

## Some Early Economic and other Developments in Eire, and their Effect on Forestry Conditions.

Two assertions are frequently made regarding the extent of Irish forests in the past and present respectively. One is that the entire country was at one time covered with trees, apart from mountain tops, and similar unpromising sites. The other assertion is that the present area under woods is lower, calculated on a percentage basis, than in any part of Europe other than Ireland. There is no reason to doubt these statements as founded on fact, but the interval of time which elapsed between the two extremes is almost invariably overlooked. This interval must be calculated in thousands of years, and not in three or four hundred as is often done, and the omission to do this throws the whole question out of perspective.

Ireland's forestal condition did not differ greatly from that of the whole of Western-Europe, which possessed and possesses a somewhat similar climate, and the original forest area would have persisted to this day had man not intervened, and substituted artificial for natural conditions. But the change over from a forested to a non-forested condition was brought about in Eire by several factors which are not common to the remainder of Europe, although they closely approach them in many respects. Climatic and physiographical features in one direction, and economic developments in another have set up various processes which have tended to destroy the balance between agriculture, stock-rearing, and timber production, which economists, taking a broad view of the situation, consider should have been maintained. It is with the object of briefly noticing the main local causes which have contributed to this state of affairs, that this paper is being put before your Society, although the gaps are so numerous that no claim can be made for any great accuracy, or the presentation of a complete record.

Take, to begin with, the question of climate, which may be considered a primary factor in any industry in which vegetation plays a prominent part. Ireland, as everyone knows, stands as a kind of advance post on the Atlantic front of Europe, and possesses a climate of an extremely insular character. This is an advantage in some respects, and particularly in connection with cattle rearing, as it enables live-stock to be fed through mild winters and cool damp summers with the minimum of expense, and this in itself has put many millions into the pockets of the rural population.

Between sea level and 1,000 to 2,000 feet or more above it, grass grows for ten months or more out of the twelve sufficiently fast to keep store cattle alive without artificial feeding, or the necessity for housing. No other country in Europe, and only a certain proportion of the British Isles enjoys this advantage, and to it can be traced certain features of Irish rural economy and customs which have reacted upon the forest area of the country from prehistoric times, and will be referred to later on. But where the cultivation of corn, or any crop requiring much summer heat is concerned, the insularity of the climate has its drawbacks when once the plains and low level regions are left behind. This is due to the rapid fall in summer temperatures at every 200 to 300 feet in altitude. Theoretically this should only be 1 degree F., but actually wind creates such a cooling effect on Irish hillsides, that a mean July temperature of 60 degree F. at sea level is reduced to 53 or 54 degrees at 1,000 to 1,200 feet, or below the minimum requirements of average forest crops. If, for instance, the surface of the country is separated into three zones of altitudes, one between sea level and 600 feet above it, another between 600 and 1,200 feet, and a third between the latter and the highest hill tops, it can be shown in a general way that tillage or crop growing, as distinct from grazing, is only successful in the first of these zones, partly owing to more favourable soil, partly to higher summer temperatures, and in-

cidentally to a class of farmer with sufficient capital to maintain a high standard of cultivation. Between 600 and 1,200 feet, farms are on poorer soils, less highly or intensively cultivated, and possess a larger proportion of grazing land. Above 1,200 feet or so, tillage and meadow land, for all practical purposes, may be said to cease altogether, and rough grazing is the only form of agricultural enterprise possible, while successful or economic forest crops are inhibited by low temperatures. These, of course, are very rough generalisations, and exceptions are frequently being met with. But it is not far from the truth to say that the whole agricultural land of Ireland, together with towns, villages, demesnes, water, roads, etc., must be accommodated within 1,200 feet of sea level, and that whatever woodland the country contains, or may make, must find space for itself at the same levels. The general result is that agricultural holdings, demesnes, and woods have been scattered promiscuously over the surface, and no obvious reason can be found, in the vast majority of cases, for any particular piece of ground having been devoted to one purpose or the other.

If a comparison is made with some mountain region in Central Europe, with the highest points rising from 3,000 to 5,000 feet, the proportion of forest land will often amount to 40 or 50 % of the total surface. This will usually be found due to the concentration of all industrial and agricultural activities in the valleys and lower ground, while almost the entire surface above 2,000 feet or so is given up to forest. This is not a matter altogether of deliberate policy, but chiefly to the fact that both climate, configuration of the ground, and surface conditions preclude agriculture, render grazing difficult or impossible, and are unfavourable for settlement or industries. Heavy snow falls during three to four months of the winter, short summer seasons, steep slopes, difficult access, etc., all played their parts in impeding or discouraging forest clearing to any appreciable extent down to the last two or three hundred years, and since then forest laws and regulations have been in operation to ensure the retention of the forest on a permanent basis. On the flat lands to the north of the Central European mountain masses, general configuration does not play a big part, but the long winters prevent cattle being kept in the open, induce the rural population to congregate in villages, and confine intensive methods of cultivation to definite areas of the better land. Much of the poorer soil has been left under forest from the earliest times, and this is being retained as a matter of policy.

While, therefore, the early forest growth of Eire has been replaced by crops and grass, and the population has gradually spread itself over the surface, most of the Continental forest areas, which are pointed to as a reproach to this country, remain chiefly because there have been few inducements to change them for the benefit of some other form of utilisation.

But what the forest area gains under these conditions, the cattle stocks of the countries concerned lose. For instance, Eire with the lowest forest area, has the highest number of cattle per square mile, while Sweden with almost the highest forest area in Europe, has the lowest head of stock. This compensating factor should be borne in mind by those advocating relatively vast schemes of afforestation. Stock cannot be fed in any closely cropped woodland, and economic forestry does not admit grazing as a legitimate method of using its soil. Rough grazing on mountain areas is not such a casual asset to the Irish farmer as is usually supposed, and while the reduction in forest, due to this practice has reached the economic limit, the process cannot be reversed too rapidly. These differences in climate, physiography and rural economy are usually lost sight of, and we often find the forest areas of Eire contrasted with that of countries like Germany, Sweden, or even Russia. This rather resembles a comparison between the hare and the tortoise, without the moral usually attached to it.

These preliminary considerations are necessary to show the peculiar, and in some respects exceptional, conditions of climate and land utilisation in this country. Agricultural methods and customs are fairly old, and the rearing of cattle can be traced back to pre-historic times. The various legends which are so freely interwoven with Irish history, continually refer to cattle in the form of gifts or payments, causes of raids and intertribal wars, and as the ordinary currency of the country. These features in the life of the nation are clearly responsible for the gradual clearing of the primeval forests which once covered the land. The influence of continuous cattle grazing on natural woodland may have been very slight for hundreds or even thousands of years. As long as those animals had a wide range, and change of pasture was continually being sought by their nomadic owners, the country as a whole probably showed little change. Cattle are not so destructive to seedling trees as are sheep, horses or goats, and these animals at any rate were not indigenous, and only gradually exerted their influence as destructive agents. Until the growing of corn crops became general amongst the Irish communities, therefore, the forest would remain more or less intact in its main features, but possibly becoming thinner and more open with each century.

When the actual clearing of the forest area attained appreciable significance, no one can say. Prof. McNeill supposes that most of the land was enclosed during the 7th and 8th centuries, when the present townland divisions of the country may have been initiated as allotments of the common land amongst family groups. O'Curry in "Manners and Customs of the Ancient Irish," believed that 8,000,000 Irish, or 12,000,000 statute acres were in cultivation in the 5th and 6th centuries, and that the population at that time numbered about 3,000,000, or about the same as in the 17th century.

These townlands correspond to the more ancient ploughlands, and their boundaries were clearly and permanently defined when the first Ordnance Survey was carried out in the years 1835-40. This fact alone proves that their existence is due to some well recognised tribal laws, which admitted all members of a sept or clan to a share of the land of the country, and was not due to haphazard squatting of landless men, such as may occasionally be seen here and there to-day.

The average size of the townland is about 300 acres, and it is assumed that this varied with the quality of the land. The underlying idea seemed to be that of giving an equal share of productive and tillage land to each, while an area of mountain, wood, or rough grazing was included within the boundaries wherever these existed. How the boundaries were fixed in the first instance no authority appears capable of explaining, but such an extensive and widespread system must have been administered by a central authority, and could scarcely have been due to customs varying with each sept, or with different chiefs or rulers. But in any case this universal land division resulted in an agricultural population settling itself in every corner of the country, and over bogs, mountains and woodland; and its descendants have retained possession of the land from a very early period down to the present day in spite of wars, revolutions, rebellions, and all the disturbing influences of questionable land systems, and political upheavals.

In the earlier estimates, wood, bog and unenclosed ground were left out of account, but if they are in any way accurate, it is obvious that the clearing of the forest had made considerable progress before this townland divisions of the country took place. Long before this would have been worth doing, or the population large enough to require it, century after century must have seen a steady diminution in the tree covered land, and an increase in rough pasture and tillage. We have not only to take into account the 2,000 years of the Christian era, but also the unknown length of the Neolithic and Bronze Ages, relics of which suggest types of civilisation of no mean order.

But when the townland settlements were well established it can easily be seen that the numerous patches of forest which were included

within their boundaries had a very precarious existence. Each townland group had the right to come down upon them for building timber, fuel, domestic articles, farm implements, etc., and the mere fact that the users had the material close at hand hastened the process considerably. Live stock, again, instead of roaming over the same ground at long intervals, had a restricted range, and kept down any seedlings or stool shoots necessary for regeneration of the mature trees, and the woodland which happened to be included within the boundaries of a townland would quickly disappear, and be reduced to scrub.

How far the Brehon Laws were applied to the native Irish woods is difficult to ascertain. They refer to certain "Chieftain trees," which were: Oak, Hazel, Holly, Yew, Ash, Pine and Apple. The mixed character of this list, as given by O'Donovan, suggests that more importance was attached to the use than to the size of the species enumerated. Hazel and Holly, for instance, have nothing to recommend them as timber trees. Mention is also made of "Co-occupancy" and "sacred" woods, which may have meant woods held in common, and in the hands of the Church respectively.

While the townland division of the country exercised its de-afforestation effect in one direction, it also resulted in a form of tenure which has had an extremely retarding influence on attempts to improve or turn to account large areas of hill land which were split up amongst numerous occupiers, or were held in common to avoid the trouble of keeping up divisional fences, or maintaining a large number of herds or shepherds. This has been especially obstructive to attempted afforestation in the last few years. To obtain 500 or 1,000 acres in one block, negotiations have often to be carried on with twenty or thirty individuals or joint owners, with the result that a scheme of acquisition has often to be abandoned, or brought to a conclusion in an unsatisfactory manner. Probably much the same difficulties occur in other countries, but are not quite so universal as in this.

It appears to be fairly clear that the early system of land tenure so far reviewed, persisted down to the Norman Invasion in the 12th Century. The change which then took place can be traced from State Papers and other written documents which began to appear from that time onward. Without any preliminaries, the Normans evidently regarded Ireland from the time of their arrival as under the Feudal System, but how far this was possible to put into practice is another question. The first visible result of the occupation was the erection of castles over most of the country, and the building of these was finally done in such a substantial style that a large number remain, so far as the outer walls are concerned, intact to this day. These castles must have consumed in their construction much of the finest oak timber in the districts in which they were erected, while the garrisons which occupied them doubtless commandeered, "*according to plan*," corn, cattle, fuel, etc., from the local inhabitants. The Irish chiefs either submitted gracefully to the intruders, effected compromises, or resisted at the point of the sword, and in the course of a century or so, Irish Chiefs and Norman Barons were found living side by side on terms which constantly fluctuated between peace and war. But the land, with which we alone are concerned, probably changed little as the result of the invasion.

When the Normans took possession of the territory of a native chief they called it a barony, the sub-division or ballybetaghs became something of the nature of manors, the ploughlands "*vills*" and so on. The cultivation of the land, and the rearing of stock probably went on much the same, whether under the old regime or the new. The waste or unoccupied land became the "*forest*," and was subject in theory, if not in practice, to the forest laws, but the effect of these laws, if any, cannot be traced. The "*forest of Ireland*," as it was termed in a State Paper, extended over the entire surface, but in only two instances is there any evidence that the Norman kings or their

representatives took any action in the matter. These two instances are Glendalough and Taghmon, near New Ross, and had it not been for the deafforestation of the areas concerned, probably nothing would have been heard about them, or the forest law in Ireland.

The Glendalough forest was the waste land of the See of that name. Taghmon was part of the territory first allotted to Strongbow by Henry II., and came later into the hands of his grandson. The deafforestation of the forest took place in 1229, during the reign of John, and that of the latter in 1234, and payments of 300 and 600 marks respectively were paid for the charters issued in these connections. Full particulars of these incidents are given in a paper I read before the Royal Irish Academy, in 1932. The short period which elapsed between 1172 and 1229—about 57 years—does not suggest that the Forest Laws were ever enforced in a general way, and it is almost certain that their application to Ireland was little more than a feature of the general feudal system introduced by or associated with the Norman occupation. It is highly probable that the use of the word "forest" in the legal language used in connection with grants and charters has been responsible for many of the exaggerated ideas which prevailed about the wooded state of the country at that time. All waste or unoccupied land, including bogs, mountain tops, etc., came under the head of "forest," and was regarded as the property of the Crown, whereas under the Celtic tribal system, it was held in common under the native chiefs. As a case in point regarding these ideas, I may mention a conversation I had some years ago with a gentleman who might justly be regarded as an authority on Irish mediaeval history. He gravely assured me that the records showed that the whole of the Wicklow Mountains between Dublin and Glendalough were covered with trees down to the last five or six hundred years, and his belief was founded in the supposed application of the Forest Laws to this district, already referred to.

One important but undesirable event can however, be traced to the Norman occupation. This was the introduction, or at any rate the protection of rabbits, and the introduction of fallow deer. The rabbit burrow is frequently mentioned in Charters and State papers of the period, and appears to have had a fairly high revenue value. That these animals were scarce can be judged by the price paid for them, and the trouble taken to obtain them. In the Account Rolls of Holy Trinity, 1329-1380, it is recorded that a William Follyng was given 1d. for going to Holmpatrick to get rabbits. In the same account 100 planks of "Wicklow" board were bought for 14d., so that we may assume that seven planks were equal to the cost of one rabbit.

The first record of fallow deer being introduced is in 1242-4, when about 60 head were brought over from Chester for the deer park of Glencree. Similar introductions are noted in the State and Domestic Papers down to the 17th Century or later. Most wooded districts in the country possess small herds which have either escaped from parks in recent years, or are the descendants of animals which were living free two or three centuries ago. Compared with rabbits they are a minor evil, and at any rate make the country-side more interesting.

From the year 1224 until 1700 or so, frequent references are made to deer parks in charters, grants, patents, etc., and the term "liberty to empark" is almost invariably used. The term was more a matter of form than anything else, for the forest laws prohibited enclosures which prevented deer from roaming freely over the land, and although these laws, as already said, were never taken seriously in Ireland, the legal phraseology was maintained right to the end of the "Stuart Period." Deer parks seem to have been associated closely with rabbit warrens, decoys, fish ponds, and anything connected with game or animals of a wild, or semi-domesticated nature used for food. The creation or maintenance of these features was probably a privilege enjoyed by the ruling classes, and must have been one of the first steps taken when many blocks of land were parcelled out amongst the

adventurers and undertakers who came into forfeited estates at frequent intervals for several hundred years. They seem to have been a long way in advance of the demesnes we are familiar with to-day, and suggest that a good many owners who could not boast of a castle or abbey suitable for a residence, must have built themselves some sort of temporary quarters until the mansions created later were ready for occupation. Writers in or about the 18th century, which are frequently quoted by Lecky and other historians, refer to the poor housing accommodation of the average landowner about this period, although the change then gradually taking place was in the other direction.

Before dealing with the next important development affecting the question, it may be as well to glance at the probable extent of native woodland which survived the various Wars, Rebellions, Confiscations, and other disturbances between the 15th and 18th centuries, or during the 300 to 400 years which covered the Tudor and Stuart Periods, and introduced modern ideas and customs. These periods have been very thoroughly dealt with by modern historians, but unfortunately they have nearly all repeated a number of mis-statements on the supposed abundance of woods and forests in Eire about that time. Most of these errors have been due to the reliance placed upon various descriptions of Ireland written by travellers between 1598 and 1650, and which mix up bogs and woods in a manner which renders it practically impossible to get any clear idea of the actual state of affairs. The confusion which has arisen on this point may be best illustrated by an extract from the volume on Ireland, published in the Cambridge Historical Series in 1898, and which summarises, in a very thorough manner, all that is recorded by numerous writers in the history of the country. This statement refers to the Desmond rebellion in 1580-83, and reads as follows: "Immense masses of forest covered whole counties, the roads were few and bad; the defiles intricate and the open lands, oases in an unexplored wilderness, covered with the castles of Geraldine and Celtic chiefs, and dotted with habitations of their vassals and serfs, were scarcely accessible through morasses, thickets, and all kinds of obstacles."

Yet coming to 20 years later, Fynes Moryson, who is generally regarded as a reliable authority on that period, writes in his "*Description of Ireland*," about 1603: "But I confess myself to have been deceived in the common fame that all Ireland is woody, having found in my long journey from Armagh to Kinsale few or no woods by the way, excepting the great woods of Ophalia and some low scrub by places which they call 'glins.'" He certainly states that Ulster and the Western parts of Munster yielded vast woods, but as these were the regions in which the rebels had chiefly to be dealt with by the army to which he was attached, he would naturally come more in contact with wooded parts than open areas in any particular district.

To take another statement referring to a later period, Lecky, in his history of "*Ireland in the Eighteenth Century*," has the following: "A serious and enduring change passed over the material aspect of the country in the forty years that followed the revolution (1631-51) from the rapid destruction of its forest trees. The history of this destruction is a curious and a melancholy one. When the English first established themselves in Ireland, no country in Europe was more abundantly wooded."

Moryson's account, however incomplete it may be, has the merit of being circumstantial rather than general, and all the more likely to be correct on that account.

The safest plan to adopt is to steer as carefully as possible between various divergent views on the former wooded state of the country, and to assume that a great deal of native woodland of a rough and scrubby character existed down to the 16th Century, and that much of this was cleared, or became incorporated with holdings before the year 1700 or so. Notes by intelligent observers were made by various Englishmen after that date, of whom Arthur Young is prob-



ably the best known, and they all agree that the country at the end of the 18th century was singularly bare of trees, and that most of the plantations they saw on demesnes had been recently planted. All of these opinions and observations cannot be incorrect; and as they were comparing Ireland for the most part with England, which was at that time, a by no means heavily wooded country, the comparison is all the more significant.

There is much evidence that oak timber, bark and charcoal were exported from Ireland in fairly large quantities from certain districts between 1550 and 1700. Pipe staves were sent to the Madeiras, and ship timber, boards, etc., to England, while iron smelting used up large quantities. Instances are given in both England and Ireland of iron ore being shipped to the wood producing districts for smelting. Oak was also greatly valued for its bark down to the last hundred years or so, and long after charcoal had become of secondary importance.

Much of the timber cut about this time was on estates which had been forfeited to the Crown after the various rebellions, and subsequently sold or granted to adventurers and undertakers throughout the country, whose main object was that of turning it into cash before the next disturbance or change of government took place. The Oak woods which are scattered throughout Ireland to-day owe their condition largely to these particular transactions. As is well-known, they are for the most part singularly uniform in age, size and density, due to the fact that most of them were clear cut, and were re-generated by stool shoots, finally reduced to a single stem. They thus possess much the same appearance as planted woods. Their exploitation seems to have been methodically carried out, and the idea that they were deliberately destroyed for political or military reasons has been erroneously entertained, as mentioned a few minutes ago. Old leases granted to Englishmen can often be met with in estate records, which show that the custom was usually to give a long term of 30 or 40 years for clearing a large wood, subject to the condition that cattle were fenced out. We often find that sub-contracts were entered into for clearing up the refuse, or using it for charcoal, and it is quite evident that deliberate waste was not encouraged, although many woods may have been left unfenced or the fences improperly made up. Banks running through many of these woods still exist, and may have been thrown up by the lessees, while saw pits for the breaking down of the larger timber are numerous. The practice of leaving standards of oak or ash at each felling does not appear to have been followed in Ireland, as was almost universal in England at the time, but successive fellings, at intervals of from 25 to 50 years, possibly led to the dropping of a routine which may have been followed at an earlier period.

It is interesting to speculate, not only on the extent of these oak woods in the 16th to 18th centuries, but the causes which led to their preservation or retention, when the land surrounding them was cleared, or the timber on it destroyed. Situation had something to do with the latter in certain cases, no doubt, and rocky and broken surfaces retained their crops of scrub owing to the difficulty of clearing them, and the irreclaimable condition of the ground. But a contributory factor was probably the tendency of oak woods, on the poorer and drier soils, to show a dense surface growth of wood-rush and *Vaccinium*, which characterises most of them to-day. The grazing value of these woods is consequently extremely low, and while better soils gradually changed over from normal forest to woodland pasture, and from this to a comparatively treeless condition, the typical oak woodland was left more or less alone by the rural community until it became private property, and was absorbed into estates. Of the extent of these woods, in the year 1600, for instance, before demesnes and demesne woods had become general, we have no means of finding out. Possibly a quarter of a million acres would not be an exaggerated estimate, and at least half of this area can be seen to-day doing useful work in contributing to the fuel supply of the country. History seems to be repeating itself in many ways in this connection.

The year 1700 can be regarded as the low water mark of the native Irish woods, and brings us to the most important development in the history of Irish forestry of the past, and of considerable importance in regard to its future. This is the creation and laying out of demesnes in all parts of the country, but more especially in those districts and on those types of soil which, in the ordinary way, would be out of the reach of the economic planter. When this work first commenced in a general way it is difficult to say. Probably the more important castles built by the Normans gradually became residences rather than fortresses and, by the time of Elizabeth, had been surrounded by small parks or gardens in which trees were preserved, and an occasional exotic planted. But these early efforts were few and far between, and were continually endangered by Civil War and Revolution. The first definite records of demesnes dated from about 1650, when references are made to Carton, Castlemartyr, and others which no longer exist. In the Domestic Papers of about 1660, correspondence is given between Sir George Rawdon and Lord Conway, on the building of Portmore in Co. Down. This house had a deer park of about 2,000 acres, a rabbit warren, decoy, and a glen specially *planted* for woodcock, and contained magnificent oaks, which were doubtless of natural origin. One of these is said to have been sold for £120 in 1661. Charleville, built by the Earl of Orrery, about 1680, at a cost of £40,000, was burnt by the Duke of Berwick, nine years later. The formation of later demesnes is not always easy to trace, but the process appears to have been somewhat as follows. Large areas of land came into the hands of the Crown between the years 1550 and 1700, as the result of forfeitures and attainders, following the Desmond and Tyrone rebellion at the end of the 16th century, and additional areas after the 1641 outbreak suppressed by Cromwell. Most of this land was granted or sold by the Crown to adventurers or planters, who were prepared to take the risk attending its occupation. In many cases, however, the land so disposed of was sold, or leased for long or short periods to residents in the country, the grantees remaining in England or Scotland until they were more certain of their position. After the Restoration, the condition of the country improved sufficiently for many of the more influential grantees to take up residence on land, already in their possession, or out on lease for short periods. With an area of three or four hundred acres of demesne on their hands, building a mansion was obviously the first step, and while this was going on, the planting and improvement of the demesne was also attended to. Landscape gardeners from England or Scotland appear to have been put in charge of the larger schemes, but, doubtless, many owners had ideas of their own, and carried them out in person. The progress of the work was recorded by numerous visitors to this country about that period, Arthur Young standing out prominently in this connection, and it is evident that every part of the country was a scene of activity between 1750 and 1800, although much work was done before and after those years.

Samuel Hayes, founder of Avondale, describes some of the planting practice at that time, and was particularly enthusiastic over a planting machine introduced by a Scotsman named Robertson for the purpose of pulling up trees of 20 feet high or more by the roots. These trees were used for forming clumps on the demesnes Robertson was laying out, and must have been a very expensive process even in those days of cheap labour. Apart from this method, however, the planting described by Hayes was very similar to that practised to-day, and included all the European and Eastern American species of any economic value. Western American and Japanese varieties were, of course, not then known. In nursery practice, again, there does not seem to have been any great advance. While some of Hayes' statements suggest that he was quoting English or Scotch writers rather than drawing on his own personal experience, other remarks show that he was a keen observer and an enthusiastic forester.

To quote all the authorities dealing with this particular period would be impossible in a short space, but at least one source of informa-



tion of a very reliable order must be made use of. This is the report made to the Departmental Committee on Irish Forestry in 1908, by the late Mr. Richard Moss, on the result of granting premiums for planting and nursery work by the Royal Dublin Society. This has a very close connection with present conditions, when compulsory replanting is the order of the day, and grants to private owners have been sanctioned by law. The report states that the premiums were instituted in 1739, and were continued until 1808, but the returns are incomplete for the first 22 years. In 1761, the Irish Parliament voted the Society a sum of £2,000, which was largely increased until the Union, when the Votes-in-Aid to the Society were reduced, and the premiums ceased. As the returns do not show the entire outlay, it is not possible to give the total acreage planted by the help of the premiums, but 2,800 acres are mentioned in the course of 40 years (or 70 acres per annum) in return for £12,460, or approximately £4 per acre, practically the same as that given to-day. The trees specified for planting a minimum of 10 acres were: oak, beech, chestnut, walnut, sycamore, elm, larch, fir and pine, and varied from time to time. Weymouth pine being mentioned in 1765, and maple and ash in 1783. Oak was occasionally scheduled as a main crop in particular cases, but the quality of the soil was not considered and subsequent reports stated that it was sometimes planted where larch would have done better. Neither spruce nor silver fir is specified, but these may be covered by the word "fir." The most surprising feature was the number of trees to be present on an acre of ground, which varied from 1,000 to 8,000 at the end of 10 and 3 years respectively.

Premiums to nurseries, either by the number of plants sold, or by the acre of nursery ground, were also given, and one hundred and eight nurseries in all raised and sold 24,767 millions, of which Galway alone contributed nearly half. These premiums were finally abolished on account of the frauds practised in connection with them. In one case quoted, the bulk of the trees alleged to have been planted consisted of mountain ash, which were probably self-sown, and pulled out of the nearest wood.

In all these early records of planting methods, we cannot help wondering how the rabbit problem was dealt with, but no mention is made of it. Wire netting at that time did not exist. The earliest reference I can find to netting against rabbits is in Brown's "Forester" for 1871, and the brief statement therein, merely suggests that it was *coming* into use about that time. How were trees protected before then? Or was the rabbit less in evidence? Brown certainly suggests painting the trees with a mixture, but as we all know, this was a very feeble safeguard. The steel trap was also out of the question in those days. One possible reason for a scarcity of rabbits in the 18th and early part of the 19th centuries may have been the very high rural population, and the necessity for keeping down ground game at that time. Against this, we have the tendency of the landlord interest to preserve game of all kinds on tenanted holdings, and their powers in this direction were very considerable. The question, therefore, must be left unanswered, but possibly the game-keeper and the wholesale contractor for rabbit trapping had strong motives for having a good stock on the ground at the end of each season.

After the great activity in laying out demesnes, which lasted for about a century, and appears to have terminated round about 1820, it is probable that little planting was done until the years following the famine of 1845, when all kinds of relief work were started in rural districts. According to Agricultural Statistics between 1841 and 1891, there was an increase of about 80,000 acres under conifers during the 50 years, although mixed woods decreased by nearly double that area during the same period. Much of the former would be on mountain land, and outside the boundaries of demesnes, but the big decrease in mixed woods is difficult to account for. As 1880 seemed to mark the almost total cessation of planting on private estates, it may have been accompanied and followed by a heavy felling of woods affected

by the Land Act of 1881, and most of the reduction had taken place in the last decade of the period in question.

Two or three incidents which are of some interest occurred at the end of last century, and with them I think this paper may be brought to an end. In 1884, Mr. W. E. Gladstone, one of Ireland's most sympathetic statesmen, ran into a Danish gentleman named Howitz. The latter must have been extremely plausible, for he induced Mr. Gladstone to give him a commission for reporting on "*The Reafforesting of Waste Lands in Ireland.*" The report was a most extraordinary document, and advocated the planting of a shelter belt along the entire West coast to exclude the Atlantic gales, and to bring down the rain which accompanied them. The area of waste land estimated as suitable for planting amounted to 5,000,000 acres, and must have included every bog and mountain top. The species recommended for planting them were apparently taken from a nurseryman's catalogue in alphabetical order. It transpired later that Mr. Howitz had no forestry qualifications whatsoever, and must have compiled the report more in the nature of a hoax than as a serious attempt to grapple with the problem at issue.

About the same time, the Knockboy experiment was inaugurated on about 1,000 acres of bog land in Connemara. As this was the first attempt at State afforestation in Ireland, its failure was little short of a tragedy, but it illustrated the evils of political influence being applied to technical work. About £10,000 was spent on the scheme in about ten years, when further attempts were abandoned. The history of Knockboy is briefly this: Mr. A. J. Balfour—when Chief Secretary—was urged to start the afforestation of so-called waste land. His reply was that the cost of such land would probably be prohibitive, but if an area could be obtained, he would provide the necessary funds. The owner of Knockboy at once came forward with an offer, and to redeem his promise, the Chief Secretary was obliged to purchase, and attempt the impossible.

These two incidents constitute what may be termed the genesis of State action in Irish forestry, and illustrate how wide was the gap between theory and practice, and the amount of spade work which had to be accomplished before a practicable forest policy could be initiated.

I think enough has been said to bring some early events to your notice which have had, and still have a bearing on State forestry in Eire. Some of them are, of course, well-known to students of Irish history, but I doubt if many of you ever think of them in the course of a busy life. But history is said to have a trick of repeating itself, and it is sometimes well to bear in mind that events which happened one thousand years ago may find a parallel in modern times, remote as the probability may seem to most people. If these events are classified in order of importance, I should say that the two which have reacted most powerfully on present-day conditions are the relatively minute division of the land into townlands at a very early period, and the creation of demesnes within the last three hundred years. The former hastened the removal of the natural tree growth, and rendered its reafforestation more difficult, while the latter brought a great deal of first-class land under timber crops which would have otherwise remained in the hands of the farmer.