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IRISH FORESTRY

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IRISH FORESTRY

VOLUME IV

OCTOBER, 1947

NUMBER I

EDITORIAL

Since the first issue of the Journal saw the light of day in November, 1942, we have attempted to provide suitable mental fare for the Irish Forestry public. Looking back we see-naturally enough-that historical matter predominated in the early numbers; that this phase was succeeded by another in which the major contributions consisted of general summaries of our present position (e.g., on pathology and vegetation). From this phase we have yet to emerge. In fact the Journal has not become-in the best sensetopical. It does not hold the mirror up to forestry, to reflect the latest sylvicultural trend or fashion, and such items as the vagaries of weather and markets and their effects in the forest. In short, it has yet to become the sensitive vehicle of forestry thought and the day-to-day record of foresters' observations and experience. When it does enter this desirable phase it will lay the foundations on which a high technical standard of work and a proud tradition must rest.

With the best will in the world, the Editor is quite helpless to alter the present state of affairs unless he gets the co-operation of members. In fact at the moment, the main hindrance to what the Constitution terms the "timeous appearance of the Journal" is the difficulty of obtaining in time sufficient material for the issue in hands, not to speak of building up a reserve for future numbers. The remedy is in the hands of the forester. He must overcome his natural disinclination to prepare material for publication; he must not lull his conscience with thoughts of leaving writing to professors, scientists and research workers; he must be prepared to observe acutely developments in his woods and to record them with all possible accuracy.

There is a tendency to think that because a contribution is brief and simple in form it is unimportant and unworthy of permanent record. Nothing could be further from the truth. We are using in afforestation inadequately-tested exotics of which no mature plantation exists here, e.g., Pinus Contorta. We are planting in conditions of soil and altitude of which we have all-too-little previous experience. In fact our whole essay in forestry might be described as an expedition into the unknown in which we cannot afford to ignore the smallest tittle of evidence. Few are equipped or have the opportunity for advanced research but every individual can do his bit as scout, intelligence officer or observer to spy the dangers and pitfalls that beset our path and guide us safely past!

Retreating to his last line of defence, the forester may claim that there is nothing remarkable to record from his particular area. But, like beauty, lessons in forestry, lie in the eye of the beholder, and the discerning eye seldom fails to learn from the apparently commonplace. The field for observation and record is vast. Take, for example, the forester working on limestone soils. Our general teaching regarding planting on this type is taken *en bloc* from English and Continental literature and may not apply in full here where rainfall is higher and leaching more pronounced. Yet the Editor has received nothing on this topic.

Again the milder climate of our Atlantic seaboard and its effects on vegetation are so remarkable as to be the subject of repeated studies by British botanists. Surely foresters must now be able to set down their experience in establishing tender exotic tree species such as Pinus Insignis and Eucalypts on the Atlantic coast? To cite a case in point, are the remnants of the very successful Maritime Pine plantation on sand dunes exposed to the Atlantic's fury at Mullaghmore (Co. Sligo) to disappear unrecorded, so that the history of a courageous and significant experiment may be traced only in the fickle and uncertain memory of the local "ancients"?

Two years ago a more-than-usually destructive May frost caused complete defoliation of mature oaks and killed outright many Sitka, Insignis, and even Contorta plants. This exceptional event scarce stirred a passing mention in our Journal. Lists of species in order of severity of damage for different districts would have been of general interest but the Editor did not receive a single account. Yet this is such stuff as sylviculture is made on !

If members are still diffident about authorship, may we at least hope for contributions couched in the more informal style of "Notes" or even "Letters to the Editor"? Associate members too can contribute much to the Journal, perhaps not always of a technical nature but touching the general aspects of forest policy and the views of private woodland owners. Such contributions will be of general appeal and will be particularly welcomed as catering for associate members' interests—interests which lack of suitable material has forced us to neglect in the past.

There is just one other matter which has obtruded itself unpleasantly into the deliberations of the Editorial Committee and of the Council, and to which we might draw members' attention. Last year the publication of two issues of the Journal cost fgo. With a 40 *per cent*. increase in printing costs in the interval, two similar issues would cost f_{125} this year so that the entire subscription income of the Society, if not more, would be absorbed. The Council is reluctant to economise by reducing the size or quality of the Journal but may be forced into this course to maintain our solvency. The obvious, and in every way desirable, alternative is an increased income through a substantial increase in membership. The point may be emphasised by giving costs of production. The first 400 copies of a 48 page issue now $\cos t 2/3$ each to print but an extra 100 can be printed at less than a shilling each. Increased membership will enable us to produce the Journal quarterly and to improve all our services. It is therefore important, and indeed urgent, that everyone should seek to introduce as many new members as possible in the immediate future.

In conclusion, may we apologise for this tedious Editorial introspection and hope that future Editors, secure in the knowledge that Irish forestry has reached adult stature and become fully articulate, will be able to address their eloquence to forestry problems proper as distinct from the growing pains of the Society's organ ?

OBITUARY

THOMAS MADDEN

Members will have learned with deep regret of the death in Baggot Street Hospital on 24th August, 1947, after a brief illness, of Thomas Madden, State Forester, Coolgreaney, Co. Wexford.

On completion of his training at Avondale School of Forestry with the 1941 class, he was placed in charge of portable sawmills and charcoal production at Rathdrum Forest where he did pioneer work in the preparation of charcoal and its use in petrol engines. He was later in charge of Donadea and Coolgreaney Forests. In each of these posts he showed marked ability.

He was an enthusiastic member of our Society and served on the Council in 1945 and 1946 when he was instrumental in bringing the library scheme into action. He also contributed to the Journal.

To him Forestry was more than a livelihood, it was an abiding interest and his numerous friends will regret the cutting short of so promising a career at the early age of twenty-nine. R.I.P.

THE NATURAL AND ARTIFICIAL REGENERATION OF TEAK IN BURMA

By H. BERESFORD BARRETT, M.A. (Late Indian Forest Service).

When I told my relatives and friends that I had been posted to Burma I usually had to show them on an atlas where it was. One dear old aunt wondered how I could find enough forest on the islands: she was thinking of Bermuda !

Burma, to the East of the Bay of Bengal and cut off from India by mountains, is really the western part of Indo-China. The country is mainly in the drainage of the Irrawaddy, exceptions being Tenasserim in the South and Arakan in the West, and some Salween drainage in the East, in the Shan States really.

On arrival in Burma, one enters the orbit of China. Decennielly what the Burmese called "Ambassadors" and the Chinese "messengers bearing tribute," were expected at the Court of the Sun of Heaven in Pekin. If the expedition failed to arrive, the Yunnan Viceroy would send an army, which would ravage much of Burma and chase the King into the jungle. As might be expected the people are of Mongolian types mainly speaking monosyllabic languages with tones.

Burma, with the Shan States and frontier tracts, some of them sketchily or not at all administered, is about 8 times the size of Ireland, with, before the war, a population of about 15 millions, about three-fifths being Burmans, the rest mainly Shans in the Shan States, Karens and Taluing, in the South, Chins and Kachins in the North and Arakanese in Arakan. There were a good many Indians, coolies and shopkeepers in the towns. The indigenous people were nearly all Buddhists, except that there were a good many Christian Karens.

Buddhism among the Burmans, like many other things with that delightful, gay, brightly dressed race, was somewhat vague, shading off to animism. The women are perfectly free; Burmans are rather henpecked.

Historically, there were three powers; the Burmans whose capital was usually near Mandalay, the Talaings or Peguans of Pegu, and the Shans of the East. In the middle of the 18th century, the Burmese got control and kept it till the dynasty began to collapse in the 19th century. They never achieved anything much of an ordered Government; when a king died his successor was the one who succeeded in murdering all possible rivals, male or female, a la turque. The successful one rewarded his followers with districts or provinces, on condition that they sent an annual contribution to the Capital. These Myo-Wuns sent as little as they dared and squeezed as much as they could. The last dynasty had a strain of madness. Thorrawaddy Min's idea of a joke was to rush into the audience chamber and throw spears at his Privy Council. Thibaw Min could not maintain order at all and the people migrated in numbers to British Burma. When he was deposed, the only reasonably sober member of the Royal Family died soon after and Upper Burma had to be annexed and the long task of restoring order began. But all the time the forest grew on and the teak trees in it.

GENERAL DESCRIPTION OF FORESTS.

There are broadly, from the legal point of view, three kinds of land in Burma: (I) *fields*, etc., which belong to someone, though land revenue is paid to Government on practically all land; (2) "*unclassed forest*," which is really commons, and may or may not contain trees—it usually does—94,855 square miles in 1939-'40.

In practice, one could cut unreserved trees within 10 miles of one's village, for one's own use, cultivate land and so on, though in some cases restrictions were imposed.

(3) There were also 31,409 square miles of *reserves*, nearly the area of Ireland, about 80 % teak bearing. These were, of course, completely under Government control, apart from rights granted at settlement. There are considerable areas of forest in tribal tracts not under forest control.

Burma has a moist monsoon climate, governed by the S.W. monsoon, which reaches Tenasserim, Lower Burma and Arakan usually about the middle of May; meeting high hills near the coast in Tenasserim and Arakan. The precipitation there is heavy, up to 300 inches, producing evergreen forest without natural teak. The Irrawaddy Delta being wide, the rain drives across it and up the Irrawaddy and Sittang country, and along the low Pegu Yomas, losing force as it goes.

The high Arakan Yoma stops the rain from the S.W. further North so that there is a dry zone, more or less desert in places for about 100 miles N.S. of Mandalay, with rainfall down to 20" against about 100" in Rangoon. Again there is a wet zone in Upper Burma with a fall of 60"-100". Teak will grow with 40", but 60"-120" is best; above that the forest becomes evergreen. It must be borne in mind that little or no rain falls from November to May, the Sittang, for example, a bigger river than the Shannon, is only a few disconnected pools in March.

Teak is a deciduous light-demanding tree, and can only regenerate in a deciduous forest, the best types being moist bamboo forests, with good drainage. There are, of course, numerous other species as well as teak. Leaves begin to fall in December and the first fires begin in January and accelerate leaf fall. The second lot of fires is in February and by March the ground in the average teak forest, apart from evergreen along more or less perennial streams, is black with ashes.

EXTRACTION OF TEAK.

Distances are such that the only economical way is usually by floating. Green Teak is useless and will not float, so the trees are girdled by cutting a ring exposing 3" of heartwood round the butt. The trees then stay 3 hot weathers to dry. Girdling, usually in a thirty year cycle, begins as soon as the forests are healthy after the rains, working plan control being now usually by basal area.

Minimum girth limits are usually, at 7' 6'' in moist forest, and 6' 6" in dry. Also trees down to 3' are measured and recorded at girdling and grouped 3'-4' 5", 4' 6"-5' 11" and 6'-7' 5" in the report, and a stock map is made. Girths are taken at 4' 6".

RELATIVE IMPORTANCE OF TEAK.

Teak is far more important than all the rest of the forest produce put together. It has always been a royal tree in Burma-it being illegal to cut a teak tree anywhere without a licence. It is extremely durable. For example, when girdling in Katha about 1924, I found a log which was left behind by the Bombay Burma Timber Trading Company and by chance had got into a moist spot, so escaped fires and bore perfectly clearly Mindon Min's marks and was perfectly sound. King Mindon died in 1878. The timber also has the advan-tage that iron nails do not rust in it. To show its relative value, out of £1,079,500 revenue in 1939-'40, about £750,000 was from teak, though 400,000 tons of teak came out against 434,000 tons of other timber, 1,236,000 tons of firewood, astronomical numbers of bamboos and quantities of other kinds of produce from sea-swifts' nests to leaves for thatching. We work a few forests in Lower Burma, but otherwise extraction is done by timber merchants and the revenue is thus nearly all royalty. A ton is 50 cubic feet, nothing to do with weight. The expenditure by the way, was $f_{447,000}$, surplus $f_{632,500}$ over 58 % of the revenue.

NATURAL REGENERATION.

The best teak is in bamboo forests burnt over annually. At the beginning of this century, fire protection was tried extensively with unfortunate results. Evergreen species came in and teak regeneration failed. In some cases fire has not re-entered the reserves and there may even be a top storey of teak with an evergreen undergrowth. This is largely the case in Myitkyina Division, which is near the northern limit of teak and is moist and misty. It was also found that the girth classes were not normal, even in forests never protected, one of the smaller classes often being deficient.

Ring countings are made on felled trees where possible, and an approximate relationship between their girth variations and

flowering of bamboo begins to be noticed. It was also noticed that young teak often comes up profusely in old "Taung-yas." "Taungya" is "hill-farm" in Burmese and is our old friend, shifting cultivation. The Ya-Thama cuts the forest down, burns it, sows his crop in the ashes, reaps it and moves on. Seed buried in the undergrowth for years then germinates. When the bamboo flowers, there are exceptionally fierce fires next season, and by the end of the rains, the ground is covered with bamboo seedlings. The teak seed germinates and gets well ahead of the bamboo. Though we cannot make bamboo flower to order, we help the teak by cutting climbers on it at girdling, leaving climbers not likely to reach teak, carrying out improvement fellings in favour of young growth, and felling ficus-bound trees. Teak is vigorous and responds very well to these operations: where funds permit, and the teak stock is good these operations are repeated at intervals and local timber merchants are encouraged to extract other species, the less valuable having very low royalty rates. The quantity of teak per unit of area has in many cases doubled in the last 50 years.

ARTIFICIAL REGENERATION.

In 1939-'40 about 140,000 acres of plantations remained on the books; 1,640 acres were planted that year. There has always been considerable controversy about plantations and the less successful centres were closed down and unsuccessful areas written off. At first areas of forest were cut down and planted by direct labour but this cost too much. Since about 1915 all plantations have been by the *Taungya* method. We have seen that profuse teak regeneration was found in old *Taungyas* and after bamboo flowering.

The method is this. An area is selected that is considered suitable for teak, though poorly stocked or not stocked at all. Any teak in this area is girdled and got out. When this is done other species if marketable are sold to contractors and arrangements are made to start a forest village. Considerable care is needed in selection. A village should be about 20 households, each household needs anyway three acres of forest a year for its ya and the centre should be big enough to last 20 years. As far as possible plantations should continue straight ahead, not in patches. There must be a good permanent water supply for the village and reasonably good grazing for the village cattle.

The villages are usually inside reserves, are called forest villages and are largely under forest department control. Incidentally they are about the most contented part of the rural population and there are always applications for vacant places in these villages. They have privileges but I think what they most like is that practically all their dealings with Government are with the local forest ranger and so they are not harrassed by numerous petty officials who make a nuisance of themselves to villagers in accessible areas.

The plans are drawn up for ten year periods, revised after five years if need be, the annual area being prescribed in the management map. The individual *yas* are allotted by the headman in consultation with the villagers. Disputes, which are very rare, are settled by the ranger. If any villager really makes a nuisance of himself he can be evicted after due inquiry by the D.F.O. I held 6 different charges in my service and I think I can only remember having evicted one man who refused to cut *yas* and took to theft.

By the end of December the fire lines have been cleared. It has been found advisable to fire-protect teak for about 5 years; young bamboo forest does not burn to any extent. In practice fire lines follow the most convenient boundaries—rivers, wide roads, etc. as far as possible to save expense. It is most essential that no accidental fire reaches the ya of the year as an imperfect burn spells failure. To make things safer the ranger carries out controlled burning of a wide belt outside and up to the fire line.

In January the villagers begin to cut their yas and the felled forest dries during the hot weather. Near the end of the hot weather the great day arrives, a calm evening being chosen. The ranger and his staff and the villagers assemble. At a given signal, usually by the ranger firing his gun, torches are put to the now dry yas. Fierce flames roar up, clouds of smoke billow up into the sky, thousands of bamboos explode in all directions, the noise is terrific. Next day the villagers start clearing up any débris left. If the burn has been good they should not have much to do. Then the ranger comes and puts in rows of stakes 6' by 6' across each ya and issues teak seeds with which the villagers form nurseries. When the rains come the villagers sow their crops in the ashes and transplant the teak seedlings to the stakes. In the first rains the villagers keep the teak weeded; about December, after their crops have been reaped, the ranger comes and counts the successful and unsuccessful stakes. The villagers are paid so much per hundred live plants, rates varying according to the percentage of success-highest rate for 90 % and up, then 75 %-89 %, 60 %-74 %, and under 60 %. I have had every single ya over 90 %. Percentages under 75 % are bad luck of some kind and one did one's best to make it up to the villager. Apart altogether from the cash the villager took great interest in the work. In the slump of the early thirties villagers offered to plant for nothing and during the rebellion in Lower Burma they carried on on their own.

From the second year we do the weeding. At the onset of the rains myriads of weeds appear, one can almost see them grow. The first weeding has to be well judged. If done too soon work and money may be wasted. If done too late the weeds may overtop the teak and climbers get too bad. Towards the end of the rains another weeding is usually needed, and occasionally a third. This is an anxious time for the ranger. The finance department in Burma kept a tight hold of the purse strings and money was hard to get. Usually by the third year the canopy had begun to close and at most one weeding was needed; in good areas the canopy might have closed and teak shade keeps down weeds. By the fifth year teak should be 20-25' high and a first thinning is done. It is essential to keep young teak growing vigorously so this is drastic, 50 % usually and it may be 75 %. By now *ya* cutting has moved on and the plantation is probably outside the fire line. It is carefully inspected by the D.F.O., failed areas, if any, written off and the balance taken as established. Another thinning is usually made between the tenth and fifteenth year and after that thinning is done at much wider intervals. As far as possible, plantations are inspected annually and arrangements for the thinning made well ahead.

All this sounds ideal, but there are, alas, snags—two principal ones, the Beehole-borer and erosion.

The Beehole-borer is the larva of a small brown moth, who lays her eggs in the bark. The grub lives three years in the tree and makes the timber useless. Infestation in plantations is appalling and many otherwise excellent centres had to be closed down. Shortly before the recent temporary irruption of unpleasant yellow savages into Burma a parasite had been found but it is rare.

Teak is very deciduous and casts a heavy shade when in leaf. In the hot weather the sun burns the ground and cracks it. In the rains with no weeds to hold the ground, erosion is heavy, many plantations have begun to show signs of stag-headedness.

CONCLUSION.

Two problems have been mentioned, (I) Natural v. artificial regeneration; (2) To burn or not to burn.

As far as Burma is concerned I was in favour of natural regeneration except in areas where teak had become scarce in sites suitable for its growth. It became obvious that, apart from the few years initial fire protection that corresponded to the early nonburning stage of the bamboo, it was better to burn.

As regards Ireland, I have been abroad so long, you know far more than I do about it. I make the following suggestions for what they are worth.

I think a survey of the country as a whole from the forestry point of view should be made. Such regeneration centres as are selected should be of reasonable size and the question of establishing permanent forest villages should be considered. There should be plenty of work, planting, thinning, fire-protection, road making, felling, boundary repairs and many other things. My opinion is that forestry will never flourish in any country that is not forest-minded. Of course in war time, Governments get scared and forestry gets a temporary boost up but when people begin afterwards to grouse about taxes, finance ministers cut first on things fewest people know or care about. Forestry is one of these. If the forest village idea is practicable we shall have at any rate a nucleus of forest-minded people living a healthy outdoor life. The people should have good gardens, a certain amount of free grazing would probably be available in old woods and along fire lines. It might be possible to run poultry in old woods, the birds would eat large quantities of harmful insects. In some cases crops might be taken from old felled woods, this working improving the soil. I have very happy recollections of my forest villages with their churches and schools if Christian, or pagodas and monastery schools if Buddhist, peaceful happy people among whom crime was almost unknown. In over 20 years I can only remember one bad man.

BURNING.

In many mature woods I have seen leaves or needles so thick that the chances of the seedling root reaching the mineral soil seemed to me to be negligible and the forest floor must be very sour. Would not a controlled burning help to get us natural regeneration ? Has natural regeneration ever been tried ?

FOREST MINDEDNESS.

We must, I think, aim as far as possible at seeing the point of view of others. I come from Connemara, I think Sir Shane Leslie would like it to be a National Park. I think I am as keen on forestry as anyone but I heard some time ago that our lovely country was to be covered with rows and rows of Sitka spruce. *Absit Omen.* Forestry can be beautiful as well as useful, there are oak and beech and ash.

We are all foresters. We are all Irishmen too. The cynical say that the difference between doctors and foresters is that they bury their mistakes and we are buried before ours are found out. Let us try and not make a mistake, but help to leave behind us not only a well afforested Ireland, but a beautiful Ireland.

APOLOGY

Owing to the continued accumulation of arrears of work in the printing trade, the editor regrets that the first issue of volume IV of the Journal has been delayed in going to press and apologises for its lateness in coming into the hands of members.—ED.

THE FORESTRY REVIVAL IN-EIRE

By A. C. Forbes.*

For the last three or four hundred years, that part of Europe now known as Eire has had the unenviable distinction of occupying the lowest place in a small group of countries which have touched rock-bottom in the matter of forest area to total land surface. The three constituent countries of Great Britain; England, Scotland, and Wales, have all been more or less in much the same condition, the differences being so slight that they might almost be disregarded for practical purposes, and at the end of the seventeenth century it is probable that all parts of the British Isles were at a lower ebb as regards woodland than at any other time subsequent to the Norman Invasion. This was brought about in much the same way. Mild winters permitted continuous grazing by large herds of cattle and flocks of sheep, leading to the destruction of seedlings which should have taken the place of trees dying, falling by wind, or other causes. Only in England due to the manorial system on the one hand, and the preservation of crown forest on the other, was there any check on this movement, and the result was the existence of 5 % of that country under wood at the time referred to.

THE LAST REMNANTS OF NATIVE FOREST.

Agricultural statistics upon which any reliance can be placed do not go far enough back to enable the woodland acreage to be given for Eire in or about 1700 A.D. But probably 100,000 to 200,000 acres would not be too low, leaving out scrub and partially open ground. This acreage was chiefly covered with oak, ash and birch, the first named being cut over periodically for pipe staves, charcoal, and bark down to about 150 years ago, after which many areas under oak were left to grow on for the production of timber only. Old records show that many of the larger oak woods were leased to English merchants for a number of years, and one of the conditions was the fencing out of cattle before danger to stool shoots could occur. This was probably the first effective step taken to preserve the native woodland which still remained at that period. The distribution of this oak woodland is not very uniform at the present time, and a portion of it has been replaced by conifers or species not entirely indigenous to the country. But it is much more in evidence in the South of the country than in the North, and in hilly districts and on poorer soils than in those better suited for producing high class timber. The quality of the trees still standing had, until quite recently, a low reputation, and they were not in much demand for industrial purposes, but at the present moment anything which

* Mr. Forbes is a past Director of Forestry for Eire.

looks like wood has more or less the same value for some purpose or other.

By 1650-1700 or later the whole surface of the country had practically been given over to grantees for services of a military or political character, and these in their turn leased or let it out in the form of manors, (so called) the holdings on which were continually increasing in number proportional to the size of the population, but decreasing in size. Whatever natural forest survived at this time was unfenced, apart from that just referred to, and gradually overrun by cattle, exploited for timber and fuel, and diminished in area at a rapid rate.

THE BEGINNING OF ESTATE PLANTING.

But the bare nature of the country as a whole was quickly realized when the landlords and adventurers of the period found themselves in a position to erect mansions and settle down as residents on what looked like a permanent footing. To complete their position as landed gentry, and embellish the immediate surroundings of their seats, woods and shelter belts were necessary on a much larger scale than could be provided by natural scrub and woodland capable of being enclosed within the boundaries of the demesnes, as the land which had been cleared of small holdings was termed, and which invested the property with the necessary privacy and protection. Planting thus became an important operation in laying out this form of property, and although forestry in the ordinary sense of the term was not the primary object in view, the methods adopted in carrying out the work laid the foundation of the industry which is now beginning to receive attention as an important factor in rural economy.

The chief feature which distinguished the earliest efforts to clothe the country with trees for shelter and ornament, and which differ from ideas prevailing at the present time, was the attention paid to landscape effect from the central view point of the planter. Land was planted or left unplanted without any reference to soil qualities or economy in fencing. Labour was cheap, and much of the material required in the way of wire or ironwork which is considered essential at the moment was then dispensed with. The particular species used in forming a clump was not regarded as of much importance, but there seems to have been some preference shown for beech and other broad-leaved species which could be planted at a good size, and obtained easily from public nurseries. This was apparently the period when beech was introduced into the country, as there is no evidence that it is indigenous. Whether the object was to produce a quick effect, or to use plants likely to escape injury from ground game cannot be definitely stated, but planting trees up to ten or twelve feet in height was quite usual, and special machines were in use for lifting and transporting them. Probably

both objects had something to do with the practice in the earlier stages of the work. Boundary lines, hedgerows, and short avenues were the first to receive attention, so far as can be judged from the few examples still remaining of Spanish chestnut, sycamore, elm, and beech in these positions.

The more ambitious efforts in laying out demesnes can be traced to the popularity of "Capability Brown" as a landscape gardener in England about the end of the 18th century. One of his disciples laid out a number of demesnes in Eire on the stereotyped lines prevailing at the time, and which were probably followed during a period of 40 or 50 years without much variation, and possess one feature which might be termed the trade mark of the method. This was the marginal belt which separated the demesne from the agricultural land outside, and is probably more conspicuous in Eire than in any other country showing this form of planting.

Whether there was any serious object in view connected with the production of commercial timber when the work described above was initiated it is difficult to say. The country seems to have managed up to 1750 or so with fairly small imports of foreign softwoods for building purposes, and to have had little difficulty in making good any deficiency with home grown wood. But after about 1800 planting as a commercial proposition on the poorer soils of estates, and with little reference to landscape effect, came more into evidence. This was probably stimulated by the quick returns possible when larch was cut at an early age as pitwood for export to England, and props shipped from the Southern and Eastern ports enabled coal to be brought back as return cargoes at easy freight rates. At that time, and during most of the 19th century labour and plants were cheap and plentiful, while the financial position of most estates enabled planting to be carried on without too great a strain upon their finances. In the Statistical Reports and Surveys of Irish counties furnished to the R.D.S. about that time prices for timber appear to have been about the same as now. Probably the Napoleonic Wars were responsible for this.

But with the various Land Acts which came into operation after 1880, poor land suitable for planting passed into the hands or under the control of agricultural tenants, and landlords had few opportunities for extending the work commenced earlier in the century. The re-planting of cleared land still went on in a dilatory way on many estates, but the slowing down of the forestry operations at this period has never been renewed as a private enterprise, and it appears to have practically brought to an end the activities which had been going on for more than 200 years. Apart from the uncertainty connected with the trend of land legislation, the general drop in the prices obtained for home-grown timber, and the increasing imports of building wood, gave most estate owners the impression that their work would not be sufficiently remunerative under the policy of free trade then being pushed to its extreme limit by successive governments with progressive tendencies. If planting did not cease entirely, therefore, it was continued more as a duty based upon tradition than as a profitable branch of estate economy.

OUR DEBT TO THE EARLY PLANTERS.

It is not necessary to go into great details connected with estate forestry in Eire as it was practised for about 150 to 200 years The developments connected with nursery work, the fencing of the land, the choice of species, and the systems on which they were planted can all be traced without any difficulty to similar methods in Great Britain, carried out for a similar reason, but at a somewhat earlier period. It would not be correct to say that nothing was done in Eire or in Great Britain before 1650 or after 1880, but this particular period forms a convenient starting point for considering private planting in the two countries, when landscape effect was of more importance than the value of the timber produced. But the one object could not be obtained without bringing in its train a great many of those features which are now carried on by the State for quite another reason. But it is only fair to call attention to the enormous saving which the enterprise and experiments of private planters has effected by anticipating the solution of innumerable problems, which would either have necessitated many years delay, or the expenditure of large sums of public money had they been postponed until a recent period. The introduction of exotic species, the classes of soil on which they have proved successful, and the commercial value of their timber have all been investigated during the last 100 years or more on a sufficiently wide scale to supply the modern planter with information of the greatest value, and without which he would be working on very uncertain lines to-day. If the State Forest policy now being adopted recognises its obligation in this connection, it merely pays back a debt which has been owing to several generations of private owners. But the greatest value of these woods has been found in the functions they performed as timber reserves during the partial or total cessation of imports during the two periods of 1914-1918, and that of the timber crisis through which the country has been going since 1939, and which has not yet terminated. This anticipation of present day conditions may be excused at this particular point, but one almost trembles to think of what the position in Eire would have been without the private planter of 50 to 100 years or more ago.

Outside demesnes little planting was done until the famine period of 1845 to 1850, when all forms of rural work were put in hand to the greatest possible extent. For these plantings conifers were chiefly used, Scots pine, larch, and spruce forming the bulk of the species on the hillsides and poorer types of soil devoted to this work, which seems to have been the last big scale operation of its kind which took place on private property. After this period little happened in connection with estate woods to alter their condition, until the big storm of February, 1903 which devastated many areas across the centre of Eire, but seems to have spared the North and South of the country. The effect of this storm can still be seen on many estates in the shape of semi-waste ground, covered with brambles, bracken, birch, scrub, etc. and scattered patches or single trees remaining over from the old crop, which often had to be practically given away to get it off the ground.

THE HOWITZ REPORT AND KNOCKBOY.

So far conditions have been referred to which belong to a day which is past and gone, and had little to do with present day policy. But there is no doubt that estate forestry laid the foundation of practices which have not greatly altered during two or three centuries so far as essentials are concerned, or at least not altered them much for the better. But between 1880 and 1900 while little development of a practical nature in Irish forestry occurred, important changes in the general outlook as regards public opinion on rural affairs were taking place. A committee was set up in 1885 to enquire into Irish Industries, and amongst other matters forestry came under its view as one of those industries which imaginative persons considered eminently suitable for extracting wealth from waste material, of which unlimited quantities were supposed to exist in the country. One form of material in the minds of some was the area of poor land covered by bog, heather, bracken and other vegetation which could not be brought under the head of crops or pasture in the agricultural returns of the period, and was usually described as "mountain and heath "land. The committee referred to had witnesses before them of various denominations, all or most of whom appeared to take the view that the whole of this mountain land could produce timber; that it had no value at the time whatever; and could be acquired without asking for it, while its extent corresponded to a somewhat imaginative acreage which had never been clearly ascertained. As regards the last point, the principle followed by enumerators seems to have been similar to that adopted by Sir William Petty when making his forfeited estates maps in or about 1655, "when the various categories of occupied land don't fill up the barony or county in question put in a forest, mountain, or bog." The largest area of waste land recommended for planting by witnesses before the committee was given by a Mr. Howitz, a Danish gentleman who appears to have read a paper at the Fisheries Exhibition being held in London about that time. His estimate was 4,000,000 acres, and when asked how he had arrived at that figure stated that " he saw what he did and was told that the rest was similar." The same witness thought that flax should be grown on the hillsides and mountains as a preparatory crop for timber plantation, and also recommended that half a million acres should be devoted to a shelter belt along the west coast to keep out Atlantic gales. Water courses he thought could serve as natural fences against stock, and all the river banks from the Bann to the Blackwater should be planted to stop flooding throughout the country. As the evidence given by this witness occupies forty pages of the committee's minutes, it may be assumed that his ideas were taken seriously, and it might be useful or at any rate interesting to give his qualifications as an authority on forestry in Ireland. Mr. Howitz described himself as a Danish forestry commissioner, and stated that he had been a Superintendent of forestry in Australia. He had also made a report on Ireland as a possible forest area in 1884, and it appeared that he had in some way buttonholed Mr. W. E. Gladstone in London, by whom he was requested to carry out this task. In that report the area of waste land was given as 5,000,000 acres, but this "trifling" discrepancy may be disregarded. A list of trees recommended by him for planting would be considered fairly complete in a nurseryman's catalogue, and possibly 10 per cent. of them might have survived for a few years.

No doubt Mr. Howitz was a respectable man in his own sphere of life, but to regard him as an authority on Irish conditions in general, and on forestry in particular seems bordering on the ludicrous. Yet this illustrates in a manner the knowledge existent in the country on this particular subject, and explains the difficulty responsible Departments and officials had in successfully opposing any wild-cat scheme put forward by well-meaning enthusiasts without practical experience. A good illustration of this can be found in connection with Knockboy. The true history of this scheme has been long frgotten by, if it was ever known to, the present generation of tree planters, but it may be described in a few words. When Mr. A. J. Balfour was chief secretary he was urged by some deputation to start afforestation on the waste land of the West of Ireland. As might be expected, his answer was in the negative. But it is said that he promised to put a scheme into operation if anyone could show him where land free from grazing rights could be obtained. Mr. Balfour was caught out. About 1,000 acres of the finest snipe bog in Connemara was brought to his notice, and as for grazing rights "Shure, didn't Mick O'Flaherty's ass die of hunger on him ten years ago on that same land and who'd be lookin' for grazing rights after that." The Agricultural Branch of the Irish Land Commission, later to become the Congested Districts Board, (better known in the West as the "Congisted Boord,") was given the task of dealing with the matter, and after considerable efforts to be relieved of the work altogether commenced spending about f.10,000 in 1891. About eight or nine years were spent in trying to get trees to grow, and after about 3,000,000 had been planted, comprising some 25 species, the undertaking was given up as hopeless. In this way State Forestry was initiated in Ireland. Before the experiment was wound up two forestry experts were brought over to pass an opinion on the subject. One was a German with experience in India, the other a Scotsman. The former thought depth of bog was the cause of the failure, the latter thought a good deal but said little, but there appears to have been no attempt to obtain the opinion of many men in the country who could have said straight off that the attempt was hopeless from the start. It was the old story about prophets in their own country.

ESTABLISHMENT OF FORESTRY SCHOOL.

The events just recorded might be described as the final stage of an era of propaganda lasting about 20 years, and running through it without much variation was the plaint that two to three million acres were lying idle, and waiting for the planter's attention, and to make a start with anything less would be trifling with the matter. The magnitude of the schemes advocated effectually prevented anything being done, for while deputations to the Chief Secretary at the time being became annual events, and questions in the British House of Commons were always springing up at appropriate intervals, the reply was always the same, " No funds available at the moment." Had the policy of the thin end of the wedge been adopted, an earlier start might have been made in some way by the Land Commission throughout the country in general, in connection with the acquisition and breaking up of encumbered estates, but many years were lost through the neglect of this step being taken, and it was not until the Irish Forestry Society was brought into existence by Dr. Cooper in 1900 that the question had to be seriously considered by the Government. This Society was made up of a few landowners and others interested in the subject, but its membership was never large and it finally wound up after ten or twelve years of existence. What it did do, however, was to come into existence at a psychological moment when rural economics were being widely discussed by a few leading men in the country, prominent among whom was Sir Horace Plunkett, who in the course of two or three years, succeeded in setting up the Department of Agriculture and Technical Instruction for Ireland in 1900. Amongst the various activities this Department was supposed to foster out of an Endowment Fund which brought in about £100,000 per annum, forestry was one and the Society referred to above made the most of it. In a manner of speaking its policy was to sit upon the Department's doorstep and give that body no rest until something practical was accomplished. Unfortunately the experience hitherto possessed by Government Departments in this country was not favourable to land purchase, which was one of the preliminaries required before any operations connected with forestry could be started. The policy at that time was to delay the evil day as long as possible, but the importunities

of the Society referred to would not admit complete inattention to the subject, and to stave off its demands a few enquiries were set on foot regarding land throughout the country with the idea of starting a school for working foresters at some suitable spot. Eventually Avondale in County Wicklow, which was in the market at the time, was purchased for that purpose. This was about as far as the Department was prepared to go with its own funds as so many demands were made on the latter that it was impossible to launch out into any big scheme of the nature demanded. The writer of this article was brought in to lay out some sort of a demonstration area which would serve the purpose required for training men. From now on the personal aspect of the subject rather vitiates the narrative and the views expressed must be judged from that angle.

Avondale Demesne, as most readers of this Journal know, consists of a rather long, narrow strip of land lying parallel to the river Avonmore in Co. Wicklow, and is about 120 acres in extent. In 1904, the date of its purchase, this demesne consisted of about 60 or 70 acres of grassland, and 50 acres of scrub or old woodland from which most of the timber had been cut when the previous owner, Charles Stewart Parnell, was in occupation. The heads of the staff under which the enterprise would in future be administered had no particular ideas as to the form this property would ultimately take, and to begin with it was even contemplated using part of it for an agricultural station, numbers of which were then springing up in various parts of the country. However, this idea was fortunately abandoned after brief consideration, but one point was insisted upon at the outset. This was that the work should be practically completed in one year, otherwise it was feared that political influences would come into play and compromise things all round. This time limit would have been simple enough if any of the common species, like larch, spruce, or Scots pine had alone been used, but with a small area of a little over 100 acres it did not seem particularly useful to form an ordinary plantation of this kind as a demonstration of various types of woodland which would ultimately come into existence in different parts of the country. The "forest garden " suggested itself as a more appropriate form of demonstration, using all species at all likely to thrive in the Irish climate in small plots of an acre or so, and mixing these with the ordinary trees which could be used as "fillers" or nurses. Obtaining these various species in a short time was no easy matter. Nurseries in Great Britain, France, Germany, etc., had to be drawn upon, but the number of plants found available was limited to two or three hundred in many cases, and their age and size were not always suitable for the purpose. However, most of the work was got through in the first winter, although much remained to be done for several years later. Owing to the hurried nature of the work the results turned out not altogether as they might have done had more

time been allowed, while as regards species both negative and positive results were more or less anticipated. The tests initiated with regard to the latter have not yet enabled definite conclusions to be reached, while spring frost, snow blizzards, wind, and other minor troubles have affected the development of many.

THE DEPARTMENTAL COMMITTEE IN IRISH FORESTRY.

When the financial position of the Department became more critical in this particular respect, it was decided to set up a Committee to investigate the whole problem of State afforestation from an independent point of view. Generalities had gone far enough to establish the fact that one and a half *per cent*. of woodland over the entire surface of the country was not sufficient to give it that finished appearance which had been acquired by the equally civilized countries of Europe, and the various forms of propaganda were having their effect at last upon public opinion.

The Departmental Committee on Irish Forestry was set up in 1908 under the Chairmanship of Mr. T. P. Gill, whose literary ability and experience in Parliamentary procedure and press matters were of great value in carrying out the duties involved. Witnesses of all shades and various occupations were given full opportunity to express their opinions, while the various theories which had been evolved during the previous 100 years were not lost sight of. If everyone was not absolutely unanimous as regards the findings of the Committee as set out in their Report, it was generally agreed that a good case had been made out for something substantial to be done. Two points in this Report may be briefly dealt with. One was the proposal to purchase, within a period of ten years, 300,000 acres of hill land, and to plant 200,000 acres of this in forty years. This figure as regards acreage was not based on any exact data, but it was assumed that 10 % of the total mountain land in the country could be found in the shape of fairly large blocks and could be acquired without interfering with the hill farmer and grazier, whose interests in all previous estimates had been entirely ignored. As regards the rate of purchase and planting there is no doubt that this was the estimate of the chairman, and the writer had nothing to do with it. It was far too rapid in both directions, and would have involved setting up special machinery for letting the unplanted land for a number of years. This would have brought in its train all manner of complications, as everyone acquainted with Irish land occupation can understand.

The first result of the Committee's report was an annual grant from the British Treasury of $f_{6,000}$ to acquire woods which were gradually coming into the hands of the Land Commission, and could not permanently be retained by them. The next step of any importance came when the Development Commission for the financing of various enterprises in Great Britain and Ireland came into existence. The Department was the first to take advantage of this Commission's powers by making an application for a substantial grant, and the final result of various arguments and correspondence was to obtain one of $f_{25,000}$ as a preliminary instalment. This grant was made on the recommendation of a small committee of investigation set up by the Commission, and which consisted as regards Ireland, of an ex-Indian forest official, a retired Irish timber importer, and a Welsh farmer, a trio beyond reproach, but not particularly conversant with Irish rural conditions. In any case they recommended the financing of three areas of 5,000 acres each in Wicklow, Queen's County, and Cork, and as time went on there is no doubt other blocks would have been brought in and supported by the Commission. Before this benevolent scheme could be carried out however, the first world war came along, and everything of a financial nature was suspended pending what might be termed "alterations and disrepairs" to the world in general!

THE FIRST WORLD WAR AND ITS EFFECTS.

From 1914 to 1921, a period of six years, State forestry in Eire was in a state of comparatively suspended animation. Planting was cut down to a minimum, and only the most urgent work connected with maintenance received any financial support from public funds. Activities at this time were connected with the cutting and conversion of home-grown timber for war purposes, and under the Timber Supply Department of the Board of Trade saw-milling operations were conducted on private estates, and round timber and pit props purchased for export in the round. The two or three last years of this period were, of course, affected by civil disorders rather than the European war, but the effects were exactly the same in both cases. The general result of the disturbances, both international and local, resulted in about 30,000 acres in Eire being either cleared or rendered little better than scrub. Young plantations also suffered greatly from lack of attention and thinning, although other damages, apart from theft and trespass in the unsettled parts of the country, were not particularly noticeable.

But if the European war brought about big losses in the area of stocked woodlands in Eire, these losses were still greater in Great Britain, and before the end of hostilities measures for repairing the damage were being considered by the British Government. These measures were to have a more permanent result than most people imagined. In 1916 to 1917 an Interim forestry committee was set up to act as a sort of advance guard to a more influential body which succeeded it. These two committees, representing the United Kingdom at that time, examined the losses which had been sustained and the best means of redeeming them by both private and state action. An area of one and threequarter million acres was recommended as an addition to the existing woodland area, and the necessary funds were eventually provided by the Government. Ireland came under this scheme, and was treated in exactly the came way as England, Scotland, or Wales between 1919 and 1921. But the Commission had scarcely started this work, before what was known as the Free State came into existence, and another changeover took place in the administration of Forestry operations in the twenty-six counties. This again reverted to the Department of Agriculture, and a new organisation had practically to be framed.

The above events and administrative changes may have been beneficial in various directions, but they did not prove particularly favourable to State Forestry in general. Every change over meant delays, interference, and uncertainty regarding executive work of various kinds, and of more significance still was the attitude of the administrative bodies or heads to various matters of policy. It was difficult to get any definite ideas, for instance, as to whether this policy was to go fast or to go slow, and there was always the uncertainty, when a doubtful decision had to be made, about the corns likely to be trodden on and the feet they belonged to. Matters of small importance in the abstract often assumed large dimensions when land was touched in which some particular person was interested, or some right or privilege demanded which was not in the interest of the executive to grant. Ground was often cut from under the feet of officials in more ways than one, and many decisions were reversed which reacted on work already carried out or in contemplation.

THE FORESTRY ACT OF 1928.

After 1921 few changes of an administrative nature were made until the passing of the Irish Forestry Act of 1928, which vested certain powers in the Department for the restriction of felling timber on private estates, and the imposition of replanting to replace it. This enabled a general review of the situation from year to year as regards felling and planting, and gave the Minister in charge an opportunity to step in when land and timber were being sold for the obvious purpose of what might be termed devastation. Other clauses were intended to check abuses which are fairly well known. The Act of 1946 was based upon the previous one, and did not materially differ from it.

Another change which the writer advocated but which was not carried out in his time was the transfer of the Forestry Division to the Land Commission. For reasons which need not be gone into, agriculture and forestry in most countries are not twin brothers with a joint interest, but rival claimants for the same estate, and this applies to government departments set up to further the interest of the two industries. One blade of grass is considered of more value in the one case than a ton of timber in the other, and the balance is always weighted in favour of the former when questions of area or expenditure of State money come into the matter on the agricultural side. An agricultural department enters life with a conviction that flocks, herds, and food crops are the main objects for which the earth came into existence, and the fact that the forest can claim priority by many thousands of years is always ignored or lost sight of. This outlook on the matter has a prejudicial effect when the one authority attempts to maintain a fair balance between its two branches, and it is better not to put them under the same ministerial wing.

THE FRUITS OF STATE INTERVENTION.

The above brief sketch of events traces the artificial development of forestry in Eire since the country assumed its present appearance and economic condition at the beginning of the 18th century. It may now be asked what has been achieved in the course of nearly forty years of direct State action, during which private enterprise has been more or less suspended. In 1900, when this phase began, it is fairly correct to say that Eire possessed no State woodland apart from a few acres in the hands of the Land Commission and held by that body on a temporary footing, and Knockboy had passed out by then. The first acquisition by the Department of Agriculture for the definite object of forestry development was in 1904, when a small area was acquired in Co. Wicklow for the purpose referred to already. Between 1904 and 1908. surveys, investigations, committees and other preliminaries occupied most of the time, and this period may be eliminated from the calculation. Taking the latter up to 1943 a year in which returns were most readily available, the total area of woods in the hands of private owners and the State as given by the Department of Industry and Commerce was 282,888 acres. Compared with the approximate area taken into the Irish Free State in 1921 and which may be put at 250,000 out of a total of 300,000 acres for the entire country, it would appear that 33,000 acres were added by both classes of ownership. The total area of ground said to have been planted on bare land by the State alone in the 39 years was 65,514 acres or about 2,000 acres per annum on the average. Under the head of total State woodland 110,000 acres are included in a total of 136,576 acres of productive land. Of this area 25,000 acres consisted of plantations, and 25,000 acres of cleared woodland purchased from private estates, both of which areas must have been included in 1921. How many of the 33,000 acres added since 1921 consist of mountain land, and how many of the demesne land usually classed as agricultural cannot be given from the Abstract, but the proportion of unplantable land to the total acquired suggests that more than half of it came into the latter class. During the 25 years occupied in actual operations, therefore, the acreage planted works out at 2,600 per annum.

Compared with the Committee's programme drawn up in 1908, only about one-fifth of the increase suggested has been added to the woodland area appropriate for Eire alone, but most of the deficit is due to the earlier years when adequate machinery had not been provided. Acquisition, however, has made better progress, for which Land Commission co-operation has probably to be thanked. But compared with the extravagant estimates made previous to 1900 it can be easily demonstrated that the increase in Eire's woodland must take place much more slowly than enthusiasts have advocated on purely imaginary grounds. If the 5 per cent. of woodland to total area is ever to be obtained, it will have to be effected by the State, and the land must be derived from one or the other or both of two sources, a larger proportion of mountain, or the absorption into the planting scheme of about 400,000 acres of agricultural holdings and unplanted portions of good land in demesnes taken over by the Land Commission.

After 25 normal years of work under various administrative systems, and in a period which certainly dragged along slowly to begin with, but is probably moving more rapidly to-day by virtue of several factors of a political, administrative, and financial nature not dreamt of in the philosophy of the past, four-fifths of the road have yet to be travelled. But it must be noted that the full programme of 1908 . reckoned on the active co-operation of private landowners, and this has not been forthcoming. This has altered the whole aspect of the problem. Regarding Eire as an agricultural country, almost pure and simple, a smaller programme may have to be kept in view, and the acquisition of existing woods prove its main feature. This appears to be the tendency at present.

THE GROWTH OF SILVICULTURAL KNOWLEDGE.

So far nothing has been attempted beyond a brief summary of facts and figures relating to forestry revival in connection with acreage. But area or volume is not the entire essence of the problem If State forestry is to fulfil its ideal function, it must not only produce adequate quantities of commercial timber per acre, but also timber of a quality which the merchant and builder require. One of these essentials depends upon species and soils, and the other upon silvicultural methods. The soil cannot be controlled or materially altered by the forester as is often possible in farming or gardening, and it has to be taken or left as opportunities occur. Species have been limited, after two or three centuries of experiment by private planters, to about a dozen, but those which are in favour with one generation of planters do not necessarily retain their popularity indefinitely, and it is often difficult to ascertain the cause. Going back for a century or two one can note the confidence placed in species like Weymouth Pine and silver fir, neither of which have a place in any planting operation to-day. The former was given up on

account of the " blister rust," the latter owing to its liability to die back after 10 to 20 years, presumably owing to attacks of Adelges Nusslini. The silver fir, as individual groups or specimens, still towers above all other trees of the same age on the most exposed sites, and many contain 400 to 500 cubic feet of timber. One cannot visualise any change of climate during the last 200 years or so which can account for the trees originally planted succeeding as they did, and their successors invariably fading away after an apparently healthy start. So far as any evidence goes at present Adelges may just as easily be the result of this failure as the cause of it. To give an example of what is possible where the conditions are favourable, the case of Derreen, in County Kerry, may be quoted. This estate was visited by the writer in August, 1892, and the plantations reported on for the fifth Marquis of Lansdowne. Most of the young woods were then from 10 to 20 years of age, and amongst the species planted were a large number of silver firs all over the estate, but more especially round the edges of Glanmore Lake. The growth which has been made by this species in the course of 60 or 70 years may be judged by the volume of some individuals measured in 1945. The cubic feet in these trees were estimated respectively as 250, 200, 180, 160, and 114, and the volume per acre based on small sample plots worked out at 8,000 to 10,000 cubic feet. Another species which might be mentioned and which has been introduced during the last 20 years as a forest tree is *Pinus contorta*. Seed was obtained from Rafn of Copenhagen about 1921 or 1922, but its value for use on poor soils was not clearly recognised until later. Its rapid growth on ordinary ground had already been noticed in seed beds of Douglas fir, in which the pine had obviously arisen from stray seeds accidentally mixed in the main consignment. Nothing can be said at present of its timber qualities, but it is beyond doubt capable of growing where the most hardy tree hitherto known has proved a failure. These examples are quoted to show what may occour both with well-known species in Europe, and more recently introduced ones from the extreme west of North America. Other examples show that it is impossible to foresee the result of planting any exotic tree, and if we refrained from doing so we should lose larch, Sitka spruce, Douglas fir, Spanish chestnut, sycamore, etc. and, so far as Eire is concerned, beech would have to be regarded with suspicion.

On the silvicultural side experience has proved over and over again that even-aged crops are the most profitable from an all round point of view. Uneven-aged woods, resulting from interplanting, under-planting, or natural regeneration may look much better from an aesthetic point of view, but the difficulty with rabbits and hares, the lack of intensive sunlight, and other drawbacks not always anticipated, such as the extraction of mature timber without damage to the younger trees, discounts a good deal of the theoretical value of these systems. On bare ground, of course, even-aged woods must be the fore-runners of any system, but sooner or later modifications have to be introduced, and nothing is more profitable, or can be more easily carried out than even-aged clumps, varying with the nature of the soil and other factors. A little acquaintance with most estate woods demonstrates that this system is already in operation, and proves quite successful in breaking up the monotony associated with large areas of the same age. The demarcation of these clumps requires careful consideration and judgment, and finality is not always desirable.

Attempts to render natural regeneration a standard silvicultural system in Great Britain and Ireland have not been particularly successful, except perhaps in the beech woods of Buckinghamshire, and Scots pine here and there on gravelly soils. Numerous patches of self sown seedlings can be found associated with many trees, both indigenous and exotic, but with a Hare's Protection Order in operation, anticipations as regards the results may not always be realised.

THE WOOD CRISIS.

During the last two or three years conditions relating to fuel have introduced a new element into Eire's forestry problem, which may have far-reaching effects on silvicultural systems. The necessity for firewood throughout the country as a substitute for, or supplement to turf has assumed formidable dimensions, and there is no immediate prospect of the situation altering for the next four or five years, or ceasing to be a permanent drain on the country's attenuated supplies of timber. How can such a drain be met? The old ash, beech, oak and sycamore standing in demesnes and hedgerows are at present sustaining the bulk of the attack, but this cannot go on indefinitely. Sooner or later other classes of timber will be called upon, and this has already been intensified by demands for building and construction work to replace the supplies formerly imported from Northern Europe and Canada. Possibly the winter of 1946/1947 has been a record as regards firewood demands, following as it did, a wet summer and autumn which interfered with turf supplies. Whether conditions of a similar degree of hardship for all parties concerned will recur for many years to come or not, it is fairly safe to predict that both public and private stocks of timber will have to be drawn upon in future to a greater extent than was anticipated 10 or 12 years ago. The question is how long will these stocks last without creating another shortage in commercial timber, which is acute enough already. It is fairly clear that the forest authority of the future must be ready to meet demands for fuel on some organised basis. If a suggestion may be of any value, it is that the natural oak woods still left, and capable of cultural treatment, should be restored to a coppiced condition on a fairly long rotation, and the old English system of retaining standards of the most promising trees at each felling resorted to. Oak, ash, larch, and one or two other trees fit in with this system without any complications. The alternative appears to be the use of thinnings from coniferous woods, which would not be particularly popular amongst ordinary householders. Hayes, the author of *Planting*, had something to say about the oak coppice of his day, and believed the retention of standards was part of the system down to about 1750 or so, but gives no definite evidence to support his opinion. It is doubtful if it was ever general throughout the country, although a few owners here and there may have adopted it.

Another reserve of a different character and which can only be regarded as temporary, is the broad-leaved timber standing on small patches of the demesnes now being acquired. This reserve would serve a double purpose, retain for a few more years the trees of beech, ash, and other broad-leaved species which will soon cease to exist on many sites, and in the meantime enable them to be drawn on when urgently required. Their retention would break up the woodland scenery sufficiently to relieve the monotony now becoming apparent in thickly planted districts.

Whether Eire ultimately requires 700 or 800 thousand acres of woodland or not, it is evident that a continuance of the present forest policy will render her independent of all but a small proportion of the imports from abroad, which in a normal year do not exceed 300 to 400 thousand loads, and these should easily be supplied by a similar number of acres of plantation on good timber producing ground.

To those who have to solve the problems, and carry on the legacy imposed by previous generations, the writer of this article may conclude with the word "Sláinte."

BACK NUMBERS.

The following is the complete list of back numbers of *Irish Forestry*, all of which are obtainable from the Secretary:—

Volume I. Number 1 (1243)—Price 5/-. Volume I. Number 2 (1944)—Price 5/-. Volume II. Number 1 (1945)—Price 3/-. Volume III. Number 2 (1945)—Price 3/-. Volume III. Number 1 (1946)—Price 3/-.

AFFORESTATION FOR BENGAL

By T. M. COFFEY, C.I.E., I.F.S., Chief Conservator of Forests, Bengal.

(A TALK ADDRESSED TO THE ROTARY CLUB, CALCUTTA, 18th MARCH, 1947).

First of all I would like to thank you for giving me this opportunity of addressing you on this very important subject. It is a subject which I am interested in myself and it is also one in which the Government is very interested.

The first point I would like to remark on is the necessity for afforestation. Apart altogether from the urgent necessity of stopping further soil erosion, Bengal must also make itself self supporting as regards forest products. At present Bengal is a deficit province so far as the area under forests is concerned. The area of Government forest per head of population is only $\cdot 07$ acre. Ecnonomists estimate that to be self supporting in forest products a country should have at least 20 % of its surface area under forests. Against this, Bengal has only 9 % and a good deal of that is protection forest such as in the Delta area and in the Darjeeling Hills, which must not be exploited. Therefore, there is an all round shortage of timber, firewood, charcoal, bamboos, and all the other minor forest products which are so essential to a country.

Other provinces are not so badly off, Bombay has 17 %, the Central Provinces 23, Madras 15, and the United Provinces 13. The average for the whole of India is 14 and the average for Europe is 26 %. I therefore, think you will agree with me that afforestation in Bengal is both essential and urgent.

The Forest Department has been urging the Government of Bengal for many years to legislate for the afforestation of waste lands and for the conservation of what is left of the private forests. At long last a bill was introduced in the Bengal Assembly in 1944 for this purpose. Fortunately before the Ministry resigned the Bill passed successfully through a select committee so the Governor, considering the famine and other calamities which faced the province was able to make it a Governor's Act, and not postpone legislation any longer. The Bill was enacted in August, 1945 and, so far as private forests are concerned, and thanks to the co-operation and help of the Zeminders, I am glad to be able to report considerable progress. The idea of the private forest act is to help the owners put their forests in order; there will be no change in ownership, but, Government will have the power, and incidentally, the duty to tell the owner how to run his forests. Government will meet all expenditure for the first ten years, and in certain cases of hardshipsuch as where there is a serious drop in revenue because of conservation—Government will make loans to the forest owners. That is the present position about the private forests in Bengal and it can now be said that it is a satisfactory position, or at least working up for that. Not so with the waste lands.

The province has millions of acres of cultivable waste land which should be afforested. The exact area is estimated to be 4 million acres, i.e., 9 % of the province or the equivalent of the forest area already under Government management. At present all this waste land is rapidly deteriorating in quality, and in some places that I have seen in West Bengal desert conditions are fast approaching. The only use this land is being put to is to provide grazing (and very poor grazing at that) for thousands of half-starved more or less useless cattle. The owners of these cattle are a menace to land owners. They refuse to pay any grazing fees, and when the cattle have cleared the waste lands of every blade of grass they then invade the private forests and eat up all the young seedlings; later on graziers even set fire to the forests so that they may have a nice young crop of grass coming up after the early rains. To my mind these graziers are as bad as any criminal tribe and they constitute a problem which must be faced. So much for grazing. I shall now revert back to the waste land problem. All these waste lands were under forest not so very long ago, until with the increase in the population they were deforested and cultivated for a few years until all the surface soil was washed away. They are highlands really, above the paddy field level and should never have been deforested. Now the problem is to get them back under forests as quickly as possible and see that they are never again deforested for cultivation. To do this we feel that there must be change of ownership, in other words that Government must acquire the waste lands and reafforest them. The private owners will never reafforest them. With this object in view we started preliminary enquiries sometime ago and were informed by some land owners keen on afforestation that they would give the land for nothing or practically next to nothing. However, when the time came and acquisition proceedings began the owners wanted fantastic prices. Government perhaps expects to have to pay more than a private individual but to be asked to pay 10 or 20 times what a private person would be asked is not good enough. We have, therefore, come to a standstill for the present about the afforestation of these waste lands. This is a very serious thing for the province, the people are crying out for forest produce, and soil erosion of the waste lands will continue unchecked if something is not done. Government have, therefore, been compelled to introduce a new Bill called the Bengal Acquisition of Waste Land Bill. The object of this Bill is to speed up the acquisition of waste lands and to acquire such land at something approaching its proper value. We have Forest Officers under training at Dehra Dun, Edinburgh and Oxford, so as soon as this Bill is enacted we shall be

in a strong position to take up afforestation immediately and in a big way. The idea is to have a Forest officer in every District in the Province. At present there are 10 Districts with Forest Officers and 17 without. All that we want now is the land, Government have even provided the money for the afforestation.

The afforestation of these waste lands is not going to be an easy matter. Some of them are as bare as a rock with which nothing can be done except to try and stop further erosion. All of you know that to grow even the poorest quality grass, even spear grass, that some surface soil is necessary. A tree requires a good deal more. It will not be possible, therefore, to reafforest Bengal in a night; it is going to be a long and tedious job to get these waste lands back into production from the terrible state that they are in now. Some experts think that we are taking on too much and that we are over optimistic, but we must try. To begin with, we shall have to stop further erosion, particularly sheet erosion, and thus improve the quality of the soil. The climate of Bengal is very much in our favour for this. In this damp, hot climate, vegetation comes in of itself and establishes itself quickly provided it is protected from cattle. As soon as the soil is reclaimed we propose to plant quick growing species suitable for the requirements of the local people such as species for building materials, agricultural implements, firewood, country boats, carts, furniture, fodder grasses, matchwood and paper pulp. The cultivation of bamboos and the conversion of some of the waste lands into grazing grounds is also part of the programme. As grazing will have to be restricted in the private forests it will be essential to grass down some of the waste lands for controlled grazing. This should help to improve the quality and breed of cattle and reduce the number of useless animals. I should have told you that the estimated area of unculturable waste land in Bengal amounts to the staggering figure of 18 % of the total area of the province. I am afraid nothing can be done about this at present, but we must try and stop any further cultivable waste land from becoming uncultivable.

That is the position to-day. After many years of difficulties and disappointments, lack of policy and lack of legislation, fighting up-hill all the time we have now reached a very interesting stage in in Forestry in Bengal. The prospects are bright and the future is so full of interest that I feel envious of our successors. The future programme is organised for them and they will have the pleasure of actually putting into practice something which is definitely for the good of the whole country and part of a world-wide programme. They will see waste lands planted up, soil erosion checked, plenty of water in the rivers for irrigation and river communication, and country boats plying their way all the year round as they used to do 20 or 50 years ago before wholesale deforestation was allowed.

FLOOD DAMAGE AT BALLYHOURA NURSERY

By T. McCarthy (Mallow)

Much devastation was caused all over Munster by the abnormal floods which occurred on the 11th and 12th August, 1946. These floods caused extensive damage to nursery stock at Ballyhoura State Nursery.

In this paper it is proposed to give a brief account of the extent of this damage.

The Nursery is situated on the southern fringe of that portion of Ballyhoura State Forest at Streamhill. It is bounded on the north and west by young plantations, on the south by a laneway and agricultural land and on the east by a stream and open mountain. Its area is approximately $5\frac{1}{2}$ acres. It is divided into three main sections known as the western, middle and eastern—a road and a shelter belt making the divisions.

A few days previous to the floods I visited the nursery which was then very promising. The seedbeds had got a final weeding and the lines of transplants a final hoeing while paths and roads had been cleaned up and there was every prospect of excellent crops of seedlings and transplants. On my next visit to the nursery immediately after the floods it was an entirely different sight which met my eyes. Transplants and seedlings had either been washed away, partly uprooted or partly covered with silt and everywhere could be seen the ravages of the floods.

The stream which flows along the eastern boundary of nursery and which rises some 3,000 yards further north on the Ballyhoura mountains, became a roaring torrent on the night of the 11th and the morning of the 12th August last as a result of the heavy rains which commenced on the morning of the 11th August and continued well into the following day. As the stream, in full flood, rushed down the mountain side it brought with it uprooted trees and large boulders and as it reached the valley bottom the trees and boulders tended to block it and make it overflow its banks.

At a point 300 yards north of the nursery the rush of water from the overflowing stream swept westward towards the adjoining plantation. It broke down an embankment which was running parallel with the stream on the outskirts of the plantation. Here the flood entered and took a course diagonally across the 14 ft. high Sitka spruce plantation (See Fig. 1 which shows where flood entered the plantation). It thus reached the northern end of the western section of the nursery. On its way it levelled the nursery fence and spread out over the entire western section of the nursery and portion of the middle section bordering on the road dividing them. It swept



FLOOD DAMAGE AT BALLYHOURA NURSERY

Fig. II.

Fig. III. over freshly ploughed in green crop, Pinus contorta and Lawson cypress transplants and Pinus contorta seedlings. It carried with it much of the soil in the freshly ploughed area—to a depth of one foot in places. The soil was washed away from the transplants and approximately 30,000 Pinus contorta and 15,000 Lawson cypress transplants were completely washed away with the soil. The affected transplants remaining fell over. 86,000 Pinus contorta and 35,000 Lawson cypress were thus affected. Approximately 1,500 square yards of Pinus contorta seedbeds were completely carried away resulting in a total loss of 750,000 seedlings (see Fig. II which shows where seedbeds were washed away). The soil was washed away from a further area of seedlings affecting 340,000 Pinus contorta. Here the roots were partly exposed and as in the case of the affected transplants the seedlings fell over.

Much of the soil carried away was deposited at the lower end of the nursery as the flood was temporarily checked here by a sod fence. The flood finally broke through this fence and coursed down the road leading from the nursery to the public road. Here it turned what was once a reasonably sound road into a trench varying in depth from 3 to 5 ft. The road was thus damaged for a length of 800 yds. (see Fig. 3, which shows damaged road).

The task of putting the nursery back in some kind of order was no easy one. All partly uprooted seedlings and transplants had to be lifted and temporarily heeled in. They were bedded out and lined out as soon as nursery was sufficiently dry which was about a fortnight from date of floods. The risk of failures in lifting, bedding out and lining out so early in the season had to be taken as there was a greater risk in allowing the partly uprooted plants to take their chance of surviving as they stood. As much as possible of the soil which was shifted by the floods was collected and carted back to the nursery. The fences and roads had to be repaired, watercourses had to be diverted and embankments had to be built up where there was any danger of the stream again encroaching on the nursery and plantations. Eight months after the occurrence it is possible to report that 90 % of the relined transplants have survived but that close on a 50 % failure is expected in the bedded out seedlings.

Some old residents in the Ballyhoura district say that the river in breaking down the embankment and sweeping through the. plantation was taking its original course until it met a sod fence some 50 yards north of the nursery. Had not the sod fence intercepted it and diverted it towards the nursery they contend it would have continued along what is locally known as "The Dry Glen." This glen runs parallel to the nursery and about 200 yards to the west of it. The old people say that the course of the stream was originally along this glen but was changed to its present course by a Mr. Murphy, then residing at Streamhill House away back in 1790.

THE IRISH NURSERY TRADE

By JAMES GALVIN.

It has been suggested that some notes on the Irish nursery trade might be of interest to the readers of this Journal. Unfortunately, as the private planting of forest trees in commercial quantities is only practical for administrators of extensive tracts of land who are not worried by rapidly changing conditions, the heyday of forest tree nurseries coincided in Ireland and Great Britain with the spacious days of the landed aristocrat between the middle of the eighteenth and the latter part of the nineteenth centuries. The decay of their estates due to changes in social legislation and, additionally in Ireland, due to the Great Famine and to the land division legislation, militated against the survival of the numerous small nurseries scattered through the country.

These nurseries would appear to have catered mostly for a local demand and there do not appear to have been any large nurseries sending plants all through the country, nor, strangely enough, is there any evidence of any group in the Dublin area to take advantage of its metropolitan position in the same way as occurred around Edinburgh. There was, however, a very interesting group of small nurseries at Summerhill, Co. Meath, which specialised in the growing of *seedling* forest trees for re-sale for growing on by the country nurseries.

It is a melancholy fact that, with a business of such a traditional character and so completely divorced from the changes wrought by the development of mechanics, it seems rare, even in the richer and better developed countries of Europe, for families to survive in the nursery trade. It seems further an evidence of the lack of prosperity of the industry that when the original family drops out the firm is not taken up and carried on by another. In spite of this and of the exceptionally difficult times in Ireland through much of the nineteenth century, there remained up to the beginning of this century, perhaps twenty-five of the Summerhill growers and the following of the old firms: Fennessey of Kilkenny and Waterford, Hartland of Cork, Saunders of Cork, Griffin of Croom and Limerick (still extant). Harpur of Wexford, Madden of Ballinasloe, Tully of Hollymount, Behan of Tullamore, Galvin of Roscommon. Perhaps some of your readers can fill in gaps. At this stage the breaking up of the estates under the Land Acts virtually gave the coup de grace to private forestry planting on any scale, though a little still continued to be done by contract planting (which my firm continued to cater for) and some estate owners continued to buy limited quantities from Scottish or English nurseries, a few of which still retained a worldwide connection. Incidentally when things were at their most difficult in Ireland Irish nurserymen managed to keep going by

exports of young forest trees to Scottish and English nurseries and this gradually became a large part of the trade at Summerhill, continuing up to 1938. Unfortunately this is now broken by our inability to get over the English discriminatory regulations against such supplies from Ireland as compared with other European countries, and enforced apparently against the expressed wish of important British nursery firms.

At the turn of this century a few other firms of comparatively recent establishment were able to take advantage of the growing prosperity of the farming population. The newly-formed Department of Agriculture and Land Commission, as well as encouraging the planting of fruit trees, paid considerable attention to the planting of small shelter belts of forest trees on the new divided holdings of which a great number were established, especially in the western counties. To this activity, which has been continued more or less up to the present day, and to the occasional purchases for the State Forestry service we can ascribe, the survival of commercial forest tree growing. Useful as these recent developments were to the trade their nature was too spasmodic in the opinion of the writer to continue to maintain a healthy, even though small, forest tree industry. This view was shared by the surviving firms and in 1932, when it appeared that the Government would be able to arrange for a considerable increase in its planting programme, they sent a representative delegation to wait on the Minister for Lands. They offered to provide some share of the increased supplies that would be necessary in the same way as in other countries, notably in Germany, where much of the supplies of trees for State forests are supplied under a contract system. These trees are produced from seeds supplied by the State Forest Services according to their rather particular requirements as to seed strain, particularly in the case of Pinus sylvestris. The nurserymen maintained that such an arrangement would provide a useful " cushion," as their connection would provide a practical outlet for the occasional surpluses and gluts due to variation in germination and in planting programmes which necessarily cannot be completely foreseen when making sowings and and which must create considerable worries for those in charge of nurseries in the State organisation with its narrower scope. Some such arrangement would have helped to round out the activities of these nurseries most of which also raised fruit trees and hedge plants mainly for the small farmer population, and which, due to the close prices at which these were sold under the contract system, found difficulty in maintaining a practical volume of sales. Unfortunately such counsels did not prevail; on the contrary, before very long the forest tree-raising nurseries had to face the propsect of having surpluses from State nurseries intermittently dumped on their limited market. Strong representations on this point were made to the Minister for Lands and for one season he conceded the rights of

the case presented by the producers but in less than twelve months the decision was reversed and the threat of such State dumping is apparently to hang over the head of anyone rash enough to risk any extensive commercial forest tree production. At the same time quite a number of one-man nurseries have recently sprung up started by ex-workmen from Forestry Division nurseries who have learnt something of tree raising and, though individually of lesser importance, in the aggregate further reduce the market for the firms who in the past endeavoured to give a comprehensive service in all the species that might be called for.

All this unfortunately strikes a pessimistic note and I have not made any reference to the planting called for under the 1928 Forestry Act to replace the exceptional felling during the recent war. The total numbers are very large but the impossibility of obtaining the necessary seeds and the consequent inability to have the necessary small trees available in practical quantities before 1950 or 1951, means only another temporary demand. Without some comparatively steady outlet which, as far as I can see, could now only arise in sufficient volume from state sources or from export to Great Britain (both of which seem at present most unlikely), practical commercial forest tree raising in Ireland must gradually and at no very distant date disappear.

OBITUARY

GEORGE DANIEL ALLT. 1879-1947

Though not a member of the Society, Mr. Allt was so intimately connected with the initiation and growth of State Forestry in Ireland that a record of his services and a tribute to his memory is not out of place in this Journal.

He entered the Civil Service in 1899 and was transferred to the old Department of Agriculture & Technical Instruction in 1902. He was one of the first officers to be appointed to its Forestry Section and saw the earliest steps in the formation of a State Forest Service, including the acquisition of the Parnell Estate as a School of Forestry and demonstration area. For a period during the 1914-'18 war, he was transferred to the War Office, in which he had previously served. From the date of his return in 1920 his fortunes were bound up with those of the Forestry Division under the old Department of Agriculture, the Forestry Commission, the new Department of Agriculture and finally the Department of Lands, until in 1934 he was transferred on promotion to the Land Commission.

Up to his death he never lost interest in forestry matters and was always anxious to keep in touch with the latest developments. Of a reserved disposition, Mr. Allt did not make friends easily but those who had the privilege of knowing him intimately valued it accordingly and had a very high opinion of his straightforward character and undoubted abilities.

Reviews

Forestry and Woodland Life. H. L. Edlin, B.Sc. Batsford, London. 15/-.

This book is, according to the author, planned as an outline for the layman, and as a summary for those concerned with forest work, of the science and craft of tending woodlands as at present practised in Britain. It is indeed an ideal book to place in the hands of those seeking an introduction to the life of the forest and the work of the forester. In non-technical language it tells of the forest society, the trees, birds, insects, wild flowers, forest animals. The author has put a tremendous amount of solid information into this simple but scientific narrative of the forest and its environment, and few foresters will claim they have learned little when they have got through the early chapters.

The accounts of work in the forest, raising young trees, planting, tending and felling plantations are sketchy as one might expect in a review of this kind and anyone seeking details of forestry practice must search elsewhere. Nevertheless this is a book that the forester will welcome to his bookshelves. The pictures are really beautiful and it is claimed by the publishers that they provide the most comprehensive series ever collected in a book on this subject.

As for our non-technical members this is the book for which they have been waiting. They will enjoy every page and picture and having read it will look forward with eagerness to the excursions and outings of the Society and to private rambles in "The Wildwood" and under "The Greenwood Tree."

T. C.

Forest Operations, Series No. 2 (The Establishment of Hardwoods). London, H.M.S.O., 9d.

This booklet of 36 pages is the second of a new series, the first of which (dealing with Thinning) was reviewed in Volume III, No. I. Separate chapters deal with the establishment of oak, beech, ash, sycamore, sweet chestnut, birch and alder both by sowing and planting, and the final chapter suggests treatment for restocking various types of hardwood coppice and devastated woodlands.

The arrangement of the material is logical: the natural distribution of the species and its segregates is given first, its place in woods and plantations and its silvicultural characteristics discussed. This is followed by sections on nursery treatment, methods of planting and selection of suitable sites and tending up to establishment. The information given should prove of real service to all foresters, summarising as it does the results of twenty-five years of experience and research involved in the establishment of 35,000 acres of hardwoods.

Irish foresters will note that some practices common here are not mentioned. Autumn sowing of acorns in the nursery under heavy cover is not mentioned in spite of the difficulties of storing acorns without risk of premature germination or damage by dessication according as storage conditions are too damp or too dry. The planting of small oak groups of about 20 plants, set 18 inches apart, the groups being 15-20 feet apart centre to centre in a matrix of conifers has been favoured here but the practice is not apparently favoured by the Forestry Commission. Strip planting is preferred with a spacing of 8 feet between adjacent rows of conifers and oak. The complete omission of elm from this booklet is rather disappointing.

The insistence on confining ash and sycamore to really good sites is to be welcomed, especially as there is such a temptation to accept natural regeneration of these species in restocking woodland. The warning against planting ash in grassland is fully borne out by experience here even where soil and local climatic conditions seem favourable. On the other hand the assertion that both the silver and common birches "are so similar in their characteristics that they may be treated as one from a silvicultural point of view" appears doubtful. On better soils the silver birch usually gives a better bole and grows taller while the common birch is more tolerant of a high water table.

An interesting point in cultivating chestnut is the recommendation to cut back all plants to ground level at an age of 6 to 8 years and to thin the resulting shoots speedily until only the straightest is left.

At the modest price of ninepence, this simply-written and attractively produced booklet should be in the hands of every forester and woodland owner.

T. McE.

Forestry Commission Booklet No. 1 (Woodland Mosses). London, H.M.S.O., 2/-.

In this, the first of a new series dealing with subjects of importance to foresters, two pages are devoted to a description with photographic illustrations of 20 moss species considered as useful indicators of woodland conditions. An attempt is made to indicate the soil and climatic conditions under which these mosses are found.

The booklet will be particularly welcomed by those students of vegetation who have a reasonable grasp of the identification of the flowering plants but who have been deterred from a study of the mosses by the absence of a suitable introductory or elementary work. The remarks on soil and climatic conditions are on the whole sketchy but suggestive. It is admitted frankly that this section is limited by present knowledge, but it should be emphasised from the start that mosses are much more sensitive indicators of local climate (or micro-climate) than flowering plants. They are most useful too in showing the nature of the woodland humus and course of its decomposition, an important point in new coniferous forests. On the other hand we must still rely on the flowering plants and on examination of the soil profile if we are to learn anything of conditions beneath the actual surface which are so decisive for tree growth.

T. McE.

Forestry Commission Leaflet No. 7. H.M.S.O., 2d. Forestry Commission Leaflet No. 19. H.M.S.O., 2d.

Both these leaflets have been revised and brought up to date and the text is well illustrated with photographs.

Leaflet No. 7 deals with Adelges (or Chermes) attacking Spruce and other conifers and gives all the information the forester requires about these pests.

Leaflet No. 19 concerns the Elm Disease (Ceratostomella Ulmi). As this disease does not appear to have reached Ireland, the chief function of this leaflet will be to keep us on the alert against suspicious symptoms so that, if necessary, early measures for eradication can be put in hand.

T. McE.

OBJECTS OF THE SOCIETY

The Society of Irish Foresters was established to advance and spread in Éire the knowledge of forestry in all its aspects. It welcomes to membership everyone interested in forestry.

Membership consists of two Orders, technical and associate; the former catering for those who have chosen forestry as a career, and the latter for those of the general public who are not actually engaged in forestry.

Technical members pay an annual subscription of 10/- or £1 according to grade; associate members pay 15/-.

Full details are available from the Secretary.

Annual General Meeting, 1947

The fifth Annual General Meeting of the Society was held in Jury's Hotel, Dublin, on Tuesday, 4th February, 1947, at 7.45 p.m. There were about 35 members present when Mr. FitzPatrick, the outgoing President, took the chair and called the meeting to order. The minutes of the fourth Annual General Meeting having appeared in *Irish Forestry*, Vol. III, No. I, were taken as read and signed by the President. The Secretary then read the report of the Council for 1946.

COUNCIL REPORT FOR 1946.

Meetings.

There was a satisfactory attendance at the four meetings of the Council. Ten and nine respectively attended the first and the fourth meetings which were held in Dublin, nine came to the second meeting which took place in Delgany and six to the third meeting in Killarney during the Annual Excursion.

Membership.

The number of enrolled members now stands at 176: 30 Grade I, 66 Grade II and 80 Associate Members. During the year there were elected 26 Associate, 4 Grade II and 2 Grade I which is a welcome increase in our number. Unfortunately there have been losses too through deaths, resignations and lapsed membership. It is a regrettable fact that many who made application for membership and were elected to the Society never paid the initial subscription and that others ceased payments after the first year or two.

Finance.

The Abstract of Accounts for 1946 has been sent out to all members. Our income for the year from all sources amounted to \pounds_{135} 15s. od. and our expenditure to \pounds_{114} 13s. 2d. In addition to the small credit balance between these two sums there is a favourable carry-over from 1945 of \pounds_{90} 12s. 11d., leaving the Society with \pounds_{111} 14s. 9d. on hands on the 31st December, 1946.

It should be pointed out that this amount would have been greatly reduced had the second issue of the Journal been published and paid for during the year.

Journal.

No. I of Volume III of *Irish Forestry* was published. It runs to 68 pages and contains five original articles by members, one abstract and four reviews of books and articles of forestry interest. The Council failed to obtain a suitable cover design embodying an official crest, as foreshadowed in the last Council report, and instead decided to give a trial to a cover consisting of a plain printed title and a photograph of a handsome tree growing in Ireland. The result seems to have met with general approval and it is likely that the idea will be followed in subsequent Journals.

It is regretted that the second part did not appear during the year as intended. It has been long prepared and in the printer's hands but he has been unable owing to a rush of other work to get it out in time.

Excursions.

Thirty-one members attended the Annual Excursion which was held in Killarney district from the 3rd to the 7th June. Visits were paid to the State forest lands, the Bourne Vincent Memorial Park and to two private demesnes. A meeting of the Society was held at which a paper entitled "The Vegetation of Irish Woodlands" was read by Mr. McEvoy and discussed by many of the members present. An account of the excursion and a copy of the paper is included in the second part of the Journal.

A "local" excursion was held on the 28th September and the afternoon was spent visiting the nursery and experimental plots attached to the Forestry School at Avondale, Co. Wicklow; 26 members attended. An account of the outing appears in the second part of the Journal.

The Council wish to express their appreciation of the kindness of the Minister for Lands and of private owners for permitting the Society to inspect their woodlands and to acknowledge the cooperation of the officials of the Forestry Division in making the excursion a success.

Library.

The arrangements made for the loan of books from the Central Students' Library continue in operation and forty requests by members for forestry books were forwarded by the Secretary during the year.

Tree Registration.

A beginning has been made in compiling the Society's register of notable trees. Members of the Council undertook the collection of data in neighbourhoods to which they had access and some particulars were furnished by Society members. It is hoped to make headway with this work in 1947 and the assistance of all members is sought.

Mr. Barry in proposing the adoption of the Council's Report, thanked the Council on behalf of the Society for its work during the year. He expressed disappointment at the poor attendance of members, and said that this must be attributed to the arctic conditions which must have discouraged many of the country people from attending. He suggested that the meeting might be held at a later date in the year, when travel conditions might be more agreeable. Mr. T. Manning seconded and the motion was adopted.

Abstract of Accounts for 1946.

The Abstract of Accounts for 1946 had been circulated amongst members. The adoption of the Abstract was proposed by Mr. S. O'Sullivan and seconded by Mr. D. Mangan. In putting the motion to the house the President pointed out that had the second issue of the Journal appeared as planned in December, 1946 and been paid for, the Society's finances would not have appeared so favourable as the statement indicated. A number of members had had to be written off owing to non-payment of subscriptions and quite a number were in arrears for 1946. He made a special appeal to members to pay up their subscriptions punctually. The motion was then adopted.

Election of Mrs. A. H. Henry to Honorary Membership.

The President then called on Mr. O. V. Mooney to propose Mrs. Augustine Henry's election to honorary membership.

Mr. Mooney said that the bestowal of honorary membership the greatest tribute we foresters could offer anyone—was in a very special way due to Mrs. Henry as a mark of the esteem and respect which she richly merited by years of talented dedication to trees. Her activities in our field were so ubiquitous and so modestly undertaken that it was not at all possible to do justice to them.

She had always been a great giver of that deep fund of knowledge which was hers with her husband's, the late Professor Henry the greatest of tree botanists. As his faithful companion and true friend she accompanied him and helped him in his never-ending search for unknown tree species and races.

We, and all tree lovers, he said, are deeply indebted to her for her presentation of her husband's collection of herbarium specimens to the State, to form the Augustine Henry Herbarium in the Botanic Gardens at Glasnevin. It contains 9,000 specimens of leafy branches, twigs, cones, and seeds collected by them in their widespread travellings. It was on these that the specific descriptions of trees in that monumental work *Trees of Great Britain and Ireland* by Henry and Elwes were based.

Mrs. Henry spent some eight years of really hard work at the Botanic Gardens arranging and cataloguing the specimens, so that now we foresters and botanists have an unequalled reference for any dendrological work. This work alone must place Mrs. Henry high in the ranks of tree botanists.

In Dublin she has been well known as an organiser and member of many societies for the promotion of tree consciousness. As a staunch supporter and active organiser of the Irish Roadside Tree Association, her work had practical and self-evident fruition in our many suburbs and roads which have been so greatly enhanced in beauty by the planting of wayside trees in recent years. Less known is the fact that many years ago Mrs. Henry translated from the German, *The Structure and Life of Forest Trees*, by Büsgen and Münch. This work would, no doubt, have brought her into the forefront of every forestry student's career, but unfortunately was never published. Years later a similar work by Professor Thompson appeared—one which is well known to-day.

He would be sorry to conclude without mentioning Mrs. Henry's personal kindness and hospitality to all who happened to pass her way. In formally moving the proposal he wished her many happy years to enjoy her membership and the great work she would always continue to do for trees and their lovers.

Mr. Forbes in seconding, said that he had always thought it extraordinary that Mrs. Henry was not mentioned in *Trees of Great Britain and Ireland*, a work which owed more to her than to any of those to whom acknowledgment was made in the postscript. He suggested that the only explanation was that the knowledge and work of Mrs. Henry and the late Professor were so interlocked and inseparable that no exact distinction could be drawn between their contributions. Her gift for languages was most extraordinary, extending even to remote dialects. It was only equalled by her faculty for getting on intimate terms with peoples of all races and classes, a faculty which served them well in their search after rare species and peculiar local information.

Before putting the proposal to the assembly, the President wished to be associated with the tributes to Mrs. Henry's work. He felt that in accepting the honorary membership, Mrs. Henry had added lustre and dignity to our young Society.

Mrs. Henry, visibly touched, thanked from her heart, the Society for the honour conferred on her. To find that her slight efforts were so highly thought of was most gratifying, and she wished to assure the members that whatever she had done in the past, she would do as gladly for forestry in the future.

The retiring President, Mr. FitzPatrick, then read his valedictory address.

President's Address.

The year which has just ended witnessed a number of happenings in the forestry world which are worth retailing here. In Ireland the new Forestry Act was of outstanding interest. This Act repeals the two previous Acts of 1919 and 1928 on which our forest policy rested but re-enacts most of their provisions, modified in the light of experience gained over the years, as well as adding new ones.

Extended powers are given to the Government for the compulsory acquisition of land needed for afforestation and for rights of way and sawmill sites considered essential for the exploitation of woodlands. In speaking of these powers the Minister said that it was not proposed that they would be used generally. The normal method of acquisition would be by agreement as heretofore and compulsion would be employed only when other means had failed. The Act deals with the three major obstacles to success in afforestation: the prevalence of hares, the criminal carelessness of fire lighters in the vicinity of plantations and the neglect to replant properly on the part of those who fell trees. It is made legal to destroy hares in a plantation, the scope of the heather burning section of the 1928 Act is enlarged and the Minister may enter on neighbouring lands to take steps to ensure the safety of State forests, and those who obtain a felling licence with a replanting condition are bound to care and protect the trees so planted until they are 10 years of age.

The Dail provides £287,000 for the work of the State Forestry Department in 1946. In introducing the estimate the Minister said that the annual planting target was 10,000 acres and that this figure would be reached as soon as the supply of tree seed and fencing material permitted. Shortages of these items had greatly hindered work during the years of the emergency and supplies continued short. He urged private people to plant as far as lay in their power to do so and mentioned that his Department had a scheme of assisting planters by the payment of a free grant of £10 per acre.

In Great Britain the stage is being set for a big forestry drive. For the first time the forest authority is to be provided with all the money they can usefully spend and the work of recruiting and training staffs is in hand. The necessity for large scale afforestation cannot be denied. The fellings of the war years and the virtual stoppage of re-planting for a period of six years has left the woodlands of England, Scotland and Wales in a sorry state with scarcely a sizeable tree remaining. In an important statement on the future of British forestry the responsible Minister declared, "The Forestry Commission recommended in 1943 that we ought to aim at planting 5,000,000 acres in 50 years, an area capable of producing one-third of our annual consumption and to enable us to stand any international emergency." I think they were right. There are hundreds of thousands of acres crying out for afforestation. One of the Forestry Commissioners said that this great national work can only be accomplished if the private owners play their part. To enable them to do this fully the Commission will provide money grants and technical advice and have appointed officers whose special duty will be the advancement of private forestry. Closer co-operation between woodland owners and the State service is provided in what is known as the "Dedication Scheme." Owners electing to dedicate their woods are paid a subsidy on the condition that they make timber

production the principal purpose of the land, that they adhere to an approved working plan, that they employ skilled supervision and that they keep woodland accounts: This scheme has no counterpart in Ireland and we will watch its development with interest.

The shortage of timber of all sorts continued to be felt. The scarcity is world-wide, due to the heavy consumption of the war years coupled with the disorganised state of many wood producing countries and the unprecedented demand for reconstruction. Our own stocks of mature trees are fast running out and, although we were able to augment our meagre supplies with purchases in Canada and the Baltic the shortage is acute and is the greatest single obstacle to the provision of houses and other construction work.

No review of Irish Forestry in 1946 would be complete without mention of the departure from this country of Dr. M. L. Anderson. Dr. Anderson was the principal founder of this Society. He occupied successively the posts of President, Editor of the Journal and Excursion Convener. In his official capacity as Director of Forestry he was responsible for many developments in the past six difficult years when the activities of the Department were switched from afforestation to mainly utilization in order to meet the urgent demands for timber. I am sure I speak for the whole Society when I say we wish him every success in his new work in Oxford University.

Venue for Excursion.

In the absence, owing to illness, of Mr. Meldrum, the incoming President, Mr. M. O'Beirne, the Vice-President, took the chair. Mr. O'Beirne said that the meeting had before it the proposal to hold an Annual Excursion. The Council had considered the matter at its meeting earlier and had decided that Portlaoighise would be a very suitable venue and suggested the dates to be 3rd, 4th and 5th June. He asked if any of the members present had any suggestions to make. Mr. J. Maher thought Portlaoighise a very suitable venue and proposed that the excursion be held there. He mentioned the many areas of interest in the locality. Mr. Clarke seconded the proposal and the meeting unanimously adopted Portlaoighise as the venue.

As Dr. Anderson, one of the trustees, had left, Mr. O'Beirne invited proposals for a trustee to replace him. Mr. FitzPatrick, who was proposed by Mr. Mangan and seconded by Mr. Mooney, agreed to act. This concluded the private business and Mr. O'Beirne called on Mr. H. Beresford Barrett, M.A., late Indian Forestry Service to give his address on "The Natural and Artificial Regeneration of Teak in Burma," which appears in this issue.

Discussion on Mr. Barrett's Paper.

Mr. Forbes proposed the vote of thanks to the lecturer. He drew a comparison between the regeneration of teak and oak, allowing for the difference in climatic conditions within the range of each species. As with oak, teak regenerated better under natural conditions. In our case grazing was the great enemy of forest and our mild climate favoured the out-wintering of stock. He drew attention to fire as an important factor of the habitat in determining the survival of certain species especially of broad-leaf trees which were fire-resistant as compared with conifers. This applied particularly to the native Podocarps of New Zealand. He thanked Mr. Beresford Barrett for a most interesting lecture.

Mr. McEvoy seconded the vote of thanks. The study which we have listened to, he said, of the forester's efforts in Burma has many lessons for us here. The Indian Forestry Service was the first organised service in the British Empire and had a very creditable record of achievement. The subject of Burma Forestry, tropical and sub-tropical, seemed far removed from our conditions but the fundamental natural forest laws are identical the world over; only their application differs and the very variety of their application emphasises their identity. In these large countries forests are seen in best perspective—especially with regard to varieties of soil and climate. These are just as important here but their effects are less obvious; consequently there is a tendency to discount local differences, a tendency we should learn to avoid.

One thing that struck him was the novelty of the methods employed, e.g., controlled burning as a preliminary to natural regeneration. They showed that foresters in Burma had not been conservative or hide-bound in the application of preconceived ideas. Their success in attaining natural regeneration of teak outside its natural range should encourage us in our attempts at regeneration of species which are neither climax nor native in our country.

Again in the matter of maintaining harmonious relations between the Forestry Department and the public we have a lesson to learn. If in Burma a forester can live and work in harmony with a rather primitive people, we should be able here to carry through our forest policy with the goodwill of all land users. In this connection the suggestion to establish forest villages had much to recommend it here.

Mr. FitzPatrick associated himself with the vote of thanks.

The lecturer, replying, thanked the members for their kind reception and answered various questions raised. He emphasised that fire was a natural condition of Burma forests, being due to spontaneous combustion in the tropical heat by rubbing of twigs, etc. THE SOCIETY OF IRISH FORESTERS.

STATEMENT OF ACCOUNTS FOR THE YEAR ENDED 31st DECEMBER, 1946.

INCOME.	2	£ s. d.		EXPENDITURE.	F	s. d.	324
I. To Balance from last Account:			1946. Dec. 31. 1	3v Stationery and Printing	IO	0	1.00
In Secretary's hands £5	2 I)	", Printing of Journals	52 I	9 0	
At Bank on Deposit A/c. 35 At Bank on Deposit A/c. 50	0 0			", Fostages	w 4	о о л	21. Carton
ar Carboninetions anotised .	6	0 I2 II		", Bank Charges	H I	н	-
1. ", subscriptions received :	0 0			"Excursion—expenses "Secretary's Honorarium	12	0 0	
30 do. do. 1946 30	0 0			" Balance:—			
3 do. do. 1947 3	0 0			In Secretary's hands £8 13 1			
I 2nd Grade do. 1944	0 01			At Bank on Current A/c. 53 I 8			
7 do. do. 1945 3	0 01			At Bank on Deposit A/c. 50 0 0			
40 do. do. 1946 20	0 0				III	4 9	-
I do. do. 1947	IO 0						
2 Associate 1945 I	0 01	¢.					
56 do. 1946 42	0 0						
2 do. 1947 I	0 01						
I do. 1948 & 1949 I	0 01						
	105	0					
" Journals sold " Excursion—Fees received	245	19 0 16 0	4				
			51				
	£226	11 L	1	£	6226	LI L	

I have examined the above Account, have compared same with vouchers and certify it to be correct, the balance to credit of the Society being £111 14s. 9d. of which £53 1s. 8d. is on Current Account and £50 os. od. is on Deposit Receipt with the Ulster Bank, Ltd. Credit has not been taken for Subscriptions for 1945, £7 15s. od. and for 1946, £26 1os. od. which were outstanding at 31st December, 1946.

10th January, 1947.

Auditors and Accountant, 102/3 Grafton Street, Dublin.

D. M. CRAIG,

LIST OF MEMBERS ELECTED AND ENROLLED DURING 1946.

- * Thomas Almack, Gilltown Stud, Kilcullen, Co. Kildare.
- a Edward J. Burke, Killemly, Cahir, Co. Tipperary.
- a Major E. A. T. Bayley, Ballyarthur, Woodenbridge, Co. Wicklow.
- a Laurence Brannigan, Beechmount, Mornington, Drogheda.
- * H. Beresford Barrett, Crocknaraw, Moyard, Co. Galway. Liam Condon, Mitchelstown, Co. Cork.
- a Michael Connolly, 20 Shop Street, Drogheda. Sean Campbell, "Teac Muire," Wicklow.
- * John Doyle, Muckross, Killarney.
- a Sean Delaney, Technical School, Prosperous, Co. Kildare.
- a Vincent Deeney, 114 West Street, Drogheda.
- a Charles P. Dowling, 64 Hillsboro' Court, London, N.W.6.
- a Major S. A. Grehan, Clonmeen, Banteer, Co. Cork.
- a W. J. Johnston, Lansdowne Estate, Kenmare, Co. Kerry.
- a Thomas H. Jeffers, Ashfield Hall, Ballickmoyler, Carlow.
- a Albert L. Lowry, Bachelor's Lodge, Navan, Co. Meath.
- a General Hardress Lloyd, Glasderrymore, Brosna, Offaly.
- a Patrick J. McCartan, "Cranmore," Ballinrobe, Co. Mayo.
- a Patrick McCartan, Cloncormack, Hollymount, Co. Mayo.
- a Morgan McMahon, Dromore Castle, Kildimo, Co. Limerick.
- a Michael D. O'Shea, 7-8 Main Street, Killarney.
- a Daniel O'Brien Corkery, Kenmare, Co. Kerry.
- a Aodogan O'Rahilly, Moreen, Clondalkin, Co. Dublin.

a Roderic More O'Ferral, Kildangan, Co. Kildare.

- a Lord Rosse, Birr Castle.
- a R. C. F. Ryan, Inch, Thurles.
- a Maurice J. Spillane, 5 Upper Sherrard Street, Dublin.
- a Mrs. Marguerite Solly Flood, Ballyduff, Thomastown,

Co. Kilkenny.

- a J. J. Sheils, James Street, Drogheda.
- a Mrs. Eileen Trant, Dovea, Thurles.
- a Captain L. D. Trant, Dovea, Thurles.
- a Thomas Wallis, Main Street, Midleton, Co. Cork.

* Technical Member, Grade I. a Associate Member.

