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RESOURCE-DISPOSITION SYSTEMS:

AN ECONOMIC OVERVIEW

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Introduction. The very topic of this conference, "Public Disposition of Natural Resources," says much about its geographic and political setting. The phrase equates "the public" with government and implies that government retains title to a substantial portion of the land and natural-resource base, but also that it is private enterprise which produces resource commodities for the market. This is a combination of political semantics and of circumstances that is shared only by Canada, the United States, and a handful of other "new" nations, democratic and capitalistic and, indeed, mostly former colonies of England.

Even in an overview confined to North America, we contemplate an amazingly varied accretion of land-ownership arrangements, of laws, rules, and customs governing the management and disposition of rights in "publicly" owned land and resources, and of agencies administering or adjudicating these rights. Laws and customs differ according to the resource and the jurisdiction: provincial and state arrangements vary considerably across Canada and the United States, and often differ profoundly from federal arrangements which, in turn, differ considerably between the two countries. This variety reflects the variety of social values, and the differences in the political and economic order prevailing when each of them made its appearance.

Important parts of this institutional palimpsest¹ have their origins in ancient customs and the legal traditions of feudal France, England, or Spain, or even in aboriginal usages of the Indians and Inuit. Laws and customs dating from the Nineteenth Century are often relics of the drive to open the frontier and fill up the countryside, and still tend to emphasize **disposal** of land and resources. Some of them, including the general mining laws of the U.S., Canada, and the Western states and provinces, remain almost pure expressions of an individualistic and

libertarian frontier ethos. A somewhat more modern layer of laws and institutions has a "conservationist" bias that echoes early-1900s fears of imminent resource exhaustion and a backlash against the "cut-and-run" patterns of exploitation under lassiez-faire arrangements during the late Nineteenth Century.

The institutions passed down from successive generations also reveal the swings in public sentiment about big business --- land companies, railroads, mining companies, and large-scale agriculture, for example --- and the role they should play in resource development. Contrast, for example, the vast grants of land to the railroad companies in the middle and late 1800s with the populism of an early Twentieth-Century reclamation law in the United States which denied water from federal irrigation projects to farms of greater than 160 acres.

My instructions for this meeting are to offer an economic overview of resource-disposition issues. In doing so, I shall have to devote some attention to taxes and subsidies, price controls, and export policies affecting the natural-resource industries. Out of the maze of existing systems and proposed changes to them, moreover, there is not time for me to deal with more than a handful of specific illustrations. Instead, I shall summarize a few basic principles which are likely to shape the advice "mainstream"² natural-resource economists will offer policy-makers on particular problems. None of these principles is an absolute; some of them may occasionally conflict with other legitimate principles of public policy; they sometimes conflict with one another; and in many cases it is not always obvious how best to translate them into practice. Nevertheless, I think they will convey the sense that there is a coherent philosophy lurking among the ambiguities.

Rent-maximisation. Most important policy controversies in natural-resources economics deal with the creation and apportionment of "economic rent" --- the difference between the market **value** of a resource commodity and the economic **cost** (the value of labour, capital, and materials³) necessary to produce it and get it to market.

Because rent is an "unearned" component of a commodity's final value it is, at least in principle, available for non-producers, government and landowners (including governments qua landowner) to appropriate and dispose of without stifling any useful private-sector activity. As the difference between potential value and necessary cost, rent is an index of the net contribution resource development makes to society's economic welfare (as measured, for example, by its effect on the real net national product). Fortunately for the long-standing symbiosis between resource economists and the politicians or civil servants we advise, these principles imply that those resource-development institutions which maximise the social welfare tend also to be the ones which maximise economic rent but, at the same time, deny most of that rent to the private operators.

Such a welfare-and-rent-maximising arrangement will typically be designed to mobilise the drive, ingenuity, and material resources of private enterprisers by playing on their **hopes** of capturing some portion of the potential economic rent in the form of above-market rates of return to investment. Another deliberate feature of these systems, however, is an attempt to limit the rent **actually** appropriated by operators to the minimum required to keep those hopes alive.

A remarkable thing about the systems expressly designed to maximise the government's rent collections, is that leaders of big mining, wood-products, and petroleum companies seem to prefer them to any other system. The same can not be said for ranchers and for the smaller mining and timber companies, however. They usually deny that collection of resource rents is a legitimate government function, and battle to retain traditional non-competitive preference-right systems of resource appropriation. Would-be reformers should never underestimate the tenacity and grass-roots political influence of these and other direct or indirect beneficiaries of anachronistic resource-disposition arrangements. Benefit-cost analyses may well show that the losses reform would inflict on these parties are only a small fraction of the potential revenue gains to government or efficiency gains to society,

but economic rationalization may nevertheless be out of reach because the real world offers no acceptable way of identifying and compensating the losers.

Resource-management agencies and officials are also frequent enemies of efficiency- and rent-maximising systems. Cash collected for the general treasury does not lead to an enlargement of one's duties, public prominence, or staff. Bureaucratic rationality almost invariably chooses those resource-disposition and management rules which, instead, maximise these latter goods. And agencies can readily satisfy themselves of the need to sacrifice potential rents on subsidies for regional-development, social-welfare, or environmental programs that could never stand on their own or win a direct appropriation of public funds.

The all-time champion in this game is probably the U.S. Forest Service, which espouses a doctrine of "multiple use" under which it is obliged to foster every plausible resource use in every district (and, ideally, on every acre) under its jurisdiction, and has consistently chosen those disposal and management mechanisms that maximise the agency's administrative tasks. The long-term success of this strategy stems, in large part, from its incorporation into a theology of Forest Management that is virtually immune from either internal reexamination or corruption by outside influences like modern resource economics.

Competition. Where economic rationality prevails, however, there are two policy rules that point the way to a simultaneous maximisation of social benefit, economic rent, and government revenues:

**Sell or lease resource rights at market value,
and above all, don't give them away.**

Sell or lease them competitively in competitive markets.

Perhaps these two sentences constitute a single rule. The only accurate measure of market value is the market itself. The way to find what something is worth is to offer it for sale or lease to the highest bidder. In a competitive sale, no bidder is ever compelled to pay more than he thinks the net value of the good to be, but he is nevertheless impelled to bid away almost all of the expected economic rent. The highest bona fide bidder is, by definition, the most optimistic about the benefit-cost relationship; there is good reason to presume that, on the average, he is the most likely to succeed in the venture. "Location" or staking systems (typified by the general mining laws), lotteries (like those employed for onshore federal oil-and-gas leases in the United States), and preference rights not only fritter away potential rent that the government might have harmlessly appropriated, but they tend to fragment and immobilise the resource-rights themselves --- leaving them under the control of parties who can not or may not even want to develop them.

Even if the original disposition of resource-rights is non-competitive, all is not necessarily lost:

No matter how resource-rights are originally allocated, make them freely combinable, divisible, and transferrable.

A non-competitive mining claim or mineral lease can, at least, be resold to the highest bidder. In this case, a speculator rather than the government will capture the economic rent (and some of it may be dissipated in unnecessarily high transaction costs), but it will not be wholly wasted, and society as a whole will be no worse off from the transaction. But the most vicious fruits of non-competitive resource allocation flourish where private rights in land or resources can not be freely sold or assigned.

Historically, the most iniquitous cases have probably concerned those water rights that are legally bound to a particular place and a particular use, usually agriculture, either irrevocably or under a "use-it-or-lose-it" rule. These rules direct much of the water resource of the

Southwestern states into marginal or redundant agriculture, while cities like Los Angeles and Tuscon, mines and factories throughout the region, and farms without historic water rights suffer a worsening shortage and ever-rising real costs. For some cities, the cost of procuring additional water is fifty times the price at which the federal government sells irrigation water to neighbouring farms. All parties would be better off if those who valued their water rights least could sell or assign them to those who would value them most. But federal water laws and the laws of most of the arid states rule out this elegantly simple cure for the seeming shortage. It is a tribute to the tenacity of ancient and irrational institutions that there is more political support in the region for a trillion-dollar scheme to divert the Columbia, Peace, and Yukon Rivers into the Southwestern deserts than there is for letting those who have water sell it to those who don't.

On the assumption that most resource-rights will ultimately be sold or leased in competitive markets, however, most mainstream resource economists would probably agree on another strategic principle:

Public authorities should settle for being "price-takers".

Resource-owners should not strive to be "price-makers", because it is impossible (except by accident) for any seller to set both his price and his sales volume, without either leaving overpriced goods "on the shelf" or, by underpricing, leaving "money on the table." Canada's natural-gas export policies are an analogy that is familiar to many of you. The National Energy Board determines how much natural gas is "surplus" to Canada's needs and thereby available for export, while the Ministry of Energy, Mines, and Resources (after consultation with U.S. officials) sets the border price. In the 1970s, the official export price was less than U.S. pipelines were willing to pay. Canada therefore had no difficulty in exporting all of the gas it deemed surplus, but received less revenue from those sales than producers could have negotiated on their own. By 1983, however, the U.S. market value had fallen below

the administered border price, and Canada's gas exports consequently fell to less than half the contracted volumes.

Taking the highest price bid for a resource or resource right "clears the market". Every saleable unit, in other words, will indeed be sold and, given a bit of competition, each unit will get the highest price the market will permit. There is no system of administered, appraised, or negotiated sales or pricing that is likely to achieve such a happy result. A working example of this principle is the contrast between the hundreds of millions, or even billions, of dollars the oil companies willingly pay the United States government and the State of Alaska in auctions of frontier exploration rights, and the hundreds of millions of dollars in tax and other subsidies the government of Canada has to grant those same companies as inducements to explore politically-allocated frontier concessions, subject to variable royalty rates, unforeseeable pricing rules, PetroCanada "back-in" rights, and other policy uncertainties.

Difficulties may, of course, arise in identifying or creating workably competitive markets for certain kinds of resources or resource rights. Such markets clearly exist on a world scale, however, for oil-and-gas development rights, coal reserves, exploration rights for metallic minerals, and (with some imperfections stemming from transport costs) for timber-cutting rights. There is, nevertheless, no set of simple rules by which to determine (1) just **who** should be eligible to bid; (2) **what** good the public authority should sell or lease (exploration, development, or removal rights, for example, or a commodity as such); (3) in what size units, for what term; and (4) whether the "bidding variable" should be a lump sum, a fixed time rental, or an ad valorem or physical unit price or royalty. A vast literature exists on these and related issues, generated by lawyers as well as by economists, and this conference will devote considerable time to them.

Internal and external costs. One of the most important of our general rules is often disregarded by the existing resource-disposition systems:

Recognize all costs associated with resource-disposition, development, and production.

Resource-disposition arrangements can create perverse incentives from society's standpoint if they confront operators with private costs that differ significantly from social costs. A fixed percentage royalty, removal price, or severance tax, for example (or some combination thereof), can stifle useful production if it exceeds the rent expected from developing the resource. An oil and gas royalty rate that a lessee willingly accepted **before** exploring a given prospect, may, **after** he has found recoverable hydrocarbons, turn out to exceed the anticipated difference between their market value and their development cost. The outcome is, therefore, abandonment of a reserve that could have been produced at a profit, and whose production could have created a net benefit for society and revenue for the landowner --- had only the royalty rate been lower. This tendency is a particular danger under "royalty-bidding" systems (where oil-and-gas leases are awarded to the bidder who offers the highest royalty rate).

A fixed percentage royalty, removal price, and/or severance tax that is not high enough to prevent all development of a particular hydrocarbons reservoir, mine, or tract of forest, may still induce its "high-grading" and premature abandonment. Lump-sum once-and-for-all sales avoid these difficulties entirely, because sunk costs do not affect operating economics, but front-end lump-sum prices are at odds with the prescription I offer elsewhere in this paper --- that landowners and government, as "residual" claimants on the value of resource commodities, should bear a large measure of market and cost risk. The most widely applicable way to deal with the tendency of fixed-rate royalties or taxes to choke off marginal production is probably to replace them with a profit-participation, net-profits royalty, or net-income tax. Participation and net-profits arrangements have their own

disadvantages, however, relating to the attribution and verification of costs, and the incentives they create for accounting gamesmanship.

The resource-disposition system can also lead to social inefficiencies wherever minimum bids or "reservation prices" do not include all the "external" costs of production (pollution or scenic degradation, for example). In the last two decades, resource-disposition and management institutions in North America have become more sensitive to external costs, including unpriced environmental values. So far, however little effort has been spent on assuring or even assessing the cost-effectiveness of alternative environmental-protection measures. Operators should pay the costs of administration, public investments like access roads, and public services like fire protection attributable to the resource-development operation.

Fixed social costs should ideally be incorporated into a minimum lump-sum fee, and variable social costs should be incorporated into a minimum royalty or removal price. If these minimum charges choke off development and production, so be it: Development in such a case would create **negative** rents; social costs would, in other words, exceed social benefits.

One such instance involves U.S. Government outlays to build timber-access roads in Southeast Alaska, which have historically exceeded the private benefits of wood-products production --- market value less costs. It appears, therefore, that the forest resource would not have been developed if the companies had to pay for their own access roads. Some parties will undoubtedly regard this fact as a justification for the subsidy, but a resource economist would typically suggest that timber sales should never have taken place in the region under conditions that apparently **reduce** the nation's overall economic welfare.

The time-value of capital. Another cost category that is often disregarded in resource-disposition or management schemes is the time-

value of capital. Even-flow timber-harvest rules and hundred-year rotation schedules, for example, sacrifice present values which, at any plausible social discount rate, exceed by many times the value of their welfare contribution (if any) to future generations. Likewise, natural-gas conservation and export-licencing rules that require reserves of 25 or 30 times current production increase the real cost of producing gas by a factor of three or four (with a corresponding reduction in development incentives and potential economic rents), because operators as a group must invest in finding and developing three or four cubic metres in order to get government authorization to produce one.

Providing for the welfare of future generations is the usual rationale for this kind of "conservation" regulation, but it is not a rationale that will get much support from mainstream resource economists. It rests on the doubtful assumption that our descendents would prefer to receive their inheritance from us in the form of underutilized standing timber or idle gas reserves than in some other form. Such policies inflate production costs for future generations just as they do for ours. Even-flow, long-rotation rules reduce the wood produced per hectare (or what amounts to the same thing, require a commitment of a greater area to commercial timber production at the expense of agriculture, quality recreation, or watershed and wilderness protection), for as long as those rules are in force. High mandatory reserve-life indexes for oil or gas, likewise, increase their real resource cost no matter when we choose to produce them.

Change, uncertainty, and risk. Uncertainty about future values is an inescapable fact of life, and the management of risk and uncertainty about the future is a prominent theme in resource economics (as it is in the economics discipline generally). I should like to suggest two broad rules for dealing with change, risk, and uncertainty.

The resource-disposition system should be capable of adapting smoothly to unforeseen changes in demand, costs, or technology.

**Non-producing interests in resource development
should bear a major share of the commodity-market risk.**

Natural-resource industries sell their products into national and international commodity markets that are subject to wide and unpredictable price fluctuations. Extraction costs do not normally move systematically with commodity prices, however, so that the economic rent available to landowners, government, and other non-producer interests tends to fluctuate even more widely than production costs or market prices. For this reason, governments and other "passive" claimants on resource revenues should expect their revenues to vary more widely than anybody else's.

Government attempts to avoid the natural fluctuations of resource-rental incomes are likely to be in vain, and indeed will probably **reduce** revenues when prices decline. Upward inflexibility in rent-collection mechanisms tends to leave money on the table and to leave the resource-disposal system and those who manage it open to accusations of giving away the people's patrimony to special interests, outsiders, or both. A lack of downside flexibility can lead to shutting in otherwise commercial and socially-profitable production, loss of markets, and unemployment in the resource-extraction and processing industries.

The certainty of change, combined with uncertainty about its direction or magnitude, are an additional reason for building automatic flexibility into royalty rates, removal prices, and production taxes. Rates that vary only proportionally with commodity prices will seldom contribute enough flexibility; wherever possible, rates should be calculated against net income rather than gross revenues or physical production. Long-term lease or sales contracts with price or minimum-take terms which are inflexible, or flexible in only one direction, are economically senseless. A long-term contract that is rigid in **both** dimensions is worse than senseless for both buyers and sellers, as it is almost certain to be repudiated by one party or the other before it expires.

Consider, for example, the timber-sale policy of the U.S. Forest Service. The last time the lumber business was depressed, the Forest Service (which does not adjust its sales schedules to the business cycle) had to sell stumpage on long-term contracts at very low prices; and it continued to collect those low contract prices even when business was booming and lumber prices had risen fourfold. In 1982 and 1983, the market was once more depressed, but those loggers and mill operators who signed long-term stumpage contracts at high boom-time prices are now walking away from their commitments, going broke, or both. In one phase of the cycle, therefore, the government was giving away resource rents it could have collected without hurting either the industry or consumers, and in the present phase it has no hope of collecting the revenues to which it is contractually entitled. In insisting on enforcing these contractual rights in a depressed market, the government is, ironically, setting the stage for the taxpayers to bail out failing lumber companies.

On this issue too, the natural-gas conservation and pricing policies of Canada and the province of Alberta are rich in lessons. Just as it is impossible for a seller to dictate both his price and his sales volume without giving something away, resource owners cannot have it both ways about the business cycle. They can choose to maximise rents by always taking what the market will bear at the moment, no more and no less, or they can seek revenue stability at a considerably lower level as seen over the whole cycle. Trying to have it both ways, ironically, delivers neither: the effort promises **less** income and **more** instability.

The devil we know . . . Our existing resource-management and disposition institutions were not, by and large, designed by political economists or political scientists. Many of them accord poorly at best with modern resource-assessment and extraction technology, market organization, or theories of public administration. Medieval scholastics would doubtless delight in the complexity, antiquity, and sophistries of contemporary North American fisheries, mining, or water law, and in

the varieties of Indian land-title (to name only a few). Professional economists, for whom the summum bonum seems to be allocative efficiency, find much to condemn in our inherited institutions for resource-disposition and management. The only redeeming feature in this heritage may be its very conservatism, which appeals to our suspicion that an entrenched bad law that everyone has learned to live with might sometimes be less harmful than the uncertainty attendant on frequent "reforms" or the unrestrained exercise of discretion by civil servants (and, in the United States, by federal judges).

The first canon of the medical profession is "Do no harm." For a first canon of resource-disposition policy, I am indebted to Bert Lance:

If it ain't broke, don't fix it.

The defects of entrenched institutions are obvious, but every innovation is bound to have adverse side-effects, most of which are **not** obvious in advance. In a rapidly changing world, these side effects can easily overwhelm the intended benefits of reform. Canada's National Energy Program may not be a resource-disposition plan as such, but it exemplifies the economic disasters that can be crafted by well-meaning and clever lawyers, economists, and political scientists whose hubris allows them to disregard the inevitability of surprises and adverse side-effects.

Intellectual rationality vs business rationality. Machiavelli deserves credit for my next pair of rules, which together stand as a corollary to the admonition, "If it ain't broke, don't fix it:"

Don't mess with the rules without a damn good reason.

**If you've got to mess with them, do it and get it over with;
but don't KEEP messing around.**

To paraphrase Scott Fitzgerald, businessmen are different from you and me. Decision makers in successful resource-extraction firms are especially different. They aren't irrational; they just belong to a special subculture and have a different kind of rationality from most

professors, lawyers, journalists, civil servants, or even the executives of regulated utility companies. What people like us see as equity, environmental and social responsibility, or economic rationality, they often perceive as a brand of anarchism that winks at theft; as intellectual bigotry, arrogance and snobbery; as effete sentimentality; or as a stubborn, irrational, and reactionary rejection of modern life. For better or worse, however, these people are the ones to which our economic system has delegated the responsibility for organizing the production of fuels and crude materials. Self-serving and ideological as their perceptions may be, socially irresponsible or economically irrational as they may seem, it is the businessman's concepts of responsibility and rationality which count most in real-world resource economics. Like it or not, it is the perceptions and reactions of resource-industry entrepreneurs that will determine the success or failure of a proposed system of resource-disposition and management.

Contrary to common belief, resource-development firms are **not** inherently risk-averse. There is no evidence, over the long run, that petroleum and mining-company stocks sell at lower price/earnings ratios than stocks in other industries --- whatever evidence exists is indeed on the opposite side. These companies attract and nurture leaders who relish geological uncertainty, seek out technical challenges, and are at home with market risk. As I observed earlier, they eagerly commit hundreds of millions of dollars to lease-acquisition and exploration investments in totally unproved frontier areas.

Most industry leaders abhor political and regulatory uncertainties, however, because they differ from geological, technological, or market risk in one way that is crucial to business decision-making: These uncertainties are, or appear to be, **assymetrical**, and this perception supports a belief that dealing with governments (as opposed to gambling on an exploration play or commodity-price movements) will never be an even bet. Few business decision-makers expect those political leaders who reached out decisively, quickly, and without misgivings for an enlarged share of resource revenues when OPEC opened a window for

them, to reduce those shares promptly, gracefully --- or at all, for that matter, except in the face of desperate necessity.

It is unlikely, for example, that Alberta, which unilaterally raised royalty rates, or Alaska, which raised its severance-tax rates, when rising world oil prices permitted them to do so will now unilaterally reduce them promptly in response to falling prices. It is also unlikely that British Columbia, which interposed a Crown monopoly between the producers and buyers of natural gas in order to siphon off windfall rents in a seller's market, will easily give up those revenues in a buyer's market, even for the sake of preserving export sales or producer incentives to keep looking for gas.

Both of these provincial governments, by the way, regard themselves as passionately pro-business and anti-socialist. Any doubts that may be warranted about the economic symmetry of their exercise of official discretion are justified many times over regarding the government of Canada. "Canadianisation" of the energy industries, for example, was supposed to be financed painlessly out of swelling resource rents. In reality, it has driven capital out of Canada's energy industries while leaving the nation owing billions of additional dollars to foreign banks --- a bill that will ultimately have to be met by Canadian consumers and taxpayers. What could Ottawa possibly offer in the present period of falling prices and shrinking rents to offset the private loss of confidence (not to mention the public fiscal losses) engendered by this ill-timed experiment? What could the government do, therefore, to convince business decision-makers that ministerial discretion is, like exploration risk, a "fair gamble" which requires no special discounting?

Canadians generally do not demand insist on the same formality or adversarial posture in relations between government and business that are needed to reassure Americans or Australians that businessmen are not plundering public property, officials are not tyrannical and corrupt, or both. It is also true that multinational resource-develop-

ment firms (some of them based in Canada) operate under Third World tyrants and Marxist commissars with almost as much relish as they do in liberal economies. Let us not kid ourselves, however, about the **direction** in which business decisions are pushed by frequent changes in rules, and the growing grant of discretionary authority to officials, civil servants, or judges. Grand policy experiments, frequent "reforms", the fine-tuning of prices, taxes, and subsidies, expanded ministerial discretion, and prolonged quasi-judicial proceedings, inexorably lead business decision-makers to discount the future more steeply, to shorten their horizons, and to bid less for long-term resource rights --- the same way they do with respect to investments in Third World and Communist countries.

Policy innovation leads firms to demand a higher expected rate of return in exchange for accepting a given quantum of exploration or technological risk, and to tilt their investments away from those plays which seem to be the most exciting geologically and technically, toward those ventures which receive the most favourable regulatory or tax treatment, or are eligible for subsidies. Entrepreneurs now spend less time in the field digging for new reserves and more time in Ottawa drilling for favours. All things being equal, constant experimentation, meddling, and tinkering over past mistakes inevitably tilt investment incentives away from the resource-development industries, and away from Canada.

For every problem spawned by regulation or institutional innovation, you and I can, of course, whip up a plausible regulatory or institutional fix. We can invent tax and royalty incentives, subsidies and safety nets, and the like, which will bring at least the most "progressive and patriotic" firms around. Some will, indeed, rally 'round the flag . . . as Dome Petroleum did. The Dome fiasco indeed typifies the kind of enterprise and the kind of business decision-making that enlightened people like us are likely to evoke when we force our own notions of social responsibility and economic rationality on a system whose soul we can never possess.

Summary and conclusion. The specific reforms of the resource-disposition system which I support are generally those which would increase society's reliance on competition to allocate resource rights. They generally aim at capturing more economic rent for government, because true economic rent is the most painless tax of all. They require cost-effectiveness tests for environmental-protection measures or infuse environmental-protection incentives into private decision-making. They let businessmen do what they do best, and reserve to government what it can dispatch responsibly. In trying to accomplish these goals I would seek **to build economic flexibility into the new rules themselves**, so as to minimise the need to amend them frequently or make broad grants of ministerial discretion.

I have urged caution in implementing reforms, not for the sake of lassiez faire (which is not a realistic program for "public" lands and resources), but for something truly conservative: humility about the ability of intelligent people, or democratic governments led and staffed by intelligent people, to foresee or control events, even those events which they themselves set in motion. Resource-disposition and management institutions in North America are dreadfully anachronistic, irrational, and inefficient. They dissipate rent and fail to capture for the public owners the rent they do generate. They are insufficiently sensitive to environmental costs, and they exacerbate economic fluctuations in regions that depend disproportionately on resource industries. The need for reform stands out everywhere. But constantly changing the rules, leaving major business decisions at the mercy of civil servants who neither understand nor empathize with the business subculture, and perpetual petty tinkering with laws and regulations, prices and subsidies, will not make democratic capitalism work better. They won't maximise the national economic welfare, and they won't even maximise government revenues.

Notes

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1. Palimpsest: a manuscript on which remnants of one or more earlier writings are still evident.

2. Mainstream resource economics is my shorthand for a tradition of research and analysis whose wellspring is probably Resources for the Future, Inc. (RFF) For the last quarter-century RFF has been writing the agenda for natural-resource investigations in North America, and has been directly or indirectly involved developing most of the important new tools of economic research and policy analysis regarding natural resources, energy, and the environment.

Professional economists in this tradition tend to be economists first and natural-resource specialists afterwards. Their attitudes are different in a number of respects from those characteristic of many resource economists trained in schools of engineering, mines, forestry, or agriculture --- who seem to predominate within the resource-extraction industries and in federal, state, and provincial resource-management agencies.

The current I have in mind is probably influenced more by neo-classical microeconomics than by any other sub-discipline of economic inquiry. Its practitioners tend to insist on methodological rigor, but as a means of testing policy-relevant hypotheses rather than as an end. Market-tied welfare tests and market-incentives abound, but the attention of the mainstream to collective goods, externalities and other instances of market failure, and its acceptance of government as a natural feature of the economic landscape, sharply distinguish it from the "Chicago school" and other more doctrinaire brands of "free-market" economic thought.

In Canada, I would judge the bulk of the economic research and policy analysis at the University of British Columbia to fall squarely in the middle of this mainstream, which probably is, however, broad enough to include the Fraser Institute on the Right and Energy Probe on the Left.

3. A rigorous definition of economic or resource costs would add to labour, capital, and materials something called user cost, which represents the present value of a resource's future use that is sacrificed by its present use. But this cost category is of serious interest, even theoretically, only for goods whose unit value is expected to rise at a rate that is significantly large relative to

the "social discount rate". Even if we could arrive at an agreement what the latter rate is (and I don't believe we can), appraisal of user costs would require exceptional foresight about future supply and demand. As there are few natural-resource commodities which have in fact shown consistent long-term upward trends in their real prices, user cost is a doubtful and at best highly speculative concept for dealing with real-world phenomena.