

A Forestry Centenary

Niall OCarroll^a and Padraic M. Joyce^b

Avondale House opened its doors as a school of forestry in October 1904, a year now mainly celebrated as the year of ‘Bloomsday’, the day celebrated in James Joyce’s *Ulysses*, and of the founding of the Abbey Theatre. In its first year it had eight students – apprentices – as they were then called. The passing of a round century since that date gives us a suitable opportunity to reflect on progress, achievements and mistakes. This account will try to do that for forestry in Ireland over the period.

Basics

Let us begin with some primary questions: what is forestry; what does forestry do, and what is it supposed to do?

Definitions of forestry are not scarce to find. These two are from internet sources: ‘The total system of managing and using for human benefit the natural resources that occur on and in association with land with trees.’ That is acceptable as a general principle. ‘The science of planting and caring for forests and the management of growing timber.’ seems more relevant to the Irish situation. Many may believe that no definition is necessary; that, to use the poet AE Housman’s analogy, we can no more define forestry than a terrier can define a rat, but a definition is often useful as a general statement of purpose. Some definitions specify forestry as an ‘art’. That may be acceptable so long as ‘art’ is understood in its primary dictionary meaning of ‘skill as the result of knowledge and practice’, but not in the sense of the creative so-called fine arts: literature, painting etc. – its most usual modern sense. To define the principal purpose of forestry in Ireland we can combine elements of the first two definitions, i.e. to plant and manage trees for human benefit, and in Ireland in the past that benefit related almost entirely to physical resources.

Historical

Modern forestry in Ireland started with an almost entirely clean sheet. The once well-wooded land had been cleared down the centuries for a variety of purposes: to provide land for food crops; as raw material for house-building and the manufacture of barrel staves; as fuel for industries including iron smelting and glass making, and for domestic heating and cooking. There was little left by the eighteenth century.

Planting was grant-aided by the newly formed precursor to the Royal Dublin Society, by its members in 1741, and after 1747 with money voted by the Dublin Parliament in College Green. But that supply of money was cut off by Westminster after the Act of Union of 1800.

^a Ballynakillew, Ballinrobe, Co Mayo, Ireland (nakillew@eircom.net)

^b 27 Linden Grove, Blackrock, Co Dublin, Ireland (redmondjoyce@eircom.net)

That Dublin Parliament also passed laws to assert the rights of forest planters to own the trees they planted; previously they had belonged to the landlord. Many of the woodlands planted and registered under those laws provided timber to be felled during World War I and the ‘emergency’ (World War II) of 1939-45.

Policy, Objectives and Targets

The Department of Agriculture and Technical Instruction (DATI), conscious of the perilous condition of woodlands in Ireland, had established the forestry school at Avondale and in 1906 appointed a Forestry Expert, AC Forbes. Towards the end of the previous century a number of experts were also called upon to report on the suitability and extent of land for forestry but the most forcible and persuasive arguments came from the findings of the Departmental Committee of inquiry which reported in 1908. They envisaged the objective as the maintenance of an area of woodland sufficient for the country’s needs, for the development of industry and for shelter for agriculture (Departmental Committee 1908). This Departmental Committee criticised the government in Ireland for its “deplorable neglect” of forestry, and called for an urgent scheme of forestry to be carried out “by or under the direction of the state”. It pointed out that such a scheme could not be carried out by private individuals: the capital required would be too great and the investment period too long, and family circumstances could change. As it pointed out “... the State is a proprietor who never dies”. In their opinion forests were a matter of grave national concern, an opinion that was to be reinforced within the following decade by the U-boat campaign of World War I. The objective of a strategic reserve for time of emergencies, so prominent in Britain during the 18th and early 19th centuries (when ship-building was entirely dependent on timber), was resurrected. In deciding on the extent of land available for planting the Committee concluded that 5%, or a total of at least 1 million acres (400,000 ha), could be allocated to forestry without interference with agricultural industries.

The Committee concluded that a comprehensive scheme of forestry could only be undertaken by the state either directly or through local authorities or private owners. Some local authorities became involved in woodland ownership (e.g. Kildare and Donegal) but with the Land Acts still fresh in their minds few private owners felt sufficiently secure to invest in their woodlands. In any event whatever government funding was available was directed towards the acquisition of a nucleus of state-owned woodland (e.g. Camolin and Dundrum).

The outbreak of war in 1914 and the subsequent U-boat campaign brought home to the government the need for a strategic reserve. Private woodlands were again called upon for supplies during the war and were largely left in a derelict state, having been highgraded¹ for the best stems; nothing remained except the unwanted culls. By the end of hostilities most woodlands were overgrown with scrub and were either acquired by the fledgling Forestry Section or the culls were left to grow on until World War II when the process was repeated.

¹ ‘Partial harvest removing only the most valuable species or trees of desirable size and quality without regard for the condition of the residual crop’ (Society of American Foresters).

A Reconstruction Forestry Sub-Committee sitting in 1916 saw forestry mainly in terms of a national insurance, and introduced a productivity concept rather than a financial criterion for new planting. This was estimated to be 80 cubic feet of conifer timber per acre per annum ($7 \text{ m}^3/\text{ha}/\text{yr}$) of which "... 40 cubic feet is large timber".

State planting began in a small way and some progress had been made when the Forestry Act of 1919 provided for the creation of the Forestry Commission, which operated in both Britain and Ireland. But its operations in Ireland were severely disrupted by the political uncertainty and armed hostilities of the period up to the establishment of an independent state in Ireland.

Estate woodlands acquired during the early years were mainly on highly productive land but this was to change after 1925 with the announcement by the Minister for Agriculture setting a ceiling on the price that could be paid for forest land so as not to compete with agriculture (Gray 1963). This policy remained in force for the next half century, apart from the 'Economic War' period of the 1930s when Britain embargoed imports of agricultural produce from the Irish Free State and virtually crippled the economy of the agricultural sector. The consequent collapse in the price of land, leading to a higher quality of land acquired during this period, provided an opportunity to diversify species and create the older broadleaf stands of today.

Because of a lack of funding the pace of acquisition was slow in the early years; by 1918 a total of 15,357 acres (6,200 ha) had been acquired in the whole of Ireland. Almost half of this came from private woodland estates. Altogether forest cover remained extremely low; by 1922 it had reached 250,000 acres (100,000 ha) in the new independent Free State, all, with the exception of just over 17,000 acres (6,700 ha) in private hands.

Afforestation targets were increased in the early years of the Free State. In the 1920s a figure of 200,000 acres (80,000 ha) was being mentioned. Following strong advocacy by Senator Connolly for a target of 500,000 acres (202,000 ha) a compromise of 300,000 acres (121,000 ha) was agreed in the late 1930s. With the import difficulties experienced in the early war years the government decided that a programme of 600,000 acres (240,000 ha) was needed to satisfy home requirements.

In the immediate post World War II period a change of government combined with the enthusiastic determination of the Minister for External Affairs, Seán MacBride, brought about a change that was to influence afforestation programmes for the next half century: a decision was taken to increase the afforestation programme to 25,000 acres (ca 10,000 ha) per year.

Having taken "a policy decision ... involving the establishment of 25,000 acres of new forestry plantations annually over a period of 40 years" the Government then authorised a 'flying survey' (in the sense of speed; it was done by ground survey) to determine if sufficient suitable land was available to sustain the programme. The survey indicated the availability of approximately one-and-a-quarter million acres (500,000 ha) of "rough mountain grazings" which were plantable but which would give rise to a conflict of interest (objections to a change in land use from agriculture to forestry). However, the conclusions reached "... were to the effect that the national interest would be better served by the dedication of these areas to forestry purposes ..." (Rea 1985).

In light of these conclusions the government "... expressed the desire to have the conclusions of the survey checked by independent expert advice, and requested that FAO undertake a one-man forestry mission for this purpose." Roy Cameron, Chief of FAO's Forestry and Forest Products Working Group for Europe, duly arrived, spent some ten days in the field and four in discussion with Forestry Division staff. His report recommended the division of the planting programme into two parts of 500,000 acres each (200,000 ha); one with a commercial and the other with a social objective; the latter to be directed mainly to the western counties (FAO 1951). The commercial objective was readily accepted for both parts and the social element was quietly shelved. Such is the genesis and maturation of one of the most profound policy decisions to affect Irish forestry. A detailed and more comprehensive historical account, with source references, can be found in OCarroll (2004).

Achievements

Our main achievement is probably the attainment of a target. In 1948 the Government announced that it intended to introduce a planting programme of 25,000 acres (10,000 ha) a year for forty years, to be completed in 1988. If we add up the annual figures for new planting that target was finally achieved in 1991, despite some vicissitudes in matters of exchequer finances and land availability. But it would not have been achieved so soon were it not for the essentially eleemosynary contributions from Brussels. We will later discuss some of the imperfections that developed in the course of that success, but the achievement of a government target over such a long period, and under a variety of governments must be seen as meriting a mark of perhaps 9 out of 10. The total of new planting up to that year was 1,013,621 acres or 410,373 ha. Planting on privately-owned land contributed 51,943 ha to that total.

In terms of wood production, the output from state-owned forests in the year 2003 amounted to 2,660,000 cubic meters of roundwood. FAO statistics for the year 2002 indicate that Irish production of sawn conifer wood represented more than half of the total consumption. An analysis carried out in 1985 showed that the state's investment in production forestry had given a net return, above inflation, of about 2% compound interest.

Other benefits are hard to estimate in money terms, but most Irish residents will be aware of the increased opportunities for recreation, the greater diversity in the landscape and the visible movement of log-bearing trucks moving from forest to busy sawmills, and wood-using industries such as those in Drumsna, Clonmel, Scarriff and Waterford.

Tradition and public opinion

There is no tradition in Ireland of forestry in the sense of managing a crop of trees. There is much ancient lore concerning individual species. One practice that still survived when this story begins is that of planting a rowan tree (mountain ash) beside a house, presumably to ward off fairies, which were generally believed to be maleficent.

Scholars have elucidated many ancient texts concerning trees, but are less helpful in telling how much of this is to be taken literally. Often repeated is the classification of trees into four orders, apparently related to their utility as food, fuel or building

materials. The classes are: 1. Nobles of the wood, including oak, ash and Scots pine. 2. Commoners of the wood, which includes alder, rowan and birch. 3. Lower divisions of the wood, such as elder, arbutus and aspen, and 4. Bushes of the wood, including bog myrtle, furze or whin and heather (Kelly 1997).

Many tree names occur in anglicised form in local names; the commonest appears to be derry (*doire*, oak wood). Other examples are Mayo (*Maigh Eo*, plain of the yew trees), Lucan (*Leamhcán*, place of elms) and Ferns (*Fearna*, elder trees). Many placenames begin with 'Kill-'. This can represent either *coill*² a wood, or *cill* a church. (Room 1994).

Public opinion on forestry has had two main influences: the fact that woodlands were associated with the landed estates, and so connected with the largely Protestant ruling classes of the 18th and 19th centuries, and also the fact that such woodland occupied land on which the growing population might grow food crops, a perception heightened by the great famine of the 1840s. In the process of gaelicising Ireland, begun towards the end of the 19th century, the habits and fashions of the ascendancy landlords were eschewed, however unconsciously, but much stronger was the general land hunger among the small tenant farmers. Trees on good farmland were seen as the enemy, probably even more so than the landlords, ever pressing for higher rents. The need for land was exacerbated by the rising population level: from 4.4 million (1791), to 6.8 million (1821), 8.2 million (1841), followed after the famine to a fall to 6.5 million (1851) and 4.4 million in 1911 (Connolly 1994).

Public opinion, as is usual, was slow to change. Despite the belief expressed by the 1907 Committee that "...there is a love of trees among the people" and that "... support will be forthcoming in Ireland for a national scheme of afforestation..." that support was often less than whole-hearted. The Irish Land Commission, set up in 1881, had as its main purposes the fixing of fair rents and the acquisition of estates in order to transfer ownership to the tenants. It subsequently monitored all land sales, and in response to local pressure, ensured that no land of any agricultural utility was planted. This became official government policy for many years and was enforced by a ceiling imposed on the price that the forest service could pay for land for planting. Thus was public opinion enshrined in government policy.

Only in recent years has general public opinion softened in respect of afforestation. This has probably arisen largely from the consciousness that agricultural surpluses in output cannot continue to be subsidised as they formerly were, and also the increase in off-farm employment combined with increased incentives for afforestation, both in planting grants and annual premiums.

There appears still, however, to be a lingering public distrust of commercial forestry. Many urban dwellers have a rural farming background and retain vestigial traces of the land hunger of their forebears. A common public perception of forestry was summed up by an informal off-the-record and tongue-in-cheek comment at a conference: "Trees are all very well as long as nobody is making any money out of them".

² Not to be confused with *coill* (v.t.), castrate.

The profession

In discussing the training course at Avondale with the 1907 Committee, Mr H. Munro-Ferguson M.P., Scottish forest owner and chairman of the Departmental Committee on British Forestry, 1902, said “I would sooner have it than all I have in my own country”, in which he included Oxford and other centres of education. The Avondale course continued to develop, and increasing numbers of students, triggered by the expanding afforestation programmes during the late 1950s, led to its transfer to Shelton Abbey and Kinnitty Castle. Oblivious to actual needs, recruitment continued with little abatement until the government embargo on recruitment of staff to the public service in the 1980s led to the closure of both. There has been no subsequent replacement, but later a perceived overstaffing situation in state forestry was alleviated through voluntary early retirement.

The 1907 Committee also pointed out the need for higher forestry education to train future experts. It recorded that “... last year [1906?] scholarships were offered for the first time at the Royal College of Science to students of forestry”. The earliest recorded forestry graduate from that college is D. McCaw, 1913. Augustine Henry was appointed professor of forestry in 1913 but on his death in 1930 the professorship lapsed until the promotion of Thomas Clear in 1959. At the time of writing (2004) the professorship appears again to have lapsed.

Entrants to the profession of forestry have tended in the past to have been moved as by a vocation; it has never been seen as an opening for promotion-hungry and ambitious potential high-flyers. Such people have tended to opt for callings such as medicine, the law or big business. As Garret FitzGerald (2004) has pointed out “...there has been a disturbingly short-sighted tendency by many parents to push their children towards courses they believe are likely to secure for them in due course high levels of income”. This is in contrast with the situation in, say, Finland, where forests constitute the main natural resource covering 76% of the land area, and the forestry profession as seen as highly prestigious, and attractive to recruits of the highest calibre. Two foresters have become Prime Minister of Finland, Aimo Kaarlo Cajander, author of *The Theory of Forest Types* (1927) and Mauno Pekkola, who is not known to have left any mark on forest science. Similarly in Sweden where, according to an eminent modern forester, in the late 19th century and early 20th it was generally accepted that the figures of power and trust in rural life were the Forester, the Priest and the Doctor. This difficulty in Ireland was conceded by Professor Clear in the course of a discussion of the quality of forestry graduates with a senior official of the Forest Service in the 1950s. He believed that the best students, those with scholarships, were more apt to follow the course in General Agriculture where at least jobs as agricultural instructors seemed in prospect for graduates.

Land

In recent times in Ireland forestry has always been regarded as a land use of last resort. This arose from the land hunger already described, and was so strongly imbued that it led to the disastrously abortive attempt to plant at Knockboy, a barren windswept hill near Carna in west Galway in the 1890s: disastrous because of its influence on public opinion on forestry; abortive because most of the trees were soon dead.

The 1907 Committee criticized the Land Purchase Acts for not making adequate provision for dealing with waste land, part of the estates acquired, but not included in tenants' holdings. Much of this land was suitable for afforestation had to be disposed of, but could not easily be got back for public use.

In a paper presented in 1963 Henry Gray, effective administrative head of the Forest Service, quoted from a report of the Minister for Agriculture for 1925-6 stating that "The Department do not desire to acquire for afforestation land fit for agricultural purposes which might be capable of being used to form new holdings or to enlarge existing ones." This policy was followed by imposing on the Forest Service a ceiling price that it could pay for land, which excluded all but the most infertile and otherwise unwanted land. With increasing land values, that limit became more and more limiting as to land quality, but was strictly enforced by the presence of a Land Commission Inspector in every Forest Service acquisition office who saw all the relevant files and officiously, as well as officially, excluded all land of any conceivable agricultural value. That policy came to an end only with the demise of the Land Commission in the 1990s and European moves to reduce agricultural surpluses.

Politics

Afforestation, or reafforestation as it was frequently called, became politically topical towards the end of the nineteenth century. Seán MacBride in the 1980s wrote "I think I can say that I have been keenly interested in the whole question of the reafforestation of Ireland ever since my childhood days. The aim of pursuing an active afforestation policy was an integral part of the Sinn Fein movement in the early portion of the century. Bulmer Hobson, Arthur Griffith, George Russell, James Stephens and my mother [Maud Gonne MacBride] were always emphasising the importance of a re-afforestation policy. The failure of our governments to give adequate recognition to the importance of forestry and forestry-related industries the priority it deserves has been one of the great disappointments of my life" (MacBride 1984).

While the new independent state carried on with the afforestation programme begun during the previous administration, no serious attempt at a major afforestation drive was made until the arrival of Seán MacBride as a cabinet minister, albeit Minister for External Affairs (i.e. foreign minister) in 1948. MacBride had spent his early years in France and was aware, no doubt, of the successful major afforestation project in the Landes region on the Bay of Biscay in the early part of the nineteenth century. It was MacBride's influence that brought about the government policy to plant 25,000 acres (10,000 ha) each year for forty years.

Although the concept was vigorously opposed by the Department of Finance on the basis that it was inflationary and too long-term an investment without monetary return, MacBride ensured acceptance of his proposal by making it a condition of securing post-war Marshall Plan funding.

Political influence may also have played a part in appointments. Forbes, as Director, was in place at the beginning, but a Scot, Mark Anderson, may have seemed better than an Englishman, and, in the political climate of the 1930s, a German, Otto Reinhardt, Director, 1935 – 1939, better still.

Organisation

In 1904 forestry activities were controlled and directed by the Department of Agriculture and Technical Instruction. With national independence it remained within the domain of the Department of Agriculture, and remained there until 1933 when it was transferred to the Department of Lands, parent department to the Land Commission. That was a convenient arrangement since it allowed the easy transfer of ‘waste’ land, not suitable for redistribution among farmers, from newly acquired estates, to forestry.

Originally known as the Forestry Division, the combined forest authority and forest enterprise was later renamed the Forest Service, and later again the Forest and Wildlife Service, the ‘wildlife’ element being dropped when responsibility for wildlife management and conservation was moved to the Office of Public Works (later to Dúchas and now with the National Parks and Wildlife Service). The Forest Service has since then resided variously with the Department of Fisheries, The Department of Energy, the Department of the Marine, the Department of the Marine and Natural Resources, the Department of Agriculture Food and Rural Development, the Department of Communications, Marine and Natural Resources and currently back with the Department of Agriculture and Food; a ‘you name it, we’ve been there’ scenario.

In 1984 the then minister, Mr Paddy O’Toole, set up a group to review the current position of forestry and to make recommendations about its future. In its report in 1985 the group recommended the formation of a commercially motivated body similar to the Forestry Commission of Great Britain, to be named the National Forest Enterprise (Review Group on Forestry 1985). A new government decided to set up a state company, Coillte Teoranta, or The Irish Forestry Board Limited. This was implemented under the Forestry Act, 1988. Coillte took over the state forests and most of the Forest Service staff. Forest authority functions, including forest policy, forest health and grant-aid schemes remained with the parent department.

Silviculture

The 1907 Committee, while it explicitly avoided drawing conclusions on technical aspects of the subject, endorsed the suggestion by both Augustine Henry and John Nisbet that initial policy should be to cover the ground mainly with “... the quicker-growing varieties of coniferous timber”. That policy was adopted, using initially Scots pine, Norway spruce and European larch. Later the particular merits of Sitka spruce became clear, particularly in high-rainfall areas and on wetter soils, its only serious fault being its vulnerability to late spring frosts (Joyce and OCarroll 2002). But the political imperative of a large annual planting programme, together with increasing land prices, caused further difficulty in acquiring land for planting. This forced foresters more and more to look to the peatlands, and especially the blanket bogs of the west. Fortunately, the availability of heavy forestry ploughs and a knowledge of the efficacy of phosphate fertilisers on such land indicated a possibility of success and much peatland afforestation followed.

Sitka spruce planted on peatland appeared to start well, but often, after a few years, growth slowed to a virtual standstill, entering a condition known as ‘check’. Some recovery could be induced by fertilizer treatment, primarily with phosphate. It is likely

that the check resulted, in many cases, from the early practice of applying the phosphate as a spot treatment to individual plants rather than as an overall broadcast treatment.

No such growth difficulties arose with lodgepole pine, but there were other problems. The first was genetic: lodgepole pine is highly variable, and at first was thought to consist of two species – *Pinus contorta* (shore pine) from west coastal regions of North America, and *Pinus murrayana* from inland regions. A.C. Forbes planted a line of each at Avondale, and on the basis of observed early growth, chose the coastal variety for general forest use. This policy appears to have been reversed by Mark Anderson as Director, presumably because the inland variety had a better stem form. In the event neither has been successful so far. The coastal forms grow fast but usually have very poor stem form, conforming to its botanical name *Pinus contorta*, while the inland forms are of slower growth and often tend to become moribund in later stages, or as it was once put, "... it tends to peter out and die". The other problem with lodgepole pine is that, unlike Sitka spruce, it is subject to a variety of disease and insect pests.

It subsequently transpired that, while relatively high volume yields could be obtained through peatland forestry, the cost of growing and harvesting the product made the investment less attractive (Farrell and Boyle 1990). Fortunately, changes in European agricultural policy released more suitable forest land such as the widespread wet mineral soils. Even some land which had once been 'reclaimed' for farming became available, and the reclamation process was beneficial to the tree crop also.

Douglas fir has also been successful, but only on better forest soils.

In more recent years measures to reduce farm production, and increased incentives for forestry have increased the availability of land suitable for broadleaves, but those same incentives have at times led to pressure to plant broadleaves on less suitable sites. A condition of vigilance on the part of the Forest Authority needs to be maintained in order to avoid a heritage of large areas of unprofitable broadleaf scrub. There has also developed a fashion in public opinion that favours broadleaf planting, irrespective of the economic outcome, combined with a general, and quite unjustifiable denigration of Sitka spruce, primarily on the basis of its superficial appearance.

Research and inventory

Research is an essential component of any progressive organisation. It could be argued that Forbes has research in mind when he established the Forest Plots at Avondale. Certainly the growth performance of Sitka spruce there helped to encourage its acceptance as a suitable species from the 1920s onwards but the plots at Avondale fell far short of the rigorous experimental design standards later stipulated by e.g. Yates (1937), and Cochran and Cox (1957) for scientific research.

A Research Branch was formed with the establishment of the Forestry Commission in Britain in 1919 and the first scientific experiment of latin-square design on thinning was laid down at the Bowmont Estate in Scotland in 1930 which was to provide invaluable data for yield modelling in later years. Yet the Free State continued its afforestation programme without research, preferring to depend on Anderson and the Scottish cohort to provide the experience on species selection. Had research results been available it is possible that the fiasco of planting Scots pine on the Old Red Sandstone

podsol of Cork and Kerry in the 1920s and 30s might have been avoided. In the mid 1950s these Scots pine plantations were waist high and stagnating at 20-25 years of age. Many were burned, either deliberately or accidentally preparatory to ploughing, but when this practice was seen to be injudicious they were merely ploughed-in and planted with Sitka spruce after fertilising with phosphate. Forest research was deemed unaffordable to a department operating on a tight budget. When the question of affordability of research was put to Timothy McEvoy, then a high-ranking technical officer in the Forestry Division, his reply was succinct: "We can't afford not to have it".

Forest research finally arrived linked with forest inventory in 1957. Two main questions required answers. One concerned the westward expansion of forestry on to oligotrophic peats, the other sought information on the volume and growth potential of the forest resource in order to provide forecasts for sawmills and wood-using industries.

Peatland afforestation had already taken place in Britain but, possibly conscious of the Scots pine debacle of the 1920s and 30s through incorrect interpretation of species selection principles, it was decided to undertake research under Irish conditions on the most suitable site preparation, species and appropriate nutrition regime for afforestation of oligotrophic sites along the western seaboard. Rigorous design standards amenable to scientific analysis were observed for all experiments and LSD³ assumed a connotation very different from that of a hallucinatory drug in vogue at the time. Research findings were conveyed to management as information became available. Close liaison was maintained with the Northern Ireland Research Section and the Forestry Commission Research Branch and experimental results were compared at seminars and field tours.

The need for information on the forest resource became acute in the 1950s with the establishment of the hardboard manufacturing mill (Bowaters) at Athy and the chipboard producing mill in Scarriff. To satisfy demand a roading programme was undertaken to gain access to stands in which thinning had been neglected during the war years, but information on the extent, volume and growth potential of stands was not available. Information from an inventory undertaken during the war years was never uncovered.

The Forestry Commission had completed a National Forest Inventory in which data were transferred onto punch cards (Hollerith) for subsequent sorting and collation. The Forest Service adopted the system with minor modifications for the Census of Woodlands 1958/59. All state forest over 10 years of age was mapped into stands and species characteristics recorded in 'boxes' on field sheets. The information was then punched onto Hollerith cards. This provided the first reliable estimate of standing volume by species and area for state forests in the country, as well as providing information for growth forecasting. As a by-product it provided the forester with excellent stand maps of his forest with management information on time of thinning and felling. Subsequent inventories have up-dated the information with the digital computer replacing the Hollerith system. A criticism of the approach adopted was that ocular estimation of volume precluded any estimation of the accuracy of the volume estimate. This, however, could only be achieved by time consuming measurement of samples which, taking into account the urgency of the required information, was impractical in

³ Least Significant Difference

the first inventory. This feature is being remedied in the current National Forest Inventory where a system of Continuous Forest Inventory based on permanent sample plots is planned (Farrelly 2004).

Over the years other disciplines were added. A growth and yield section was formed in the late 1950s and a genetics section shortly afterwards. One of the early tasks of growth and yield section was to prepare a preliminary yield table for coastal lodgepole pine for yield forecasting of inventory data in the absence of a Forestry Commission table for that subspecies. It went on to lay down a series of thinning grade and thinning intensity experiments for various species which were to provide data for the construction of a yield model for Sitka spruce in Ireland. It was always felt that the British yield model for this species did not accurately represent growth under Irish conditions. A new dynamic yield model has been developed for the species, which it is planned to release in 2005 (Lynch 2004).

In view of its limited staff numbers genetics section concentrated on provenance trials of the two main species, lodgepole pine and Sitka spruce, and was instrumental in drawing up guidelines for the selection of seed provenances of the species. The authenticity of labelling by seed merchants, particularly the suppliers of lodgepole pine seed, required the utmost vigilance in order to avoid planting the wrong provenance. This could have had serious consequences when lodgepole pine constituted 20-30% of the planting programme.

With entry into the European Economic Community, currently known as the European Union (EU), forest health and hygiene assumed added importance. Previously our island situation maintained a barrier which was relatively easy to defend. However, the advent of the Single Market and the free movement of timber and plant material within the EU has made protection against forest insect pests and pathogens much more difficult. The discovery of the bank vole in Munster forests; the presence of the giant spruce bark beetle in Sitka spruce stands in Wales and the introduction of oak wilt from the United States into Europe are constant reminders of our vulnerability.

Initially within the Forest Service the Research Branch seemed to be regarded as an appendage rather than an integrated part of forest management to provide information for informed decision-making, but with time this situation improved. However, research was done on a somewhat *ad hoc* basis rather than adopting a long-term strategy with priorities and targets, followed by an audit to determine progress. This would have forced staff to spend more time analysing data instead of concentrating on fieldwork and establishing ever more trials. With time the accumulation of field data needing analysis became unmanageable. Official publication of research findings was spasmodic and readers had to resort to articles in forestry publications such as *Irish Forestry* for research results. In mitigation, there was no established career path within research, a fact which forced promising researchers to migrate to management or acquisition sections. Research Branch was always understaffed and under-resourced; some sections consisting of just one inspector and a field forester.

Private planting

The 1907 Committee, while it foresaw that the main thrust of a national afforestation scheme would be by or under the control of the state, also envisaged that "...corners and

small patches which are of inconvenient shape for cultivation or pasturage, ... might be profitably used for growing timber". That approach continued to dominate official policy for many years. The Forestry Act, 1928, controlled forestry on privately-owned land for the first time; it prohibited the felling of trees without a permit from the Forest Service, a move advocated by Jonathan Swift in his *Drapier's Letter No. VII*, first published in 1735. That act also provided for planting grants, without any repayment conditions as had been required under the British Forestry Act, 1919. But those grants were set at a level too low to attract significant areas into forestry, and farmers generally were reluctant to transfer any productive land out of farm use. Further, while not saying so publicly, the Forest Service believed that any available substantial areas would be better incorporated into its own operation. It was not until the mid-1980s, when European policy moved towards alternative crops, and when incentives were set at a more appropriate level and an annual tax-free premium was introduced, that private planting began to grow. With the continuing reduction of state planting by Coillte private planting now exceeds state planting by a factor of about ten.

Throughout the period prior to the mid-1980s private planting made very little impact on the overall programme. This was partly due to the availability of generous grants for reclamation of marginal lands that many agriculturists would privately admit to be better suited to the growing of spruce than stock raising. Soils along the drumlin belt were virtually impossible to drain and 'poached' badly in wet weather, whereas such soils were among the most productive in the country for Sitka spruce. Attempts by the Forestry Division to acquire some such areas were met with stiff resistance. This caused unnecessary resentment towards forestry in general. Forestry, even when privately undertaken, was eschewed by the farming community despite the examples of successful and financially rewarding plantations as shown on the O'Rahilly farm in Leitrim and the Tottenham farm in Clare. It is of interest that planting on the latter was undertaken only after futile attempts at reclamation and against the advice of an agricultural instructor. A more enlightened approach to land use on the part of the Department of Agriculture would have directed money that was ill-spent on attempted reclamation into rewarding plantations that would benefit the private owner. That farmers would have responded is demonstrated by the success of organisations such as the North-Western Co-Operative today. The ingrained inclination of each civil service department to protect its own sphere of influence resulted in a certain rivalry that militated against active co-operation. The position is exacerbated when both departments are competing for the same resource - land in this instance. Both the Department of Agriculture and the Forestry Division operated in isolation rather than in integrated land use development. As the dominant organisation responsible for the vast majority of the resource the onus lay with the Department of Agriculture to take the initiative. The position was resolved only in the 1980s when a superior authority, the EU, took the situation in hand and with the aid of generous grants and premiums over-rode the isolationism of both departments. Just as improvements in agricultural methodology helped to curtail destruction of the forests of Europe one and a half centuries ago, over-production in agriculture is now helping to restore forests to countries such as Ireland.

The Forestry Act, 1946, included a provision, not in the 1928 Act, that to every General Felling Licence "... there shall be attached ..." a condition requiring the cleared

land to be replanted within a specified period, and there is no provision permitting that condition to be rescinded. This incorporates the widely accepted principle that land under trees is normally deemed to be permanent forest.

The formation of the state company, Coillte Teoranta, in 1988, put forestry on a more commercial footing. A strategic plan – *Growing for the Future* – published in 1996 envisaged a target size for the industry or ‘critical mass’ which would require timber production to increase at least four-fold from a current 2.5 million m³ per annum to approximately 10 million and preferably to 12-15 million m³. The achievement of critical mass would require maintaining an afforestation level of 25,000 ha per annum to year 2000 and 20,000 ha per annum to year 2030, with a target yield class equivalent to Sitka spruce yield class 18 m³/ha/yr for all sites. Furthermore, the plan envisages reducing Sitka spruce to 60% of national average afforestation with other conifers replacing Sitka spruce on 20% of sites, and broadleaves on a further 20%.

The 1996 plan for afforestation of 20,000 ha per annum ran into difficulty when the EU made very generous grant and premium schemes available to farmers in order to get land out of agricultural production and avoid the creation of ‘beef and butter mountains’ through intervention. Farmers responded enthusiastically and land that might have previously been sold to Coillte was planted privately. Unfortunately the ‘stop-go’ nature of these schemes led to alternating periodic shortages and surpluses of nursery material, particularly broadleaves. As every forester knows it takes two to three years to prepare plants in the nursery, so advance planning is essential. Retrenchment of planting programmes left nurseries with plants that they could not dispose of which had to be destroyed. When planting resumed plants were not available and had to be imported from continental Europe, usually France. This has resulted in unknown provenances being planted and even some undesirable species, such as brown-bud or narrow-leaved ash (*Fraxinus angustifolia*) instead of common ash (*Fraxinus excelsior*). Although they are difficult to distinguish⁴ in early years, common ash grows into a magnificent forest tree up to 40 m in height (used for hurley manufacture, furniture etc.); the other into an overgrown shrub (up to 25 m in height) of inferior quality wood. Since they hybridise freely in southern Europe contamination of the native ash gene pool is a serious probability.

Conclusion

We have come a long way in the last 100 years and the future, as always, is uncertain, but with prudence and caution our forests can continue to develop and prosper and be a source of national prosperity and pleasure.

In looking back over the century it is appropriate to pay tribute to those who contributed in no small way to the creation of what is the Coillte estate today. They are the forest workers who, in the hungry 20s, 30s and 40s had what to them was a job in ‘the Forestry’, working for meagre wages on the slopes of mountains from Cork to

⁴ *Fraxinus excelsior* can be distinguished from *Fraxinus angustifolia* by its black buds and its leaves which show more serrations than lateral veins; *Fraxinus angustifolia* has brown buds and its leaves show the same number of serrations as lateral veins (Tutin *et al* 1972).

Donegal, as an alternative to joining McAlpine's Fusiliers in Birmingham, London and Manchester, and further afield. Although working conditions improved for later generations their lot was only relatively less demanding. They are the true builders of what John Mackay called 'Green Gold' (Mackay 1928).

Acknowledgements

We wish to acknowledge the help of Petri Vasara, Helsinki and Louis Carbonnier, London.

References

- Departmental Committee on Irish Forestry. 1908. *Report and Minutes of Evidence and Appendices*. H.M.S.O. Dublin.
- Cochran, W.G. and Cox, M.G. 1957. *Experimental Designs* (2nd edition). Wiley, New York.
- Connolly, S.J. (Ed.) 1998. *The Oxford Companion to Irish History*. Oxford University Press.
- FAO (Food and Agriculture Organisation of the United Nations). 1951. *Report on Forestry Mission to Ireland*. Stationery Office, Dublin.
- Farrell, E.P. and Boyle, G. 1990. Peatland Forestry in the 1990s. 1. Low-level Blanket Bog. *Irish Forestry* 47: 69-78.
- Farrelly, N. 2004. Personal communication. Forest Service, Johnstown Castle, Co Wexford.
- FitzGerald, G. 2004. Attitudes to Higher Education need a Shake-up. *The Irish Times*. 18 December 2004.
- Gray, H.J. 1963. The Economics of Irish Forestry. *Journal of the Statistical and Social Enquiry Society of Ireland* 21(3): 18-54.
- Joyce, P.M. and OCarroll, N. 2002. *Sitka Spruce in Ireland*. COFORD, Dublin.
- Kelly, F. 1997. *Early Irish Farming*. School of Celtic Studies, Dublin Institute for Advanced Studies.
- Lynch, T. 2004 Personal communication. Coillte, Newtownmountkennedy, Co Wicklow.
- MacBride, S. 1984. Personal Communication.
- Mackay, J. 1928. *Trodden gold: merchandise of silk, and paper and wood and the glory of the arat-tree*. Talbot Press, Cork, Dublin.
- OCarroll, N. 2004. *Forestry in Ireland – A Concise History*. COFORD, Dublin
- Rea, T. 1985. Irish State Forestry: Government Policy 1948-1959. *Irish Forestry* 42: 7-15.
- Review Group on Forestry. 1985. *Report to Minister for Fisheries and Forestry*. Stationery Office, Dublin.
- Room, A. 1994. *A Dictionary of Irish Place-names* (revised edition). Appletree Press, Belfast.
- Tutin T.G., Heywood V.H., Burges N.A. 1972. *Flora Europea, Volume 3. Great Britain*. Cambridge University Press.
- Yates, F. 1937. *The Design and Analysis of Factorial Experiments*. Commonwealth Agricultural Bureau, Farnham Royal, England.