

THE ROLE OF FORESTRY IN NEW ZEALAND AT THE TURN OF THE CENTURY

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I have rather a nerve to talk to you on a topic which must constitute the basic professional question of your Institute; for with the scales of time involved, and the scales of land resources which have to be committed, the forest industry is not one which can change its policy rapidly, nor adjust to changing roles very quickly. Hence, much of the role of forestry at the end of the century is already determined.

But there is another characteristic of forestry and foresters that is beginning to have a marked influence on the future role of the industry. In my early years as a soil scientist we regarded the forester as a rather starry-eyed fellow who enjoyed moving through the forest with which he felt such affinity; who became so much part of the forest that he somehow knew how the trees felt, and that in some mysterious way he believed he felt like them. And just as the forests were considered to be slow-growing, with slow changes and gradual patterns of development, so the forester was considered to be rather slow to change, and to be in the happy position of keeping his eyes on a distant time horizon. He was secure in the knowledge that his own life was too short to see the results of changes he was inducing, and thus he had some feeling of lack of direct accountability for his actions.

Perhaps there were two major influences which changed quite rapidly the outlook (and the public image) of the New Zealand forester. The first was the realisation that exotic trees could be grown as a crop on a fairly short rotation—short enough for establishment, culture, harvesting, processing and marketing operations to require overall integrated planning. The second was that some of the work on climatic changes, geomorphological processes, and volcanic ash shower histories had shown that many of our indigenous forests were not as old or as static as had been thought, but were in fact in a state of constant and relatively rapid readjustment to an environment that is dynamic and undergoing frequent change. And so foresters found themselves recognising that, on the one hand, they were crop managers trying to identify what

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the future markets of the world would want to buy, and then finding ways and means of growing it efficiently and at a cost which would still maintain the world's wish to buy, and, on the other hand, that in managing indigenous forests they were adjusting an ongoing dynamic system of natural processes.

C. A. Fleming expressed this clearly in his paper on the History of Life in New Zealand Forests (*N.Z. Journal of Forestry*, 22 (2), 1977): "The past history of our forests," he said, "leads us to conclude that each member of a forest community, be it tree or shrub or herb, or bird or insect or earthworm, has had its own history, never independent of its companions and surroundings, but not rigidly dependent on their absolute stability. Despite their great age, and seeming permanence on the time scale of human life, the forests have varied in their composition and structure, in their dominant species, and in physiognomy or growth form; so that the interrelationships and interdependence between the component members of the communities have changed through geological time."

So, in seeking a basis for sustained yield, foresters were looking for a means by which they could divert resources for man's use while maintaining dynamic balance and establishing useful regenerative processes. And gradually this has evolved into what I consider responsible environmental thinking—how to *use* resources rather than *use them up*; how to *manage* resources rather than *expend* them; how to *sustain* them rather than *consume* them.

Since I first worked with foresters in the central North Island my most direct and continuing association has been with the Forest Research Institute, especially its activities on the production forestry side—I chair the Production Forestry Research Advisory Committee. And this association has led me to admire greatly the multi-disciplinary team approach which the Institute can mount, especially the very effective incorporation of the economist into the team, providing a down-to-earth direct consideration of the value of research projects and progress in real terms. This gives great strength to forestry research and assists greatly in the close matching of research to future management needs.

This strength is mainly in the production (principally exotic) field, and it is unfortunate that there is not corresponding strength in indigenous forestry. Partly this is due to lack of foresight as to how critical indigenous management was to become in New Zealand and how rapidly that critical point would be reached. Partly it is because the value of indigenous forests is so difficult to express quantitatively against the relative simplicity of the exercise for an exotic production forest.

Partly it is because the dominant requirement was to establish a new industry on a sound base—an industry desperately needed by New Zealand to diversify production from its land resource. And so to some extent New Zealand foresters were "caught short" on management information when an active and vocal section of the public began questioning the principles and procedures behind the management of the diminishing indigenous forest resource.

I believe that the response of the Forest Service to this questioning was enlightened and very effective. The development of a policy for indigenous State forests by the two-stage conference called by the Forestry Development Council, the participation by a wide range of public interests and the examination in public of the issues involved were an excellent example of stewardship and accountability to the real owners of a public resource—the people of New Zealand. I hope that this method, so successful in the indigenous forestry scene, will be applied shortly, in a closely parallel way, to the development of a much wider and more complicated issue—a land-use policy for New Zealand.

An understanding of the unifying concept of "ecosystems" and an appreciation of the ecological principles covering the inter-relationships among the component parts of the whole ecosystem are fundamental to wise land use. In his use of land and natural resources, man manipulates the living and non-living components of the ecosystems, and serious land-use problems arise where there is a lack of understanding of the natural limits to this type of management. Any enlightened land-use policy must recognise the fundamental differences between man and nature and seek to accommodate the long-term objectives of both. Whereas nature seeks maximum *protection* through the ecological development of complexity (e.g., maximum diversity, stability, resilience), man's goal is usually maximum *production* through simplification of the ecosystem, energy subsidies and manipulation to obtain the highest possible yield from the land.

This philosophical dichotomy between man and nature is basically responsible for the land-use problems throughout the history of our civilisation. It is reflected in our present culture's differentiation between "natural ecosystems" and "agroecosystems" (those ecosystems intensively managed for agriculture, forestry, etc.). In an ecological sense these two types of ecosystems are not discrete, but rather stand at different ends of a continuum with respect to both diversity and intensity of management. The point is that the same ecological principles of management should apply to both these essentially *protective* and *productive* rural environ-

ments, as well as to any *intermediate* between them. Furthermore, even at the extremes of this land-use continuum, the policy should recognise the *multiple-use* principle, and seek to manage according to this principle when to do so is compatible with the primary purpose of the ecosystem.

It is, I think, to the credit of forestry in New Zealand (both publicly and privately owned) that foresters have generally tuned in to these principles and built them into policy and management programmes, providing a good, soundly based springboard for their role to the turn of the century.

I want to stress this positive attainment of a readjustment of outlook because I believe it is something that your Institute should recognise, take pride in, and build on. In some parts of the world increased public interest, better informed questioning, and criticism of fundamentals, coupled with attacks of emotional intensity, have shaken the confidence of the forestry profession to the point at which foresters seem to be putting their main efforts into the defence of the *status quo*. I think that in New Zealand we are past that danger, but I would stress the importance to New Zealand's future that forestry thinking should be progressive and future-oriented, tuned to contemporary public thinking, skilled in anticipating changes in such thinking, and with flexibility built in to adjust to changed objectives. This demands much more of policy determination and management than establishing and following a single clearly defined objective.

Over the last few years the people of New Zealand have increasingly come to regard forests—and not only publicly owned forests—as “our forests”. There is a great opportunity for the forester to capitalise on this interest, provided he has the skill to make use of it rather than to resist it. For, although the forester *does* know how to manage forests to achieve a desired objective, he must recognise and accept the discipline of the public interest in setting the objectives for *our forests*, and in seeing that those objectives are not deviated from. For those foresters still motivated in the tradition that the professional always knows what is best for the people of New Zealand, this makes life complicated and frustrating; but for those who recognise the changed sense of public responsibility, and who can see the value of an interested public and the opportunities to enthuse and gain the confidence of the people, this change presents a challenge and a stimulation.

So perhaps within that framework it is not quite so out of place for me to suggest to you some ideas on the future role of forestry. For of one thing I am sure—we must not just “drift” into a pattern, type and scale of forestry when this

will have such a dominant influence on how people will live, work and take their recreation in the future. The direction should come through thorough investigation, imaginative presentation, and enthusiastic adoption by the people who are going to be affected.

And who will be affected? Here is another subtle change that is taking place. Traditionally, land-use decisions have been made by people on the spot, by the farmer on his own land, by the Conservator of Forests or the Commissioner of Crown Lands for publicly owned land. But as our public administration web becomes more complicated, the urban (as well as the rural) taxpayer becomes more involved in the financial operations of the land, whether through a soil conservation subsidy or a fertiliser subsidy, and he feels a right to have a say. The change in balance between rural and city electorates illustrates clearly that city representatives are increasingly making decisions on rural policy. It is for this reason that I do not attach too much weight to the criticism that some of the active objectors to local projects come from far away. To me this illustrates our broadening view of responsibility for the national asset, and the inevitable feeling of participation and responsibility arising from distribution of population changes. It would be *disastrous* if in our community the townspeople did not feel involved in the country: in many ways we seek to foster this sense of mutual dependence, and so we must also accept the concept of mutual responsibility.

It is generally accepted that city people should be involved in parks and reserves, even where these are remote from urban areas. Forest park advisory committees and national park boards involve city people as users of the facility, and there is much better public understanding in consequence. Somehow I believe that we should translate this public interest more widely into forestry. I do not mean that we should be setting up forest advisory committees for all of our production and protection forests: rather I mean that we should find ways of involving people more closely than as taxpayers they are involved in State forests or as shareholders in huge forestry companies. Most of you who have travelled in Europe will have been impressed, especially in Switzerland and Austria, by the intimate relationship between the communities of people and the forests around them. The community ownership and community participation in operating the forest through working in it, planning for it and generally feeling responsible for it, seem to me to have a health of body and mind which we might emulate. We in New Zealand have so far stressed the efficiencies of scale,

and our forestry operations have been designed to maximise the economic good. Forestry has become a distant, depersonalised operation. It is so big that the man in the street feels he cannot have any influence on how it will develop. He is by nature suspicious of big business—it makes him feel small and powerless as an individual—and he finds that modern production forestry in New Zealand with its processing, transport, and servicing is business on a big scale by big impersonal organisations. He finds exotic forestry creating extensive and apparently irreversible alterations to the surface of the land, to his way of life and to his means of livelihood. And he is not sure that he likes it that way. He is concerned at the monotony of a large exotic tree farm with its straight roads and miles of trees, all at the same stage, without the variety of animals, houses, hedges, and cultivated patches characteristic of a farming landscape.

I hope that in the future there will be greatly increased opportunity for the "community" forest—owned, worked in, enjoyed and used by the community itself. Interfingering with other forms of land use (whether urban or rural), such forest would offer employment, recreation, landscape enhancement, aesthetic satisfaction, and a pride of ownership and participation which so many communities sadly lack in our New Zealand society today.

Our countryside should employ people: there is an innate satisfaction in the intimacy of land and forest and people in central Europe—a satisfaction which our rural communities have shared but seem to be being forced out of. I fully agreed with a recent criticism by the New Zealand Parliamentary Under-Secretary of Trade and Industry of a world economy which forces primary producers like New Zealand into the industrial commodities market to survive. Though he was speaking principally of agricultural products, his thesis applies equally to forest products. He charged that the EEC, Australia, Japan and North America erected barriers against New Zealand's primary products so that New Zealand had to develop an industrial base as a trade lifeline. In a world desperate for food (and forest products) we are forced into the industrial commodities market. And so our countryside, the husbandry of whose land should be providing productive and satisfying jobs for people, is still further depopulated as workers move to the industrial centres.

Processing of forest products is often given as the reason for the big-business organisation of the forest industry, but there are other primary industries that have combined small production units with large-scale, highly sophisticated, co-operatively owned processing units. I particularly refer to

the dairy industry, which, producing its raw materials from a multiplicity of small units, has developed the most sophisticated and efficient processing industry in the world using large-scale co-operatives. Key elements in this are the very successful Dairy Research Institute with a product development station right alongside. Both are financed jointly by the industry and the Government.

Though the dairy industry and the forest industry are poles apart in many ways, the success and efficiency of the dairy industry have lessons which forestry might well study seriously, particularly if, over the next 20 years, it were to become closer to the community and more integrated into a multi-purpose land-use pattern.

Irrespective of how it is owned or organised, exotic forestry has some far-reaching decisions to take in the near future. If it is to occupy a bigger proportion of our available land resource; if it is to become an essential element in our energy base by the production of biomass for liquid fuels; if it is to become part of the way of life of more of our people; if it is to become an element of the environment into which communities will integrate and on which they will depend; then it must be soundly based and have its future as fully secured as possible. Though I am well aware of the work that has gone into the evaluation of "other species", always leading to the conclusion that "there is nothing to touch radiata", I do not think that the industry has an adequate base of security until there is something else to touch radiata! So far we have been lucky with our exotic monoculture, but it is not good enough to gear the great bulk of our forestry, and more and more of our society, on to such a narrow genetic base. Pests and diseases, physiological disorders and deficiencies, changing market requirements, and even landscape aesthetics point to the desirability for diversity, especially in a crop which takes time to reach maturity. I am sure the Ministry of Energy would be happier to base our industries on natural gas if there was a second field available as an alternative. And I am sure we would all be happier to become more dependent on exotic forestry if we knew that there were backup alternatives to *Pinus radiata* available with methods of management researched, understood and ready to plug in as needed. I hope that this breadth will have been achieved by the turn of the century.

Genetically improved seed is beginning to take its place in the forest establishment programme, and as the natural processes and characteristics of the environment are better documented and understood, the matching of tree vigour, disease resistance, desirable form and timber characteristics, and

adaptability to the range of conditions of the available forest sites will become a more major research and management activity. Again there is the danger of further narrowing of the genetic base. But a strategy will have to be decided on early. Is the breeding programme going to follow the pattern which agriculture has taken—to breed plants which perform best on highly fertile sites, enriched by and dependent on added nutrients? Or is forestry going to breed trees which will make the best use of the sites available, at more or less their present levels of fertility?

The objectives can be quite different, and the programmes to reach them could be quite distinct. A forest bred for high production (but dependent on applied nutrients) might be less attractive from the economic, energy and environmental points of view than a forest designed for the best possible production under natural levels of fertility. And it is unlikely that an improvement programme aimed at one objective will be readily transferable to the other. So the strategy must be thought through and decided upon.

New uses of forests will make special management demands which will depend to a great extent on understanding of basic processes. Energy farming is perhaps the most challenging of these, and it is highly significant that an apparently unrelated piece of basic research by G. M. Will, showing that most of the nutrients in a tree are held in leaves and twigs, should be of such importance in planning a management regime. By leaving on the ground the leaves and twigs which produce relatively little energy, the nutrient supply for the next crop is assured—and dependence on added nutrients is considerably delayed.

Producing wood to customer's specifications may seem rather hard to attain in these days of broad quality categorisation, but in many branches of agriculture it has been found insufficient to say "Here's what we produce—what will you pay for it?" Is the Japanese market for sawn timber sufficiently important for us to change our tune from "You should like our *radiata*!" to "What characteristics do you want in timber?—we will seek to incorporate them into our product by species selection, breeding, silviculture and processing." This is what our meat industry has had to do, and while it may be harder for forestry it need not be impossible. It will, however, call for foresters in research and management who are clear-thinking, imaginative and versatile.

Indigenous forestry has changed rapidly from exploitation to conservation. This change was inevitable because of the decreasing balance of the indigenous forest resource, but its timing has been determined by public attitudes. It seems cer-

tain that conservation in its truest and widest sense will be the permanent motivation behind indigenous forest management in the foreseeable future, with a range of practice from sustained-yield production, through the extraction of elite trees and removal of decadent trees, to absolute protection from any interference with the natural cycle.

I believe there will have to be a great deal of understanding, of tact, of diplomacy, and of patience by all parties, including foresters, if we are going to manage our remaining indigenous forest heritage responsibly and wisely. I do not think we can make all the decisions now, or that we should block off our freedom to modify decisions as our experience develops. For example, I have strong views that national parks should not be compromised by having any element of temporariness or provisionality in them. They should be truly national parks in perpetuity. Hence I do not think that areas of forest which under present technology could not have any timber extracted from them without damaging the forest structure should necessarily be transferred to national parks for protection in perpetuity. I favour the full protection of such forests, but in a way which will keep the opportunity open for the development of improved technologies that will allow the extraction of certain elements of the forest without damage to the rest. Whether this will be a development of helicopter or balloon technology to allow logging of elite trees without felling, I do not know. But I do consider that forestry, if it is to manage indigenous forests efficiently at the turn of the century, should have developed nondestructive extraction techniques which will enable the recovery of some high-value logs while managing the whole forest for conservation. And concurrently with this must come greatly improved understanding of forest processes and species dynamics, so that foresters, with a great deal more certainty than at present, can manipulate forest tree populations in a way which will convince a sceptical public that they know what they are doing. For the public *are* sceptical about this and will need to see and understand the basis for new practices before they become fully confident that this resource, very dear to their hearts, is being managed with full responsibility.

"High value" is the key to such highly selective—and inevitably very expensive—logging, and the techniques to take fullest advantage of the qualities of such expensive raw materials must be developed to justify such extraction methods. High-priced furniture made from imported timbers seems quite unnecessary and out of place in New Zealand. Some of our timbers are as beautiful as any timbers in the world. It is my hope that, as part of people's involvement

with forestry, special high-value crafts can be developed, using the qualities unique to some of our timber trees and giving satisfaction and pride of craftsmanship to another section of the community.

The use of native species as plantation crops for special purposes is being amply demonstrated with kauri in the north. Nursery, planting, and cultural techniques to widen the range of native trees for plantations are undoubtedly available. As with so much of forestry, the limiting factor seems to be the identification of special needs for special timber with special qualities. Experience in creating a "native timber bank" might be invaluable in the future.

I have tried as a non-forester to suggest to you some ways in which I see foresters being challenged over the next 20 years or so. Some are technical challenges, some are public confidence challenges, but all are demanding of broad view and positive professionalism. I have deliberately avoided suggesting in any detail what forests might look like and what forestry might be doing at the end of the century—for you as professional foresters should be doing this, not me.

I think the real challenge to your Institute and to your profession is not to wait until you are asked to produce some biomass for energy or some more cardboard for packaging; it is to produce ideas—lots of them—of what forestry can do for New Zealand, in economic, social and environmental terms, as New Zealand seeks to restructure its economy. You are not alone in having to reappraise the form, direction, and community relationships of your industry. Inevitably the period of asymptotic growth occurring in so many facets of our society had to slow down, and people, consciously or unconsciously, had to re-examine directions and objectives in reassembling the pieces into a new pattern. Forestry will, I am sure, be a big and important piece in the new pattern, but it will take skill, patience, broad vision and understanding to make it fit neatly.

There have always been challenges and opportunities for those ready to recognise them, but the next 20 years look to me to have even more than usual opportunities to do *new* things in *new* ways for *new* purposes. There is a lot of uncertainty—that is part of the thrill—but there is at least one certainty: that the role of forestry in New Zealand at the turn of the century will depend very largely on the professional capacity, the positiveness, the vision and the initiatives of the forestry profession.