

IRISH FORESTRY



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IRISH FORESTRY

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IRISH FORESTRY

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GROUP DYING OF SPRUCE IN EIRE

By James S. Murray

IN July, 1953, I was privileged to visit Eire to see 'group dying' in Sitka spruce. In an earlier conversation, Mr. T. Clear of the National University, had described deaths of Sitka spruce in several Irish forests and as the symptoms appeared similar to those of a disease of spruce being investigated in Britain, I was very glad to have the opportunity to see the disease in Eire.

Group dying in Sitka was first reported in Britain in Dumfriesshire in 1936. Since then, between twenty to thirty reports have come in from places between Argyll and Somerset. It has also been reported on Norway spruce. It is characterised by death of the root system accompanied by thinning of the crown, reduction in height increments and usually heavy coning before death. The final needle fall occurs when the needles are green, in contrast to most other diseases which cause needle shedding when the needles are to some extent discoloured. Typically, on the affected roots there can be seen longitudinal cracks in the bark and dead areas in the cortex. These latter, though not apparent at first sight, are usually easily observed when the outer dead bark scales are scraped away. The trees die in groups and there is some evidence that these groups become static after enlarging for some years. The largest groups in Britain at present, do not exceed one quarter of an acre.

No fungus or insect has yet been shown to be responsible for the disease. The only explanation put forward, so far, is that of Day who ascribes the dying to unfavourable soil conditions which do not permit adequate rooting depth for the trees as they develop.

The first area where I was shown diseased Sitka was in Glendalough Compt.26, P.23, in County Wicklow about twenty five miles south of Dublin. The glen, running NW/SE, is formed partly of granite, partly mica schist. About 900 acres of conifers are planted here, 54% of them Sitka spruce, which is confined to the peat areas. The local forester had said that about eight groups of dying Sitka spruce existed in the forest, but we found only three. The first was on a medium to steep slope, on a black amorphous peat, about 9 inches thick, over sandy, slightly podsolized mica schist. Rainfall 60" per annum, altitude about 1500 ft., aspect north-east. About forty dead trees were standing in the centre of the group without any survivors among them. Surrounding trees had

dead roots and typical root lesions were found on living roots. These symptoms are characteristic of 'group dying' in Britain. The roots were largely confined to the peat and had made little attempt to penetrate the mineral soil. Drainage was free both in the peat and in the mineral soil, but the area was water receiving as it formed part of a large concavity on the hill. The rooting here was certainly shallow, but I could see no obvious reason why the trees should have died so suddenly from this cause. There was, as usual, the sight of long, once vigorous leaders on some of the dead trees. The depth of peat and rooting characteristics of healthy Sitka a little way off along the same contour did not appear to differ appreciably from those of the dying group.

The second group lay almost immediately below and was slightly larger. The site details were much the same as for the first, but the site was much wetter, being flatter. The third group lay farther down still, in the valley bottom. The ground here was waterlogged, with water lying on the surface. Heavy rain had fallen in the past week, but surplus water on this area must be the normal condition over a greater part of the year.

All three sites had the shallow rooting habit of the Sitka in common, but the dying groups were so well defined and local in extent that it is difficult to imagine this feature alone being responsible for the deaths. Also there were large areas of healthy spruce nearby with soil conditions and moisture relationships similar to those where trees were dying.

A visit was paid to Glenmalure, which adjoins Glendalough to the south west. Dying Sitka spruce had been noticed here in Compt. 8, P.29, of the Clohernagh property about 1949. This again was typical 'group dying', and dead roots on the outer fringe of live trees showed that it was still active. The soil was about nine inches of raw peat over granite and, at the time we saw it, was water-sodden. I should think the site quality was inferior to those seen at Glendalough. The slope was steep, aspect north, altitude about 750 ft., rainfall about 60". The second group at Glenmalure occurred in the Ballyboy property, P.23. This was on an alluvial flat at about 500 ft. with a soil considerably deeper than the other examples seen. It was, however, watersodden at the time I saw it but to what degree this was its normal state or merely the result of the heavy recent rain, was rather uncertain. The growth of the Sitka was good. Mr. Clear, who knows the local conditions well, said that he considered this site of high quality for Sitka.

A visit was also paid to Dundrum Forest, Compt. 36, P.18, Co. Tipperary, where dying of Sitka spruce had also been reported. As the forest was approached a long strip of Sitka spruce about half a mile in length with a large percentage of dead individuals among them could be seen on the flat land bordering the forest which then sloped upwards. The extensive area over which trees were dying was rather alarming since one of the few reassuring things about 'group-dying' so far observed, is its tendency to remain local in its effect. Inspection of the trees, however, failed to disclose the usual 'group dying' symptoms. No extensive death of roots occurred, even on trees whose crowns were so thin that

in true 'group dying' there would have been associated death of roots up to the stems. No dead patches could be found on living roots. The site was extremely ill drained. The soil, derived from the Upper Coal Measures, was a structureless clay with a gleyed horizon, providing very poor rooting material. It had at one time been drained but drainage had been neglected. The vegetation was typical of ill drained situations containing, *Ranunculus lingua*, *Aira caespitosa* and *Juncus*. The crop had been grossly underthinned as was evidenced by the slenderness of the stems compared to height growth and the number of trees on the ground. I was unable to examine the crowns but their general appearance was typical of *Neomyzaphis* attack. On this site also, some of the dead trees had long leaders and apparently undiminished growth up to the end, whilst others showed a reduction in height increment over the last few years.

This area of dying Sitka corresponds better to Day's explanation of restricted root depth than any other I have seen. It is the first I have seen without the typical root death and lesions, but I am not sure whether it is quite different from what I have described previously as 'group dying' or just another phase of the same thing. In this area, also, wind-blown trees were found, the deeper going roots of which had obviously died before the blowing of the trees, but whose surface roots were quite healthy. This is exactly the condition Day has always described in his work and the details of the site are very similar to the conditions under which he says 'group-dying' occurs. The inconsistencies of the observations on these six Irish areas are typical of observations on our British ones.

Since my return from Eire, Mr. Clear has written to me describing the occurrence of *Rhizina inflata* (Schüss) fructifications on spruce roots in a group dying area in Glenmalur. This accords with observations made this summer on several areas of group dying in Britain which are in the early stages of the disease. The fruit bodies were so numerous and conspicuous, and occurring in such close association with dead and dying roots, that it is highly probable that they have some influence on the disease. Perhaps the weather conditions of this year favoured the production of fructifications because they have never been noticed in such quantity before. The exact role played by the fungus will now have to be investigated by inoculation experiments as it is very important to know whether it is primary or secondary.

I should like to express my gratitude to the Eire Forest Service for making my visit possible and for the kindness shown to me by various members of the staff. I am also deeply indebted to Mr. Clear, who personally conducted me on all the visits to the forests and who spared no effort to make my tour as worthwhile and informative as possible.

Acknowledgement

This note has been published with the permission of The Forestry Commission (Great Britain).

ASSOCIATION OF RHIZINA INFLATA WITH GROUP DYING OF SITKA SPRUCE

By R. McKay, D.Sc., and T. Clear, B.Agr.Sc.

University College, Dublin.

GROUP dying of Sitka Spruce (*Picea sitchensis* Carr.) was apparently first recorded from the Lake District in England in 1936. Since then, the trouble has been reported from widely separated localities in both England and Scotland, and it has been attracting considerable attention. The importance of this malady and its relation to shallow soils and wind-throw have been adequately discussed by Day in a recent article in *Forestry* (2). Group dying of Sitka spruce, however, is not confined to Britain, as it has been under observation here in Ireland for some time, and, during a visit to this country by Mr. J. S. Murray, Assistant Pathologist, British Forestry Commission, several plantations were inspected this year, where the disease symptoms of the dead and dying groups were stated to be typical of those occurring in Britain.

A rather unusual occurrence in an affected group of trees was brought to the writers' notice by Mr. W. Shorten, Head Forester, Glendalough, Co. Wicklow. Quoting from Mr. Shorten's letter dated 17th September, 1953—

“When making a thinning of S.S. in compartment 20, Lugduff, I came across one of the diseased patches that we had thinned out 3 or 4 years ago. Beside it now is a patch in what I would call the middle stages of decay and in what I would consider a perfect state for investigation.”

The authors accordingly visited the plantation at Glendalough on 21st September and found fructifications of a fungus present at the base of practically every affected tree in this particular group, which comprised between two and three dozen trees. These were about thirty years old, and an examination of their roots showed that many of them were dead right up to the base of the stem. Resin flow was profuse from affected trees; in some cases it was confined to a height of a foot or so above ground, but in others the resin was exuding from the stems to a height of three or four feet. Although the entire root system was frequently found to be dead, there was no rot of any kind found in the base of the stem when a sample tree was felled.

The fungal fructifications occurred on the soil surface around the base of the stems, and not infrequently directly over a dead root. They were fleshy and sessile; upper surface somewhat glutinous and chestnut-brown in colour, under side pale buff, woolly, with loose mycelial strands hanging down. They tended to be circular in outline but were rather diverse in shape, with diameters varying from half an inch to two inches.

Larger forms were found which seemed to be due to several fructifications having coalesced. Further examination of the fructifications in the Department of Plant Pathology showed that the glutinous upper surface was made up of innumerable eight spored asci (some of which were 400 microns long), interspersed with paraphyses. Microscopical examination also revealed fungal hyphae in the cortex of the brown lesions on the roots. The fungus was provisionally identified as *Rhizina inflata* (syn. *R. undulata*), and this identification was confirmed by Dr. P. O'Connor, National Museum, Dublin.

The fungus *Rhizina inflata* is often found growing saprophytically on woodland soils, and not infrequently occurs near tree stumps. Mycelial strands ramify through the soil and invade the roots of neighbouring healthy trees. When the mycelium reaches the collar of the tree, the tree suddenly succumbs. The parasitic nature of this fungus was first shown by Hartig (3). He records it attacking the following species of conifers, *Abies pectinata*, *Tsuga Mertensiana*, *pseudotsuga Douglasii*, *Picea Sitchensis*, *Pinus strobus*, and *Larix europea*. Brooks (1) reported attacks of it on Scots Pine, Corsican pine, European larch and Japanese larch. Apparently the fungus seldom attacks broadleaved trees.

The general symptoms of "group dying" in Sitka spruce plantations are similar to those described by previous workers for conifers dying from attacks of *Rhizina inflata*, with perhaps the sole exception that "group-dying" occurs mainly in plantations thirty years old and upwards, whereas attacks of *R. inflata* have formerly occurred on young trees four to ten years old. In view of these facts, the object of the present note is to record the occurrence of the fungus *Rhizina inflata* on Sitka spruce showing typical "group dying". Further investigation of the relation of the fungus of "group dying" would appear to be very desirable.

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AN OUTBREAK OF THE PINE LOOPER MOTH

(*Bupalus piniarius*, L.) AT CANNOCK CHASE IN STAFFORDSHIRE, AND SOME NOTES ON THE BIOLOGY OF THIS PEST

By Dr. Myles Crooke

British Forestry Commission

FORESTERS have for long realised the insect risks attached to the planting of large blocks of pure crops, and experience on the continent of Europe and elsewhere has clearly shown how serious the results of such attacks can be, particularly in coniferous woodlands. Up till the present time in Great Britain we have not suffered from epidemics of defoliating insects in conifer forests but this is due, at least in part, to the fact that we have not had areas of sufficient extent, and of suitable species composition and age to create the right conditions for outbreaks. In the last thirty years, however, large areas have been afforested with a number of conifer species and as the age of these forests increases, so does the danger of insect damage.

Bupalus piniarius, L. the Pine Looper, is a serious defoliator of pine on the continent of Europe, where it attacks pole stage and older crops, most usually where these are situated on sandy soil types in areas of low annual rainfall. This moth is of widespread distribution in Great Britain and, although it has not before caused any severe damage in this country, it has been regarded as a potential menace and has for the last two years been the subject of intensive study by the Forestry Commission Research Branch. This year, for the first time in our recent forest history, a serious outbreak of the pine looper has occurred in the forest of Cannock Chase, near Birmingham, in Staffordshire. This forest is about six thousand acres in extent and, on Bunter sandstone and pebble beds with a mean annual rainfall of twenty-five inches, is composed mainly of Scots and Corsican pines, the oldest of which are thirty-five years. Late in the summer of this year about 120 acres of Scots pine of Quality Class II and of the oldest age class were discovered to have been completely defoliated by *B. piniarius*. The effects of the caterpillars' feeding did not become obvious until early September although in the spring of the year the forester had observed badgers turning over the needle litter in the search for pupae and had also observed the mass flight of adult moths during the summer.

Since it is possible that this epidemic at Cannock may be the forerunner of a series of similar ones in other parts of the country, the following descriptions of the various stages of the insect and of its biology are appended.

DESCRIPTION OF INSECT

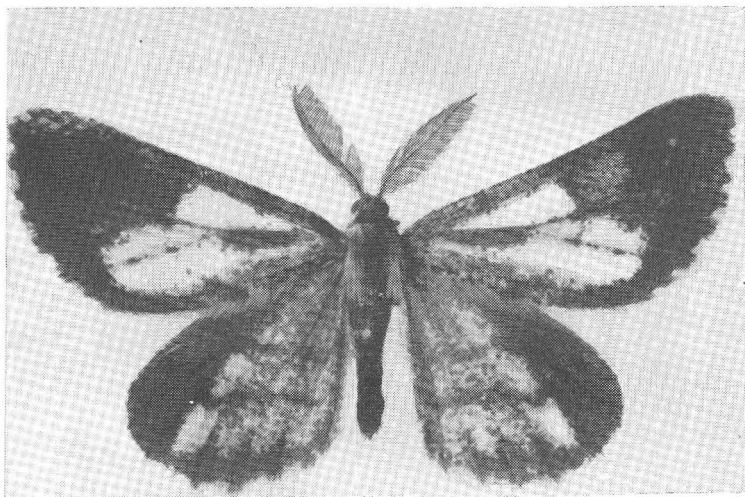
- (a) Adult (wingspan up to $1\frac{1}{2}$ ""). The male has a dark brownish ground colour and the markings are white to yellowish white. The antennae are bipectinate. The female is orange brown and the markings darker brown. The antennae are filiform.
- (b) The eggs are green when unhatched, white and iridescent when hatched. They are laid along the length of the needle in a row.
- (c) The larva is a "looper". When full grown it is green and bears five white or yellow white stripes. The head is also green and the central three stripes extend on to the head. In all stages the larvae have the ability to suspend themselves on a silk thread.
- (d) The pupa is dark brown with green wing cases, and is slightly less than $\frac{1}{4}$ " in length.

LIFE CYCLE

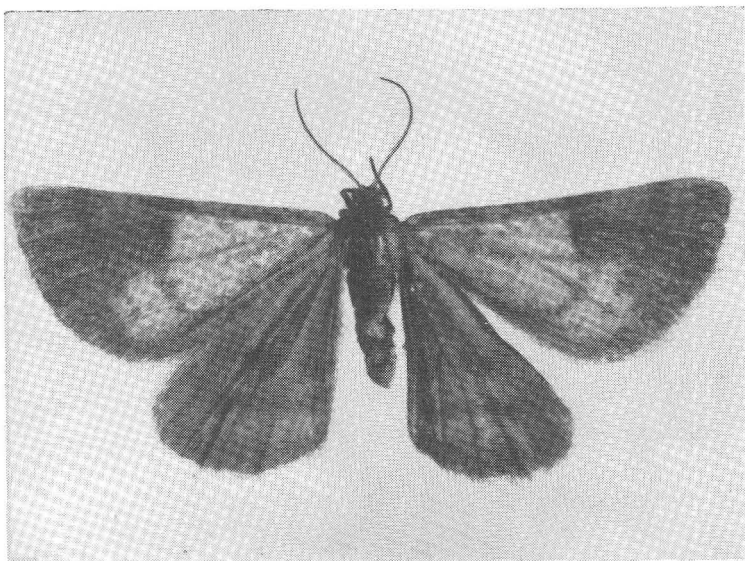
The first adult is on the wing at the end of May and the numbers flying increase to reach a maximum at the beginning of July. The flight period is completed by the end of this month. The flight of the adults is characteristic and they can be easily picked out flying amongst the crowns of the trees with a very quick zig-zag flight. The females lay their eggs throughout the crown, placing clutches of from one to sixteen, or more, eggs on a single needle in a long row. These eggs hatch within ten days or a fortnight. The life of the larva is long and development is slow, the five instars or stages taking about three or four months to complete. The effects of larval feeding during an infestation are first noticeable in the forest during the fourth stage at about the beginning of September when a distinct browning of the foliage becomes apparent. This browning is caused by the wilting of remnants of half-eaten needles. Mass feeding is normally completed by early November and at this time the appearance of the attacked trees is quite characteristic. There is a complete absence of green and the brown rather feathery needle remnants are either still attached to the shoots or are hanging from the twigs in long strands held together by the silk produced by the caterpillars. When feeding has been completed the larvae spin down from the branches on silken threads or crawl down the trunk and pupate in the soil and litter at a depth of one or one and a half inches.

The distribution of *B. pinarius* in any pine area is usually fairly uniform so that an increase in population in any part of it means that the population throughout is probably also increasing. Thus, the first signs of defoliation indicate that the risk throughout the area is high and that in the following season defoliation will probably spread not only from the nucleus but also by a general increment of numbers throughout the

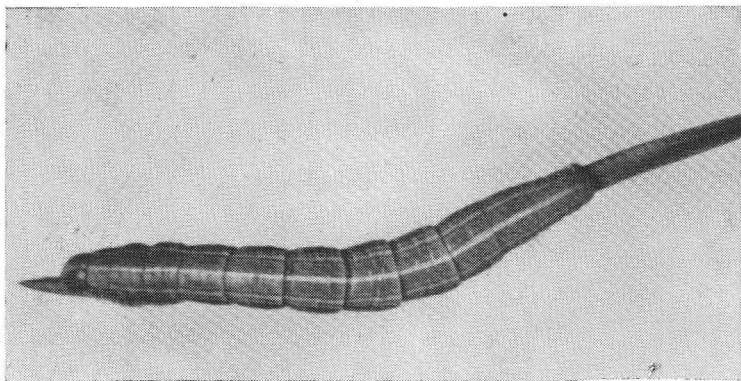
Bupalus Piniarius



ADULT MALE $2\frac{1}{2}$ times natural size



ADULT FEMALE $2\frac{1}{2}$ times natural size



B. Piniarius LARVA $2\frac{1}{2}$ times natural size

forest. Continental experience demonstrates that natural control of an outbreak is only very seldom effective so that artificial controls must be used. It is obviously important to initiate those as early as possible to prevent further damage to the crop. Normally, Scots pine will recover from a single year's defoliation but should the attack continue for another year one can expect a high proportion of deaths in the crop, often accelerated by secondary bark-beetle attack. A third year's defoliation is invariably fatal.

Early detection of pine looper outbreaks is a matter of prime importance and this preliminary notice of the epidemic at Cannock will, it is hoped, draw attention to the danger and ensure the co-operation of foresters and others in notifying any incipient outbreak.



SCENIC AMENITIES AND THE FOREST

By K. L. SCHORMAN

MUCH criticism has been levelled at the Forest Authorities both in this country and Great Britain, on account of the policy of laying down large areas of coniferous forest. It is claimed that the conifers are alien to this country, that their uniform dark green colouring is monotonous and dull and that the regularity of spacing with which they are planted destroys any charm they might otherwise have. Some critics go so far as to maintain that the purple of the heather and the varying hues of the bracken in Autumn should be preserved at all costs while others content themselves with a plea for the planting of hardwoods for their tender green in spring and their colourful Autumnal foliage.

On the first type of critic very little sympathy need be wasted. To leave the land to the heather and bracken is very largely to leave it to waste and, with an annual bill for the importation of timber and timber derivatives running into millions of pounds, we just cannot afford the luxury. Moreover, bracken spreads rapidly and is a threat to the better grazing lands in its vicinity. Its elimination, except above the timber line, is highly desirable and planting of the middle slopes of our hills would safeguard the lower slopes from further encroachment by this weed. For my own part I feel that any scenic value it has in growth and early maturity is not sufficient to compensate for the black ugliness in decay but I may be peculiar in that respect.

When we come to the second line of criticism there is perhaps more to be said. Alien most of the conifers certainly are but so also are most of the hardwoods we now regard as the ordinary trees of the countryside. It is only a question of time, and not necessarily a very long time, before the Spruces, Larches and other introductions become just as natural to our scenery as the native so called Scots Pine. Moreover, apart from a certain conservatism which is innate in most of us, a lot of criticism of the conifers seems to be based on the appearance of the young plantations. In the thicket stage these are certainly not very beautiful but it appears to be forgotten that this is a temporary stage, that as they grow older the plantations will improve in appearance, and a lot of the regularity will disappear. All conifers do not grow at the same rate nor are they all the same shade of green, thinnings may alter the regularity of spacing, the Larches at least have a winter colouring of their own. If ultimately felling is done on a selection basis and not by clear cutting

there will ultimately be an irregular mixture of ages and heights in our forests which will definitely free them from the objections of mechanical uniformity. In any case the vast bulk of the land acquired by the Forest Authority for planting is mountain land of inferior quality, not fitted for the growth of good hardwoods but eminently suited to the growth of coniferous timber. The main problem before the Forest Authority is to produce timber of commercial quality. Four fifths of the timber used in commerce is softwood. In these circumstances is there any real choice open to it?

The Forestry Act of 1946, from which the powers of the Forestry Authority is derived, nowhere lays it down that the State's operations must be conducted on strictly commercial lines and, keeping in mind the considerations mentioned above, we are entitled to ask whether, in fact, the commercial aspect is not being overdone and whether more consideration could not, and should not, be given to the aesthetic aspect. Even from a financial point of view the growth of a screen of hardwoods on the edges of coniferous plantations is to be recommended as a check upon the risk of fire. This is done in some cases but by no means in all. Such belts, along the roadsides for instance, would provide attractive colouring and the loss of ground, in so far as there would be a loss at all, would be so small as to be negligible. Personally I would like to make a plea for still greater efforts to add beauty to the plantations by a deliberate policy of planting purely ornamental trees along the roadside edges and on the margins of such rides as are visible from the roads. Admittedly these trees would never produce commercial timber but think of the addition a few rows of say flowering cherries would make to the beauty of the countryside in spring and autumn and the delight they would give to the motorist, the cyclist and the pedestrian. Some destructive vandalism could be expected, particularly in the early years, but if the Roadside Tree Association has found it worthwhile to plant such types of trees on some of the main roads near Dublin and elsewhere and the Wexford Co. Council has had the courage to plant apple trees on the roadsides of that county, the State ought not to flinch from a slightly greater task.

Recent announcements regarding the State forestry activities have mentioned extensive experiments in the planting of bog land and if these are successful it is to be expected that they will be expanded. Though the motive is again purely financial, the results are likely to bring about big changes in scenery of some of the most desolate looking areas in the country, areas where any change could hardly fail to be an improvement. Of course, there will be dissidents who maintain that the bogs have a beauty of their own but it is difficult to maintain patience with those who see beauty in the monotony of a huge sweep of bog but complain of the dullness of a similar area of pine woods.

I suppose Ministers and their advisers are considered to be infallible because, while the Forestry Act does not mention aesthetic considerations

in connection with the powers and duties entrusted to the Minister and gives no direction either positive or negative, it does make specific provision for the retention of trees on private lands in order to preserve scenic amenities. Under Section 44 of the Act it is provided that the Minister shall not refuse, solely for the preservation of scenic amenity, permission for the felling of any tree unless the district planning authority (usually the County Council) has consented to the refusal. If permission is refused the owner may require the planning authority to acquire the site of the tree, and presumably the tree itself. The clauses dealing with compensation refer to various other Acts and, without a study of those Acts, convey very little to me and would, I suppose, convey very little to most of my readers. It would seem reasonable to assume that the compensation should at least equal the market value of the tree as timber plus the market value of the land and, in practice, it is likely to be somewhat higher. So far, I am not aware of any instance in which the County Council or other planning authority, has insisted upon the retention of trees purely for the purpose of preserving scenic amenities. Indeed their problem is not quite so simple as it may seem at first glance. Trees do not live for ever and without some provision for replacement of the existing trees the wooded aspect of any area would probably disappear sooner or later.

If I may revert to a personal note, one autumn some years ago I was walking through an area of scattered trees beside a stream. On lifting my eyes from the stream, in which I confess I was mainly interested, I looked ahead and beheld a most glorious sight. In amidst the green of other trees there was a patch of brilliant red standing out as would a lighted torch in the dusk of evening. It was a maple of some sort and the colouring of the foliage was something to marvel at. Whether seen from afar or from close at hand this tree was a thing of outstanding beauty and a joy for ever, or at least for as long as the mind can carry a picture. I do not want to suggest any specialisation in or concentration on maples. For ought I know they may be most difficult subjects to grow but if a few of these or some allied species could be scattered irregularly through the pine woods, as an autumnal supplement to the spring flowering trees, to which I have referred above, the Forest Authority would have taken very positive steps to add to the scenic amenities of our countryside and have redeemed itself from the charges made against it of sordid commercialism and soulless monotony of outlook.

COMPARISON IN YIELDS OF SITKA AND NORWAY SPRUCE

By P. M. Joyce

RECENTLY the writer had occasion to carry out an assessment of growing stock at Castlepollard, Co. Westmeath. The operation included the mensuration of a conifer stand containing plots of Sitka and Norway Spruce. While comparison in respective yields of those species usually indicates results in favour of Sitka Spruce, nevertheless, so overwhelmingly convincing were the figures obtained that they are deemed worthy of recording.

The soil type is uniform throughout the area which because of its low-lying situation is subject to occasional late frosts, the latter atmospheric condition being, if anything, to the detriment of the Sitka Spruce.

The data is based on the mensuration of one-tenth acre plots details of which are set out hereunder.

SITKA SPRUCE	NORWAY SPRUCE
Age 30 years	Age 30 years
Number of stems per acre—280	Number of stems per acre—290
Mean Q.G. B.H. 9"	Mean Q.G. B.H. 7¼"
Mean Height (total)—75 ft.	Mean Height (total)—62 ft.
Mean tree—19.7 cu. ft. O.B.	Mean tree 11.1 cu. ft. O.B.
Volume per acre—5516 cu. ft. O.B.	Vol. per acre—3219 cu. ft. O.B.
Volume per acre—4966 cu. ft. U.B.	Vol. per acre—2898 cu. ft. U.B.

The most cogent comparisons to be noted from a perusal of the above data are the figures contained under the headings "volume per acre" for both species. It will be observed that the mean annual increment of Sitka Spruce is practically 72% greater than that of the Norway Spruce.

A comparison between figures set out above and those tabled in the Forestry Commission Yield Tables for Quality Class 1, Sitka and Norway Spruce, shown hereunder, will be of interest.

SITKA SPRUCE

Age 30 years
Number of stems per acre—505
Mean Q.G. B.H. 7"
Mean height—69 ft.
Mean tree—11.5 cu. ft. O.B.
Vol. per acre—5,800 cu. ft. O.B.
Vol. per acre—5,220 cu. ft. U.B.

NORWAY SPRUCE

Age 30 years
Number of stems per acre—710
Mean Q.G. B.H.—5 $\frac{3}{4}$ "
Mean height—51 ft.
Mean tree—5 cu. ft. O.B.
Vol. Per acre—3,500 cu. ft. O.B.
Vol. per acre—3,150 cu. ft. U.B.

At first glance it would appear that the yield per acre for both species at Castlepollard compare unfavourably with those shown in the latter tables. It should, however, be borne in mind that the number of stems per acre is, due to a heavy thinning programme, considerably lower than that shown in the Forestry Commission Yield Tables. This of course means a much greater volume per tree, a most desirable result, when one considers that the Sitka Spruce at Castlepollard is mainly of boxwood dimensions, in contrast to the Yield Tables stand which would be predominantly pulpwood and therefore in a much lower price category.

Note : Since this note was received for publication a "Revised Yield Tables for Conifers in Great Britain" has been published by the Forestry Commission. These tables have been constructed entirely from permanent sample plot records and accord more closely with current practice in that they assume a heavier thinning regime than the old tables. Figures from the revised table for comparison with Mr. Joyce's figures are

SITKA SPRUCE

Age 31
Number of stems per acre—245
Mean Q.G. B.H.—9"
Mean Height—75 $\frac{1}{2}$ ft.
Vol. per acre—4890 cu. ft O.B.

NORWAY SPRUCE

Age 30
Number of stems per acre—560
Mean Q.G. B.H.—6"
Mean height—50 ft.
Vol. per acre—3,400 cu. ft. O.B.

—Editor.

EUROPEAN TIMBER TRENDS AND PROSPECTS

A Study.

Prepared jointly by the Secretariats of the Food and Agricultural Organisation of the United Nations and the United Nations' Economic Commission for Europe.

GENEVA, 1953, Price 25/-.

THIS is one of the most important publications that has appeared since the end of the war. The aim of the publication is to help governments and individuals to appraise their forestry programmes and problems more accurately than in the past. This study must surely arouse apprehension in those who are concerned with the growing and marketing of timber. For many it will mean an awakening from a delightful forestry daydream, in which the forester revelled as a much courted producer of goods for which a host of suitors sought. The boom is over in timber as in many other commodities. We have now a buyer's market once more and fears are general that forestry products will be in surplus supply.

The study surveys the whole field of forest marketing, consumption and supply and for the first time produces a picture which is both disturbing and reassuring at the same time.

"The study underlines the continuing importance of wood in various forms in the European economy and shows that consumption of industrial wood tends to rise. Production, on the other hand, tends to remain stable. Since there is little prospect of a substantial increase in overseas imports of timber, serious difficulties must be expected by 1960, unless a change in production policies is adopted without delay and European timber output is raised both in the short term and the long term."

For the purpose of estimating Europe's wood requirement and production by 1960, the study makes two alternative assumptions, the first, that gross European production would rise by 50 per cent. during the present decade, and the second that it would rise by only 20 per cent.

The study reveals that whether Europe's economic growth is rapid or slow, wood production under present policies and prospective import supplies will be insufficient to achieve equilibrium, and the balance could be restored only through a rise in relative timber prices.

The most important conclusion of the study is that if timber consumption does not rise in line with, although not necessarily at the same rate as, gross European production, then it is likely to fall, and the fall may not be a relative one, as measured in terms of consumption per

unit of output or per head of population; it may in due course, through the loss of markets to other materials, become an absolute decline. There exists already definite danger signs.

Part I of the study deals with consumption.

Among the factors influencing wood consumption in any country are the degree of its economic development (highly industrialised countries tend to consume more industrial wood per head) the availability and the technical possibility, of using substitute materials such as steel for saw timber in general construction, and stone, bricks and cement, in housing.

The picture of stability or slight decline in the consumption of wood in Europe is shown by the figures for all wood and industrial wood (roundwood equivalent).

	1913	1950
Cu. metres of Total wood (Roundwood equiv.) per head83	.77
Cu. metres of Industrial wood (Roundwood equiv.) per head	.41	.41

Ireland's consumption of industrial wood based on 1935-38 figures is given as .31 cubic metres roundwood equivalent per head.

The tables given in each chapter are most interesting and repay study. Table 1/5 shows that sawn softwoods account for 43% of the industrial wood consumed in Europe in 1950.

In Chapter II tables show the use of wood in housing in Europe and reveal a steady decline in the use of saw timber due to substitution by other materials, mainly steel, concrete and glass, but also other forest products, such as wall board and laminated board. It is this decline in the traditional uses of timber which has aroused the concern of the timber trade. The study reveals that this relative decline in the use of saw timber for house building has gone as far as it is likely to go in most countries and that the fall in consumption to date has been largely due to the very considerable rise in the price of timber relatively to those of cement and structural steel. Whether timber will hold its own, regain some lost ground or decline further depends among other things on the price of timber and competing materials. This is what one would expect. One wonders if the timber trade lost sight of this basic economic factor during recent years. That timber prices have soared in recent years is due as much to controls and price fixing by the trade as to shortage in supply. The boom is now over and the trade is worried at the loss in business. Foresters who might be inclined to say, "serves them right" should pause and reflect that the timber trade is the life blood of forestry and its well-being a matter of vital concern to the future of all concerned with timber growing.

The influence of the "drift from the land" is also analysed. There appears to be a close dependence of the rural use of wood on agricultural prosperity.

The consumption of wood in mining is dealt with in Chapter VI. While it might appear that this form of use is of little importance to this country where the prospects for mining are not bright, it is true to say that the pitwood market has been a very great asset to the industry in the past and should not be overlooked in the future.

The study runs right through the whole gamut of utilization, in transport, in packaging, textiles, paper, woodworking and finally sums up the prospects for 1960. Table XII/3 is well worth studying in that it gives an indication of the probable trends in wood use in the coming years. The big increases foreshadowed are mainly in the field of what might be broadly termed the pulpwood category. Consumption of paper and paper board is expected to rise by 65% to 113% as compared to a 23% rise in sawn timber.

Chapters XIX and XXVII provide much food for thought. These chapters reveal the dependence of the forest industries on the general economic position. Further they show up many of the weaknesses of the present position of the forests of Europe. First and foremost it appears that "the general belief that construction in general and housing in particular, is the key-index of the continent's wood needs is becoming less valid." The most striking change is the increase expected in the consumption of pulp products.

A matter of serious concern to Irish forestry is the revelation that Europe's annual timber producing capacity has been reduced by 31 million cubic metres as a result of loss of forest areas to Russia, excessive war-time fellings in Germany and unsatisfactory age distribution in Northern Europe. Under present programmes and at unchanged prices, Europe's output of industrial wood in 1960 is likely to be 50 to 80 million cubic metres less than requirements. If this situation, which, according to the study, is avoidable, is allowed to materialise it will have serious consequences for European economic recovery and also for the forest owner. In ten to twenty years time the output from European forests is expected to rise sharply again. If by that time the substitution of other materials for wood has been pushed too far, these additional supplies may fail to find a market.

This last conclusion is of vital significance to us here. Any contribution now by way of increase in mill capacity, in the fields of pulp and paper here in Ireland would be a very material help to European economy. This increase in pulp mill capacity would stimulate supplies here enormously during the next 10 years. If these pulpmills fail to materialise, not alone will we have missed a golden opportunity of getting established in the most important field of forestry utilization open to us but we will be contributing to a situation where by 1970 or so, with a vastly increased supply of material, we may find ourselves without a market for the products of our forests.

THE FORESTER'S HANDBOOK

by H.L. Edlin.

Published by Thames & Hudson. 395 pp. 35/-.

THE publication of a new Handbook covering the entire field of forestry is something of an event, especially as so many changes have occurred in methods, costs, prices and the legal position since the last publication of a comparable nature before World War II. Few have the necessary contacts with all aspects of forest management together with the industry and the literary facility which combine to make this work by Mr. Edlin at once practical, comprehensive and easily digested.

Most of the technical information will be familiar to the professional forest officer who has access to all the publications of the Forestry Commission and the various Journals. This book is rather intended for the forester, landowner and land agent who cannot hope to keep up with the spate of detailed technical publications. The attractive layout and illustrations and the simplicity and directness of the text as well as the extremely comprehensive coverage of the subject should ensure its popularity in its own field. The chapters dealing with Management Plans, Financial Assistance and Taxation will be particularly welcomed.

Thirty five pages are devoted to "Seed Collection and Storage," and "Nursery work" and give a very good picture of this aspect of forestry bringing to the reader's attention recent developments in weed control, mechanisation and heathland nurseries.

Close on 70 pages are devoted to the assessment of the planting site, its preparation for planting, and choice of species. This is perhaps one of the most difficult aspects of the forester's work to reduce to paper in clear and unambiguous terms—even for the student who has a solid grounding in Geology, Soil Science and Ecology. It is well nigh impossible within the limits set by the author and it is felt that the estate planter will be well advised to supplement his own judgments as to choice of species and mixtures with expert advice, especially when he has to deal with any of the more difficult sites.

Thinning is treated comparatively briefly—11 pages—the author confining himself mainly to general principles to be followed; but the table showing average number of trees per acre by species after thinning as against height of dominants will be found useful—especially to anyone who is in danger of being misled by reference to the old Yield Tables. The modern tendency towards earlier and heavier thinning is clearly illustrated in the table.

Felling, Measurement, Valuation and Marketing are adequately dealt with in succeeding chapters while the field of Protection is nicely summarised with references to sources of more detailed information where necessary.

The Chapter on "Shelterbelts and Screens" provides much interesting information particularly for the estate owner who has to get the most out of his land in the shape of livestock, crops and timber.

Many readers would welcome good drawings of the various specialised forestry tools—rutters, semi-circular spades, pruning and crosscut saws, lining-out board, etc.

The price may seem high by pre-war standards but for a technical publication of its size with a necessarily limited circulation, it cannot be regarded as unreasonable—in fact the book is very good value at the price.

PLANNED MANAGEMENT OF FORESTS

by N. V. Brasnett

Published by George Allen and Unwin Ltd., London. Price 20/-.

IN the first chapter of this book the author deals with the definition and scope of forest management. He rightly stresses that there are no ready-made systems of forest management which can be taken off the peg and made to fit any particular forest. He therefore follows the wise road of dealing with the subject in a broad way—laying down the principles that have come to be accepted by the forestry profession. He further stresses that the management of forest areas is a practical activity, a duty which should be entrusted only to trained foresters. In fact as he aptly states it is the main reason why such men should be trained.

It is very necessary for all connected with forest organisation and management to get away from the routine grind of day to day administration once in a while and to stand back and see what the management is really aiming to achieve. What are the objects of managements? What factors influence the attainment of these objectives? Do we fully understand the nature of the crop we are handling—the way it grows, the length of time it must stand on the ground—should we work to the physical, silvicultural, technical, or financial rotation. How should we organise the forest—so as to give the best arrangement of crops in time and place—to avoid gluts, and scarcities—to make the best use of labour, transport and milling facilities. All these are matters affecting management. They can only be decided on the ground and only then if the jig-saw of crops and development stages is put together properly to give a clear picture. The forest is dynamic—changing from day to day—

and subject to modification in composition and productivity by the application of cutting and tending prescriptions. All this requires management skill of a high order applied on the ground and with the technical knowledge and skill which can foresee the effects of treatment for decades ahead.

This text book on forest management helps us to appreciate the manifold tasks of forest management as applied to forest crops. It does not solve the local problem of any estate or any forest service as to how to run its day to day business. Questions of personnel relations, and detailed administration are not dealt with but it does provide a sound basis for anyone who has to teach the groundwork of forest management.

It also provides excellent material on forest organisation—working plans—orderly arrangement of reports on crops and prescriptions for future management. The student, the practitioner in the field, or the administrator at his desk will all find something of value in this text book.

Finally the author outlines the history of forestry and forest management in Western Europe, giving the evolution of current practices in Germany, France, and Switzerland from the classical simplified management of Cotta, to the highly involved, Methode du Contrôle, which is now the hall mark of Swiss forestry.



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DAY EXCURSIONS FOR 1953

THE Society's practice of holding a number of day-excursions to places of forestry interest was continued during 1953. All outings were well attended and many lively and interesting discussions arose.

The first outings were on Sunday, 12th April when two separate excursions were held, one to Ballyward property of Blessington forest, for members from Dublin and the midlands, and the other to Kilworth forest for our members in the south. Both excursions were by kind permission of the Minister for Lands.

The plantations at Ballyward are mostly well advanced and the main theme of this excursion was thinning, which was very fully discussed from all aspects during the day.

At the Kilworth excursion interest centred mainly round the *Pinus contorta* plots, which are a feature of this centre, with very lively and interesting discussions on this little known species as well as on general forest topics.

On Sunday, 13th September a very interesting excursion was held to Pakenham Hall Estate by kind permission of Lord Longford. The woodlands on this estate are being run on strict commercial lines and the devastated woodland areas are gradually being rehabilitated. All forest work on this estate is being conducted under contract by Irish Forest Products Ltd. We were fortunate to have the directors of this firm and their operational-manager, as well as the forest-advisor to the estate present to answer all questions—and they were many—put by our members. Detailed costings and records of all operations are kept by the firm and were made available to us. The most important and significant fact emerging was that the remnants of the old stands on the devastated areas were being made to pay for the rehabilitation of these areas, which is a tribute both to the estates forest-advisor Mr. T. Clear and to the contracting firm, Irish Forest Products Ltd.

An interesting experiment by this firm in the control of pine weevil by insecticides was explained at length and with detailed costings, but unfortunately it was yet too early to judge the results, although the indications were that some measure of success was being achieved.

In the evening the members were entertained to tea as guests of Irish Forest Products Ltd. and were shown some of the heavy equipment used by this firm in their operations. To private woodland owners this was probably one of the most interesting and significant of our day excursions to date.

On Sunday, 4th October we travelled north for our excursion to Ravensdale property of Dundalk forest. This, our last excursion of the year was designed to cover all aspects of forestry from the nursery to the mature crop and to provide a general summing up of our year's activities.

TENTH ANNUAL EXCURSION

FIRST DAY

THE Councils decision to return to the Valley of the Suir for the Society's 10th annual excursion, proved to be a very popular one, and the attendance included 14 of those who attended the first outing of the Society there ten years ago. Clonmel again proved to be an excellent headquarters and members freely expressed their appreciation of the accommodation it provided.

The party travelled in two buses to the Department's forest at Carrick-on-Suir. Here, our President, Mr. H. M. Fitzpatrick, welcomed the members and the guests of the society, among whom were Mr. Burgess representing the Northern Ireland Ministry of Agriculture and Mrs. Burgess, and Mr. McPhearson of Argyleshire. Mr. Fitzpatrick went on to give an interesting dissertation on the history of the district, with particular reference to the de la Poer family, former owners of the lands we were about to visit. He referred to an account by Dr. Nesbitt of a visit to these woods some 50 years ago. Quoting from Dr. Nesbitt's account he said: "The plantations extend to about 1,200 acres, most of which consist of Larch, Scots Pine and Spruce under 40 years of age, those about 20 years predominating. The system aimed at is to thin freely all the young plantations at about 15 years, some of the biggest poles being cut as well as all the smaller ones. Then at about 20 years, the plantations are again thinned rather freely, and once more at about 27 years, and then finally clear felled when about 33 to 35 years, after which the lands are replanted with larch chiefly, at 4' x 4'.

"This system is based on the two main facts (1) that larch is the only timber which can at present be easily or profitably disposed of, and (2) that the only favourable market at present is for pitwood, down to 3" diameter for export to Wales and it yields altogether about 115 tons per acre or an annual increment of 3.3 tons per acre. The land is well sheltered and of good quality." Mr. J. A. Crammond, representing the Minister for Lands, welcomed the party to Carrick-on-Suir Forest and gave a brief outline of the route to be taken. He then handed the party over to the convener, Mr. T. McEvoy who conducted us through the Forest.

Our first stop was at a 64-years-old European Larch stand. Planted in 1889 its present stocking is 120 stems to the acre. Average B.H.Q.G. is 8½" and average total height 76'. Volume 2,300 c. ft. per acre. We next saw a Scots Pine stand planted the same year having a stocking of 240 stems per acre with a B.H.Q.G. of 7¼" and a total height of 54'. The volume was 2,000 c.ft. to the acre. Members were very interested in these stands and agreed that they had benefitted by treatment since our last visit. The party was unanimous that these crops should be allowed to stand for some time longer despite the fact that a ready market exists for this type of material. The next stands visited revived the

evergreen question of thinning. Mr. Clear held that in vigorously growing stands such as those we were looking at, heavier thinning would be more beneficial to the crop and more economical. Mr. Crammond pointed out that frequent light thinnings made it possible to meet market demands better. Mr. Bogue supported Mr. Crammond and emphasised the importance of marketing timber when the demand existed. Mr. Galvin expressed the view that market reporting should be a Government function.

Mr. Mangan gave details of tests carried out by the E.S.B. on native poles. He said that tests were carried out at Inchicore on five species of native poles, and for comparison purposes, one imported species, Baltic Redwood (*Pinus sylvestris*). Each pole was held between two rigid supports 6' apart and a gradually increasing load was applied. He summarised results of the test as follows.

(1) Only one type of native pole (*Thuya plicata*) had a breaking stress considerably less than the imported pole.

(2) One type (Douglas Fir) had a value well above the imported pole.

(3) All the poles except *Thuya plicata* had a breaking stress greater than the Board's calculated ultimate breaking stress for safety.

Individual results were :—

Species	Breaking Strength in lbs. per sq. in. as per experiments	Breaking strength in lbs. per sq. in. as per Dept. of Scientific and Industrial Research (Princes Risboro')
Imported		
Baltic Fir	8,400	8,850
Sitka		
Spruce	9,500	6,800
Norway		
Spruce	8,300	7,850
Douglas		
Fir	10,420	9,600
<i>Thuya plicata</i>	5,320	not available
Corsican		
Pine	8,740	8,100

Mr. Clear said that it was very important that architects and engineers should be educated to the quality of our home grown timbers.

At the end of the trip through Carrick-on-Suir Forest, the party enjoyed an al fresco meal in pleasant sylvan surroundings.

We then proceeded to Kilsheelan forest. Our first stop here was in Gurteen where *Tsuga heterophylla* had been introduced as a filler through an open crop of oak. The oak was subsequently removed and the *Tsuga* has developed into a healthy vigorous crop. Commenting on this crop, Mr. Clear suggested that *Tsuga heterophylla* might be grown more extensively. Mr. Mooney said that the species had become more popular in recent years and would probably supercede Silver Fir

for shade planting. Mr. McEvoy remarked that the timber of this species imported to the London market had a higher moisture content than other conifers, but that kiln drying proved successful, and a ready market was available for the timber. Mr. Deasy said that *Tsuga heterophylla* was difficult to grow due to its poor germination, its susceptibility to frost damage in the seed beds, the difficulty of importing reliable seed and the scarcity of suitable parent trees at home. During a discussion on a shelter belt of scrub oak left after the remainder of the crop had been removed, Mr. Mooney said that the belt was justified as a fire break as well as a shelter belt. He recommended the establishment of hardwood belts around most of our conifer areas. Such belts were good for three generations of spruce.

In compartment 104 we saw a pure crop of Douglas Fir which was planted in 1918 and is at present carrying 250 stems to the acre. The present average B.H.Q.G. is $7\frac{1}{4}$ " and the average total height is 60', giving a volume per acre of 2,660 c. ft. It was noticed that trees which had enjoyed ample growing space all their lives had Quarter Girths of up to 11". A lively discussion on spacing ensued.

We next visited a 50 acre E.L. plantation belonging to Messrs. McAinsh and Co. where we were met by Mr. A. B. Ross, managing director and Mr. Hamilton. Mr. Hamilton gave the party a brief history of the plantation which is carrying a crop of 260 trees per acre having a volume of 2,600 c. ft. The party was impressed by the excellent condition in which the plantation was maintained. We were pleasantly surprised when Messrs. McAinsh's representatives treated us to refreshments which were very welcome after a long day's walking. Mr. Mooney thanked Messrs. Ross and Hamilton on behalf of the party.

The Society's annual dinner which was held in the Ormond Hotel, provided an excellent ending to a very interesting if somewhat strenuous day.

SECOND DAY

ON the second day the party first visited Bansha Forest. Lying on the slopes of the Slievenamuc ridge this forest comprises about 2,837 acres in a compact block. The soil, derived from O.R.S. series is light and generally suitable for pines. On the lower sheltered slopes, however, Douglas Fir and spruce compete for pride of place.

Our inspection started at Kilshane property and we then proceeded along the wooded southern slopes. It was noted that on this ridge Douglas Fir was having a lean time and that pine might have been a happier choice. Further on we observed some promising groups of pole stage Douglas Fir. They had been heavily thinned at 15 years of age as a safeguard against snow-damage. Shoot growth was quite good and the strain was considered to be good also, judging by the fine branching and straight stems.

Continuing, the party moved through some promising thicket stage Norway spruce. Some checked patches were observed and it was noted that calluna formed 50% of the ground vegetation, which brought on

the familiar questions regarding the advisability of planting spruce on such sites. Some members contended that the crop would pick up on suppressing the heather; Mr. Clear was of the opinion that Japanese Larch or a pine would have been more satisfactory. It was generally agreed that pine would be more economical in the long run considering the initial checks suffered by spruce.

The next halt was made in Ballagh Property to study the 40-years-old mixed stand of Scots Pine and European Larch. This stand was originally planted as a mixture by groups and records reveal that per acre there are at present 190 E.L., and 400 S.P. The respective Quarter girths at breast height are $5\frac{1}{2}$ " and $6\frac{1}{2}$ ", while their respective heights are 58' and 55'. Mr. Crammond informed us that the crop was thinned in 1946, 1947, 1951 and 1953. The thinnings were light, about 60 stems per acre being removed at each thinning. Members expressed surprise at such frequent light thinning. Some members were of the opinion that heavier less frequent thinning would have been more economical and sounder from a silvicultural point of view. Mr. Crammond in reply pointed out that from the financial point of view it was wiser to fell and sell when the price was favourable other things being equal. Many poles, he explained, were found suitable for transmission poles and consequently fetched high prices.

The party then visited a mature 80-year-old stand of S.P. which had been opened out very heavily with the object of inducing natural regeneration. Unfortunately, however, a dense growth of calluna and *Vaccinium* had completely negated the effort. Mr. Bogue was of the opinion that ground preparation such as mechanical scarifying would increase considerably the chances of success by giving a better seed bed. We then continued the ascent to Lisnagaul property on the hill top. Here, on this exposed height, interest was immediately focussed on the poor performance of Scots pine and the remarkable performance of *Pinus contorta*. Here, too, we had the unique experience of comparing the mountain type *contorta* with the low land variety. As thinning was in progress it was natural to expect a lively discussion on the treatment of this species. This stand had been green pruned—the thinning was in the nature of a light crown thinning and the removal of crooked stems. It was agreed that it is important to thin this species early owing to its fast rate of growth and tendency to windfall. Mr. Condon considered it a wasteful practice to "brash" all stems prior to thinning.

It was gratifying to learn that the thinnings were being sold profitably to the Wallboard Factory at Athy. The unspoken question in everybody's mind was, "How are the poles extracted?" because there was no road for miles, the terrain was rough and steep and altogether unsuitable for slinging with horses. The answer came abruptly even dramatically in the shape of a large lumbering vehicle which bumped and tore its way effortlessly up the steep heathery slope. It was a converted Artillery Quad car designed to haul guns and crews on ground such as this. Its four wheel drive and powerful engine rendered it ideal for its present tasks.

Descending the slopes we passed through a thriving stand of mixed Douglas Fir and Sitka spruce. Here the soil was more fertile and kinder conditions prevailed, and it was noted with satisfaction that the aim in previous thinnings was to maintain this happy mixture.

After lunch we travelled to Dundrum to inspect the modern sawmill and drying kilns, and to visit the forest. At the mills we were welcomed on behalf of the Minister for Lands by Mr. G. Haas and then addressed by Mr. Meldrum who during his term as Director of Forestry had been responsible for modernising this sawmill. In his address Mr. Meldrum said that his object in modernising this mill was to refute the general opinion that our native timber was inferior to imported stock. He said that native timber subjected to proper treatment could compare with any but he emphasised that proper seasoning was essential.

Mr. Moriarty first described briefly the lay-out of the mill and drying kilns then conducted the party on a tour of inspection which included a brief description and a practical demonstration on each machine. At the drying kilns he explained fully the theory of kiln-drying as well as demonstrating the working of the kiln.

From the sawmill we visited some of the older stands of this centre but the main interest was centred in a stand of Black Italian Poplar planted in 1927. Originally the planting was of poplar and alder in mixture at 5' x 5' spacing but the alder has nearly all been cut out so that the present crop is almost pure Poplar at 10' x 10' spacing. The average height is 78 ft. and the crop now carries just on 3,000 cubic feet per acre. Mr. Clear admired the stand but questioned the wisdom of growing poplars on a site which would have produced excellent spruce. He believed that poplar was essentially a farmland tree in that it can be grown admirably in hedgerows producing early shelter and a large volume of reasonably good commercial timber. Many members contributed to the lively and interesting debate which was wound up by Mr. Morris with a resume of poplar culture as practised on the Continent and particularly in Germany. He pointed out that there was no finality or general agreement, even among the acknowledged experts of other countries, on the general treatment, spacing, etc., for poplars.

THIRD DAY

ON the morning of the third day the party assembled at the State Forest of Curraghmore. This area comprises 2,680 acres of plantation and woodland, most of which is leased from the Marquis of Waterford, and contains various age classes.

Attention was concentrated in the Tower Hill section on the lower slopes of which the party first inspected a crop of 19-year-old sitka spruce which had just received its first thinning. In this operation 114 cubic feet per acre had been removed and some high pruning of selected stems had been carried out. It was stated that this crop had had a tough struggle in the early stages having suffered severe competition

from lush habaceous vegetation and damage from Spring frosts, but that since it established its ascendancy growth had been extremely rapid.

Further up the slope, however, another plantation of nineteen-year-old sitka spruce was inspected which presented a different picture. The soil here is dry but deep and the vegetation is predominantly "Irish" furze (*Ulex gallii*). The trees were not on an average more than four feet high and members were unanimous in ascribing such slow growth to the notoriously severe competition which this species of furze can offer. Any gloomy prognostications in respect of the crop were offset by reference to examples of similar severe inhibition of the growth of sitka spruce by this furze, which check however was followed by rapid and sustained growth as soon as canopy was formed and the furze suppressed. On the higher reaches of the slope the sitka spruce had been beaten up with Japanese larch and the latter had grown comparatively well, competition from furze notwithstanding. This aroused a brisk discussion on the relative suitability of these two species for such sites. It was generally agreed that, with modern mechanical equipment, pre-planting cultivation of similar sites is now not only possible but highly desirable. At an elevation of 700-800 feet an 18-years-old crop of Corsican pine on a dry grass site was inspected. The crop was poor and the local officers stated that the species does not thrive in that locality. Some were of the opinion that *Abies nobilis* might be tried on such sites.

On descending the western slope the party inspected an area carrying old, widely spaced, spreading beeches. An attempt was being made to restock the area by natural reproduction of the beech. Much success had been achieved but in some cases the operation was proving very difficult as the necessary conditions normally brought about by the "light and often" regeneration fellings were not possible of attainment here due to the great area exposed by the removal of any one of the trees. Seedlings are not able to survive for long the heavy shade of the parent tree but on the other hand the felling of the parent tree in time to save the seedlings is providing its own problems—seedlings given full light are smothered by the vegetation that springs up. The periodic removal of some of the heavier limbs where such is practicable was suggested as one way of overcoming the difficulty here.

From the State forest the party passed into the Curraghmore estate property of the Marquis of Waterford where we were welcomed by Lt.-Col. Silcock. Near the nursery an old wood of about 15 acres was inspected. The striking feature here was the abundant and vigorous regeneration of the common silver fir (*Abies alba*). Lt.-Colonel Silcock outlined the technique employed in achieving such successful restocking and mentioned the difficulty experienced in preventing damage to the young growth during felling operations. In the pleasure grounds members had a delightful time examining the fine collection of rare and beautiful trees and shrubs. Among the well known major tree species

in adjoining groves were some massive oaks and truly lordly pines, the latter (*Pinus sylvestris*) being up to 15 feet in circumference and 120 feet high. A specimen of Sitka spruce, probably one of the earliest introductions of that species to this country, stated to be 166 feet high with a circumference of 18 feet at 5 feet from the ground illustrated the possibilities of the species in this country.

Oak is an important constituent of the old woodlands and the average volume per acre in the pure oak stands of over 100 years is 2,700 cubic feet.

On leaving the estate the President, on behalf of the Society, thanked Lt.-Col. Silcock for his kindness in conducting the party through the estate.

After lunch which was taken at St. Joseph's Convent, Portlaw, the party travelled in buses to the Lismore estate, property of His Grace, the Duke of Devonshire. The party was met on arrival by Mr. Cantillon, who stated that the estate contained 2,000 acres of forest, 1,700 acres of which were productive and 300 acres scrub. Most of the planting had been done prior to 1900, the total planting during the period 1935-50 being only 58 acres. A nursery and sawmills are attached to the forest in which all the estate plant requirements are produced and all timber felled is converted.

One of the areas visited was Knocknagoppul Wood. This comprised two sections, one planted in 1831 and the other in 1851. The species was Scots pine mainly with some hardwoods, chiefly oak. The Scots pine in the first section numbered on an average 75 trees per acre with a volume of 5,000 cubic feet while in the second section the stocking was similar with a volume of 4,850 cubic feet per acre. Mr. Cantillon stated that it is intended to carry out clear felling in two ten-year felling cycles and to replant the felled areas immediately, mainly with fast growing species such as poplars of the Black group, the aim being the largest volume tree in the shortest possible time. To achieve this an initial spacing of 20 feet apart will be adopted for the poplars.

In this wood members inspected a 10 h.p. petrol driven "McConnell" saw unit which was being used in the conversion of inferior logs to fuel blocks.

In the nursery were stool beds of six varieties of Black poplar which had been imported from England and which were certified canker free and true to name. One purpose of these stool beds is to provide high-grade cuttings from which will be derived the planting stock required in the replanting work mentioned above.

Some seed beds of *Pinus contorta*, *Pinus radiata* and Sitka spruce sown with a McCormick corndrill were inspected. This machine has thirteen tines and it was stated that by closing the centre seed outlet an alley 12 to 14 inches can be left between every 6 rows which rows are themselves 6 to 7 inches apart. To facilitate distribution the seeds are mixed with sand in the ratio of 1 part of seed to 3 parts of sand. Norway spruce had been sown by this method the previous year with a fair

measure of success, but some members were rather dubious of the suitability of the method for the smaller seeded species such as *Pinus contorta* and Sitka spruce (the sowing of these species had been carried out only a few days before and it was not possible to judge results).

Before leaving Lismore the party was very kindly treated to refreshments by the Estate on behalf of the Duke of Devonshire.

On the return journey to Clonmel the party were given the opportunity of inspecting the recently constructed foresters house at Clogheen forest.

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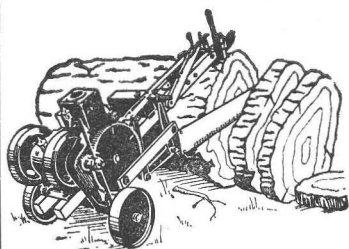
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The cover photograph shows a specimen of the Noble Fir, (*Abies procera*, Rehder).

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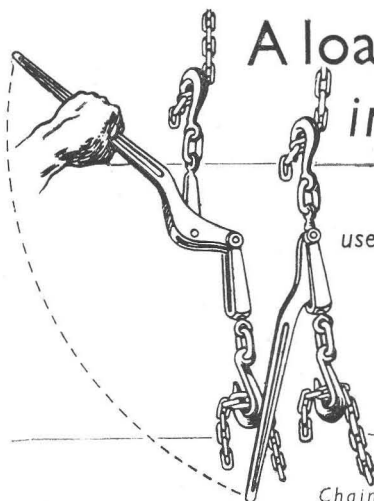
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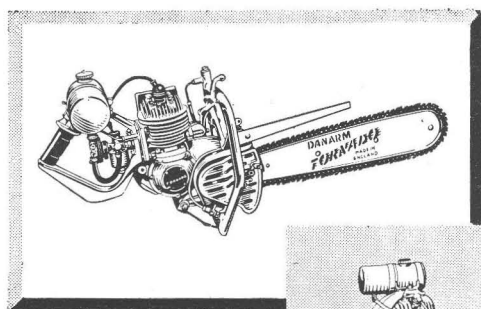
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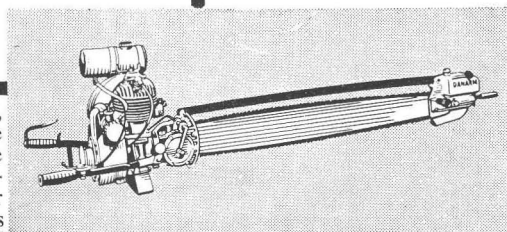
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