ONE-WORLD FORESTRY: NEW ZEALAND'S ROLE

JACK C. WESTOBY*

When I was invited to participate in this phase of the New Zealand Forest Service's Golden Jubilee celebrations, I accepted with alacrity. I must confess that my eagerness to accept was prompted rather by a personal wish to satisfy my long-standing curiosity about these islands, than by any thought of the personal contribution I might be able to make to the celebrations. Thus, my reaction to the invitation was a purely selfish one.

However, as the months passed, I became increasingly perturbed, so perturbed as almost to repent my decision. I read some of the Proceedings of the Forestry Development Conference, and more recently received the Forestry Sector Report to the Plenary Session of the National Development Conference. It is evident that during the past year the problems facing the forest industry sector in this country have been ventilated with a thoroughness that all countries must envy. Broadly representative committees, of high competence, have examined every phase of the sector's problems. I have no doubt that many decisions have already been taken, and are in the course of implementation.

In view of all this, it is quite evident that there is very little that I can add to the illuminating discussion that has already taken place. What I have to say must therefore necessarily be marginal, and perhaps inconsequential. I beg you therefore to consider the remarks I am going to make as more of a footnote speech than a keynote speech. My footnotes will be mainly directed towards shedding further light on the progressive insertion of New Zealand into the world forest and timber economy. The title I have chosen is more than a catch phrase. We in FAO are pretty well placed to observe the progressive internationalization of forestry, at several different levels.

First, at the rather obvious level of trade and markets, the world forest and timber economy is steadily becoming more integrated. You are probably all well familiar with the tremendous acceleration in the consumption of forest products that has taken place since mid-century. This was most spectacular in Europe, where the rise in wood consumption in the first post-war decade was twice that in the previous half-century. A similar acceleration, though less spectacular, is evident in other regions of the world. This phenomenon is, of course, associated with the higher economic growth rates that have prevailed generally since the war. What is perhaps less generally realized is that a growing proportion of total

consumption is satisfied through international trade. Thus, around 1950, forest products traded internationally represented 19% by value of total forest products produced and consumed. By 1967, this percentage had risen to 24. Over the period the total volume of forest products traded had risen by 150%, and the value by 80%. Moreover, it is quite apparent that international trade in forest products will continue to increase, certainly in absolute terms, and probably in relative terms — relative, that is to say, to global consumption. This is partly because in several areas of the world rising demand is pressing hard on locally available resources, and there must be increasing recourse to imports. A contributing factor is that rising living standards have brought about a sharp increase in the demand for tropical hardwoods, a preferred constituent of many durable consumption goods. Another notable feature of the last two decades has been the increasing importance of those forest products which involve reconstituted wood, such as fibreboard, particle board, and the whole range of pulp products. This is leading to steadily changing calls on the forest, and hence to modification of forest production goals. Since this trend is also accompanied by rapid technological advance which serves to broaden the raw material base of the industries reconstituting wood, the price of wood is tending to become more decisive and wood quality less decisive. This naturally opens up great possibilities for those countries suitably endowed to produce wood cheaply and quickly.

These factors — the growth in wood consumption, the changing pattern of demand, advancing technology, and greater emphasis on price — together mean that it becomes increasingly necessary for each individual country, in establishing its own forest production goals, to take account of the international context. That is to say, each country, in deciding how much to invest in forestry, and what the pattern of that investment should be, must take into account, not only its own future needs, but also the extent to which it will be more sensible to meet part of those needs from imports, and also how far it ought to provide a margin to satisfy needs arising elsewhere. This, then, is one sense in which forestry is becoming more international; one sense in which we stand today squarely in front of one-world forestry.

There are still some countries, I fear, which have failed to realize the direction in which the world forest and timber economy is evolving, which have not started the task of reappraising their forestry production goals in the changing international context, and which have not understood the importance of continuing studies of present and prospective future production costs in their own country as compared with other countries. In the light of the recent National Development Conference, I think New Zealand can reply “not guilty” to this charge.

But if some forest administrations have been slow to understand, some of the major forest industries have been less slow. We have witnessed during the last decade international
capital movements, and new company links, in this sector, on an unprecedented scale. Product diversification and security of raw material supplies have been two of the principal motivations in this trend.

But not only is forestry becoming more international at the obvious level of trade and markets, it is steadily becoming more international at the technical level, in terms of science, research, and the application of science and technology. This applies both on the growing and harvesting side, and on the processing side. Successive congresses of the International Union of Forestry Research Organizations demonstrate that forestry, too, shares in the contemporary information explosion. Increasingly, funding authorities, when reviewing the work programmes and budgets of forest research organizations, insist on sensible answers to two elementary questions: What proportion of your effort do you devote to ensuring that you are making full use of research carried out elsewhere, and avoiding useless duplication and replication? And what proportion of your effort do you devote to ensuring that any useful findings get promulgated and applied? Twenty years ago the first of these questions would hardly have been necessary. Save in very limited fields, the volume of research being conducted was not sufficiently considerable to give rise to real dangers of duplication. Over the last twenty years, the number of forest research institutes in the world has almost doubled. The IUFRO Congress in Rome in 1953 was attended by about 150 scientists; that in Munich in 1967 was attended by 750 scientists.

Nor is it simply a matter of more work being conducted, of more facts and findings becoming available. A growing proportion of applied, as well as basic, research is becoming internationally relevant. This is not simply because forest types do not respect political frontiers, or that similar man/resource relationships occur in widely separated countries. It is rather because, first, the accelerating evolution of the man/resources relationship poses country after country with problems which have already been faced elsewhere; and partly because the economic and intellectual climate for adapting and exploiting technological breakthroughs has radically altered. Multiple-use forestry is a good example of the first; the whole area of tree improvement is a good example of the second.

A corollary of the two trends towards one-world forestry that I have outlined is that the forestry profession itself is becoming more and more international. More and more foresters are coming to realize that a stage overseas is not only desirable; it is necessary. This is particularly true of the younger generation of foresters, many of whom are in fact looking forward to spending a substantial part of their career overseas. Their motivation is of the highest. They recognize far better than do my contemporaries, that the principal problem of the mid-twentieth century is the growing gap between the have and the have-not nations. They believe that development assistance can help solve this problem. And they
find professional and moral satisfaction in devoting themselves to this cause.

But, leaving aside those who seek careers in international forestry, we are reaching the stage where it can be truly said that the education of a forester is incomplete without some international experience. And the real gain from service overseas and from multiplying international contacts lies less in techniques and gadgetry than in the intellectual cross-fertilization which enables the forester to think about his own problems in new and different ways and, in particular, to see them in the light of a world perspective. This is particularly important at a time when the tasks of the forester, both in developed and in developing countries, are changing with a rapidity never previously experienced. In the advanced industrialized countries, the forester is perforce becoming more cost conscious; he is seeking to get to grips with advances in related disciplines, and notably in the managerial sciences; he is striving to meet the rising demand on the forest for values other than the timber crop — the complex range of protection and recreation values that it is convenient to term social forestry; and in some countries he is already planning for the forestry use of land liberated by agriculture following the current green revolution. The forester in the developing countries has to face most of these problems too, but in addition he is under far stronger pressure to pursue a development-oriented forestry, directed to cutting down his country's timber bill, earning foreign exchange, providing employment opportunities, and broadening his country's industrial base.

These are, in fact, new and exciting days for forestry, perhaps as exciting as any since those distant years when forestry as a science was becoming established. This is why the stay-at-home forester is beginning to be regarded as the half-educated forester. I doubt whether this accusation can be levelled at the foresters in New Zealand, who are well known to have itching feet. I believe the peripatetic foresters of New Zealand have brought back to these islands many of the ideas which have contributed to the healthy state of New Zealand forestry today. And already, in a large measure, New Zealand forestry is repaying some of the debt in ideas it owes to the rest of the world. Today there are splendid opportunities of enriching your own experience while helping those less fortunately placed. I am surprised, for example, that New Zealand has not as yet devised some kind of Associate Expert scheme, whereby young graduate foresters acquire international experience by working alongside experienced men in multilateral and bilateral programmes. I can only think that this is because New Zealand does not yet appreciate how much it has to offer in this field, and how much it could gain.

You will notice that I have used the phrase "the healthy state of New Zealand forestry". There are plenty of signs that New Zealand forestry is in a healthy state: the Jubilee celebrations, the National Forestry Development Conference, the ceremonies which have taken place in this town today, the high acclaim which New Zealand forestry has won all
round the world, the growing number of forestry pilgrims that come to these shores. What is perhaps most surprising is the extent to which many New Zealand non-foresters are beginning to look upon forestry as the white hope of these islands, the most important diversification measure in the economy, the best insurance against the manifold perils that seem to beset New Zealand agriculture. Now I am no agricultural expert myself, and I am in no position to pronounce on the prospects of New Zealand agriculture. But I have the distinct impression, if I can rely on informed gossip, that some people are seeking to bury New Zealand agriculture before it is dead. There is much talk again of the possible entry of the United Kingdom into the European Economic Community; this would tend to affect some New Zealand exports dramatically, but you have succeeded in making the special problems which such an event would pose for your country well understood by the main parties. My expert colleagues tell me that wool is by no means a finished commodity, in spite of the inroads of synthetics. And the vigorous development of wool processing in New Zealand in recent years suggests that this country is finding a way to hold on to a share of the market. Many people in Asia are tasting New Zealand mutton for the first time. Given the shortage of animal protein in the world, there seems to be no reason why more should not do so, and it should prove possible to introduce many consumers both in Europe and Asia to the delights of New Zealand lamb. The prospects for meat generally seem to be quite favourable. The immediate outlook for butter is certainly less promising, but if New Zealand’s initiative to seek some international regulation of the market is successful, and productivity here continues to reach even higher levels, there should be brighter days ahead for this industry.

Thus, it seems to me that there is no question of forestry replacing agriculture as New Zealand’s main export-provider. Rather it is a question of forestry supplementing agriculture, and helping to keep the ship moving in those times when the winds of agricultural trade falter. Certainly, as of now, there seems to be no need for any sizable shift of land resources from agriculture to forestry. The National Development Conference has recognized that enough land, of the right quality, in the right place, is available to meet the future needs as foreseen without trespassing significantly on the agricultural estate.

As you celebrate your Forestry Jubilee, the balance sheet of the last fifty years must look pretty good. The old-timers in my audience must feel considerable satisfaction, perhaps tinged with surprise, at having seen the forestry sector in this country grow up from infancy to lusty maturity in the space of a few decades. You have created one of the largest concentrated man-made forest resources in the world, and one with exceedingly high growth rates. On the basis of this resource, modern processing plants have been established, well located and of economic size. Consumption of forest products has steadily grown, so that New Zealand has today the world’s
highest *per capita* consumption of sawnwood though, in relation to income, New Zealand remains an underconsumer of most other forest products. Though the home market is heavily protected, a growing export trade to Australia has been developed in some forest products — but it must be observed that these do not necessarily correspond to the most dynamic elements in the Australian forest economy, since they are largely limited to newsprint and sawnwood. And of late, a very important log trade has developed with Japan.

What sort of launching pad does all this give you for the next fifty years? As far as the first two decades are concerned, the targets set in the forestry sector report to the National Development Conference (and implicitly endorsed by the NDC, since *all* the relevant associated recommendations were accepted) reveal great confidence in New Zealand’s future as a forest products exporter. The target for 1979, $96 million, at constant prices, as compared with $51 million in the calendar year 1968, is based (I quote): “on a realistic assessment of future market opportunities overseas and New Zealand’s ability to produce the required output and meet competition from other countries”.

The export targets from 1980 on, to the end of the century, are not specifically endorsed in the forestry sector report, but again, in accepting the relevant associated recommendations, the volume export targets originally set out in the 1969 National Forestry Planning Model have been implicitly endorsed by the NDC.

Now I did not have the pleasure of participating in the NDC, nor have I seen the summary records. But the impression I get from these quotations is that the sense of the Conference was broadly as follows: up to 1979 we *think* we can see the markets; from 1980 on, we can’t, but we think they ought to be there; in any case, we feel we ought to plan as though they will be.

Now, if I were a New Zealander, I think I would endorse this broad strategy. I would do so in spite of certain doubts and misgivings. I would do so because it seems to me that, in the present situation, it is imperative for New Zealand to keep as many options open as possible. To renounce the targets set, or to scale them down considerably would, in fact, mean closing off one very important option.

You will expect me to give an account of my doubts and misgivings. Let me, at the outset, make it plain that I have full confidence that world demand for forest products will continue to expand, and that between now and the end of the century any incursions which other materials may make in the forest products field will be more than offset by new applications we shall discover for wood and its products. Like my colleague Dr Steenberg, who was privileged to address the Forestry Development Conference earlier this year, I do not envisage a “world without wood”.

We in FAO are presently attempting to carry out consumption projections forward to the year 1985. Table 1 sets out figures of global consumption of the principal forest products in 1955 and 1965, with some very tentative estimates of future

14
consumption in 1975 and 1985. These last figures are taken from our current work on the Indicative World Plan, eked out with a number of guesses. Since our work is still proceeding, they may be subject to considerable modification in due course. This is why I stress that, at the present stage, they are very tentative indeed.

That there has been a considerable expansion in the consumption of forest products between 1955 and 1965 is clear from Table 1. Moreover, we think that the estimates are sufficiently reliable to show that this expansion will continue through the two decades 1965 to 1985. In the final column is shown the expected percentage rise over this period. You will note that the reconstituted woods show the highest percentage increases. Over the period 1965 to 1985 we expect global consumption of sawn softwood to go up by about 60 million cubic metres, and that of sawn hardwood by some 45 to 50 million cubic metres. Thus, by the end of the period, the proportion of hardwood in the sawnwood total will have risen from 22 to 27%.

Now one of the items we have not yet felt able to quantify with any precision is the future hardwood component of the pulp sector. This will be a disappointment to you, as it is to me; indeed, this is one of the points which would cause me some concern if I were a New Zealander. We are pretty sure that hardwood pulp in the future is going to be much more important than it is today, as the economic and technical advantages of hardwood pulp become more widely appreciated. Hitherto most of us have tended to think of long-fibred coniferous wood as the ideal pulping material; and that, provided there was enough of it, and it was cheap enough, there would be no need to look around for hardwoods. The situation today is very different, there is every indication that the shortage of hardwood will soon be as pressing a problem as was the shortage of softwood some ten to fifteen years ago. Already a quarter of Europe's pulpwood production consists of broadleaved species. The proportion ranges from 8% in Austria to 97% in Italy. This represents a big change over recent years. The trend has been similar in the United States, where the consumption of hardwood (including roundwood, chips and residues) rose from 14.4 million cubic metres in 1955 to 31.4 million m³ in 1965; that is, from 17 to 24% of the total wood furnish. But even this performance is overshadowed by the striking changes which have taken place in Japan. In 1955, the Japanese pulp industry consumed only 0.8 million m³ of hardwoods; 85% of its wood consumption in that year consisted of round softwood pulpwood. By 1967, round softwood pulpwood accounted for only 15% of the intake. No less than 58% of the intake consisted of hardwood, of which rather more than half was in the form of hardwood chips. I think you will understand, from the figures I have quoted, why it is difficult for us at this stage to give any firm prediction of the role of hardwoods in the world's pulp industry by 1985. Any prognostication made on technical grounds must necessarily be conditioned by the availability of economic supplies.
<table>
<thead>
<tr>
<th>Item</th>
<th>Million Units</th>
<th>Actual Consumption</th>
<th>Estimated Consumption</th>
<th>Increase</th>
<th>Volume</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawnwood</td>
<td>m(^3)</td>
<td>303</td>
<td>384</td>
<td>424</td>
<td>485</td>
<td>81</td>
</tr>
<tr>
<td>Plywood</td>
<td>m(^3)</td>
<td>10.4</td>
<td>25.7</td>
<td>44</td>
<td>65.2</td>
<td>15.3</td>
</tr>
<tr>
<td>Fibreboard</td>
<td>m. ton</td>
<td>3</td>
<td>5.6</td>
<td>10.9</td>
<td>15.2†</td>
<td>2.6</td>
</tr>
<tr>
<td>Particle board</td>
<td>m. ton</td>
<td>0.5</td>
<td>5.2</td>
<td>16.5</td>
<td>23.6†</td>
<td>4.7</td>
</tr>
<tr>
<td>Wood pulp</td>
<td>m. ton</td>
<td>46</td>
<td>74</td>
<td>130</td>
<td>215</td>
<td>28</td>
</tr>
<tr>
<td>Newsprint</td>
<td>m. ton</td>
<td>11.2</td>
<td>17.2</td>
<td>26</td>
<td>37.8</td>
<td>6</td>
</tr>
<tr>
<td>Printing and writing</td>
<td>m. ton</td>
<td>10.1</td>
<td>17.5†</td>
<td>32.4</td>
<td>53.9</td>
<td>6.4</td>
</tr>
<tr>
<td>Other paper and board</td>
<td>m. ton</td>
<td>35</td>
<td>63†</td>
<td>104</td>
<td>180</td>
<td>28</td>
</tr>
</tbody>
</table>

*Three-year averages. †Estimates allowing for incomplete data.
Similarly, if we look at the other reconstituted woods — particle boards and fibreboard — we see that there are no established patterns in wood furnish, which increasingly depends very largely on supplies available. It is clear that hardwoods and softwoods are substitutes over a very wide range of wood products, and that they are capable of replacing each other to an extent that we certainly did not foresee twenty years ago. The likelihood is that technological progress will still further reduce the technical differences between hardwoods and softwoods, so that as time goes on countries will tend more and more to use what they have available or what they can get. I imagine that already, given the technological trends in pulping, New Zealand is reviewing the possibilities offered by some of its native hardwoods, and the desirability of supplementing them by planting exotic hardwoods.

Now I would not like anybody to conclude, from what I have said, that we think the day of first-class long fibre pulp is finished. What I am trying to suggest is that it is no longer the premium material that we used to think it was a decade ago. If it is cheap enough it will still find a market. For certain purposes it will continue to be needed as a blend. And certainly there are several countries in Asia which, in the course of the next two decades, will want to set up their own manufacturing facilities, basing them on the raw materials they have available in their own country. Several of these will doubtless be looking for long fibre pulp as part of their furnish, to complement the qualities innate in their indigenous materials. I believe that they will be all the more ready to do this if they have the prospect of importing, along with the long fibre pulp, some technical know-how and perhaps capital aid. If New Zealand wishes to move in this direction, it will require a purposeful campaign by Government and industry in partnership. In these affairs industry cannot move alone, and Government can accomplish nothing without industry. Some years ago, when disillusion spread at the limited impact of aid programmes, the cry went up: “trade, not aid”. This was a false slogan, since both trade and aid are necessary, and bilateral arrangements which marry aid to trade are those most likely to speed the development process.

Another misgiving which doubtless many New Zealanders must share stems from this country's unfortunate geographical situation from the standpoint of trade. A latitude in the forties and a longitude in the hundred and seventies may be fine for growing radiata pine; but it does not offer the best access to the world's principal forest products markets. And there seems little likelihood of early changes in freight patterns that would go very far to offset this eccentric location. Geography, it seems to me, has already decided what New Zealand's principal market for forest products will be, now and for always. It is an expanding market, and New Zealand's share in it will be determined, as much as anything, by New Zealand's ability to convince her Australian friends, inside and outside the trade, that New Zealand is capable of supplying them with a sustained and expanding supply of
forest products at a price they cannot hope to match. The political frame for developing a complementarity between the forest economies of Australia and New Zealand has already been established. As Polonius might have advised had he been around: "The friends thou hast, and their adoption tried, grapple them to thy soul with hoops of radiata pine".

The situation of the Japanese timber economy is such that Japan's timber gap will continue to rise, certainly until towards the end of the century. There are few signs that Japan will renounce her preferences for importing logs and wood chips, at least until such time as these raw materials become too hard to get. This, it seems to me, is unlikely to happen, given Japan's ingenious use of hardwood, and the hardwood resources in and outside the region still waiting to be developed. The situation may change, of course, if labour costs rise fast in Japan, or if international pressure persuades Japan to modify its tariff structure. Meanwhile, however, New Zealand's share in this trade will depend very much on price and freights. And if the day does come when Japan is willing to accept more processed products, New Zealand will face strong competition from the west coast of North America and from the new industries being set up in Soviet Siberia with Japanese help. Here again, geography will favour New Zealand's principal competitors.

China, in spite of her vigorous plantation programme, will remain a wood-starved country for several decades. How far this wood famine will be translated into a wood import trade it is difficult to estimate. I myself would not expect a substantial expansion in imports save in the context of a general political and trade agreement, but such an agreement is not to be excluded.

I have mentioned already the possibility of New Zealand cooperating with Asian countries in helping to develop local forest industries, requiring the import of capital, know-how and some long fibre. It is conceivable that such developments could be stimulated were New Zealand to diversify her imports, and offer to her own consumers a wider range of forest products by importing more tropical woods.

But with all this, it seems to me that the principal lesson which New Zealand must learn from its geographical position is that its long-term export prospects for the forest industries, apart from Australia, must lie in the direction of high-value, sophisticated products with a longer export range, rather than relying on lower-value, mass grade products on which freight bears heavily, and in relation to which there will always be serious competitors.

As I see it, New Zealand's problem is a very simple one. You have versatile, cheap raw material. And you can easily create more of it. But so can some others, better placed for world markets. How can you beat geography? By moving towards high value lines and by getting ahead and keeping ahead in the whole field of product research, design and development. So what really matters is how much money and effort Government and industry are prepared to put into research, design and development in the next years. In this
respect, I find the research targets set by the NDC, bold as they are, to be somewhat disappointing. They imply that forest products research will not double until eight years have passed. But these eight years may well be decisive for the whole future of New Zealand's forest industries. Certainly, the new facilities opened today* at Rotorua represent a great step forward. And of course I heartily endorse the NDC conclusion that the scale of research increase has no direct relationship to the scale of production increase aimed for. But the considerations which I have set before you do seem to me to require a very special effort in the area of product diversification and product development.

I know that many of the possible export lines are already developing or under study — collapsed, prefabricated houses, non-housing structures for assembly, knock-down furniture, laminated beams. I am sure, too, that with the rapid trend towards containerization of sea freight, and with more bulk moving out of New Zealand than moves in, the possibility of a massive export of once-used containers is under examination. Perhaps it will be a New Zealander who first designs a satisfactory modular wooden house, one that can change and grow with the changing family pattern. But perhaps the more important possibilities lie in products not yet designed or invented, and here there is an ample field to be pioneered. I am convinced, for example, that in the paper field there are innumerable high-value disposables waiting to be invented and patented.

The point is that this is the time when those concerned with New Zealand's forest industries should be ceaselessly scouring the world for ideas. Here it is as well to remember that most of the true innovations spring from the lunatic fringe of research, so that the approach in sanctioning research should be neither earthbound nor conservative. This is the time to attract to these shores the crackpots who are crying in the wilderness in other countries. This is the time to give every encouragement to your own crackpots. And this is certainly the time to keep under continuous study the advances being made in the technology of other materials, to see how these can be adapted to or married to the forest products field.

If I have emphasized this point about research, it is because I believe that the forest industries in these islands are going to need energy, imagination, inspiration and a dose of genius if they are to defeat geography. And the next years will be crucial. It is just conceivable that the forest industries in New Zealand would be more energetic in this direction if they were not so comfortably ensconced in their own domestic markets. It is rather disconcerting to note how, for example, the consumption of wood-based panels has stagnated in New Zealand over the last decade, as compared with the progress made in other countries of comparable income level. The salient facts are set out in Table 2.

*Stage I of the new Forest Research Institute buildings, mainly comprising the Forest Products laboratories.
TABLE 2: INCREASES IN *PER CAPITA* CONSUMPTION OF WOOD-BASED PANELS IN SELECTED COUNTRIES, 1955 TO 1955

<table>
<thead>
<tr>
<th>Country</th>
<th>Relative National Income per head 1966</th>
<th>Plywood m$/1,000</th>
<th>Particle Board m. tons/1,000</th>
<th>Fibreboard m. tons/1,000</th>
<th>Total m$/1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A.</td>
<td>178</td>
<td>34</td>
<td>3.5</td>
<td>2.6</td>
<td>43.8</td>
</tr>
<tr>
<td>Sweden</td>
<td>134</td>
<td>6.5</td>
<td>12.5</td>
<td>17</td>
<td>55.7</td>
</tr>
<tr>
<td>Switzerland</td>
<td>116</td>
<td>4.7</td>
<td>13.3</td>
<td>2.5</td>
<td>30</td>
</tr>
<tr>
<td>Canada</td>
<td>112</td>
<td>34</td>
<td>3.8</td>
<td>-</td>
<td>40.1</td>
</tr>
<tr>
<td>Denmark</td>
<td>103</td>
<td>4.1</td>
<td>13.3</td>
<td>6.3</td>
<td>35.5</td>
</tr>
<tr>
<td>New Zealand</td>
<td>100</td>
<td>1.4</td>
<td>2.3</td>
<td>1.1</td>
<td>6.9</td>
</tr>
<tr>
<td>Australia</td>
<td>100</td>
<td>-0.4</td>
<td>5.5</td>
<td>1.1</td>
<td>10.1</td>
</tr>
<tr>
<td>German Federal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Republic</td>
<td>86</td>
<td>6</td>
<td>17.4</td>
<td>3.4</td>
<td>39.3</td>
</tr>
<tr>
<td>Britain</td>
<td>86</td>
<td>8.2</td>
<td>3.6</td>
<td>2.1</td>
<td>17.4</td>
</tr>
<tr>
<td>Japan</td>
<td>45</td>
<td>19</td>
<td>1.4</td>
<td>2.5</td>
<td>25.2</td>
</tr>
</tbody>
</table>

Table 2 shows the extra volume of wood-based panels sold to every man, woman and child in 1965 as compared with 1955. New Zealand, as you see, is at the very bottom of this league of selected countries. Is this because the New Zealand consumer clings conservatively to his home-grown sawn softwood? By no means, because, although it is true that New Zealand remains at the top of the world table of *per capita* sawnwood consumers, in several of the other countries listed in the table the rise in wood-panel consumption has been accompanied by a sharp rise in sawnwood consumption.

New Zealand is also a serious underconsumer (in relation to income, that is) of paper and board, other than newspaper. In 1965, both Germany and Britain, with *per capita* income one-seventh lower than that of New Zealand, consumed *per capita* one-third more of these grades, while Japan, with *per capita* income less than one-half of New Zealand's, had around the same *per capita* consumption as New Zealand. In fact, on the basis of income (and there is a pretty good correlation between income and paper consumption in the world as a whole), New Zealand ought to be consuming about one hundred thousand tons more of these grades a year than she does at present.

It may come as a surprise to some of you to learn that the New Zealander apparently reads less, writes less, and wraps less, as well as using fewer panels, than his fellows in other parts of the world enjoying about the same living standards. I simply state the fact — I don't pretend to explain it — although doubtless some observers will ask themselves whether this might not be associated with the relatively high degree of protection enjoyed by the New Zealand forest industries. If I have mentioned the matter at all, it is because it leads me to pass two other observations. First, the technical innovations and breakthroughs that will carry New Zea-
land forest products to the ends of the world are more likely to come from a vigorous, expanding forest industry than from a stable and sheltered one, resting on its laurels. Secondly, if New Zealand is presently an underconsumer, one must necessarily ask whether it will remain so, staying under the global trend lines for the next decades, or whether it will tend to catch up. The per capita consumption targets set out in the 1969 National Forestry Planning Model seem to assume that, for many forest products, New Zealand will remain an underconsumer, in relation to income. Let me give one or two examples. On the basis of the income growth rates postulated in the Planning Model, New Zealand will have, by the year 2000, an income per capita about 50% higher than the U.S.A. had in 1966. But the year 2000 target for per capita consumption of all grades of paper and board other than newsprint is 172 kilos. Actual consumption of these grades in the U.S.A. in 1965 was 179 kilos per capita. The plywood target for New Zealand for the year 2000 is 47 m$^3$ per thousand of population; the comparable figures for Canada, U.S.A. and Japan were 74, 68 and 24 already in 1965. This comparison is perhaps not altogether fair, since the three wood-based panel products are to a considerable extent interchangeable. But if we take these three panel products aggregated, the New Zealand target for the year 2000 is 118 m$^3$ per thousand. Already in 1965 Canada was consuming 100, Sweden 95, and the U.S.A. 93 m$^3$ per thousand of population. The targeted expansion of consumption of these products in New Zealand is certainly considerable, but it may be doubted whether it is sufficient to enable the targeted fall in per capita consumption of sawnwood to take place.

These figures suggest that those who constructed the Planning Model have assumed that New Zealand will continue to trail behind other wood-rich countries of similar income as a forest products consumer. Should this assumption not be realized, then domestic needs to the year 2000 may well be somewhat higher than has been predicted, and the surplus available for export correspondingly less. One thing is certainly clear: continuing study of domestic trends in demand, and international comparisons, will be as necessary as continuing study of supply trends in ensuring that rational goals are set in successive reviews.

With the rest of the programme proposed by the Forestry Development Conference, I have little serious quarrel. Moreover, I am confident that the research programme outlined will succeed in holding costs to a reasonable level, and securing a better integration of forestry objectives with overall land use problems. However, it does seem to me that there is one particular area which might have received more attention. It is customary to speak nowadays about the revolution in transport. Revolution there certainly is, but the revolution does not go as deep as to radically diminish the limitations set by freights and distances on commodity trade. I think it is already becoming clear that the movement of persons is going to entail more revolutionary implications than the
movement of things. And I would respectfully suggest that the forestry sector report to the NDC has not taken sufficient account of the revolutionary implications of moving persons.

I would like to dwell on this point for a moment, because all the indications are that some of the greatest changes in store for forestry over the next 50 years will spring precisely from the rapidly rising movement of persons. The one-world forestry I spoke of will also encompass something like a one-world forest. It is a fact, confirmed by films, photographs, and the little I have managed so far to see, that these islands, from the standpoint of tourist potential, are incomparable. Glaciers, alpine peaks, mountain-ringed lakes, warm fiords, active volcanoes, hot springs, unique native culture, salmon and trout fishing, deep sea fishing, hunting, limitless space and verdure. These are the things people want to see. And these are the things which, thanks to growing affluence, and more equitable distribution of wealth, more and more people can afford to see. And not only the rich and the upper middle classes; also the teachers, clerks, tradesmen, tram drivers. With the jumbo jets already here, the present trickle can become a flood — that is, if you want it to become a flood. Potentially, tourism can become New Zealand's number one foreign exchange earner. But you have to make up your minds whether or not you want to share the delights of your country with others. It is not easy to discern from the forestry sector report to the NDC whether you do or not. When I read the recommendations emerging from the work of the working party on multiple-use forestry, I got the impression that your answer to this question is a reluctant, grudging, yes. Thus, I find the references to tourism in the relevant sections of the forestry sector report (paras. 132 to 140, with the associated recommendations) almost laconic, as if scant consideration had been given to some of the cogent material submitted to the Forestry Development Conference. Moreover, the report of the Tourism Committee to the second plenary session of the NDC seems to give, in its relevant recommendations (32 and 33), less than full recognition to the tourist potential of forest lands and the role of the Forest Service. This may spring from the fact, as I have noted with astonishment and regret, that no member of the New Zealand Forest Service served on either the Main Committee on Tourism or on any of its working parties. I therefore suspect that the economic significance of managing forests for recreation is still under-rated. Yet there are already considerable areas of forest, both in North America and Europe, where tourism, whether it be in the form of camping, boating, fishing, hunting, nature trails, pony tracks, or what have you is already yielding more direct revenue than when the forests were managed for timber production. As the concept of multiple-use forestry has developed, in the changing world, we have come to understand that the management of particular forests must be directed towards a major use, with other uses subordinated. Already the leading schools in the
west are revising their curricula so that more foresters are capable of managing their forests to draw full advantage from the world’s fastest growing industry: tourism.

Should New Zealand decide to give great emphasis to the development of her forests for tourism, we in FAO would have a very special interest. It is precisely from countries with a large proportion of marginal and unused lands that we can hope to see the most important advances in our understanding of how to manage those lands. Countries like New Zealand are in no way inferior to Canada or the U.S.A. when it comes to the potential multiple uses which may be developed on lands now wild and under the control of the Forest Service. Already there is a large and growing literature on assessing tourist potential in forest lands, on various forms of fish and wildlife management, and on methods for assessing the value of these non-timber products of the forest. But much more needs to be done. In developing new areas, there is much to be gained by assessing potential non-timber values at the same time as the initial forest inventory is made, so that both types of data can be made available to forest and land use planners. So we in FAO have a selfish interest in seeing how you tackle these problems here. But perhaps the most important consideration, from New Zealand’s point of view, is that deliberate planning towards this end would keep open for New Zealand forestry another option, an option which will surely be of growing economic significance, and one which might ultimately become, as it has already done in certain areas of the world, the most important forest-based industry.

It is worth while reflecting on what tourism can mean in economic terms. The NDC target for exchange earnings from tourism is $70 million by 1979 — a figure which strikes me as somewhat conservative. This excludes any income New Zealand might earn from carrying tourists back and forth. Adding New Zealand’s share of tourist transport, the exchange earning target rises to $110 million — a figure already somewhat higher than the export target for the forest industries. So, in economic terms, tourism is certainly not chicken feed.

Now of course the responsibility of getting these people here does not rest wholly on the Forest Service. But the Forest Service will have an important part, indeed a decisive part, to play in shaping the facilities and attractions that will bring them here. The point I am trying to make is that forest management for tourism, in all its manifold aspects, is neither a sideshow nor an incubus. For many forest areas and most marginal lands under the control of the forest services, it is becoming the major management objective. The Americans and Canadians have discovered this. So have the British. Several European countries learned it some time ago.

Now of course these aspects were not neglected at the Forestry Development Conference. But I do think that they were underemphasized, and appeared to lean heavily on the potential and needs of domestic tourism. I have the distinct
impression that the participants may have failed to appreciate the significance of the facts that world spending on travel abroad has been rising three times as fast as total national incomes, and that the impending revolution in passenger transport is going to offer many more strangers the chance to visit these distant shores.

This is really all I have to say. I cannot claim to have shed much light on New Zealand’s role. The scattered comments I have made have, as I stated at the outset, really been in the nature of marginal footnotes to the forestry sector report to the NDC. This Conference, and the way it was prepared, the way it was conducted, impressed us deeply in FAO. We believe there are many countries in the world which, at the present stage in the development of their forests and timber economy, could greatly benefit from similar initiatives.

So far as New Zealand’s forestry sector is concerned, the Conference has charted the course in a very general way, and has made some important preparations for the voyage. Much remains to be done. You have to keep alert to changes in the weather. You have to keep an eye on the seaworthiness of the boat. And sooner or later you have to decide on your exact ports of call. But it seems to me, from what I have been able to learn of your forestry and forest industries, that there is nothing wrong with the crew.

I wish you all bon voyage!