

NATURAL RESOURCES AND THE ECOSYSTEM IS TEN YEARS THE FUTURE?

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I. *The Planning Predicament.*

Man's current relationship to natural resources is one of an exponentially increasing rate of use. *The Limits to Growth*¹ projects into the next century show a utilization curve that peaks and collapses as man's demands outreach nature's bounty.

Man can only predict the future by applying his wisdom gained from experience to his knowledge of the past. He extends current trends to provide his map for the future. One must first, therefore, acknowledge that predicting the future, whether foredooming man's civilization or foretelling its Golden Age, is not a science but an art. Science can only establish the current trends for those indicators that can be counted or measured. Foretelling the future, despite the computer, still eludes man's science and is an art to which intuition and feelings have as valid a claim to contribution as do facts and figures.

Consequently, belief in an impending collapse of man's present relationship with nature is as much a prophecy as is faith in man's ability to thrive independently of the earth's finite resources. One can, in all honesty and sincerity, either forewarn of a United States energy crisis in the next decade or assert that ensuring an adequate supply of hydrocarbons to meet future United States energy requirements is merely a function of pricing—if the price is high enough, the domestic petroleum industry can supply the demand.²

In any event, prophesying is not the function of the engineer, businessman or politician—and the lawyer traditionally scans the past rather than the future. Planning, not prophesying, is the expertise of these architects of the new industrial state.³

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¹ Meadows, *The Limits to Growth*, A Report for the Club of Rome's Project on the Predicament of Mankind (1972).

² The American Petroleum Institute, a voice of the domestic oil-producing industry in the United States, asserts this viewpoint.

³ John Kenneth Galbraith, *The New Industrial State* (2nd ed., 1971), shows how technology leads to planning, p. 38.

Reduced to essentials, planning for the businessman means choosing between one investment opportunity and another. His planning time scale is determined by the rate of return he desires on the chosen investment. If the risk is high, the rate of return must be high, and consequently the time scale is shortened. For example, because high risk is usually associated with resource extraction ventures, a high rate of return is required and payout periods are short—normally as short as five or six years. The term “payout period” means the projected time within which the rate of return will restore the original investment capital plus the desired amount of profit. To this “payout period” must be added a “lead” time, usually, in the case of a mine or an oil field, the three or four years required to establish producing facilities and commence commercial operations. All together, less than a decade passes between the initial investment decision and the final payout. This time span becomes the future horizon for the business planner in the resource extraction industry. There is no economic justification for looking beyond it. In effect, ten years is the future!

It is precisely because economic planning must discount the future that there can be a pretence to planning expertise. This discounting so abridges the future for the planner that he can be reasonably scientific and therefore reasonably “expert” in his prophesying. Projection of trends within the next decade can be made with some pretence to scientific objectivity although even annual trends frequently confound the experts when performance is measured against forecast.

Discounting is a method of calculating the present worth of a future benefit or cost. Should it be uncertain whether the anticipated benefit will be realized, the present worth is not as much as if there were no such uncertainty. This uncertainty factor is simply a matter of predictability of changing circumstances. In a technological society in which it is claimed that the rate of change is increasing, the uncertainty factor and therefore the rate of discounting the future must also be increasing unless the increasing rate of change is being off-set by a rising degree of predictability. The predicament presented to the twentieth century man is that his time scale for planning, as a function of the discount rate, is continually being abridged as the rate of technological change increases, for there is little evidence of a corresponding increase in predictability. Whether or not an historical trend to increasing discount rates can be shown, it is clear in the case of resource extraction investments that payout periods are extremely short and not getting longer.

The time scale for the engineer is constrained within the time horizon of the businessman to whom he contracts his services, and therefore engineering works must be designed to serve the payout

period at minimum cost. But the key to the engineer's professionalism is that he must look beyond the businessman's future horizon. His professional responsibilities for public health and safety, for example, require him to plan beyond mere market place parameters. To be quite specific, a decision to spend another million dollars on a toll bridge so that it will not collapse shortly after payout of the investment may not be justified on economic grounds. But this decision may be dictated by the professional imperative of the engineer who must design to acceptable safety standards.

In modern societies the professional standards of the engineer are usually both supported and shaped by legislation such as building codes. At this point the politician's time scale is linked with the engineer's because it is the politician as legislator who has the responsibility to express through statutes, regulations and by-laws the standards and specifications which must now be met in order to serve future requirements. In realistic terms the politician must measure his success by election day results and therefore his day-by-day decisions must be based on his judgments as to the extent to which his constituency is prepared to forego present benefits in exchange for future possibilities or to incur future risks in order to enhance present benefits. In result, the politician, like the businessman, is discounting the future, the difference being that the businessman has a highly institutionalized economic system to aid him in determining discount rates whereas the politician is usually relying on nothing more than his political intuition backed by sporadic opinion polls.

In a panoramic sense we can see that the decisions which shape mankind's future are incrementally made by individuals applying their judgments as to the extent to which maximization of present benefits is to be constrained by concern for future benefits. These judgments are, of course, value judgments and not scientific determinations. But they are made under highly institutionalized conditions. Two of these institutions are the economic system under which business decisions are made, and the political system from which the legal and legislative restraints derive. Others are the social and cultural traditions which mark out the extent to which a society lives for today rather than for tomorrow. If one's goal in planning is the articulation of a public policy, and if it is assumed that public policy should be a continuing distillation through decision-making of the consensus of a fully informed populace, then the critical element in the planning process is the institutional one, for institutional constraints will totally shape the consensus that emerges.

This analysis of future planning shows that Club of Rome-type concerns about man's overreaching the earth's resources cannot enter into the planning process however much they may fester

as nagging doubts in the minds of planners. Institutional constraints seldom permit the decision-maker to probe beyond a decade or at the most two. One Canadian writer about natural resource planning places the outer limit as thirty years for even the most bold and speculative planner.⁴ At a recent "think-type" conference on energy which brought together industry and government spokesmen, as well as independent consultants and academics, an "in depth" analysis of the North American energy crisis concentrated on all aspects of supply and demand projections until the 1990's without any reference to the implications of current growth trends when projected along their exponential paths.⁵ Finally in the summing up at the end of the conference, one scientist stated that he found it necessary, speaking for all, to place on record his awareness that the exponential nature of current trends in demand for energy imply a system collapse in the next century. In the silent acceptance that followed, one sensed the helplessness of experts who can graph the future of mankind into extinction but must make planning decisions as if that graph does not exist.

What emerges provides a puzzling outlook for the future. In the twentieth century society it is a picture of decisions which ordain the future for Canada's natural endowments made incrementally in the private and public sectors under a planning process which is institutionally constrained to pursue current trends on a time scale that seldom exceeds a decade, even though the planners are aware that such trending cannot be projected beyond the life times of their children without producing absurd results.⁶

There are no new physical laws at work. Malthus demonstrated the mathematics of exponential population growth. It is because the mathematical formulations are beginning to be felt in concrete terms in modern society that there is a growing awareness of natural limitations affecting man's aspirations, and because life scientists have found the insight and courage to carry to society the message that physical laws circumscribe man's relationship to nature as part of an interdependent ecosystem.

The spiritual return of man to nature in North America has been an incredibly swift transition. Beginning with the escapism of the hippy movement, it has become a concern of affluent people to re-establish within their lives a more natural existence in harmony with nature. This rapid change in values demands a corresponding change in the choices made by decision-makers.

⁴J. W. MacNeill, *Environmental Management*, Information Canada (1971).

⁵Energy Conference, U.B.C., December, 1972.

⁶The Ontario Advisory Committee on Energy has forecast (January, 1973) an annual growth rate in consumption of energy of 4.6% until 1990. If this growth curve is projected into the next century its exponential character produces startling results.

But these value changes must be translated into decisions through the highly institutionalized and resistant planning system that we have described. The consequent frustration of those whose value choices are ignored will lead them to seek means by which they can short-circuit the system. There is an onslaught on decision-making institutions. It is at this point that the significance and thrust of the lawyer's role becomes manifest. He must reshape the legal system so as to convert the decision-making institutions into responsiveness to the new values in society. The remainder of this article will explore the kinds of institutional changes that will permit society to respond to the new values shaped by its ecological awakening.

II. *Two Approaches to Institutional Change.*

There are two ways in which an analysis of man's relationship with nature can proceed. One is to concentrate on man's dependence on earth's life support systems of air, water and soil and the need to preserve them, and the other is to focus on man's utilization of the earth's natural resources and the need to exploit them rationally. This distinction is drawn rather than the familiar distinctions between renewable and non-renewable resources, or between stock and flow resources in order to emphasize a difference in the institutional problems confronting the lawyer. In the case of life support systems, the emphasis must be on preservation of capabilities where they now exist and restoration where they do not. Air and water quality must be preserved or enhanced. Pollution must be abated. It is in urban and near-urban communities, where life support systems are most obviously under onslaught, that the need for a quality environment has been first articulated.

In the case of utilization of natural resources such as oil and minerals the emphasis is quite different. The resource extraction industries are usually located in remoter communities and often invade wilderness frontiers. In this context questions of environmental protection are secondary to questions about whether the resource should be exploited at all, or whether the required capital investment can be better allocated in other ways, or whether detrimental secondary effects may not outweigh the benefits. For Canadians, the issues may also include foreign ownership policies, impacts on native persons, and questions of export of irreplaceable resources as against conservation for the use of future generations.

In Canada these issues frequently arise with respect to virgin territories before any commitment has been made to industrialization and while basic policy choices remain open. The institu-

tional planning context is one of granting initial concessions and authorizations on the public side and of making initial investment decisions on the private side. On the other hand, in the case of earth's life support systems, the concerns usually arise after there has been deterioration and the context is one of seeking remedial action to prevent further deterioration and to bring about a restoration of life support capabilities.

III. *Preservation of Life Support Systems.*

In Canadian domestic law the legal outline for dealing with life support problems is now discernible. Federal and provincial statutes will require the establishment of air and water quality standards. Disposal of effluents will be governed by control boards which issue permits and enforce conformity with their terms and conditions. Performance bonding will be required to ensure that environmental damage will be corrected, and compensation funds will be established to provide those who suffer loss from environmental deterioration with proper compensation. In the case of new ventures, the requirement of biological and other impact statements will become widespread.

While this legal outline is becoming clear, much remains to be done before environmental protection can be taken for granted. The surprising element is how little inventive genius has been required to encase the new environmental concerns within a working legal framework. Possibly the answer is that the emergence of the new concerns about the earth's life support systems is not without parallel in recent legal history.

Before the turn of the century, with the Industrial Revolution accomplished and factory employment established on a massive scale, a new consciousness emerged demanding that working conditions be established which would ensure the factory employee a decent standard of living. The emphasis was originally placed on health and safety and only later on improving standards of wages and benefits. Just as environmental protection is a value which is pressing today for recognition within the legal system, so in the nineteenth century, protection of workmen was a value which gained legal recognition only after protracted social struggle. When the workman found the courts unresponsive to his claim for compensation for injury suffered during his work owing to the nineteenth century legal doctrine of common employment, there is a parallel to the position of the plaintiff today who cannot succeed in an action to correct environment abuse because he cannot show injury beyond that suffered by the public at large. The nineteenth century suit for an injunction against a factory owner to put a stop to an unsafe working practice would meet with

the same denial of *locus standi* that confronts a plaintiff today who seeks an injunction to restrain activities which harm the environment.

In the cases of both protection of workmen and protection of the environment, the first remedial steps have been legislative, with the Factories Acts beginning to stipulate safe working conditions for workmen just as new Canadian legislation now requires the establishment of air and water quality standards.

Along with legal recognition of these new concerns, there must emerge a technology through which recognition can mature into a comprehensive regulatory system. It is a simple matter to legislate that factory working standards or environmental protection standards will be established, but it is a complex and difficult task to specify what those standards shall be. At the root of the difficulty is lack of basic knowledge which can be supplied only by time-consuming empirical research. But just as the health hazards of the nineteenth century factory were identified and analyzed by medical men, so environmental hazards are being documented today by men of science.

Even when data is fully available, the establishment of standards remains a difficult task, because the necessity of finding an acceptable trade off between costs and benefits requires, even in the case of human life and safety, that standards recognize a dollar limit on expenditures to reduce hazards. In fact, the establishment of standards of protection against hazards, whether they be to health and safety or to the environment, can never be a wholly scientific process and must always be arbitrary in the sense that someone must decide the cutoff point between costs and benefits. Society accepts the automobile with clear predictability of the human toll it will take. Hospital budgets are established with full knowledge that increased expenditures could prolong life.

The establishment of safe and healthy working conditions in factories no longer engages the attention of the public at large. Over the course of a century a complex of institutions has become established to ensure that proper standards are maintained and enforced. Workmen's Compensation Boards, factory designers and equipment specialists all maintain constant surveillance of work hazards and conduct basic research into accident prevention. Both government and industry deploy safety supervisors whose job is to ensure that working rules are obeyed. Trade unions have safety committees and insurance and bonding companies play a watchdog role. A key element in the development of these institutions is the emergence of professionals. These persons become expert in matters of health and safety in factories, and whether they work in consulting firms, in industry or in government, it is

in their self-interest to lobby for higher safety standards and performance.

In Canada at the present time there is great floundering in the process of establishing standards of environmental protection. In the context of air and water quality, there is basic dispute as between those who claim that standards must be established in absolute terms that will ensure an appropriate level of quality and those who assert that standards must be tailored for each individual effluent source in order to ensure "equity". In the case of establishing standards which will protect fish and fish habitat in the water systems affected by the proposed Mackenzie Valley pipeline, the floundering stems from a total absence of precedent for determining what levels of protection can be justified having regard to anticipated effects of construction projects where design is not yet known, hazards can only be conjectured, and a means of evading or minimizing them are matters of mere speculation. Even to speak of standards for protecting spawning grounds and fish populations is to assume that these areas have been identified and that fish populations have been inventoried. This basic research work is only now being completed in the case of the Mackenzie River system, and the newness of these frontier ventures makes it plain why satisfactory standards will be slow to emerge.

Already in Canada the technology for environmental protection is developing with a class of professionals rapidly gaining a foothold. Hundreds of biologists and earth scientists are now engaged in environmental research, either to establish baseline data or to document environmental impact and recovery factors. While most of them are employed by industry or government, many have organized into consulting firms, and many established engineering firms have broadened their operations to include environmental work. It seems likely that the momentum for environmental protection initiated by conservation groups will be accelerated by these new professionals. If the pattern of other professions is followed, this new group, as it matures, will become a powerful lobby for wider and wider application of higher and higher standards.

The arbitrary nature of standards requires that someone dictate them from a position of authority. The private entrepreneur initially makes the decision but his standards, because the impact of environmental deterioration is usually external to him, are not likely to be as high as that demanded by the community. In this circumstance it is likely that government will take over the role of dictating standards. The revolution in environmental values that has taken place in Canada in the last decade has been chiefly manifested in activist movements lobbying for government control through legislation establishing standards of environmental protection. In addition to new legislation, new administrative agencies

have been demanded. Not only Canada, but many of the provinces as well, have established departments of the environment. These bureaucracies, which will include hearing tribunals as well as enforcement agencies, will also, in the course of time, become lobbyists for increased environmental protection.

While lawyers will be engaged in writing the new legislation and in planning and organizing the new institutional structures, their main role will be the traditional one of advocacy. Already an environmental bar has been organized as a subsection of the Canadian Bar Association. Its first instructions are coming from activist organizations which seek to maintain the "citizen's lawsuit" to correct environmental abuses. For each such lawsuit, there must also be counsel for the defendant, and lawyers whose clients are polluters are finding themselves face to face with a newly emerging "environmental law". Legal inventiveness will be displayed as plaintiffs' lawyers begin to formulate the lawsuits that will not founder for lack of standing. Possibly the standing issue will be resolved by Michigan-type legislation.⁷ The Canadian Bar Association is already on record as supporting an environmental protection statute which would give members of the public standing to sue in cases of environmental abuse.

But in the longer run, it is likely that the lawyer's advocacy role will find its main expression before government agencies and tribunals which have responsibility for environmental protection. Again there seems to be a close analogy between likely developments in environmental law and developments that have occurred in the case of employers and employees. The field of labour relations began with suits in the common law concerning the right to strike and ends before conciliation and arbitration boards. The field of environmental law will become institutionalized in the same way, with "citizen's lawsuits" giving place to hearings before boards and tribunals.

In summation, so far as sustaining the earth's life support systems is concerned, the outline of an environmental protection law is now clearly discernible. There will be a rapid development of institutions, both public and private, that will impose environmental standards and ensure their enforcement. The pervasiveness of these institutions will be as embracing as those that now regulate the fields of employee safety and labour relations, and the bureaucracies serving these institutions will be as large. Indeed, because all activities, non-industrial as well as industrial, can have environmental impact, these new institutions and bureaucracies may in time dwarf their labour counterparts. Lawyers will appre-

⁷ Joseph L. Sax, Roger L. Conner, Michigan's Environmental Protection Act of 1970: A Progress Report (1972), 70 Mich. L. Rev. 1004.

ciate that this possibility is not fanciful when they learn that the Supreme Court of California recently held that the issue of a building permit by a local government must be preceded by an environmental impact assessment and a public hearing under the State's new environmental legislation.⁸

The question mark, and it is a significant one, concerns the interests that will gain representation before the new environmental tribunals. It is characteristic of environmental issues that there is seldom a single person with a sufficient interest at stake to justify the expense of representing the protection side of the controversy. Conservation organizations presently provide this representation, albeit in a sporadic and often ineffective way. The question is how the role of these organizations can be institutionalized so that representation will be systematic and so that it will continue even if the conservation movement suffers diminution in volunteer support. It is not an answer to argue that the government agency which is responsible for regulation can play this role, for it is a common complaint that the agency identifies itself with the industry point of view. There is a similar need for institutionalization of the representation role provided by consumer action groups for the individual consumer seldom can afford the costs of legal proceedings. In the case of labour interests, the powerlessness of the individual employee is compensated for by his labour union which represents his interests. Institutionalization has been brought about by legislation which gives recognition to certified bargaining agents and requires arbitration to settle disputes and conciliation towards reaching agreements. Possibly the future for environmental protection will include the registration and public support of volunteer groups as ombudsmen in service of various environmental interests.⁹

IV. *Utilization of Natural Resources.*

The utilization of natural resources presents a broader range of concerns. Conservationists are first preoccupied with environmental impacts. Soon it appears that more basic problems are involved than scarring of landscapes and pollution of the atmosphere. As exploration for oil and minerals pushes into frontier regions, it is seen that resource development decisions involve basic choices affecting Canadian life now and in the future. When a pipeline was first mooted to bring Prudhoe Bay oil and gas to markets through the Mackenzie River Valley, the first concerns expressed were environmental ones. In a very short period of time Cana-

⁸ *Friends of Mammoth v. Board of Supervisors of Mono County*, Sup. Ct. of Calif. in Bank, Sept. 21st, 1972, Sup. Ct. No. 4637.

⁹ In the United Kingdom the nature conservancy programme gives local nature societies official status as wardens to supervise sanctuaries and reserves.

dians learned about the "fragile ecology" of the north and the many hazards to terrain and wildlife documented by conservationists in the United States in their fight against the Trans-Alaska pipeline system. But within the past year Canadian concerns have broadened to include new issues. They are "life style" issues rather than environmental ones, being questions about the future for native persons, for other northern residents, and for Canadians as a whole in their cultural, social and economic relations with each other and with the rest of the world. Even the economic growth imperative is being questioned as Canadians insist that a national energy and resources policy be formulated.

These macro issues are presented because Canada is at a take-off point with respect to the exploitation of natural resources in its far northern regions. These particular issues may not be enduring ones, but the context in which they are raised is an attack on the planning and decision-making processes surrounding northern development and for this reason the outcome of the controversy will have long-reaching effects. While the attack focuses on politicians now in power, its real thrust is against an industry-bureaucracy collaboration which pursues the exclusively development-oriented philosophy of the past, and against the economic and political institutions that sustain this collaboration. It is contended that these institutions must be changed so that the voices of all citizens are heard. This context can be seen to be part of the basic questioning of the citizen's role in the modern industrial state.

Canada's current oil and mineral laws provide substantial justification for this attack on established institutions. The basic approach is "open entry" whereby individual entrepreneurs make exploitation decisions independently of government. For example, the entire sedimentary regions of northern Canada are now covered by oil permits which give the holders exploration and development rights which they can exercise at their discretion. Not only does the government have no say as to the initiation of activities, but also all other potential land uses are clouded by the possibility that incompatible exploration activities will be undertaken. Because, as has been shown, the planning decision made by the entrepreneur is so constrained both as to external effects and as to future consequences, it is plain that "life-style" issues about natural resources should not be left exclusively to entrepreneurial decision-making. Institutional changes, which must begin at the basic stage of allocating resources, must ensure both that decision time scales are lengthened and that external effects are considered. New institutional imperatives must broaden the businessman's horizon.

These imperatives will be not unlike those that now constrain developers at the urban and regional levels in Canada. Already,

in the United States, new planning legislation is extending land-use controls into non-urban areas under new state-wide agencies charged with the responsibility of developing overall planning objectives and criteria. New planning legislation for natural resource developments in Canada must include participation procedures that ensure representation of all public interests. In the quest for these new procedures, progress must be made towards fuller citizen involvement in Canadian society.

V. *Twenty Years Hence.*

The legal response to the need for protecting life support systems will be preoccupied with standards, enforcement and remedies, while the legal response to concerns about the exploitation of natural resources will be concentrated on the planning process. In both cases new institutions will introduce wider public participation in decision-making. These developments will not represent any resolution of ideological conflicts about free enterprise and socialism. For more than a century an enlarging social consciousness has been introducing increasing social responsibility into men's affairs, with more and more constraints being placed on individual decision-making. Now an ecological consciousness is enlarging man's perceptions of himself in relation to the natural world. These new perceptions entail new responsibilities, and new constraints must follow.

Futuristic images are for artists and clairvoyants. It is true that the expert can but trend the past, and that one can be thoughtful about the future only in a modest way. The legal future of man's relationship to the environment and to natural resources will be a continuing evolution of rules and institutions that force him to expand his awareness like the infinitely expanding universe in both space and time. In the process we must somehow reconcile increased authority with greater public participation, more control with greater recognition of individual human worth, more institutional constraints with less legalism, and increasing technological change with an enlarging human consciousness.
