secretary of State does not need to accept the Reporter's findings.

Dunnet Bay

The first major use of the inquiry system for oil-related developments occurred in the case of an application for a steel platform yard at Dunnet Bay in north Caithness. The applicant, Chicago Bridge, intended to develop the yard adjacent to an area (the Dunnet Sands) regarded in Scotland as having great landscape value. Local reaction to Chicago Bridge's proposal was mixed: concern for environmental and visual damage was outweighed by the lure of jobs in chronically underemployed Caithness.

The inquiry pitted conservation and development advocates, with the Reporter's ultimate recommendation being for approval of the application. However, the Secretary of State's review of the Reporter's findings became stalled, and Chicago Bridge began to criticize the length of time consumed by the whole process. The company announced in 1973 that it

had obtained planning permission for a site in the Irish Republic and that it was withdrawing its Caithness application. Although Chicago Bridge never developed the Irish site (undoubtedly leading to frustrated expectations in that country) it was noted by Scottish planners that similar inquiry delays in the future might result in even more lost development opportunities. (As recently as November 1978, Chicago Bridge was still looking for a good site for a platform yard.)

Drumbuie

The second major Inquiry, dealing with a proposed concrete platform yard at the West Ross site of Drumbuie, had the effect of mobilizing outside forces into strong advocacy positions possibly unrepresentative of consensus opinion. Broady [13] describes the inquiry as a David-Goliath confrontation which perhaps over-dramatizes the tone of the Inquiry. Local impacts of the project quickly became submerged in greater issues: Drumbuie as a symbol of the economic re-development of the Highlands and Islands, advocated by the Highlands and Islands Development Board; the susceptab lity of local semi-traditional communities to external change; the relat ve merits of environmental protection over economic stability (itself a vexed issue in the case of a platform yard) and so on. In the absence of a large or sophisticated resident population, national and international organizations (e.g., Friends of the Earth) adopted Drumbuie as a cause celebre.

This is the principal lesson suggested by the Drumbuie inquiry: the scale of the project was so great, and the local environment was perceived as

so delicate, that examination of actual local impacts quickly was transformed into a discussion of national priorities and advocacy positions. Notable from an Alaskan perspective are two issues:

- Broady describes the reaction of local residents to their sudden limelight. Those residents who had moved to the remote and beautiful West Ross area from metropolitan regions to retire or retreat (termed "white settlers" throughout the Highlands) tended to offer the most "protectionist" testimony. These residents were most concerned with environmental and visual damage. Those residents who were native to the western Highlands reacted either in a passive manner or actively supported the proposal. The proposed yard and the Inquiry were sharply politicizing agents in West Ross, in that locals perceived their roles in national issues for the first time. Local people or agencies felt compelled to choose up sides with powerful national advocacy positions, and to put faith in professional opinion-givers retained by large organizations for the Inquiry.
- The second important issue was confronted later and elsewhere in Scotland (see below): the merits of the Drumbuie yard were argued in isolation. That is, the possibility of alternate, perhaps inappropriate, sites was not raised. The developer's original intent had some merits: Drumbuie is located adjacent to a railway, which, despite its limited use, could have been used to supply the site and to offer an exit for platform workers. This railway is often mentioned as a likely candidate for closure; its use for platform supplies could have provided a vital source of revenue for British Rail and might have postponed what at the time seemed

an inevitable closure. Central government's program of oil infrastructure assistance [172] to Ross and Cromarty County (now District) would have further offset the County's fears of over-taxed roads and utilities.

The Secretary of State's ultimate rejection of Drumbuie was evidently based less on the Reporter's concern for the social impact the yard would have on this crofting area as on the SDD's worry over site acquisition problems: the site was within an estate owned by the National Trust for Scotland [13]. This might have been a convenient excuse, but it also could be viewed as a wise step to avoid a situation where a controversial industrial site existed adjacent to a major tourist resource, with inherent possibilities for sustained (possibly adverse) publicity. In any case, the politicization and posturing of local and regional parties had already occurred by the time the Secretary of State killed the project.

Developers at another nearby site, at Loch Kishorn, applied for and received planning permission for a concrete platform site within six months of the Drumbuie decision. The Kishorn site is away from roads but no less scenic or environmentally delicate. No public inquiry was held this time. The yard is presently operating although prospects for continuing orders are often questioned.

Moss Moran

A more recent case of increased political awareness and submersal of local feelings in national issues concerns a proposed petrochemical processing plant at a site called Moss Moran, in central Fife north of Edinburgh. Shell/Esso have announced their intent to locate ethane cracking and natural gas liquids processing activities originally intended for Peterhead at the Fife location, The new site is near the existing north-south pipeline corridors from northern landfalls to the BP refinery complex at Grangemouth.

Moss Moran itself is probably a suitable location for Shell's plant: the site is mainly moorland and useful for only a few potential land-uses, and not environmentally as delicate as some other areas. An important factor is its proximity to existing population centers with high unemployment rates. The arguments surrounding approval of the Moss Moran proposal center on its product terminal on the Firth of Forth, where ethylene and petrochemical feedstocks will be loaded on vessels for export. The proposed terminal is adjacent to the middle-class Edinburgh suburb of Dalgety Bay, and a major part of the local objection to the facility stems from this community's fears over the safety of the terminal. Rodger [136] in an incisive paper, records the process at work in the Moss Moran controversy in a manner useful for Alaskan examination.

Rodger calls the inquiry process "inauthentic politics" in that it ultimately removes control from local people who set it going in the first place. In his analysis, local organizations are fearful of the impo-

sition of a dangerous petrochemical facility, evidently sanctioned by local authorities through the planning process. They are therefore mobilized to retain technical and legal expertise equal to the developers'. (The judicial atmosphere of formal inquiries is enforced by their frequent reliance on "expert witnesses" including planning consultants, lawyers, and other professional parties.) This transforms the inquiry processinto a "celebration of technical details" rather than a careful weighing of basic alternatives. By one group confronting one developer at one site, the initiative remains with the developer, who generally will have done his technical homework (probably elsewhere) prior to the planning application. Moreover, discussions of alternate sites are irrelevant to the Inquiry at hand: the question "would this facility be better sited there rather than here" is not addressed. Instead, the specific merits and demerits of the given use at the given site take up everybody's attention.

The "inauthenticity" of the process results from the alienation of effected populations from decision-making while cloaking the review process in public participation terminology. This is a familiar problem with all planning work: even by setting out alternatives public responsiveness is not guaranteed. By the initial option of location going to the developer, everyone down the line is put into a reaction mode. The only ways of avoiding this trap are either a) for government to direct industrial location, at the risk of developers not cooperating, b) government making a number of alternate sites available for the developers' choice, or c) becoming involved in a public selection process where somebody is bound to lose, usually the party with the least resources to spend in his (perceived)

defense,

As of the time of writing, the Moss Moran controversy has not been finally resolved, although Shell/Esso's project appears to be moving forward [139].

Summary and Alaskan Relevance

The use of formal public inquiries in planning reviews of major oil-related developments may have two unforeseen results:

- Politically unsophisticated residents are brought into the assessment process in a manner which supports the opinions or points of view of parties foreign to the locality.
- Because the initiative for a given project rests with a developer, the relative merits of one site over another for a given use are not discussed. Also, a reliance on expert testimony and legal procedures creates a false participatory atmosphere. Specific details of a project may consume an unbalanced share of the inquiry's attention, at the expense of overall qualities of appropriateness.

In both circumstances, the impact is an imposition of wider objectives over local populations. Where local opinion coincides with these wider objectives, the inquiry process is strengthened; where elements of local opinion are not specifically reflected in expert testimony, the inquiry process tends to foreclose other avenues of expression.

The relevance of the foregoing to Alaska must be decided in light of the extent of socioeconomic planning already underway in critical areas of the state. While some active participation of local residents may be induced through pre-lease hearings and discussions of general plans and timetables, the detailed kinds of impacts at the local level will still be related to specific developments. The question of pre-development planning thereby becomes central again: in the absence of area- or community-based contingency plans for coping with particular kinds of developments, a project-by-project assessment will need to be made. The dangers of alienation discussed above may then come into play.

One of the characteristics of the Scottish coast not shared by the Alaskan coast is a relatively satisfactory supply of port facilities or coastal sites potentially usable by the oil industry. This is not often the case in Alaska, especially in certain areas (e.g., the Bering Sea), so increased pressure for development in a few locations may occur accordingly. The deliberateness and systematic analysis implied in official public review procedures may be jeopardized in the resulting pressurized and high-tempo atmosphere.

11.3 LOCAL PLANNING VARIATIONS

Variations in local government structures have resulted in different local responses to oil developments. The 1975 local government reform led to establishment of new types of local authorities insofar as planning and development controls are concerned. Regional councils act in strategic planning roles on the Mainland, with smaller District councils responsible for local planning, housing and the like, as described in Section 1.1. Regional councils are generally responsible for infrastructure and finance collection. An analogy to Alaskan Boroughs encompassing incorporated cities within Borough boundaries is only approximate but not misleading.

However, certain Scottish Regional Councils, importantly including Highland Region, are single-layer authorities as far as planning is concerned, reflecting small rural populations at the District level. In these authorities, all planning is deemed "strategic". This is not dissimilar to area-wide planning powers in Alaskan second-class Boroughs.

Islands Authorities are also different. Orkney, Shetland, and the Western Isles are organized on a unitary basis, with all municipal powers vested in an Islands Council. In Orkney and Shetland the 1975 local government reorganization was really repackaging of prior county councils; the Western Isles had previously been split inconveniently into Inverness and Ross and Cromarty jurisdictions. These are now unified in the Western Isles Council.

Each type of local authority--two-tier, combined-planning, and island--has experienced oil-related demands and impacts, and responses have varied to some degree.

Two-tier Authorities

In the case of some (former) Large Burghs, reorganization of local government provided a) the first real forum for local representatives to deal effectively in areawide affairs, since old county council areas may have had unrepresentative electoral district boundaries (or may have returned "at large" representatives); and b) first-ever planning controls, through the local planning powers accruing to District councils. Thus while some Scots may have interpreted the creation of Regional and District authorities as adding new layers of redundant government (the reorganization has been so criticized), it is possible that under some circumstances major avenues for political expression were created.

An example may be provided by the city of Peterhead, a community which experienced major early oil-related impacts. The planning authority prior to reorganization was Aberdeen County Council, a body which represented a very large territory, in which Peterhead's population formed a small fraction. Removed from direct confrontation with oil-related quesitons, local councillors took little official part in oil impact planning.

Following reorganization, Peterhead voters returned representatives to Banff and Buchan District council and to Grampian Regional Council, both

of which deal with oil-related affairs. While control over these Peterhead interests remains vested in bodies larger than the city itself, the reorganization appears to have resulted in a greater level of interest and activity among Peterhead representatives than before. One manifestation of this change is an apparent polarization of opinion about oil issues, with strong pro and con positions being voiced by Peterhead's representatives.*

Elsewhere, a different situation might be seen in the case of Argyll-Strathclyde. The west coast District of Argyll, while traditionally considered part of the Highlands, was included in massive Strathclyde Region at the time of reorganization, probably more to reduce the size of Highland Region than to help Strathclyde. Dominated by the Glasgow area, Strathclyde Regional Council is the largest local authority in Scotland. Argyll 's representation on the council is comparatively tiny, yet Argyll has experienced the most direct impact by oil-related activities, in the form of two platform yards built, others given planning approval, and other uses suggested. Argyll 's planning relations with Strathclyde can only have been made more awkward following reorganization, as job-starved Glasgow looks at developing Argyll. Competition between Districts for scarce oil-related activities cannot be ruled out in Strathclyde, with the Regional Council the focus of debate, especially given Regional planning authorities' powers to "call in" planning applications from Districts similar to the Secretary of State's powers **vis** a vis all planning authorities,

*This process is discussed in a semipublished paper by J. Hunter and M. Grieco (Univeristy of Aberdeen) which is unavailable for direct citation.

There have been discussions in Argyll that it would fare better as a part of Highland Region, where its small population would command relatively more power. While planning powers would be removed from the District because of Highland Region's combined-planning role (see below), the trade-off in influence might be regarded as worth it. (Strategic pl an-ning issues--like oil-related developments--are likely to be "called-in" to the regional or central level anyway, so the loss of local control might not be so severe.) From a full-power local authority before re-organization, one which coped well with oil questions as a result of its small size, Argyll has seen a considerable diminishing of local political control since the advent of Strathclyde Region.

Combined-planning Authorities

Highland Region came into existence after major oil-related developments had already occurred in Ross and Cromarty, especially around the Cro-marty Firth and at Ardersier on the Nairn coast. On balance it appears the existance of one-stop planning has had little effect on oil develop-ments' location. This is possibly due to little new activity since re-organization, or the stability of established uses on the Moray Firth. Importantly, the Regional Council appears to have had little success in attracting new oil-related activities to Sutherland or Caithness districts, where oil's influences have been almost wholly negative due to out-migra-tion.

While all planning powers are vested at the Regional level (in Highland, Borders, and Dumfr' es and Galloway Regions) the other powers allocated to

Districts are unchanged, so the possibility therefore remains that one level of government, through its planning powers, could commit subordinate levels to plans with implementation and financial implications, notably in the area of housing provision.

Islands Authorities

Continuity of control has clearly benefited Shetland [1 58]. While some councillors may have been replaced in the changeover between county and Island's authorities, the local government bureaucracy was largely untouched. As before, conflicts between council members over oil policy--there have been a few [62]--are resolved at one level, and coordination of subregional efforts is accomplished within one forum. A similar history applies to Orkney, where steps similar to Shetland's were taken following passage of the Zetland County Council Act. (see Section 11.12.)

The Western Isles were administered by old Ross and Cromarty County in the north (including Stornoway) and by Inverness County in the south. Local government reorganization removed this division and established the Western Isles Council. It is difficult to assess what effect reorganization may have had on the Western Isles' approach to oil developments. Stornoway is by far the largest community in the Hebrides, and possesses the most complete infrastructure in the region. Stornoway's choice by Lewis Offshore Ltd. for a module yard followed a lengthy period of assessment of the region's capabilities in accommodating oil interests [5, 35], but it is perhaps indicative ofan aggressive pursuit of oil-related development that Ross and Cromarty's former portion of the region was the

first to experience this development (and, unhappily, the first to experience its departure [145]).

Summary and Alaska Relevance

Local government reorganization in Scotland resulted in the establishment of new local authorities with varying powers over planning and development. In some cases, local communities experienced increased access to planning decisions over such issues as oil-related developments; in other cases, old authorities with oversight over all planning issues experienced a diminishing of their planning powers. In the cases of Shetland and Orkney, old general-purpose administrative structures were basically repackaged with new names.

experience suggests the most favorable circumstances (in terms of effective control) occurred when minimal disruption to the continuity of established government structures took place (as in Shetland and Orkney). In two-tier authorities, where previously centralized executive powers became split, the chances of difficulties in coordination increased.

There may be two ireplications for Alaska. First, local government and planning "economies of scale" may be useful in allowing more staff and resource attention to be applied to any given oil-related proposal. In other words, boroughs may be better placed to cope with strategic questions. while still preserving a degree of local political control, than smaller cities. It should be noted, however, that in instances of incorporated cities within boroughs, the division of powers existing in Scotland has

a rough counterpart. "Strategic" borough planning may commit "local" authorities to an implementation program not otherwise anticipated. For example, a borough which exercises areawide planning powers may encourage oil-related developments within cities that are independently responsible for water and sewer provision.

Second, applying the experience of single-tier authorities like Shetland to Alaska is an attractive proposition, but one which requires qualification. Shetland's success in controlling speculative development (see Section 11.12) may have been more a function of its isolation than any inherent advantages of a single-tier local authority. Certainly it can be argued (and it has been) that by presenting a united front to oil companies Shetland extracted more concessions that might have been the case if its administrative structure was more diffused. However, Shetland's strategic location relative to other potential pipeline landfall or servicing points also has been cited as a key factor in its evident bargaining success. Both central control and isolation could be important factors in OCS development issues in coastal Alaska, and possibly both at once, but which factor would dominate is questionable. Further, the role of the State is a factor in Alaska with no Scottish counterpart. Multiple tiers of local and "regional" (i.e., State) government are more common and longer-standing in the U.S. than in Britain, so methods of coordination and linked decision-making may have had more time to develop in Alaska than in Scotland.

11.4 COASTAL DEVELOPMENT GUIDELINES

In 1974 the Scottish Development Department responded to increased numbers of oil-related planning proposals [156] by issuing coastal zoning guidelines for the location of onshore facilities [151]. These guidelines contained the designation of “preferred conservation zones” and “preferred development zones”, along with un-zoned areas, along the Scottish coast.

Generally speaking, the preferred development areas coincided with either a) established east coast oil development sites or b) traditional industrial areas. On Scotland’s Atlantic coast, the only “preferred development zones” were the high unemployment Glasgow region and three small areas, one near Loch Ryan in extreme southwest Scotland, a second at Campbeltown at the southern end of the Kintyre peninsula, and a third at Stornoway on the Outer Hebridean Island of Lewis. Not surprisingly, all three small areas at one point prior to the guidelines’ issuance had been suggested as possible sites for platform construction (only Stornoway has seen any activity). Most of the “conservation” areas were on the remote west Highland coast.

In the north and east the designated development areas also tended to coincide with operational areas, with, as in the case of the west coast, a certain amount of optimism evident that oil-related activities would follow the SDD's zoning. Certain areas like economically-depressed Dundee were designated for development but have not experienced oil activity to the same degree as other communities. The SDD's obvious strategy was to

encourage development in such areas through affirmative zoning.

Since planning in Britain tends to be reactive to developers' proposals, the concept of "affirmative" zoning was probably only as effective as the willingness of local authorities (or the SDD) to deny proposals in non-affirmative areas, or the extent to which the affirmative-zone areas coin-tide with developers' needs. And, by designating already-active areas as development zones the SDD simply re-enforced established trends: the size and number of locations indicated was clearly sufficient to accommo-date increased activity.

Although the SDD's zoning proposals were released in 1974, they appear to have anticipated Mackay's comments[113] discussed in Section I.2: a highly limited number of major oil-related industrial locations would provide more stability and a "better-controlled socioeconomic impact than a multi-plicity of smaller or more temporary yards.

However, the SDD's designation of conservation areas was quickly overtaken by events. Two concrete platform yards, one at Kishorn (following the Drumbuie inquiry) and the other at Portavadie on Loch Fyne, were subse-quently approved squarely within the designated west coast conservation zone. Kishorn was developed as a major yard, and has produced a number of platforms; Portavadie was built but has received no orders (it is now in government ownership). In these cases two factors led to the approval of the developments: site requirements and promises of encampment. Of the two, the site requirements of concrete yards dominated, since very deep sheltered water is required for floatout, final tower-forming, and

service module-base connections of concrete structures. Maters of adequate depth are not found on the east coast but are relatively plentiful on the west coast. Encampment, on the other hand, was a tactical move on the part of the developers designed to reduce anxieties over the social and visual impact of the yards: both were to be provisioned by sea.

The SDD's coastal zoning efforts were one of the first major intrusions of central government into "national" planning. The SDD has been traditionally reluctant to become involved in what it regarded as "local" issues, but evidently felt compelled to do so in the face of numerous development proposals in counties which, for the most part, were ill-prepared to take them on. The coastal development guidelines were precursors of much more extensive SDD involvement in national planning affairs, evidenced by recent issuance of national planning guidelines covering a large number of topics [162]. The SDD has moved into this arena despite the sweeping regional planning powers allocated to the new Regional authorities.

Summary and Alaskan Relevance

By 1974 the Scottish Development Department, a branch of central government, felt compelled to issue "coastal planning guidelines," establishing development, intermediate, and conservation zones along the Scottish coast to control the location of oil-related activities. For the most part "development" zones tended to coincide with areas already involved with oil, or areas suffering from chronic high unemployment, such as Glasgow and Dundee. Conservation zones were so designated mainly due to their

remoteness, scenic value, or perceived social delicacy. However, the physical requirements of concrete platform yards quickly led to two site approvals in the designated conservation zone. Meanwhile, greatly increased oil-related activities have not been forthcoming in those "development" areas which had not experienced oil-related activities prior to designation.

More significant to Alaska than the evident failure of the coastal zoning policies established by the SDD is the fact that they represented a major central intervention into regional scale planning. The Scottish coastline was regarded as a national asset, and control over its development was deemed a legitimate role for central authorities. This is reminiscent of current Coastal Zone Management (CZM) thinking in the U.S. Again, an underlying theme is the national importance of oil-related development, leading to an increased role for central authorities.

Another significant point is the primacy of technological requirements over land use policies. While the possibility of major platform yards in Alaska must be regarded as relatively small, it cannot be ruled out. In the case of deepwater concrete platforms, the site requirements for their construction are very specific. The point may be reached, as it was in Scotland, where a choice must be made between using a scenically valuable and/or socially or environmentally delicate site for platform construction, or having that construction occur elsewhere, with consequent lost employment opportunities. There has been much criticism leveled in Britain over having to import platforms from other countries (notably Norway) while high unemployment remains in the home country. Alaska's economic status

may lead to similar objections if major OCS development proceeds in areas where platform fabrication in Alaska could be feasible.

11.5 PLANNING FOR PETROCHEMICAL ACTIVITIES

Central government has become increasingly concerned with processing and petrochemical developments, and has taken an aggressive approach in planning for them,

Petrochemical and processing activities are less location-specific than coastal facilities strictly oriented to offshore operations. On the Scottish mainland, oil and gas landfalls are all in the Grampian Region, in relatively prosperous farming and fishing areas. Although processing and petrochemical plants have been proposed near these landfalls, especially at Peterhead near the Frigg and Ninian Field gas lines, they have not developed, aside from drying and separation facilities enabling direct addititon of methane to the British Gas Corporation's national distribution grid.

The land and infrastructure requirements of petrochemical facilities are largely givens (for a known product throughput) so the marginal variables are important: labor and transport costs foremost. Thus (it appears) would-be petrochemical developers are more free to shop for ideal circumstances than their shore-based counterparts. This fact has been recognized by central government and its response has been to issue guidelines to local authorities detailing the requirements and impacts of petrochemical and processing plants [159].

This has not proven to mean central government has given over all responsibility for planning these "downstream" facilities to local authorities.

Quite the contrary: the standing order that local authorities notify the Scottish Office about all oil-relatd proposals has been extended, and the SDD's call-in of all major new processing plant planning applications continues.

The most recent ramification of the "footloose" nature of processing activities has been felt in the Moss Moran controversy (see Section 11.2), where Shell has announced its intent to open a major LNG and ethylene processing facility at a remote site in central Fife, an inland location north of the Firth of Forth. Shell's Moss Moran proposal was initially proposed in Peterhead, 100 miles away, but local opposition and delays in planning approval (it was stalled in the Secretary of State's office) resulted in Shell's withdrawal of its application from Peterhead and resubmission of it in Fife, where a somewhat warmer reception was anticipated. Moss Moran is situated in an area subject to chronic unemployment due to the local coal industry's contraction. A petrochemical plant's visual and environmental intrusion" was evidently regarded by many local parties in Fife as a fair trade-off for the 300 long-term jobs associated with the plant. (In all fairness, Moss Moran is a physically unappealing place, not now put to any particularly vital economic use.)

Aside from limited older facilities (many oriented to coal gas feedstocks) in the Glasgow area, petrochemical and refining in Scotland has been largely centered on the community of Grangemouth, on the upper River Forth. A relatively large number of related petrochemical plants (under various corporate' ownerships) have developed next to Grangemouth's major BP refinery, to capitalize on the proximity of feedstocks and on the

transport and infrastructure facilities available in the area. While the Moss Moran plant's product line may be different from materials produced in Grangemouth, the proliferation of petrochemical terminals on the Firth of Forth is a source of concern, given the inherent dangerousness of the materials to be transshipped.

Like the Scottish Office, the U.K. Health and Safety Executive (analagous to OSHA in the U.S.) can only react to proposals, not direct them. Thus, while the controversy surrounding the safety of Moss Moran's terminal was intense [11, 12, 139], at no time were any participants in the debate able to direct the development to a community like Grangemouth, where established safety provisions, infrastructure, available manpower, etc., might be usable.

The issuance of planning information notes [159] provided guidance to local authorities in anticipation and evaluating petrochemical and processing applications, but did not change the basic method of coping with live planning applications. These are still routinely "called-in", are often subjected to public inquiries, and are usually ultimately decided upon by central government authorities.

However, the simple act of producing the planning information series (al beit possibly after the fact) may have provided two key benefits to local authorities charged with initial acceptance and review of processing and petrochemical development proposals. By being better informed, local authorities:

- will be less liable to commit themselves to major expenditures without full knowledge of the implications of a facility's needs, or to be "stampeded" into quick or inaccurate projections of impact; and
- will be less vulnerable to developers "auctioning" their plants to job-hungry local areas, since more precise labor and infrastructure requirements will be known by all parties before the proposal moves into serious consideration.

Summary and Alaskan Relevance

The Scottish Office has extended its particular concern over oil-related developments to include refining, processing, and petrochemical installations. This has been manifested by:

- extending the notification and "call-in" requirements for oil developments to embrace these "downstream" activities, despite the activities occurring wholly within Regional jurisdictions;
- issuance of "planning advice notes" and "planning information notes" which set out typical requirements, impacts, and industrial linkages related to these developments.

However, the basic reactive approach to planning has not altered, even given the possibility of plant proliferation and/or hazardous circumstances developing. Despite this, local planning authorities may have benefited in that they are a) more able :in early stages to anticipate and evaluate processing plant applications; or less vulnerable to developers who may wish to induce competition among local authorities for the

jobs represented by the new facilities. Local authorities will be better positioned to assess the real costs and benefits of potential developments at a point early enough to be useful (despite the fact that ultimate decision power may rest with central authorities).

Alaska has possibly already experienced the "auctioning" aspect of petrochemical development between competing locations in the case of the Alpetco refinery. At one point, Alpetco was publicly undecided between locations at Fairbanks, Kenai and Valdez. In the event more locations for potential petrochemical facilities are discussed for Alaska, it may be advisable to adopt procedures similar to those used in Scotland, especially planning guidelines along the lines of the planning information notes issued by the SDD. To some extent this approach has already been used by the State in its draft Gulf of Alaska OCS handbook. Extension of the principal to processing facilities may be useful in Alaska, especially given the limited planning manpower or expertise in many communities.

11.6 PLANNING APPROVALS VS. ACTUAL DEMANDS

Planning approvals for onshore facilities have greatly outnumbered actual demands. Industrial planning for onshore support facilities in Scotland (e.g., platform yards, service bases) appears to have been surprisingly ad hoc, especially in earlier years. This is probably related to the highly variable pace of offshore development, itself governed by national or international factors, and, in the North Sea at least, by changing fashions in extraction techniques and types of facilities required. A key factor in any would-be developer's decision to invest in an onshore facility evidently is the likelihood of orders, should the facility exist. Developers have evidently felt obliged to be poised and mobilized to begin work at once, and this has meant a high degree of site and capital speculation.

The most convenient mechanism for site control and readying has been for potential developers to apply to the relevant local authority for "outline planning permission" for the site in question. This application sets out only tentative information; once actual development is slated, the developer submits a further application for "detailed" planning permission, where he shows proposed building layouts, access patterns, etc. The outline application may set off call-in or inquiry stages of planning review, and once outline permission is granted, subsequent outright rejection by local or central authorities is highly uncommon.

The surface effect of obtaining outline planning permission is to sterilize a site to other uses for the duration (normally five years) of the

permission. The effect on adjacent communities is no doubt psychological since the general public probably does not normally differentiate between one step in the (speculative) planning process and another. Even fairly light-hearted planning applications may have considerable effect on small communities, especially those who may feel left out in a region's general oil-related prosperity.

Analysis of SDD returns on oil-related planning applications [156] shows a very large number were submitted in early years before the industry "sorted itself out" vocationally and economically. Literally hundreds of applications for planning permission were submitted in areas believed to be particularly prone to oil activities, especially in the Moray Firth subregion, forcing land prices up and attracting speculators. Rosie [138] discusses this and sums up the problem:

> And the areas on which these [oil-related] industries descend--areas like the Cromarty Firth--become prime sites which attract the attention of the development companies. Some are big, well-run, well-banked and responsible organizations; others are small, under-financed, and not so reputable.

The pace of speculative applications has declined since the mid-70's and by now it might be assumed that established uses are much more competitive than possible new facilities on new sites. In addition, the Offshore Petroleum Development (Scotland) Act passed by Parliament in 1974 permitted government acquisition of any shore-based oil development. Under present conditions, therefore, new orders, for example, for platforms could be "directed" to established yards through virtual blackmail of new developers through the prospect of Government takeover. This could enforce Mackay's view [113] that a rationalization (i.e., reduction or at

least stabilization) of oil-related developments is appropriate to maximize their benefits.

Summary and Alaskan Relevance

Considerable speculative planning occurred in the early years of oil activities, shown by large numbers of applications for planning permission from developers, many of whom never executed their plans. The impact of these actions was to overtax limited local authority planning manpower. It also quite possibly led to unrealistically raised expectations among local residents as to the potential scale of developments in their areas.

This phenomenon has moderated in recent years as shore-based oil-related facilities have become established and stable local working relationships have been created. Further, the British government now possesses powers to take coastal oil-related facilities into public ownership, which presumably has discouraged irresponsible speculation in coastal sites.

The “outline” and “detailed” planning development control procedures are aspects of British practice not directly applicable to Alaska. The principle potentially holds, however, in that the uncertain period immediately following the decision to develop an offshore reservoir may see considerable jockeying for position by would-be vendors, servicing interests, and so on. Under whatever planning system prevails, developers may be compelled to seek competitive advantage over one another, thereby presenting unrealistic or inflated impressions of the likely scale of developments to local residents and local officials. Especially in the bush

Alaska circumstances this would be quite disruptive. The only means to control completely the problem are fairly straightforward: a ceiling potential level of activity for a particular community must be decided upon, translated into land-use terms, and a monitoring process created which assesses each development proposal not only for its contents, but also for its likelihood of implementation. This assumes a level of planning (and political) control not normally present in rural Alaska, and one which may not be politically feasible except in extreme circumstances.

11.7 HOUSING PLANNING AND PROVISION

A central problem in the areas influenced by oil developments has been the planning and delivery of new housing aimed at incomer populations. This problem has arisen in the important historical context of out-migration in many of the effected regions. It must be assumed that the psychological impact. of rapid population growth has led to major attempts to make the oil boom as permanent as possible, through the provision of the maximum amount of new housing (and schools, shops, roads, etc.) as can be justified in the boom period. This has had major implications for the public and private housing sectors and the housing ownership and delivery mechanisms used in oil-effected regions.

Ownership and Planning

Local government owns about one-half of the housing stock in Scotland, and usually more than half in economically depressed regions (e.g., about 3/4 in Glasgow). Housing is therefore one of the central missions of local government in the country, and by far the most important power vested in District councils (see Section II.1). Local authority housing (termed "council housing") typically constitutes, along with education, one of the largest budget elements in local government finance in Scotland.

Planning for housing development therefore is an "affirmative" local government power, and can be (and is) closely tied to other planning considerations. In the case of the East Ross oil boom, a perceived high and sustained period of population and economic growth (recalling the intense

competition for Cromarty Firth sites in early years) undoubtedly led to local authority plans for a greatly increased housing stock.

Implementation of such plans may involve the local council directly designing and developing houses, or, as in the case of East Ross, a semi-government agency, the Scottish Special Housing Association, can be utilized in a supplementary capacity. The SSHA may develop housing in local authority areas along very similar lines to local authorities. The SSHA retains ownership of its units in the same manner as the local council. Council and SSHA housing is rental-only, although sell-off of council housing is periodically discussed by politicians. Thus any increases in council or SSHA housing stock remain in public ownership. This has been the option chosen in East Ross [66].

Housing developed in East Ross because of the oil boom will remain in public ownership even if the oil boom ends. In this event, if vacancies develop, the financial impact on the District will be severe, since debt service requirements (bonded debt or monies borrowed from central government) will not abate.

Finance

Local authority housing is financed principally through loan aid from central government or through the issuance of bonds, similar to procedures in the U.S. Private housing finance is available through banks or more commonly through "building societies" equivalent to savings and loan institutions in the U.S.

In the case of council housing, central government (the SDD) is charged with reviewing and approving plans for development. This reportedly was a root cause in housing delivery lags in East Ross. Rosie [138] credits Ross and Cromarty County Council in anticipating oil-related housing needs at an early date, but accuses the Scottish Office of contributing to the area's subsequent housing shortage by a 14-month delay in approval of the County's plans.

It may be argued that the presence, albeit sometimes inefficient, of an elaborate public housing sector may have a restraining effect on private housing construction in cases of "boom" developments. In East Ross it is possible the private housing finance sector saw the "boom" situation more clearly than the county or SSHA, and concluded that the mixture of an uncertain or cyclical future and minimal lead time, made for an unattractive investment atmosphere. The local authority therefore became the housing speculator in the area.

Construction

Housing construction in East Ross (and to some degree in Aberdeen [58]) was badly delayed because of oil developments. The industry most vulnerable to "poaching" by oil platform yards was the general construction industry, including house builders. Rose [138] quotes a housing contractor at the peak of the East Ross boom period:

> How can we build houses for the folk working at Nigg [the platform yard] when all our men are down working at Nigg? We can't afford to pay them the kind of money they are getting there. And even if we had the men, we can hardly get the materials.

There is evidence to suggest the same problem has arisen in Shetland [89]. In both East Ross and Shetland temporary accommodation has been required, in the form of camps for construction workers and through the use of obsolete cruise liners moored near the construction yards. In Shetland, however, some permanent housing has been built for construction workers near the Sullom Voe terminal but it is anticipated this will be used for managerial personnel once the terminal is operational and the construction camp is dismantled. See Section 1.10.

Housing Cost

Gaskin and MacKay [58] indicate average private house prices in Aberdeen increased by 170% over the period 1970-74, compared to a 90% rise in Scottish averages. (Care must be taken to appreciate that the private housing sector is heavily weighted to relatively prosperous parts of Scotland; public housing accounts for the bulk of new housing starts in depressed areas.) Factors of labor and material availability are most frequently cited as causes, along with rapid increases in the price of residential land [1 67] especially in the overheated Aberdeen economy. There can be no question increases of this sort have led to further use of public housing finance mechanisms than might otherwise have been the case.

Summary and Alaskan Relevance

Housing delivery in oil-impacted areas of Scotland has been hampered by a) rapidly increasing prices of land and materials in inflation-prone

local economies, b) a severe labor shortage in the construction industry, brought on by oil operations themselves, c) construction material shortages, and d) possible reluctance on the part of private lenders to become involved in temporary economic boom areas. Available data suggest the problems have been most severe in areas with the least diversified oil-related employment, particularly East Ross. As oil employment has slacked off, concern has risen over the possibility of "overbuilt" situations, with debt service on existing (vacant) housing borne by government authorities.

Alaskan experience with oil-impacted areas is somewhat similar, although the public sector's involvement has been less pronounced. New housing starts in Anchorage and Fairbanks are at a very low level, and the construction industry in general is much less active than during the pipeline construction period. Of course, much of the pipeline's construction occurred well away from these urban centers, but the prevailing high vacancy rates in rental accommodations in both cities reveals an overbuilt stock, at least for the short run.

In the event more remote coastal communities experience direct OCS oil-related development, the problem will be exacerbated by the weakness of Alaska's housing delivery systems in the bush. If a) Alaskan private lenders continue their reluctance to promote housing development in the bush, and b) the oil companies maintain their positions (as in Scotland) that housing is not their responsibility, then the only remaining entities to provide housing are the regional housing authorities, using Federal (probably Farmers Home Administration or HUD) housing programs, each

subject to delays and underfunding. Given the high tempo of oil-related buildups, how these systems might cope in remote areas is difficult to imagine. Again, use of camp situation is suggested as the only viable alternative, albeit at the potential cost of lost local economic opportunities and a “we-they” local mentality with regard to incoming workers.

11.8 INFRASTRUCTURE PLANNING AND PROVISION

General

Substantial infrastructure investment by government has occurred in oil development areas. About one billion dollars was spent between 1973 and 1976 by local government (counting central government support) for infrastructure in the so-called "oil and gas areas." [168] Given a population base of about 450,000 (actually less when census areas are examined closely), this represents a per capita investment of upwards of $2000. Included in this figure are estimates for publicly-financed house building, which constitute public debt, but which skew the total somewhat. Nevertheless, significant investment has occurred on fixed public works, such as schools, airports, roads, water, sewer, and electrification facilities. In the case of Shetland, for example, over £8 million ($16 million) was earmarked for water and sewer upgrading, 8 million on airport expansion, nearly 7.5 million ($15 million) on new schools.

This is in the context of usually a very low pre-oil level of public investment in these areas; indeed, in some rural areas school and service closures have been more common as population decline rendered public services uneconomic.

McCrone [117] discusses a common problem in areas faced with needs for infrastructure expansion, that of construction force availability. Infrastructure requirements (especially related to new housing) have been felt simultaneously with direct demands on small local construction industries

from the oil sector. Since as a rule the oil developers have been able to offer more for scarce construction workers than strapped local authorities, infrastructure provision has lagged demand. In the case of housing, this has led to shortages, overcrowding, the use of temporary accommodation, and rapid price inflation of the existing stock. Excessive demand has also been felt in school facilities, especially where relatively large numbers of in-migrant families have arrived in small or previously declining communities [138].

Central government support

Central government has interpreted its financial obligations to assist oil-affected areas as pertaining only to "exceptional works or services" required by the "main activities" of exploration and extraction [173]. This presumably means assistance would be unavailable to local authorities faced with extraordinary road or utility demands to serve increased population, but would be available to support, say, an industrial development. Also, the Scottish Office specifically excludes for support purposes costs related to processing or petrochemical activities, although the long-term infrastructure demands of these facilities are probably greater than short-term development phase uses. McCrone mentions that local authorities would normally ask would-be developers to foot some of the bills for infrastructure provision to their plants, but this must be seen in the context of the apparent mobility of many firms. Potential petrochemical developers may be inclined to shop for the best infrastructure deal, just as they would for site and labor components.

Long-term indebtedness is as worrisome to Scottish local authorities as it is to Alaskan, and the Scottish Office's policy of limited assistance appears contrary to the interests of areas already designated by the British government as requiring special development attention. Further, this policy has been instituted alongside Scottish Office demands for greatly reduced local government expenditures, with reductions imposed through lower levels of central government "Rate Support Grant" (RSG), or revenue sharing, to local authorities. As with Alaska, a sizable portion of local public expenditure in rural areas is funded through support from central government. In the U.K., the RSG, which may constitute up to or more than half a local authority's budget, is the revenue sharing vehicle. The Scottish Office administers the RSG and passes judgement on the eligibility of each item the RSG is used to fund.

Overbuilt Infrastructure

Published sources are as yet unavailable regarding "overbuilt" infrastructure situations, although two possibilities can be suggested warranting close attention. The first is Stornoway, the community in the Outer Hebrides which experienced the first closedown of a major onshore development; the second is Portavadie, the non-opening platform yard on Loch Fyne. In both cases, significant local infrastructure expenditure followed the proposed developments, and efficient afteruse of newly improved roads and utility distribution networks seems questionable. Long-term debt service or running costs of under-utilized infrastructure could develop into a major concern in instances like these, especially where the new infrastructure represents a sizable portion of the communi-

ty's total.

Summary and Alaskan Relevance

Extensive public investment in new or improved infrastructure, including roads, utilities, and schools, has ensued from oil-related developments. The cost and speed of new facilities' development has been adversely effected by labor shortages. To a degree this additional investment has been offset by grant aid from central government, although categories of aid have been limited to direct, rather than secondary, costs arising from oil-related development. "Overbuilt" infrastructure or facilities situations probably now exist, but are poorly documented.

If anything, potential Alaskan parallels are more disturbing than the Scottish. While Alaskan percapita domestic product is higher than Scottish, the debt-carrying abilities of Alaskan communities, especially in the bush, are very limited. In cases of oil-related development, an Alaskan community's ability to retire oil-induced debt is controlled by State law, to much the same end as the Scottish Office's control over the RSG. Worse, much of rural Alaska's land, especially around native villages, is tax-exempt, thereby making an impacted community's reliance on taxes on oil facilities even greater, to pay back the cost of new facilities.

Scottish experience suggests a good measurement of the advisability of investing in a given infrastructure project is gained by setting the project's debt retirement schedules against the lifespan of oil activities,

and by applying factors of depreciation, operating costs, and revenues to simple debt service. The temporary nature of oil in predominantly non-industrial areas again must play a key role in making infrastructure investment decisions.

Many bush Alaskan villages with little or no property tax base rely on sales tax as their main source of local revenue. In the event temporary workforces are kept in camps for social reasons, the resulting sales tax impact of these workers (through local purchases) may be minimal.

11.9 IMPACT ON LOCAL FISCAL PLANNING

Delays in onshore developments have badly hampered effective public financial planning. The most graphic example of this concerns Shetland, where consecutive delays in the opening of the large Sullom Voe oil terminal reportedly have led to considerable shortfalls in local tax revenue to the council [148]. Initial delays in construction timetables for the project led to requests for additional construction workforce, which strained workers' accommodation reserves; a more recent delay arose from a suspected submarine leak in one of the oil pipelines terminating at Sullom Voe. It was feared startup of the line would be delayed at least until mid-1979 as a result of this problem [52].

Private property tax payers in Shetland have faced a proposed 35-50% increase in their "rates" because of these delays. The Island Council had predicated its Fiscal 1979 budget on an immediate rateable value (i. e., taxable value) of the terminal of over £3 million per year (rising eventually to over £30 million). Business and industrial taxpayers in Shetland were told in March 1978 [148] that tax increases of up to 400% could be expected, although it is not known if this enormous increase actually transpired.

Shetland's annual "rates" have climbed from £560,000 in pre-oil years to an estimated £7.5 million at present. Shetland's perceived prosperity (by the Scottish Office) resulted in initial cancellation of over £2 million in direct government "Rate Support Grant" aid (see Section 11.8). By mid-summer 1978 an agreement had been reached with the terminal's

operators for a subsidy in lieu of taxes, in an amount totalling roughly £1 - 1.5 million [178]. (The potential pipeline leak has been announced since July. Supplemental arrangements with the operators have undoubtedly been made in light of this development, but restoration of central government financial aid is more problematic.)

On the other hand, in Orkney, where the Flotta terminal is now onstream, general property taxes have been sharply reduced and the council's income has been repeatedly supplemented by use of the "Disturbance Fund" set up after oil's arrival (see Section 11.12). Shetland chose not to use this approach, although emergency assignment of £1 million from the Shetland fund was discussed in the council [148]. While the Orkney situation is not well documented, some of the difference in attitude may be related to Orkney's traditional economy. The Orkneys are much more oriented to commercial agriculture than Shetland, and, since agricultural land in the U.K. is "zero-rated," i.e., generally exempt of property tax, the increment of additional property taxes to meet oil revenue shortfalls would fall most heavily on town-dwellers in Orkney. In Shetland, while much land is given to common grazings, agriculture per se forms a small part of the domestic economy; food processing, fishing and knitting are generally more important [111]. Thus Orkney's per capita tax base may be smaller and less dispersed than Shetland's, and Orcadians may be correspondingly more willing to tap reserves rather than let increased taxes fall on this narrow base.

Other examples of delayed financial benefit are not available, although Stornoway and the Western Isles council can certainly be expected to have

been badly effected by Lewis Offshore's closure and the resultant drop in local taxes.

Community fiscal planning also should take into account major revenues (or their loss) resulting from oils' multiplier effects on the local economy. Therefore errors in income timing or projection of magnitudes relating to the oil sector could have major filtered effects throughout any municipal budget, could commit local authorities to staff hiring or facility-building, and result in general overextension of government expenditure.

It may be that the key source of these difficulties lies in the same area as the employment forecasting problem discussed in Section 1.6. The operators themselves provide the bulk of data to local authorities on their hiring needs, investment timing, and other critical factors. Errors and inaccuracies generated in this manner are probably manifested, without a source of countervailing review or commentary, throughout the public sector. The problem is rooted in information-gathering and dissemination procedures and in the "frontier" nature of much of the technology involved (i e., the operators themselves are unclear as to timing horizons). In similar circumstances (like Alaskan coastal environments) delays in development and consequent delays in public revenue, may well be inevitable.

Summary and Alaskan Relevance

Local governments' financial planning has been severely hampered by unforeseen delays in oil-related projects, leading to equivalent delays in

tax collection. This has forced property taxes up by considerable margins, or has led local authorities to tap special reserve funds to make up the shortfalls. Scottish areas effected by oil have tended to be remote and dependent on very limited population and local revenues in the past, so new infrastructure development and additional running costs resulting from oil activities has been predicated on estimates of new revenues from the oil sector. Since (like with employment projections) revenue forecasts have been ascertained from operators' own timing estimates, the absence of any review mechanism at the local level may have led to unwise adoption of operators' projections by local authorities. Since the operators themselves may be uncertain of development timing, owing to the newness of the technology, the problem is thereby compounded.

The lesson for Alaska is a truism, that is, it is unwise to make major speculative expenditures before their timely repayment is guaranteed. However, it is noteworthy that in Scotland these problems have been felt most acutely in Shetland, where there is a great deal of local pride over the council 's management skill and its familiarity with oil developments (see Section 11.11). The problem may be inevitable, and, like in Shetland, Alaskan communities faced with similar problems might do well to assure close cooperative relations exist with the operators, so that short-term solutions to acute fiscal problems can be worked out. They might best be worked out in advance, however.

11.10 NATIONAL POLITICAL CHANGE

Oil has spurred major political change within Scotland and throughout the United Kingdom. Malcolm Slessar, a one-time aspiring Parliamentary candidate for the Scottish National Party, said in 1971 that Scotland's environment was forcing her to develop her politics [179]. Written before the full magnitude of North Sea oil was conceived, Slessar's words seem understated in today's hindsight. Oil has emphasized (some would say exacerbated) peripheral nationalism in Scotlad, and therefore has changed the political makeup of Scotland and the rest of the U.K. The recent Labour government in Westminster depended on the tacit support of the Scottish National Party's Parliamentary constituency to remain in office, and withdrawl of that support led to its loss of power. Measured in terms of voter shift in national elections, the SNP, with its slogan "It's Scotland's Oil," has been the fastest growing political movement in Europe in the 1970's.

While Alaska clearly is not experiencing similar separatist sentiments, the dynamic of political change in Scotland appears to be a common corrolary to oil development. James Kellas, a reader in politics at Glasgow University, records similar shifts in Canada [90], equating Albertan attitudes toward "its" oil and Parti Quebecois' appeal to Quebec nationalism with the SNP's policies and growth in Scotland. Far from peculiar to Scotland, Kellas suggests oil developments in Canada have also aggravated traditional "center-periphery grievances" especially regarding the disposition of "exported" revenues from oil extraction.

The most notable evidence of oil's political impact on Scotland is the rise of the SNP, whose share of the Scottish national vote rose from very minor levels to over 30% of the total vote cast in the October 1974 general election. Its representation in Parliament rose from one in 1971 to eleven (out of 71 Scottish seats) and the SNP sat a close second in 10 further seats in 1978 [97]. The 1977 District Council elections recorded further major SNP gains, this time at the most local level. In Glasgow, for example, a strong SNP showing at Labour's expense resulted in Labour's loss of control of that city for the first time in recent history.

Kellas [90] is uncertain as to the total appeal oil per se has retained in influencing voter behavior in Scotland; the nationalist trend has clearly grown and metamorphosed beyond the oil issue. The SNP'S original tactic in proclaiming it Scotland's oil was undoubtedly to focus attention on Scotland's long-standing economic disadvantages with respect to the rest of the U.K. The argument went that a lack of self-government in Scotland, combined with a permanent minority in representation in Parliament (71 seats out of 635), left no clear central point for public articulation of Scotland's relative needs in resource distribution. Self-government to the SNP meant economic self-determination. Oil's revenues would underwrite this arrangement.

The Labour government's political response was to offer a system of "devolved" central government authority to a new Scottish legislature, an elected Assembly with wide-ranging powers (save economic development) sitting in Edinburgh. The Scotland Act 1978 [74] formalized this arrangement, subject to approval in a March 1979 referendum. The referendum

vote resulted in a majority in favor of the Assembly; however, the size of the overall majority vote (as a percentage of the eligible electorate) was too small to allow implementation of the government's devolution proposals. The government's inability to resolve the problem in Parliament resulted in the withdrawal of the SNP's support from the minority Labour administration and the consequent May 1979 general election.

The public debate over "evolution" in Scotland has been the single most pervasive issue of the 1970's, and its significance cannot be underestimated. Oil's role has clearly been to initiate, or at least enforce, the nationalism/devolution trend in Scottish politics. The SNP set this trend initially by contrasting oil's apparent social costs (or missed opportunities) against the national disposition of oil revenues. It pursued this point aggressively in an advertising campaign, which, for example, contrasted statistical evidence of social pathology in Scotland with the photo of a Scotsman or woman, asking why, if it were his or her oil, were things so bad in Scotland. The SNP attacked the government's central collection of oil revenues and the lack of a clear method of redistributing the wealth back to the depressed regions where it had been obtained.

The SNP proposed a slower extraction rate, in order to allow infrastructure to go in place prior to oil developments, and in order to allow Scottish industry sufficient time to prepare for inevitable orders from oil companies. When it became clear (by 1975) that the pace of oil development would remain high, inhibiting this more orderly approach, and that the British government was unlikely to permit the easy secession of Scot-

land from the U.K., the SNP joined in Labour's devolution campaign. It also began in earnest to try to make political gains at local government levels, presumably recognizing that an SNP-controlled Assembly, which it viewed as a stepping stone to full independence, would tend to draw from experienced local or regional politicians.

The SNP used the oil issue to make its first psychological imprint on the Scottish population. It has used this leverage to extend its influence to local levels of government, leading to the establishment of partisan contests in local government races in rural areas of Scotland. A tradition of independent nonpartisan local representation in these areas has been attacked, with limited success, by the SNP. Knox and Wilson [97] now comment off-handedly that the days of independent local politics in north and south Scotland "are probably numbered."

The rise of the SNP and the devolution issue has occurred in the context o flowering fortunes for the other political parties in Scotland. Traditionally dominated by the Labour party, Scotland's representation at Westminster has long been the U.K. Labour party's hedge against the Conservative Party's influence in England and Wales. With erosion of its Scottish support to the SNP, Labour has faced a period of minority rule in Commons, and the effectiveness of the party's Scottish organization has been subjected to considerable scrutiny from inside as well as outside. Devolution within the Labour party itself, to a more autonomous Scottish entity, now appears likely, although actual fission into an independent "Scottish Labour Party" undertaken by two dissident pro-devolution Labour M.P.s has failed to gain wide support.

It is possible oil has helped set off at least a federalist trend in Britain , if not a separatist one. This is clearly opposite to the major flow of modern European politics, where expansion of the powers of the Common Market has enforced the trend toward European economic and policy unification. The SNP has risen above the ranks of many other “regional” splinter movements in Eruope to full political legitimacy, and has made oil impacts and revenues its policy centerpiece.

On a more theoretical level, one possibly useful in other national contexts, the political impact of oil on Scotland can be portrayed in politicization terms. (This is definitely not a new concept: oil’s politicizing influence in the world is easily demonstrated.) A peripheral area, regarding itself as a nation (or at least a collection of common interests) has used a “found resource” of global significance as a means of exploring and expressing its uniqueness and apartness. What Cohen [16] describes in Shetland--a verification of identity--occurs across an entire country, be it Scotland or Mexico. That it is oil which forms the stimulus may not be coincidence: the fact of the resource’s centrality in world politics is not lost on the country which finds it. The many options oil presents in terms of extraction rates, areas to benefit, disposition of revenues, etc., are integrated into the political sphere and result in increased awareness of, and participation in, the political institutions, in short, politicization.

Summary and Alaskan Relevance

Oil was quickly seized upon as a political issue in Scotland by the emerging nationalist movement in the country. By means of questioning the disposition of oil revenues and the resource's impact on depressed regions within Scotland, the Scottish National Party has grown to strategic importance within the United Kingdom, and has set off major constitutional change in Britain. A system of devolved (nearly federal) power-sharing has been created and may be implemented, and partisan politics have been introduced in local government affairs in many previously nonpartisan areas. Oil has worked (as in other countries) to politicize many elements of Scottish society through increased self-awareness.

Possbile application of these phenomena to Alaska is not as remote as some may think, although a "nationalist" movement of major proportions in Alaska is unlikely. Instead, guidance can be taken from oil's politicizing effects. For example, it can easily be argued the North Slope Borough exists solely because of oil's discovery at Prudhoe Bay and the consequent availability of revenues for local use. Other Borough formations have been discussed as well because of the State's local government finance laws governing oil-related installations. The NSB, once established, has clearly taken on a political agenda greatly expanded from the oil issues which dominated its early existence. Like the SNP, an organization which came into existence (or achieved major growth) through the oil issue has felt itself obliged to extend its representations to other arenas (such as whaling) because of the higher degree of politicization generated by oil impacts.

At the state level, analogs to the SNP's challenges on oil revenue disposition are probably still to come, as initial Permanent Fund investment choices are discussed. There is no reason to believe these questions will not be subject to partisan attention when they are eventually raised.

11.11 POLITICAL IMPACT ON SHETLAND

Oil impacts on the Shetland Islands have transformed the government and political makeup of that area. The dynamic of political and social change in Shetland resulting from oil is by far the best documented story associated with the social impact of North Sea developments. Several linked aspects are generally recorded:

- A tradition of "apartness" between Shetland and Scotland, which had led to a mystique of self-reliance in the islands, helped mobilize the Islanders' response to oil. Shetland's accession from Norway to Scotland only in medieval times has long been referred to in the islands; self-perceptions of Shetlanders as having Norse cultural roots has influenced the independence of Shetland political life [114].
- The late 60's and early 70's were a time of general prosperity in the islands, owing to reasonably prosperous fishing industry. Oil was not seen therefore as the only hope for economic growth facing Shetland; on the contrary, it was seen more as an opportunity for economic diversification [111].
- Shetland perceived its importance, through its strategic location, to oil operators, and used this knowledge accordingly. Shetlanders tended to be aware, as seagoing people, that their islands would be a crucial locational resource for the oil companies. This did not constitute so much a rationale for blackmail as the basis for joint acceptance of an eventual role for Shetland [62].
- The phase of oil operations principally impacting on Shetland had the twin benefits of a long-term nature and long lead time. Aside

from important service base operations, Shetland's principal oil-related development is the world-scale oil terminal at Sullom Voe. Proposed early, the terminal is only now in the start-up stage, so the same degree of rapid build-up as in, for example, platform yard areas, was not experienced. A further advantage was in the basic nature of the facility: the terminal will survive at least as long as North Sea oil is extracted, so planning for a semi-permanent workforce, as well as semi-permanent local revenues, was possible [111].

- Unlike mainland authorities, Shetland has a one-tier local government structure, allowing easy co-ordination between infrastructure, housing, and planning responsibilities. This is discussed in Section 11.3.
- With no statutory Development Plan in force at the outset of oil-related planning, Shetland had no areas earmarked for one kind of land use or another. This gave the islands' leadership great flexibility in reaching ad hoc agreements with operators, without the burden of prior anticipation. Only real, not forecast developments, needed answering. Indeed, the Zetland County Council's initial major involvement with oil-related developers was a result of this lack of prior planning. A major speculative development consortium ("Nordport Ltd.") attempted in 1973 to corner the development land market near a suitable oil terminal site at Sullom Voe. The Council's subsequent direct involvement in oil affairs grew from its success in fighting this proposal [14].

- Shetland has long been an important fueling and service port of call for the international fishing industry. This has lent a degree of cosmopolitanism and of acceptance of foreigners in the islands, and Shetland's self-awareness of its international importance has been a long-standing factor in island life.

Oil's arrival in Shetland has not been without its political costs, however. Margaret Grieco [62] records the process whereby the outgoing County Council arrived at its financial agreements with the Sullom Voe operators (see Section 11.12). Her assessment is that the Council began to operate generally on economic and financial bases in negotiating with the operator companies, somewhat at cross-purposes to its ordinary role of voter representation and social welfare promotion. Grieco reviews the method by which the council worked with the operators in moving toward the Disturbance Fund, and characterizes it as largely a personal effort on the part of the County Administrator, conducted mainly in closed sessions. She does not question the propriety of this approach as much as its advisability in the supposedly public forum of local politics and administration. Grieco's critique centers on possible confusion between business advantage and development control motivations which arose from the Council's aggressive bargaining with the oil operators, and on the long-term validity of a mixture of local politics and direct intervention in private enterprise. Her concerns are echoed by Tim Power in [14], who also hints at possible bargaining advantages possessed by career administrators with preferential access and information, over a committee-dominated local government system, The resultant acquiescence of elected officials to professional "expertise" is a controversial element in recent Shetland

political decision-making, especially given the intimate size of the Shetland political system.

The Council's success in promoting the Zetland County Council Act (see Section 11.12) through Parliament signalled the beginning of a more general examination of Shetland's political role with respect to the rest of the U.K., especially its potential relations with a devolved Scottish Assembly. (Recalling that a traditional element in Shetland's political self-regard is a feeling of separateness from mainland Scottish concerns, it is perhaps not surprising that the political mobilization which went into the ZCC Act outlived that particular action.)

Shetland's long-term constitutional arrangement with the rest of Scotland and/or the U.K. is now questioned. Much as grievances have been heard in Scotland about the remoteness of London, so too are arguments heard in Shetland that even Edinburgh is too removed to be of real help to the islands. The ZCC Act proved that the islands' interests in Parliament could be well represented by direct intervention and that shelter in the Scottish Grand Committee (the Scottish "caucus" at Westminster) was no guarantee of favorable action. Shetland, sharing one Member of Parliament (a very influential one) with Orkney, would scarcely be better represented in the proposed 150-seat Assembly than it already is in Parliament. On the contrary, a Labour- or SNP-dominated Scottish Assembly would be at considerable political odds with Shetland Liberalism, which now can better utilize the more politically plural London environment to its. relative advantage.

Alongside this questioning of the Assembly's relevance is a deep concern that Shetland will lose its voice in the international arena by the addition of a new layer of representative government in Scotland. Shetland's fishing industry has been in a period of decline in the mid-70's as a result of herring fishery closures in the North Sea and most of the traditional north Atlantic grounds. While diversification to, and expansion of, the British groundfish industry has provided some outlet, increased foreign fleet competition in Shetland's traditional fishing areas has mobilized interest in the islands nearly to the same extent as oil's arrival a few years ago. The prospect of an EEC Common Fisheries Policy is a grave concern to Shetland fishermen, who look to other island communities, notably Iceland and the Faroes, and now possibly Greenland, for models of action. The issue has become controversial because Britain possesses (assuming a 200-mile limit) the lion's share of the EEC's continental shelf, and, under EEC policy, must therefore allow access to other community countries' vessels to British OCS fisheries.

These two factors--increased political confidence from oil developments and perceived external threats to self-control--have enforced one another, and the outcome has been a public examination of Shetland's constitutional alternatives. A recent study undertaken for the islands [96] examines nine alternate political scenarios, based on different combinations of Shetland vs. Scotland vs. British political control. T.M.Y. Manson, writing in the New Shetlander [115], echoes a sizable body of opinion in opting for the Faroese model of limited independence within the overall framework of a major European state (Denmark in the case of Faroe). Important to Manson would be an adoption of Faroe's self-patrolled fishing

limit approach, independent of any EEC-set limits or national participation quotas. (The whole question of the Common Fisheries Policy is still unresolved and, like currency synchronization, is a major sticking point in EEC pol itics.)

The salient lesson from Shetland has less to do with the islands' handling of its oil or constitutional challenges (these are by and large peculiar to Shetland) than with the dynamic of politicization which oil developments either created or enhanced. Through astute leadership, a tightly knit method of communication and decision-making, and a long-standing attitude of uniqueness, Shetland's political self-confidence has grown to new levels. A network of politically active (and well-financed) Shetlanders now influences domestic Scottish and international politics greatly out of proportion to Shetland's size. Tactics found useful in negotiations with multinational oil companies are now being applied in other arenas.

Summary and Alaskan Relevance

For locational reasons, and possibly due to the long-term nature of oil developments impacting on the islands, Shetland has emerged as the most successful Scottish local authority in coping with offshore oil. The political changes in the island resulting from oil are major, and relate to greatly increased political self-confidence and considerable Shetland influence in Scottish and British politics. In the context of uncertain future constitutional relationships between Scotland and the rest of the U.K., Shetland has taken the debate one step further, so that the islands'

future legal relationships with the rest of Scotland, the U.K., or the EEC, are now open to question.

The dynamic of Shetland's increased control and self-confidence resulting from oil is instructive to Alaska. The islands' political and administrative leaders:

- recognized their strategic location relative to OCS oilfields, and realized that oil developments probably were inevitable;
- realized the oil industry's receptivity to businesslike dealings (al beit behind closed doors) and opted to use this approach, willingly sacrificing open debate for commercial advantage;
- used Shetland's small size and perceived vulnerability to considerable advantage in dealing with national-level interests;
- used the newly-augmented local political process (helped along by perceived "victories" in dealings with multinational oil companies) as a springboard to involvement in other political issues, notably fishing limits;
- have transformed the islands' perceptions about long-term constitutional relations with their neighbors.

Some of these phenomena are evident in Alaska, although offshore oil has contributed as yet only a small degree of the initial impetus. The broadening of Alaskan native concerns over land claims into international fishing and whaling issues, for example, is possibly anal agous to Shetland's use of its new political identity in constitutional debates, or debates over the Common Fisheries Policy. It may be that very similar steps have occurred: negotiations by small groups with multinational oil firms has

provided valuable on-the-job training usable in other forums.

One possibly key lesson to be learned from Shetland has been the central role of local government administrators in negotiations with major oil companies. Through businesslike and intimate bargaining, the Zetland County Council struck a deal with the multinationals--discussed in the next section--which met both sides' requirements sufficiently to allow the oil companies to work on behalf of the Council in assisting the Zetland Act through Parliament. Perhaps this is an example of the industry's co-optation motives [80]in reverse, i.e., the Council was able to build up confidence in its abilities with the companies to a degree where the companies began acting out of perceived mutual self-interest in the politcal realm. Surely this may be useful in Alaskan circumstances where the local details of oil industry accommodations are of little interest to State or federal authorities, but where a combined local-industry point of view would have a major beneficial influence on obtaining special powers or special aid.

11.12 SHETLAND LEGAL POWERS

Shetland's control over oil-related development has signalled a new type of relationship between oil operators and local governments. The old Zetland County Council, recognizing its strategic location and the requirements of offshore operators, extracted a unique agreement from the oil companies. It anchored its own legal powers to control development further by pressing for, and achieving, a Parliamentary Act [77] giving the Council extraordinary interventionary abilities, including the power to take equity positions in oil-related investments.

The dynamic of these achievements is the subject of some controversy (see Section 11.11) as a large part of the hard council-company negotiating was undertaken by the council's Chief Executive, i.e., County Manager, now the chief executive of the state-controlled British National Oil Corporation. Close security over the negotiations led to charges of too-private political decision-making, and speculation at confusion between representative and entrepreneurial roles by councillors.

The focus of most discussions was Sullom Voe, a deep sheltered inlet on the north end of the Shetland "mainland." The voe (a Norse term for sea inlet) was a likely scene for development almost from the moment it was realized Shetland would probably be the site of major oil pipeline landfall(s) and a trans-shipment terminal. A syndicate of Edinburgh bankers and speculators had optioned most of the land in the voe's vicinity from the local crofters, creating the prospect of private monopoly ownership of the best site for a supertanker terminal. This mobilized both the

County Council and possibly the oil operators themselves into seeking comprehensive means of controlling oil-related developments on the voe and indeed across Shetland.

The political response to this challenge was two-fold. First, the old County Council promoted a Provisional Order, later, an Act, through Parliament giving the following unusual powers to the Council:

- Naming itself the Harbor Authority for the Sullom Voe and adjacent Baltasound area, permitting shipping oversight and dockage charges near the oil terminal;
- Controlling seabed developments within a three-mile limit of Shetland's coast, through issuance of licenses and permits. This effectively extends the council's planning control powers into marine areas;
- The ability to invest in private corporations. These have included the Sullom Voe Association, Ltd. and other oil-related firms;
- Development control powers in the harbor areas, irrespective of ownership and control of those areas;
- Compulsory purchase of land prone to oil-related development. This extends the range of reasons Scottish local authorities can exercise eminent domain, and is regarded as the "cornerstone" of Shetland's control over oil activities;
- Shipping and ship ownership, for oil-related or coastal management purposes. The Council owns a share of the towage firm operating in the Sullom Voe area;
- Creation of a "Reserve Fund" to invest revenues from oil (including

the Disturbance Fund), akin to the Permanent Fund in Alaska.

Second, the Council arrived at an agreement with the terminal operators establishing a "Disturbance Fund" and a barrel age tax on crude oil flowing through the Sullom Voe terminal. Estimates on the ultimate value of this tax vary; however, a commonly-heard figure is in the range of £100 million ($200 million) accumulated by the end of the century.

Some of these powers merit closer examination. First, extension of planning powers to submarine areas is a key advantage in coping with oil developments. In other areas of Scotland (e.g., Loch Fyne in Argyll) this has been a controversial issue, as "development" within the meaning of the British planning acts normally is defined as occurring on land. Because a facility might be floating, like a dormitory cruiser, or resting on the seabed (like a platform nearing completion), its potential for impact on infrastructure and the environment is not removed. Local planning control over marine installations is a new and very significant alteration to British planning law, of considerable interest to coastal U.S. states.

Second, the council's ability to invest in private firms, when combined with the resources implicit in the Disturbance and Reserve Funds, provides a very powerful local authority tool, very nearly identical in concept to Alaska's Permanent Fund or discussions of "Alaska, Inc." This is quite an extraordinary power for a British local authority, and one which evidently caused some role confusion among Shetland councillors.

Third, the extension of compulsory purchase abilities to oil-impacted sites is clearly an effective means of forestalling speculative development. Eminent domain in Britain is generally used about to the same extent, and for the same purposes, as in the U.S.; its use in what amounts to land banking in Shetland was considerably before its time. This provision evidently was supported [14] by the prospective terminal operators (Shell , BP, Mobil, et al) who saw it as a means of consistent control over the terminal. These firms presumably weighed the costs and benefits of leasing the terminal's land as opposed to owning it, from the perspective of equity and commercial advantage. In the event the terminal closes, it will be the Shetland Islands Council who must cope with site disposition or afteruse.

Finally, the Disturbance Fund concept, in addition to providing seed funds for non-oil sector investments, lets the Council offset some of the costs incurred in accommodating the oil companies' activities throughout the islands. These have been extensive, and many infrastructure improvements have been ineligible for central government aid (as discussed in Section 11.8). The additional income from the terminal operators may help offset these non-reimbursed costs. In essence, the Disturbance Fund must be viewed as an additional, if acceptable, tax levied strictly on the oil companies in addition to their corporate taxes, Petroleum Revenue Tax (PRT), barrel age throughput tax at the terminal , U.K. government Value Added Tax, royalties, offshore tract lease payments, and so on. The various direct payments from the operators to the Shetland Islands Council undoubtedly make Shetland, on a percapita basis, the wealthiest local authority in Britain.

Shetland's use in this manner of its peculiar situation was copied almost immediately by Orkney, where similar, though less dramatic oil developments have occurred at the Flotta oil terminal.

A number of spinoff joint industry-council organizations have come into existence through the council's aggressive pursuance of its new powers. These include the Sullom Voe Environmental Advisory Group (SVEAG), the Joint Employment Monitoring Group (JEMG) and others. Oil-council relationships are quite close, a subject of criticism by Grieco [62] sand others.

Summary and Alaskan Relevance

The Shetland Islands' unique accommodation of the oil industry has grown from a Parliamentary Act giving extraordinary powers to the islands' local government. Among other aspects, this Act empowers the Shetland Islands Council to:

- control marine developments in a similar manner to land-based planning issues;
- use eminent domain to take any potential oil-related development site (including the huge Sullom Voe terminal area) into public ownership;
- establish a "Disturbance Fund" with compensation from the oil operators, to use as an investment pool for non-oil related activities.

The negotiations by which these points were agreed upon were controversial , but tended to support the proposition that the major oil companies are very receptive o negotiation and pragmatism in dealings with impatted local author" ties.

Applicat on of Shet and's experience to potential Alaskan cases is very tempting However, care must be taken to control for major differences of environment, economy, and the political cultures of the islands and Alaska. Many of the Zetland Act's powers would be of very questionable political feasibility in Alaska, although the ability of the North Slope Borough to control oil activities in its jurisdiction suggests there may be some areas of convergence. It is also important to note that no intermediary level of government existed between Shetland and Parliament, unlike the situation which prevails in Alaska, where the State has consistently taken an activist posture with respect to energy development. Shetland did its own brokering, an option which may not be available to localities in future major developments in Alaska (notwithstanding the experience of Yakutat in negotiating a temporary arrangement with ARCO).

Still, some of the Zetland Act's provisions are very noteworthy for Alaskan communities with planning powers or where Coastal Zone Management is regarded as a positive development control tool. Shetland's accommodation of the oil industry has been a positive, rather than negative, planning story, since it capitalized on the knowledge that a) there were few alternate sites available to the operators, and that b) the long-term requirements of the industry might help diversify the islands' economy

rather than rescue it. These facts probably led to positive attitudes which helped the subsequent negotiations.

11.13 DIRECT GOVERNMENT PARTICIPATION

The British government has chosen to control oil developments through its own intervention and participation. Government involvement now ranges all along the development-stage hierarchy, from ownership of the resource through to processing of landed materials. Two major points are worth noting from an Alaskan viewpoint.

First, the competition for onshore development sites mentioned in Section 11.1 led in 1974 to the passage of the Offshore Petroleum Development (Scotland) Act by Parliament, permitting the government to take platform building sites into public ownership. This it did in the case of the concrete yard at Portavadie on Loch Fyne, which was built speculatively and has not received any orders. (The government plainly rescued a developer in dire financial straits.) This power has probably also been used inter alia in discussions with developers and local authorities to forestall further fragmentation of platform-building capacity. A clear government policy is now to concentrate platform building into established sites with a proven track record and existing infrastructure and labor supplies [58], echoing Mackay's suggestion [113] that the industry needs rationalization. This obviously begs the question of changing technologies towards tension structures or subsea completions.

Second, and farther reaching, the U.K. government has taken an equity position in the development of offshore fields themselves, acting through the new British National Oil Corporation. Unlike the "auction" method of lease sales used in the U.S., the British government has mainly used a

more strict licensing allocation for subsea development. Hamilton [68] regards this as evidence of the U.K government's desire to control more closely the "nationality" of North Sea developments, i.e., to keep the maximum economic benefits from offshore oil wholly in the British economy, and to regulate better the pace of developments. While licensing "rounds" similar to U.S. lease sales are held, development of any given field is subject to a government-approved development plan, containing logistical and methodological elements as well as financial.

Taken"in this context, and given a Labour government committed to public ownership of principal national resources, the creation of BNOC is consistent with other government actions. (British Petroleum, while largely government-owned, nevertheless is given virtually unlimited scope of movement as one of the "seven sisters" of multinational petroleum. BNOC ' S role, while wide, probably was not meant to embrace overseas operations, although there is considerable discussion on this point.) BNOC's initial role is, at its option, to acquire up to a 51% interest in offshore fields (and thereby to acquire up to 51% of exploration costs and risk, unlike the prevailing Norwegian or Middle East models) and to compete with other companies on a head-to-head basis in new licensing rounds or marketing strategies [42].

This establishes a potential tension between arms of government, one of which, BNOC (albeit semi-independent on paper), is charged with direct intervention in exploration, development, and production phases, while another, say SDD or SEPD, is charged with rational onshore planning to minimize "boom-bust" conditions. BNOC has moved firmly into its develop-

ment role, as the press records [42, 43, 46, 51]. The Conservative Party announced in 1978 that if it won the next General Election (May, 1979) it would disband BNOC and remove it as a symbol of social ownership of an oil company in a competitive market.

Summary and Alaskan Relevance

British central government has moved increasingly into public control of the oil industry. Already the largest owner of British Petroleum, the U.K. government has a) been empowered to take oil-related coastal installations into public ownership if necessary, and b) created a British National Oil Corporation as a commercial participant in development of the North Sea fields. In particular, BNOC's aggressive role may set up conflicting pressures within government as one arm (e.g., the Scottish Office) attempts to minimize disruptive aspects of rapid extraction policies, while another (BNOC) is a participant in high-tempo offshore activities.

Drawing parallels between this aspect of British experience and Alaskan conditions is risky: neither the U.S. nor Alaska have a nationalized oil company. Nor, in all likelihood, can either a state or federal government be expected to nationalize development sites in any but the most extraordinary circumstances. Sale of Alaska's royalty share of Prudhoe oil, or a State investment role in a gas transmission system, may be the likeliest levels of State intervention.

Instead, the parallel might center on the dual-purpose problem, where a high degree of economic involvement by one agency of government, be it either federal, state, or even local, conflicts with the social objectives of another. Certainly in Britain the creation of the BNOC has added some heat to the Department of Energy's scheduling plans, by adding new direct profit and employment factors to government energy planning. The resulting increasing of pace has been roundly criticized by the SNP (not surprisingly) as another example of a rapid depletion policy based on short run GNP or balance of payment considerations [87]. The possibility of similar tensions arising between agencies or government bodies in Alaska cannot be ruled out.

III. OIL AND FISHING

This chapter discusses some of the relationships between oil and fishing interests in the North Sea. It contains sections dealing with:

- employment shifts in the fishing industry associated with oil operations;
- questions of access and debris affecting fishing operations;
- competition for coastal facilities and infrastructure between the two industries;
- perceptions of conflicts between the two industries.

It is evident oil's main impact on fishing employment has been seen more at secondary than primary levels. In particular, fish processes appear to have suffered more from employment shifts that actual fishermen, especially as "key workers" in some semi-automated industries have been attracted to oil-related employment. This may reflect more the two industries' wage structures than any inherent attractiveness in the oil industry.

Some conflicts have been experienced at sea, in the areas of access and debris interfering with fishing operations. Methods for marking offshore installations and for compensating fishermen have been instituted, and appear to be working well. New jointly-managed institutions have been created to ameliorate conflicts between oil interests and fishermen. However, the prospect of a major oil spill remains, and may ultimately become a source for more direct conflict.

Ashore, competition for dockage occurred to a limited extent in early

years, but no reports of significant conflict have been heard for some time. Purpose-built shore facilities have been constructed in most locations with servicing roles. However, applicability of this finding to Alaska needs to take into account differences in the state of fishing economies in the two areas, and the question of overall port availability in Scotland and Alaska. There may be some opportunity for long-term use of port space and infrastructure built for oil servicing by the fishing industry, although no direct positive relationship has as yet appeared.

These developments have resulted in some moderation of Scottish fishermen's fears over conflict between the two industries. In the critical Shetland fishery, fishermen's anxieties and attentions have been diverted from oil to wider issues, especially the management of Shetland fishing grounds subject to increasing foreign competition. A recent spill at the Sullom Voe terminal may have long-term effects on these perceptions, however.

To establish a context for Scottish-Alaskan comparisons, it is important to appreciate the differences in fishing economies between the two areas. Scottish fishing in general is in decline, as traditional species and fishing grounds have been over-exploited and ultimately closed to harvest. This has been most acute in the North Sea, as herring, the principal fish taken by Scottish fleets in the past, has essentially been removed from commercial harvests. This has resulted in some redeployment of the Scottish fishing fleet to other species in other areas. Bottom fishing continues strong in many other areas, however, and it is this sector of the fishing industry which has experienced the most direct competition with

the oil industry. Coastal shell-fisheries may be most easily damaged by oil spills, so some degree of comparability with Alaskan circumstances may exist in this respect also.

Alaska's fishing industry has been in a period of growth as the Scottish industry has been in decline. Salmon and shell-fishing in Alaska is a robust and growing element in the state's economy, while these two industries have been static at best in Scotland. Alaska is now seeing some diversification into bottom fishing, an event which occurred in Scotland many years ago.

Most importantly, Alaska possesses limited coastal facilities and infrastructure by comparison with northern Europe. In the event of OCS oil developments occurring in areas of Alaska with established or growing fishing activities, the relative painlessness with which oil arrived into Scottish fishing areas may not be repeated, This is especially true of the growing Bering Sea fishery.

Like many of their Scottish counterparts, Alaskan fishermen are frequently owner-operators, so changes in fishing economies have effects at the family level as well as the corporate. Also like Scotland, many coastal Alaskan settlements are heavily dependent on fish processing as their major economic activity. If oil operations affect the internal labor structure of this industry, a whole community's livlihood may be adversely influenced. For these reasons and others, examination of the impact of oil on Scottish fishing is warranted.

111.1 IMPACT ON FISHING EMPLOYMENT

There is little evidence of any net flow of employees from direct fishing employment to oil-related activities. However, some data suggest oil-fishing employment conflicts may exist on secondary levels.

Fish processing

George Hunter, writing in Button (Ed.) [14], records a falloff in Shetland's fish processing employment as a result of higher job security offered by oil-related firms. Fish processing workers in Shetland are evidently paid on a piecework basis, so it is probably not surprising this might be the case, given the irregular nature of whitefish landings. Statistitally, it is impossible to isolate direct changes in fish processi ng employment attributable to oil for two reasons: first, fish processing is combined with overall meat processing in the British government's Standard Industrial Classification; second, fishing as an overall industry has been experiencing diminished landings in the 1970's, so isolation of oil's direct effects from general labor market forces is made more difficult [171]. Mackay, writing in 1975 [111], agrees with Hunter that a negligible number (less than .3%) of Shetland fishermen have taken direct oil-related employment, but that the processing industry is more vulnerable to fluctuations. Of special concern to Mackay is movement of "key workers" in processing plants to oil employment. He characterizes processing employment (especially whitefish filleting) as female labor-intensive, a labor supply which may increase as Shetland's population grows. However, employees such **as** machine maintenance person-

nel or other skilled trades are vulnerable to "poaching" by oil interests and would be difficu t to replace. The entire plant may therefore be jeopardized. Mackay raises the possibility of an eventual fishing resurgence being caugh in the position of adequate boats, crew, and gear, but without enough skilled processing capability on shore, interrupting the industry's vertical integration on the islands. This suspicion appears borne out in Joint Employment Monitoring Group (JEMG) [89] data, which records continuing vacancies in the skilled trades in fish processing. JEMG narrative refers to the "persistence" of the problem, exacerbated, as with all oil-related issues in Shetland, by a continuing housing shortage for non-oil workers.

Mackay and Marr [108] in 1976 recorded similar conditions in the Peterhead area, the other oil-impacted district with major fishing and processing employment. (There the situation extends beyond fish processing employment into other agricultural concerns.) They report a falloff in fish landings in the earily 70's in the Peterhead area resulted in some investment delays by local processors, although a general trend toward greatly increased capital-intensity in processing plants seems unaltered. Again, the most damaging employee losses were in skilled or semi-skilled areas; consequently, females are now replacing males in jobs traditionally filled by men. Finally, Steel [185] in 1976 recorded a 29% drop in fishing ancillary employment (i.e., everybody but the fishermen) in the Peterhead area since 1972 (about the time oil arrived), but only negligible change in Shetland. Steel does not attempt to assign direct causality to oil, however.

Shipbuilding

There is no reliable evidence suggesting any falloff in shipbuilding activity directly attributable to oil. However, oil developments have coincided with a general trend (as in Alaska) to larger vessels, to the relative detriment of Scottish shipyards, traditionally specializing in smaller craft.

Postponed Effects

MacKay and Mackay [105] speculate as to the overall influence of oil impacts on labor markets traditionally dominated by such industries as fishing, fish and food processing, and knitting. Their findings suggest, like Hunt's [83], that one of the results of oil developments might be a loss of local entrepreneurial control over industry to larger companies. This may lead to a higher degree of vulnerability to post-oil depression than might otherwise be the case, as externally-imposed "rationalization" takes lace. As in Alaska, the Scottish fishing industry (aside from processors) is still dominated by owner-operators, unlike the general English and European cases. An up-scaling to more capital -intensive practices following harvest depletions may combine with oil-generated changes in the local finance market, prevailing wages, and alien management practices to damage the family-controlled nature of Scottish fishing.

Although unsubstantiated by empirical evidence, there have been suggestions in Scotland that in the long run some loss of fishing employment to oil is not only inevitable, but possibly a good thing. As in Alaska, Scottish

fishermen are normally paid on a share basis, the better the catch, the larger the income for all hands. Under these circumstances, the group most likely to switch from fishing to oil employment are the less-efficient fishermen. The result is a general improvement in percapita fishing efficiency, a positive selection process with long term benefits to fishing. In Shetland, oil's influence on fishing employment is definitely a secondary concern at the moment. Negotiations between the U.K. and her EEC partners are leading to eventual adoption of a Common Fisheries Policy, allowing, inevitably, increased foreign presence in Shetland fisheries. This is perceived as a more direct threat to Shetland's fishing economy than oil, and is a central theme in Shetland's ongoing disagreement with the rest of Scotland over devolution (see Section I1.11).

Finally, concern has been widely expressed (see Section 111.2) that a major oil spill would permanently damage inshore stocks, especially in Shetland, with consequent impact on fishing employment. The recent modcrate spill at Sullom Voe [144] undoubtedly has inflamed this sentiment, although statistical data on loss or damage is as yet unavailable.

Summary and Alaskan Relevance

Employment shifts from the fishing industry to oil have been experienced most acutely not among fishermen, but among lower-paid processing workers whose skills (e.g., metal trades, equipment operators) are useful to the oil industry. Analysis is difficult, however, due to ongoing contractions in the British fishing industry unrelated to oil, and due to combination of some fishing industry with other agricultural figures. Some Scottish

regions with traditionally large fishing sectors, notably Shetland, report continuing vacancies in the fish processing industry. Fishing boat building has not clearly suffered as a result of oil impacts, although again, external factors have effected this small but important industry. Increased scale economies, introduction of foreign management techniques by oil operators, and increased cost of capital because of oil-inflated economies may lead to some loss of local control over the fishing industry. The advent of the EEC'S Common Fisheries Policy will probably have a much more profound effect on Scottish fishing than oil has had.

Care must be taken in comparing these experiences to Alaskan situations. Most significantly, Scottish fishing has been on a declining trend while Alaskan fishing is on a general upswing. The risk of OCS oil development damaging Alaskan fishing employment may be in delaying growth rather than accelerating decline (as may have been the case in Scotland). The general point may apply, however: fish processing, with its lower wage structure, may be more vulnerable to oil impact than fishermen per se. In Alaska, processing employment tends to utilize imported casual labor extensively, with minimum-wage scale frequently paid by salmon and crab processors. Skilled personnel are paid more, of course, but their relative numbers are small, and the "poaching" problem experienced in Scotland may tend to repeat.

Equally worrisome is the data from Shetland which indicates a major deterrent to growth or improvements in fish processing is housing unavailability. This is already a problem in some fishing communities in Alaska. Many areas anticipate more year-round resident fishermen as species

diversification leads to continuous fishing activity. The possibility of oil-related population growth on top of this situation could lead to severe housing shortages.

One of the main deterrents to increased fishing activities (and employment) in some Alaskan coastal areas--such as the Bering Sea and the Aleutian Chain--may be a relative lack of coastal facilities: docks, fueling and provisioning points, refrigerator and ice plants, etc. (see Section 11.3). In the event oil-related developments were to occur in these areas, and were to result in new facilities to handle offshore servicing activities, the opportunity may exist for fishing employment to increase as a result of oil operations.

111.2 ACCESS AND DEBRIS

Access and debris questions have led to procedures for controlling marine conflicts. An amount of “common knowledge,” backed by relatively scanty evidence, has developed surrounding marine conflicts between fishing and oil interests, such as suspected “nursery” effect of offshore installations, large losses of catch due to access limitations imposed on fishermen, and so on. Unfortunately, there has been very little formal investigation into these subjects in Scotland, with only one major research document [3] now available on the subject of access. This study comes to inconclusive findings, and cites statistical measurement difficulties as the major barrier to accurate quantification of fish harvest losses due to access limitations imposed by offshore operators.

A number of mitigating factors have played some role in reducing the scope of empirical investigation into oil and fishing relationships in Scotland. These can be stated briefly:

- the principal areas for North Sea oil and gas development tend to be clustered along the U.K.-Norway median line (see Map 1.1.3), in deep waters not heavily fished in the past;
- overall fish landings have diminished in Scotland in recent years, especially of herring, due to prior over-exploitation of North Sea fisheries by various national fleets. There is, therefore, no reliable North Sea “baseline” data from which to measure oil ‘s total influence on landings;
- offshore installations (platforms, drilling rigs, pipelines, suspended well heads, mooring buoys, etc.) occur in a wide range

of submarine environments: different bottom and current conditions, different depths, etc. Generalizations on offshore installations' effects on fish behavior or location are thereby made relatively unreliable.

Access

The principal North Sea oil operators, represented by the U.K. Offshore Operators Association (UKOOA) have established (jointly with various government bodies, including DAFS--the Department of Agriculture and Fisheries for Scotland) various safety zones and marking procedures to be observed by general marine traffic and fishermen, including a 500m (.31 mi .) exclusive safety zone around oil installations, and extensive locational guides to undersea installations.

The ISSPA study [3], by aggregating the various formal barriers to fishing, and assuming prudent behavior among fishermen, attempted to quantify in tonnage and value the current and projected loss of fish represented by all oil and gas access limitation. The study's findings are highly qualified as to methodology, and the cumulative range of possible loss is set at either 192 - 1,741 tons in 1976 (one method) or 86.7 - 1,666 tons (a second method) of demersal (mainly bottom) fish, with projected loss rates growing slightly as more oil and gas installations are placed in the middle and north North Sea areas under investigation. The estimated equivalent cash loss also varies by factors of 8 to 9, from a low low of £52,570 ($105,000) to a high high of 1462,612 ($925,000) for the north North Sea, the area most heavily involved in offshore oil. At the mini-

mum levels, this loss must be reagrded as nearly negligible given the overall values of North Sea landings [24]. Johnston [88] reminds readers that the total area of the North Sea "immediately and directly physically denied" to fishermen by installations is a "trifling fraction of the total North Sea fishing grounds; perhaps $200{,}000m^2$ in 200,000 square miles ($518{,}000km^2$), or three parts in one million."

The ISSPA study supports the hypothesis that fish tend to congregate beneath platforms. The authors disagree, however, that this has anything to do with the growth of the overall stocks. They argue the evidence is very inconclusive that the "catch rate" of fish is altered by the physical structures. The situation is further complicated by some offshore oil areas showing increased catches recently, while others show diminished catches. Assignment of causality is impossible at this point, according to the ISSPA study.

Submarine pipelines tend to be another matter, since bottom seining is a commonly-used technique in some North Sea fisheries. Some scouring of pipelines by fishermen has been reported, apparently reflecting the "reef" effect of offshore installations. This has been of special concern with the new Beatrice Field [183] in the Moray Firth, where a likely pipeline corridor from the field to the shore terminal (near Nigg) transects major bottom fishing grounds. Some fishermen have evidently felt the potential loss of gear damaged through snagging posed by any pipelines has not been great enough to deter them from trawling along the lines. Obviously, damage incurred in this sort of operation would not

be reimbursable under the compensation scheme described below.

Debris

Cases of fouled fisher gear from oil-related debris have been reported on both sides of the U.K.-Norway median line. These problems have been occasionally severe, with one article mentioning "scrapyard" conditions prevailing in some abandoned exploratory drilling sites [130]. Debris problems have not been isolated to drilling sites, but have occurred all along servicing support routes, with numerous incidents reported of fouled gear due to oil barrels, rope, metal scraps, and so on, obviously jettisoned from supply vessels. This has led to marking protocols and to a system of recordkeeping whereby known companies servicing on known routes may be assessed for ocean bed debris (if reasonable proof can be obtained as to likely liability).

Compensation

A means of compensation for such losses has been established by the Fisheries and Offshore Oil Consultative Group (FOOCG) with participation by the Department of Agriculture and Fisheries for Scotland. Controlled and funded by the UKOOA, a Compensation Fund has been established to provide ex-gratia payment to fishermen who have suffered damage or loss of gear through marine conflicts with oil-related operations or debris. However, the Scottish or Shetland Fishing Federations (representing fishermen) determine the eligibility of a given claim, a self-management aspect shared on the other side, since the UKOOA maintains registers

of oil operators and ship movements. "Pass through" procedures exist on both sides, i.e., with the fishermen policing claims and the UKOOA assessing its members for proven damages (if the offending debris can be identified either by location or by vessel markings).

Similar steps have been taken in Norway, where the possibility of a large-scale cleanup of the Norwegian Continental Shelf seabed has been discussed. There, some concern has been expressed over the possibility of the debris problem moving north into more valuable fishing grounds as exploration licenses are granted in waters north of $62^{o}N$.

Summary and Alaskan Relevance

Estimates of lost catch due to access limitations posed by offshore oil and gas installation have been made in the North Sea. The conclusions, subject to some methodological qualification, are that estimated losses per year may be anywhere from under 100 to over 1,500 tons of fish; i.e., the degree of loss is unknown, on a range of negligible to moderate. The North Sea situation is complicated by external (to oil) trends in the fishing industry itself and in respect to variations of offshore installations and environments. Debris fouling fishing gear has been a problem both in drilling areas and in access corridors to them; self-policing compensation measures have been established whereby both industries participate in reimbursing fishermen for loss or damage.

Alaskan parallels, aside from marking protocols and a means of compensation (the Outer Continental Shelf Act of 1978 makes provisions for reimburse-

ment of damaged gear) are not yet evident, but may develop over time. An important difference is in species harvested, of course, in that crab fishing uses fixed points and salmon fishing generally occurs close to shore. The potential for conflict may heighten significantly when Alaska's bottom fishery develops in areas with OCS oil activities. Even here, however, North Sea experience may offer comparatively little guidance, because of the loss measurement problems inherent in deep sea fisheries, as reflected in Scottish loss estimates.

If any one subject might be applied from Scottish to A'laskan experience, it may be in the area of oil-government-fishing communications. The FOOCG (discussed above) clearly manages conflicts in an open and equitable fashion. Its ability to provide a neutral forum for conflict resolution and for information exchange is probably quite valuable in the North Sea arena, and may be generally applicable to Alaskan circumstances. Government intervention is minimized by such direct procedures, and it is conceivable this communications channel could be beneficial in more serious matters, such as spill control or competition for coastal facilities.

111.3 COASTAL COMPETITION

Competition for coastal infrastructure between fishing and oil interests has been minimal. Some initial competition was experienced in Aberdeen, Shetland, and at the Harbour of Refuge in Peterhead between forward oil service bases and fishing fleets [58]. The nature and severity of these conflicts are unfortunately poorly documented.

However, it appears a number of factors acted together to make adaptation unusually easy. Chief among these was a fallof in fishing operations on the North Sea during the early years of oil activities. North-east Scottish fishing boats, especially those involved in the herring fishery, moved in large numbers to northwest coastal ports to exploit fairly large shoals of herring in the "Minches" separating the Scottish mainland and the Hebrides. Despite this relocation of vessels, many northeastern fishermen continued to domicile in, and market their catch at, the east coast fish markets at Aberdeen and Peterhead. Thus it is conceivable that potential marine traffic conflicts might have been reduced because of this (temporary) relocation of a portion of the fishing fleet.

Second, the shore demand characteristics of the two industries are quite dissimilar, so a shortfall in dock space would only be to the detriment of oil service operators, where fish landing operations already exist. This appears to have been the case in Aberdeen, Peterhead, and Montrose, where purpose-built oil service bases were grafted onto existing harbors. The funding source for these was typically the local port authority, in all cases a semi-private corporation or board of Trustees, able to incur

and retire debt based on landing fees or dockage charges.

Third, competition for marine-related services appears not to have been a significant problem, again probably due to spare capacity following partial relocation of the fishing fleet. Also, the type of vessel typically working on oil-related capacity is quite different from the small coastal fishing boat prevalent in Scottih ports.

However, the situation has not been entirely this straightforward. A relative decline in importance of Peterhead's oil service base role relative to Aberdeen's roughly parallels increased labor union activity in the Aberdeen fish market. Peterhead's current role in fishing-related activity is proportionately greater than Aberdeen's, where, in turn, oil-related activities now play an increased role in ship movements. Here forces external to the oil servicing industry may have led to alterations in its locational behavior.

Aberdeen's importance as a major British port has grown parallel to its oil-related activites, so much so that discussions have been held regarding the (high) possibility of a new Scotland-Europe passenger ferry service, perhaps to Denmark via Norway. Scotland presently has no direct links to the continent.

In Shetland, the situation has been more complicated, owing to the County (now Island) Council's role as harbor authority in the Sullom Voe area. Concern has been expressed that a "no go" zone around the voe for fishermen, especially those concerned with shellfish, has led to some lost catch.

This concern roughly parallels Shetland fishermen's fears over possible damage to shellfish around the islands due to spills or ballast water dumping [31]. A spill has recently occurred at Sullom Voe, so monitoring efforts are undoubtedly now underway.

Moreover, the British government responded to fears over harbor conflicts by passage of the Harbours Development (Scotland) Act 1972 [72], allowing the U.K. government to take into public ownership any privately-held port in Scotland. Use of this act in an oil-related context has been minor, especially in view of the Zetland County Council Act passed in 1974 [77], which set a significant precedent in this regard.

Summary and Alaskan Relevance

Direct competition for port and harbor facilities between oil and fishing interests appears not to have been a significant problem, for a variety of possible reasons, including:

- a decline in actual demands for fishing-related uses, as North Sea fishing entered its current depressed state;
- differing harbor space demand characteristics of the two industries;
- changing roles for key ports related to non-oil factors.

In instances of mutual use, the incomers (oil servicers) have tended to develop purpose-built facilities away from established fishing-related areas. In the case of Aberdeen, oil servicing has led to significantly increased general cargo activity, to the relative financial benefit

of the port authority. In Shetland, concerns over competition and fragmented control led to sections in the Zetland County Council Act enabling the County (Islands) Council to become the port authority, but no major infrastructure-based conflicts between oil and fishing operators appear to have occurred.

In applying these relatively positive findings to Alaska, a number of factors ought to be considered:

- Alaska's fishing industry is in a growth period, not one of decline. There is already competition for dock space in many coastal settlements among established users. Additional oil-related volume may not be as easily accommodated as in Scotland.
- The oil areas of the North Sea are located so that even if the fishing and oil industries were in competition more often, there would be more opportunity for port substitution. Differentiation by North Sea fishermen between, say, Peterhead, Montrose, Aberdeen, Shetland, etc. , while important, is voluntary to some degree. If oil activities led to too much congestion in one port, movement of fishing activities to another would probably be feasible, especially as spare capacity exists. This is not so much the case in Alaska, especially in the Gulf and Bering Sea coastal areas. Aside from very limited port infrastructure on the Aleutian chain and in the Dillingham/Naknek areas, the Bering Sea would be especially vulnerable to dock pressures in the advent of offshore activity in those waters. The north Gulf/Prince William Sound area is relatively better off, though not to anything like the same degree as the Scottish coast. Fishermen in Alaska might be

more justified in their worries over infrastructure and labor availability than their Scottish counterparts, especially given the time and procedural delays in harbor development on U.S. waters.

111.4 PERCEPTIONS OF CONFLICT

Concerns over three possible sources of conflict between oil and fishing have been most frequently cited: pollution, debris and wage inflation. Fears over pollution are evidently the most permanent, since a catastrophic spill or blowout can occur at any time. Johnston [88], writing from a government perspective has tended to discount the long-term effects of a mid-ocean spill on fish stocks; careful long-term monitoring of conditons following the Ekofisk-B blowout in the Norwegian sector of the North Sea is underway, and interim findings suggest little long term damage to fish stocks has resulted. (One can assume equivalent long-term studies are underway following the Amoco Cadiz disaster near the Breton shellfish grounds.)

Fears of Damage

The Sphere attitude survey regarding development of the Beatrice field [184] recorded worry over oil damage to the fishing industry in 48% of the total sample interviewed, with the fears of biological conflict mentioned by up to 91% of respondents in some coastal areas with established fleets. (In the same survey, 88% of all interviewees either approved or accepted oil developments in their area.)

Shetland

Perceptions over oil-fishing conflicts in Shetland have been variable. Cohen [16] records a general moderation in fears over damage, while Dowle

[30] reports the opposite. Again, worries over the two problems of gear damange and pollution are most vociferously heard, with questions over access limitations also appearing in Dowle's work. Charges of oil interests "riding roughshod" [31] over fishing appear only rarely, however, and are not well-defined. A moderate spill was recorded in the Sullom Voe area in January 1979, and damage to local shellfish stocks has evidently been sustained [144]. Perceptions in Shetland have no doubt clarified since this event, but it is too recent to provide more data.

Fishing-oil relations is one perceptual element in the area's accommodation of oil developments, and the topic is too highly interwoven in the available literature to permit easy isolation. Oil's impact on a fishing-based economy was initially viewed from a holistic viewpoint. That is, the so-called "Shetland Way of Life" is so intimately penetrated by concerns over fishing after centuries of seafaring that discreet changes in these concerns that may be cause by oil cannot be cleanly isolated. The best source for tracing perceptions about oil and fishing is the New Shetlander, an influential quarterly journal produced by the Shetland Council of Social Service. By reviewing New Shetlander editorial and contributors' comments over the period 1972-78, an image develops of a modus vivendi being established between oil, fishing, and political concerns. This pattern of relationships appears to be one of multiple watchdogs: fishermen watching oil activities, government watching both, vice versa, and so on. The advent of the Fisheries and Offshore Oil Consultative Group (see Section 111.2) in essence formalizes this relationship. Whether the FOOCG has led to lessening of tensions or fears is unknown.

If oil can be said to have had any one particular impact on Shetland fishermen's perceptions, it may have been a unifying one. Perceived common interests among fishermen which developed as a response to oil activities now have been directed to wider issues. In particular, there has been great solidarity among Shetlanders against the imposition of the EEC Common Fisheries Policy which would increase foreign competition (through a quota system) in Shetland waters. This is clearly now regarded as a more significant threat than oil conflicts.

Summary and Alaskan Relevance

Initial fears over possible oil-fishing conflicts have tended to moderate as the two industries have become more familiar with one another. However, concern persists over the negative impact a severe spill or blowout could have on inshore fishing stocks, especially in areas with coastal shellfish harvests. Recent spill incidents, including a moderate spill at Sullom Voe, will undoubtedly lead to renewed expression of concerns and to long-term monitoring steps. In Shetland, concern over future harvest declines due to increased foreign fishing has now overtaken oil as the most worrisome subject in fishermen's perceptions.

Until actual oil development experience is gained in Alaska fishing waters, comparability with these experiences will have to wait. As has been mentioned earlier, major differences exist for the moment between Alaskan and Scottish fisheries, although some convergence can be anticipated as new species are harvested off Alaska. It is noteworthy that worries over the impact of major midoceanic oil spills persists in the North Sea,

despite a seeming lack of clear data either justifying or diminishing the grounds for such concerns. It is doubtful if fears of lost catch due to this eventuality have lessened in Scotland; quite the contrary in view of recent developments. Similar occurrences in Alaska, if they are ever to happen, are still some years off.

The joint oil-fishing consultative group in Scotland may be playing a valuable role in offering a forum for resolution of any conflicts between these industries, including fears or prcedural problems. Adoption of a similar approach in Alaska might be well advised, especially since Scottish experience suggests initial anxieties may be more a function of lack of communication than outright conflict.

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References are listed alphabetically by author. The number appearing on the left-hand margin is the number used in the preceding text in brackets, e.g. [144]. Where no author is cited, entries are placed by the first word of the source. For example, “Los Angeles Times” [100] follows “Lewis” [99].

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This brief document outlines procedures to be followed by fishermen in cases of gear damage attributable to offshore oil activities.

24. Department of Agriculture and Fisheries for Scotland, 1978

Fisheries of Scotland: Report for 1977
DAFS, Edinburgh, 34 pp.

DAFS' annual reports cover statistical performance and current issues facing the Scottish fishing industry.

25. Department of Agriculture and Fisheries for Scotland, 1975

Fishermen and North Sea Oil Developments: A Ready Reference to Offshore Oil Activities for Fishermen
DAFS, Edinburgh, 21 pp.

This is a simply-worded pocket-sized handbook aimed at fishermen describing the technologies and behavior of the offshore oil industry, and some of the relations between oil and fishing interests.

26. Department of Agriculture and Fisheries for Scotland, 1978

Oil Installations in the North Sea
DAFS, Edinburgh, 14 pp.

This document records the positions of North Sea oil and gas installations including pipelines, platforms, and wellheads, as of April 1978. Locations are given by latitude/longitude, and by Decca readings.

27. Department of Agriculture and Fisheries for Scotland (no date)

Letter to the Council of Scottish Local Authorities
DAFS (draft typescript), Edinburgh, 5 pp.

DAFS' letter to COSLA sets out some of the Department's concerns regarding marine conflicts and corrective measures useful to oil and fishing interests.

28. Dinwoodie, Robbie, January 13, 1979

Firm Count Cost of Lost "Jacket"
The Scotsman, Edinburgh, 1 pp.

This relates to the steel platform destined for Brazil which sank in a storm in January. The same edition of the newspaper indicates 450 workers at the Ardersier yard where it was built had been laid off the previous week.

29. Douglas, Derek, July 22, 1978

Leith Factory Will Bring Jobs for 70
The Scotsman, Edinburgh, 1 pp.

Leith, the port section of Edinburgh, has seen comparatively little oil-related activity. This article refers to a submarine pipe-coating operation.

30. Dowle, Martin, January 25, 1978

A Tale of Two Societies
The Scotsman, Edinburgh, 13 pp.

31. Dowle, Martin, January 24, 1978

Islands Take a Divided View of Oil
The"Scotsman, Edinburgh, 1 pp.

32. Dowle, Martin, January 26, 1978

Shetlanders Remain Suspicious of Assembly
The Scotsman, Edinburgh, 13 pp.

Dowle's series of articles on Shetland form a recent account of oil-related and political-related changes in the islands.

33. Dowle, Martin, September 16, 1978

Shetlanders Press for Autonomy
The Scotsman, Edinburgh, 1 pp.

This records formation of the "Shetland Movement", a political group advocating greatly increased legislative and tax powers for the islands.

34. Egeland, Kjølv Eivind, April 1975

Oil Activities and Social Change in the County of Rogaland
Preprint for The Social Impact of Oil Conference, University of Sussex, 12 pp.

This paper, one of very few English-language sources from Norway, records sociopolitical change in the Stavanger area. Many common themes to Scottish experience are suggested.

35. Ennew, Judith, March 1978

Gaelic as the Language of Industrial Relations
Preprint to Oil and Scottish Society Conference, British Sociological Association, Aberdeen, 19 pp.

The title of this paper is misleading: Gaelic language is not discussed. instead, the paper contains a useful record

of the process whereby oil-related industry arrived in the Western Isles. Issues discussed include industry adaptations to local religious practices, population movement implications in very traditional areas, etc.

36. Fife Regional Council, May 1976

Regional Report 1976
FRC, Glenrothes, 158 pp.

Required of all new Regions, a Regional Report constitutes a baseline record of capabilities and issues facing a Region's development.

37. Fisheries and Offshore Oil Consultative Group, 1975

Report from the Fisheries and Offshore Oil Consultative Group
FOOCG, Department of Agriculture and Fisheries for Scotland, Edinburgh, 9 pp.

This early paper sets out the operating frame of reference of the FOOCG and discusses some of its concerns.

38. Francis, John and Swan, Norman, February 1975

Scottish Oil Shakedown
Church of Scotland Home Board, Edinburgh, 70 pp.

These authors, in work sponsored by the Church of Scotland, had earlier published the important "Scotland's Pipe Dream", now out of print. This document discusses opportunities for oil-generated economic improvement in depressed areas of West Central Scotland.

39. Fraser, Michael, June 24, 1978

The Kishorn Connection
The Scotsman, Edinburgh, 1 pp.

Fraser's brief account of the industrial/social environment of the Loch Kishorn platform yard is one of very few references to this subject.

40. Frazer, Frank, July 24, 1978

Atlantic Oil Find "Big as Forties"
The Scotsman, Edinburgh, 1 pp.

The announced find west of Shetland has questionable recovery potential and is chemically different from the crude now produced in the North Sea. This find is regarded as the tip of the iceberg, however.

41. Frazer, Frank, August 26, 1978

Berm Reveals Plan for "Oil Instead of Cash"
The Scotsman, Edinburgh, 2 pp.

This article discusses U.K. Energy Secretary Tony Berm's proposal to take the government's royalties from oil in kind, similar to Alaska's royalty oil arrangements.

42. Frazer, Frank, July 29, 1978

BNOC Consider Oil Deal
The Scotsman, Edinburgh, 1 pp.

This article is representative of media coverage of the state oil company's activities with other offshore operators.

43. Frazer, Frank, September 23, 1978

BNOC Not Deterred by Leap in Drilling Costs
The Scotsman, Edinburgh, 1 pp.

Despite major cost escalations in offshore facilities, the article records that the state oil company intends to take a major role in joint development of the U.K.-Norway Statfjord field.

44. Frazer, Frank, March 4, 1978

BP Decision Will Mean Biggest Platform Order
The Scotsman, Edinburgh, 1 pp.

Development of new fields leads to continuing platform orders.

45. Frazer, Frank, December 16, 1978

BP Plan More Jobs
The Scotsman, Edinburgh, 1 pp.

BP's plans center on increasing its Aberdeen workforce to nearly 3000, many located in administrative functions.

46. Frazer, Frank, October 28, 1978

Call for Oil Curbs
The Scotsman, Edinburgh, 1 pp.

Lord Kearton, the chairman of BNOC, advocates reducing the number of offshore operators to simplify management aspects of BNOC's operations dealings.

47. Frazer, Frank, July 24, 1978

Crackdown on North Sea Oil Tax
The Scotsman, Edinburgh, 1 pp.

Major changes and increases in taxation of offshore operations are discussed in this article.

48. Frazer, Frank, August 5, 1978

Economists See Oil Problems Ahead
The Scotsman, Edinburgh, 2 pp.

This records publication of Gaskin and MacKay's study, reference No. 58.

49. Frazer, Frank, July 25, 1978

Further Slowdown in Pace of Development
The Scotsman, Edinburgh, 1 pp.

50. Frazer, Frank, April 1, 1978

Government May Seek Oil Development Curb
The Scotsman, Edinburgh, 1 pp.

51. Frazer, Frank, June 24, 1978

Increase Exploration, BNOC Tell Firms
The Scotsman, Edinburgh, 1 pp.

Taken together, these three articles portray the apparently conflicting government objectives of rapid pacing of oil developments and maximum economic benefit, and the volatility of the industry.

52. Frazer, Frank, October 7, 1978

Major Leak Threatens Oil Output
The Scotsman, Edinburgh, 1 pp.

A major leak was reported in the Brent field cluster pipeline threatening startup of these fields and further complicating planning at Sullom Voe.

53. Frazer, Frank, June 17, 1978

Redundancy Pay Warning for Platform Workers
The Scotsman, Edinburgh, 1 pp.

Some platform-yard workers have been demanding severence pay each time the yard lays them off after a platform completion. The "warning" was from a government minister, who worried over possible cost inefficiencies.

54. Frazer, Frank, July 25, 1978

Scottish Yards in Bidding for Brazilian Platform Order
The Scotsman, Edinburgh, 1 pp.

A steel platform built at Ardersier for PetroBras recently sank in transit to Brazil off the English coast. The order is indicative, however, of the new export orientation of Scotland's offshore platform yards.

55. Frazer, Frank, July 21, 1978

Setback to Prospects of Big Gas Projects
The Scotsman, Edinburgh, 1 pp.

A proposed "gas-gathering" pipeline system, serving the various fields too small for independent gas extraction was deemed uneconomic.

56. Frazer, Frank, March 11, 1978

Taxation Driving U.K.'s Top Oilmen Abroad, Meeting Told
The Scotsman, Edinburgh, 1 pp.

Like rock stars, oil industry managers chafe under high British personal income tax rates.

57. Gaskin, Maxwell, March 1977

North Sea Oil and Scotland: the Changing Prospect
Royal Bank of Scotland, Edinburgh, 22 pp.

Produced for a lay audience, this records the changes in the basic economic impacts of oil on Scotland.

58. Gaskin, M. and MacKay, D.I., 1978

The Economic Impact of North Sea Oil on Scotland
Her Majesty's Stationery Office (HMSO), Edinburgh, 101 pp.

Gaskin and MacKay discuss current issues associated with oil, and suggest that economic growth resulting from oil may peak sooner than expected and may not be as great as anticipated. Their work is probably the most significant recent overall examination of North Sea oil from a political-economic viewpoint.

59. Grampian Regional Council, June 1976

Regional Report, 1976-1981
GRC, Aberdeen, 55 pp.

This Regional Report covers Grampian Region, scene of many intense oil-related developments.

60. Greig, M.A., 1972

A Study of the Economic Impact of the Highlands and Islands Development Board's Investment in Fisheries
Highlands and Islands Development Board, Inverness, 39 pp.

This pre-oil paper is useful to show the attitudes toward fishing which prevailed before oil's advent and before the recent decline in major fish stocks.

61. Grieco, Margaret, October 1975

Notes on Llewelyn Davis, Weeks, Forester, Walker, and Bor--Zetland County Structure Plan
Unpublished typescript Lerwick, 9 pp.

Ms. Grieco comments critically on various aspects of the Structure Plan produced for Shetland.

62. Grieco, Margaret, 1977

Oil and the Council (4 parts)
The New Shetlander, Nos. 119-122, Shetland Council of Social Services, Lerwick, 16 pp.

This important series of articles traces the history of Shetland County Council's accommodation of oil developments leading to the Zetland County Council Act and subsequent behavioral and policy positions relative to the petroleum industry.

63. Grieco, Margaret, March 1978

Oil Related Development and Return Migration: The North of Scotland
Preprint to Oil and Scottish Scoeity Conference, British Sociological Association, Aberdeen, 12 pp.

While useful, Grieco's paper is less definitive than Birks and Sewel, reference No. 175.

64. Grieco, Margaret, May 1977

Oil Related Development and Shetland: The Institutional Framework
Robert Gordon's Institute of Technology, Aberdeen, 19 pp.

This paper essentially repeats Grieco's findings as set out in No. 62 above.

65. Grieco, Margaret, 1976

Towards a Sociology (of) Construction Activity in an Oil Related Context: Shetland
Robert Gordon's Institute of Technology, Aberdeen, 12 pp.

This paper provides interesting insights into the sociocultural impact of oil on workers in Shetland, especially regarding hiring practices of international firms in the context of a non-industrial tradition.

66. Grigor, Isobel, March 20, 1978

Local Authority Accommodation of Oil Related Developments in East Ross
Preprint for Oil and Scottish Society Conference, British Sociological Association, Aberdeen, 19 pp.

Grigor's account of council-industry relations in Easter Ross makes for interesting comparisons with Grieco's work in No. 62 above.

67. Grimond, Mr. Jo, M.P., July 7, 1978

Many Claims to Oil Resources
Extract of Parliamentary Statement, The Shetland Times, Lerwick, 1 pp.

Jo Grimond is the M.P. for Orkney and Shetland, and one of only three Scottish Liberal Party M.P.'s.

68. Hamilton, Adrian, March 1978

North Sea Impact: Off-Shore Oil and The British Economy
International Institute for Economic Research, London, 191 pp.

Title tells all. This book provides a fairly good overview.

69. Henderson, David M., July 11, 1977

The Response of a Development Agency to Oil and Gas Related Developments
Preprint for 4th International Seminar on Marginal Regions, (University of Aberdeen) Plockton, 12 pp.

Henderson works for the Highlands and Islands Development Board. The tone of this paper is somewhat defensive, reflecting the HIDB's changing opinions and policies towards oil developments.

70. Henry, George J., Hairst (Autumn) 1977

The Oil Man Cometh
The New Shetlander, No. 121, Shetland Council of Social Services, Lerwick, pp. 24-25.

This is a personal account of the arrival of oil personnel with "innocent faces but laser-beam eyes."

71. H.M. Department of Energy, 1977

Development of the Oil and Gas Resources of the United Kingdom
HMSO, London, 48 pp.

72. H.M. Department of Energy, Offshore Supplies Office, 1977

Offshore 1976: An Analysis of Orders Placed
HMSO, London, 7 pp.

These two papers basically set out statistical performance information over orders for production and construction projects related to offshore operations.

73. H.M. Government, August 1972

Harbours Development (Scotland) Act 1972
HMSO, London, 2 pp.

In concert with the Petroleum Development (Scotland) Act 1972, this legislation covers increased national control over ports and coastal infrastructure.

74. H.M. Government, November 1977

Scotland Bill
HMSO, London, 96 pages

Now the Scotland Act 1978, this legislation sets out the proposed system of "evolution" under which a new Scottish Assembly would be formed, subject to approval in a national referendum held March 1, 1979.

75. H.M. Government, March 1978

The Challenge of North Sea Oil/Cmnd 7143
HMSO, London, 21 pp.

This is the Labour government's most recent "white paper" (a semi-legislative statement of intent) dealing with various aspects of oil development. Among other topics, it discusses "permanent fund" concepts, production rates, and government participation.

76. H.M. Central Office of Information, 1975

Town and County Planning in Britain
HMSO, London, 47 pp.

This booklet describes the planning system in Britain for the uninitiated.

77. H.M. Government, April 1974

Zetland County Council Act 1974
HMSO, London, 51 pages

This landmark legislation sets out the powers over oil-related developments to be exercised by the Shetland County (now Islands) Council. A "private member's" bill, the Zetland Act was later largely copied by the Orkney Islands, who share the same M.P. with Shetland.

78. Herring Industry Board, June 1976 and June 1977

Annual Report No. 41 (1975) and No. 42 (1976)
HIB, Edinburgh, each 36 pp.

These two annual reports trace the decline of inshore herring fishing in Scottish waters.

79. Highland Regional Council, 1976

Regional Report
Highland Regional Council, Inverness, 72 pp.

This is the statutory Regional Report for Highland Region.

80. House, J.D., March 1978

Adapting to Aberdeen: the Oil Companies' perspective
Preprint to Oil and Scottish Society Conference, British Sociological Association, Aberdeen, 19 pp.

House's useful record of the industry's point of view and internal structure is one-of-a-kind.

81. Hudson Institute Europe, 1974

The United Kingdom in 1980
Associated Business Programs, London, 127 pp.

The Hudson Institute's European office conducted a speculative review of Britain's prospects through 1980. Its gloomy findings were little relieved by the team's discussion on oil's influences.

82. Hunt, Deirdre, February 1975

Aberdeen and the Oil Boom
Personnel Management (journal), pp. 24-28.

83. Hunt, Deirdre, 1976

Responses of Industry Within Aberdeen to Oil-Related Change: Some Implications for Urban Planners
International Journal of Environmental Studies, Volume 9, pp. 269-278.

Ms. Hunt's speciality is Aberdeen's industrial response to oil and resultant changes in management approaches and ownership structures.

84. Hunt, Deirdre, 1977

The Sociology of Development: Its Relevance to Aberdeen
Scottish Journal of Sociology No. 1, pp. 137-154.

Hunt has specialized in analysis of the local impact of oil-related activities on the industrial structure of Aberdeen.

85. Hutcheson, A. MacGregor and Hogg, Alexander (Eds.), 1975

Scotland and Oil
Oliver and Boyd, Edinburgh and New York, 127 pp.

Hutcheson and Hogg's record gives good comprehensive coverage of many aspects of oil impact. Now possibly dated, it nevertheless retains considerable usefulness.

86. Johnston, Dr. Cliff, July 25, 1978

Risk to Marine Life Causes Concern
The Scotsman "Oil Register" supplement, Edinburgh, 1 pp.

Dr. Johnston's article describes the proceedings of a conference held to discuss possible negative impacts of oil activities on marine life.

87. Johnston, James, July 25, 1978

MP Condemns "Irresponsible''(Oil Policy
The Scotsman, Edinburgh, 1 pp.

The M.P. referred to is Gordon Wilson, SNP spokesman on oil and energy. The SNP is constantly critical of the high pace of oil extraction without benefit of more time to develop infrastructure and other baseline improvements.

88. Johnston, R., 1977

What North Sea Oil Might Cost Fisheries
Journal of the International Council for Exploration of the Sea, No. 171, pp. 212-223.

This article attempts to model losses in fish stocks possibly attributable to oil activities, especially mid-ocean spills. Its conclusions are that there may be some over-estimation in the potential degree of damage from such incidents, albeit particular factors such as currents, winds, etc., will play a major role in dispersal of any spilled oil.

89. Joint Employment Monitoring Group, 1978

Routine Reports
JEMG, Lerwick, various pp.

The JEMG is a joint local government-industry organization to review oil impacts on Shetland employment trends. Their data is valuable in portraying a dynamic of secondary as well as primary employment shifts in the islands.

90. Kellas, Dr. James G., August 1977

Federalism and Quasi-Federalism: Some Scottish-Canadian Comparisons, with Special Reference to Oil
Preprint for Joint ECPR/Canadian Political Science Association Conference, Kingston, Ontario, 15 pp.

This is an instructive comparative paper tracing similar tensions developing in Scotland and Canada, especially regarding Quebec and Alberta vs. Ottawa.

91. Kellas, Dr. James G., 1977 (?)

Offshore Oil and Sub-National Governments: The Experience of Canada and the United States
Report to North Sea Oil Panel, Social Science Research Council, Glasgow, 37 pp.

Kellas contrasts different aspects of political and economic control over offshore resources in this paper.

92. Kemp, A.G., June 1977

Book Review: Optimal Developments of the North Sea's Oil Fields, by P.R. Odell and K.E. Rosins
Energy Policy, London, pp. 172-174.

93. Kemp, A.G., November 3, 1975

Fiscal Policy and the Profitability of North Sea Oil Exploration
Scottish Journal of Political Economy, Vol. XXII, pp. 237-260.

94. Kemp, A.G., 1976

Taxation and the Profitability of North Sea Oil, Research Monograph No. 4
Fraser of Allander Institute, University of Strathclyde, Glasgow, 35 pp.

95. Kemp, A.G., August 1976

The Taxation of North Sea Oil
North Sea Study Occasional Paper No. 11, Department of Political Economy, University of Aberdeen, 36 pp.

Kemp specializes in the taxation and revenue implications of North Sea oil. He has previously advised the State of Alaska on oil revenue matters.

96. Kilbrandon, Lord (Chairman), 1978

The Shetland Report: A Constitutional Study (223 pp.)
The Shetland Report, Vol. 2: The Supporting Papers (203 pp.)
The Nevis Institute, Edinburgh.

The Nevis Institute, a nonprofit research organization, conducted a series of political scenarios exploring various alternate constitutional arrangements for Shetland. This attempted to harness growing sentiment in Shetland against imposi-

tion of "devolved" Scottish government. These are important documents.

97. Knox, John and Wilson, Eben, 1977

Scotland 1978
Wilson and Knox, Ltd., Alva, Clackmannan, 262 pp.

This is an almanac-like guide to Scottish current affairs. Oil impacts are discussed at moderate length.

98. Larminie, F.G. (no date)

The Onshore Handling of Oil
British Petroleum, Ltd., London, 9 pp.

Larminie, a senior environmentalist with BP, produced this brief paper which discusses oil handling technology used in Scotland.

99. Lewis, T.M. and McNicoll, I.H., June 1977

Oil-Induced Technological Change in the Scottish Highlands
Department of Business Studies, University of Edinburgh, Edinburgh, 11 pp.

Lewis and McNicoll examine the opportunity for oil modernizing established Highland industry and/or developing forward or backward industrial linkages to improve oil's integration into the regional economy.

100. --- 1978

Shetlands Oil Sparks Secession Hassle
The Los Angeles Times, Los Angeles, 1 pp.

This is an American account of Shetland's political posturing.

101. Lothian Regional Council, 1976

Lothian Regional Report 1976-1981 (2 Vols.)
Lothian Regional Council, Edinburgh, Vol. 1, 102 pp.; vol. 2, 90 pp.

Lothian Region's Regional Report addresses oil influences only indirectly.

102. Lyddon, W.D.C., 1976

North Sea Oil and Its Consequences for Housing and Planning: The Scottish Experience
Planning and Administration, No. 1 (jounral), pp. 71-84.

Derek Lyddon is the Scottish Development Department's chief planner, and this paper offers a comprehensive, if government-oriented, accounting of oil impacts.

103. MacKay, D.I., January 1975

North Sea Oil and the Scottish Economy
North Sea Study Occasional Paper No. 1, Department of Political "Economy, University of Aberdeen, 31 pp.

MacKay covers more ground in The Political Economy of North Sea Oil, reference No. 105.

104. MacKay, D.I. (Ed.), 1977

Scotland 1980
Q Press, Edinburgh, 211 pp.

This is another futurist look at Scotland, examining various economic and social trends. Oil plays a significant role.

105. MacKay, D.I. and Mackay, G.A., 1975

The Political Economy of North Sea Oil
Martin Robertson, London, 193 pp.

Now possibly somewhat dated, this book probably constitutes one of the definitive cources on the economic impact of oil on Scotland. It contains sections dealing with government policies on land and at sea, employment and other economic indicators, and so on.

106. Mackay, G.A., July 1977

An Economist's View of Sociologist's Views on North Sea Oil and Gas Developments
Preprint for 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 9 pp.

Like Crofts, Mackay is critical of the direction in research taken by some academics in analysis of oil impacts.

107. Mackay, G .A. and Sewel, J. B., May 1978

Economic and Social Implications of Employment Reductions in Oil-Related Areas
Typescript, Glasgow, 4 pp.

This is a proposal for research into rundown aspects submitted to the Social Science Research Council.

108. Mackay, G.A. and Marr, Alison, May 1976

Prospects for the Buchan Economy
North Sea Study Occasional Paper No. 9, Department of Political Economy, University of Aberdeen, 29 pp.

109. Mackay, G.A., August 1975

Prospects for the Moray Firth Sub-Region
North Sea Study Occasional Paper No. 6, Department of Political Economy, University of Aberdeen, 22 pp.

110. Mackay, G.A., December, 1975

Prospects for the Orkney Economy
North Sea Study Occasional Paper No. 8, Department of Political Economy, University of Aberdeen, 22 pp.

111. Mackay, G.A., February 1975

Prospects for the Shetland Economy
North Sea Study Occasional Paper No. 4, Department of Political Economy, University of Aberdeen, 17 pp.

These Occasional Papers produced by the University of Aberdeen's Department of Political Economy offer brief but fairly comprehensive assessments of the subregional economies listed. ("Buchan" is another term for Northeast Scotland) They include indigenous as well as oil-related industrial change, fishing, infrastructure implications, and much other useful data.

112. Mackay, G.A. and Trimble, N.F., February 1975

The Demand for Production Platforms and Platform Site, 1974-1980
North Sea Study Occasional Paper No. 3, Department of Political Economy, University of Aberdeen, 21 pp.

This paper was a brave attempt to quantify those demands during a period of some uncertainty in oil extraction rates. The predicted demands Mackay and Trimble anticipated were greatly in excess of actual events.

113. Mackay, G.A., September 1977

Revised Estimates of the Demand for Production Platforms, 1977-1982
North Sea Study Occasional Paper No. 12, Department of Political Economy, University of Aberdeen, 11 pp.

This paper formalized downward revisions in Aberdeen University's estimates. Both papers, it should be noted, were considerably more conservative than equivalent U.K. government estimates.

114. Mageean, Deidre M., July 1977

Oil and Development in Shetland: Social Structure and Change
Preprint for 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 13 pp.

Ms. Mageean discusses various aspects of sociocultural change occuring in Shetland following oil's advent. She points out some major changes in Shetland society were already underway in the period immediately piror to oil, due to fluctuations in the knitting and fishing industries.

115. Manson, T.M.Y., 1978

The Nevis Report. . . What Future for Shetland?
The New Shetlander, Shetland Council of Social Service, Lerwick, pp 7-9.

Manson's favorable review of the Nevis Institute, reference No. 96, provides a valuable Shetlander viewpoint.

116. Marr, Alison, August 1975

Foreign Nationals in North East Scotland
North Sea Study Occasional Paper No. 7, Department of Political Economy, University of Aberdeen, 19 pp.

This Aberdeen Univeristy Occasional Paper statistically examines the numbers and characteristics of foreigners in northeast Scotland.

117. McCrone, R. G. L., May 1974

The Role of Central and Local Authorities
Preprint for (unidentified) Conference, Aviemore, 15 pp.

A Scottish Office official, McCrone discusses the split between local and central control over oil developments. This paper was delivered during a formative period in Scottish Office policies towards oil.

118. McGrath, John, 1974

The Cheviot, the Stag, and the Black, Black Oil
West Highland Publishing Co., Breakish, Skye, 33 pp.

McGrath and the 7:84 Theatre Company produced this scathing light opera version of Highland history, in which the foreign oil companies are portrayed in the same light as the English and Lowland Scot exploiters of previous eras.

119. McNicoll, Iain H., 1977

The Impact of Local Government Activity on a Small Rural Economy: an Input-Output Study of Shetland
Urban Studies No. 14, pp. 339-345.

120. McNicoll, Iain H., 1977

The Impact of Oil Supply Bases on the Economy of Shetland
Maritime Policy and Management, Vol. 4, pp. 215-226.

121. McNicoll, Iain H., 1976

The Shetland Economy, Research Monograph No. 2
Fraser of Allander Institute, University of Strathclyde, Glasgow, 56 pp.

These three papers are somewhat statistical treatments of their subjects, but portray useful modelling-type data. His input-output study is only slightly relevant to oil inquiries. In the other papers, he arrives at employment multipliers attributable to oil.

122. Mewett, Peter G., July 1977

The Emergence and Persistence of Peripheral Areas in Relationship to the Processes of Development and Under-Development, With Particular Reference to the Highlands and Islands of Scotland
Preprint for 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 15 pp.

123. Milligan, James, July-August 1973

The North Sea Oil Game
Town and County Planning (journal), 5 pp.

This early paper laments the lack of a more affirmative economic planning policy through a Scottish Development Agency, in preparation for oil activities.

124. Moore, Robert, March 1978

Northern Notes Toward a Sociology of Oil
Preprint for Oil and Scottish Society Conference, British Sociological Association, Aberdeen, 25 pp.

Both Mewett (reference No. 122) and Moore portray north Scotland's experience with oil in terms of Gunther Frank's theories of underdevelopment.

125. Naustdalslid, Jon, July 1977

Problems and Approaches for the Study of Oil-Related Development and Local Politics
Preprint to 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 11 pp.

Naustdalslid discusses politicization resulting from Norwegian oil developments in this theoretical paper.

126. NESDA (no date)

Grampian: the Resourceful Region
North East Scotland Development Authority, Aberdeen, 32 pp.

This is promotional literature produced by NESDA.

127. NESDA, April 1978

Offshore Oil Directory
North East Scotland Development Authority, Aberdeen, 77 pp.

The North East Scotland Development Authority keeps tabs on oil-related firms in its (Aberdeen) region.

128. --- 1977-1978

Da Wadder Eye
The New Shetlander, Issues No. 121-124, Shetland Council of Social Service, Lerwick, var. pp.

This discussion column in The New Shetlander provides useful recurrent commentary on a variety of local oil-related topics, including oil-fishing relationships, social relationships, etc.

129. --- 1977

Special Status
The New Shetlander, No. 121 (editorial), Shetland Council of Social Service, Lerwick, pp. 5-6.

The New Shetlander is an influential source of opinion in the Islands: this article is representative of its involvement in the developing constitutional questions in Scotland.

130. --- January, 1977

Drill Sites Left Like Scrap Yard
Offshore Engineer (journal), pp. 29-30.

This article is critical of U.K. policy in policing seabed conditions by comparison to steps taken in Norway. Techniques for seabed debris location are discussed.

131. Park, George, July 1977

Notes on the Political Nexus in the Development of Marginal Regions
Preprint for 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 30 pp.

Park's theoretical analysis centers on popular sociological theories of marginality and underdevelopment. He uses some interesting Canadian examples, including arctic locales.

132. Planning Exchange, The, 1978

The Social Impact of Large Scale Industrial Developments: A Literature Review Commissioned by the North Sea Oil Panel Social Science Research Council
The Planning Exchange, Glasgow, 108 pp.

This is an annotated bibliography not specifically limited to oil-related developments.

133. Pounce, Richard and Upson, Richard (et al), May 14, 1976

Scottish Industry and the North Sea
Trade and Industry, London, pp. 414-421.

This is a record of statistical performance of Scottish industry (a government publication).

134. Prattis, **J.I., 1977**

Economic Structures in the Highlands of Scotland, Speculative Paper No. 7
Fraser of Allander Institute, University of Strathclyde, Glasgow, 36 pp.

Prattis' theoretical and mainly retrospective treatment of the Highlands rests, again, on theories of underdevelopment and neo-colonialism.

135. Prattis, **J.I., July 1977**

Modernisation and Marginality in the North Atlantic: A Theoretical Perspective
Preprint for 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 37 pp.

Once more, theories of development and underdevelopment are discussed.

136. Rodger, John J., March 1978

"Inauthentic" Politics and the Public Inquiry Process: the Case of the Moss Moran Controversy
Preprint for Oil and Scottish Society Conference, British Sociological Association, Aberdeen, 20 pp.

Rodger's useful paper is critical of the planning inquiry system of public involvement in oil-development issues. The Moss Moran incident he discusses is still highly dynamic.

137. Rosen, David H. and Vorhees-Rosen, Deborah, R. N., 1978

Shetland and North Sea Oil: A Study of Rapid Social Change and Health
The New Shetlander, No. 123, Shetland Council of Social Service, Lerwick, pp. 6-9.

These Californian researchers have been involved in a long-term study of health, particularly mental health, in Shetland following oil's advent. Their findings are only now appearing

138. Rosie, George, 1974

Cromarty: the Scramble for Oil
Canongate Publishers, Edinburgh, 64 pp.

Rosie's account of early-days influences of oil in the Cromarty Firth area is a valuable history of raised expectations, policy confusions, and local social impacts of oil-related activities, notably the Nigg platform fabrication yard. Its point of view is well-balanced.

139. Saunders, George, June 3, 1978

Gas Project Objectors Win Court Fight on Hazards
The Scotsman, Edinburgh, 1 pp.

This refers to the Moss Moran controversy.

140. --- September 9, 1978

Development Status Loss Criticized
The Scotsman, Edinburgh, 1 pp.

This refers to loss of economic Development Area designation of the Aberdeen area.

141. --- January 27, 1979

English Money for "No" Vote
The Scotsman, Edinburgh, 1 pp.

The SNP accused wealthy English industrialists of supporting a "no" vote in the March 1979 referendum on devolution. These interests, the SNP says, want to keep Scotland from getting the maximum benefit from oil revenues.

142. --- August 12, 1978

"Hotel" Ship for Oil Terminal
The Scotsman, Edinburgh, 1 pp.

As with Nigg, an ocean liner is being used for accommodation for construction workforces in Shetland.

143. --- July 1, 1978

Mesa Opt for Pipeline
The Scotsman, Edinburgh, 1 pp.

Mesa is the consortium operating the Beatrice Field. They had previously considered single buoy moorage, but now apparently favor a pipe system, to the concern of bottom trawlers in the area.

144. --- January 6, 1979

Oil Slick Kills Off Wildlife
The Scotsman, Edinburgh, 1 pp.

About 600 tons of oil escaped into the waters of Sullom Voe after a tanker was damaged. Preliminary reports indicated much loss of life among seabirds and waterfowl.

145. --- July 1, 1978

Severence Pay for Workers at Amish
The Scotsman, Edinburgh, 1 pp.

This records the closure of the oil platform module yard at Stornway.

146. --- April 15, 1978

Shetland Warned About "Going Solo"
The Scotsman, Edinburgh, 2 pp.

Some reaction to possible new constitutional arrangements for Shetland has already been voiced, especially by Labour party officials.

147. --- April 1, 1978

Stornoway Oil Firm Make 300 Redundant
The Scotsman, Edinburgh, 1 pp.

This records the collapse of Lewis Offshore Limited.

148. Scott, David, March 4, 1978

Shetland Rates Soar
The Scotsman, Edinburgh, 1 pp.

Shetland property tax payers have faced massive increases in their "rates" as projected deadlines for the council's receipt of oil-generated revenues passed. Delays in opening of the Sullom Voe terminal have reportedly caused the revenue shortfall.

149. Scottish Development Department, August 1978

Monitoring Social Change in Small Areas
SDD, Edinburgh, 40 pp.

This was the SDD's attempt at using social indicators to assess oil impacts in selected areas. Two communities, Stornoway and Peterhead, were subjected to in-depth experimental analysis. No subsequent attempts along similar lines have been recorded.

150. Scottish Development Department, 1973

New Scottish Local Authorities: Organization and Management Structures
SDD, Edinburgh, 127 pp.

This document set out nominal O & M patterns for the new local authorities established in 1975.

151. Scottish Development Department, August 1974

North Sea Oil and Gas: Coastal Planning Guidelines
SDD, Edinburgh, 15 pp.

This guideline document demarcated coastal development, conservation, and intermediate zones for Scotland, and constituted a major intervention of central government planning authority in local areas.

152. Scottish Development Department, April 1976

North Sea Oil and Gas Developments: Environmental Impact Analysis, Scottish Experience: 1973-1975
SDD, Edinburgh, 18 pp.

This paper summarizes central government policy towards environmental (and planning) assessment of early oil-related developments.

153. Scottish Development Department, August 1975

North Sea Oil and Gas Developments in Scotland: A Physical Planning Resume
SDD, Edinburgh, 17 pp.

As above, this document summarizes planning issues associated with offshore oil to date.

154. Scottish Development Department, December 1975

North Sea Oil and Gas Developments in Scotland: Oil Terminals: Implications for Planning
SDD, Edinburgh, 14 pp.

The SDD issued descriptions of the siting, labor and infrastructure requirements of oil terminals. Several terminals, including major facilities at Sullom Voe, Shetland, Flotta, Orkney, and Hound Point in the Forth Estuary have been built since the advent of North Sea oil.

155. Scottish Development Department, May 1974

North Sea Oil and Gas: Pipeline Landfalls: a Discussion Paper
SDD, Edinburgh, 8 pp.

Also, like the paper above, this sets out various parameters associated with the siting of pipeline landfalls and ancillary facilities.

156. Scottish Development Department, 1975-1978

North Sea Oil: Oil Related Proposals: Summary of Returns
SDD, Edinburgh, var. pp.

The revealing aspect of these semi-condfidential documents is the great volume of applications relative to the limited number of actual developments, illustrating the speculative nature of shore-based oil developments.

157. Scottish Development Department, June 1977

Planning Advice Note 17: High Pressure Methane Gas Pipelines
SDD, Edinburgh, 7 pp.

158. Scottish Development Department, December 1977

Planning Information Notes: "A" Series (No. A1-A11b)
SDD, Edinburgh, 32 pp.

159. Scottish Development Department, 1978

Planning Information Notes: "B" Series (Plants & Processes)
SDD, Edinburgh, 65 pp.

PANs and PINs similar in format to Nos. 154 and 155 have been issued by the SDD to help local authorities cope with potential oil-related developments. They deal with various land-use and infrastructure aspects of oil and petrochemical developments.

160. Scottish Development Department, October 1977

Report for 1975 and 1976, Cmnd 6943
HMSO, Edinburgh, 33 pp.

The SDD's report includes discussion of oil developments and infrastructure implications.

161. Scottish Development Department, November 1975

Report on Rehabilitating Schemes and Possible After Use for the Platform Construction Yard at Portavadie
SDD (typescript), Edinbrugh, 33 pp.

This working paper speculated on various possibilities for using the unused platform yard at Portavadie.

162. Scottish Development Department, May 1977

SDD Circular 19/1977, National Planning Guidelines
SDD, Edinburgh, 61 pp.

Despite its national purview, the SDD has been reluctant to move towards "national" physical planning. These guidelines generally show regional physical constraints, etc.

163. Scottish Development Department, September 1974

SDD Circular 61/1974, North Sea Oil and Gas: Coastal Planning Guidelines
SDD, Edinburgh, 2 pp.

This circular regards implementation of reference No. 151 above.

164. Scottish Development Department, May 1974

SDD Circular 23/1974; North Sea Oil: Oil-Related Development Proposals
SDD, Edinburgh, 5 pp.

SDD Circulars normally contain instructions to local authorities. In this case, SDD instructed recipient local authorities to notify the Secretary of State (i.e., the SDD) automatically in the case of receipt of oil-related planning proposals. This permits an easier "call-in" of planning applications by the SDD.

165. Scottish Development Department Central Research Unit (no date)

Social Consequences of Oil Developments: SDD Summary of Aberdeen University Research Report
SDD, Edinburgh, 18 pp.

The Aberdeen University paper summarized contains incisive conclusions in a number of areas, including case-study examples from five oil-related areas.

166. --- Winter 1977

Skills Involved in North Sea Oil-Related Manufacturing
Scottish Economic Bulletin, No. 11, pp. 15-20.

Not surprisingly, metalworking and specialist trades predominate.

167. --- Winter 1977

The Impact of North Sea Oil-Related Activity on Employment in Scotland
Scottish, Economic Bulletin, No. 11, HMSO, pp. 8-14.

The Scottish Economic Bulletin is produced quarterly by central government, and keeps a running narrative on various oil-related topics.

168. Scottish Economic Planning Department, April 1977

Infrastructure in the "Oil and Gas Areas"
SEPD, Edinburgh, 14 pp.

This limited-distribution document quantifies and costs out infrastructure investment associated with oil activities. Housing and educational facilities are included in the analysis and data is not specifically broken out to show costs directly attributable to oil influences.

169. Scottish Economic Planning Department, November 1977

North Sea Oil Information Sheet
SEPD, Edinburgh, 13 pp.

170. Scottish Economic Planning Department, March 1978

North Sea Oil Information Sheet
SEPD, Edinburgh, 15 pp.

These sheets summarize basic economic data associated with oil developments,

171. Scottish Office, 1978

Scottish Abstract of Statistics No. 7
HMSO, Edinburgh, 221 pp.

This is an annual summary of key statistical data, including population and economic activity figures, produced by central government.

172. Scottish Office, July 1975

Special Financial Assistance for Oil-Related Infrastructure provided by Local Authorities (Circular 18/1978)
Scottish Office, Edinburgh, 2 pp.

This was the original document later updated by reference No. 173.

173. Scottish Office Finance Division, August 1977

Finance Cirular 21/1977; Special Financial Assistance for Oil-Related Infrastructure Provided by Local Authorities
Scottish Office, Edinburgh, 10 pp.

This circular sets out procedures whereby local authorities can recapture some expenses associated with oil-related infrastructure provision.

174. Scottish Office, Joint Standing Committee of The Scottish Economic Council and the Oil Development Council for Scotland, 1977

Scottish Industry and Offshore Markets
Scottish Office, Edinburgh, 18 pp.

This document reports on Scottish industry's performance in obtaining oil-related work, and includes speculation as to possible potential products and markets suitable for penetration by Scottish industry.

175. Sewel, John and Birks, J.S., July 1977

Towards and Typology of Population Movements in Response to Large Scale Developments in Peripheral Areas
Preprint for 4th International Seminar on Marginal Regions, University of Aberdeen, Plockton, 12 pp.

This is a reworking of their findings in refernce No. 5.

176. Shetland Islands Council Research and Development Department, April 1978

Shetland in Statistics No. 7
Shetland Islands Council, Lerwick, 28 pp.

The S.I.C. produces a variety of intelligence documents of this sort for public consumption.

177. Shetland Islands Council Research and Development Department, (no date)

Shetland's Oil Era
Shetland Islands Council, Lerwick, 73 pp.

This informative publication describes oil-related activities in Shetland in some detail.

178. --- July 7, 1978

Compensation Agreed for Oil Delay
The Shetland Times, Lerwick, 1 pp.

The principal oil operators of the Sullom Voe terminal agreed to help the Islands Council when the terminal's delay in opening damaged Shetland's public finance posture.

179. Slesser, Malcolm, 1972

The Politics of Environment: A Guide to Scottish Thought and Action
George Allen, and Unwin, Ltd., London, 176 pp.

Slesser, a one-time SNP parliamentary candidate, wrote this book before the full magnitude of North Sea oil was known.

180. Smith, Hance D.; Hogg, Alexander; (et al), September 1976

Scotland and Offshore Oil: The Developing Impact
Scottish Geographical Magazine, Vol. 93, pp. 75-91.

This is one of a large number of omnibus overview-type articles on North Sea oil,

181. Smith, Hance D., 1977-1978

The Making of Modern Shetland
The New Shetlander, Nos. 122-123, Shetland Council Social Service, Lerwick, var. pp.

Smith's records is another account of the various changes affecting Shetland since its "oil era" began.

182. Smith, Peter J. (Ed.), 1975 .

The Politics of Physical Resources
Penguin, Hammondsworth, Middlesex, 245 pp.

North Sea oil does not play a major part in this book. However, the dynamics of resource development in Britain are discussed at some length.

183. Sphere Consultants, Ltd., 1977

Beatrice Field Environmental Impact Study, Section 8-12-1, Fishing and Fish Processing, 8-12-50, Employment Impact
Sphere Consultants, Ltd, London, 26 pp.

This excerpt discusses potential impacts of development of the Beatrice Field on fishing and fishing-related employment.

184. Sphere Consultants, Ltd., (no date)

Beatrice Field Environmental Impact Study, Sec. 9: Social Environment and Attitudes
Sphere Consultants, Ltd., London, 56 pp.

The Beatrice EIS is the most recent manifestation of an industry-supported impact study. Its social survey component is unique thus far in the North Sea theater.

185. Steel , D.I.A., July 1977

Employment in the British Fishing Industry with Particular Reference to its Regional and Local Significance
White Fish Authority, Edinburgh, 33 pp.

Significant in this paper is its data base covering direct and ancillary employment trends in oil-impacted areas.

186. Stewart, David, April 1, 1978

“Hong Kong” of Britain Tag for Aberdeen
The Scotsman, Edinburgh, 1 pp.

It is a “Hong Kong” because of the reported proliferation of small firms.

187. Sullom Voe Advisory Group, May 1976

Oil Terminal at Sullom Voe: Environmental Impact Assessment
Sullom Voe Advisory Group, Sandwick, Shetland, 133 pp.

This is a comprehensive EIS-type document for Sullom Voe.

188. Taylor, Dave W. (Ed.), June 1974

Offshore Oil: A Cause for Regret?
The Architects' Journal, Vol. 159, No. 26, London, 53 pp.

This issue of the AJ took a very cautionary position over potential oil impacts.

189. Tayside Regional Council, 1976

Regional Report 1976
TRC, Dundee, 90 pp.

This is Tayside Region's statutory Regional Report.

190. Trimble, N., January 1975

Estimated Demand for Supply Boat Berths in Scotland, 1974-80
North Sea Study Occasional Paper No. 2, Department of Political Economy, University of Aberdeen, 34 pp.

Supply vessel movements and berths are closely tied to numbers of offshore installations. This paper uses some inaccurate data obtained by the same author (and Tony Mackay) in reference No. 112, so its descriptions of dynamic relationship are more valuable than. its quantified projections.

191. Trimble, N., May 1976

The Costs of North Sea Oil Developments, Past Trends and Future Prospects
North Sea Study Occasional Paper No. 10, Department of Political Economy, Unviersity of Aberdeen, 14 pp.

This paper traces the awesome increases in offshore field development costs. A further updating would be extremely useful .

192. Trimble, N.F., July 1975

The Demand for Helicopter Services for the U.K. Continental Shelf
North Sea Study Occasional Paper No. 5, Department of Political Economy, University of Aberdeen, 25 pp.

Like supply boats, air service is tied to the number and nature of offshore installations, hence vulnerable to repetitive error.

193. Troon, Anthony, July 25, 1978

Accommodation Camps are Just Like Holiday Camps
The Scotsman, Edinburgh, 1 pp.

Troon's tongue-in-cheek account equates construction camps with the British tradition of enclosed seaside vacation resorts.

194. Troon, Anthony, July 22, 1978

Scotland in the Fourth World
The Scotsman, Edinburgh, 1 pp.

Troon talks of Scotland's emergence into the ranks of ethnic-minority states or mini-states.

195. White Fish Authority, June 1977

Annual Report and Accounts, 1976-1977
WFA, Edinburgh, 36 pp.

This report shows the relatively good condition of the white-fish industry in the U.K. (by comparison with the herring industry).

196. White Fish Authority, November 1977

Fisheries Economics Newsletter No. 4
WFA, Edinburgh, 76 pp.

This is an example of the WFA's international research journal.

197. White Fish Authority, April 1977

The White Fish Authority: What it is, What it Does
WFA, Edinburgh, 12 pp.

This is an informational booklet on the role and services of the WFA.

198. Wilson, Brian, (no date)

Huge Jobs Blow to Isalnds f Oil Company Collapses
Glasgow Herald, Glasgow, 1 pp"

This refers to the now-col apsed Lewis Offshore Limited.

PART TWO

CANADIAN BEAUFORT EXPERIENCE

IV. CANADIAN BEAUFORT EXPERIENCE

This chapter examines some of the socio-economic issues confronted to date in offshore oil exploration activities in the Canadian portion of the Beaufort Sea. It contains sections dealing with:

- the communities affected by oil developments, and their traditional economic bases;
- the possibility of conflict between oil interests and other economic activities in the region;
- the use of socio-economic planning and monitoring devices in assessing the social and cultural impacts of oil operations on the region;
- the available evidence of social change which has occurred during the offshore exploration period.

Preparation of this paper was undertaken by using secondary sources exclusively. In the case of Canadian Beaufort activities these are extremely limited and cover comprehensively only two operating seasons. References are indicated in brackets []; a bibliographic listing by these numbers is found at the end of Section IV.4. The most comprehensive coverage of Canmar's operations can be found in the Mary Collins Consultants [12] and North West Territory government's [34] reports. Readers desiring detailed information not summarized in the following sections are directed to these sources.

General

Oil exploration activities have been conducted in the Canadian Beaufort Sea by Canadian Marine Drilling Ltd. ("Canmar"), a subsidiary of Dome Petroleum Ltd., since the early 1970's. Intense summer operations have been undertaken during 1976, 1977, and 1978, and are planned for 1979. While no official announcements have been made regarding the scale of any discoveries, it is generally assumed Canmar has hit potentially productive hydrocarbon zones in a number of its wells. Proving tests are undoubtedly scheduled through Canmar's projected exploratory operations, presently planned to continue at least until 1985.

Offshore operations have been concentrated in geologic structures about 160 km (100 mi) north of the mainland coast, in waters ranging from 30 m (100 ft) to 70 m (230 ft) in depth. The village of Tuktoyaktuk, on the north coast of the Tuktoyaktuk Peninsula, has been used as a summer service base; drillships and ancillary craft have wintered at Herschel Island, some 200 km (120 mi) to the west.

The Mackenzie Delta-Beaufort Sea region of North West Territories has been subject to energy exploration activities for a number of years. The Canadian federal government opened the Canadian arctic to mineral exploration many years ago [27] as a response to internal and international demands for economic growth. Oil and gas development in the north has been advocated by public and private parties in Canada since the 1950's. Most recently, a federally-appointed commission looked into proposed north-south pipeline corridors for oil and gas (the "Berger Commission")

and recommended that decisions of the type and scale required to implement such a plan should wait for resolution of native land claims in the arctic and subarctic.

Canmar's activities in the Beaufort Sea have therefore been pursued without the means of transmission of any reserves being assured. Ice-breaking tankers to move crude oil from the Beaufort Sea to west-coast ports is presently envisaged as the most likely method of transporting the resource, despite the newly-completed Dempster Highway from Dawson Y.T. to Inuvik, N.W.T. being open. If its tanker transport system is developed, the environmental implications will extend into Alaskan waters.

Social Impact

Canmar's social impact has been felt principally on the community of Tuktoyaktuk, through that village's role as service and staging base. More limited effects have been experienced in outlying communities in the Beaufort region, notably Inuvik and Aklavik. These communities and the smaller subsistence-based villages of the area have experienced impacts from Canmar's operations mainly through the employment of local people by the company.

Two factors have influenced Canmar's social impact on the region in major ways. First, the company's operations have been seasonal, and its non-resident workforce (Dome is headquartered, like most of Canada's energy industry, in Alberta) has been housed in a camp 2 miles distant from the core village. Thus the workforce has been temporary, and its temporariness

has been enforced through isolation.

Second, Canmar has agreed to a negotiated plan governing its social impact on the region. This "Socioeconomic Agreement" between Dome and the Canadian government has set out performance criteria for the company to meet in maximizing its beneficial effect on the region; and annual reviews of the company's adherence to the plan have been undertaken by government sources.

The very limited evidence available suggests these two factors have been relatively beneficial in minimizing adverse influences of the company's operations thus far, although some incidence of social problems have risen since summer working began in earnest in 1976. As in all issues relating to Canmar's program, analysis is hampered by the lack of base data. Post-mortum information on the company's operating seasons are available only for 1976 and 1977. Clearly, a longer base term for analysisis required before definitive conclusions can be drawn.

Social and Environmental Conflict

While some of the villages affected by Canmar's operations are more familiar with wage economies than others, all the region's settlements are dependent on subsistence hunting or cash trapping to some degree. Since many of these activities are based in the winter in the Beaufort region, there is little available evidence that the company's summer operations have damaged harvests to a major degree. However, there are two issues which may change this picture significantly in the coming years.

First, Canmar is proposing to extend its operations into fall and winter months. If this occurs, the potential for direct conflict with traditional activities will grow significantly, since many of these activities involve hunts on the ice, or access to hunting or trapping areas via Tuktoyaktuk Bay, which would need to be kept open by icebreakers.

Second, and more disturbing, Canmar has recorded a number of well control difficulties in their operations thus far. These have resulted in water or gas flows from submarine wells to the surface, so the possibility of a "blowout" involving more toxic substances cannot be ruled out. The problem represented by oil spills under the ice has been graphically demonstrated by the incident involving the icebreaker "John C. MacDonald," which sustained damage en route to Canmar's base in the winter of 1978. The "MacDonald" released some of its fuel oil into arctic waters, and according to Canadian government sources [35] the exact whereabouts Of the spilled oil are unknown. They will not be discovered--if at all--until the icepack recedes in summer 1979. Thus a major spill or blowout involving crude oil in the Beaufort Sea may have international as well as regional implications. This fact has not been lost on native interests on both sides of the border.

Implications for Alaska

Canmar's operations in the Canadian Beaufort are extremely relevant to Alaska insofar as they represent the leading edge in arctic offshore technology. Further, the types of impacts experienced by local communities in the Canadian/Beaufort region may well be replicated in Alaska in the event

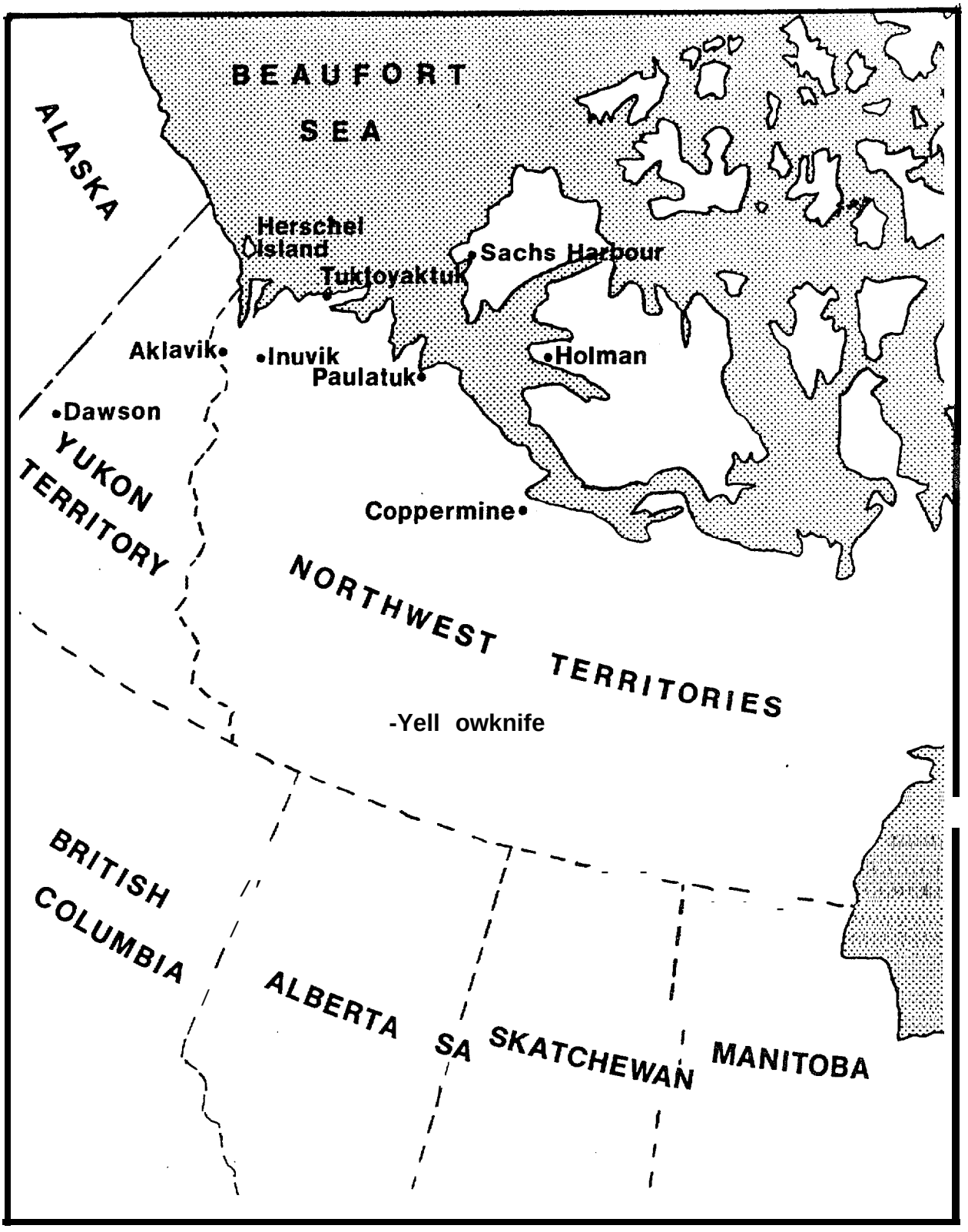
offshore exploration proceeds in Alaskan Beaufort waters.

It is important, however, to recognize some of the differences between the two areas. These fall into economic, social and political categories.

- Economic. The Canadian Beaufort region is, by comparison to the Alaskan Beaufort region, relatively heavily settled. Trapping still is a major economic activity, and the area has not experienced a development "boom" equivalent to that which followed discovery of the Prudhoe Bay fields.
- Social. The Canadian government has consistently attempted to integrate "northerners" into Canadian life. However, unresolved land claims issues prevail in arctic Canada in much the same manner as they did in Alaska before the stimulus for their settlement was realized in the form of the pipeline. On the other hand, some of the communities most heavily influenced by Canmar are predominantly involved in wage economies, unlike some of their Alaskan counterparts. A further influence on the social future of the Canadian Beaufort region without a current Alaskan analog is the opening of road access (the Dempster Highway) between the Beaufort-Delta region and the rest of Canada. This highway may well represent an experimental proving ground to see what environmental and social effects would be generated by opening of the North Slope Haul Road to unlimited public use in Alaska.
- Political. The North West Territories are administered by the Canadian federal government, although many powers are executed by a Territorial administration answering to an elected legislature from the Territory. However, most strategic powers (e.g.

the budget) are reserved to Ottawa. Therefore many of the political issues involving oil and gas development are resolved at the federal level. There is no regional layer of government in the Beaufort region. Local communities are governed in a variety of manners with no Alaskan counterparts (e.g., “hamlet” councils, “settlement” councils, etc.). Thus the point for political articulation represented by the North Slope Borough in Alaska has no Canadian equivalent.

Finally, it must be recognized that Canada’s arctic regions are huge by comparison to the U.S.’s. Oil and gas exploration is occurring in a number of areas, and Canmar's operations are but one set of circumstances among (potentially) many. If Canada has been accused in the past as being less strict in environmental impact questions than the U.S. [31], it might be well to recall this fact. Canada has clearly opted to become a major energy exporter, and the pace of energy developments in the Canadian arctic must reflect this national desire. Based on limited evidence, however, it appears this attitude has not resulted in a careless attitude regarding the social, economic, or cultural implications of these developments. Whether these implications are positive or negative in the long run will rest to a major degree on events in the next several years, and careful monitoring of energy development activities in the Canadian arctic is therefore obviously required.



Map IV.1 Canadian Beaufort

IV.1 EXPERIENCE IN WAGE ECONOMY

Oil developments have been concentrated in communities already experienced in wage economies. Exploration activities have been conducted by Canadian Marine Drilling Ltd. ("Canmar"), a subsidiary of Dome Petroleum Ltd. in the southern Beaufort Seas since summer 1976. Three exploratory drilling seasons have been completed with some hydrocarbon reserves evidently discovered in various offshore locations [2]. At the time of writing, no information has been released by Dome or by Canadian government sources as to the outcome of proving tests.

Affected Communities

The communities principally affected by Canmar's Beaufort activities are Inuvik and Tuktoyaktuk (see Map IV.1). Additionally, the outlying villages of Aklavik, Holman Island, Paulatuk, Copermine and Sachs Harbour have experienced some impact, mainly through employment of local persons by Canmar [12]. Canmar employed 185 local people in its 1977 season, out of a total workforce of 650. Inuvik, the regional administrative and service center, is by far the largest community in the area (4,150) with Tuktoyaktuk second (770) followed by Aklavik (700), Holman Island (288), Sachs Habour (168) and Paulatuk (113) [12].

Inuvik is predominantly (71%) non-native; all other communities are inhabited mainly by natives (e.g., Tuktoyaktuk is 85% native) with whites generally making up from 0-27% of the local populations.

The principal centers of Inuvik and Tuktoyaktuk have had differing roles with regard to Canmar's exploratory operations. Inuvik's role has been one mainly of staging and administration for Canmar's activities, with important communications and recreation roles also. Tuktoyaktuk, about 160 km (100 mi.) north, is less than one-fifth the size of Inuvik, but has played the central role in Canmar's field activities, acting as service base, and, following airport expansions, hosting additional staging and communications activities. The bulk of socioeconomic planning and research attention in the Beaufort has been directed at Tuktoyaktuk, owing to its size, ethnic makeup, role, and the consequent heavy relative influences Canmar's activity has had on the local economy and community life.

Wage Economy

A major element for examination of comparability between Tuktoyaktuk, other small Canadian Beaufort communities, and possible Alaskan counterparts is the question of hisotry of wage or cash economies. Tuktoyaktuk's background is heavily involved in cash trapping in winter (arctic fox, muskrat, polar bear, etc.), with traditional subsistence hunting only a supplemental source of employment, mainly in summer. [121. Significantly, Tuktoyaktuk was the scene of considerable wage economic activity through the 1950's and 60's as a result of construction of a nearby DEW line station. The village had only really been stabilized as an important center following transfer of a Hudson's Bay Company base from Herschel Island in 1937, followed by the arrival of church missions [4]. The HBC base provided the cash economy outlet for furs from the area, a trend

enforced by an RCMP station's opening, arrival of Northern Transportation Co. Ltd. (NCTL) a few years later, and so on [12]. As the early 1970's saw the arrival of initial oil-related activities such as geological and seismic teams, a trend to summer seasonal wage employment apparently accelerated, which, combined with (mainly wintertime) trapping, led to additional departures from subsistence as the predominant lifestyle [12]. (In the two years immediate y prior to Canmar's main arrival in Tuktoyaktuk, i.e., 1974-75 and 1975-76, 17 and 24 man-years respectively of oil-related emp"loyment for locals was provided in initial survey operations. See Section IV.4.)

Tuktoyaktuk in this respect departs from the norm of native villages in the Beaufort region (both on Canadian and U.S. sides of the border), which are much more reliant on traditional economic activities [12]. Inuvik, of course, is not predominantly a subsistence village, probably due to its ethnic composition as much as its size. Data is unavailable as to residual or casual reliance on subsistence hunting in these two communities, but it appears safe to suggest this forms a relatively small portion of the food supply, especially in Inuvik.

The impact of wage employment on Tuktoyaktuk has been pronounced. In the 1977 drilling season, for example, Canmar injected C$368,017. in wages into the local economy (i.e., paid this amount to its 103 Tuktoyaktuk employees), with hourly wage rates ranging from C$5.65 (Laborer) to C$8.60 (crane operator), and time and a half after eight hours (in a twelve hour shift) [12]. This is a major fiscal impact on a village of 800. By comparison, the value of exported furs from Tuktoyaktuk jumped

from C$71,744 in 1975-76 to C$122,518 in 1976-77, while the number of active trappers fell by 4 from 83 to 79.

Collins [12] quotes from an earlier study (W. D. Brackel, "Socioeconomic Importance of Marine Wildlife Utilization," Beaufort Sea Project Technical Report No. 32, 1977) in describing the basic economic differences in villages in the Beaufort. Region:

> In the Mackenzie economy [presumably including Aklavik, Tuktoyaktuk and Inuvik] only a small segment of the people are intensively active in hunting, trapping, and fishing, although a larger segment of the population shares in the benefits from wildlife resources. In contrast, most of the people of the Rim (outer) economy [presumably including Holman, Sachs Harbour, Paualatuk, etc.] are virtually dependent on marine wildlife for their livelihood.

Canmar's primary impact on the economies of outlying villages has been through the employment of villagers who are moved to Tuktoyaktuk for staging, rather than through major direct intervention in local services, etc. Only Aklavik reported business creation or expansion directly attributable to oil exploration activities, this at a fractional level of Tuktoyaktuk's experience [34]. Combined wages paid to residents of outlying viallages (Paulatuk, Sachs Harbour, Holman Island and Coppermine) amounted to C$132,343 for the 32 persons employed. In other words, Tuktoyaktuk experienced roughly 3/4 of the total wage impact generated by Canmar in Beaufort coastal villages. (Inuvik and Aklavik amount to C$240,438 for 51 northern employees.)

Thus the heaviest burden of Canmar's activity has fallen on settlements which are either mainly non-native, and/or, in the case of Tuktoyaktuk, already quite familiarized with a wage/cash economy. This is not to say

either a) Tuktoyaktuk is a non-traditional village, or b) outlying subsistence-based villages have not been impacted by intrusion of a cash economy. It does possibly suggest that comparability to subsistence-dominated Alaskan or Canadian villages needs some qualification.

Summary and Alaskan Relevance

Of the various communities affected by Canmar's exploratory offshore operations, the major impacts of wage employment have been experienced in communities already familiar to some degree with wage and cash economies. Most notable of these are the communities of Inuvik and Tuktoyaktuk. Inuvik, the largest settlement in the Mackenzie-Beaufort region, is predominantly non-native; Tuktoyaktuk, while 85% native, experienced considerable wage economic growth through the 1950's and 60's as a result of construction of a nearby DEW station. Smaller, but still significant, wage employment was experienced in outlying traditional (i.e., subsistence-based) villages, but Tuktoyaktuk has borne the brunt of coastal development for Canmar's activities.

The relevance of this to Alaska lies in the comparability of baseline economic conditions in the villages affected. In the event OCS oil exploration in arctic Alaskan areas progresses, the relative sociocultural impact of shore-based activities may be governed to some extent by experience in wage economies in the affected communities. Unfortunately, Tuktoyaktuk has been subjected to the lion's share of socioeconomic analysis in Canadian Beaufort operations, so direct application of findings to more traditional Alaskan villages will be difficult. It would be ad-

vantageous to observe more closely, if possible, Canmar's impacts on the outlying villages, since these may have relatively more in common with arctic Alaskan settlements or villages on the Bering Sea.

IV.2 POTENTIAL FOR ENVIRONMENTAL/SOCIAL CONFLICT

Environmental and social objectives may come into more direct conflict as exploration continues. There are arguably two ways of examining the emotional socio-environmental issue of "oil under the ice" from involved Beaufort communities' points of view.

The first viewpoint, most familiar to Alaska, is the environmental cautionary one. This position holds that the potential socioeconomic harm resulting from damage to the physical environment (especially the food chain) is high enough to warrent a delay in arctic offshore oil development, at least until reliable technology is available to safeguard against catastrophic spills or other negative environmental impacts (such as scaring off whales or fish).

The second position is more familiar in the North Sea or other "onstream" locations, i.e., that a suspension of energy development will result in damage to the local communities and economies through unemployment and spare capacity. Both sides to this development issue can be seen in the limited Canadian Beaufort experience.

They are made more disturbing in view of the actual history of Canmar's activities in the Beaufort. In 1976 at least two exploratory wells encountered control difficulties resulting in water and/or gas flows to the surface [10]. In 1977 another exploratory well gave water and gas flow problems (1200 bbls/day; 20-40 cfm gas). And in **1978** at least two major accidents occurred, *one* involving a major water flow after a drillship

was forced to abandon a well due to icing conditions [18]; another due to a fuel oil spill from an icebreaker employed by Canmar. In 1977 the Department of Indian and Northern Affairs' technical assessment of Canmar's operations reported an unsatisfactory exercise in spill-control procedures (in the context of a generally favorable report) which must raise again the issue of pollution control in arctic marine drilling conditions. The problem apparently was encountered in practice deployment of an oilslick containment boom: DINA reported that Canmar's training for spill conditions which might require the boom was inadequate [18].

The point has not been lost on native organizations. The Committee for Original Peoples' Entitlements (COPE), following the icebreaker spill, have called for a suspension of Canmar's 1979 drilling program until adequate contingency planning is completed and/or technological improvements take place minimizing risk. COPE has referred to success in its ongoing negotiations with Canadian authorities over land claims settlements as being linked to a satisfactory arrangement to control the likelihood of pollution in Beaufort waters [35].

Contrasted to this is the NWT Government's 1977 assessment of social, economic, and cultural implications of Canmar's operation on local behavior [34]. The report says "in all communities a desire for more jobs was expressed, especially for the young people and for women also." Thus the two forces are clearly at work in the Beaufort communities, arguably enhanced by Canmar's "socioeconomic agreement" [34] calling for substantial local hire.

Compared to the debate in Alaska, there is little published empirical information in Canada as to the economic and cultural implications of Beaufort Sea oil developments on subsistence patterns. COPE, in a 1974 press release, voiced strong objection to fast-tracked oil exploration in the Beaufort, citing the region's dependence on winter subsistence and (Beluga) whaling in summer. The socioeconomic assessment documents published variously by Mary Collins Consultants Ltd. [12] and the NWT government [34] treat the subject quite briefly by saying no noteable negative influences have appeared. They report stable or increasing winter participation in trapping and/or caribou hunting, and suggest Canmar's policy of allowing leave time for employed natives during summer hunts(presumably mainly for waterfowl and whales) has been well-received [34]. In view of the 1978 operational incidents, however, and especially with the prospect of extended fall or winter exploration (which COPE opposes) continuing investigation into Canmar's impact on traditional activities appears warranted. Any winter operations would potentially conflict directly with local subsistence hunting and trapping patterns, which involve bear and seal hunts on the ice. Oil work which may have been viewed (up to now) as an income supplement for hunters and trappers may suddenly come into direct conflict with the long-established baseline economic activity of the region.

Economic dependence on oil activities in Canadian Beaufort areas is variable, but is clearly major and increasing. Between the 1978 and 1977 drilling seasons, the percentage of all Tuktoyaktuk workers directly employed by Canmar grew from 37% to 44%. Other villages, while the absolute numbers of their workers are small, typically experienced 100-

500% increases in direct Canmar employment [12]. 1978 data is unavailable, but the trend appears set. However, employment multipliers in the affected villages appear unusually low, about 1:0.3 (i.e., one Canmar job leading to the creation of .3 non-Canmar job), so oil-related employment has been heaviest in the primary sector. This can conceivably lead easily to an overdependence on oil activities for baseline employment, which could in turn lead to depression if exploration should not lead to development.

The socioeconomic agreement (see Section IV.3) reached between Dome/Canmar and the Canadian government contains a strong training element. The NWT Government's report on 1977 activities [34] reports a number (up to 50) northerners employed offshore by Canmar were offered winter-time employment in Dome drilling areas in Alberta, and at least 18 accepted. No data is available as to how these trainees fared, While a positive step, this raises the possibility of out-migration of skilled people from Beaufort communities should exploration halt or development not occur. Given the prevailing unsolved questions of environmental safeguards and ultimate transport of oil from the area (ice-breaking tankers evidently are presently favored, despite the opening of the Dempster Highway), the middle- or long-term potential for emigration must be recognized.

Summary and Alaskan Relevance

General acceptance of Canmar's activities in the region may diminish as a result of:

- a number of offshore well control difficulties and minor spills

leading to fears over environmental damage in Beaufort waters; and

- the prospect of extended operations, potentially encroaching on traditional subsistence and cash trapping activities in winter months,

These concerns are balanced to some extent by demands for more jobs the region, since Canmar now represents such a sizeable portion of the area's wage employment.

Canmar employment has not generated particularly favorable spinoff economic growth patterns. The company's aggressive (and positive) training program might, if development of offshore fields does not occur, lead to first, overdependence on one employer in one industrial sector, and second, out-migration of newly-trained employees as local opportunities to use their skills decline.

The questions raised are directly applicable to Alaskan scenarios, and require little emphasis. For example, the North Slope Borough has kept close contact with COPE regarding Canmar's offshore experience; the "blowouts" (they are not) encountered i n Canmar's exploratory wel 1s have been well publicized , and have contributed to arguments in favor of postponing Alaskan Beaufort offshore exploration.

More difficult to assess is the issue of possible long-term social damage resulting from positive short-term motivations on the part of offshore operators. Adhering to its negotiated socioeconomic agreement, Canmar has

utilized and trained considerable numbers of northerners in oil exploration activities. In the event explorations do not lead to development of offshore fields, the short-term benefits to affected communities gained by this employment and training may be outweighed by long term losses, as former local employees seek to continue their emp" oyment in other locations, thus reducing the number of skilled and emp" oyable persons in the villages.

IV.3 SOCIOECONOMIC PLANNING AND MONITORING

A system for socioeconomic impact planning and assessment has been instituted and is functional. Pimlott, Brown, and Sam [32] record what they see to be a history of secrecy in Beaufort Sea oil exploration activities and lack of consultation between company, government, and local interests, a point also raised by COPE [35]. The socioeconomic monitoring program which has been established in conjunction with Canmar's Beaufort activities is probably an outgrowth of this history; it is also in the context of a long-standing motivation in Canada to induce the social integration of northerners into Canadian life.

Socioeconomic Planning

Canmar's use of a jointly-negotiated socioeconomic plan [34] was not the first in Canadian arctic oil exploration. Hobart [21] records that Gulf Oil's earlier (1972-73) exploration activities in the Mackenzie delta, near Coppermine, followed establishment of similar socioeconomic guidelines. These involved mainly local employment and training provisions, and a long-term socioeconomic monitoring program to assess the impact of rotation employment on local Inuit men. Employed on land-based rigs some distance from Coppermine, local men served 14-day shifts on Gulf's camps, returning to the village for 7-day furloughs. These arrangements were jointly agreed to by company, Territorial, village council and federal parties; village council veto power over the agreement was one of its terms.

Thus Canmar did not set a precedent by agreeing to a formal socioeconomic affairs plan. However, the company evidently saw advantages in establishing both a plan and a methodology for assessing performance against its objectives, and retained the services of a consultant firm to undertake both the monitoring program and to manage public information in the region. Mary Collins Consultants Ltd., starting in 1975, has issued such periodicals as the "Beaufort Seer" and the "Canmar Bul letin," and has edited the Arctic Petroleum Operators' Association newsletter, "APOA Review." Ms. Collins also has directed an annual review of the progress against the Socioeconomic Agreement and related socio-cultural implications of Canmar's activities.

Ms. Collins' reports for 1976 and 1977 [12] (1978 is as yet unavailable) record generally a favorable pattern of impacts of Canmar's activities on the social and cultural life of the region. Her findings have been supported in 1976 [20] and 1977 [34] by the Government of the Northwest Territories, acting through a steering committee of Territorial and federal personnel.

Canmar Socioeconomic Agreement.

The Socioeconomic Agreement [34] used as the basis for these reviews was formally instituted in 1977 (although clearly anticipated in 1976} between Dome (Canmar's parent firm) and the federal Minister of Indian Affairs and Northern Development. The agreement sets goals in the following areas:

- Employment and Training;
- Use of Local Services;

- Social and Cultural Consideration;
- Information
- Other (hiring preference by subcontractors, etc.)

The wording of the agreement ties Dome's adherence to the agreement's socioeconomic goals to the company's future drilling permits; it is uncertain how serious this factor was in neogitations.

- Employment and Training: The main thrust of the agreement is in a five-year plan for the hiring and training of local people by Canmar for full time and skilled positions in addition to unskilled seasonal ones. Dome was obligated, for example, to conduct its hiring and payroll administration functions in Tuktoyaktuk. (see Sections IV.1 and IV.4 for information on Canmar's performance in meeting these objectives.) Importantly, a provision for leave without pay for subsistence hunting absence was included in the agreement "upon the condition that the absence would not interfere with the [company's] operations." This provision does not apply to local trainees,
- Use of Local Services: Dome had apparently previously come under some criticism for not adequately using local suppliers and services in its operations. The agreement seeks to remedy this by requiring Dome to "seek ways" (not spelled out) of using local businesses more and to consult with various authorities on possibilities for new or expanded business resulting from Canmar activities. Dome was obligated to publish lists of required supplies which could be acquired locally if "price and service are satisfactory." A bid system for locally-supplied goods and services

was required.

- Social and Cultural aspects: The major element in Dome's social service proposal is the maintenance of an alcohol-free operation, both on ships and in port, i.e., Tuktoyaktuk. Measures are proposed to enforce a dry camp policy. Further, Dome is required to counsel local employees on financial management matters, such as banking, personal financial planning, and so on.
- Information: A program of general consultation with local groups is required by the agreement. In addition, Dome is obligated to fund a "Beaufort Sea Community Advisory Committee, "composed of representatives from all impacted communities. An Information Office in Tuktoyaktuk and periodic newsletters are also required. (Many of these steps had al ready been taken by Dome prior to their appearance in the agreement.)
- General: A final section qualifies the foregoing ones by allowing a waiver and review procedure. It also obligates Dome to favor firms with local hire provisions in the case of materials or service subcontracts.

An important element in Dome's community relations program is the presence of a five-year local employment plan, showing an increase of about 100% in Dome's use of local labor. The plan anticipates that locals will be moved into skilled positions at an increasing pace through the period.

The NWT government review of Dome's 1977 plan [34] is generally favorable, i.e., that Dome generally adhered to the agreement's provisions. No material has been available from other sources to suggest alternate views.

Summary and Alaskan Relevance

Although not a new procedure, Dome/Canmar and Canadian authorities have worked out a "Socioeconomic Agreement" which sets out perfromance criteria in several areas of potential social impact:

- employment and training
- use of local services
- social and cultural considerations
- public information
- local subcontract preference, etc.

Available reviews from Canmar's 1977 operations season indicate general compliance with the provisions of the agreement. In particular, adherence to local hire plans (now broadened into a five-year horizon) is recorded. Direct social impact is to be minimized through establishment of a camp some distance from Tuktoyaktuk, and maintenance of a liquor-free operations policy in the region. Provisions are made to accommodate subsistence hunting activities by native Canmar employees.

Viewed from Alaska, Dome's use of a socioeconomic agreement must be regarded as a good idea, both from the company's as well as the communities' perspectives. By establishing published performance criteria, measurement of progress against objectives can be made by any party. The crucial step therefore becomes the setting of the targets themselves rather than midstream negotiations. Dome has agreed to update its socioeconomic plan yearly, to allow for changing local conditions or the company's changing work program.

Such an agreement format will require monitoring over the duration of Canmar's activities in the Beaufort region, since the body of available evidence of progress against the agreement's provisions is so limited. However, adoption of such a procedure in Alaska may well be worth arguing for, in view of a number of factors:

- by setting performance criteria in advance, some of the inevitable local anxiety over how much activity may occur at what time, can be reduced.
- by establishing numerical goals for local hire in advance, the companies themselves may be able to plan better their own internal training and scheduling procedures.
- by establishing an overall framework of objectives, but leaving to annual reviews the detailed performance criteria, an adequate degree of flexibility can be built into the system to permit moderate changing of the pace and scope of the companies' work, or to allow disagreements to lead to negotiations rather than confrontations.
- by establishing local-hire and local service use criteria, some regional economic multipliers may develop which might not appear otherwise.
- from the companies' point of view, such an agreement might lead to development of a "community of interest" easing opposition to oil operations. (The opposite interpretation of this is that companies can co-opt locals to the industry's goals.)

IV.4 SOCIAL IMPACTS

Direct economic impacts of oil developments have been more significant than socio-cultural influences. This is not to say the social and cultural implications of Canmar's activities on the Beaufort region have not been major. However, social pathologies, while generally increased over pre-oil levels, present an inconclusive picture. Espeically in Inuvik and Tuktoyaktuk, statistical isolation of direct oil-caused social problems is impossible, at least without direct interview data. From an overview, however, the NWT government's assessment of Canmar's 1976 [20] and 1977 [34] activities' influences on community socio-cultural conditions is quite favorable; Mary Collins' review [12] is, if anything, more so.

A number of conditions clearly go into qualifying the degree of social impact in Canadian Beaufort areas. One is that Canmar's activities have been summer-only. Annual incidence of crime, alcoholism, and family service difficulties traditionally tend to be most pronounced in winter, obviously related to economic activity levels and probably to extended amounts of close-contact indoor life. Another factor is Canmar's policy of encampment for its imported crews. At Tuktoyaktuk, Canmar's camp is two miles distant from the core village and is fenced. It is kept on a "dry" basis, and personal and luggage searches are required of incoming staff and visitors. Collins reports a number of terminations (both of locals and outside Canmar personnel) for alcohol or drug-related problems [12], and records generally strict adherence to the Socioeconomic Agreement's provisions regarding alcohol.

A third qualifying factor is possibly statistical. Several communities (e.g., Tuktoyaktuk and Paulatuk) are combined for some reporting purposes. Disaggregation of reported data on social problems without access to original sources is impossible.

A final factor is more problematic. This is the moderating effect of any carry-over influence from previous industrial experience in the affected communities, say from DEW station construction or other activities. It is impossible without direct interview data to assess this influence, but it must be regarded as a possible cause of the relatively apparent ease of Canmar's adaptation to the villages.

Alcohol

Liquor sales in the area have risen slightly through the period of Canmar involvement, but are still below 1974 (pre-Canmar) levels [12]. Collins records half-year 1977 statistics for Tuktoyaktuk/Paulatuk showing alcohol-related offenses in about 1/4 of all crime cases. The period 1974-77 shows a variable alcohol-crime rate, with alcohol offenses generally running around 30-40% of total, roughly the same as other Beaufort locations except Inuvik (where the figure is close to 50%). Both the Collins and NWT government studies state Canmar's impact on local alcoholism problems has been only incidental or coincidental. As before Canmar's arrival, winter rates of alcohol-related crime as a percentage of total are higher than in summer, although categories of all crimes show general increases in summer.

Social Welfare

Child care cases have increased sharply in Inuvik and Tuktoyaktuk during the Canmar activity years (from 2 cases per month to 8); only minor and variable changes have been reported from outlying villages. Alcohol-related problems appear to dominate those cases reported by Collins [12] and the NWT Government [34]. The NWT study also records a higher demand for family counseling services, reportedly due to father absenteeism and changes in "traditional male-female roles" brought on by increased wage employment. Unfortunately, the NWT Government review does not elaborate on this topic.

Crime

A disturbing 86% increase in reported crime is recorded in Tuktoyaktuk-Paulatuk over pre-Canmar years, from 339 cases in 1974-75 to an estimated 633 in 1977-78. The villages of Coppermine and Holman Island (combined) also show sharp increases; other settlements' rates show variable annual rates prior to and through Canmar's operating years. As with alcoholism, both reports cite statistical reporting difficulties and qualify Canmar's contributing role, although the NWT study refers to an opinion from the Tuktoyaktuk RCMP station that Canmar's influence (presumably a high tempo, high wage economy) has played some part in that village's crime increase. In contrast, the NWT study also mentions that the Regional Supervisor for the Department of Health and Social Services "did not perceive any direct increases in the crime rate directly attributable to Dome/Canmar operations." More research is obviously called for.

Education

The NWT Government survey reports mixed impacts on local schools attributable to Canmar's operation. Evidently some increased student motivation can be seen as outlying village children perceive oil work as a direct rationale for attending school. In Tuktoyaktuk, however, high wages paid to unskilled labor by Canmar or its subcontractors have reportedly [34] led the local Principal to question Canmar's ultimate influence on school attendance and dropout rates. A point for continuing review will be the effect of Canmar's employment planning as it relates to education demand. It will be recalled Canmar intends to offer more semi-skilled and skilled positions to local people, and some managerial level employment, through the course of its five-year plan [11].

Employment

The heaviest degree of analysis has centered on Canmar's impact on local employment and business development. Employment of Beaufort region residents rose from 116 in 1976 to 185 in 1977, or from 4.1% of the region's total available workforce to 6.6% [34]. In Tuktoyaktuk, however, the figures are strikingly different: 87 persons, or 33% of the village's entire workforce, were employed by Canmar in 1976. This rose to 103 persons (44%) in 1977. By comparison, other villages recorded Canmar participation rates between 1% (Inuvik) and 21% (Paulatuk). Numbers of employees from "Rim" villages (Holman Island, Sachs Harbour, and Paulatuk) tended to be low, possibly as a result of continued reliance on summer subsistence hunting in these villages. Average wages paid to all Tukto-

yaktuk natives employed by Canmar regardless of length of service were C$3,951 in 1977, either at or below the averages paid to workers from other communities. The NWT study indicates Canmar preferred younger, male workers in 1977. They also comment that welfare and unemployment assistance clients tended to include only a few individuals potentially employable by Canmar. They report no serious labor shortages in Tuktoyaktuk, despite Canmar's high penetration of the local labor market.

Participation in Traditional Industries

Collins [12] and the NWT Government team [34] believe Canmar employment may be having a positive impact on participation in winter trapping and hunting. Collins states:

> An increasing number of Tuk [Tuktoyaktuk] residents are establishing trap lines over the winter. Many trappers are engaged in wage employment during the summer in order to obtain a "grub stake" for equipment.

The NWT Government study, relating the outcome of 6 out of 8 Hunters' and Trappers' Association meetings, goes on:

> Money earned was used to buy snowmobiles, traps and guns, ammunition and food. Purchases of this nature have been documented by Hill (1977) [unreferenced] who notes that 80 new snowmobiles have been sold recently in Tuktoyaktuk, which is significant considering there are only about 125 households in the community.

The NWT study notes only 6 northern Canmar employees felt their employment had a negative influence on their hunting and trapping activities, through interference with goose and whale hunting, and/or because of the Tuktoyaktuk harbor being kept open longer, impeding access to hunting areas.

Canmar has instituted a policy permitting unpaid leave for summer subsistence hunting purposes (for whale or geese hunting). Six employees in 1977 utilized this allowance [12]. Collins states this policy:

> . . .did not seem to present any problems. While it is recognized there will be some conflicts, northern employees will have to decide upon their priorities and recognize it is not always possible to accommodate all interests.

No data is available regarding more recent local perceptions on continued Canmar operations having an adverse effect on subsistence and trapping activities, aside from COPE's statement of opposition following the John A. MacDonald oil spill [35]. It is believed the Canadian Arctic Resources Committee, a nonprofit environmental advocacy organization, has expressed similar sentiments and has also called for a suspension of Canmar's activities out of concern for wildlife, including subsistence species.

Business Expansion and Creation

The NWT Government study records 18 new businesses in Tuktoyaktuk established as a direct result of Canmar activities by end 1977, accounting for 22 new jobs [12]. ''Expanded" businesses, 6 in Tuktoyaktuk, 2 in Aklavik, and 4 in Inuvik, account for 28 additional new jobs attributable to Canmar's influence. New businesses provided a range of services, including vehicle rentals, motels, a bank, a bakery, equipment rentals, marine transportation, a new air charter service, etc. Expanded business included increased grocery sales, snow machine sales, construction, water hauling, and recreation.

Terminations

50 native employees were dismissed for cause, a further 71 were layed off at the end of the summer season, and a further 66 resigned during 1977. Only 9 northern employees remained in employment in full-time "core" positions at the end of 1977, less than the 15 indicated in Canmar's employment plan [11]. This is explained by the NWT study as due to an apparent "unwillingness of some northerners to meet the terms of full-time employment." [34].

Of those individuals terminated for cause, half (25) were dismissed as absent without leave and a further 14 were terminated for being "casual". The rest were terminated for insubordination or laziness (6), jail terms (2), liquor, unspecified, or temporary layoff (1 each). Medical and unspecified reasons accounted for 31 of the 66 resignations, 9 took other work, 9 "didn't like the working conditions", and the balance left for various other reasons. Five employees left Canmar to go trapping.

Training

A total of 38 trainee: participated in Canmar activities in 1977; 13 did not complete training, were dismissed, or returned to prior jobs [12]. The reasons for this are not elaborated upon, but Collins and the NWT study contain favorable references to Canmar's training program. A further number of local trainees were employed by subcontractor Challenger Drilling aboard drillships; of 50 trained Challenger employees, 18 were offered positions in Alberta over the 1977-78 winter.

1978 season data is not available at time of writing, but a continuation of established 1976-77 trends can be expected.

A summary analysis of the direct local socioeconomic impacts of Canmar's Beaufort activities to date must lead to the conclusion that a relatively beneficial picture has resulted, albeit subject to a number of strong qualifications. Through voluntary and negotiated steps, the company appears to have taken local social and economic conditions and objectives into some consideration in its employment and local service use activities The company's socioeconomic agreement appears reasonable, and progress against its objectives is general ly recorded.

The larger issues of social, cultural, and economic impact resulting from Canmar's work will not be measurable until more data, based on wider observation, is assessed. Areas for special attention will be the impact of extended operations on subsistence and trapping rates, and ocal political response to spills and operational difficulties. Of longer-range concern is the social and economic transformation of out" ying villages resulting from increasing wage economy participation. This is a universal concern in cases of industrial development in remote areas, and subject to considerable theoretical review by other sources.

Summary and Alaskan Relevance

While subject to qualification, evidence suggests Canmar's impact on affected Beaufort region commun ties has had a major effect on employment levels, and the local economies but has had a variable role in

causing major increases in social pathologies or cultural conflicts. Alcoholism rates are still below pre-Canmar levels; social welfare referrals are up; crime is up considerably in Tuktoyaktuk but not necessarily attributable to oil work. Education levels may benefit from increased student motivation but may also be damaged by increased dropout rates due to job availability. Employment increases due to Canmar have been experienced most sharply in Tuktoyaktuk, where nearly half the available summer workforce was employed by Canmar in 1977. Employment of residents from more distant traditional villages has not been as major. Increased summer earnings by Canmar employees may have led to increased paritcipation in winter trapping and hunting activities; no evidence has yet been presented that summer subsistence hunting has been damaged by Canmar's offshore activities. New and expanded businesses mainly in the service sector have resulted from Canmar's operations. A number of Canmar employees were terminated during the 1977 season; a smaller number of local trainees were moved into permanent jobs.

Statistics in these areas are unique to the circumstances prevailing in the Canadian Beaufort, and direct application of problems in crime or alcoholism rates, for example, to Alaska is probably unwise. A few significant points merit continuing examination, however, chief among which are Canmar's policy of encampment at Tuktoyaktuk to reduce interactions among its white employees and locals; and the suspicions voiced that summer wage employment has contributed to increased winter hunting and trapping activities.

Throughout, however, two qualifying factors must be kept in the foreground: a) the data base on which these findings are based is very small, and covers only two years out of a multi-year exploration program; and b) recently publicized difficulties in Canmar's offshore operations may have led to different feelings on the part of locals than are reflected in the available literature.

Relevance of Canadian Beaufort experience to Alaskan conditions is also limited to some degree by the exact characteristics of the communities involved. By comparison to the Alaskan arctic, the Canadian Beaufort region is more heavily settled, and faces additional potential growth as a result of the opening of the new Dempster Highway from Dawson Y.T. to Inuvik (and ultimately to Tuktoyaktuk). The only means of assessing comparability of experience is through longer-term monitoring of Canadian activities in this region and expanded contact between U.S. and Canadian authorities and groups with common interests in the use of the Beaufort Sea.

CANADIAN BEAUFORT BIBLIOGRAPHY

The following bibliography relates to Chapter IV, and contains references relating to the Canadian Beaufort portion of this paper.

References are listed alphabetically by author. The number appearing on the left-hand margin is the number used in the preceding text in brackets, e.g. [34].

Because of multiple citations of some texts, page numbers have not been indicated in Chapter IV. This is regretted but unavoidable.

Comments on references are presented beneath each listing.

1. Advisory Committee on Northern Development, 1977

Government Activities in the North 1976-1977
Minister of Supply and Services, Ottawa, Canada. 209 pp.

This is the Canadian government's combined yearbook for all government agencies active in the Yukon and North West Territories.

2. Arctic Petroleum Operators' Association (various dates)

APOA Review
APOA, Calgary, Alberta.

The APOA Review is the industry journal for the northern operators.

3. Arctic Petroleum Operators' Association (various dates)

The Beaufort Seer
APOA, Calgary, Alberta.

The Beaufort Seer was the APOA's newsletter and industry journal before the APOA Review commenced publication.

4. Bachmayer, G.W.; Lesky, M.J.; et al (no date)

Tuktoyaktuk: A Community Study
University of Calgary, Calgary. 132 pp.

This is a community planning study undertaken by students in Environmental Design at the University of Calgary, and supported by Canmar. Various environmental and socio-economic baseline characteristics of Tuktoyaktuk are discussed.

5. Beak Consultants, Ltd., September 1974

Gas & Oil Pipelines in the Mackenzie Valley and Northern Yukon: Some Considerations for Contingency Planning No. 74-23
Task Force on Northern Oil Development, Ottawa.
102 pp.

A large number of subordinate studies accompanied the Canadian government's inquiries into possible north-south hydrocarbon transmission systems. This is one such.

6. Berger, Mr. Justice T.R., Commissioner, 1977

Northern Frontier, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry, Volume I
Minister of Supply and Services, Ottawa, Canada. 213 pp.

7. Berger, Mr. Justice T.R., Commissioner, 1977

Northern Frontier, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry, Volume II Terms and Conditions
Minister of Supply and Services, Ottawa, Canada. 268 pp.

The Berger Commission was convened to lead debate on Mackenzie Valley/Delta pipeline systems. It recommended oil developments should wait on settlement of native land claims.

8. Canadian Arctic Resources Committee, 1978

A Submission to the Federal Environmental Assessment and Review Process Hearings on Exploratory Drilling by Norlands Petroleum, Ltd. in the Lancaster Sound Region
CARC, Ottawa. 43 pp.

CARC criticizes both Norlands' proposal and the EARP approach in this paper.

9. Canadian Arctic Resources Committee, 1974

Gas from the Mackenzie Delta: Now or Later?
(May 23-24, 1974 Conference)
CARC, Canada. 118 pp.

Later, recommends CARC.

10. Canadian Marine Drilling, Ltd. (various dates)

Canmar Bulletin
Canadian Marine Drilling, Ltd., Tuktoyaktuk, NWT.

The Canmar Bulletin is Canmar's local public relations newsletter, issued locally in Tuktoyaktuk and other effected Beaufort coastal communities.

11. Canadian Marine Drilling, Ltd., 1977

Summary of Dome-Canmar's Action Plan Relating to Socio-economic Matters in its Beaufort Sea Offshore Drillings Project
Typescript, Canadian Marine Drilling, Ltd., Calgary. 17 pp.

This plan sets out Canmar's employment and community relations goals in its Beaufort operations.

12. Collins, Mary, 1977

The Social and Economic Impacts of Canadian Marine Drilling Ltd's 1976 Operations in the Beaufort Sea Communities

Collins, Mary, December 1977

Social and Economic Aspects of Dome/Canmar's Beaufort Sea Project
Mary Collins Consultants Ltd, Toronto. 109 pp.

Mary Collins Consultants Ltd. has been commissioned by Canmar to perform analyses of Canmar's socioeconomic impacts on Beaufort Sea coastal communities effected by oil exploration. These reports cover Canmar's activities in 1976 and 77 respectively.

13. Contract Education & Training Services Ltd., January 1975

Adult Trainees in the Mackenzie Area No. 74-41
Task force on Northern Oil Development, Ottawa. 151 pp.

This is another adjunct study to the Mackenzie valley studies.

14. Department of Indian and Northern Affairs, 1977

Annual Report 1976-1977, Indian & Northern Affairs
DINA, Ottawa. 83 pp.

Energy-related developments are covered briefly in DINA's annual reports.

15. Department of Indian Affairs & Northern Development, December 1973

Regional Impact of a Northern Gas Pipeline Vol. **111, No. 73-30**
Task force on Northern Oil Development, Ottawa. 166 pp.

16. Department of Indian Affairs & Northern Development, February 1974

Regional Impact of a Northern Gas Pipeline: Vol. IV, No. 73-31
Task force on Northern Oil Development, Ottawa. 147 pp.

17. Department of Indian Affairs & Northern Development, February 1974

Regional Impact of a Northern Gas Pipeline: Vol. VII, No. 73-74
Task force on Northern Oil Development, Ottawa. 181 pp.

Like the Berger Commission's findings, these documents are useful mainly as baseline sources, fairly unrelated to offshore activities in the Beaufort Sea.

18. Department of Indian and Northern Affairs, March 1978

Review of the 1977 Drilling Program in the Beaufort Sea, Final Report
DINA, Ottawa. 48 pp.

This summary report offers DINA's commentary on technical, environmental, and socioeconomic aspects of Canmar's 1977 activities. Its annexes are:

I. Environmental Review, 60 pp.
II. Social, Cultural, and Economic Assessment, 148 pp.
III. Technical Review, 68 pp.

Annex II. contains findings essentially identical with the Northwest Territorial government's review, reference No. 34.

19. Francl, W.J. & Associates Consulting Engineering Ltd., January 1974

Townsite Expansion Study - Fort Simpson, N.W.T. No. 74-27
Task force on Northern Oil Development, Ottawa. 193 pp.

This is another study linked to possible transmission systems' impacts.

20. Government of the Northwest Territories, January 1977

Social Economic Cultural Reviews: Dome/Canmar Operations 1976
Government of N.W.T., Yellowknife. 3 pp.

This is the N.W.T. government's version of Collins' report, and contains similar findings.

21. Hobart, Walsh, and Associates Consultants, Ltd., 1978

Rotation Employment of Coppermine Inuit Men: Effects and Community Perspectives
Hobart, Walsh and Associates, Edmonton. 391 pp.

The study finds a generally high degree of acceptance of wage employment among traditionally employed men in this N.W.T. community, providing opportunities for trapping and subsistence are given.

22. Keith, R.F.; Fisher, D.W. (et al), January, 1976

Northern Development & Technology Assessment Systems, Science Council of Canada Background Study No. 34
Science Council of Canada, Ottawa. 219 pp.

This important book covers comprehensively the (mainly environmental) issues of oil development in the arctic.

23. Kennedy, Thomas, April 26, 1978

Beaufort Sea Activity Expected to Increase
Toronto Globe and Mail, Toronto. 1 pp.

Kennedy reports that Beaufort exploration by Gulf and Dome is expected to increase considerably over the next 3 to 5 years.

24. Kennedy, Thomas, September 19, 1978

Output Anticipated from Beaufort Sea Wells by 1985
Toronto Globe and Mail, Toronto. 1 pp.

Kennedy cites industry sources' predictions, and affirms that marine, rather than surface, transport of crude is presently envisaged.

25. Kupfer, George, and Hobart, Charles W., 1978

Impact of Oil Exploration Work in an Inuit Community
Arctic Anthropology XV-1. 58-67 pp.

While not relating to Canmar's offshore Beaufort operations, Kupfer's and Hobart's record of Gulf Oil's impact on the Mackenzie region village of Coppermine is comprehensive if brief. Topics covered include socio-cultural changes in fields of kinship, diet, etc.

26. Lysyk, Kenneth M., Chairman, 1977

Alaska Highway Pipeline Inquiry
Minister of Supply and Services, Ottawa. 171 pp.

This analysis anticipates various implications of a gas transmission system on the approved Alcan highway route.

27. Maxwell, Judith, 1973

Energy from the Arctic: Facts & Issues
Canada and U.S.A. 125 pp.

Now somewhat dated, this book discusses potential reserves and possible policy issues. Discussion of eastern Canadian arctic fields is included.

28. Meldrum, Sheila M., January 1975

Territorial Employment Record and Information System
No. 74-79
Task force on Northern Development, Ottawa. 54 pp.

This is another of the pipeline-corridor studies supported by Canadian central government.

29. Mosquin, Theodore, 1974

Editorial: Arctic Offshore Drilling--A Calculated Policy of Grave Risk
Nature Canada, Vol. 3 No. 4. 1 pp.

Mosquin endorses Pimlott's views (below) regarding the environmental hazards of arctic exploration and production.

30. Noble, Martin, January 23, 1978

Yukon Determined to Benefit from Oil and Gas Boom
The Scotsman, Edinburgh. 1 pp.

This is an interesting Scottish perspective on Canadian petroleum issues.

31. Pimlott, D.; Brown, D.; and Sam, K. (no date)

Oil Under the Ice
CARC, Ottawa.

Oil Under the Ice is a major work by CARC, and contains valuable sections on the Canadian socio-political consequences of proposed arctic oil exploration, and related environmental hazards.

32. Pimlott, Douglas H., 1974

The Hazardous Search for Oil and Gas in Arctic Maters
Nature Canada, Vol. 3 No. 4. 20-27 pp.

Pimlott is highly critical of DINA's role in allowing oil exploration in arctic waters, and warns of major environmental dangers of energy production in the north.

33. Pipeline Application Assessment Group, November 1974

Mackenzie Valley Pipeline Assessment
Northern Task force on Oil Development, Ottawa. 412 pp.

This lead document in the Mackenzie debate is useful as background reading to Beaufort Sea activities.

34. Subcommittee for Social, Economic, and Cultural Aspects, January 1978

Review of the Social-Economic-Cultural Impact of the Dome/Canmar Operations 1977 in the Beaufort Sea
Government of Northwest Territories. 143 pp.

This is essentially the same as reference No. 18.

35. Personal communication, January 1979

APPENDIX

LIST OF COMMON ABBREVIATIONS

A.P.O.A.	Arctic Petroleum Operators' Association (Canada)
B.P.	British Petroleum
B.N.O.C.	British National Oil Corporation
C.A.R.C.	Canadian Arctic Resources Committee
C.O.P.E.	Committee for Original Peoples' Entitlements (Canada)
D.A. F.S.	Department of Agriculture and Fisheries for Scotland
D.I.N.A.	Department of Indian and Northern Affairs (Canada)
D.O.E.	Department of the Environment (United Kingdom)
E.E.C.	European Economic Commission (European Common Market)
F.O.O.C.G.	Fisheries and Offshore Oil Consultative Group (Scotland)
H.I.D.B.	Highlands and Islands Development Board (Scotland)
H.M.S.O.	Her Majesty's Stationery Office (United Kingdom)
I.S.S.P.A.	Institute for the Study of Sparsely Populated Regions (University of Aberdeen, Scotland)
J.E.M.G.	Joint Employment Monitoring Group (Shetland, Scotland)
M.P.	Member of Parliament (Canada and United Kingdom)
N.E.S.D.A.	North East Scotland Development Authority
N.W.T.	North West Territories (Canada)
S.D.A.	Scottish Development Agency
S.D.D.	Scottish Development Department
S.E.P.D.	Scottish Economic Planning Department
S.I.C.	Shetland Islands Council
S.N.P.	Scottish National Party

S.V.E.A.G.	Sullom Voe Environmental Advisory Group (Shetland)
U.K.	United Kingdom
U.K.O.O.A.	United Kingdom Offshore Operators' Association
W.F.A.	White Fish Authority (United Kingdom)
Y.T.	Yukon Territory (Canada)
Z.C.C.	Zetland County Council (Shetland, Scotland)