We may have to revise fire protection objectives. Due to the vastness of the area, it may be necessary to establish well defined protected and non-protected zones. Because of the other values referred to earlier, particular areas may be protected primarily or solely for values other than timber.

The scattered nature of the stands in some of the northern forests precludes industrial utilization but conversely provides a good deal of latitude for non-conflicting outdoor recreation. The value of the northern forests in terms of wilderness sites and natural areas should be recognized.

The increasing importance of high quality water and the major volumes which flow through Canada's northern forests makes it incumbent upon us to reflect this in the specific management principles we adopt.

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Conclusion

The area we have been considering has a future but no past. It provides the opportunity for planning and necessitates no patching. Historically, much of our natural resource policy has resulted from crisis situation: anticipation of timber shortages precipitating forest management; flood control legislation following rampaging flood waters; pollution control in the aftermath of oil soaked beaches.

Canada's northern forest represents a vast resources base with a clean slate. If we recognize that technology has widened our spectrum of choice and provided certain room to manoeuvre, we will not be found wanting by a sensitive public which no longer finds acceptable single solutions to resource-use problems.

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Conflicting Objectives in Forest Policy: The Case of British Columbia

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"We need a new and modern approach to policy that will make use of the available criteria for serving the public interest in the face of changing conditions, increasing values, and competing demands on the resource base."

Abstract

This paper takes a critical look at some of the basic principles on which forest management policies in British Columbia are based. Much of our present management procedures are designed to serve technical objectives which can be traced to traditional forestry principles imported from Europe. These, it is suggested, are inappropriate criteria for maximizing the value we obtain from our forest endowment in modern conditions of rapid change and growing competitive demands on the resource base. It is argued that our well established concepts of sustained yield, full utilization and maximum wood growth, among other

things, should be re-appraised in the light of modern economic criteria for maximizing the values generated by forest resources.

Un exemple d'un antagonisme dans les objectifs de politique forestière en Colombie Britannique

Résumé

Cette étude jette un regard critique sur quelques-unes des règles fondamentales sur lesquelles sont fondées les méthodes de gestion forestière en Colombie Britannique. Une grande partie de nos méthodes actuelles, en matière de gestion, sont établies à servir des objectifs techniques dont l'origine remonte aux sources traditionnelles de la sylviculture, importées d'Europe. Il a été proposé que celles-ci sont des critères impropres pour maximiser la valeur que nous tirons de nos

richesses forestières, en vue des conditions modernes de changement accéléré et aux demandes concurrentes et croissantes des ressources fondamentales. Il a été suggéré que nos concepts bien établis de rendement soutenu, utilisation complète et productivité maximum du bois, entre autres choses, devraient être ré-évalués à la lumière d'un critère économique moderne afin de maximiser la valeur des produits résultant de nos ressources forestières.

Introduction *

Few Canadians, least of all foresters, need to be reminded of the eminent importance of forest resources and associated secondary industries in the Canadian economy. No other western economy is so heavily oriented toward timber utilization. Canada is conspicuous among western nations also in the extent to which forest resources remain under public ownership. As a result of early policy decisions, the largest part of our forests remains in Crown title (the share increasing westward and northward from a small fraction in Prince Edward Island to almost all in British Columbia and the federal territories) and much further alienation appears unlikely.

The economic importance of our forest resources, and the omnipresent role of government as landlord and manager, mean that public forest policies carry extremely important implications for our total economic welfare — much more than is the case in other countries. During the last few years some of the basic precepts of public forest policies have attracted fundamental criticism, and a debate has developed (much of it in this Journal) which can only be regarded as healthy in view of the importance of the subject.¹ This paper is a contribution to that debate.

The most developed forestry resources in Canada lie within the provinces, and it is the provincial governments which have primary jurisdiction over these resources. No attempt will be made here to analyse in detail the differences in policy among our ten provincial governments. Instead, the following discussion examines the apparent objectives of only one — British Columbia. In general terms, however, the observations apply *mutatis mutandis* to other provinces as well. The purpose of the paper is to identify how, in certain important respects, public forest policies fail to ensure that our forest wealth is used to our best advantage.

British Columbia, even more than other provinces, illustrates the two characteristics already mentioned which underline the extreme importance of public forest policy. Some 97 percent of the forest land is held in Crown title, and the forest-oriented industries account for more than 45 percent of manufacturing in the province (Government of B.C.,

1968). The province is conspicuously rich, and has a highly competent body of professional foresters in both the private sector and the public service. Forest management is therefore critically important for the economy of the province; we can reasonably expect it to be highly sophisticated; and any shortcomings of policy deserve careful and constant scrutiny.

Conflicting Ideals

With some oversimplification, the influences that have shaped forest policy in the West can be traced to three schools of thought on natural resource development, each of which is deeply entrenched in our traditions. These might be labelled the "conservationists", the "promoters" and the "technologists". The policies they advocate are inherently conflicting. Conservationists advocate protection, restraint and preservation, while promoters press for greater efforts toward development and exploitation in the interests of economic growth. Both of these schools believe that their conflicting approaches are in the best interests of society. The characteristic of the technologists, in contrast, is that they are primarily interested in the forests for their own sake.

The conservation ethic is a legacy of the conservation movement which was sweeping the United States at the time British Columbia's forest policies were first being formulated. It was concerned with the apparent despoilation of our bounty of natural resources under the pressure of western expansion and industrial exploitation. But conservationists are a very mixed group, and the term conservation can apply to almost anything. Aesthetes use it to mean complete preservation of nature untouched. At the other extreme, it is used by exploiters to refer to full recovery and utilization — i.e., avoiding physical "waste". To others, it means rehabilitating the land, and so on. William Howard Taft once said that everyone is in favour of conservation, no matter what it means, and so it is perhaps not surprising that the advocates of almost any policy find it desirable to use the word to describe their proposals. Often it is meant to describe good management generally, but sometimes the goodness defies logic. One favourite, for example, is that conservation is the use of natural resources for the greatest good of the greatest number for the longest time. As Oris Herfindahl has suggested, this is as illogical as attempting to distribute a bag of candy among children in such a way as to maximise the amount of candy received by each child, and the number of children who receive candy, and the length of time the candy will last (Herfindahl, 1961). A little thought reveals that pursuit of any one of these three objectives precludes achieving the other two.

But there is perhaps one consistent thread among the so-called conservationists which needs emphasis here. This is the conviction that private industry tends to exploit natural resources wastefully, or too fast. Their sympathies lying with the natural order of things, conservationists tend to regard man

* An early version of this paper was delivered at the 1967 Annual Meeting of the Canadian Forestry Association in Vancouver, B.C. Allan Moss' paper, which appears elsewhere in this issue, is a critique of this article.

¹ This, and Allan Moss' paper in this same issue, are only the most recent examples. For some of the earlier debate that has appeared in this Journal, see Haley (1968); Smith (1969); Wiksten (1966) and various contributors (1968).

as the intruder, and his industrial activity tolerable only after careful study demonstrates that it will not destroy our natural heritage. This concern was epitomised by the early conservationists' outcry against western timber barons. Conservationists conclude that it is in the interests of society for governments to impose regulations and controls to enforce restraint and prudence on the part of private industries involved in natural resource exploitation. In this, Gifford Pinchot became their champion.

The promoters are led to the opposite conclusion. This group sees natural resource exploitation as the key to growth. Governments, far from imposing restraints, are enjoined to subsidise development by public expenditures on roads, railroads, shipping facilities, power and communications, in order to open up the frontier and otherwise unlock the doors to nature's bounty. Primary industries deserve special concessions to encourage them to expand our primary industrial base. Unlike the conservationists, the promoters tend to be confident that the social interest can be entrusted to private business, and the proper role of government is to assist the entrepreneurs. It is this school which advocates public programmes to open up the North, build roads to resources and provide fiscal and other special incentives to resource industries. At the extreme, development becomes an end in itself, regardless of cost.

In the words of A. R. Thompson, the development ethic can be paraphrased as follows:

Any enterprise that an individual or corporation initiates and prosecutes for profit is presumed to be in the best interests of society. Society may impose restrictions on the conduct of the enterprise, and may even prohibit it, but the onus is on those who advocate restrictions to justify them, and the restrictions won't be justifiable if they would render the enterprise unprofitable unless serious matters of public health and welfare are at stake. (Thompson, 1969).

These first two schools conflict directly. The third school — the technologists — cut across the other two. The characteristic of the technologists is their interest in the resource itself, and the policies they advocate tend to be more in the interests of the resource than in the people who own or enjoy it. They set themselves technical or administrative goals for management, without much reference to economic and social considerations, and seem to implicitly assume that these will best serve the social welfare. I refer to such goals as obtaining the maximum physical growth of timber, complete physical utilization and equal annual harvests, without reference to whether these represent the most desirable objectives on economic or social grounds.

These three schools have had a powerful influence on the forest policy of British Columbia. The conservationists are widely dispersed, and make themselves heard through organizations of naturalists, outdoor clubs, sportsmen and aesthetes. The promoters are concentrated in industrial, financial and promotional enterprises. The technologists con-

sist of professional groups of foresters and ecologists in government and private enterprises. Needless to say, the lines of demarcation between these groups cannot be clearly drawn; foresters, for example, sometimes advocate conservationist policies and sometimes policies more closely associated with those of the promoters. But it is helpful to identify conflicting forces in this way and examine their varying effects on our policies (Pearse, 1968).

The Supremacy of Interests: A Swinging Pendulum

The relative influence of these three schools on our forest policy-makers has varied through our history. In the earliest days, the only people who were much interested in forests (apart from settlers who wanted trees out of the way) were those who wanted to exploit them — the promoters. And the main interest of the provincial government was to encourage logging and sawmilling in order to establishing industry in the province.

But early forest policies in British Columbia were being formulated at a time when the conservation movement was gathering tremendous political strength in the United States. Concern over speculation in timber by large promoters and suspicion about whether *laissez-faire* resource development would serve the public interest had its effect in western Canada too. The early decision of the government of British Columbia to retain public title to forest land, in spite of inherited traditions about free enterprise, was almost certainly a result of the rising influence of conservation philosophy.

The retention of Crown title to forest resources led to important problems for the industry. In particular, industry worried about assuring itself long-run supplies of timber which, it was argued, were necessary in order to justify heavy investment in utilization plants. Moreover, logging was still on a "cut-and-get-out" basis, which disturbed the growing body of professional foresters within and without the Forest Service. These, and other factors, led to the first Sloan Report, which created Forest Management Licences and a host of other changes in forest policy (Sloan, 1945).

The first Sloan Report (of 1945) and its successor (of 1957) were milestones for forest policy in British Columbia. Few Royal Commission reports have been adopted with so few qualifications. Industry supported it because it provided for assured supplies of timber for capital-intensive utilization plants. The forestry profession supported it because it incorporated the major principles of traditional good forest practice. The Forest Service liked it because it solved many of their pressing problems of management and administration. Criticism was weak and uncoordinated. The Sloan Report became, and indeed still is, the foundation of present forest policy in British Columbia.²

² Commissioner Sloan, who was well aware of the pace of change and the need for constant scrutiny of forest policy, recommended another commission of enquiry ten years later. Although he, and most others, assumed this would be done, there has been no thorough re-examination of forest policy in British Columbia since 1956.

The Sloan Report was an heroic effort to reconcile the demands of industry (the promoters) and those of the forestry profession (the technologists). But in terms of the evolution of forest policy, it clearly marked the ascendancy of the technologists.

The technologists, as referred to earlier, are those who are trained in the management of a resource. They tend to be interested in technical objectives, such as maximum growth, maximum utilization, equal annual sustained harvests and therefore evenly graded age classes of timber stands, and so on. These are the precepts of classical forestry which we inherited from Europe, and continue to be expounded as "good forestry" in many forestry textbooks. Professional foresters imply that these principles of good forestry are in the best interests of society, but their economic and social implications are seldom rigorously analysed. Commissioner Sloan received a good deal of testimony from professional foresters (but little from economists) and accepted the classical forestry principles almost without qualification.

Implications of Technological Goals

Presumably, there is general agreement that the objective of forest policy, in the last analysis, is to ensure that our forests make their maximum contribution to the welfare of the people whose resources they are. For the moment, let us assume that the only value gained from forests is in the form of wood (though other values will be referred to later). It is appropriate, then, to examine the extent to which the principles of classical forestry which have been adopted in British Columbia are consistent with the objective of maximising the value of forest resources for the people of the province. Indeed, even if it were not true that the ultimate objective is to maximize long run benefits, this would still be a valuable analysis because rational decisions can only be made in the light of the costs, which may be in the form of reduced timber values in order to achieve other objectives.

Consider, first, the policy objective of sustained yield, which has become the subject of growing debate. The "ideal" forest, our traditional textbooks tell us, is one in which there is a stand of trees of each age from zero to the age of harvest. Each year, the oldest stand is harvested, and its area then becomes the youngest age stand. A perpetual annual harvest is therefore obtained, and if each gradation of age classes is made the same in terms of volume productivity, the annual harvests are equal. In British Columbia this concept of the perfectly regulated forest (sometimes euphemistically referred to as a "normal" forest) is no abstract ideal: it is the objective underlying all forest harvesting. In Sloan's words (Sloan 1957):

"... it is the objective of sustained yield management to bring irregularities into balance ... to minimize interference with the establishment of a regular series of age classes ..." (pp. 222-3)
"... it is important to maintain an adequate

healthy growing stock, enough and no more than is necessary (sic!) to yield a continuous stream of the products ..." (p. 226).

And hence the removal of virgin timber

"... should be designed to produce an evenly graduated series of age classes in the reforested lands ..." (p. 241).

It is hard to exaggerate the significance of these objectives in influencing forest management in British Columbia today. The size and form of tenures on Crown lands follows from them, as does the rate of harvesting and the length of the cutting cycle. The achievement of "normal" forests is the keystone of the Sloan recommendations. Thus our sustained yield policy involves much more than ensuring new crops following harvests. It aims at equal annual harvests, which is another thing altogether.

The ideal "normal" forest is a technologically appealing goal: it is neat, easy to comprehend, and provides a clear framework for action. To foresters brought up in the classical tradition, a perfectly graded forest yielding equal annual harvests is a natural objective and perhaps even has a certain aesthetic appeal.

But will equal annual harvests maximise the value of the forest resource? Not likely, as long as the demand for forest products fluctuates over time. One of the most elementary rules of economics is that the value of an inventory will be increased by selling more when demand (and price) for it is high and less when its value falls. Variations from the prescribed annual sustained yield harvest in British Columbia are permitted, but these are limited, and there is a clear implication that the more equal harvests are, the better.³ For such a policy to maximise the value of the forest resource, a unit of timber would need to be of equal value today and in all future periods. But the most certain prediction is that costs, and the value of the product, will change. Moreover, while many foresters would prefer to wish away considerations of compound interest, the hard economic fact that a dollar today is worth more than a dollar in the future (as long as capital is productive at all) cannot reasonably be ignored.

Interestingly, Sloan argued, as does Allan Moss (Moss 1970), that equality of harvests would have the desirable effect of producing stability in the industry. This fails to recognise that a fixed supply of timber in the face of changing market demand causes timber values to fluctuate more widely

³ Allan Moss, in his paper (Moss 1970) suggests that operators on Crown timber have a good deal of discretion in designing working plans, and can even use formulae designed according to strictly economic criteria. But in fact, adherence to sustained yield principles described above are mandatory in Tree Farm Licence contracts in British Columbia. In any event, if flexibility in application of the sustained yield principle were very great, the principle itself would lose its meaning. A policy objective can hardly be defended on grounds that it is interpreted with such flexibility that it is non-operative. The criticism here is directed toward the basic objective, explicit in provincial forest policy, of attaining equal (or near-equal) annual harvests through programmed removal of virgin timber.

than if supply was permitted to respond to price, as in other industries.⁴

Adherence to this form of sustained yield implies also that the industry is static. But as economic conditions change, standards of economic utilization change also. We have already seen substantial increases in yields through closer utilization and we can expect this trend to continue. Improvements in silvicultural practice have a similar effect. Thus the size of sustained yield units established to produce a particular yield at one point in time will, at another time, be found to be capable of producing substantially different yields. In addition, of course, the optimum size of utilization plants (which has influenced the size of sustained yield units established) changes with technological and economic conditions.

But for the present, the most serious economic implication of our pursuit of the technologically-ideal forest arises from the way we must harvest our old growth. To end up with an evenly graded series of stands by the time the old growth has been removed, the old growth must be spun out for a full rotation, harvesting roughly an equal amount each year for as many years as we expect to grow future crops. So calculation of the present allowable harvest of old growth is made by applying a variant of the Hanzlik formula, which involves simply dividing the total volume of old growth by the number of years in the rotation, and adding an allowance for growth on established young stands. Now, quite apart from the fact that this formula cannot achieve even its technological objective if there is much cut-over land already, it takes no account whatever of the economic considerations involved. Indeed, there are no economic variables in the formula at all.

Every businessman knows that there is a cost involved in holding inventories. Similarly there is a cost to society in holding Crown inventories of timber through time. But the very large economic cost of carrying old growth inventories is completely ignored in setting our harvesting rates. Another important economic consideration is the value of second growth crops that are foregone as long as we maintain old growth on the land. This too is ignored in the calculation. Provision for these costs would not, of course, lead to the conclusion that all timber should be harvested immediately (as evidenced by the large inventories carried by private owners of extensive forest lands, who inevitably consider all costs). But neither would it lead to a prescription of equal annual harvests.

The allowable cut calculation is surely the most critical issue of present policies for it determines the

⁴ It has been argued that equal annual harvests provide insurance against uncertainty about future markets, and that producers can accommodate fluctuations in market conditions by adjusting product (rather than raw material) inventories (c.f. Moss 1970). It should be apparent, however, that if fluctuations in demand are certain to occur, commitment to a fixed supply is a spurious hedge against uncertainty. That adjustments in product inventories are more efficient in meeting fluctuations in markets than adjustments in raw material inventories is an assertion of fact, with which many operators would disagree (especially when the government bears the cost of carrying the raw material inventory).

size of the whole forest industry. But the criteria adopted cannot pass the tests of elementary economics.

A second example of a purely technological goal is that of maximising the growth in volume (not value) of wood. Following traditional principles, which are concerned with the forest to the exclusion of social values, we select the age to which our forest crops are to be grown by calculating the number of years over which the volume growth of wood will be maximised.

"If, as experienced witnesses stated, sixty years on an average site will produce a mean annual increment of pulpwood of a size already commercially useful, there should be no hesitation in adopting a sixty-year rotation for a working circle to be managed chiefly for pulpwood production" (Sloan 1957, p. 241.)

Now the rotation age that maximizes volume is typically very different from the age that maximizes value. If the criterion about rotation age affected only second growth, there would be little cause for immediate concern, because it will be some time yet before the industry is heavily dependent on second growth, and we can hope that by then procedures will be improved. It is, however, of immense importance at present, because the Hanzlik formula is used to calculate present harvests of old growth to achieve the "normal" forest objective, and the results of that formula depend very heavily on the rotation age selected for the second growth. All the studies of which this writer is aware indicate that economically optimum rotations differ substantially from maximum volume rotations, and are usually much shorter (Pearse, 1967; Smith and Haley, 1964). If this is so, present allowable cuts are considerably too low whether harvests are to be equalised or not. In any case, they will be either too high or too low to maximise the value of the resources to the province as a whole. Preoccupation with volume of wood regardless of its value in such a critical investment decision undoubtedly results in a most serious misallocation of public resources.

A third example of a technological principle is that fuller utilization is always desirable. It is assumed that the quality of a logging operation can be judged by the closeness of utilization and salvage and hence the standards achieved in Europe should be our goal. Wood left on the ground is considered a waste. But the quality of wood that it is desirable to remove is determined by well-established economic constraints. It should be the lowest grade or size the value of which, when harvested, will cover the cost of harvesting it. To take out lower grades at a loss involves a waste of society's other resources, namely the labour and capital used in logging, and society will be left worse off. Efficient logging here involves a very different standard of utilization than in other places where relative economic values are different. Certain silvicultural considerations might well affect the data involved in many situations, but the criterion remains the same.

Obviously, the best standard of utilization will

vary widely from place to place and from time to time, which reflects the inappropriateness of prescribing general utilization standards over wide regions. The same general argument applies to the problem of how much should be spent on regeneration and silviculture in different situations. In these respects also, present policies are largely indiscriminating.

There are other examples of technological goals of management which have the effect of reducing the value we derive from our forest resources, but space limits the discussion here to these few, which seem to this writer to be the most serious. They are conspicuous examples of important problems which can be analysed and solved with well-established techniques of economic analysis, but economic criteria are not in fact employed (Scott and Pearse, 1968).

One other shortcoming of forest policy deserves mention, because it is becoming very pressing. This is the attitude taken toward conflicting demands on forests. In British Columbia, like other provinces, rural public lands are assigned to various uses in a rather unsystematic way. They are then placed under the jurisdiction of departments and agencies which are exclusively concerned with those uses: the Forest Service in the case of forest land, the Parks Branch in the case of parks, the Department of Agriculture in the case of farmland, and so on. These agencies understandably see themselves as guardians of the resource for the assigned uses. But their special interests create an obstacle to secondary users, and for flexibility in land use as conditions change (Pearse, 1966).

One of the first rules for efficient resource use is that secondary or tertiary uses should be allowed to encroach on the primary use to the extent that this yields secondary or tertiary gains in excess of the loss to the primary use. But under our single-minded administrative agencies, secondary uses do not receive unbiased consideration. The Forest Service, for example, is primarily concerned with timber production on the forest land under its jurisdiction. There is a built-in bias against other uses, such as recreation, which might well interfere with forestry objectives. Foresters usually agree with the principle of multiple use, but often interpret it to mean that recreation (for example) should be allowed as long as it doesn't interfere with timber production. This is not sufficient, for in order to maximise the value of total output, it should be allowed to interfere as long as recreational gains exceed forestry losses. These considerations are particularly important in planning the location of development and access roads and methods of exploitation.

It is unhelpful to ascribe to the idea of multiple use as if it were a panacea. The best use is frequently, if not usually, a single use, and in any event the concept of multiple use gives no guide as to how much of each use is desirable (Pearse, 1969).

Forest values are increasing, but timber values are not increasing more rapidly than other benefits from rural resources such as recreation. The argument that we shall need every acre of forest land

to meet our future wood needs is totally unhelpful, for needs are a matter of degree. Relative needs for different purposes will inevitably change through time, as they have changed in the past. It is therefore necessary to assess all needs, predict their trends to the extent possible, and maintain flexibility for reallocation of resources as conditions change. The fact that some of these benefits yield no market return does not mean that they are worthless. It does mean, however, that more effort is required in order to systematically assess these values. Recent controversial examples of conflicts between industrial and non-commercial interests can be expected to be repeated with increasing frequency until a consistent set of principles which provide adequate recognition of all relevant values is adopted. Non-forestry interests should be able to rest assured that non-forestry values will be considered on issues of mutual concern, so that the uncertainties surrounding individual cases will be minimised.

Commissioner Sloan held that competing demands on forest land could be reconciled with full forest development if only resource management policies were improved. We now know that this is too easy an answer. Under intensive development for more than one use, maximization of the value of combined outputs necessitates trade-offs which frequently involve compromise of any one purpose (Pearse 1969).

Traditional forestry principles offer little help in rationalizing conflicting uses, and present forest management policy in British Columbia involves only an *ad hoc* approach to the problem.⁵ But we cannot, in the best interests of society, continue to treat non-timber values as a nuisance, or even as secondary benefits in all cases. An efficient forest policy must systematically recognise all the benefits we derive from forests, and treat them in an unbiased way.

Conclusion

This article draws a picture of an evolving forest policy in British Columbia in which the dominant influence has varied among conservationists, promoters and technologists. During the last two decades, the pendulum has swung strongly in favour of the technologists. Indeed the technical forestry expertise in British Columbia will stand up well by most comparisons. But, by default of other considerations, technical criteria have been adopted not only to manage our forest resources, but also to set the goals of forest policy. As a result, our objectives are technical ones, and our crucial decisions are made according to technical criteria.

In short, if we accept the ultimate objective of managing Crown resources to derive the maximum

⁵ A recent innovation in British Columbia is a land classification called "Recreational Areas", which merely establishes recreation as a legitimate use of these Crown lands without giving it any priority over other uses. This gives rise to a possible inference that recreation is not a legitimate use of other public lands, or at least that it does not warrant compromises in other uses elsewhere. Until the last year or so, the Forest Service had no designated authority to accommodate recreation on forest lands.

value from them, we cannot superimpose technical objectives and assume that they will lead to the desired social result. The technical criteria of management referred to in this paper imply that forest management is an end in itself. But forests comprise part of our endowed stock of capital which must be utilised to our best long run advantage. We must therefore subject our policies to economic tests before we can be sure that they will serve the interests of society as a whole and not simply create forests that are technically neat.

Nothing in this paper should be inferred to mean that the forest industry should be discouraged or restrained. On the contrary, the message here is that, where the highest use of forest resources lies in timber production, public policies should encourage the most efficient exploitation of timber crops. Many aspects of present policy stand in the way of this efficiency at present. Nor should the arguments above be construed to imply a disregard for considerations of silviculture, ecology, fire protection or fire preservation. All such matters provide essential data for any thorough economic analysis. Sometimes appropriate data are difficult to assemble and put in quantitative terms, but this does not diminish their relevance. Often special regulations and restrictions will be necessary for silvicultural or protection purposes, but this does not change the basic purpose of management or the criteria adopted in achieving it. Nor, finally, should it be assumed that the plea for economic analysis of policy procedures in this paper runs counter to forest practice everywhere. Foresters familiar with forest resource management on most private forest lands in North America would find nothing surprising in these ar-

guments, nor would state forest planners in some other countries where forestry has long traditions, such as the United Kingdom.

This paper is more a critique of present policies and procedures than a presentation of alternatives. Recognition of shortcomings is prerequisite to receptive consideration of other methods. Alternative approaches to most of the serious problems mentioned here have been developed elsewhere, some of which appear esoteric because they relate to inevitably complicated problems (Pearse, 1967; 1968; Nautiyal and Pearse, 1967). But, once objectives of forest management are clearly identified, much more effort needs to be devoted toward application of existing analytical techniques of economics to issues in forest management.

The analogy of a swinging pendulum is unfortunate, in the sense that it implies that it will swing back again to something we had earlier. This, hopefully, will not happen. We need a new and modern approach to policy that will make use of the available criteria for serving the public interest in the face of changing conditions, increasing values, and competing demands on the resource base. Such an approach will make heavy demands on our technical expertise. But if foresters are to retain their influence in designing forest management policies appropriate for a rapidly changing society, we must recognise the necessity of subjecting our accepted principles to criteria for maximizing social values. Only then can we move with confidence toward the objective of the Association of British Columbia Professional Foresters: "to promote those policies . . . which ultimately provide the greatest social and economic returns to society" (A.B.C.P.F. 1970).

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