Conservation gathers momentum

In early December 1971 some 40 bodies interested in conservation of the environment banded together in a body shortly titled COENCO (The New Zealand Conference on Environment and Conservation). Many of them make strange bedfellows, and the new body is a mixture of interests from wild uninformed emotionalism to sober informed expertise. Whether such disparate interests will gel into a strong coherent organization remains to be seen. It is probably in the public interest that they should. But recent attacks on the Forest Service for at length, after protracted but fruitless studies to determine causes, deciding to fell and utilize dead totaras at Mangawiri, do not bode well, based as they are on ignorance and prejudice. The Forest Service is responsible for wise utilization of resources; the country is short of good joinery timber which can be imported only at ruinous prices, and if these trees should be left they will deteriorate beyond use. Moreover, the Forest Service must give thought to the well-being of the national forest industry. Impossible restrictions imposed by vociferous band-wagoners are not necessarily in the national interest, and the Forest Service, while giving due weight to conservation in its management practices, will probably have to be careful not to bow too readily to uninformed pressure.

The N.Z. Institute of Foresters, a notable absentee at the inaugural meeting of COENCO, can scarcely ignore the implications of this conjunction of forces even if, at present, it decides to remain aloof. For those interested in conservation, their appetites whetted by the success of the Manapouri campaign, are now beginning to look at forestry with a far from sympathetic eye. In particular, they are concentrating their attention on proposals to manage the beech forests of the South Island.

The Forest Service is well aware of the implications of proposals put forward in the Report “Utilisation of South Island Beech Forests” published in October 1971. Prior to making any commitments, the Forest Service invited several responsible bodies to comment on tentative proposals, among them the N.Z. Institute of Foresters, the Forest Research Institute and the Department of Scientific and Industrial Research, the Royal Forest and Bird Protection Society, the Nature Conservation Council, Soil Conservation authorities and the Forestry Development Council. Comments by some of these are freely quoted in the Report; suggestions and criticism have been welcomed and are to form a basis for further consideration of certain aspects of the proposals. In addition there is to be further scientific study of specific aspects to give a scientific basis for practice.
Further to reinforce the conservation and overall planning aspects of the scheme, in August 1971 the Nelson Catchment Board was empowered to invoke Section 34 of the Soil Conservation and Rivers Control Amendment Act, 1959. This states that “no person shall after the date of the publication of the notice cut, fell or remove timber from, or form or construct roads for the purpose of such cutting, felling and/or removal of timber over any land without the consent of the Board.” This binds both private landowners and forestry companies, but not the Forest Service. It may be doubted whether many soil conservators are sufficiently aware of the practical aspects of roading and logging to make sound judgements in all cases, and possibly friction will arise, but there can be no doubt that conservation interests will strongly approve this move. Some, indeed, may feel that the restrictions should also apply to the Forest Service, and this attitude will certainly harden if Forest Service practice does not conform to the strictest rules applied by the Catchment Board to other owners of timber. There are signs that it is already hardening. It is common practice in Nelson to “line-doze” steep hillsides in preparation for planting in country encumbered with gorse. This is the most practical and economic establishment method known at present in these circumstances, but it bares a considerable proportion of land for two to three years, and no doubt increases the rate of water run-off and sediment load of streams. It would seem essential, even if only for good public relations, to find alternative methods. Conservationists have also been looking critically at roading and logging methods in beech forests, and claim that these leave much to be desired, while they deplore the current absence of working plans, or any concrete plans available for public inspection, as noted in paragraph 22 of the Report.

"Utilisation of South Island Beech Forests" is as notable for what it leaves out as for what it contains. For example, it is said that “A system of zoning and classification has been adopted to arrive at the utilisable area of 800,000 acres. Using broad but acceptable criteria, provision has been made for the reservation of protection forests, amenity forests, and biological reserves . . .” (p. 5). Little is said about what these criteria are (p. 10), whether they are scientifically based, or indeed how much research has been done to define such basic matters as soil types, forest types, methods of regeneration and silviculture, and forest health. The bodies asked to report to the Forest Service were equally in the dark on these points. It is scarcely valid to imply (presumably because silver beech has been managed in Southland) that beech management on the West Coast will be a simple matter of reserving seed trees and soil scarification brought about by logging (p. 28). An observation from Cockayne's Monograph on the New Zealand Beech Forests to the effect that achievement of beech regeneration can be safely left to nature does not dispel a natural dubiety.

In spite of the care exercised by the Forest Service in laying the groundwork and keeping the public informed, there still remains a credibility gap. But the proposals have such merit,
and promise for the future prosperity of the South Island, especially the West Coast, that the Forest Service must pursue the matter with all the resources at its disposal, including care in controlling its own operations. The power and impact of conservation interests is growing and their wishes should, where possible, be met. The Forest Service is trying to do just that, but has also to consider the legitimate claims and desires of others in the community, not least the people who will be most affected — those who live in the beech forest areas. Where such complex issues are involved, nothing but harm could result from a head-on confrontation between the Forest Service and conservationists.

National planting targets and private afforestation

The Director General of Forests, in his Annual Report for the year ended 31 March 1971, has suggested a new national planting target of 32,400 hectares — an increase of some 10,000 ha over the original Forestry Development Conference target — and made a plea for a regular State Forest programme, rather than have to accept erratic progress due to planting only that part of the target which private enterprise does not accomplish. It would be interesting to speculate on the reason for the proposed figure, but no explanations are offered. It is apparent, indeed, that prophesying future demands in those countries which might be expected to show an interest in our exports of wood is fraught with insurmountable difficulties. The secretariat of the Forestry Development Council is charged with constant revision of the data and projections based upon them, and the widely-varying results might well dismay tidy-minded Treasury accountants, even though they appear to be cautiously in favour of forestry development. The more pragmatic forester could say, with some truth, that such prophesies are likely to be far from accurate even 25 years hence, let alone half a century away. Even so, from a national point of view, some target seems desirable, and some calculations seem necessary in order to define a target (although one can note in passing that those who established the large Bay of Plenty forests did very well without benefit of such academic refinements as now seem necessary; will all the calculations now made give any better results?). Those who indulge in indicative planning are certainly not averse to their figures coming out right. What better method therefore than to allow the Forest Service to "balance" the books? If the private sector plants (say) 15,000 ha per annum in the present favourable circumstances, then the Forest Service can plant 7,300 ha and the planners' target is bang on. But if the private sector slumps to (say) 5,000 ha per annum then the Forest Service will no doubt be required to gird its loins and achieve the almost-impossible to make up the deficit so that the planners can again be right. With this in mind, how long will the present climate last? For undeniably favourable it is. Farmers and other private landowners, local bodies and companies are planting a substantial area. Some
may wish to plant for payment of death duties in due course; some to obtain capital gains; some to avoid taxation; but overseas demand for logs, and related stumpages, could also be a spur.

The most important contribution to the target is made, however, by the big companies which, with their overseas colleagues, are sanguine enough to believe that planting is a good investment and that vertical integration of forest and mill is economically desirable. It is indeed remarkable that the standing of N.Z. Forest Products Ltd. is such that it could negotiate a loan of $25 million through an overseas banking group, indicating its independence of sources of capital within the country; a loan ranking with the largest national overseas loans of recent years. Both this company and Tasman Pulp and Paper Co. Ltd. are establishing large forests within easy distance of their utilization plants, a policy which, at least for pulpwood, will no doubt pay handsome dividends. And one presumes that the current euphoria will last until such time as something intervenes to dampen enthusiasm — a pathological, silvicultural, financial or marketing cause. Will the State then be required to take up the slack at a moment's notice?

The weakness in the situation is the traditional Treasury view that one works and plans by financial years. One cannot do this in forestry simply because the establishment phase can take anything up to five years, and seldom less than three years. If a constant Forest Service planting target is considered undesirable, targets could be based, say, on a period of years; three would probably be the minimum and perhaps six the maximum. The Forest Service programme could then be the mean difference between the national target and private planting over the previous period of years. This would allow smoother transitions from year to year and permit the Forest Service to plan with a reasonable degree of precision. At the same time it is now probably timely to examine the efficiency of private planting under the various subsidized schemes. At least some of this has failed and more is of dubious quality. A proper examination could show that a less liberal attitude is warranted and that the Forest Service should get on with the job of establishing large concentrations of forest as soon as possible. Wide dispersion of small plots of trees will, at time of maturity, prove very costly.

Waste

The Minister of Forests has rightly, on several occasions, drawn attention to waste in forestry operations — a long tradition, as he avers. It would be pointless to speculate on the colossal waste of timber when land in New Zealand was first being developed for farming, even if we now deplore it. The point is that the pioneer outlook is still too common in the industry, and the view that there is plenty of land is rapidly becoming untenable. J. E. Henry, in a Note in this issue of the Journal, draws attention to the need to use fully the forest land we already have. No figures are available to
indicate the quantities of cellulose left in forests at the time of logging, but Professor McKelvey, as guest speaker at the inaugural meeting of the Forest Industry Engineering Association, said that "every year, about 75 million cubic feet, representing 34% of the total wood volume taken from the forests, is burnt or dumped on waste land". The standard of utilization in our beech forests has on the whole been deplorable. The waste on our exotic cutovers, apparently uneconomical to extract, leads to expensive and sometimes only partially successful re-establishment. For over a century we have chased softwoods in our native forests, ignoring the large volume, often well over 50% of the total wood on the site, of so-called secondary hardwoods. When, in 1958, a West Coast company tried to start up a chipboard industry based on this waste, the authorities opposed the venture, even though there was ample material available and overseas tests had shown that it would be excellent for the purpose. If the project had proceeded, the re-establishment of commercial forest on hill land in Westland would have been simpler, cheaper and more successful.

This is not now an academic question. Harry Morey, of Morbank Industries Inc., who visited New Zealand in April 1971, stated that stands of timber considered utilizable in some other parts of the world carried a smaller standing volume than what was left on clearfelled radiata pine areas in this country. Machinery has been developed overseas which can pick up discarded forest residues of all kinds — bark and twigs included — and chew it up into chips. It is reported that a factory in Byelorussia runs entirely on forest waste, producing pulp, plywood, hardboard, resins and medical preparations, while the pine needles are used to make a vitamin-rich flour! Machines for such salvage operations range from small to very large, from simple to highly complex. There seems no reason, technically, why they should not find a place in New Zealand. For example, according to "Land Preparation for Forestry in New Zealand" (F.R.I. Symposium No. II, 1969) the area of cutover exotic forest will be about 8,000 ha per annum in 1980 and 15,000 ha in 2000. Assuming some 70 m$^3$/ha of usable material left on the site, the quantities that might be salvaged would be equal to a final crop on 800 and 1,500 ha, respectively. A hard look at the economics of this situation, not ignoring related costs of re-establishment of a new crop, seems overdue. There is little doubt that a buyer could be found for a modest 550,000 m$^3$ per annum of softwood chips. A Japanese firm has recently made an agreement to buy sawdust and other timber residues from the Rotorua area; a move back into the forest for equally useful material seems indicated.

Waste, however, is not confined to the harvesting end of the business, nor to wood. In his Presidential Address to the Loggers' Annual General Meeting, J. J. K. Spiers drew attention to the effects of incautious logging allowing water to "strip the soils, causing sedimentation which blocks drainage, destroys natural water channels, disturbs fisheries . . . blocks dams and pollutes industrial and municipal water
supplies”. Loss of land is occurring in afforestation areas, mainly because of inadequate establishment practices leading to poor stocking and, in some cases, downright failure. Re-establishment of cutovers may be unsuccessful over 5 to 10% or more of the area. Then there are thousands of acres of unthrifty stands of one kind or another scattered throughout the country — larch, strobus pine, and above all poor provenances of ponderosa pine. The forest areas on which they grow have to be serviced — that is, these stands cost money to retain — but unthrifty stands could be removed and replaced with valuable crops. Of small size, and much branched, the ponderosa stands cannot be prepared by traditional hand methods owing to high cost. But the Swedes, making a virtue of necessity, have developed highly efficient systems of handling and preparing small branchy trees. There have been sporadic attempts from time to time to “convert” these stands to something better; methods have been costly and results not encouraging. Total removal would be by far the most appropriate method, but if the crops cannot be harvested then this may be economically impossible. But here again, economics of the situation must take into account the cost of re-establishment, the returns from subsequent crops, and the cost of leaving things as they are. It may be that the sale of these crops at a loss would be good economics in the long run. In Nelson Conservancy unthrifty stands are being quit for chips and are yielding income. Similar operations could doubtless be mounted elsewhere.

New Zealanders are sometimes accused of being lackadaisical salesmen. In the present climate of demand, however, there seems little doubt that even a small amount of promotion could lead to an end to forest waste.

Quantity versus quality

The Director-General of Forests, in his Annual Report for the year ended 31 March 1971 drew attention to the fact that a decision had to be made whether “to invest in planting at a high rate in order to produce large volumes of relatively low-quality wood, or to reduce plantings and channel part of the investment into pruning and thinning, thus enhancing the quality of wood grown”. It was claimed that concentration on quantity would lead to uses of wood being invaded by other materials, and that the high financial return on pruned logs would be forfeited. It was concluded that “the current swing of the pendulum is towards quantity, but it cannot be allowed to swing too far.” Curiously enough, in mid-year (1971) the shortage was not of high grades but of No. 1 framing, while box exotic timber was relatively easy to quit, mainly for re-manufacture.

The job of the forest economist is fraught with insurmountable difficulties when trying to arrive at valid conclusions as to what to do with a timber crop now, when that crop will have to be sold in a market distant in time and perhaps bearing little resemblance to current demand. Moreover, some
choice has to be made as to what figures to use. Can the forest be established for $75 per hectare, or will it perhaps cost $300— that is about the range of choice? Will annual charges (that controversial e in the Faustmann formula) be $12 or $25 per ha per annum? Will logging cost $1.75 per m³ or $2.45? Will stumpage be $2.60 or $6.50 per m³. Will clear timber command the same premium over knotty as it does now? Will there be, indeed, any demand for boards; or framing? Certain it is that, given similar current situations, two forest economists, on the basis of their own choice of figures, can arrive at diametrically opposed conclusions.

In the context of a large industrial forest and plant, B. McConchie came to the conclusion that quantity is more profitable than quality; that expenditures on establishment and re-establishment show better returns than expenditure on pruning and thinning. On the other hand the economists at the Forest Research Institute have long claimed that investment in pruning and thinning should pay very handsome dividends in future. Both points of view are based on a number of unprovable assumptions. The first assumes certain absolute stumpage levels, with some differentials for log size and quality. It is also based on an established pattern of utilization in an existing plant. If quality is required, the assumption is that it may be preferable to achieve it during processing in the plant rather than in the forest; investment is incurred at the end of the forest-plant production line when product forecasting can be measured in months rather than years with a correspondingly better chance of being right.

Those who champion intensive tending, however, have some sound figures which may well remain relevant in future; other things being equal, larger trees are cheaper to log and handle per unit of volume, and also generally cheaper to process, while for certain products (notably sawn timber) utilizable yield per unit of volume is higher than for small logs. Even here, recent studies indicate that uniformity is important and, with advances in mechanization, will become more so. What is uncertain is whether higher grades induced by tending in the forest will continue to command present premiums, and whether the grower will be compensated, by means of higher stumpages, for his outlay. There is also the assumption that capital and labour will be available. The Forest Research Institute studies indicate a great increase in production of factory grade if the proposed regime is applied—a commodity which has so far not been of much importance in New Zealand. An over-supply could well lead to a slump in price which, in turn, would strongly affect financial results. It is claimed, however, and possibly with some justice, that overseas countries, notably North America, are spending nothing on tending second crops, while the magnificent old crops are a rapidly wasting asset. There could then be avid demand for clear timber from tended stands in New Zealand. One could perhaps believe this estimate if the timber were mahogany rather than radiata pine, but the idea can be accepted as an informed opinion equal in value to many others of the same calibre.
These comments may seem unhelpful to those anxiously trying to decide what is the best course to pursue now, but there are certain pointers which, on balance, seem to favour quantity rather than quality. First, and over-riding, world population is rising so fast, on an exponential curve, that demand for wood could well overtake available resources. Secondly, the demand for manufactured wood products, especially pulp and paper, is rising very rapidly, while requirements of sawn wood are increasing only slowly. Thirdly, there is the trend towards using the whole tree — in which case size will be of less importance. Fourth, there is a growing tendency to produce the required quality in the factory. Fifth, changes in technology will revolutionize handling and assembly of wooden articles, including houses. Sixth, there will be a great deal of substitution or partial substitution by mixtures of wood and other materials. Seventh, labour and capital will simply not be available for tending. Eighthly, mechanization will lead towards standardization and mass production in the forest. Against this can be set the possibility that very high quality wood will be in demand for luxury purposes at luxury prices. It looks as if the future demand will be for a very small quantity of very high quality and a massive demand for, simply, wood.

The real crux of the matter will be to improve yield per dollar of input expenditure. If this is so, money would be better spent on genetical improvements and increasing yield per unit of area (for example, with fertilizers) than in costly pruning for a problematical return. A firm commitment to quantity would be realistic in place of half-hearted and erratic attempts at quality production of radiata pine. At the same time, it would be of value to consider small-scale production of very high quality wood on the best sites.

Should we grow eucalypts?

Forest Industries Review, in three issues in 1971 (Nos. 8, 10 and 12 of Vol. 2) contained a trenchant debate on the question of growing eucalypts in New Zealand. In the first article, E. H. Bunn came to the conclusion, after a factual evaluation of silviculture, yield, utilization and marketing, that “eucalypts should have a role in providing some of New Zealand’s future requirements of clear wood and pulp products. . . . There is a strong case for planting a lot of one or two species now, plus a little of a few now, but a little of a lot never!”

This provoked a strong rejoinder from S. C. Scott, who imports hardwoods, who doubted whether we could grow eucalypts successfully in New Zealand, and considered that, if we did, NAFTA would be in serious jeopardy. It was hardly surprising that N. A. Barr sprang into the lists, championing hardwoods as a useful and attractive alternative to “yellow knotty pine” and observing that from the weighty deliberations of the Forestry Development Conference had emerged a recommendation to grow eucalypts.

Perhaps too much has been made of repercussions on NAFTA. Since April 1968 Ministerial talks and Australian
Tariff Board hearings have considered the preferred position of New Zealand softwood pulp in the Australian market. In May 1971 this preferred position, to the extent of a 20% tariff barrier against third countries, was granted. As part of a *quid pro quo*, a preferred position was extended to Australian hardwood pulp in New Zealand. This means that Australia could, if it so wished, make uncomfortable the position of any New Zealand manufacturer who imported hardwood pulp from countries other than Australia. But New Zealand is still fully entitled to grow eucalypts for pulpwood, just as Australia is fully entitled to grow radiata pine for the same use. However, within the NAFTA arrangement the easy negotiating positions in the forest sector have now been eliminated. More “give” will be required in future discussions. Perhaps this is where the question of establishing eucalypt plantations could be used as a trading point, although its value for this purpose would be much greater if eucalypt plantations had been more successful in the past.

Could an undertaking not to establish eucalypt plantations in New Zealand be used to persuade Australians to plant lesser areas of pine, so that any shortfall in that country, whether pulp, paper or timber, could be made up from New Zealand? This is only one of the questions that can be asked. There are several others. For example, is productivity of eucalypt forests in Australia likely to keep up with demand, both in quantity and quality, especially in view of Japanese consumption and strong bargaining position? Where would this country be if, as seems likely, supplies can no longer be obtained? If this occurs, where else could we obtain our requirements? And how much more costly would this be than growing our own requirements? Finally, are we to consider Australia as our major outlet for softwood products for all time to come? Softwood planting is booming in that country and many foresters there are keen to see self-sufficiency. Is it not more likely that our softwood pulps will help to fill the inexhaustible demand from the huge populations of Asia in the long run?

There is little doubt that we shall continue to need hardwoods, probably in increasing amounts. There are, of course, alternatives. The projected utilization and management of beech forests in the South Island will result in large quantities becoming available, at least in the short term. But these are remote from pulping plants and long-term productivity is problematical. There is still a large volume of tawa near to present pulpmills, but this shows no sign of being a renewable resource, and the forests from which it is extracted, after several cycles of logging, are much degraded. A third alternative would be to grow highly-bred poplar hybrids, but for this there would need to be large areas of sheltered fertile land available, and experience with diseases overseas indicates that one should not rely entirely on poplars for long-term supplies.

Eucalypts, when considered in this context, are the most logical choice for hardwood pulp; several species show promise of being highly productive, healthy, not too dis-
criminating as to siting, and silviculturally tractable. In regard to high quality timber, the same sort of considerations apply. Native softwoods of high quality are dwindling rapidly. Utilization of beech species is the obvious alternative, but here again the resources are currently remote from markets. There seems reason to believe that high quality woods will command ever higher premiums in time to come and, if we could produce enough, might one day assume some importance as exports.

A dispassionate evaluation of the facts, and an examination of likely trends, indicate that there is a good case for planting eucalypts on a realistic scale, especially in northern areas.

Forest Industry Engineering Association

Nan Fairbrother, in her engaging polemic, *New Lives, New Landscapes*, accuses those engaged in country crafts as mentally inhabiting the "hook-and-scythe era" and ignoring the possibilities of such powerful new tools as herbicides and machines. It could equally be said that forestry is currently divesting itself of a grubber-and-axe mentality; while the timber industry has yet to descry the possibilities should it decide to dispense with the piece-by-piece mentality. All this adds up to mechanization, and finally automation.

Too long has the forest manager—had to put up with unsuitable agricultural machinery ingeniously adapted by local handymen; with a miscellaneous collection of inefficient ironmongery developed by enthusiasts with insufficient time and knowledge; with, in the field of silviculture, a costly lack of machines for much of the hard toil involved. It is therefore a welcome sign that a new body, the Forest Industry Engineering Association, was set up in November 1971 with the following objects:

1. To promote, encourage and co-ordinate the science and practice of forestry engineering and allied branches of engineering.

2. To bring together all persons and bodies concerned with matters related to forest engineering and allied branches of engineering.

3. To initiate and maintain investigations and researches into the design, construction, production, testing, maintenance and operation of all forestry machinery.

It is intended that membership will embrace mechanical, civil, electrical, telecommunications and chemical engineering, surveying and architecture. A notable lack, pointed out by Professor McKelvey, was aeronautical engineering, since the aircraft is one of the most important and costly forestry machines already, and promises to become more so in future.

There is also a certain exclusiveness in membership which could with profit be re-examined. Individual members will be those employed in an engineering capacity, at any level, in a
company or organization associated with the forest industry. This may indicate that the Association intends to be inward-looking. But it is the user who is the final arbiter of the value of any machine, and much wasted time and effort has been expended on the development of forest machinery, both here and overseas, simply because forest managers and engineers have not got their heads together at the earliest stages of planning. Whatever engineers may think of foresters and rangers (and vice versa) each has much to learn from the other.

It would be of value to the Association to note, therefore, that the Forest Research Institute mounted a symposium on silvicultural machinery in March this year, at which were debated such matters as nursery production systems, land clearing machines and techniques, planting and releasing machinery, the use of aircraft in forestry, and thinning methods. Valuable contributions were made by engineers although this was essentially a gathering of forest practitioners. Nor are foresters and rangers lacking in knowledge and appreciation of machinery, and many of them could make notable contributions to research into design and construction. While wishing the Association every success, it is suggested that a leavening of forest managers, foresters and forest technicians would be to its ultimate advantage.