BROADLEAVES IN BRITAIN :

addresses, supplementary papers and discussions.

Edited by A.J. Grayson.

Broadleaves in Britain symposium
Loughborough, Leics. 7–9 July 82

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A.J. Grayson

Director of Research and Development, Forestry Commission

FOREWORD

The Forestry Commission and the Institute of Chartered Foresters organised a symposium under the title "Broadleaves in Britain : Future Management and Research" at Loughborough, Leics., on 7-9 July 1982. This Occasional Paper contains supplementary papers and addresses which, in combination with the set of papers published previously*, provide a complete set of the addresses and papers presented at the symposium. The opportunity has been taken to record summaries of the discussions at the session entitled "A policy for broadleaves", and at the closing session.

The symposium attracted over 250 participants. This fact in itself marks the occasion as a significant one in British forestry. It is because of this that the organisers have decided to complete the record of the proceedings, hence making all formal presentations available for reference.

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* *Broadleaves in Britain*, edited by Malcolm, D.C., Evans, J., and Edwards, P.N. (1982), 253 pp., obtainable from Publications Section, Forest Research Station, Alice Holt Lodge, Wrecclesham, Farnham, Surrey GU10 4LH. Price £8.00 + £1.00 postage and packing.

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I OPENING SESSION

Chairman

Dr W.E.S. Mutch

President of the Institute of Chartered Foresters

INTRODUCTORY ADDRESS

G.D. Holmes

Director-General, Forestry Commission

This symposium was conceived early in 1981 by the Forestry Commission's Research & Development Division who were embarked on the preparation of a publication on the silviculture of broadleaved woodland based on the result of research programmes spanning more than 50 years. The level of interest in broadleaved woodland was such that it was decided, in consultation with the Institute of Chartered Foresters, that the time was right for a discussion meeting to bring together a wide range of interests not only to review research data and the "state of the art" in broadleaved silviculture but also to consider two basic questions for the future:

1. the place of broadleaved woodlands in Britain;

2. what needs to be done to improve their management.

The response to this opportunity to take a cool practical look at these issues has been most encouraging and as you see we have a programme of 32 speakers with some 40 papers covering all aspects of Broadleaves in Britain, including the growing stock, the aims and

methods of management, the results of research and development, the market and its prospects, and not least the financial implications. In discussing these questions we have many outstanding contributors. However, we are particularly fortunate to have the advice of our distinguished speakers from France drawing on that country's great expertise and long tradition of good broadleaved silviculture. I therefore extend a special welcome to Dr Oswald and Dr Auclair.

There is a great deal of knowledge and experience represented here and I feel confident that there will be vigorous and constructive discussion which should do much towards achieving what I believe to be the central tasks of this symposium, namely:

1. to review the objectives and methods of management for broadleaved woodlands in Britain;

2. to clarify the way ahead, particularly in terms of motivation, management priorities and research and development priorities.

With such an impressive array of speakers there is not a great deal I can say in an opening address without anticipating what is to come. I shall therefore try to confine myself to some very general scene-setting. First, it is highly appropriate that we should be having this meeting now in view of the interest in broadleaved woodland being expressed by a wide cross-section of society. This reflects the fact that such woodland is an increasingly valued feature of the countryside, sustaining scenery, wildlife, sporting and recreation values, as well as providing timber. This interest has also been stimulated by the 1980 report of the House of Lords Select Committee on Science and Technology* and by the long debate on conservation measures leading to the 1981 Wildlife and Countryside Act. It is also a long time since the last major review of this topic, the Institute's discussion meeting on "Management of Broadleaves" at Reading in 1974. The report of that meeting still reads well when looked at in relation to current problems.

The extent of public interest in broadleaved trees stems from many sources:

from awareness of the richness and diversity of broadleaved woodland in terms of visual beauty and its unique variety of wildlife;

from concern about its depletion due to neglect or conversion to agriculture, coniferous plantation, or to urban development;

from concern about the prospect of diminishing supplies of good quality hardwood timber, both from home sources and from the dwindling tropical hardwood forests;

from awareness of the under-used productive potential of our broadleaved woodland soils;

from awareness of the considerable historical and heritage value of certain woodlands; stemming in part from the work of Oliver Rackham and George Peterken and others;

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*"Scientific Aspects of Forestry", House of Lords' Select Committee on Science and Technology (Sub-committee Chairman Lord Sherfield) Session 1979-1980, 2nd Report, Cmnd 381, HMSO, London, 59pp.£3.60 net.

from awareness of the value of broadleaved woodland for quiet recreation;

and perhaps not least by a sharpened appreciation of these values following the shock of the Dutch elm disease disaster, topped up by some rather lurid accounts of the possible future threat of oak wilt.

Many organisations and individuals have done much to generate interest and to improve standards and methods of broadleaved management. But I would like to single out for mention the initiative in setting up the collaborative programme under the National Hardwoods Project launched in 1980 with the inspiration of that great pioneer and champion of broadleaved silviculture the late Lord Bradford.

Broadleaved woodland comprises about one-third of the total forest area of Britain, 90 per cent of the broadleaved woods being privately owned and nearly 75 per cent of the total being located in the lowlands of the southern half of England.

Many of these woodlands are located on some of the best and potentially most productive forest soils in the country. For this reason, many foresters are concerned that more than two-thirds of the area is either unmanaged or unproductive scrub or felled woodland and they would like to see steps taken to develop the potential timber production, particularly in view of the limited scope for further afforestation in southern Britain.

Many conservationists on the other hand regard a substantial proportion of these woodlands as of such importance that their prime purpose should be for wildlife conservation.

Everyone has their point of view on what is of value and what needs to be done: the forester wants to improve productivity by more intensive management, perhaps involving fast growing broadleaved species where appropriate; the conservationist favours less intensive work with preferences for long rotations, natural regeneration and native species; the general public in the main valuing the woods as attractive and familiar features of the landscape.

So, one way and another, everyone loves broadleaves and everyone looks expectantly to the key person (who incidentally is often overlooked in discussions), and I refer to the owner, to do the "right thing".

Much of our discussion at this symposium will turn on what is the "right thing" in the national interest, and how do we help it happen?

Each interest group will answer these questions differently but there is a common bond in the general wish to safeguard and prevent any serious depletion of the area of broadleaved woodland. As throughout history, the main threats to the existence of our broadleaved woodland are the activities of man and his grazing animals. It is clear that small woods open to farm stock deteriorate, fail to regenerate and will ultimately disappear; and this is happening. On the other hand, most broadleaved woods, providing they are protected from grazing stock, survive and develop and even scrub will eventually

progress to woodland. The first figures available from the 1980 Census of Woodlands relate to south-eastern counties of England and in this region there appears to have been no marked reduction in the total area of broadleaved woodland compared with the 1947 Census.

Nevertheless, the fact remains that much of our broadleaved woodland is in an unsatisfactory and run-down condition, being understocked, over-aged and often comprising trees of poor timber quality. About a third is reasonably well managed and productive but a third consists of unproductive scrub with the remaining third in an intermediate condition, but in the main under-managed and unproductive. When one places this situation alongside the value judgements I have spoken of earlier it appears to me that there are three major tasks before us:

1. to safeguard the environmental values of broadleaved woodland;

2. to restore some of the scrub and cut-over woodland to a more productive state;

3. to improve the productivity and financial return from managed woodland.

I believe that in the great majority of circumstances the production of good quality hardwood timber is entirely compatible with the needs of good nature conservation, good landscape and good sporting values. There are of course exceptional areas which need exceptional treatment, but by and large we are speaking of fertile land capable of growing good quality timber and I would go so far as to suggest that the greatest single contribution we could make to the interests of landscape and wildlife conservation will be to reduce the costs of growing broadleaves for timber.

In Britain, growing hardwoods has never been an attractive prospect financially on account of high establishment costs and long rotations and this has led in many cases to conversion to high yielding conifers or a failure to rehabilitate derelict woodland. In general, however, owners have been and still are motivated in their woodland management by a wide range of benefits some less tangible than others. These include capital appreciation as a result of creation of a high quality environment, an income from timber sales, improved shooting and shelter, and values associated with landscape, recreation and wildlife conservation.

The fact remains however that high establishment cost is probably the main deterrent to planting broadleaves. Since the early 1970s it has been Government policy to contribute to the continuation of the broadleaved woodland character of the countryside both in the private and public sectors of forestry. Through the Forestry Commission, premium rates of planting grant have been available for broadleaved planting with a greatly enhanced differential for planting broadleaves under the new Forestry Grant Scheme introduced in 1981. Whether this will give a fresh impetus both to new small woods planting and to the rehabilitation of run-down broadleaved woodland can only be judged by results. However, I am glad to say that so far, the response to the new scheme has been most encouraging. Applications for <u>all</u> species,

conifer and broadleaved, have totalled more than 40,000 ha in the first six months, including nearly 750 applications averaging around 9 ha each in England. It of course remains to be seen how these figures translate into actual planting, but taken together with the fact that some 40 per cent of recent English private sector planting has consisted of broadleaved species, I am not unhopeful.

The Forestry Commission manages less than 10 per cent of the country's broadleaved area but our policy of combining conservation of broadleaves with timber production is applied wherever possible, that is:

1. existing broadleaves will normally be managed and restocked to ensure that broadleaved species will form the major part of the mature crop;

2. the woodland will be managed as economically as possible for the production of utilizable timber;

3. unproductive scrub will be converted to broadleaved high forest where it seems financially sensible to do so, otherwise it will be left untreated.

The House of Lords' Select Committee on Science and Technology recognised the need and the difficulty of reconciling the many interests in the future management of broadleaved woodland. When they published their report at the end of 1980 they urged the development of policies designed primarily to prevent further loss of this woodland and their recommendations included two principal points:

1. the need to identify and protect those woods which are of very special interest for their nature conservation or historical value; they recommended that these should be set aside as nature reserves with the help of the Nature Conservancy Council;

2. the recognition that the best way to safeguard the remaining broadleaved woodlands is to make their management more profitable by technical development to reduce costs and improve production and markets, with the help of any necessary research, advice and financial incentives to assist owners.

In principle, I feel sure that the Committee's approach is right and points the way forward, but as usual the difficulty is likely to arise when one tries to quantify these two categories of woodland in terms of area and public expenditure. In practice of course it has to be kept in mind that the cost of preserving the traditional structure of woods set aside exclusively for conservation is likely to be high so that areas will need to be chosen critically.

The Nature Conservancy Council is pressing ahead with its woodland surveys, and when we in the Forestry Commission have our new woodland census data we will get together to draft a tentative classification scheme for discussion with the many other interests involved.

II SESSION ENTITLED "A POLICY FOR BROADLEAVES"

Chairman

Dr J. Balfour

Chairman, Countryside Commission for Scotland

THE PRIVATE OWNER'S VIEW OF BROADLEAVES

(A supplementary address to the paper contained in the symposium proceedings)

R. Parker-Jervis

President, Timber Growers England and Wales Ltd

The euphoria of enthusiasm for import substitution generated by Professor Bowman's "Strategy for the UK Forest Industry" published in February 1980 made it hard to attract attention to the problems of native woods, despite the Professor's recommendation for increased broadleaved planting. Other issues dominated. I want to thank the Institute of Chartered Foresters and the Forestry Commission for calling this symposium. Whether it was inspired by calls for help from owners in distress I can only guess, but it is to me quite a miracle that we actually have the top brass of the forestry world assembled to take stock of the broadleaved problem and draw together information on research and management practices with a view to improving and sustaining our broadleaved woods.

Third world countries as well as some who should know better are exploiting their indigenous hardwoods for currency on a massive scale.

In due course this will cease and they will export only common cellulose in large quantities to slosh around the commercial world with all the rest. As that happens Britain's hardwoods, if they are properly maintained, will gain a vastly added value. Perhaps at last owners of hardwoods will see financial profit from their faith in tradition. That is a commendable object of management, but it is perhaps still fifty years away with bankruptcy intervening.

Some years ago as a guest sitting high on a hillside in Wester Ross while we paused to eat a sandwich, the stalker and I fell to discussing the proprietors whose land was in view from where we were sheltering. He had a splendid and rather arrogant certainty that proprietors could come and go; it was not of consequence who actually paid the bills. The getting of money was an owner's skill, but it mattered little where either owner or money came from. The stalker's own skills were those which no proprietor could do without, and the way of life was assured by natural regeneration.

Why have I mentioned this memory? Because, to my surprise, analysing the list of symposium participants I reckon that over 80 per cent of you who are present have no significant personal investment in trees, let alone broadleaved ones.

It would be unsurprising if amongst you there existed a strong majority who agree with the stalker's philosophy. Certainly the public attitude towards owners of Britain's traditional woodlands reflects such a view, and on first sight, the programme for this symposium gave much the same impression. Yet, of the 367,000 hectares of broadleaved high woods in Britain, over 80 per cent is in private ownership. It is only the enthusiasm of an owner, based on optimism and confidence in the future, together with a willingness to invest hard cash and tie it up for generations, that can sustain a broadleaved crop over a complete rotation. Only then, at the end of it, with luck, is the full capital investment realisable with interest, though this is low indeed. The small size and scattered nature of our woodlands and their intricate association with farmland means, in any event, that they are not a readily realisable asset to their owner. I explain in my paper (symposium proceedings pp.118-123) how a death, and the capital taxation which follows, leaves a black hole in the countryside.

In times of prosperity and optimism owners carry out silviculture in their woods, happy to make an investment in the future, and at the same time conserve the country's scenery for which we all have a deep affection. In recent years optimism, enthusiasm and prosperity have faded. The momentum given by Dedication is dwindling in the face of uncertainty and inflation. The investment made by private owners during the 1950s and 1960s is at risk from neglect.

Lost momentum leads to inactivity. This is almost welcome to the urban population who dominate the electorate, because the country's traditional woodlands are so apparently unchanging that the mass of the general public (and about half of you here are paid to look after the public's interests in one way or another) has a wholly misplaced presumption of the permanence and well-being of these woods: yet all the while they overlook the real and accelerating deterioration within them.

The public's inaccurate assumption of well-being is matched by lack of concern on the part of politicians who, even if they do sense a problem, see it as one allowing ample time for transmission to their successors for resolution. So, increasingly as the years go by, under capital taxation landowners' resources diminish. With age timber becomes geriatric and the silvicultural choices for rehabilitation become fewer, more drastic and more costly: or short rotation softwoods become the choice.

Woods, particularly those interspersed with farmland, do not change hands by sale very frequently; it is too disruptive to farm and estate. Momentum of management is lost as resources diminish and activity ceases. Less and less silviculture takes place.

Individuals and families who can stand large losses on their traditional woodlands are getting scarcer every year. Tax at death on a whole estate merely exacerbates an already deteriorating situation by removing income yielding assets that, heretofore, have funded woodland management. Landowners and farmers are investors, who must cut their costs and increase their return from their land, or lose it. Woodlands are the first to suffer in a cost cutting exercise, so neglect sets in which is difficult and expensive to remedy.

Enthusiasm for silviculture is generated by tradition, and a change of ownership is no guarantee that forestry on an estate or farm will be resuscitated. The first call on an owner's pocket must be agriculture. Silviculture with its high costs and long-delayed low returns is less than tempting and "can always wait".

There is nothing particularly new in this evolution save that recently its speed of change has rapidly increased. Economic necessity eventually overcomes both sentiment and depth of pocket if an objective that requires constant funding cannot be achieved within a reasonable period. The massive redistribution of wealth during the twentieth century, coupled with periods of recession, has accelerated a decline which has long been a historic trend. A judgement on the acceptable pace of change, whether it must continue or whether it can be reversed or slowed, are questions which this symposium should endeavour to answer. Economic stringency will be with us for some time. Reversal of the historic trend will only be carried through by altering priorities within existing resources. Change of attitude will be essential.

Others will tell you that it is imperative to shorten the broadleaved rotation and why. Change would be required in the training of intellect and manpower, to ensure a sufficient supply of knowledge and skills, now scarce, for the management and development of deciduous woodlands and perhaps this symposium is the inauguration of this change. Research on species, together with training in new establishment and growth techniques, could and should absorb substantial funds. Conservationists must accept a rapidly changing scene. Conifer nurse crops are inevitable.

All initiatives will fail unless damage by grey squirrels is prevented. The implementation of co-ordinated and compulsory controls

would be unpopular, but essential until investment in more and deeper research as to how the grey squirrel can be counteracted brings some solution. This remains of paramount importance.

Some may say that the public sector should take sensitive areas of woodland into public ownership. This is not only questionable politics, but would often have to be implemented compulsorily. Moreover, as well as being thoroughly unpopular, it would only transfer known costs from one pocket of an individual to his other pocket as a tax payer against his will: it is a bad suggestion which would bring added national costs and conflict.

There could, however, be much merit in the Treasury establishing a "Woodland Heritage Fund". Woodlands important in a local scene could, with the aid of the fund, be acquired by local authorities and perhaps the Woodland Trust, in lieu of capital taxation by voluntary negotiation. An owner would voluntarily surrender a responsibility which he could not afford to fulfil and which the public should rightly bear.

A further heritage measure might be to give relief from capital taxation on land surrounding and interrelated with broadleaved woods, so long as those woods were managed in accordance with an approved plan. This would counteract some of the worst effects of taxation and, in a practical way, ensure continuity of proper silvicultural activity in the landscape. In my opinion these positive proposals might check, but not reverse, the historic trend. A prerequisite of any success at all is to restore owners' confidence in lowland forestry and regain the momentum lost in 1972.

For this, momentum within the Forestry Commission needs to be re-established. Confidence and co-operation between private owners and local officers in the field has always been both welcome and of inestimable value to both private and public sectors. A new initiative for this must come again from within the Forestry Commission. They are the professionals trusted by the public to ensure woodland welfare. They must seek out owners and give positive encouragement and advice. They will be assured of support and co-operation from many public and private bodies also.

It has been said that the Forestry Commission has given scant attention to Britain's remaining stock of native woodlands in the lowlands. So obviously there are others who feel like me that it is illogical, and on a very grand scale, for the Forest Authority and private foresters to consume so much energy planting bare land in the uplands, and the bitter squabbles that result, while all the time some 15 per cent of the national native forest is gradually falling into decay behind their backs. It is absurd that foresters have been driven to plant only in the uplands because existing lowland scrub and woods are even more expensive to redevelop. It is absurd that we have to call upon Government and Treasury for funds drawn from taxpayers to aid regeneration of the native forest which is being ruined by their taxation. Because, in the interest of import substitution, there is profit in establishing softwood cellulose production on bare land, and little or none in nurturing and developing our native woods, judgements have become distorted. This

is the cause of argument and misunderstanding and has exaggerated natural evolution. The historic trend will be neither checked nor reversed unless costs and incentives are rebalanced.

The fiscal and grant structures should be rejigged so that owners and foresters are persuaded back to practising broadleaved silviculture where native woodlands now exist. If policy changes of the kind which I have indicated do not take place then, whatever eventual hope of profit there may be, the native broadleaved woods will revert to the situation of the late 1940s which I have described. No sensible private owner will be able to continue seriously with broadleaved silviculture.

Traditional owners working native broadleaved woods are few in number and should be nurtured carefully. They become fewer every year and, in the economic climate prevailing, seem ever more eccentric. For years shouts by them for help and understanding have been routinely drowned in the babble of voices surrounding other forestry disputes.

You, who have the professional knowledge and ability to create and maintain the fine forests which we want, need other peoples' money to pay the wages while you do it. Whatever the techniques and skills discussed at this symposium or which may evolve to make the task easier and in the end more profitable (or so we hope), they will not be employed unless owners in the future can be assured of a positive cash flow from their woods.

It is good to have you all here at this symposium. This is an occasion when I hope you are receiving one message loud and clear. Owners of these woods seek and require your full support to recreate enthusiasm and confidence, and to re-establish balance and common sense.

A POLICY FOR BROADLEAVES : DISCUSSION

Mr Parker-Jervis said that private owners regretted the passing of the Dedication Scheme and the Plans of Operations that went with it, because they ensured that Forestry Commission officers and owners met regularly at five-yearly intervals, that there was genuine silvicultural interest in consultation with local authorities and the public, and that individual owners would be free to practise forestry according to their inclination which provided a wide variety across the country. He claimed that Basis III was an effort to accommodate the public interest and that what he now referred to as Basis IV was a shambles which gave one grant once and for all with no guarantee of continuity of management whatever.

The proposed classification of woodlands of conservation value presented in the paper by Steele and Peterken was generally supported as being a constructive contribution. It would however take time

before it could be implemented. Dr Peterken stated that over the last 14 months the Nature Conservancy Council had been preparing a list of ancient and semi-natural woodlands by counties which would be of help to the Forestry Commission. The idea had been to produce the lists as quickly as possible with the philosophy that 90 per cent right quickly was a good deal better than 100 per cent right in the 21st century. Cambridgeshire, Northamptonshire, Buckinghamshire, Bedfordshire, Humberside, Pembrokeshire, Surrey, Shropshire, the central region of Scotland and the northern parts of Cumbria, Gwent and Clwyd had been surveyed. Although the Nature Conservancy Council had set out apparently clear cut categories, they were obviously a necessary over-simplification and a certain amount of fudging of the boundaries between these categories would be necessary when applying this concept to individual woods.

Major Ormrod asked how the Treasury would treat for tax purposes heritage woodlands designated by the Nature Conservancy Council. He also referred to a particular estate which consisted of a substantial acreage of Dedicated Woodland including three areas designated as Sites of Special Scientific Interest (SSSIs), where he had proposed a scheme for the whole of the woods rather than just the three SSSIs. An agreement was reached by the Nature Conservancy Council and the owner. Unfortunately the Forestry Commission were unwilling to accept the silvicultural management proposals that meet the Nature Conservancy Council's requirements and so a planting grant might not be available. He observed that the scheme would require regular visits and wondered whether the Nature Conservancy Council could provide that kind of input. He also pointed out that the owner had incurred additional expense as the scheme had required additional input from the professional adviser.

Mr Steele pointed out that there was a scheme which did not involve a transfer of ownership whereby woods could be transferred free of capital transfer tax provided they were managed along certain lines. He said that the word heritage had been used in his and Dr Peterken's paper because it seemed to encapsulate the considerations they had in mind. If this suggestion got some support, it would clearly have to be taken up with the Treasury. On the question of the estate mentioned by Major Ormrod, Mr Steele said that the Nature Conservancy Council would very much welcome a fairly comprehensive plan for the whole woodlands on an estate and he was sorry to hear that the proposals were not acceptable to the Forestry Commission for grant aid. He said the Nature Conservancy Council would look at this more closely with the Forestry Commission because this was just the sort of argument between grant giving bodies that is so confusing to the woodland manager. In relation to the extra expense of the management there were provisions for the Nature Conservancy Council to pay grants to cover loss of income on an SSSI. Whether the Nature Conservancy Council could visit a wood regularly remained to be seen. Such contact was extremely important: conservation in this country depended more than anything on contact between conservationists and owners and managers. Mr Neustein reminded the symposium that for a Forestry Commission grant the main objective must be the production of a utilisable crop.

Dr Peterken observed that one of the recommendations of the House of Lords' Select Committee's report on forestry (the Sherfield Report) was that there should be community woodlands; this was an idea that should be further explored, and more should be done in this country to make the idea work. At present, local authorities, for example, own a number of woods around the country and there were many places where local management committees worked together with local authority staff in managing these woods. Likewise Naturalist Trusts had nature reserves for which there was normally a local committee. Such reserves had elements of a community woodland and the local committee was drawn from the local population. The Woodland Trust was attempting to set up a community woodland in Worcestershire as an example to others.

Dr Balfour referred to small woods on farms where people were not accustomed to looking after woodland and referred to the study carried out by Dartington Amenity Research Trust. She referred to the appointment of an adviser in Gwent where a scheme for the provision of woodland management advice was being offered on a pilot basis and was working quite well. Mr Parker-Jervis endorsed these comments and thought that the Forestry Commission must set out on an act of encouragement. There was a very genuine wish by a large number of farmers and landowners to do the best they could for their woods, yet they did not know how to do it, which is why he felt very strongly that initiatives to this effect on behalf of the public should be taken at the public's expense. However, there was no guarantee of continuity and after a period of management by one enthusiast on a woodland there might be quite substantial risks of neglect by a succeeding owner; those risks were however worth taking. Dr Peterken said that the appropriate management for these very small woods was not necessarily the management which one would expect to find in an extensive forestry plantation. In many cases a light coppicing or a light thinning allied to natural regeneration was all that was required and the current grant aid available from forestry sources was not very appropriate for this kind of management.

Mr Workman supported these different initiatives, but saw them as being experimental. We needed to know how they were succeeding, where the bottle-necks were, what the reaction was, how much could be done, how much it would cost, where the priorities were. He had had the opportunity of participating in the first course that the Agricultural Development and Advisory Service had organised on the subject of small wood management. He wanted ADAS advisers to be capable of identifying where there were woodlands with problems and farmers who wanted to know something about them. The advisers could then point them in the direction of the local consultant or Forestry Commission officer. He expressed disappointment that after 30 years some of the farm colleges had absolutely no forestry input, and if there were even a mention of woods or trees it tended to be antipathetic. The Institute of Foresters had failed in that respect.

Each member of the panel was asked to say whether he thought there was or should be a policy for broadleaves. Mr Workman replied that he was asked to talk about management objectives and he had to assume that there was a policy. He considered that everyone thought that there was a rather loose policy of maintaining the "status quo",

and noted that specific decisions had been made that in quite a lot of places broadleaves should not be replaced by conifers, which was a little more positive. Mr Neustein commented that in some ways the symposium was a year too early. Had it been a year later we would have had authentic figures for the state of the broadleaves and be in a much better position to assess the priorities for any development of policy. Mr Steele thought there was a policy for broadleaves but believed that it was a very general one, namely that broadleaved woodlands should be perpetuated. He thought the main problem was to develop an integrated programme for achieving the objective which would include wood production, with some profit to the owner and with some certainty of continuity, as well as providing for nature conservation, landscape, public recreation and access.

III FINAL SESSION

Chairman

D.A. Mithen

Forestry Commissioner

CLOSING ADDRESS

FUTURE MANAGEMENT AND RESEARCH

J.D. Matthews and J.P. Newton

Department of Forestry, University of Aberdeen

INTRODUCTION

The subtitle of the Broadleaves in Britain symposium is "future management and research" and this is an excellent starting point for us. We now look ahead to see whether changes are needed in policy, silviculture, management, and utilisation, and whether the research being done on broadleaved species meets the needs of foresters, conservationists, planners and industrialists.

POLICY : WHY GROW BROADLEAVED TREES?

We believe that the symposium has shown that foresters in Britain must continue to grow broadleaved trees for three main purposes:

1. to produce timber that can be used for a very wide range of purposes, ranging from decoration, joinery, furniture, and many kinds of construction, to turnery, fencing, poles and posts,

packaging, pallets, mining timber, pulpwood, particle board, charcoal, fuelwood and wood flour. This timber must often meet demanding specifications, which together comprise "quality" for the different purposes. The difference in the prices obtained for logs of the highest quality and those of lower qualities is usually very great and there can be no doubt that growers must aim to satisfy those markets that give the highest possible income, because the expenditure on growing broadleaves is also high;

2. to provide shelter for buildings, farm crops and farm animals, reclaim sites made derelict by industry, create places for pleasant recreation and enhance the amenity of rural and urban areas;

3. to provide habitats for wild plants and animals and facilities for field sports. This objective includes the conservation of trees and woodlands for their own intrinsic value as members of the native flora.

We agree with Mr John Workman that in managed broadleaved woodlands all three groups of objectives are compatible to some degree; but they become incompatible when, for various compelling reasons, timber production or nature conservation or amenity takes precedence over the others. The vital question is "Who pays?". Although field sports often provide useful income and some forms of recreation will yield some cash, the major source of income from any woodland comes from sales of timber. The policy maker, whether central government, local government, woodland owner or manager, must normally decide what resources of land, people, machinery and materials can be diverted from timber production to satisfy the other purposes and to what extent expenditure will be covered by income.

If the prime objective is nature conservation or the preservation of ancient woodlands or some other related purpose there must be suitable arrangements for ownership or finance or both; implementation of the objectives then becomes the responsibility of individual owners (including the Forestry Commission), the Nature Conservancy Council, Wildlife Trusts or Woodland Trusts. Similarly if the prime objective is urban or rural recreation and amenity, arrangements for the ownership or finance or both are generally the responsibility of National Park Boards and Countryside Commissions and local or central government. If some of the expenditure on nature conservation or recreation and amenity can be offset by revenue from sales of timber that is very desirable because it can provide a strong incentive for appropriate management by the owners.

Where the prime objective is timber production there will be numerous constraints placed on the enterprise from within and from without. Few owners will wish to maintain broadleaved woodland, other than on a small proportion of their land, for nature conservation or for their own pleasure in internal amenity or to provide external landscape values. Rather more will retain broad-leaved woods for their sporting value, either for themselves or for the income from let shooting. These owners may also wish to manage

their woods for the income from sales of timber; to attain more than one objective will demand high managerial and practical skills to ensure close integration.

The external constraints that are commonly placed on management for timber production are several. Woodland owners may be restricted in their choice of species, especially in the use of conifers in mixture with broadleaves; or obliged to grow crops on rotations longer than the financial optima; or obliged to practise irregular selection forestry. It must be emphasised that the silviculture and management of broadleaved woodland is much more demanding of time and money than that of conifer woodland and the financial returns are often lower. The only way that growing broadleaves can be made profitable is to select sites that are above average in fertility and are accessible, to select plant species, provenances or cultivars that are suited to the site and to establish and tend them so that the cost of production is less than the sale price of mature trees. Control of grey squirrels adds to the cost of production; conifer matrices can yield valuable intermediate revenue; shortening rotations reduces costs of production, lengthening them increases costs; and a normal series of well-tended even-aged stands can be as environmentally attractive as irregular selection forest.

It is essential that those responsible for managing forests for nature conservation and for landscape in the widest sense, should achieve unanimity of purpose in the management of broadleaved woodlands. The Chilterns Plan provides an example of what we have in mind.

POLICY : HOW MUCH BROADLEAVED WOODLAND IS NEEDED?

The annual production of broadleaved timber in Britain is 1.2 million cubic metres and this provides rather less than half of the annual consumption of hardwoods for furniture, joinery and building, fencing, pallets and packaging and mining timber. Twenty per cent of the needs of these markets is imported from temperate regions, often Europe but also North America, and much consists of species that could be grown in Britain. The remaining 30 per cent of annual needs are met by tropical hardwoods imported from Africa or Asian countries. There is some room for expansion of the supplies of hardwoods grown in Britain but a greater opportunity lies in the fact that only 21 per cent of home-grown hardwoods are suitable for the most demanding end-uses with highest added value, that is furniture, joinery and building, boat-building and DIY. The price paid for home-grown oak of veneer quality is around £300 per cubic metre, whereas hardwood pulpwood may fetch only £2 per cubic metre or less. Good quality mature timber of other broadleaved species, such as ash, sweet chestnut and sycamore, can also fetch good prices.

If we assume that the potential internal market is at least 1.4 million cubic metres annually and that the average annual yield of well-managed broadleaved woodlands is 4 cubic metres /hectare,the area required to satisfy the market is at least 350,000 hectares (ignoring the contribution of hedgerow trees). Steele and Peterken (BIB 91-103)* record that there are 367,000 hectares of broadleaved high forest and

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* Page references from the proceedings of the symposium are prefaced BIB.

27,000 hectares of coppice. The area of coppice-with-standards is not stated. Unproductive scrub and felled woodland total 266,000 hectares. These figures date from 1979-80 and will soon be brought up to date by the current Census of Woodlands.

The total area of broadleaved woodland important for nature conservation is 60,000 hectares; another 60 to 70,000 hectares have been named as Sites of Special Scientific Interest; and there are 160,000 hectares of long established semi-natural woodland, ecologically rich although less so than sites selected for nature conservation or SSSIs (Steele and Peterken, BIB 91-103). Clearly the areas allotted to timber production and nature conservation must be reconciled, and we hope that the new Census of Woodlands will assist in this. Bringing 350,000 to 400,000 hectares into higher production will help the forestry industry to maintain its skilled labour force and create some new jobs.

POLICY : THE PROS AND CONS OF GROWING BROADLEAVES

The following summary of points made about broadleaved woodlands is taken from the papers presented during the symposium. We have put the points made into two groups: those which emphasise the positive factors and those emphasising problems requiring solution.

Favourable Aspects	*Unfavourable Aspects*
1. The sites available are often fertile, sheltered and accessible. They can support well-grown crops of high quality broadleaved trees.	1. The sites available are small and scattered and often support woodlands that are poorly stocked, or over-aged, or low quality, or all three.
2. Suitable techniques for establishing and tending valuable species are available and improved methods are being devised to reduce damage by vermin.	2. Establishment and tending require attention to detail under continuous, skilled management. Damage by grey squirrels and roe deer remains excessive and requires efficient keepering to reduce it.
3. The markets for small round-wood, sawlogs and veneer logs are very varied. There is a clear price differential for straight logs free from defects.	3. The markets are flooded with second and third rate material suited to fencing and mining timber for which the wood-using industry can only pay low prices.
4. The use of arboricultural techniques to improve rate of growth and tree form, and reduce defects, is increasing. This is likely to produce satisfactory returns from broadleaves.	4. Suitable growth models that permit reliable economic appraisals of broadleaved forestry are not available. Better estimates of cash flows must be made.

5. The requirements of silviculture, shooting game and amenity can be reconciled to the greater benefit of an estate; and the needs of conservation can be met.	5. The objects of growing broadleaves are not clearly stated. Clarification is needed to reconcile the often competing interests involved in planning, conservation and amenity, with the needs of forestry for profit.
6. The general public appreciate broadleaves and respond favourably to the efforts of foresters who grow them for profit.	6. Public relations are poor and the need to replace an over-aged and poor quality growing stock is not properly explained or understood.
7. Grant aid for planting takes account of the size of woodland.	7. The impact of personal capital taxation is too severe.

In his admirable book "Profitable Forestry" published in 1956 Lord Bolton stated the key factors leading to the profitable growth of broadleaved trees. Foresters must choose species, provenances and cultivars that are suited to the site, capable of producing timber of high quality and maintain or, if possible, improve the fertility of the soil. Lord Bolton said that the forester must aim to produce the greatest possible volume of timber and "it is his duty to ensure that the timber he produces is of first quality" because "no industry of any sort whatever can prosper if it consistently floods the market with second or third-rate material". He urged foresters to "start thinning early, thin often and thin drastically" and said "in the business of forestry as in every other business the best markets must be secured if the business is to yield the highest possible returns". We believe that the symposium has shown that Lord Bolton's statements remain correct and provide a sound basis for the future management of broadleaved woodlands.

SILVICULTURE : WHAT SPECIES SHOULD BE GROWN?

More than 20 species are mentioned by the authors of the papers and these can be classified into four main groups:

1. those that grow quickly when young but soon culminate in height and diameter increment. They produce useful timber on short rotations but can also be grown on rotations of medium length (say 40 years). The poplars and tree willows produce light timber and reach their best development in southern England on moist, fertile soils. The alders and birches produce medium to heavy timbers and can be grown throughout Britain;

2. those that are fast growing when young and can be grown on rotations of medium length ranging from 45 to 60 years. Sweet chestnut and red oak produce ring porous timbers of medium to heavy density; the small leaved and larged leaved limes, Norway maple and London plane are diffuse porous woods of medium density. All five species grow best in the south of Britain. Ash, various

species of elm, gean and sycamore are grown throughout Britain and the last named is especially well suited to northern Britain. All produce useful timbers, the elms and ash being ring porous and heavy to medium in density, while gean and sycamore are diffuse porous and medium in weight. The southern beeches *Nothogagus obliqua* and *N. procera* appear to belong to this group and show promise in the western and central parts of Britain. They produce diffuse porous timbers of medium density;

3. those that are normally grown on long rotations of 80 to 120 years and have in the past been planted throughout Britain. Beech, pedunculate oak and sessile oak reach their best development on lowland sites in the southern half of Britain but good stands are also found on fertile sheltered sites throughout Wales, northern England and lowland Scotland. The timbers are classed as heavy; beech is diffuse porous and the oaks are ring porous. Walnut can also be placed in this group of long rotation species but it requires fertile soils in the south of England;

4. there is also a fourth group of species which play important roles in the silviculture of the main species and contribute to conservation or amenity. Crab apple, pear, dogwood, hazel, horse chestnut, holly, hornbeam, field maple and *Robinia* produce medium to heavy woods often with specialised uses. The hawthorns are rarely allowed to reach timber size and the *Sorbus* species of rowan, whitebeam and wild service have silvicultural, conservation and amenity values.

SILVICULTURE : CHOICE OF PROVENANCES AND CULTIVARS

The identification of superior provenances and production of improved cultivars is most advanced in the short rotation species of group 1, but is under way in those of group 2. The improvement of the beech and oaks of group 3 has not advanced much beyond the registration of phenotypically good seed sources, under EEC rules. In group 4 several examples of the effectiveness of selection can be given, notably in crab apple and the *Sorbus* species.

Experience gained during 40 years of selection and breeding in the conifers, poplars and willows has been very valuable. Three additional techniques now being developed further to exploit superior cultivars of broadleaved tree species are: rooting of cuttings, tissue culture and cell culture. We have no doubt that the application of genetics and tree breeding can bring rapid improvement but in the meantime the National Register of Seed Sources must be extended to include all the major broadleaved species in addition to red oak, pedunculate oak, sessile oak and beech. In our opinion the full burden of this work should not fall on the Genetics Branch of the Forestry Commission, rather should they encourage timber growers and nurserymen to identify their own provenances and produce their own cultivars. If this were done there would be much faster progress toward the improvement that is so badly needed.

SILVICULTURE : BROADLEAVES IN THE UPLANDS

Lines and Brown (BIB 141-149) define "upland" sites as being at elevations of more than 250 metres. In these areas foresters look to broadleaves to provide benefits to conifer plantations, particularly site improvements leading to better growth of the crop, protection from late spring or early autumn frosts and firmness to wind leading to improved stability of the conifer crop. Broadleaves are also planted in the uplands to shelter farm animals and crops, provide habitats for wild plants and animals and improve the appearance of conifer plantations. If, in addition, they produce useful timber that is a good bonus for the work of planting and tending them.

The alders and birches are outstanding in satisfying all these requirements. Well grown birch timber is as strong as beech and almost as tough as ash. In addition, as Philip (1978) has pointed out, the dry matter production of a birch stand yielding 7 cubic metres per hectare per year is similar to that of Sitka spruce yielding 14 cubic metres per hectare per year.

Other species with potential on the better upland sites are ash, beech, gean, the limes, southern beeches, sycamore and the native oaks. The justified concentration in the uplands during the past 60 years on the silviculture of conifers has led to a neglect of broadleaved species, but they are now regenerating naturally in many older upland forests and should not be neglected in future, especially on the clay soils derived from shaley rocks of the Silurian and Carboniferous systems.

MANAGEMENT : PURE OR MIXED WOODS; REGULAR OR IRREGULAR STRUCTURE?

Four common situations were considered during the symposium, namely: replanting cleared woodland, rehabilitating uneconomic woodland, treating well-stocked woodland and regenerating mature or over-mature woodland. There are also special cases such as the ancient and ornamental woods of the New Forest and the western oakwoods that require special treatment and the custodians of these gave authoritative descriptions of their methods (Small, BIB 65-71; Wright, BIB 77-82; Steele and Peterken, BIB 91-103).

1. *Replanting Cleared Woodland:* The aim should be to establish fully stocked stands capable of producing timber of high quality. In many cases more than one broadleaved species is required especially if grey squirrel damage is expected or coverts are required for game birds. A conifer is included in the mixture because it generates early income from thinnings without detracting from the fixed return from the broadleaves. Mixtures by lines or groups both have their supporters.

2. *Rehabilitating Uneconomic Woodland:* "Derelict woodland may represent the result of long-term neglect and exploitation, or clearance without restocking, or coppice which has fallen out of management" (Wood, Miller and Nimmo, 1967). The main factors

influencing the treatment of derelict woods are: the quality of the site; the presence of valuable stems; and the present height, ultimate expected height and uniformity of the woody growth. Complete clearance of derelict woodland is generally not recommended, especially on clay soils. Enrichment of irregularly stocked woodland using large plants usually is successful if deer and grey squirrels are absent or can be controlled. The stocking of the rehabilitated woodland should be sufficient to allow selection of crop trees and provide income from thinnings.

3. *Treating Well Stocked Woodland:* Similar methods to those described by Oswald (BIB 31-39) are used on those private estates in Britain where the object of management is to derive profit from broadleaved woodlands. Briefly stated, these crops are usually mixed and often include one or more conifer species. Weeding is followed by early and later cleanings until the crop reaches top heights of 3 to 10 metres, access being made easier by a network of racks. Brashing to 2 metres is common, especially where shooting is practised, and during the early thinnings crop trees are identified, pruned and favoured in later thinnings. A common target is 100 to 150 crop trees per hectare, each with 6 to 8 metres of clear stem and a final mean diameter in excess of 45 cm at breast height. We suggest that prescriptions for "free growth" are an extreme form of this treatment of crop trees.

4. *Regenerating Mature and Over Mature Woodland:* The treatment of these is very varied but the essential basis is the fertility of the site and the presence of valuable stems that can be marketed. The present tendency is to avoid clear felling and use group fellings, gradually restocking the site by natural regeneration or planting or both. The use of continuous regeneration over an extended period leads to an irregular structure, which is favoured by Wright (BIB 77-82). The treatment of this class of broadleaved woodland is still evolving and further interesting methods can be expected (Joslin, BIB 53-60; Rogers, BIB 61-64; Small, BIB 65-71; Voysey, BIB 72-76).

MANAGEMENT : CHOICE OF ROTATION

The most common broadleaved trees growing in Britain at present are the two oaks and beech, and when speaking about rotations it is those three species that are commonly in the minds of foresters. We think that this is one reason why rotations of 80 to 120 years are given for broadleaves, although the native oaks and beech are the only species that are grown on long rotations. All the others should be grown on rotations of 60 years or less and rotations of 5 years are proposed by Cannell (BIB 150-160) and Stott *et al.* (BIB 249) for the production of biomass.

We suggest that although coppice plantations will continue to be very useful, especially where fuelwood is required from small areas on farms, it is not a system for general application in the future. This is because the treatment of woods to obtain a final crop of

logs of high value also generates considerable quantities of small roundwood and second and third quality logs.

RESEARCH : SOME REQUIREMENTS AND OPPORTUNITIES

The first requirement is publication of the results of past research done by the Forestry Commission's Research and Development Division. This will provide a valuable starting point for planning future work.

We suggest that the policy for research should be based on the culture of the individual tree through investigations into an appropriate form of arboriculture. We see the work of Evans (BIB 183-190) and Tuley (BIB 176-182) as excellent examples of what is needed. The silviculture and management of broadleaved woodlands should be designed to produce, as rapidly as possible, 100 to 150 trees per hectare with straight cylindrical stems in excess of 45 cm mean diameter at breast height, 6 to 8 metres long and free from defects due to large branches and associated knots. Efficient protection from damage by vermin is essential throughout the rotation.

Unless the final crop trees are decidedly superior in their genotype the forester will need to work hard to see them through to maturity; the production of superior genotypes therefore has priority in our proposed programme of research. A striking feature of the principal cultivars of poplar is their ability to grow straight and keep a persistent stem with small branches and compact, conical crown. The major thrust in research should be directed to the identification of provenances and production of cultivars of alders, ash, beech, birch, gean, limes, Norway maple, sycamore and walnut capable of producing straight persistent stems, because such trees are usually able to keep their dominant position in the canopy without too much assistance from the forester. The cultivar of elm called *Ulmus hollandica* 'Groeneveld' has straight persistent stems and there are cultivars of whitebeam with erect, though not fastigiate, habit of growth. In ash the use of planting stock derived from predominantly male flowering trees may go some way to meeting the needs; in silver birch persistent stem development appears to be inherited, although the heritability of this character cannot yet be estimated (Kennedy and Brown, BIB 246). Provenances of beech have been identified with strong dominance of the leading shoots, straight stems and small branches. In oak, reduced tendency to produce epicormic shoots is likely to reduce the occurrence of pin knots in the timber (Evans, BIB 183-190).

Ability to root from cuttings is another useful characteristic (Schwabe and Sultan, BIB 169-175) and, in poplar, selection for rooting ability has brought several valuable genotypes into forest practice. This is an area where physiological research is likely to make a valuable contribution by identifying sources of tissue on adult trees that have retained the ability to root from cuttings.

Although supplementary nutrition is widely used to improve the growth of conifers rather little work has been done on the nutrition of broadleaved trees. We think there are two basic requirements: the first being a classification of soil types for the lowlands

comparable to that used in the uplands; the second requirement is a more accurate matching of species to soil type. Fertiliser regimes can then be worked out and yields of timber increased on specific sites, such as the gleyed soils of the northern Pennines of England.

Another important task for research is construction of growth models that more accurately represent the growth and yield of several important broadleaved species, particularly ash, birch and sycamore. Because the southern beeches are exotics and well-tended plots of *Nothofagus procera* and *N. obliqua* have been established in several parts of Britain accurate yield tables have become available. The yield tables for the native broadleaved species are inadequate and do not record the rapid growth of individual trees under careful silviculture.

An area of existing research that must be sustained is investigation of the biology of the fungi and insect pests that damage important broadleaved trees. The work on beech bark disease is vital to successful growth of beech and the future of the elms largely depends in part on greater knowledge of the behaviour of the elm bark beetle.

One area of existing research that has paid good dividends already is chemical control of weeds and we recommend that new materials should continue to be tested.

Denne and Dodd (BIB 233-238) have drawn attention to the complacency that exists about the quality of hardwoods grown in Britain. We agree, and think that there should be more precision about the relation between rates of growth and wood properties in several broadleaved species.

CONCLUSION

We see a good future for broadleaved woodlands subject to three requirements being satisfied:

1. all who aspire to grow broadleaves must concentrate on producing timber of the highest possible quality; and
2. they must give the highest priority to marketing the produce in the best possible existing markets, and to capturing new markets;
3. there must be a strong national campaign to alert woodland owners to the potentially high value of their broadleaved woodlands.

REFERENCES

Bolton, Lord. 1956. *Profitable forestry.* Faber and Faber, London.

Philip, M.S. 1978. Birch: a report of the silvicultural group 1976-77. *Scot. For.* 32, 26-36.

Wood, R.F., Miller, A.D.S., and Nimmo, M. 1967. *Experiments on the rehabilitation of uneconomic broadleaved woodlands.* Res. and Dev. Paper 51, For. Commn, London.

Names with no date refer to authors of papers published in the proceedings of the symposium *Broadleaves in Britain* (See page 1).

CLOSING DISCUSSION

Dr Balfour said that although the symposium participants were supportive of broadleaves generally, a clearly understood objective was required, namely to maintain at least the present area of broadleaves, while accepting some shift from hedgerow trees to small woods; a shift which she believed would not detract from either wildlife or landscape interests.

The important question then was "Who was going to plant and maintain broadleaves?" Both the Forestry Commission and the Nature Conservancy Council own some small areas of broadleaves, but the implementation of a policy for these woodlands rested mainly with the traditional or farm forest landowners. Comments during the symposium had made it clear that city investors or pension funds were not normally interested in investing in broadleaves because of their long term nature and low return.

Assistance or incentives should be directed at the traditional and farm forest landowner, and should be:

1. for the long term approach and continuity. This required changes in capital transfer tax. The current situation falls far short of the position prior to 1974;

2. for management: by methods of reducing costs, by using improved silvicultural techniques, and by grant aid. The first two have been usefully considered during this symposium, but in the case of grant aid it could be argued that a management grant could be at least as helpful as a planting grant, and certainly the two could be complementary. It had to be recognised however that the Forestry Commission had decisively turned away from management grants;

3. for quality timber production where this was possible.

She referred to the term 'Godparents' which had been used during the symposium and underlined the lead position of the Forestry Commission in this role, since it was the Forest Authority and had silvicultural expertise and a regional structure. The Nature Conservancy Council would be working closely with the Forestry Commission on their own proposals, and the two Countryside Commissions would obviously wish to co-operate, recognising the many complementary

aspects in timber production, nature conservation and landscape. Dr Balfour indicated that the Countryside Commission for Scotland would certainly be happy to co-operate with the Forestry Commission and others.

Mr Downing drew attention to the work of the Dartington Amenity Research Trust in nine counties in England and Wales. They had looked at 506 woods, picking a small area and investigating a 100 per cent sample if the owners would allow. Ten per cent of those woods were under some kind of management. Another 25 per cent were not managed but were in fairly good condition. The other 65 per cent were not. That was indicative. He reminded the meeting that the owners of small areas of woodland were, in the main, farmers with no tradition of forestry at all, very little knowledge of it, and very little awareness of it either.

Professor Poore said that he wished to put an ecological view. He observed that the single species woods which are common in so much of Britain were artefacts; the original woods were probably of many species with composition varying gradually with topography, location, etc. We might have to put more energy into retaining a single species stand than a mixed stand; markets and priorities often changed significantly. Sometimes sycamore was no use, sometimes larch, sometimes beech, and owners reacted to these changes in fashion. He asked whether managers should not come to terms with the variability of the resource and the uncertainty of the markets and try and persuade government to accept a policy that would build up a balanced age, mixed composition, broadleaved forest estate. The country would then have an estate with a capacity for producing as much income as broadleaves could produce, and would also in very many respects meet the requirements of the various aspects of amenity and conservation.

Mr Steele agreed with Professor Poore's point. He added that many regretted the passing of the Dedication Scheme and the long-term commitment and the management plan that went with it. He considered that continuity was important and that what was especially needed in hardwoods was a sense of national purpose. We needed to make it clear that people growing hardwoods were not spendthrift lunatics, that it was in the national interest to grow hardwoods and that foresters supported this. He agreed with Dr Balfour that the Forestry Authority should provide this sense of purpose and give a lead. The Nature Conservancy Council would give their full support.

Mr Lines pointed out that for sixty years the Forestry Commission and private owners had been enclosing upland areas with fences which kept out the stock and quite often the deer as well. The effect of this over a century or so was undoubtedly going to mean a much greater proportion of the native broadleaved species coming in. In forests on the North Yorkshire moors birch was now an established component amongst the conifer plantations and would inevitably form part of the second crop. This sort of change was happening all over Britain, and in this respect at least the future was bright for the conservationist.

Mr Harley considered that a decline in the area of broadleaved high forest should be arrested, but there was one difficulty, namely that the owners must be able to sell the timber. To do this they must grow timber of good quality. The meeting had been told that good quality timber could be grown in the south of England. In other areas the owners must be assisted in some way. If the public required broadleaves for purposes of conservation, wildlife preservation, recreation and amenity then the representative public authority should intervene, and bear the cost.

Mr Niles thought that there was too little recognition of the extreme importance of very small woodlands of a hectare or so which were scattered throughout lowland England. Although very small they were usually very significant in landscape and in ecological terms. He suggested that many people still held that the only way to treat small woodlands was to clear fell them, put a fence round them and plant them up with oak in mixture with Norway spruce. He considered that the profession itself was at fault here. Foresters should be able to advise owners according to their particular circumstances.

Professor Matthews said that a lot of people wished to grow hardwoods and would not be deterred by the difficulties they faced.

Commander Marten said that the discussion was about a policy for hardwoods, and although there were going to be just as many policies as there are woodland owners, people looked to the authorities for an umbrella under which they could operate. He commented that the meeting had heard two very different views about capital taxation from Mr Rankin and Mr Campbell and he hoped that Mr Rankin was embracing forestry as a whole in his remarks and not just broadleaved forestry, because conifers and broadleaves deserved and needed different treatment fiscally. If we were going to retain the hardwoods we had to look after them properly. He considered that there was a very great danger that private individuals would sink a lot of money into hardwoods, but that neglect would set in later through lack of resources to sustain such an expensive programme over such an extended period in the face of steady depletion through capital transfer tax.

Mr Cramb of Durham County Council emphasised that 20 per cent of the broadleaves in Durham were in hedgerows and very small woodlands and about 20 per cent of them were going to die in the next 20 years because they were so old and so decayed. Since the latest Forestry Commission grant scheme had been in being, two owners had taken advantage of the grant for planting hardwoods. The County Council had become an agent for the Countryside Commission's small amenity woodland planting and in two years the County Council had encouraged 60 owners to plant about 70,000 trees under this scheme. Clearly this method of planting hardwoods was much more attractive to the small private owners than the Forestry Commission grant scheme. Many of these woods had been planted on land owned by farmers and it was clear that in many cases owners were not particularly attracted by prospects of financial advantage. Many such people felt that they should do something to maintain the landscape.

CLOSING REMARKS

W.E.S. Mutch

President, Institute of Chartered Foresters

I am very pleased to have this opportunity to comment on the considerable success of the symposium. The environment in which it has been held and the attitudes of the participants are very different from those eight years ago when the Society of Foresters held its last meeting on hardwoods. Forestry practices have changed markedly and the directly destructive practices have ceased. Foresters welcome the change in attitudes of other agencies from a generally negative role to a positive interventionist stance : this bodes well for conservation. The demise of the Dedication Scheme has removed the obligation to have a particular type of plan of operations but it has not removed the opportunity to have a plan, and any competent consultant would be prepared to undertake the preparation of one.

In connection with Dr Balfour's point about government agencies making provision for broadleaves, it is important that their advice and financial help should be well integrated so that the individual owner or farmer is not confused by the variety of the grants and the advice, but rather is given a sense of real support and encouragement. There must be greater flexibility of treatment and an avoidance of harsh interpretations of regulations that would otherwise defeat the intentions.

In relation to the farm advisory services, it is important that the education and awareness of farm advisers in forestry and conservation matters be improved. I believe that that is one of the most direct and effective ways in which we can ensure that the management of broadleaved resources in particular, is improved. This of course is being seen in many different ways. I know of the strength of the farming conservation bodies which are growing in various parts of the country. This underlines the point that the principal operators are farmers, each with his own aspirations and with his own set of influences. I feel that, at least for the present, this is a much safer state of affairs than having all the policy and all the investment decisions concentrated in the hands of the single accountant or investment analyst sitting in the City of London.

Were the trees grown for a single attribute it would be relatively simple to produce a single policy relating to them, but I am sure it would be very time consuming for us to seek a single expression of policy to encapsulate our many hopes and intentions. Instead, I suggest we should try to ensure that within our organisations and businesses we build on the good understanding that has clearly developed in this symposium to find a compromise which, though short of everyone's ideal, may be close to society's optimum. It would not be a fair reflection of the views expressed in this symposium, nor would it be a proper expression of our real needs, to suggest that we should rush out and take policy decisions or change management practices immediately. Nevertheless it is clear that an important proportion of the broadleaved resource is in a delicate state of health, and that we must not delay too long in taking more positive steps than we have taken in the past few years to regenerate and to improve management of these woodlands.

I would remind members of the general need to take management decisions on incomplete and often quite inadequate data. If we were to wait for firm information on prices of oak timber in the twenty-first century or if we were to seek a clear definition of the benefit of allowing public access to Chilterns beech forests relative to the beech timber, the opportunity for doing anything at all would probably have gone. And in that respect I am reminded of the words of the citation for those who were responsible for the development of radar during the war: "Not the least of their attributes was their cult of the third best: the best was unattainable, the second best would have come too late".

CLOSING REMARKS

G.D. Holmes

Director-General, Forestry Commission

My main object in coming here was to listen and to learn, and I have learned a great deal. I hope that goes for most of you. There has been much food for thought concerning the way ahead and I can assure you that as far as the Forestry Commission is concerned what has been said will certainly influence our thinking and our actions in the future. I suspect that goes for a number of organisations and people here.

I suggested in my introductory address that the aim of this symposium was to review the state of play in relation to the broadleaved growing stock and its management, and we should also, on the basis of that, try to clarify the way forward in terms of management priorities, research priorities, and motivation for better management. I think a number of things have emerged from this discussion, but I suggest we need time to digest what has been said and think more carefully about the way ahead. At this time I must just mention a number of things which seem to me to be the highlights of the way ahead from the Forestry Commission standpoint.

First, on the question of the state of play on policy, I think I should affirm that we do indeed have a broadleaved policy, albeit a somewhat broad one, dating back to 1971, and adjusted in 1974 when there were major shifts in Forestry Commission policy in relation to broadleaved species, with the general aim of maintaining the broadleaved woodland character of the countryside, and hence the Commission's management practices, and hence the premium grant system for broadleaves, and so on. I mentioned at the beginning of this symposium that our policy was to safeguard the existence of the environmental values of broadleaved woodlands. I also said our aim was to improve productivity and the financial aspects of management. We will be thinking about refinements to these objectives in the light of what has been said at this symposium.

Concerning the state of the growing stock, the meeting has confirmed the values that are associated with this class of woodland. There is great scope for improvement quite clearly both in relation to production and conservation potential of broadleaves. Also, I

have derived some encouragement from the census results we have seen so far in relation to the overall area of broadleaves. This information at present is highly provisional, but I can assure you that in the way ahead we are pressing on within the Forestry Commission to get these data published, with the trends traced for you, with the minimum delay.

The state of management also leaves much to be desired but, on the question of perpetuating broadleaved woodland by re-stocking, I am reasonably encouraged by the response to the Forestry Grants Scheme. On this point our way ahead includes doing all we can to promote the take-up of that new scheme. A number of bodies, including the National Farmers Union, have taken the initiative to encourage the take-up of that scheme amongst their members. I hope most of the bodies here will do the same to promote the scheme.

Concerning management priorities, the way ahead includes the provision of good advice to potential users and encouraging those who are interested in broadleaved woodland management. One of the ways of helping people is to give them advice, well-based advice, and one of the products of this discussion will be the publication of a Bulletin by the Forestry Commission entitled "Silviculture of Broadleaved Woodland. That will incorporate not only the results of research but also the results of successful management practices, and I believe it will be influenced by the sort of views and priorities that have been suggested at this symposium. Concerning advice and demonstration, from time to time Open Days are held at Alice Holt, and there are many other things of that kind on the way. I think the National Hardwoods Project 'focal point' is another positive way of carrying ideas forward.

We spent a lot of time talking about the classification of woodlands based on what the House of Lords' Select Committee has said. We shall be consulting the Nature Conservancy Council with our new census data concerning woodland categories. I think the Nature Conservancy Council has done a tremendous job in putting forward their ideas on woodland classification. Many will have questions on the detail and I certainly have on the quantitative side. The Nature Conservancy Council is concerned primarily with identifying the areas that need to be managed in the national interest exclusively or primarily for conservation reasons. That is its prime purpose. We shall certainly endeavour to help with the classification and I would remind you that the Commission grant from the Forestry Fund is concerned with supporting forestry primarily for the purpose of growing timber, but that does not exclude conservation requirements so long as they are within the compass of that prime objective. I believe that such a combination of objectives applies to the great majority of sites, and I would stress that the Forestry Fund grant money includes recognition of environmental and conservation values. Dialogue is required to achieve better understanding, so we will go ahead with the Nature Conservancy Council in pursuing this, in consultation with others concerning the way forward with this classification.

Concerning research and development priorities, I think we have some useful lines going, as other organisations have, in developing

improved techniques and improved genetical stock, and these programmes will be pursued with vigour.

The final point I want to highlight is the question of motivation and the sense of purpose that was suggested earlier. I regard it as a very important part of our job to inject such a sense of purpose. The financial aspect of motivation I find a somewhat delicate matter standing here as an agent of government, and I am therefore somewhat guarded in my enthusiasm in public on the subject. But everyone understands my problem in that respect. I think it is important that we keep in mind the clear picture of the financial problems of the private owner that has been given to us at this symposium. I agree fully with those who have said that it is hard to imagine broadleaved woodland and broadleaved investment being made attractive to the financial institutions. This is not a statement of policy, this is just an observation, and it seems to me it is wrong to look at incentives for broadleaved management purely from the financial point of view of the return on capital involved. We are really talking about people who want to plant broadleaves for a whole multiple package of reasons, only one of which is financial and even then the return may be long term and uncertain.

So we have to look mainly at the individual owner and at a package of benefits that would motivate him. As a result of considerable efforts by many parties, we have income tax benefits associated with forestry, together with what I believe to be a not ungenerous level of establishment grant, if I can call the Forestry Grant Scheme an established grant, which as you know includes a commuted management grant. These are matters that we will keep under active review, which is the expression I think a Civil Servant would use, but I would be less than honest if I said to you in a gathering like this that the prospect of a substantial increase or improvement in the immediate future was going to be easy, because obviously times are difficult. But let me just say that as far as the Forestry Commission is concerned, we are open to argument and to discussion, and our minds are not closed and never have been closed on this question.

In conclusion, I don't believe that broadleaved woodland management is entering a period of paralysis for lack of enhanced incentives. This may be something we should look at very carefully but I think that equally there is room for positive progress forward. We, as the Forestry Commission, will do all we can to encourage interest and assist action by giving a positive lead.

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