

IRISH FORESTRY



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IRISH FORESTRY

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IRISH FORESTRY

VOLUME IX.

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NUMBER 1.

AN INTERNATIONAL VIEW ON FORESTRY

By D. ROY CAMERON.

I NEED not say how glad I am to be back. Anyone who ever visits Ireland, has opportunity to make friends with its delightful people, partakes of their boundless, if sometimes overwhelming, hospitality, and feasts his eyes on the charm of its countryside, always has a longing to return.

I am particularly happy to be here under my present informal circumstances, but I have the assurance of the authorities that I am welcome to speak to you in an unofficial capacity. So far as FAO is concerned, I am not on an official mission. I speak for myself only and can give you informally my own impressions and observations following nearly five years of service with an international organisation.

I feel, however, I should start by telling you something about the organisation for which I work. FAO was the first international organisation. It is dedicated to improving the standards of living of the world as the only sure road to enduring peace. Food is the primordial need of man. The complement of food is shelter, and throughout the ages, forests have provided the raw materials by which man houses himself and his family.

FAO is the international agency responsible for forestry matters and the Forestry Division is FAO's tool to implement that responsibility. Therefore the task of the Forestry Division is to assist governments in supplying the peoples of the world with what they need in wood and wood products in their progress to a higher standard of living. Aside from soil conservation and other indirect functions this is the target. The art and science of forestry, the opening up of new areas, reforestation, technological and engineering improvements in processing, are all but a means to one end.

To meet this target, the Forestry Division must know two things :

1. Actual present and potential future needs for forest products;
2. The possibilities of the world's forests for meeting these needs.

Need I dwell on the complexities in seeking answers to these questions. From time to time, government forestry and statistical officers become irked at the apparently insatiable demand from FAO for information to be assembled in complicated questionnaires. If there are any such here, I ask your patience, your understanding and your co-operation.

From data already gathered, it appears that even to-day world needs exceed supplies available from forests actually under exploitation. The Forestry Division looks for improvement in four general directions :

- (i) Better forest management to increase yields;
- (ii) Putting virgin forest areas into production;
- (iii) Increased reforestation;
- (iv) Better utilisation and reduction of waste, both in harvesting and processing.

Action in these four directions is needed, even to meet present world needs. How much more it is needed to give the enormous populations now using incredibly small quantities of wood per capita supplies they must have to improve their lives.

FAO's facilities for meeting its responsibilities in the forestry field have been greatly enlarged under the Expanded Technical Assistance Programme. ETAP is becoming more and more the "action-arm" of the Forestry Division. Under it the whole world may be searched to find the most competent expert to study conditions in a country and give appropriate advice to governments. Assistance can be given in the establishment and operation of forestry schools and research institutes, special equipment not available in a country can be provided for pilot plant operations, and, most useful of all, selected national personnel can be sent abroad for training or refresher courses or for study tours in their specialised fields. Regional projects fill a separate need. For instance, in 1951 there was a very successful Forest Fire Fighting Study Tour in the United States in which 26 delegates from 17 countries participated. A Timber Grading School has just finished in Malaya. A Far Eastern Mechanical Logging Training Centre is being organised in the Philippines, and a study tour of the genus, *Eucalyptus* will be held in Australia next fall.

I thought it might be interesting for me to explain something of how Technical Assistance works. It is directed primarily to improving conditions in the so-called "under-developed" countries. I say "so-called" advisedly because the term "Under-developed" is a very elastic term. In effect it means practically any country that finds any part of its economy less advanced than elsewhere and is willing to request aid from an international organisation under the Technical Assistance Programme. In Europe for instance, Finland, Austria, Western Germany, Portugal and Yugoslavia have called on FAO for technical assistance in one form or another.

Regulations governing Technical Assistance are established by a Technical Assistance Board, better known as "TAB." This consists formally of the Secretary-General of United Nations as Chairman and the Directors-General of the specialised agencies as members. In practice these officers are usually represented by their nominees. Funds are contributed by countries and allocated by TAB on the basis of individually approved projects within an overall quota for each participating agency or for certain purposes from a reserve fund.

The purposes for which Technical Assistance funds can be used are being broadened as experience demonstrates actual needs. It is interesting to note the last pronouncement of the General Assembly of the United Nations requesting TAB

"2. (a) To study the practicability of meeting the needs for supplies and equipment designed to increase the effectiveness of certain economic and social services in the under-developed countries, especially in respect of the establishment of training and research centres;

(b) To place great emphasis on the establishment of training and demonstration projects in the under-developed countries and on the provision of pilot plants and similar facilities. . . ."

I call attention to these things to show that opportunities might exist for Ireland, should your Government be willing, to apply for technical assistance on the basis that this ancient civilisation is still "under-developed" in the Technical Assistance sense, so far as forestry is concerned.

Technical Assistance requests are initiated on the request of a country. A review of the situation in the forestry field was published in the last (July-September 1951) issue of UNASYLVA, and I will not take the time to detail it here. In brief, requests are of three main kinds—general missions to study potentialities of forestry development, individual experts to make general recommendations on forest policy, and specialists to give advice on specific problems.

Reports and recommendations from all three kinds of missions are beginning to flow in quantity into Headquarters at Rome. These are documents of the highest importance because their nature will influence the form and manner of forestry development in many parts of the world. The procedure adopted in the handling of experts' reports is as follows: The basic premise is that the expert is an FAO Officer. He does not report to the Government direct but to his Headquarters: It is true that he is required to discuss a first draft of his report informally with the Government authorities of his country of assignment. This is in order to be sure that any recommendations made are in principle acceptable. However, on the termination of his field work, the expert is called back to Rome for the establishment of an official report, which is done in consultation with the appropriate technical officers of the Forestry

Division. The final report is formally transmitted as an FAO report either by the Chief of FAO's Expanded Technical Assistance Programme or by the Director-General.

There are three important features inherent in this procedure for handling experts' reports. The first is that the recommendations become official FAO recommendations and must therefore be thoroughly discussed, checked and screened before approval. The second is that proposals for capital investments requiring external financing can be presented by a country to the International Bank or to another agency with the implicit approval of FAO as being based on a realistic appraisal of development possibilities. Lastly, these reports may be expected to become basic forestry documents in the history of the establishment or expansion of forest policy and programmes in a country.

Differences of opinion have arisen and will continue to arise between FAO Headquarters and the expert with respect to recommendations to be made.

The Division is meticulously careful in recruiting the best available talent. The expert is always an outstanding man in his own field. He has had an opportunity of investigating conditions on the ground. It is only therefore in cases of departure from basic principles of FAO forestry policy or insufficient attention to the known social, economic or cultural limitations of a country that the Division would have to deny approval. Fortunately, no such action has been necessary to date. It has always been possible to reach amicable agreement with experts for any suggested revisions of recommendations. The processing of the final report is usually a matter of changed format, variation of emphasis and editing. Should, however, the situation arise where differences of opinion could not be resolved, the procedure envisaged is to send the expert's recommendations, together with FAO's comments on them.

With this explanation, which I thought would be of interest to a professional society, let us proceed to an examination of some of the problems which our experts must face in their assignments. Perhaps some comparisons useful to Irish forestry may be possible. The first and most important flows from the nature of forestry itself. Forestry is a longterm proposition and continuity of policy is an unconditional essential. This is very difficult, even impossible of attainment excepting under conditions of political stability and good government. By this I do not imply any particular form of government. I do mean competence of administration and adherence to an established line of action, including regular provision of at least a minimum annual budget. This is where, in many countries, our experts run into their first and greatest troubles.

Let us take for example a suppositious country which I will invent, which has all the difficulties which our experts run into in greater or lesser degree. Let us call it Darien. On arrival in Darien it has been all too quickly borne in on our experts that not only is there no knowledge of forestry administration, but there is little conception of the

ordinary principles of government. There is no co-ordination between ministries. To be political head of a government department is a necessary stepping-stone to power—to the presidency. Persons are appointed as departmental officers on the basis of their political strength and their primary job is to advance the influence of their minister. Every time a government changes, there is a clean sweep in the department. It is not to the interest of the current president to allocate large budgets to his ministries. To get the work of government done, it is necessary to set up a commission or to give executive authority to the national bank for operations in fields of activities of departments of government. Human nature being what it is (only moreso in some under-developed countries), friction develops and advances can be at best hesitant and uncertain.

Correlated with this kind of government setup, there is a deep unrest in the population. I do not refer to the conflict of political ideologies, but a stirring against the injustices of existence. There are two classes in the population only: the rich (the "intelligentsia") and the poverty stricken peasants, illiterate, disease-ridden, eking out a bare existence by subsistence agriculture, often in the form of shifting cultivation or grazing livestock on annually burned over forest ranges. These people of course produce no surplus for the economic betterment of themselves or their country. Their way of life is based on forest destruction and its terrible consequences in tropical or semi-tropical countries, e.g. soil erosion.

Population increases in Darien are forcing migration into higher and higher areas with accelerating denudation. Pressure of political unrest are building up which will result some day in an explosion far different from the ordinary revolutions between the In's and the Out's.

The solution to these problems in Darien must be found in the provision of alternative ways of life. The stopping of forest destruction by police action, if possible, would only hasten disaster. The problem far transcends forest policy. It means general land use planning, education and a host of other measures for the economic betterment of the peasant class which comprise by far the major part of the population.

The greatest single obstacle in Darien is the system of land tenure. Decades ago, large blocks of land were awarded to the favourites of the time and these holdings have descended from father to son. The result is that the land is in the hands of a few large owners who are more often than not absentee landlords. These holdings are the good valley lands capable of intensive agriculture. In reality they support a few head of livestock or lie idle. The great mass of the peasantry is forced into the mountains to live on lands which should be under forest or used under proper regulations for pasturage. Ownership here is merely an expression of temporary occupation under shifting cultivation. There are no proper surveys. There is no incentive to progressive agriculture or to the foundation of permanent homes. Incidentally, there is no class of the population with a modicum of education from which a strong intelligent sub-professional forestry staff could be recruited and trained.

The picture I have painted of Darien is a sad picture. It is, of course, not all true of any country but there is no one of the conditions I have given you that cannot be found in some country. The picture verges too near the truth for some countries, to be pleasant to contemplate.

There is, of course, another side of the picture. There are countries with large unexploited forests, with established forest services and with hopes and ambitions for development, which FAO can help to materialise. But here are other serious problems. Forests are inaccessible, living conditions for labour are difficult, malaria must be stamped out. The costs of opening up new regions by roads cannot be borne by the revenues derivable from forests alone. They must be based on overall plans for economic development in which agriculture and other interests must play their part. From the forestry angle, new industries must be planned which will be able to use a reasonable proportion of the forest output and not just one or two presently valuable timbers.

In this connection the proposed concerted attack on the problem of world pulp and paper shortages, particularly newsprint, may prove the incentive for the economic development of new territories. You may have heard that the Economic and Social Council of the United Nations, on the request of UNESCO, passed a special resolution at its 1951 Session calling attention to the dangers inherent in this world problem. This resolution, *inter alia*, asked FAO to study present and prospective needs and supply possibilities. Invitations have been sent to governments to use Technical Assistance facilities for making initial surveys to determine potentialities for pulp and paper development in their countries. I have just come from interesting discussions in London on the role which might be played by British Colonial Territories in this field.

The experience of our forestry experts under Technical Assistance highlighted the conditions essential to the solution of forestry problems. They are not new, but they are re-emphasised. They are either a part or flow from the forestry principles approved at the Sixth Session of the Conference of FAO. The more important essential conditions I might cite are as follows :

1. Forestry must be in its proper place in overall land use. That place will be determined by many factors of which the two most important are soil and water conservation in relation to agriculture and the production of raw materials to meet the needs of industry. Highest land use in the national interest may conflict sharply with short-term profitability from the local standpoint. The determination of land use must take into account the traditional ways of life of indigenous populations. Satisfactory alternatives must be established where fundamental changes are required.

2. Forest policy must be based on enlightened public approval above and apart from political considerations. This means a broad dis-

semination of knowledge of the functions and values of forests in a national economy.

3. There must be known and agreed targets for forestry development based on a realistic appraisal of social and economic benefits as compared with others forms of land use. Where natural forests are lacking, reforestation programmes are necessary.

4. The longterm element in forestry demands either that a considerable proportion of a nation's forests shall be publicly-owned, or that private forest lands should be under constant regulation with taxation and succession duty policies designed to make permanent management for maximum continuous production economically realisable.

5. Continuity of financial support to forestry is essential, or disastrous setbacks will ensue.

6. Forestry is a business (big business) as well as a science and an art. Proper administration of a national forest estate requires a stable, effective, adequately staffed organ of government, applying modern techniques and possessed of necessary research facilities.

7. Provision must be made for forestry education, both at the professional and subprofessional level.

8. Forests need industries for the use of the forest crop. There must be co-ordination between the development of forest industries and the output of a nation's forests. Forest management plans should be orientated best to meet the raw material needs of industries. On the other hand, the nature and size of forest industries, unless operating on imported wood, must be determined in the long run by the kinds of products derivable from the forests.

9. In many countries the importance of indirect forest functions—soil conservation, erosion control, maintenance of stream flow or water tables, far outweighs industrial values. The net cost of maintaining such forests should be a charge against the public revenues of a country.

10. Non-forest tree culture—the use of fast growing species such as poplars and eucalyptus—offers opportunity for economic improvement, the extent of which is still far too little realised.

11. The forest policy of a nation should be embodied in forest legislation which should set the targets and establish the ways and means of meeting them.

Many under-developed countries have a long, long way to go before these conditions essential to sound forestry can be met. Technical Assistance can point the way and perhaps give an initial push. The peoples themselves and their governments must work out their forestry destinies in accordance with their capabilities and vision. We know that much of the seed we are trying to plant will fall on stony ground. Some, however, will take root and grow. The more backward the country, the greater its need.

I am sure you have all been mentally applying the conditions I have quoted to the Irish situation. I do not propose to discuss that problem here. I only say that you have two most important pre-conditions to success, namely, a hard-working population, possessed of a high native intelligence, and soil and climatic conditions in large parts of Ireland unusually favourable for tree-growing.

May I now turn for a moment to the Report of the FAO Forestry Mission to Ireland. Two criticisms have come to my notice. Our good friend, Dr. Mark Anderson, has commented on the hardihood of an international organisation in attempting to assess Ireland's problems in a two weeks' period. No one knows better than I do the deficiencies and omissions of that report. I can only say that the term of the mission was set by the Government and the Forestry Advisor was fortunate in having the advice and assistance of many Irish officials. The Report is, I hope, the sum of their knowledge and counsel and not just a stranger's opinions.

More important, perhaps, because it will be more widely read, is an article appearing on Page 90 of the January 1, 1952 supplement to the "Irish Times" (1951 Irish Review and Annual). This article wonders where the money is coming from. The fact is of course that the Irish Reafforestation Programme was a policy of the Government of the day. The request to FAO was to review that programme. The decision to find the wherewithal had already been taken. In my humble view, it was in principle a wise decision.

One other point in this article needs clarification. The Mission Report does not recommend, as indicated in the article, that "forestry areas should not be less than 3,000 acres, following a fairly straight boundary." Straight boundaries, "yes," but the Report actually speaks of "aggregations of not less than 3,000 acres each." These aggregations would, of course, be made up of a number of parcels in a vicinity. The fact that it would be extremely difficult, even impossible, to acquire continuous areas of that size without doing damage to other proper forms of land use, was clearly understood. This is an important point which merits correction.

Aside from these misunderstandings, it is good to see some attention paid to the Irish forestry situation. It is a rather sad commentary on public appreciation to note that forestry is relegated to the closing pages of an annual Irish review. There is here your part of a world-wide challenge to forestry.

In the world to-day foresters have a part to play in raising standards of living that is not exceeded in importance by that devolving on any other class in the society of man. On their shoulders in the longterm rests to no small degree provision of conditions essential to enduring world peace. You in Ireland have it in your power to lay new foundations for a progressively increasing economic prosperity for this historic land which has a special place in the heart of every civilised man. May you and those who follow you in the Society of Irish Foresters be worthy of your opportunity and of your destiny.

IRISH DEER AND FOREST RELATIONS

By O. V. MOONEY, B.AGR.SC.

FEW of those who have any knowledge of deer will have failed to notice that these animals have increased in numbers considerably within the last fifteen years or so, on the mountains and uplands and even in the plains of this country. The forester has good reason to know this but were he to reflect would he, it is wondered, include himself as one of the contributory causes of this increase?

During the last and in the early parts of this century, the landlords' walled demesne and deerpark was the main sanctuary for deer. A deer breaking out of these walled enclosures, as they occasionally did, found himself in a land without much cover or welcome for him and amidst a people never far away from the border-line between hunger and starvation. Without the friendly cover of woods, he was given little chance of survival.

With the passing of the demesnes and the breaking down of deer park walls in recent times deer have emerged into the open country and have found alternative sanctuary in all parts of the country and have multiplied. This increase is general but there are one or two important exceptions in places where deer have been on the decrease during the last two or three years. But what of still much earlier times?

Of the various species of deer now found in Ireland only one, the Red Deer, is indigenous to our country and is recorded in history and by travellers from the earliest times. It was natural to and ran unfettered through the then extensive forests of oak, birch, ash, holly and fir, which covered the country, the Giraldus Cambrensis during his meanderings in Ireland in the 12th century made reference to them. The Normans, with their love of the chase, imported deer into Ireland and in 1244 a record shows that eighty deer, including Red Deer, were imported from the Royal Forest of Chester to stock the new Royal Forest at Glencree, County Wicklow. It is accepted that this event does not imply that Red Deer have become extinct in Ireland before 1244. The fact was that a wall or containing fence had been established in Glencree to keep in the introduced deer and possibly exclude the indigenous humans. Also it is clear that it would not have been worth any invader's while or neck to go hunting Red Deer in the hostile woods of County Wicklow. The existence of Red Deer in this country from the earliest times is clearly established by remains found in bogs and superficial gravels and in caves. At about this time too, 1250 or thereabouts, large numbers of Fallow Deer were introduced to the more strongly held estates of the Normans.

After the arrival of the Normans the gradual clearing of the natural oak woods began, first for boat and house-building and later for iron smelting until about 1750 when most of these woods had disappeared and with them most of the Red Deer.

In earlier times, during the reign of Queen Elizabeth I of England, the clearing of the oak woods which formed the main centres of Irish

resistance to the invaders became good politics and was pressed on apace. The iron smelting initiated about 1610 was approved as an aider and abettor of this process.

Round about 1750 we find that Red Deer were on the verge of extinction in the Knockmealdown mountains and another record shows that a few Red Deer survived in the Galtee mountains and Glengarriff until after 1830. While travelling in the West in 1834, William Thompson records that there were still 13 deer in Connemara and 12 in the barony of Erris. An exceptionally heavy snow in 1834 seems to have led to the extinction of the Erris herd although, and this will be of interest to Western foresters, it is also stated in a somewhat contradictory manner that the last specimen was shot near Nephin Beg in 1830.

Meanwhile, from about 1750 the landlords were planting trees in their demesnes, building walls and introducing species of deer within these enclosures. Various strains of Red Deer were imported from Scotland and England. However, a statement made in 1900 that "descendants of the Irish Red Deer only survive among the wooded mountains that adjoin the Killarney lakes and on the estate of Lord Fitzgerald, Wexford," is generally accepted as being correct. The Wexford herd in the Deerpark of Johnstown Castle, now a school and soil research station for the Department of Agriculture, was broken up about 1914 but some fine specimens have been preserved in the National Museum, Dublin. It is now generally agreed that Killarney is the only remaining district where the descendants of the original natural Irish Red Deer are to be found. There is, however, considerable doubt as to whether the pure native strain is still in existence.

Besides the Red Deer, the earlier introduced and later augmented Fallow Deer became widely established and introductions in the latter part of the century gave us the Japanese Deer and the Roe Deer.

LIFE HISTORY AND CHARACTERISTICS

It would be quite impossible here to deal adequately with the complexities of the life and habits of deer species known in this country as these not only vary from species to species but also within each species according to the part of the country in which they live. The account offered here, therefore, attempts at no detail but aims mainly at conveying the important facts of a deer's form and habits in a general way to those who may have very little knowledge of these animals.

There is one characteristic which the name "deer" suggests to most and that is the antlers. These are the horny growths which sweep and branch upwards with poise and nobility from and around the foreheads of most species of deer. To the huntsman and deer stalker the size and formation and ramifications of these antlers are criterion of quality and of achievement after a successful kill. To many poets they have been an inspiration and to the ordinary person they make the deer the notable

animal it is. The male deer or stag bears these antlers, the female deer, hind or doe has none. The form of these antlers varies from species to species and is one of the most obvious means of identification, at least in the case of the male. The development of these horny growths is interesting. When deer are about ten months old horns start to develop on the young male deer and from this to the second year they appear only as two spikes a few inches long. In the third year they develop, growing upwards and forming off-shoots. In the fourth year further height growth and stronger formation with additional branching occurs, and so on until the fifth or sixth year when the horns are regarded as fully developed. These stages of development are illustrated in Illustration II.

The spikes or horny points on a stag's antlers are generally known as points or tines. To the deer-stalker or hunter achievement is the killing of an animal with finer antlers and more points than normal. The pointed off-shoots from the main beam of the antler are also named. Thus the brow tine is the forward and upward off-shoot from the main beam immediately above the forehead or where it emerges from the head. The second outward and upward branch from the head is known as the "Bay or Bez" tine and the third branch as the "Tray or Trés" tine. The top set of points is known as the crown or coronet.

These points are illustrated and indicated in Illustration I which is a drawing of the head of a Red Deer stag with a fine set of antlers having 12 points. (See Illustration overleaf).

The Antlers are always solid and not hollow as in cattle and they weigh very heavily and require considerable building up so that in areas which are overstocked or the type of food poor, the antlers become quite degenerate on the stag. In certain areas it is said that the stags eat the cast antlers in order to contribute to the bone building of the new antlers.

Added to this development but almost as a separate phenomenon is the casting of the antlers or horns which occurs each year quite independently of any other development. In short a buck or stag loses its antlers or horns completely at a certain time of the year and then proceeds to grow them again and this event takes place each year in the life of the deer. In this country the phenomenon occurs between February and the end of April with most deer and so the stag or buck starts off at once to grow a new set which goes on until about August when the horns or antlers are fully developed. When growing, the antlers are covered with a furry skin called velvet, and when the stage of full development is reached, the deer rubs off this velvet until the hard horn is completely bared. This is accomplished by rubbing off the velvet on tree branches or other stiff objects.

Towards the end of August and through September, the preliminaries to the mating or rutting season take place and in most species this takes the form of battles between the fully grown stags for possession of groups of does and the result usually is that the strongest stags take over possession of numbers of does and keep company with them in a most

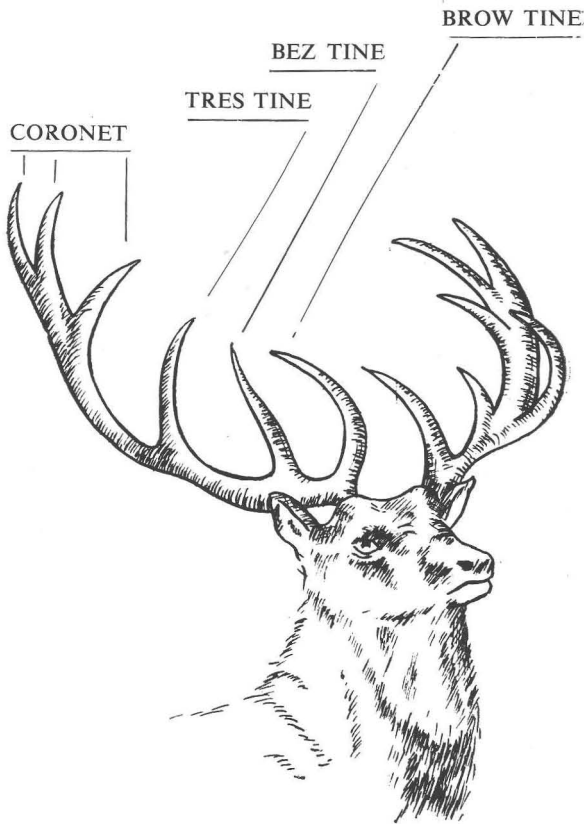
RED DEER HEAD. 12 POINTS.

ILLUSTRATION I.

jealous fashion for the month of October or thereabouts. At this time also, the roar or call of the stags and sometimes the clash of antlers can be heard echoing through the glens. Certain fine stags may dominate a district for years and annually beat off less endowed stags for possession of his pitch, but with old age the inevitable happens and some day a younger stag conquers, after which the one-time "monarch of the glen" after a few belated attempts at asserting his authority, has to lead a lonely bachelor life.

When the rutting season is over in November, the stags wander off on their own in small groups to different locations away from the does.

In certain species the stag may keep company with a doe or does the whole year round but this is not usual.

The chain of events is completed with the dropping of the calf or fawn by the doe in or about May. It is unusual for deer to have more than one fawn, but unless they lose their mothers the one fawn nearly always survives. The fawns are laid in a well camouflaged nest until they can walk and as they do not give off any scent, they are safe from a possible fox or dogs.

For food deer depend on grass, trees, shrubs, in other words, they are graziers principally, and browsers. The development of the animal and particularly the antlers depend greatly on the type and amount of vegetation available. When ground becomes overstocked with deer or where the vegetation is poor, the animals are small and puny with scrubby antlers. Deer are a menace to farmers' crops in districts where they are numerous and they also eat the leaves and twigs of broadleaved trees. They eat the bark and leaves of conifer trees also but this is not always regarded as a natural food for deer.

THE SPECIES

THE RED DEER (*Cervus elapus*). Indigenous to Ireland.

This deer has been described as the finest animal embodiment of nobility and freedom. In paintings and in poems it is invariably described as the "monarch of the glen" or the monarch of the Forest. These eulogies are well merited.

The Red Deer is found all over Europe where there are large forests, from France through Germany to Russia and south to North Africa in Syria and even on to Persia, in England and in Scotland.

In Ireland, the species is found principally in the Killarney district and in the Wicklow mountains. It is generally agreed that the Killarney deer are not now pure natural stock. Up to about 1880, it is believed that the stock in and out of the Deer Park at Muckross was of the pure native strain. Later, however, stags were imported from Scotland and from Windsor Great Park and soon an improvement was noticed in the size and general bearing of the antlers from shot deer. Also, the deer became heavier and a good stag of 18 stone and 10 points, shot round about 1870, could not compare favourable with a good stag of 26 stone and 12 points about 1916. The native type of deer was definitely smaller, redder, and its horns more upright and thinner than the breed later met with which were heavier, with antlers thicker and more spreading. Recently, fine stags have been shot and 13 points with 27 stone have been recorded. In Killarney, the Red Deer are confined in the Vincent Memorial Park at Muckross and in the Kenmare Demesne and range free on Mangerton through Torc on to Derrycunihy where they are said to be about 300 in number.

In Wicklow the strain is not native though two definite types are recognised by some observers. The stock is mainly supplied from the nearby Deer Park at Powerscourt, which have spread westwards and range across Glendalough into Glenmalure, into Aughavanagh, in the foot hills and valleys of Lugnaquilla. Red Deer were also at Ballinacor in Glenmalure, but whether the herd have broken out or was dispensed with is not known.

Red Deer are not numerous in Wicklow and are unlikely to increase greatly as they are less vigilant than the Fallow and Japanese deer and fall an easier prey to the marksman or pot hunter. When Dr. Peter Delap published his peerless record of his personal observations of Wicklow deer, he estimated the Red Deer in Powerscourt at 60-65. It is likely that there were more deer outside the park at that time but while they must undoubtedly have spread since then and increased their range considerably there are no reliable grounds for believing that there are more than 60 deer of this species in the Wicklow mountain massif to-day, and there may be less. About 300 Red Deer are reported in the Killarney district. Red Deer stags with antlers of seven to nine points are usual in Wicklow, while finer stags with antlers bearing more than 10 points are rare. The Red Deer stag, the biggest of our deer, measures from $3\frac{1}{2}'$ to $4'$ in height at the shoulders or withers and his length from nose to tail up to $80''$, and his weight anything from 15 to 30 stone with records over 40 stone, but an animal over 20 stone is considered big nowadays. The doe or female is generally smaller and lighter. The stag's antlers are round, rough and grooved along their long axis. Characteristically there is a very prominent brow tine and a big tres tine with a surmounting three-pointed coroney.

The coat of the Red Deer is reddish brown and short during the summer, changing to a bristly grey affair in the winter. Two definite types are reported from Wicklow, one small and red coated, the other heavier and grey coated. The Wicklow type generally is also distinguishable both anatomically and in colour from the Killarney deer by those who have observed in both places.

The neck is long, the tail very short and the limbs slender and ears long and pointed. The face, throat and under parts are duff grey. The sides of fawns are white spotted but these disappear with age.

The Red Deer stags fight among themselves during the rutting season but it is not usual for them to do each other serious injury. Sometimes two stags may die due to interlocking of the antlers. The call of the stag at mating season is difficult to describe, but it is often referred to as a roar. Even when kept in the semi-natural state in the parks, stags have seldom been known to attack man and in the wild they put the greatest distance possible between them and humans. However, unfortunately the Red Deer are not canny as other deer and when startled pause and gaze anxiously at the intruder and then maybe run a bit, pause again and look again. Whatever may be the underlying reason for his emulation

of Lot's wife, it frequently provides opportunity for the huntsman and the downfall of the noble animal.

THE FALLOW DEER (*Cervus dama*).

The Fallow Deer is not indigenous to Ireland but was introduced in early times. Giraldus Cambrensis made no mention of Fallow deer, but this is not conclusive evidence that they were not in the country at the time. They possibly came with the Normans with the introduction into the Glencree Royal Park in 1244. One interesting record tells of a gift of twelve fallow deer in 1296 from the Royal Forest at Glencree to Eustace le Poer, ancestor of the Powers of Curraghmore in County Waterford, but the actual date of introduction is uncertain but was certainly very long before 1600.

Since then, the Fallow Deer has spread by its own wanderings and by introduction to many parts of Ireland and is present in far greater numbers and with wider ranges than any other of our deer species. It is to be found in the midlands, west of the Shannon and on to Sligo and Donegal through Cavan and Monaghan, in Wicklow and Tipperary and Waterford, south-west to Killarney, most often in the semi-confinement or immediate vicinity of their old home demesnes and less frequently ranging nomadically, a frequenter of the lowlands and foot-hills and it is rarely met with in the mountains away from the grass and green fields.

Geographically, the Fallow Deer's natural distribution is in Southern Europe and Asia Minor. It is natural in the Ibernian Peninsula and through Southern France, Italy, Greece and Rhodes and Palastine and has been introduced into many of the more northerly countries.

There are several well-defined features by which this Fallow Deer can be distinguished from other deer in this country.

First, the Fallow Deer is smaller than the Red Deer, being from about 30" to 36" in height at the withers and about 60" to 68" from nose to tail tip and weighing about 10-15 stone in the case of fully developed males.

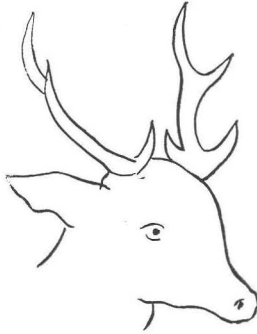
The fully developed antlers of this stag spring from the head as round horns but having thrown off a brow and a Bez tine, they flatten out in the fashion of Irish Elk antlers and give off small pointed spurs from this flattened area. (See Illustration II overleaf).

The colour of the coat in the summer is a rich fawn with white spots on the sides. The neck is greyish brown and along each flank passes a well-defined white line, and along the back and tail, which is blackish and longer than other species, runs a line of black hair. The buttocks are white. Dr. Delap emphasises a telling point in that when either the Red and Japanese deer are going away from you, the impression is just that of a white posterior but with the Fallow deer, the longer tail is emphasised as being superimposed over the white area.

2nd YEAR



3rd YEAR



4th YEAR



5th YEAR



6th YEAR. FULL DEVELOPMENT.



DEVELOPMENT STAGES OF
ANTLERS IN A YOUNG
FALLOW DEER.

The Fallow Deer in the wild state is altogether more cunning than the Red and rarely gives the marksman a second chance or even a first one, for that matter. This instinct of distrust towards man is very strong and they will not willingly cross or use paths or roads during the day-time. Like all deer, they come out to feed early in the morning and late at night but lie close in or near cover during the day. In the wild state these deer are not gregarious but wander about in small groups and the sexes segregate until the stag, which is polygamous, starts to gather his harem in Autumn. For food, the Fallow Deer depends mainly on grass but is also a natural browser on trees and shrubs and when occasion arises makes excellent headway with the farmers' crops. Though the antlers of the Fallow Deer are not so much prized as the Red Deer, his venison is much superior and makes excellent eating.

THE JAPANESE OR SIKA DEER (*Cervus nippon*)

This deer is a comparatively recent introduction to this country and seemingly did not arrive till late in the 19th century. It has, however, broken out of the few demesnes where it was established and has readily accommodated itself to the country and particularly to the mountains and has become quite numerous in certain locations.

The Japanese Deer were introduced into Powerscourt demesne, County Wicklow, in 1884 and in 1935 Peter Delap stated that there were some 500-600 head and that they had overrun the entire Deer Park. Perhaps indeed, soon, they will invade the whole mountain area of County Wicklow. Japanese Deer were also introduced into Killarney, probably about the same time and found the country there equally to their liking so that the present estimate of the number of head in that district is 700 and is probably more. There is also a remote suggestion that the Japanese deer was introduced into Waterford probably at Curraghmore but it is not named as one of the species found at large in that county or the Suir valley to-day. It has a few other stations scattered over the country but has never increased as in Wicklow and Kerry. Its natural range is Northern China, Manchuria and Japan.

The antlers of the Japanese Deer are round but shorter and simpler than any others of the Red Deer group. They arise from the head with an immediate light brow tine but then develop more or less upwards without any Bez tine instead of sweeping outwards and then upwards as with the Red Deer. There is a tres tine and then the crown which may consist of one to three points as in Illustration III. (See overleaf).

The coat is spotted in summer and there is a very distinctive white region about the tail which is very noticeable when the animal is moving away. The tail is a comparatively long one—but not as long as in the Fallow deer—with a whitish tip. The coat is chestnut-red with numerous white spots in the summer of which there is little trace in the winter. The coat is very dark and almost black in the stag and doe

JAPANESE DEER. ANTLERS.

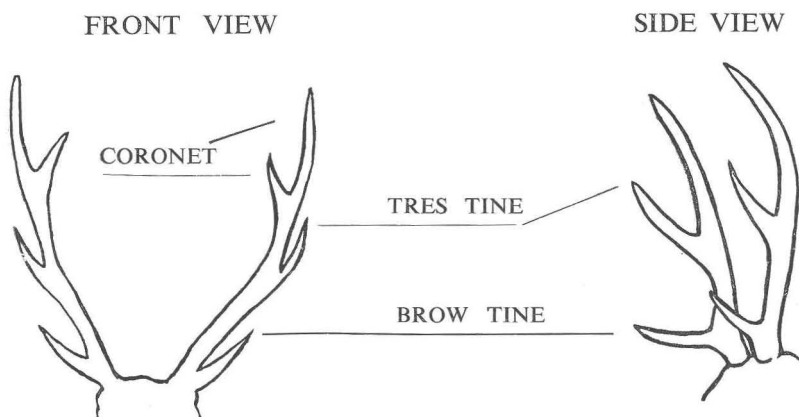


ILLUSTRATION III.

during rutting. The average height of the buck at the withers is from 2' 6" to 3' with exceptional stags up to 3' 3". Heads with seven or eight points are not unusual but nine points or more are rare. When on the run the Japanese Deer may also be distinguished from the Red and Fallow deer by reason of its hopping or jumping up-and-down motion whereas the Red or Fallow appears more to canter along with an even unhurried motion. Good sized stags of Japanese deer may weigh up to 115 lbs. entire, or 90 lbs. cleaned etc., but the majority of animals weigh much less.

The habits of this animal are similar to those of the Red Deer. It has adapted itself well to mountain conditions in this country and is a great frequenter of young plantations. Above all the other deer we know it displays the keenest sense of human approach and the greatest cunning in avoiding the marksman or hunter, but as a prize, the venison is regarded as far superior to any of the others.

ROE DEER or ROE BUCK (*Cervus capriolus*).

Mention of this deer must be made here because it has not been possible to establish definitely whether or not it still inhabits parts of our countryside to-day. A description of the deer may at least encourage anyone who has seen a similar animal to record the fact, and make it known.

Roe Deer are recorded as having been introduced into the Gore-Booth estate at Lissadell, County Sligo, late in the 19th century. This

herd, however, became extinct as the Roe buck does not flourish within the demesne wall. Reports of animals resembling Roe deer have been received from various parts of the country but in no case yet has the evidence been conclusive.

The Roe deer is supposed to have been natural in England in early times but to have died out and been re-introduced, at any rate there is no evidence at all of its being indigenous to Ireland.

It ranges naturally through most of Middle Europe into Asia Minor and Russia and it is as a part of the forest and forestry in Germany where it is the renowned Roe buck of the chase.

The Roe Deer is a very different animal to other deer described here, both as to its size, habits and antlers. It is small, only 2' to 2' 6" at the withers measuring about 4' from tail to nose tip and weighing from $2\frac{1}{2}$ to 5 stones. In general, colour of the coat is brownish-grey and the very stiff coat is shorter and redder in the summer and long and greyer in the winter. It has a pure white rump disk and a short stump of a tail. A characteristic of this deer is its very long ears and its straight short stout antlers which rarely exceed 1' from base to tips. (See Illustration below).

HEAD OF ROE DEER STAG.



ILLUSTRATION IV.

The antlers are very rough and are covered with horny nodules or pimples and bear no brow tines and divide into three points at the summit. The bucks shed their antlers in the first week of November and new horns start to grow at once and are half grown in January and fully grown and cleaned by the middle of April.

This little animal is a lover of the glens and forests and seldom ascends to high mountain heather like the Red Deer. The rutting season commences in July and is over by August when the stag goes away alone returning only to the does and fawns in the following May. The doe drops her calves in May or June.

The Roe Deer is very agile and fast and a very good and strong jumper. Its normal diet is from browsing and is much less a grazer than the other deer described. In the semi-wild state or when cornered the stag is said to be very dangerous and there are numerous records of their ferocity and of fatal attacks on man.

OTHER DEER

Doubtless other kinds of deer have been introduced from time to time and there may be stray individuals or small groups about the country. A white deer has been repeatedly reported in the Wicklow Mountains and is often referred to as a Chinese deer but reliable observers tend to the view that it is a "sport" or an albino, the product possibly of inbreeding amongst the Red deer. On the other hand there was once a herd of white deer at Grange Con in West Wicklow. These animals may be the descendants of that herd.

Several deer, small, with a pair of unbranched upright horns have been shot in the Roundwood area of Wicklow and are said locally to be a cross between a Canadian Wapiti introduced into Powerscourt, and the Red Deer. This does not seem probable as the Canadian Wapiti is a much heavier animal than the Red and bears bigger and thicker antlers. This deer has been shot by experienced men who would be unlikely to confuse the short un-branched horns with a young buck of the usual species but as yet, this oddity has not been named conclusively.

FOREST RELATIONS

The deer is part of the forest life and there are few foresters who would not mourn their passing were they for some reason or other to become extinct in our country. From time to time readers of periodicals dealing with nature and country life will find contributors who make strong cases in defence of deer with a theme that deer do little damage to forest trees and indeed there are extremists to be found who will argue that deer do no damage to trees at all.

It can, however, be stated with certainty and in a spirit of tolerance and admiration towards these fine animals that deer do damage both to broad-leaved and coniferous trees in the younger stages sometimes to a lesser and sometimes to a fatally serious extent according to the species of deer and other governing circumstances. Members of the Society who attended at any of the excursions to Aughrim, Urlingford and Glencree

must be convinced of this fact. The damage to young forest trees by deer is carried out by both the antlers and by the teeth.

The damage by antlers is caused mainly during the period when the velvet is being cast from the fully developed antlers. In order to aid this process and, as it is said, due to irritations set up by the casting velvet, the deer rubs its antlers vigorously on young trees which are stiff enough to sustain the pressure. This results in a vertical stripping of the bark which is often carried right round the tree with its resultant destruction.

This type of damage is done to trees from the time they develop their stiff stems, i.e., from 1" to smooth barked poles up to six or seven inches. Losses brought about in this manner are often very serious and accounts of stricken trees in badly hit areas are as much as 100 per cent. and often over 70 per cent. causing death or serious damage. It is probably fair to state that all of the usual coniferous and broadleaved trees used in forestry practice are attacked in this way but some are much more seriously visited than others and *Pinus contorta* of the conifers with its long internodes is selected out for special attention. Scots pine is also seriously attacked and larches are also damaged but to a lesser extent. The deer do not seem to relish rubbing their antlers on the prickly internodes of the Sitka spruce as no doubt the needle-like leaves prick their heads and ears during the process but nevertheless, this spruce is not immune and is frequently damaged where there are large areas of pure Sitka and no better alternative for rubbing off the velvet. Norway Spruce receives some attention too as does Silver Fir, *Tsuga* and various hardwoods.

The type of damage described occurs in conifers from about four to eight years after planting but more serious damage still is done to smooth barked light poles of Douglas fir and Norway spruce which are frequently killed. Japanese deer are generally acclaimed the greatest villains in this respect, while Fallow deer do a good deal of damage too, particularly to hardwoods in lowland forests, but most observers agree that Red deer do comparatively little damage in the way described. However, the Red stag does erratic but unimportant damage by lashing at conifers of six foot high and thereabouts and breaking their tops.

The second type of damage, that is injury done by using the teeth, requires attention under two distinct headings.

First comes the browsing which amounts to nothing more than the eating and nibbling of leaves and young shoots in the same way as goats deal with any hedges or shrubs within their reach. This is a natural method of feeding with deer and they are particularly severe on broadleaved trees and it is quite impossible to grow beech, oak, ash and other such like trees beyond the size of stunted bushes, as where deer abound they are eaten back every year. In rare cases where a broadleaved tree manages to grow to ten feet or more, the deer can be seen with their forelegs supporting them on the lower stem of the tree and with extended

neck reaching to the leaves in the upper parts of the young tree. Fallow deer do a lot of damage in this way which is only natural as they frequent the lowlands where broadleaved trees are most often to be found. On the other hand, conifers are also browsed down in the upland and mountain plantations and *Tsuga* (Hemlock spruce) and *Abies* species (Silver firs) are selected out for special attention which frequently nullifies under or interplanting of these shade-bearing species in deer frequented country. Of the hardwoods, beech appears to be a special favourite but oak, ash and mountain ash, sycamore, Spanish chestnut and in fact all broadleaved species receive considerable attention. Often too, in newly planted areas of conifers, deer will pluck some plants out of the pits and nip the tops off others.

The second type of injury done to the trees by the teeth of the deer is the eating or stripping of bark of both conifers and hardwoods. Here we are dealing with a very debatable and much more complex subject because there are many who will not admit that deer eat tree bark and there are others who, with some reason, argue that the eating of bark is not natural to deer and only occurs under abnormal conditions.

From collected evidence of observers it seems certain that deer eat both conifers and hardwood bark. Furthermore, and conclusively, conifer bark has been found in the stomachs of deer. Further still, it is evident from teeth marks on a tree without the slightest trace of bark under the tree. With the conifers the eating of the bark occurs on young plants usually before they reach six feet or thereabouts when the bark is more tender, but taller conifers are also attacked in this way. This seems reasonable when one reflects that young conifers of the type mentioned would not have the requisite rigidity for rubbing the antlers effectively. This is a particularly deadly form of attack for while a deer may rub off the bark on one side of a young tree with its antlers, the eating process may often proceed completely round the tree and kill it.

Pines, *Abies* (Silver Firs) *Tsuga* (Hemlock spruces) and young larches are most attacked in this way and severe treatment is handed out to all hardwoods. There is no doubt that hard cold weather and snow aggravates such damage because there is nothing else to eat and hunger drives, but there is evidence that it occurs, though to a lesser extent, in the ordinary course of events. In the case of both Red and Japanese deer, eating is definitely carried on more intensively by the does during the four months preceding the arrival of the young fawns, and Contorta pines and other pines are treated in this way in the mountain areas of Wicklow.

Teeth marks are easily discernable on trees from time to time. With pole hardwoods the deer may grip the bark at the butt of the tree and then rising its head quickly rip a strip up to a few feet from the ground, and then eat it. The Japanese deer once again heads the list of the accused and convicted with the Fallow a close second, particularly with hardwoods and the Red deer a lesser offender.

In any year when an unusually hard winter is experienced and snow lies for long periods very serious damage is done to hardwoods and conifers, even up to the heavy pole stage, and this fact itself suggests an argument in support of those who argue that deer are not naturally bark eaters as the conclusion that if natural foods are available in sufficient quantity no bark eating takes place, is quite reasonable. In any event the question as to whether the eating of conifers is a natural habit with deer is one which seems to gather most answers on the negative side. There are some places where reliable observers are very emphatic that no damage is done by deer eating bark and observers in other countries very often support this view. This is stated to be the case in Killarney.

Another type of damage often experienced and most usually attributed to Japanese deer is the plucking out of young plants from their pits just after planting or in the first year or so; plants plucked out in this manner are often consumed.

Unless some outside interference occurs we must, it is considered, expect an increase in the deer population in certain mountain areas in which Red and Japanese deer are already established and in which big areas of coniferous plantations have been laid down. Forestry plantations from the greatest planting decade 1930-1940 are now mostly pruned through and opened out or in the case of the most backward areas, crops are in the thicket stage. Though blanks and open spaces are always adroitly utilised by deer for safe sanctuary, once opened up and pruned through the crops provide greater sanctuary, for the does at least, to move about in and while the nearness of the trees at this stage does not allow of free movement of fully antlered Red or Fallow stags it seems that the Japanese stag with his tidier and more narrowly borne antlers can move around woods at the first pruning and opening out stages with a fair degree of freedom. Thus, a forester does well to consider how the deer will react before pruning through very light crops as his action may be but an invitation to trespass.

Following the first and second thinnings the forest becomes a natural home and protective fastness for the deer from which they can move out and around to feed and complete their life cycles. We foresters, it seems therefore, are creating conditions which may favour the increase and spread of deer of all species extant in our country. This is certainly not a bad thing and not likely to have any seriously detrimental effect on our plantations if the number of deer can be kept under control.

At one time deer were effectively kept outside plantations by erecting 8' deer fences. This method of protection may have had practical application during the period when planting projects were not so big as they are now and when the activities of deer were more localised and their numbers less.

Now, however, at the cost of £1 per yard an 8' deer fence completely hung with netting wire and said to be—but not always actually so—deer-proof, is a prohibitive proposition as general policy. We must rely

principally on measures of control by planned and well-conceived shooting of the deer with a prime object—limitation but not extermination—in view. With a suitable number of professional marksmen operating this is possible and not difficult to achieve.

The worst deer damage ever seen by the writer has been in plantations which have become well-established after the cleaning period and have been then felt unobserved to fend for themselves in the pre-thicket stages. The deer may enter and frequent such areas for long periods before their presence or resultant damage is detected. It is in such cases that damage to individual trees may be as much as 90 per cent. over ten acres or more with a high mortality rate. If, however, deer are chivied and shot at, such damage is not likely to occur. Vigilance, therefore, on the part of the custodians of plantations is a vital factor in deer protection as it is with rabbits and competent measures should be taken when early detection is achieved.

In shooting deer or directing their control we would do well to remember that the Red deer, the finest of our deer, is the most easily shot and yet, as acknowledged by all, is the least harmful to forest plantations. The Japanese deer is an animal with much greater elusive qualities and powers of multiplication—is unanimously agreed to be the greatest villain in its relations with forest trees.

Another point worthy of comment is that the deer species are not embraced by any of our Game Preservation Acts. There are, however, certain signs which suggest that the time may not be far distant when they should be brought under the wing of some of our legislation.

Apprehension must be expressed for the prolonged existence of Red deer in the Wicklow Mountains. Even the Japanese deer may be in process of reduction though this is not yet definitely observable. Both local people and armed visitors from the city combine to carry out a slaughter on the deer quite devoid of all sportsmanship and very frequently dominated by greed or financial gain. These people who are no mere handful have one object only, to kill. The various methods by which this is achieved are not superior to those used in killing rats. There are those, too, who come out as sportsmen and marksmen but none the less, they take their toll. We may accept that this inquisition goes on the whole year round even when the does or hinds are with young. There is no close season for our deer, they are shot down at all times. It is doubtful that they can bear this. If the Game preservation authorities took an interest in this problem it is believed that they could be convinced of the need of taking deer into their conservations.

Foresters, on the other hand, would be missing something if they did not look into the future and consider the prospect of bringing deer shooting on their properties under control and bend it to their own gain as is commonplace in European countries. When Irish foresters get older and when their plantations get older too, and become forests, they

will be able to walk in company with their deer in greater harmony. Meanwhile, we in Wicklow at least, will have to try and save them from extinction.

Finally, we foresters could profitably get to know a great deal more about deer than we do. Deer are not so widespread as rabbits, about which we are bound by training to know a good deal, yet when they inhabit a district in numbers they may cause much more destruction because they cannot be reasonably excluded from planted areas by marginal fences as can the rabbit.

The preparation and substance of this article has been greatly helped by the knowledge and suggestions generously supplied by Messrs. J. A. Crammond, K. Cremin, J. Critchley, J. Doyle, O. Grant, P. O'Grady of the Forestry Division, Department of Lands, by Dr. Peter Delap and Mr. H. M. FitzPatrick and by Miss Geraldine Roche of the Natural History Museum.

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PINUS CONTORTA as a Forest Tree in Ireland

By P. F. O'KELLY.

FROM the point of view of artificially regenerating exposed infertile upland—heaths and moors *Pinus contorta* is the most valuable species, either exotic or indigenous, in national reafforestation at present. It was introduced together with *Picea sitchensis* and *Abies nobilis* into England in the year 1831 by David Douglas who was acting as collector for the Horticultural Society of London from 1829 - 1832 but it did not make its appearance in Irish State Forests until comparatively recent years—not before 1922 and perhaps as much as 3 to 5 years later.

Our oldest stands of *P. contorta*, on this account, do not exceed 30 years and the area of stands over 15 years is comparatively small. Our knowledge of its behaviour, therefore, is limited roughly to the first half of the rotation set down for it—50 years.

While I lack the benefits of a widely scattered picture of its behaviour on other soil types—my observations of this species are confined mainly to Kilworth and Ballyhoura Forests both of which overlie Old Red Sandstone with iron pan,—difficult sites, indeed, for any species—the stands of P.C. at Kilworth, will, in my opinion, compare favourably with other stands in respect of age, vigour, and quality and its performance on O.R.S. may be used as a convenient yardstick. I write, then, not as one professing to know all its possibilities, but in the hope that what I have observed will benefit those who, like myself three or four years ago, find themselves with large areas of P.C. at the pruning stage and are undecided what to do with them; whether, in view of its present rather low rating as a timber tree, it is worth the expense of pruning it or, having pruned it, will it be subject to wind throw if it is thinned. Further I wish to point out some of the pitfalls that should be avoided, especially in thinning, and to draw attention to some of its silvicultural possibilities.

Pinus contorta, otherwise known as Beach Pine—this being the dwarf form of the barren soils of the windswept Pacific Coast—or Lodgepole Pine, the tall form of the mountains further inland and so called from the fact that it was used by the North American Indians to support their tents, is indigenous along the Pacific seaboard of the U.S.A. to the states of California and Oregon; it is abundant on the Cascade Mountains, along the banks of the Klamath and Columbia rivers; it is found also on the pumice plain between the Klamath Lake and Des Chutes River. The tall form variety *Murrayana*, is the one in general use in Ireland.

Pinus contorta (Douglas) Synonym *P. Boursieri* (Carrière) is an evergreen tree, of moderate or small size, of comical outline, with numerous sub-erect or spreading branches. In its young state it is a compact pyramidal, densely branched tree well furnished with a grass green foliage. The specific name **CONTORTA** was probably suggested to Douglas as Dr. Newberry (Pacific Railway Report) suggests by the appearance of some of the dead trees on the pumice plain between the Klamath Lake and Des Chutes River. It belongs to the *binæ* group of

pinus and is classed as a hard pine with *sylvestris*, *laricio*, *densiflora Thunbergii*, etc. It has small leaves $1\frac{1}{2}$ " - 3" long, closely resembling those of Scots Pine (*P. sylvestris*) but of a brighter shining green, slightly twisted and ending in a sharp point. The variety *Murrayana* has longer leaves which are also more twisted. The buds are brown in colour, very resinous, cylindrical with a sharp tapering point. The cones are ovoid or conical about $1\frac{1}{2}$ " long and persist for several years. The branches which have long and short shoots are borne in whorls of six to eight—generally six. Bark is thick and varies in colour from a greyish green to dark brown, much fissured and sometimes flaky towards the base of young trees and very hard.

As nursery treatment varies so little for most of the pines the following remarks will suffice in this respect. There are roughly 78,000 seeds per lb. and the germinative capacity is something around 60 per cent.; thus production per lb. at 1 year will rarely exceed 45,000 plants for broadcast sowing in beds and 35,000 to 40,000 must be considered an excellent result. A medium tilth and light covering is all that is required for sowing the seed which takes from 3 - 6 weeks to germinate. One-year-one transplants are considered best but I suggest that seedlings and transplants be graded rigorously in an effort to avoid having an uneven canopy which is a feature of quite a number of P.C. stands.

Excellent results have been obtained by mound draining along the contours at 6 or 7 yards apart,—and picking of the retentive peat with mattocks before setting out the turves has proved beneficial. The turves should be trampled to make them settle and a period of six to nine months weathering, to allow injurious humic acids to be washed out of them, should not be overlooked. However, mounded areas should not be left unplanted longer than 12 - 18 months as there is a considerable washing away of the soil after that time. The need for intensive mound drainage with the contours cannot be overstressed as this brings about a firm soil which in turn generally results in a straighter crop. Planting in pits seldom gives results nearly as good as planting on turves and even on the better types of heath mound draining and turving eventually will re-pay the extra cost.

Sometimes areas are mounded by cutting the turf and placing it alongside the resulting shallow pit; this method, while it is considerably cheaper than mound draining and setting out turves, is not to be recommended since the shallow pit is generally water-logged all through the winter and often for periods during the summer, thus checking growth in the initial years and later in my opinion causing a number of the stems to lean.

Planting with seedlings on turves, (of which there is a really good example in a seventeen year old stand in Compt. 49, Kilworth Forest), is an excellent idea. There may be a danger of the seedlings being thrown out of the mounds by frost during a severe winter but since the cost of seedlings leaving the nursery is considerably lower than the cost of one-year-one or older transplants and since seedling planting in ploughed turves reduces planting costs considerably it may be cheaper to fill

any blanks resulting from frost throw or failure than to plant with transplants in the beginning. Needless to say if the initial cost of establishment can be reduced it will further enhance the value of the crop. Seedlings to be used for planting should be graded, only those with a "neck of timber" being used for planting out on mounds.

Planting on mounds can be done both cheaply and quickly if the following method be adopted. The gang or squad of men, using wide spades, slit the mounds roughly half-way across and prise one side of the cut upwards. When it is considered that a sufficient area of mounds has been slitted one man for every seven or eight men in the gang continues slitting and the remainder with plants in buckets or planting baskets commence to plant. One man unencumbered with spade or dibbling stick can plant between 1,200 and 1,600 plants per day while it is doubtful if he will plant more than 800 per day if he slits and plants all in one.

On areas where iron pan is present and where it lies below the depth of the soil working it may be possible to reach it and break it by driving a crowbar into the ground directly under the turves.

My observations at Kilworth suggest that of the variety *Murrayana* (the tall form) there appears to be two types—one, a sub-erect branching type and the other a spreading-branching type. Of the two the sub-erect branching type at Kilworth at any rate, has given far better results than the spreading branching type, although it must be admitted that the spreading-branching type can suppress and kill heather, etc., at wider spacings than the former but it has a higher percentage of crooked and leaning stems and a more uneven canopy. However, in firm well drained sites both types as a rule will have more than sufficient straight stems to form a final crop but the workability of straight thinnings should not be overlooked if a choice is feasible. The sub-erect type will have few if any crooked stems after first thinning and more important still it will have a more uniform canopy. Planted on turves at 4' x 4' the sub-erect type closes canopy in vigorous stands as early as 12 to 14 years and eliminates all growth on the floor of the stand, while the spreading branching type, at 17 years usually has a very uneven canopy—from 3 feet to 35 feet—with strong growths of heather furze and *molinia* in patches where the canopy is open but this may in part be due to lack of mounding and insufficient drainage.

It may be necessary to prune *Pinus contorta* as early as the fourteenth year and in addition to dead and suppressed stems all the very crooked stems should be removed in the weeding. Pruning costs for the sub-erect type planted at 4' x 4' are considerably lower than for the spreading type planted at 5' x 5'. One may say that an extra foot does not make much difference but when it is considered in growing space it amounts to the difference between 16 sq. feet and 25 sq. feet and it is only then that one sees the difference in its true perspective, but a reduction in establishment costs due to wider spacing (less plants being used) should offset any extra pruning costs that are not excessive.

First thinning should be carried out when the co-dominants are 25 feet high. This will consist of removing, as many as possible of the

leaning and crooked stems that remain after weeding together with wolves and forked co-dominants, but for the sake of soil protection some of each of those three classes must be left standing. Occasional groups of straight stems will also need to be opened up. The grade of thinning would be moderate to heavy according to the condition of the stand. It is very important even at the expense of making gaps to remove as many as possible of the crooked and leaning stems in the weeding and first thinning since they have the unfortunate habit of causing, not one, but several of their immediate neighbours also to lean and considerable damage can be done to a young crop in a short period of years. Eventually they cause large canopy gaps on the side away from the lean and in a fast growing crop like P.C. it requires quite a lot of courage to deal with them if their removal is delayed. As many as possible of the wolf trees too, should be removed in the first thinning; their rate of growth oftentimes equals that of Sitka Spruce and these become progressively more difficult to deal with if they are allowed to remain. Likelihood of new growth on the floor of the stand after a moderate to heavy first thinning should not cause undue worry—the thick carpet of needles generally has subdued all but the most persistent growth and the rapid growth following thinning and consequent canopy formation together with fresh needle cast should deal effectively with these in a very short time.

Second thinnings in vigorous stands may have to follow in as short a space as 2 years and should prove to be a comparatively simple operation if the first thinning was carried out on the lines suggested.

So far, in Kilworth, thinning has not resulted in wind throw—stands thinned in 1951 stood up surprisingly well to the December 1951 storms—whereas trees allowed to spindle have been observed to snap in a storm like *Abies grandis*. Until more information is collected about this species it would be wise to thin as early as possible on the lines suggested and to continue thinning frequently. For experimental purposes a few plots might be given various grades of thinning at longer intervals.

From figures based on a 1/10 acre triangular plot in Compt. 49 the stocking of the sub-erect branding type (planted in 1935 on turves at 4' x 4' spacing) after first thinning (February 1952) are as follows: 2,030 stems per acre standing and 590 stems per acre removed as thinnings. Average stem measures 28' x 34" B.H.Q.G.O.B. Selecting .3 as a suitable form-factor this gives an O.B. volume of .7329 cubic feet per stem—say .75 for ease of calculation. For safety, assuming the stocking to be 2,000 stems per acre this gives an O.B. Volume of 1,500 cu. ft. per acre standing at 17 years. Volume O.B. removed as thinnings is estimated to be 430 cu. ft., 64 per cent. of the stems removed lying between 4" and 7" basal diameter. This gives a result of 1,930 cu. ft. per acre at 17 years! The above results are obtained from a site on which a CP/SP crop was a dismal failure!

A word of warning here may not be amiss. The thick carpet of needles on the floor of P.C. stands forms an extremely acid humus which shows little or no signs of decomposing. The downwash from this acid

humus may accelerate podsolisation on poorly buffered soils. Groups of Mountain Ash (*Sorbus Aucuparia*) and Birch (*Betula alba*) which produce a mild humus where they could be introduced would be beneficial in counteracting this tendency.

A very notable feature of P.C. at Kilworth and one which I suggest is worthy of attention is its ability to stimulate retarded crops of other species growing either in mixture with or in close proximity to it. On several sites which originally carried retarded crops of CP/SP suffering badly from exposure and saw-fly attack—in fact they were barely living—the S.P. when the P.C. got above it stirred to new life and in a few years began to show a marked difference in vigour and health, and, what is still more amazing proceeded to keep pace with the P.C. in height growth. There are scattered S.P. stems—the relics of the original CP/SP planting—in several of the P.C. stands in Kilworth. They grew from 4' - 6' or thereabouts in the first 8 years but are now keeping pace with the P.C. their total height being 25 ft., an increase of 19 ft. to 21 ft. in 17 years!—a truly amazing performance for S.P. on those poor sites. And since it benefits Scots Pine in check it might be worthwhile to experiment with it as a stimulator in retarded crops of S.S., N.S., and D.F.

A Scots-contorta mixture, however, requires attention very early in life to give the Scots more crown room and very early thinning must be resorted to to prevent spindling of the Scots Pine. To overcome this disadvantage strip planting might be tried out. That the mixture has many advantages cannot be gainsaid; most important it increases the height increment in the Scots Pine and having done this it should provide an intermediate yield of income from thinnings at a very early stage thereby reducing the carrying costs on a crop—Scots Pine—which at best is barely economic on quite a number of sites.

Pinus contorta can be grown successfully in mixture with Sitka Spruce on exposed molinia sites. Both of them stand exposure well and it will be interesting to see how these two exotics react silviculturally in mixture.

Its ability to stand exposure should make it an ideal windbreak for the more valuable species like S.P., S.S. and N.S. and its ability to subdue rank heather and furze quickly might be utilised to introduce other species in groups after opening it up. In frost hollows on tree-less sites it might be used as a nurse to be removed after the crop it protects has grown above the frost level and on the borders of light canopied crops it could be used to subdue rank growths quickly and thus reduce the fire risk. Lastly it might be considered from the point of view of its ability to regenerate itself naturally, especially if some sort of soil preparation were resorted to in narrow blanks between older stands.

Hitherto Pinus contorta was regarded as the poor relation of all our forest trees—a mere peg or two higher in the social scale than Mountain Pine. Without it, however, much of the land, now considered suitable for re-forestation, would be regarded as a liability to the Forestry Division in particular and to the nation as a whole. But it has proved itself to be a volume producer of no mean ability on poor soils and its silvicultural value is further enhanced by its other possibilities. All that

remains then to put it in general favour is to establish that its timber is capable of being used for purposes similar to those for which S.P. and the Spruces are now in general use.

I have used light P.C. poles for bridging a small stream over which a loaded tractor-trailer was passing several times each day during road repairs. They bent considerably under an estimated 6 ton load but they did not break, and they stood up to weeks of crossing and re-crossing of heavy loads. I have also used about 20 P.C. fencing stakes for re-staking during fence repairs but as they are only a year or so in the ground I cannot say what their life expectancy will be.

Lastly I had a short log of P.C. var. Murrayana, sub-erect branching type, hewn and air-dried and took it to a local building contractor who considered it on a par with, if not superior to some of the imported white deal he was using, which, however, I must admit, was of a poor quality sawn from logs of small diameter.

"*Pinus contorta*" according to the Cameron report "will undoubtedly produce important pit-prop availabilities and a large volume of round-wood suitable for sulphate pulp and fibre-board manufacture, but there is some doubt that it can be expected to make an important contribution to the commercial saw-timber needs of the country." On the other hand Edlin says "that it is not durable but is suitable for general carpentry and constructional purposes" and Buttrick mentions that it is used in the central American States as railway sleepers.

Speaking at a recent meeting of the Society Mr. Mangan said the Electricity Supply Board had made a trial of P.C. for transmission poles and found that its absorption of creosote was so much more than that of the commoner species as to make the treated pole almost as dear to them. An examination of the end grain of stumps at Kilworth shows the timber to be either open or close grained according to situation and growing space and the timber itself to be very resinous. In large dimensions, and at Kilworth there are several trees girthing 36" O.B. it should be useful at least as wall plates, collars, ridge boards, etc.

Based on measurements taken in 1/10 acre plots selected more or less at random from areas unthinned, after first thinning and after second thinning the following particulars should be of general interest. Compartment 26 got its second thinning 1952; largest stem is 50' x 10 $\frac{3}{4}$ " B.H.Q.G.O.B.

Compartment.	Age.	Stocking per acre	Height of dominants.	Average B.H.Q.G.O.B.	No. of poles removed as thinnings.
50	17	2,320	25'	3 $\frac{1}{4}$ "	—
49	17	2,030	28'	3 $\frac{1}{4}$ "	590
49	17	1,960	28'	3 $\frac{3}{4}$ "	410
26	22	510	45'	6"	210

REFERENCES :

1. *A Manual of Coniferae* (Jas. Veitch & Sons, 1881).
2. *British Woodland Trees*. H. L. Edlin.
3. *Report on Forestry Mission to Ireland*. D. Roy Cameron.
4. *Forest Economics and Finance*. Buttrick.

TENTH ANNUAL GENERAL MEETING

THE Tenth Annual General Meeting of the Society was held in University College, Earlsfort Terrace, Dublin, on Saturday, 23rd February, 1952. Mr. McEvoy, the retiring President was in the chair.

The minutes of the previous meeting, which had appeared in the Journal, were taken as read and were signed. The President then called on the Secretary to read the Council's Report for 1951.

COUNCIL'S REPORT FOR 1951

The first meeting of the Council was held on January 29th. Eleven members attended. Arrangements were made for the holding of the Annual General Meeting and also for the Annual General Excursion to Scotland. The new Council appointed sub-committees to deal with arrangements for excursions, the publication of the Journal and finance.

The second meeting of the Council was held on March 12th. 10 members attended. Final arrangements for the Annual Excursion were made and a programme of day excursions arranged.

Further meetings of the Council were held on July 9th and November 26th. Attendance was 10 at each meeting.

MEMBERSHIP

During the year 14 Associate, 16 Grade II and 3 Grade I members were enrolled.

The losses due to resignations were 6 and to lapsed membership 27.

FINANCE

The audited statement of accounts has been issued with the notice of the 10th Annual General Meeting.

Outlay was at a high level last year and exceeded income by £60. Owing to the great work of our Business Editor, Mr. N. O'Muirgheasa, the income from the Journal is very considerably increased. The main increase in expenditure can be accounted for in increased costs of postage, excursions, etc.

We are again indebted to Mrs. A. A. Henry for a donation of £15 to forward the work of the Society.

JOURNAL

Two issues of the Journal appeared during the period under review. The Secretary has received many letters commenting on the high standard of our Journal and our Editor is to be complimented for carrying out his onerous task so capably. The Journal is now being sent to libraries and colleges and forestry services in England, Wales, Scotland, Holland, Czecho-Slovakia, Germany, Australia, New Zealand, several colleges in the U.S.A. and also Canada. Most of our county libraries are now ordering copies.

EXCURSIONS

The excursions held during the year were most successful. The Annual three-day excursion was held in Argyll, Scotland, and a full report appeared in the last issue of our Journal. Other excursions included Carton, Roundwood and Avondale. The Society is indebted to the members of the excursion committee, Miss S. Cahill, Mr. J. J. Deasy and Mr. D. Mangan for the excellence of the arrangements for the Scottish excursion; also to the Minister for Lands and the officials of the Forestry Department for the great help received during the year. We would like to thank specially the officers of the Forestry Commission in Scotland for the wonderful help and hospitality received by our members on the occasion of their visit to Argyll and to the manager and staff of Irish Wallboard, Ltd., for a very pleasant and instructive afternoon in Athy.

Among the notable events of the year was the Dedication of a Memorial Grove to Professor Henry at Avondale on Saturday, September 29th. A full report of the ceremony appears in the recent issue of Irish Forestry.

The Council concludes this report by inviting members to co-operate fully in the work of the Society during the present year. Our work is of great national importance and is worthy of support. In addition, the Society, by its excursions and meetings and by its Journal, is bringing Irish forestry to a wider public every year and in making friends for forestry is helping to secure for it a recognition of the very valuable contribution it is making to our country.

On the motion of Mr. Davis, seconded by Mr. Hanon, the Council's Report was unanimously adopted.

The Abstract of Accounts which had been forwarded to members was then considered and on the motion of Mr. Chisholm, seconded by Mr. Shine, its adoption was unanimously agreed to.

PRESIDENT'S ADDRESS

Ladies and Gentlemen,

Our Constitution lays on the retiring President the duty of delivering himself of a valedictory address at the end of his period of office. This is intended to cover a survey of events in the Forestry world during the previous twelve months. On this occasion our time is strictly limited and there is some danger of trespassing on the grounds of our distinguished lecturer of the night. Consequently, I will be brief.

So far as afforestation is concerned further good progress has been made in many countries towards the high targets set when forest policies were overhauled after the last war. In our own country, we can report

with satisfaction that the rate of planting has approached 10,000 acres and exceeded our previous records. A still higher figure, approaching 15,000 acres, may be expected from the present planting season. Britain too, has managed, in spite of manpower shortages, to reach a planting programme of 53,000 acres and Germany is now making rapid strides in replanting her war-devastated forests.

Most spectacular, perhaps, has been the progress in wood utilisation. Those of us who visited Messrs. Noyek's showrooms a year ago realised the greatly increased adaptability and range of uses of wood in the form of plywood, veneer and other wood products. There have been remarkable new advances in the use of laminated wood structures in constructional engineering. After occupying second place to steel in such work for a century timber now bids fair to take the lead again.

These modern trends have made for a more economic and, therefore, more competitive use of wood as a raw material and they have brought into being the idea of the integration of the forest and its dependent industries. For most of us this idea was first proposed in Egon Glesinger's book "The Coming Age of Wood" which was reviewed in our Journal. Now we have just heard of the first really large-scale attempt to put this idea into practice. New Zealand has a large concentrated acreage of *Pinus Insignis* forest up to 30 years old. Its Government is now seeking American and British technical and financial assistance to set up an integrated forest industry with a capital of the order of £80,000,000. This will turn out lumber, pulp, news-print, plywood, etc., and by utilising the entire tree it will practically eliminate waste which in the past has been the main destructive agent of the world's forests.

At home in Athy, many of our members will have seen the production of an excellent quality wallboard from rough and small timber. They must have realised the enormous potential market even for low grade material. Killeen Paper Mills have also announced that they will shortly go into production of wood pulp and derivative products. These profitable new markets have made thinning of inferior stands and much clearing in preparation for planting remunerative, and they are a great encouragement to good Forestry both on State and private lands.

There are very few who have not been affected by the drastic increase in prices of imported softwood timber over the past twelve months. The Dublin standard has doubled its price and is now running at about £200. This represents a price of 15/- per cubic ft. The price of standing timber in Ireland has risen sharply in sympathy and now approximates closely to the British rates.

As to what the future holds, it is difficult to hazard even a guess. Britain as the world's largest importer, still remains the dominant regulator of market conditions. Last year she imported 1,100,000 standards of softwoods, under her new quota system, she may import only 650,000 this year. Such a restriction on importation would almost

certainly have a depressing effect on international prices. On the other hand, continental consumption has been on the increase and may counter-balance decreased consumption in Britain.

Whatever the immediate market prospects, we can be assured that the long term outlook is favourable. The position is well summarised by Sir William Ling Taylor, former Director-General of the British Forestry Commission, in his new book "Estate Forestry," in which he says :

"What can be said is that timber, as a primary product of the soil, gives no sign of becoming less serviceable to mankind and that, with standards of living tending to rise in all countries, there is great and growing strain on existing sources of world supply. Wood being so eagerly sought on all hands, surely none but a pusillanimous exponent of present day forestry can seriously be fearful for the future worth of his plantings."

In conclusion, I would like to thank most sincerely all our members for the honour they have done me in electing me President of the Society. I have been fortunate, in my period of office, in having in operation a strong and active Council and to that, I attribute the present vigour and strength of our Society. Incidentally, I would like to pay tribute to the way in which the representatives of the Associate Members have served the Society and so more than justified the changes in our Constitution which enabled them to share in its government.

To our new President, Mr. Meldrum, I offer my congratulations and wish his every success in his term of office.

ELECTION OF COUNCIL

The meeting formally confirmed the election of the new Council as given on page 2. The incoming President, Mr. Meldrum, then took the chair and paid a well deserved tribute to his predecessor.

EXCURSIONS FOR 1952

The members approved of the Council's decision to hold the annual excursion to the North of Ireland, with Bangor, Co. Down, as headquarters, on the 27th, 28th and 29th May.

Local excursions to Glen Imaal, Donadea and Ossory state forests on dates to be announced later were also agreed to.

This concluded the private business and after a short interval the President called on Mr. D. Roy Cameron, chief of E.T.A.P. Forestry Division of F.A.O., and a former Director of the Dominion Forest Service for Canada, to read his paper on "An International View of Forestry." A copy of Mr. Cameron's address will be found elsewhere in this issue.

The vote of thanks to the speaker was proposed by Mr. H. M. Fitzpatrick, who expressed the Society's appreciation of the great honour done to it by Mr. Cameron who had come specially from Rome to address us. Mr. Cameron's previous visit had been on the Forestry Mission to Ireland for F.A.O. and his report was at present being considered by the Government. He hoped the report would be adopted and would form the basis of Irish forest policy.

Referring to Appendix I of the report Mr. Fitzpatrick said the Faustmann formula was not applicable to Irish forestry. Its use in the report was to justify an increase in the ceiling price for land for afforestation, and as such it was a telling argument and one which might be expected to appeal to the Central Bank directors. But this was not the way for a nation to consider the position. We cannot exist without trees; a country without trees was like a house without furniture, but let us furnish it as best we can in accordance with our means.

Mr. McElligott, seconding the vote of thanks, said that in the main State forestry seemed to be concentrated in Leinster and the better class lands and he made a plea for the development of the waste areas of the West. He also expressed the hope that the Government would now define a forest policy as the first important step. But then as forestry was essentially a long term investment it was generally put on the long finger. This, he said, was a very poor approach indeed, a million acres of forest would mean as much to us as coal does to England.



Statement of Accounts for Year ended 31st December, 1951.

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D. M. CRAIG, Hon. Auditor,
85, Harcourt Street, Dublin.

COVER PHOTOGRAPH

Our cover photograph shows a specimen of the Paper Birch (*Betula papyrifera* marsh).

This species, which includes several recognised varieties, is native of North America where it is found from Labrador to British Columbia, south to North Carolina and Oregon.

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Membership Application Form

I desire to become a member of the Society of Irish Foresters, and enclose Cheque/P.O./M.O. for, being subscription for year

Full Name

Occupation

Postal Address

Signature

Date

Block Letters

To be forwarded when completed to the Secretary at Albert Agricultural College, Glasnevin, Dublin.

CONDITIONS OF MEMBERSHIP

(EXCERPTED FROM THE CONSTITUTION)

Article V.—The membership of the Society shall consist of two Orders, namely: Technical and Associate.

TECHNICAL MEMBERS shall be persons desirous of promoting the object and at the time of election resident in Eire, who are employed for their whole time in forestry or any branch of natural science closely connected with forestry, or who have been so employed for at least five years, or who, though not so employed hold a degree or diploma in forestry of a recognised University or College, in all cases subject to the approval of the Council.

TECHNICAL MEMBERSHIP shall be divided into two grades, namely:—

Grade 1—Being Forestry Inspectors; professors, lecturers, graduates or holders of diplomas of Universities or Colleges; Head Foresters, and others of an equivalent status.

Grade 2—Being Foresters, Foreman Foresters and others of an equivalent status, including students at Universities or Colleges, not being restricted to Grade 1.

ASSOCIATE MEMBERS shall be persons desirous of promoting the object but not qualified for technical membership, subject always to the approval of the Council.

Members shall subscribe annually to the Society's funds according to the following scale of subscriptions:—

Technical Members, Grade 1, shall pay	£1 0 0
Technical Members, Grade 2, shall pay	10 0
Associate Members shall pay	15 0

Benjamin Reid & Co.

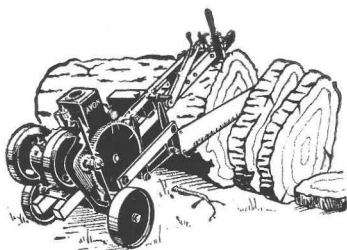
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