



IRISH FORESTRY

Journal of the Society
of Irish Foresters

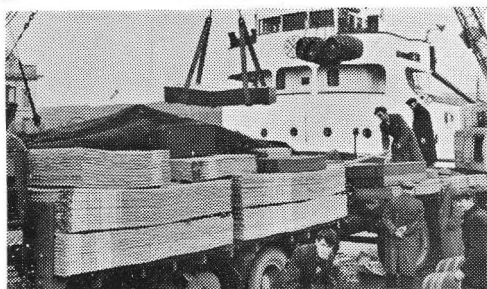
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by Eileen McCracken.

LEGEND

R. Rutland Square. TC. Trinity College. S. Smithfield. C. Dublin Castle. M. Merrion Square. F. Fitzwilliam Square. SG. St. Stephen's Green.

1. Dorset St. 2. Capel St. 3. Thomas St. 4. Corn Market and Christchurch area.

The bounderies of Dublin are taken from a map 1808.

IRISH FORESTRY

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(The views expressed in the articles and notes in this journal are not necessarily the views of the Editor or of the Society of Irish Foresters.)

Cover Photograph: *Pinus contorta* typical of the Lulu Island provenance which has been found unsuitable for afforestation in Ireland.

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IRISH FORESTRY

Volume 24

AUTUMN 1967

Number 2

The role of the Forester in a Changing World.

By PROF. BLACK

YOUR Society has paid me a great honour in inviting me to address you on the occasion of the 24th annual general meeting. The association of my predecessor, Professor Mark L. Anderson, with Ireland in general, and the early years of your society in particular, has meant that forestry in Ireland has always had a special place in the affections of the Department of Forestry of the University of Edinburgh. It is my earnest hope that these links will be strengthened in the years ahead by the broadening of my department's interests to cover the whole range of biological natural resources since, as I hope to show tonight, there are changes in the air which, sooner or later, Irish forestry must come to terms with.

You have asked me to speak on the role of the forester in a changing world. This title makes two assumptions, one of which I will allow to go without challenge, while the other will form the basis of my paper. The first of these assumptions is that the world today is changing; this is the one which I will take as read—after all, the world is always changing, always has been and, I hope, always will be. What we really mean when we speak of a changing world is that the world today is changing more quickly than we have been led to expect, and more quickly, perhaps, than we would like. We are concerned to know if we can change our institutions, and, at the personal level, our own attitudes or world-view, at a rate fast enough to adapt to changes which result from factors beyond the control either of ourselves or even the society to which we immediately belong. This leads me directly to the second assumption inherent in the title of my address, which is that the forester *has* a role in the world today. It has probably never occurred to you to inquire whether foresters have any role at all today; you have all probably taken it for granted that they have. It is this assumption which I propose to examine now.

An occasion such as this is, I believe, a very good time for a little self-examination. Every now and again we should all stand back from our chosen profession and day-to-day activities, to question the bases on which our work proceeds, in the hope that by analysing them objectively—that is, by ridding ourselves of the accumulated

dross of years of sloppy thinking and unconscious self-justification—we may see ourselves for what we are; parasites on society or saviours of mankind? Or are we, as are most people, somewhere between the two? And, in that case, towards which pole do we vere? You may perhaps feel that since I did not myself have the benefit of a formal education in forestry, having come to this subject only since my appointment to Edinburgh some 3 years ago, I should not presume to take you all to task. But I believe that it is simply because of this that I can be objective, and can discern strengths and weaknesses better, perhaps, than some of you who have been professionally involved in forestry for much longer periods.

What—if we may borrow a concept from ecology—is the niche of the forester in the world today? Is there more than one niche—say, one for a forester in an ecosystem of advanced technology, such as one in Western Europe or North America, and another for a forester in an ecosystem of lesser maturity (that, of lesser functional complexity), such as one in a developing country? Are foresters fulfilling the demands of society today and can they adapt to the needs of tomorrow?

Clearly the superficial answer to the first question is that the niche of the forester is the management of forests. Immediately we find ourselves faced with a series of formidable questions, the answers to which will enable us to assess the role of the forester in today's changing world. Here are some of them:—

- (1) On whose behalf does the forester look after his forests?
- (2) For what purpose or purposes?
- (3) Does the forester do his job or jobs as well as he should?
- (4) If the answer to question 3 is "no",—why not?

I may perhaps be accused of leaving out one of the most important questions of all—"what is a forest"? Assuming that we are probably all agreed on the answer; for the purpose of this talk, a forest is a sizeable piece of land with trees growing on it. If this was not always what the word forest meant, this is what it means today. Perhaps it was worthwhile after all to draw attention to the meaning of the word forest, if only to remind us that the forest consists of the land as well as the trees, and not just the trees alone. Since land is in short supply in many parts of the world, and is, indeed, frequently the resource limiting the growth of human populations, the proportion of land occupied by trees must be balanced against the proportion used for other purposes—food production, urban development, transport, recreation, etc. I shall return later to this question of allocation of land between competing uses, but I would like to draw attention at this point to an unfortunate, though perhaps understandable, rigidity of attitude towards changes in use. Proposals to vary land use, either between productive systems such as agriculture and forestry, or out of productive use into urban or

similar development (in so far as such use can be considered as non-productive) are almost invariably opposed and frequently lead to much ill-feeling. It is scarcely surprising that resource managers regard such changes from their own point of view, and that they should find it difficult to give proper weight to the claims of other users, or the place of the various land uses in the national economy. There seems to be a general belief, particularly strongly held in agriculture but by no means unknown in forestry, that land once given over to one form of use should remain in that form for all time. This view is, I believe, quite, quite wrong. Surely it is only to be expected that in a changing world there will be changes in the structure and function of society which will vary the priorities on which land is to be allocated between uses. We should rather see land use as a "rotation of crops", on an extended time scale, in which the products can be varied in accordance with the current needs of society.

The first of my questions was, "on whose behalf does the forester look after his forests"? The superficial answer is, of course, the people who pay his salary—the Forest Service, the Estate Owner, the County Council, etc., but we must delve a little deeper than this if we are to see the role of the forester in proper perspective. The western world today is an urbanized society with a highly sophisticated technology, and the vast majority of its members have little interest in, and no understanding of, the management of the resources upon which they depend for their survival. That management has been delegated to a number of specialists, of whom the forester is one. This dependence on a remote and unseen specialist does two things: firstly it leads the forester to think that, being an expert, his advice and opinion are not to be questioned (a common failing of many professions), thus further isolating him from the community of which he is a part; secondly, when public confidence in the specialist is lost—as, for instance, at times of forest fires, disastrous floods or slag heap failures, the specialist finds himself in the dock, a ready sacrifice to an outraged public who feel themselves betrayed. All professions concerned with resource management are in the same position, in as much as they act as agents for a society which, in the evolution of advanced technologies, have lost touch with the environment of which they are a part. I do not wish to suggest that the forester is particularly guilty in this respect; indeed I believe that social responsibility is stronger in foresters than in almost any other group in the community, for reasons which will become apparent later.

The root of the trouble is that modern man has become conceptually isolated from his environment. In a society which sees as its main purpose the domination of nature, rather than the achievement of a harmonious integration with nature, the attitude of the community towards the manager of biological natural resources is inevitably akin to that towards the engineer. "The environment is something to be manipulated; we tell you what to do; we pay you

to do it and mind you don't make any mistakes". Unfortunately biological resource management differs from engineering in one important respect—we do not have anything like the same degree of control over the variables involved.

Therefore, in answer to the question, for whom do we as foresters look after our forests, we can say that in the final analysis, we do so for society, which, like an absentee landlord, has no understanding of what we do, and no interest, save in the delivered product. An excusable result of this has been the creation among foresters of a professional "*esprit-de-corps*" which has tended to substitute a passionate devotion to the forest itself for an explicit feeling of social responsibility. Again, I do not wish to suggest that foresters are not alive to their responsibilities to the community, but rather that the forest then comes to be valued for itself alone, whereas its value should be assessed only in terms of all the competing uses for land and other economic resources, and their relevance to the total economic organization of the community.

This should serve to remind us that forestry, like any other system of resource management, requires a combination of inputs—land, capital, labour, expertise etc.—some or all of which may be in short supply. Forestry has no right to a share of the available resources just because it is a "good thing", to be encouraged for its own sake alone, but it must compete for them within the total economic framework. Accordingly forestry must expect to be judged by its results. As everyone here knows full well, the difficulty comes in expressing in economic terms the benefit accruing from the employment of scarce resources in the forestry sector. The obvious "front-line" products are easy enough to measure in economic units, though arguments based on these values often seem to involve a degree of special pleading over such matters as "national interest", "war-time security" and the like. These arguments may be valid enough, but my point is that it is not sufficient to bolster up a case which may seem weak on economic bases with supra-economic reasoning of an unquantifiable nature. Moreover, a forest supplies so many products not yet readily measured and valued—watershed management, recreational and wild-life potential, amenity rural employment and the conservation of ecological variety amongst them. Foresters themselves know that these benefits exist and that they should take them into consideration in the economic analysis, but it is certainly not enough to add a few percent in the calculation of interest on capital invested in an arbitrary and, indeed, an arrogant manner. One of the most pressing problems facing foresters today is to find ways and means of quantifying these secondary forest products so that their importance may be measured in meaningful terms.

It is clear from this discussion that the place of forests in the economy of industrial societies has changed in recent years, and that it is still changing. The spread of leisure and incomes through the

community on one hand, and an investment policy which discriminates against primary production industries in an industrialized economy on the other, to say nothing of refinements in the techniques of economic analysis, all tend towards an increasing emphasis on the so-called secondary forest products—recreation and amenity in particular. While it still remains possible for a country to widen its geographic resource base by trade, these trends may be expected to continue, but as standards of living increase in the primary producing countries, exportable surpluses will be reduced. As this occurs, there may well be a change of investment priorities, but this will not come for some long time yet.

This discussion has led us straight into the middle of an answer to the second question—for what purpose or purposes do we manage our forests? If we accept that we act as agents for a society which is prepared to delegate this responsibility to us, we must also accept, I believe, that the objects of management should also be those explicitly or implicitly laid down by that society. When the requirements of society change, so must the objectives. This is a very different thing from saying that the specialist should accept blindly all the demands made upon him, to the exclusion of his judgement on matters within his own province; but it does mean that he should preserve a flexible attitude to the changing world and not meet new demands with a reactionary determination to carry on as before. We hear a great deal today about multiple purpose management, and the need to pay due regard to secondary forest products, and this is a case in point, where new demands—such as greater public access—are not always welcome to the forester. There is, of course, nothing new about multiple use of forests, and multiple use is not peculiar to forestry. Traditional forest use was always multiple purpose—shelter and grazing for stock, acorns for pigs, firewood for villagers, hunting and fishing for the favoured few as well as timber for constructional purposes and for charcoal are easily cited uses, while water gathering and conservation of ecological variability always existed, though probably totally disregarded. If there is one important difference between multiple use ancient and modern, it is that today management for simultaneous uses, and the proportion of effort devoted to each, have become acts of deliberate policy. The importance of multiple use in other forms of land use is easily seen in hill-farming and other extensive systems of agriculture, though admittedly to a lesser extent: wool, meat, hunting, recreation and water gathering all apply.

As my colleague Dr. W. E. S. Mutch recently pointed out, the significance of multiple use management lies in its relation to intensity of effort—the input of resources (capital, labour, etc.) per unit of land area. The greater this input of resources, the more specialized and single minded must be the objectives, if a proper return is to be achieved. The whole trend of intensive resource use is towards

ecological simplification—a concept which is diametrically opposed to multiple use. I am now suggesting that for any piece of land, the form of land use which is appropriate is that which gives the equimarginal return at the highest investment; under the most favourable conditions, where the most capital and labour can be deployed, a specialized and intensive single use system can outbid other single uses and combinations of uses; where conditions are least favourable a low level of input yields a return by multiple purpose management that exceeds all single purpose uses. The idea that multiple purpose use in forestry is associated with low inputs and *less* intensive management may sound strange to foresters, and, as far as I am aware, has never been subjected to stringent economic analysis. Nevertheless, I am convinced that it is correct.

I suspect that one of the difficulties in approaching the problem of multiple use is that foresters have too easily fallen into the bad habit of comparing efficiencies of management in terms of the production of timber per unit land surface, instead of the return on the input of *all* resources invested in the venture—capital, labour, etc. *as well as land*. For the purpose of social accounting, indices of production based on one resource only are obviously inadequate and frequently misleading. Thus, in my opinion, the decision on multiple versus single use rests properly on economic criteria; where potential production is high, and the return to invested resources is good, single purpose use should prevail. Where these conditions do not hold, multiple use with extensive management comes into its own. In a nutshell, I am saying that good forests should be intensively managed for timber and that forests on poor sites should be managed for the widest possible variety of purposes. It follows, of course, that conditions which are most suitable for intensive forestry are also those suitable for agricultural use, not, it is true, for the most intensive food production, but for multiple-purpose extensive agriculture. Similarly, agriculture must give way to a more intensive system—market gardening and horticulture—as conditions become even more favourable.

The impact of this argument on the professional forester is important, since the traditional forestry training has been developed for forest management in non-industrialized economies where different investment policies are relevant and where multiple use practises are of less significance. My experience suggests to me that many foresters are unwilling to accept the validity of multiple use management, preferring single purpose use—not because the latter is simpler, I think, but because all their training was directed to this end. This suggestion—iconoclastic as it may seem—is obviously less applicable to recent graduates, but these men have yet to reach the positions of responsibility where powers of decision lie. I would appeal to all foresters to retain a flexible attitude to the changing demands of society and to be prepared to adapt their thinking accordingly.

My third question was—do we do our job as well as we should? The answer to this question involves two separate issues: firstly, are our concepts and guiding principles the most appropriate for the fulfilment of our objectives and, secondly, are the ways in which we translate our concepts into practice the best we can choose? Put in another way, I am trying to separate forest science from forest technology, both essential and interwoven components of a forester's technical equipment.

Coming new to forestry, I have been struck by the extent to which forestry thinking has been dominated by the concept of sustained yield. Enlightened forest management has always rightly regarded forests as renewable resources; but the maintenance of production by wise use has been concentrated into obtaining the highest per acre yields that can be sustained in perpetuity. It is—or should be—possible so to manage any renewable resource system that a certain yield can be sustained over long periods (we cannot really think in terms of perpetuity: for one thing we do not know what may happen to the earth's climate in anything but the short term). Obviously such a management system has major advantages from a biological point of view, advantages which, when combined with the economic benefits such as continuous availability of products and the opportunity of meeting input costs from current earnings, should lead us to depart from it only with the greatest caution. Nevertheless it seems to me that the doctrine of sustained yield has obtained an unreasonable stranglehold on forestry thinking. For instance, I very much doubt whether a rigidly pursued policy of management for sustained yield really suits a developing country at the "take-off" stage in economic growth. I believe there are occasions when deliberate mining of timber resources may be of economic benefit, without excessive difficulties being placed in the establishment of more stable systems at a later date. Forest policy must, after all, be viewed in the light of the total economic circumstances of the community. Secondly, even under relatively stable economic circumstances, a system of rigid sustained yield management may be insufficiently flexible to take advantage of temporary shifts in the market price of timber. One particular instance of the application of sustained yield management—The Harvard Forest—has been analysed in detail by Gould for an operating period of 50 years. The most important conclusion of his analysis was that "the objectives of volume production, income flow and capital appreciation could not have been equally well satisfied by any single management programme, especially one controlled exclusively by biological growth rates". An alternative method—the data being examined in retrospect—would have been to increase cutting at times of high prices, which would not only have been of value to the forest enterprise, but also to the community since, presumably, high prices reflect increased demand. Taking advantage of peak prices by cutting half the in-

ventory and investing the funds obtained would have yielded a net gain of more than twice that from sustained yield management, even assuming that there were no losses from subsequent hurricane damage, although these did, in fact, arise. Cutting practically all the inventory at the time of peak prices would have brought a net gain 4 times as great as sustained yield management. In terms of capital invested, Gould showed that the returns from the Harvard Forest were less than those earned by endowment funds managed by the University. The decision to commit the original capital investment to a forestry venture could not therefore be justified retrospectively on economic grounds alone, unless it could be bolstered up by the provision of secondary forest products and such intangibles as national security or rural employment. I do not know how widespread is a poor return on investment in forestry, but if the experience of the Harvard Forest turns out to be typical, the sooner proper attention is paid to the economic value of secondary forest products and the sooner the "intangibles" are measured in terms acceptable to the economist, the sooner may foresters sleep soundly in their beds.

Obviously one of the difficulties of this approach to management lies in knowing when prices are at their peak—but forestry shares this difficulty with many, if not all, productive industries. Nevertheless it is clear that a sustained yield based on the biological increment must be interpreted in a very flexible and pragmatic manner if proper advantage is to be taken of changes in demand and price.

Turning now to the technological aspects of the way foresters carry out their responsibilities, it seems to me that in these matters there is little room for complaint. I may well be wrong, but I have the impression that we may be wasting the skills of some highly trained forestry graduates by employing them on tasks which men with a good technological training could better undertake, but this is tied up with the whole question of specialization among foresters. Particularly since increasing emphasis on multiple purpose use will lead to a demand for specialists in such fields as game or water management, there is likely to be a marked rationalization of forestry education over the next few decades. I shall return to this point later, but at this juncture merely wish to record that on technological matters—site preparation, choice of species, planting and silvicultural practises, for instance, the forester seems to me to be very well equipped.

The next question on my list was this: If foresters are not doing their job properly—why not? One important point cannot be overlooked; speaking primarily of the United Kingdom, I very much doubt whether the finance invested in forest research is in any way compatible with the importance of the industry in the national economy. Short term matters—disease control, for instance—may be adequately looked after, but the absence of a central Forest and Woodland Research Institute where the long term aspects of research

can be studied (and are not nearly all problems facing forestry of a long-term nature?) is a serious disadvantage, and one which will become more serious as time goes on and forestry is increasingly required to justify its efforts.

Returning to the question of forestry education and increasing specialization among foresters, I have never ceased to be surprised at how much is expected of a forester after he has left the University. He must be able to command a full range of silvicultural techniques for forest management, which involve a detailed and delicate understanding of primary biological production and the factors affecting it, as well as an extensive knowledge of the end product, its marketing and its utilization; the management of wild life—usually from the view point of pest control but increasingly as a resource; the safeguarding of water catchments; civil engineering as related to extraction routes and methods, bridge-building and flood control; the list could be continued indefinitely, but one important function—labour relations and public information—is always assumed and rarely taught. It is noteworthy that departments of wild life management, for instance in developing countries, have often grown up within the Forest Department, and the French department of "Eaux et Forêts" speaks for itself. I am not of course suggesting that all forestry graduates are called upon to serve in the entire range of these capacities, but that such adaptation has come to be expected of them. It is a great tribute to the value of forestry training that this should be so.

To some extent, it is only to be expected that foresters have been able to move into related topics, since the underlying principles of the management of all biological renewable resources must be the same. But if this is so, why should so wide a gulf have arisen between foresters on the one hand and agriculturalists on the other? No one with an acquaintance of both industries can deny that this gulf exists, and this assertion is supported by the small number of people who have tried to move between the two industries. But, as I know from personal experience, having attempted to make the crossing myself, the difference between the two goes very deep, despite their obvious biological similarity. Each has evolved a completely different attitude to the resources on which it depends, and, in the long run, attitudes of mind are more important in such differentiation than technical considerations. Typically agriculture is concerned almost exclusively with the early stages of plant succession and aims at maximizing the high rates of productivity which are associated with the low biomass of pioneer vegetation. Consequently the short-term aspects of production are emphasized and the accumulation of biomass ignored—so much so that agricultural systems are frequently contrasted with ecological ones, as if agriculture were not indeed just one such system, albeit an extremely unsophisticated one. In contrast, forest ecosystems, and others which involve secondary production

systems, aim at the accumulation of biomass, the excess of gross production over respiration and other losses being fed back into the productive system. This difference, simple as it may be, is, I am sure, at the root of the matter. It would be equally valid to say that foresters have a different sense of time to many other people—this is self-evident, given the length of a forest rotation—but I think it is too facile an explanation of the forester's approach to his resource, although it certainly leads the forester to an extraordinarily responsible attitude, which above all must be retained whatever else happens in the forestry education of the future. Essentially, agriculture seeks a high rate of interest from a low biological capital; forestry, a low rate of interest from a high biological capital.

It is precisely the foresters' attitude to resource management—conservation in its best possible sense—that makes them so adaptable and useful. None the less, I am convinced that the time has come when the traditional jack-of-all-trades training of foresters should be examined, and examined most critically. This is what we have attempted in Edinburgh. Increasing emphasis on multiple use and public pressure for access for recreation demands the training of specialist resource managers—wild life, hydrology, forest parks all make special claims on a man's technical and conceptual equipment—and I look forward to the time when the great state forest services employ a range of resource managers, each with the specialist training appropriate to the job he does. No one would suggest excessive specialization, and each man must know a great deal about the other's task if a harmonious programme of management is to be achieved. One of the most heartening signs of the last few years has been the quiet acceptance of these and similar views, and the emergence of distinctive teaching objectives amongst the forestry schools.

It is probably true that the public image of the forester is better in Western Europe than in some parts of the world. The President of the Canadian Institute of Forestry has recently written—"I am conscious of the warning that unless we stir ourselves, forests may turn out to be too important to be entrusted to foresters". The picture of the ugly wastes that past management practises has left in the public's mind will not be easy to eradicate". I cannot believe that the public image of the forester in this country is in disrepute. The forester is variously blamed for large regular plantings of coniferous species; for taking over agricultural land and for restricting public access—but in the mind of most people I suspect that he is regarded affectionately as a happy open-air type with green corduroys and a Tyrollean hat. But the day of reckoning cannot be long delayed, and the forester will have to account for his stewardship along with everybody else.

Use of Rippers as alternative to Clark Plough.

By P. VERLING

Background :

IT has long been accepted that ploughing as a preparation for planting is a necessity. There has been little or no problem with the ploughing of peats and normal marginal land but the dry podsols which are so prevalent in the O.R.S. areas in the south have been causing some anxiety as to the best method of treatment. In 1959 the Hard Pan plough or Clarke plough was introduced and this has been the common method of preparation of the dry peat areas. At that time a double mould board type was used. This consisted of the usual long tyne 15" to 21" to which were attached two wings. These wings removed only a very light skin which was not suitable for planting on. The single mould board turns a sod somewhat similar to the Cuthbertson, this sod has been planted on, although from my more recent observations, I am of the opinion that planting on the side and more in the furrow is giving better results. The use of the rippers was prompted by observations made when shale was being ripped for road making and from information obtained from the 1st planting in 1959 on ground treated by the double board Clarke plough. Planting of P.C. 2+1 was done into the fracture, the spacing was 5'×10'. The trees have maintained a very even growth and are now up to 9½ ft. The vegetation has of course improved but never to the extent as to be in competition with the P.C.

Object :

By using the rippers to determine the extent of fracture in O.R.S. and to observe the conditions for planting. The rippers used were 26 ins. long mounted on a D7 crawler. Ploughing of the area was prohibited because of the danger of run off into the adjoining reservoir. No drainage was required the area being dry to very dry with pan conditions varying from 12" to 18" over the whole area.

Method of treatment :

The area carried a heavy cover of *Calluna* and *Ulex Gallii* 14" to 20" high. This had to be removed and it was decided to do this by two methods, (1) by burning; (2) by rotary slasher. It was found that the material left after the rotary slasher interfered with and slowed down the subsequent ripping because of the gathering or rolling of the material under the cross bar of the ripper. The cutting or burning of the material did, however, help the operation

of the machine because hazards were readily seen and could therefore be avoided. Burning of the material seemed to be the best method of pre-ripping preparation. Ripping through the uncut material proved to be almost impossible as it was inclined to tear along with the rippers and form into large packs. Burning therefore before ripping is recommended.

Operation :

The operation of ripping was carried out up and down hill. The gradient varied from flat to 1.6 to 1.8 but no difficulty with regard to operating the machine was experienced and up and down hill was decided on as there was a question of water conservation for the adjoining reservoir. The rippers were set at 3 ft. spacing and gave an operational depth of 26 ins. Complete fracture of the soil was obtained and this was proved subsequently by opening a large soil pit and observing the soil condition. The soil between the fractures was easily dug with a spade. Stones were not a hazard as they were either pulled out of the ground or spun around in the soil so assisting in further fracture.

Cost :

During the course of the ripping programme a cost comparison trial was undertaken i.e. to compare the cost of ripping against the cost of Clarke ploughing on a similar site type. To get a cost an area of 20 acres was chosen, which had previously been burned over. The machine worked up and down the hill. The time taken to rip the area was 13 machine hours @ £3 per hour i.e. £1 19s. 0d. per acre. A similar site ploughed by Clarke plough would cost £10 per acre (taken from Work Study records).

Conclusion :

In conclusion it may be appreciated that on such a dry site, ploughing by normal Clarke plough would add considerable unnecessary drainage to already dry conditions. This does not happen with ripping. There is no excessive drainage and no drying out of upturned soil with this method. It is possible as a result of ripping to dig between the fractures with a spade, this would indicate that thorough and complete breakage of pan and aeration of soil has taken place allowing free movement of moisture and roots through the fractured medium without exposing the soil to the elements as would be case with Clarke ploughing.

Extracts from

“A Preliminary Report on the Re-afforestation etc. of Ireland by W. Howitz, Forest Conservator.”

By M. McNAMARA

Daniel Christian Bonaventura Howitz, the son of a land agent, was born in Denmark on the 2nd May, 1841. He graduated in forestry in 1865. Three years later he emigrated to Australia and there entered the Government service. He held posts described as Forest Conservator and Superintendent of the Forests. He was also Danish Vice-Consul in Melbourne. He left Australia in 1881 and went to Algeria where for a year he was engaged in Forestry work for the French Government. From 1883 to 1887 he lived in Great Britain where he did advisory work. He returned to Denmark in 1887 and there until 1893 he was engaged in anthropological studies. He died in New York in 1893.

In 1883 Dr. Howitz paid two visits to Ireland to study the forestry potential of the country for the Gladstone Government. His first visit was of two months duration, and on his second visit he stayed for one month. His conclusions might be summarised as follows:—

1. That approximately 5,000,000 acres of Ireland was more suitable for forestry than for any other land use.
2. That 3,000,000 acres should be planted in the counties facing the Atlantic where a high percentage of the land was too poor for agricultural purposes and where the remaining farm land would benefit from the shelter provided by the forest. There also manpower was available and in urgent need of employment.
3. That a further 1,000,000 acres should be planted in the catchment basins of the country's main rivers to control run off and prevent periodic flooding of the fertile river valleys.
4. That the annual planting target should be 100,000 acres.

Howitz presented his recommendations to the Government in a report entitled “A Preliminary report on the Re-afforestation etc. of Ireland.” Subsequently on the 15th June, 1885 and again on the 14th August of the same year he appeared before the Select Committee on Industries (Ireland) under the chairmanship of Sir Eardley Wilmot and elaborated on his report. The members of the committee discussed details of tree species and suitability of various types of land for forestry, but questions on the technical and administrative problems involved were lacking. So too were references to the capital require-

ments of the scheme and the re-settlement of tenants whose lands were to be afforested. It may well be that in this period of rapid industrial expansion and Imperial wealth the problem did not appear as staggering as it would to-day.

The following quotations should prove interesting and controversial to the foresters of to-day.

"Of the 20 million acres of Ireland about $\frac{1}{4}$ is well suited for forest cultivation. All the ranges and bogs, all the barren and desolate coastlands, and a great many of the very poor grasslands are natural forest and should be made such. Many hundreds of thousands of acres do not pay an interest of 6 pence a year, and the greatest part of the 5 million of acres are waste ground and pay not a penny. There is much grassland and many fenced paddocks on the range where the heather and bracken is in such force and where rocks and stones etc. cover the ground to such an extent that the actual gain per acre is not more than 1/- to 2/-. Would it not be better to cultivate these vast areas, so eminently suited for forests, and to obtain a yearly return of at least one pound per acre instead? The calculation is easily made, and without entering upon details, which would be out of place here.

Cultivation, including cost of nurseries, purchase of seeds, purchase of ground, purchase of tools and buildings, fencing labour and superintendence, should for say 100,000 acres, be about £4 per acre or £400,000.

This first cost calculated with 4% interest for 30 years, £17 per acre. Add to this expense for superintendence, road making and repairing, maintenance of fences and drains as well as all incidental expenses made up as follows

First cost after 30 years	£1,700,000
1 Superintendent @ £500 a year; 50 forest rangers				
@ £50 to £75 a year; Repairs to buildings, tools etc.				£125,000
Road making and repairing fences, drains and incidental expenses	£35,000
				<hr/>
				£1,860,000

and to put expenses with a round sum to 2 million pounds the cost per acre will be at 30 years of age £20, this allowing for the highest wages, and I firmly believe that the expenses will be 25% less.

A pine forest at that age, under present conditions of soil and climate and at the ruling market prices, which are bound to rise considerably in 30 years, be worth at least £50 per acre all round. I have here not allowed for the small wood obtained by thinning cut the growing forest, nor for any by-products obtained during the 30 years, and still the return should be worth £1 per acre per annum.

Some of the Scotch foresters agree with me that £1 per acre is not too high; nor when we consider that in Ireland can be grown far more valuable timber trees than in Scotland or England, and that opportunities for transport are so many and so easy there, I arrive at the conclusion that the result may be more than doubled.

There is no great difficulty in cultivation in any part of Ireland as far as I have been able to see, not even in the storm blown ranges of the West coast. The winds will there undoubtedly, keep the forest down for a long while, and the outer belt will be of no great value for utilization, but by and by the forest will gain the mastery, and if the protection of the outer belt is kept permanent and intact, inside this the now barren hills will in less than half a century have become fertile rich meadows, and highly productive cereal fields. The question of the re-forestation of Ireland must therefore, to every experienced man appear a question of life and death to the country, and with the facilities as yet in existence, but which, by exposure to the climatic and other influences, may change and disappear, with the consideration that by clothing the hills and ranges the disasters from floods and droughts may be avoided and last but by not least, the consideration that "it will pay", I consider it of the very greatest importance to commence the work as soon as possible. Every year wasted is a great loss, for with every year the soil loses some of its present suitability and with every year the complications and difficulties for extended cultivation grow apace, time is lost and money. By re-forestation of Ireland, at present fast depreciating in value and fertility with every year, the whole country will be made fertile, prosperous and in consequence therefore peaceful.

A rough estimate gives about 3,000,000 acres as the area which should be cultivated fast and mainly distributed in the North, West, and South-West in a three fourths circle of the form of a C while the great river basins of the Shannon, Lough Neagh, Blackwater, Barrow and numbers of less significant basins, would require perhaps another million or more for purposes to regulate the flow of water. As the treatment of these basins should be very similar, I have taken only one in hand viz. the Lough Neagh basin, the second in importance and size, and having of late years attracted so much attention by skilled engineering works executed there to prevent the destruction by sudden flooding of the low lands, works which I feel convinced of will never be able to prevent disaster or fully deal with the flood waters. No engineering works will ever be able to do it. The real cause, the denudation of the slopes and ranges of the whole catchment basin must be removed before any real good can be done, as experience shows at the Rhone in France, and other rivers where expensive engineering works have utterly failed in stemming the mountain torrents, or preventing them from flooding the valleys and low lands to the destruction of these. There the cultivation of the great slopes and catchments, basins, ranges and high

mountains, is being carried out, a forest work is very difficult, costly, and executed under very harrassing circumstances of extremes of heat and cold, sudden rains and long droughts, and great want of earth to plant in. These places have been so long denuded of trees and shrubs that the rain has washed every vestige of fertile earth away leaving only a small quantity in crevices, and on the narrow ledges, an experience which should be avoided in Ireland, but which is sure to take place in time if the work of cultivation does not take place before very long.

The difficulties in these countries, both the physical and climatic, are so enormous in comparison to those to be met with in Ireland, where the island clime the proximity of the great ocean current the Gulf stream and the abundance of mould or humus to plant in, as well as the geological formation are all so favourable to forests, that it would be unwise to delay the works till some of these advantageous features shall have disappeared.

Considering the large area to be cultivated and all the various social and political problems out of my province to deal with, I would therefore recommend that only the Lough Neagh catchment should be cultivated first with about 100,000 acres, the whole of which should be treated as one district and subjected to one plan, and under the direction of a head forester—a trained theoretical and practical professional forester—who should have the sole charge of the cultivation.

But, at the same time, as the work of covering the denuded hills of this basin, as well as the great part of the Mourne Mountains, with forest, plans for the cultivation of the Shannon and other basins should be prepared and also a number of trial plantations, be commenced in the more difficult highland and coast areas of Donegal, Leitrim, Sligo, Mayo, Galway, Clare and Kerry. These trial or experimental plantations should be formed by making a number of small and cheap nurseries easy of approach but as close to the future plantations as possible, and representing in soil and position, as much as it can be done practically, the whole of the cultivation. For the great bulk of the cultivation flying nurseries will have to be made. Thereby the long and costly transport of plants is avoided, these are not exposed so long with their base roots, to the influence of the sun and the air, and the cultivator can choose his own time for planting, a circumstance of great importance here, where the climate changes so rapidly from cool to warm, and sudden rains may aid or prevent the work, lastly the plants are reared in the same soil and under the same conditions as those which they are to occupy in future. Large and in consequence, costly nurseries must be avoided in all great cultivations and where as in Ireland it will be so cheap and comparatively easy to fence in small plots on the hillside in the centre of the future plantations, it would be a great mistake to act otherwise.

While commencing at the North of Ireland I would therefore recommend that such experimental nurseries or plantations should be erected near the following localities namely:

Garvagh	}	in the County of Londonderry
Buncrana	}	Donegal
Barracktown		
Glenties		
Kiltyclogher	}	Leitrim
Collaneg	}	Sligo
Leaville		
Bangor	}	Mayo
Newport		
on Croagh Patrick		
on the Slieve Partry Mountains		
Clifden	}	Galway
Cahir		
on the Slieve Broughton Mountains		
Boston	}	Clare
Fairy Hill		
Kilrush		
Ardagh	}	Kerry
on the Stack Mountains		
Dingle		
on the Inveragh Mountains		
on the Slieve Miskish Mountains	}	Cork
Kilmeen		
Cahirflaggan		
on Knockmealdown Mountains		

If 3,000,000 acres should be cultivated, about 100,000 acres a year should be planted requiring between 3 and 4 hundred millions of plants yearly, and about one third could be reared in these nurseries, the rest being raised in flying nurseries. The more valuable timber trees of Western North America should be experimented with here, and there might also be reared a number of ornamental trees for distribution in the country to schools, public institutions as well as to the population.

If it should now be decided to cultivate the whole available forest land of Ireland, and to commence at once, these nurseries, together with the flying nurseries furnish 3 or 4 hundred millions of plants

yearly, and about 100,000 acres being cultivated yearly, it would be 30 years before the whole of the 3 millions of acres were cultivated; but before that time much valuable experience would have been gained, and the value of the work an established fact, while the country had got confidence in the question, and the first planted forests commenced to yield a steady increasing supply for local wants as well as for the requirements of the great markets of England.

The first thing to be done should, therefore, after my humble opinion, should be to nominate a committee of forestry, with a professional experienced forester as secretary, to examine into the requirements of each special locality, while fixing the place for each nursery and the area to be cultivated. The forest laws should then be framed for the protection of the forest, and with the experience from France and Switzerland, these would not be a great matter of difficulty to men who understood the Irish people. There should then be a central forest department in Dublin, under the guidance of some professional forester, and the work on the Leough Neagh be proceeded with as quickly as possible, firstly to prevent the floods there; secondly to gain experience, and thirdly, to gain confidence in the efficiency of the work, without which the rest of the cultivation would be difficult. The 20th Clause of the Tramways Act, 1883, provides that: The planting of trees should be included amongst the purposes for which money may be advanced by the Board of Works. This I consider a great advantage and one which may be useful here. It enables private people to cultivate forests on their less valuable land, but at the same time I consider it necessary that, the people who wish to do so, act in unison, and follow a proper plan under the guidance of efficient leadership, and this cannot be done otherwise than by placing such work under the supervision of properly trained foresters and a central forest department."

Dealing with the question of an outlet for surplus timber Howitz wrote "As England now is the greatest consumer of timber and wood in Europe it is evident that the proximity of the greatest market must raise the value of the product in the forest of Ireland. According to the Swedish "Tideskrift for Skogshushalning 1881 Upsala" the consumption of wood for the years 1872-1878 gave the mean importation as follows:

England	imported yearly	290,000,000 c. ft.
France	" "	70,000,000 c. ft.
Germany	" "	40,000,000 c. ft.
U.S. of America	" "	25,000,000 c. ft.
Holland	" "	20,000,000 c. ft.
Belgium	" "	18,000,000 c. ft.
Denmark	" "	14,000,000 c. ft.
Spain	" "	12,000,000 c. ft.
Australia	" "	5,000,000 c. ft.

The importation to England consists of 36% of timber for buildings and of larger dimensions, 55% of split and sawn timber, 5% of coopers' wood and 4% of exotic timber for furniture and articles of luxury.

The greatly increased demand for telegraph poles, sleepers, pit props etc. mainly supplied by the pine forest for the growing of which Ireland in particular seems extraordinarily well suited points directly to which kind of trees to choose. While therefore the great bulk of the forests of Ireland should be grown with pines and other conifers, in the sheltered lowlands, along the watercourses and near the sea, a great number of valuable deciduous trees might be grown as well as on the firelines which must divide the forest and prevent any large conflagration although, in such a humid climate as that of Ireland, this danger is less imminent than in the more southern and warmer climates.

Application of Forestry to the remedy of the Torrents and Floods
of the Catchment Basin of Lough Neagh

IN visiting the locality, I noticed first that a great deal of the land and the surrounding hills had of late years been formed into grasslands. The heather, brake and shrubs, which before covered these slopes, and these formed nearly the only vegetation, and by their roots and lower branchlets, kept the water from rushing to the lower grounds, during violent rains, had been removed, and drains had been cut as vertically as possible, following the direction of the fall as much as possible, thereby still more adding to facilitate the swift course of the rainwater. The cutting of drains in this way is a great mistake. The water is permitted to rush off too quickly, thereby not only drying the ground too quickly but also taking with it every vestige of fine good soil, and thus impoverishing the lands more and more. I spoke to several farmers on the subject, and succeeded in making many converts to my opinion on the desirability of a different system of drainage on such sloping ground.

The basin of which I attach a plan, showing the different planting districts—the catchment basins of which the whole basin is formed, is situated in different formations of granite, lower silurian limestone, carboniferous and igneous rock and basalt. The treatment will, therefore, vary slightly, both on the account of the formation, as well as on account of the altitude and easterly and westerly fall, but the whole should be treated as one district, and be under the sole guidance of one forester.

“———obtained from Mr. W. J. O'Neill, a gentleman engaged by B.O.W. in connection with Lough Neagh for upwards of 24 years the following information.

The Summer level of Lough Neagh is at Toome Pier, about 46 ft. above the ordinary Spring tide of Coleraine. This gives the very small fall of 9" per mile for the outlet of water accumulated in the Lough, and in the case of heavy rains, as it has been proved by such experience, quite insufficient. The supply of water to the lake is derived from the following catchment basins:—

The Black Water River basin with an area of	618½	sq. miles
Main River	313¾	"
Upper Bann River	208	"
Ballinderry River	161¼	"
Mozala River	140½	"
Six Mile River	92	"
Crumlin River	67¾	"
Portmore Lough	40¼	"
Stewart Town River	30¼	"
Closet River	28½	"
Ballygronan River	11	"
<hr/>		
Total	1711¾	"
Loure Bann & Lough Bay	340½	"
Area of Lough Neagh itself	153½	"
Total of Lough Neagh Catchment is therefore	2205¾	"

Of the area of the basin discharging water to the Lough Neagh, is about 1712 sq. miles. I consider 400 sq. miles fit for forest cultivation or about 256,000 acres.

The rain fall averages annually about 36", but it has been as much as 21 inches in 4 months and on some occasions it has been as much as 1" in 24 hours. It is, therefore easily seen that an enormous amount of water must be discharged through the lower Bann to prevent the flooding of the lowlands. The Toome Pier discharges about 400,000 c. ft. per minute when the Lough is 3 ft. above Summer level, and one occasion, when the flood waters reached 6' above this level the Lr. Bann shall have discharged nearly 700,000 c. ft. per minute, but then a great part of the flats must have been submerged already. The annual rainfall being 36" the annual rainfall per acre would be 130,680 c. ft. or for the 256,000 acres proposed to be cultivated 33,454,080,000 c. ft.

Let me presume that the Lr. Bann discharges during heavy rain 700,000 c. ft. per minute or 1,000,000,000 in 24 hours. If now, as has been the case before, there falls 1" of rain in 24 hrs. and it is calculated that at present at least seven-tenths of this reaches the lake in 24 hrs. the lake will receive in about 2,880,777,000 c. ft. as the weir will only be able to discharge third of the water. But this must be viewed in another light. The main rush of water will occur from the ranges, slopes and barren hills forming the 256,000 acres calculated for forestry culture. The rain falling on these will be heavier than

on the lowlands, and about nine-tenths of it will be discharged within 24 hrs.

With 1" of rain falling, the volume of water from these 256,000 acres will be close upon $\frac{1}{3}$ of the whole amount discharged viz. 929,280,000 c. ft. but—more likely—50% more for when heavy rain takes place, it always rains heaviest in the ranges and when these have been denuded of all vegetation and cuttings of drains the rush of water will be even heavier. That I have some foundation for this statement you will grant when I draw your notice to the following fact:— While the catchment basin of the Blackwater River contains about 618 sq. miles and the upper Bann is only 208 sq. miles, the latter discharges (during heavy rain) as much and more than the first named river and floods the lower parts much quicker. That the course of flood waters is much more violent in the Bann is also easily seen by the torn and waterworn banks of this river. The Slopes of the Upper Bann basin are much steeper and more barren than the sides of the Blackwater basin and therefore offer no resistance to the water rushing down to the lowlands. Having examined the various basins separately I consider the area cultivated should be distributed in the following proportions according to the character of their sides as well as with a view to the amount which seems suitable and obtainable, the last—being only a guess—as I had no opportunity of making enquiries about ownerships, tenants rights and all those questions which make the cultivation of these localities so intricate and difficult, but which are outside the object of this report although they are bound to influence the practical execution to a very great extent.

The proportion to be cultivated in the various basins should be:—

Blackwater basin containing	618 $\frac{1}{2}$ sq. mls.	80 sq. mls.
Main River	318 $\frac{3}{4}$ "	60 "
Upper Bann River	208 "	130 "
Ballingderry River	161 $\frac{1}{4}$ "	40 "
Mozala River	140 $\frac{1}{2}$ "	30 "
Six Mile River	92 "	20 "
Crumlin River	67 $\frac{3}{4}$ "	10 "
Portmore Lough	40 $\frac{1}{4}$ "	10 "
Stewart Town River	30 $\frac{1}{4}$ "	10 "
Closet River	28 $\frac{1}{2}$ "	5 "
Ballygronan River	11 "	5 "

Total 400 sq. mls.

Acknowledgement of assistance from the following is made with grateful thanks.

P. Chr. Nielsen. The Royal Veterinary & Agricultural College Arboretum, Horsholm Denmark.

Johnston Edwards Esq. M.B.E. President of the Royal Forestry Society.

Dr. Eileen McCracken, Portballintra, Co. Antrim.

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A Note on *Formica Rufa* (wood ant)

by L. P. O'Flanagan.

THE purpose of this note is to record the transfer of part of a *Formica Rufa* colony from Bansha Forest and its establishment in Lacken Wood, Enniskerry State Forest. (Nat. Grid. ref. O-19.15). Since it may be considered worthwhile to say something about the life and habits of this interesting woodland ant, I have compiled the following, mainly from Donisthorpe's "British Ants" (1).

FORMICA RUFA is found in North and Central Europe but is confined to the mountains in South Europe. It ranges eastwards to the Caucasus and is found in Siberia. Widely distributed in England it is of local occurrence in Ireland. O'Rourke (2) (1950) records its distribution as Kerry, Tipperary, South Galway, Waterford, Wexford, Armagh and Wicklow. He states that the Wicklow colony is now extinct and that Johnson (1896) suggested that the Armagh Colony may not be native but could have been introduced about 1840 during planting operations. The latest Wexford report was 1896. In the same paper O'Rourke refers to the "gradual extinction of this native species" as being rather peculiar and suggests that it is due to the cutting of woods. Purcell (3) (1967) reports *F. rufa* as being very well established in Bansha Forest. Our forests are now expanding so the future of *F. rufa* may not be quite so bleak.

Donisthorpe states that this ant is a "hardy, fierce and courageous species, being very strong and able to lift very heavy weights in proportion to its size, and living chiefly an open air life In warfare they attack in serried masses, not exhibiting the strategy of *F. sanguinea*, nor sending out small troops to execute flank movements. They do not persistently pursue a flying foe, but endeavour to kill as many enemies as possible at once, and do not hesitate to sacrifice themselves for the common good in defence of their nests".

They are indefatigable workers and will continue from sunrise to after sunset. Donisthorpe has noticed them at midnight and I have seen a captive nest active at 2 a.m. though the majority seemed to squat on the surface. They will play with one another and indulge in mock fights and are very partial to basking in the sun. Individually they often appear quite stupid, one ant hindering the activity of another but despite such setbacks the individual ant usually achieves its particular aim.

F. rufa avoids the neighbourhood of human habitations and normally nests in woods and other shady places. They seem to have a preference for pine but have been recorded under most conifers and in oak woods. A single large community will have a number of nests in the one area and individual nests can be two to three feet high. The nests are built of pine needles, twigs, leaves, dried grass, pebbles and any other debris found on the forest floor.

These ants secrete a large amount of formic acid (HCOOH) and eject it into the air in defence of the nest when alarmed or enraged. The workers stand up on the tips of their feet, with the gaster bent between their legs and the acid is ejected to a considerable distance, 6" - 12", from the anal aperture. They also use this acid to partially paralyze their prey as they will spray the acid into a wound made by their mandibles.

Briscoe (4) of the Imperial College of Science, London concludes that each ant on an average contains about .002 gr. (2 milligrams) of Formic acid.

F. rufa is an omnivorous feeder and lives mainly on insects, carrion, honey, excreta of aphids, caterpillars, etc., The workers bring both living and dead insects back to the nests and since they climb every tree and bush in their neighbourhood, in search of prey, they are a most useful forest insect. A nest can contain between fifty and a hundred thousand ants and since each ant may kill one insect per day the daily kill in a *rufa* territory is extremely large.

These ants propagate readily, the winged male and female appear between April and August—the fertilized females being looked after by the workers in the nest.

Portion of a *rufa* nest was taken from Bansha Forest on 13th April 1967 and transferred to Dublin where the ants were kept in a display case and exhibited at the R.D.S. Spring Show. During this period they built a nest in their cage and seemed to be unaffected by the artificial conditions, massing under an electric light in the same manner as they would in natural conditions under strong sunlight. They were fed on honey and watered regularly. This nest was taken to Lacken Wood on the 8th May and the case of ants emptied under pole stage Scots pine on a southerly slope. This area was next visited on the 13th June and the ants had established themselves where they had been originally placed, but appeared to be moving their nest. By the 27th June this nest had been abandoned and after searching the area the ants were found eighty yards down the slope in a Douglas Fir stand beside a forest road. Here they appeared to be establishing themselves in both a rotten tree stump and beside the butt of a Douglas Fir a yard away. Both nests were small but quite active and facing south.

When in this wood on the 18th August I found both these nests abandoned and the colony had moved a further sixty yards along the forest road to an open site beside a turning point. They were still under Douglas Fir and had built a nest about a foot high and of the same diameter. They were quite active and, assuming they have finished their wanderings, it is possible that they may establish a viable colony in this wood. I would suggest that the main reason for both their migrations was the light factor. They appear to be quite attracted to sunlight (within woodland environs) and the last nest situation on the roundabout is open to both east and south allowing them longest possible hours of sunshine.

Biological control of forest insect pests may well be worth consideration especially when one considers the rapid increase of the forest estate in the country during the past decade. *F. rufa* has many merits in the forest and it is possible that research into its role of a predator could provide some useful information. Being quite an adaptable insect it should not be difficult to establish it on a broad scale in many of our forests and, given some further research on the subject, this exercise could well be worthwhile.

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Society Activities

Minutes of 25th Annual General Meeting

held 18th March 67 in Shelbourne Hotel.

The outgoing President Mr. C. S. Kilpatrick opening the proceedings welcome those present. The minutes of the 24th A.G.M. were taken as read this being approved and seconded by Messrs. Kerr and Parkin. Arising from the Councils Report for 1966 which was also taken as read, was the suggestion that an honorarium be given to Mr. H. M. FitzPatrick in recognition of his efforts in successfully editing the Society's book "The Forests of Ireland". It was agreed that the Council decide as to the form the honorarium should take. The suggestion that he be elected an honorary member was ruled out as this would bar him from taking any further active part in Society affairs and it was felt that his experience and boundless energy was too valuable to loose. On the question of the book 400 copies still remained unsold. Were it not for the two donations the book would be in the red to the tune of £150. The monies from future sales was to be kept separate and be used for further publications. The President again apologised for the late appearance of the Autumn edition of the 1966 journal but he hoped it would appear shortly. The adoption of the Councils report was proposed and seconded by Messrs. McEvoy and Galvin.

The Treasurer presenting the Abstract of Accounts stated that the figure of £273 for advertisements was misleading. It consisted of returns for 1966 plus other arrears. From recent experience it would appear that we would have to subsidise the journal. The high figure for stationery and printing can in part be accounted against the book for which many extra circulars were issued. A suggestion that in future cost per journal by income and expenditure be shown on the balance sheet was agreed to. The Business Editor pointed out that on taking office he was not aware of outstanding debts. He requested that this information be made available to future holders of the post. It was agreed that the incoming Council should tighten up on the journal finances balancing expenditure against income. Messrs. Hanan and Galvin proposed and seconded the adoption of the abstract of accounts.

The President called on the successful candidates of the Society's examination for the Foresters certificate to come forward and sign the roll book. Each candidate was then presented with his certificate. The successful candidates were Messrs. J. Duane, S. O'Donnell, J. Desmond and G. Hipwell. Mr. J. Neilan being unable to attend, his certificate will be presented at a later date.

In his valedictory address the President dealt mainly with findings of the Sixth World Forestry Congress.

Before handing over to the incoming President, Mr. Kilpatrick read the results of the 1967 Council elections.

President : Prof. T. Clear, Clondalkin, Co. Dublin.

Vice-President : A. M. S. Hanan, Bray, Co. Wicklow.

Secretary : J. O'Driscoll, Goatstown, Dublin.

Treasurer : T. Moloney, Templeogue, Dublin.

Editor : M. Swan, Churchtown, Dublin.

Bus-Editor : J. D. Robinson, Rathfarnham, Dublin.

Hon. Auditor : D. M. Craig, Dublin.

Councillors Grade I : D. McGuire, Bray, Co. Wicklow.

D. O'Sullivan, Glenealy, Co. Wicklow.

Grade II : J. D'Arcy, Killygordon, Co. Donegal.

Associate : S. Galvin, Wexford.

Prof. T. Clear then took the chair and thanked the outgoing President for the excellent way he had tackled the many difficult problems during his tenure of office. He had seen the book finally launched and had stimulated a resurgence in membership. He then asked for a proposer and seconder to confirm the election results, Messrs. Parkin and McDowell obliged.

The motion on regionalisation and the resultant required changes in the constitution were next on the agenda. It was stated that the wording of the motion in the notice of the meeting was misleading. Formation of regional groups as such had been agreed by the 24th A.G.M. What was now before the meeting was a draft of a new constitution which would permit the implementation of the regional groups. Following a long discussion on the merits of the whole regionalisation proposals it was pointed out that this had already been decided and what was now required was to debate the necessary changes. It was agreed that each item of the proposed changes be debated in turn. All changes in page 1 were agreed to, being proposed and seconded by Messrs. Condon and McDowell.

Page 2 :

Proposed change to 4c should become 4f and 4f become 4g. Wording of 4f to be holding examinations and awarding appropriate certificates. Proposed K. Parkin, Seconder D. McGuire—accepted.

Page 2 :

Article V dealing with membership grades. Messrs. Barry and McDowell proposed that there be only one grade of technical member not two as in the proposed change. Present system is purely a monetary one there being no suggestion of class distinction. It was decided to vote on Mr. Barry's amendment, 20 members were for it and 12 against. As proper notice of motion had not been received it was decided that Mr. Barry's amendment be referred back in a specially worded motion to a special A.G.M. Following which article V could be fully redrafted.

Student membership was accepted unanimously.

Page 3 :

Article VIII dealing with annual subscriptions be ammended to include the words "to be fixed from time to time by the Council—unanimously."

The remaining changes to article VIII and those to article X were agreed to unanimously.

Page 4 :

Article XI line 5 it was agreed that it should now read "such regions as may be approved by the Society". Further articles will be required to cover the setting up of regions.

Other Changes on pages 4, 7, 8 and 10 were agreed to unanimously.

Page 10 :

Rule 13 was further amended to read "The Council shall appoint a registrar of examinations each year."

It was agreed to delete the proposed change in rule 13 dealing with the appointment of the convenor.

Annual General Meeting 18th March, 1967.

President's Address

1. The great event during the year in the forestry world was, of course, the Sixth World Forestry Congress.

No less than 2,000 members and 700 associate members from 93 countries assembled during the month of June in Madrid.

Our society was well represented by our Vice-President, Mr. Mooney, Professor Clear our current President and Messrs. Galvin, McEvoy and Parkin.

The central theme, not unlike the subject of Professor Black's paper to-night was the role of forestry in the changing world economy.

The concern of the Congress members was focused on meeting the growing demand for wood raw material, on the amount of wood available and its utilisation but there seemed to be a shift of emphasis from resource conservation to resource planning and management.

In the plenary sessions the Congress affirmed that there is not now, and need not be in future any overall world shortage of wood.

Previous congresses and the continuous work of the F.A.O. have borne fruit, governments have been alerted and if current programmes and trends are continued the long expected world timber famine need never happen.

The Congress considered that more attention now needs to be given to an investigation of the economic base of expenditure in forest

work and of the ways and means of reducing this expenditure. Above all cost/benefit analyses or other methods of evaluating benefits must be the base of sound forest management.

An important factor in developed countries is that manpower is becoming in short supply and the management plan must, therefore, provide for increasing human productivity.

This factor will in time also affect developing countries.

In his closing speech the President of the Congress, Don Francisco Ortuno Medina, the Director General of the Spanish Forest Service, stated that "Above all we must produce cheaper timber and make the forestry enterprise economically viable."

He stressed that "A necessary condition for the achievement of this aim is a more thorough study of the relationship between costs and profits in the forestry enterprise. It offers the only means whereby we shall be able to speak to financiers and economists in their own language." He reiterated "We are now convinced that our task is not so much one of preserving renewable sources but rather of developing them and improving their management."

"Foresters must, therefore, pass beyond their traditional frontiers and take a more active part in drawing up national development plans."

"Implicit in this objective is the granting to foresters of a sufficiently high position within the administrative hierarchy and recognition of the great contribution that may be expected by reason of their experience in long-term management of extensive areas and essential resources."

"In order that foresters may successfully perform these tasks it is necessary for them to transcend the limits of classical forestry science to strengthen the teaching of economic and planning methodology without losing sight of the traditional wellsprings of our forestry training and background."

He concluded "We must persevere in our efforts to identify and quantify the benefits offered by the forestry sector in terms of soil protection, water management, preservation of fauna and recreation. Only thus shall we be able to mould public opinion and convince governments that money must be spent to keep up and enhance these functions of the forestry sector and arrive at an equitable decision as to who pays the bill."

It is strange that these words spoken to a world audience should be so apt and have so many lessons for Irish Forestry.

2. Coming closer to home this switch of emphasis is already very noticeable in Great Britain where future large scale expansion of the forestry programme will be largely confined to areas where it can produce an economic return of about 7%, or to areas where it can contribute to the solving of social problems. These areas seem to be defined as Scotland, Wales and the Northern 4 counties of England.

As a result in the last annual report of the Forestry Commission the total area of forest land acquired during the year in England was a minus quantity. The total area being reduced by 11 acres.

In Scotland, however, the planting programme is to be increased from 30,000 acres to 36,000 acres per annum leaving only 9,000 acres per annum for England and Wales as the overall programme of 45,000 per annum is not to be increased.

3. Last year in my mid-term address I talked of how acquisitions in Northern Ireland were beginning to slow down and how this position might become worse.

This was reflected in a reduction of the planting programme to 22,000 acres in the Republic and to 4,600 in the North.

However, in the North the era of the freeze and the period of severe restraint and the rise in unemployment which followed have altered the scene at least for the time being.

Offers of land have increased to the point of embarrassment and for the first time, since 1958 unemployment relief schemes have been started.

One of the advantages of working plans has been amply illustrated as most plans contained programmes of work to be undertaken by possible future relief schemes. At very short notice these have been implemented and the total labour force increased by 33%.

Side by side with this apparently backward step two other economically important events have been taking place in the North, following to some extent the existing policy in the Republic.

(a) Experimentally several different methods of marketing produce are being tried including roadside sales by tender, contract felling and contract thinning with the aim of securing the best possible return.

(b) A work study officer has been appointed and a team of two works study foresters are about to be selected for training. At a later stage a decision as to the best type of incentive payment will be made in the light of their recommendations.

Mr. Gilmore Warnock the Works Study Officer was greatly impressed by the help and co-operation he received on his visit South from Inspector General down to leading worker.

4. The main event in the Society's year was the publication of "The Forests of Ireland" and I would now like to refer to another piece of writing which it may have inspired.

In October a series of five articles appeared in "The Irish Times" written by Mr. Michael Viney under the general title of "Down in the Forest."

The articles were extremely well written, penetrating and hard hitting and I have yet to meet a forester who was not amazed at the author's grasp of a very involved and complex subject.

In his last instalment he wrote "These articles have sought to be provocative and critical, especially of the economic basis of the State's afforestation programme."

"The assumption that forestry is inevitably a profitable use of public money is so widespread that the points of challenge must occasionally be made clear. The scale of the planting programme, the type of land assigned to forestry, the kind of tree it will support, the immediate costs and potential returns, the issue of comparative land use, these deserve critical attention from a people who have encouraged their Government to believe that "trees are a good thing"—and to spend £4½ million a year on growing them. Otherwise the forests could become not a national asset but a national liability."

We waited for the rush of letters to the editor, but we waited in vain. How can we explain this silence when so many lesser subjects fill the correspondence columns? Does, no one care?

I have concluded that the general public, while very interested in forestry in a general way, were baffled by the technical and economic details produced by Mr. Viney. The public appears to be ready to trust its foresters to spend the funds allocated to them in the best interests of the nation as a whole.

This while being very complimentary puts on us a great burden of stewardship. If we are to discharge that responsibility we must ensure that we know precisely where we are aiming and what our objects are.

Mr. Viney put his finger on many soft spots. One of these was the failure to define forest policy.

We never quite know whether we are a social service or an economic undertaking.

Mr. Viney concluded that morale would suffer if forestry terms of reference, especially in the western countries were clearly defined.

I cannot agree with this view. Nothing is worse for morale than to be left without a proper sense of purpose.

A firm forest policy appears to be hardening elsewhere, it is time that some hard decisions were taken in Ireland.

Our Society has a great part to play in providing a forum for open and informed discussion where these matters can be debated and our minds made clearer on the many aspects of our forestry role in this rapidly changing world.

5. I have greatly enjoyed my period of 2 years as your president. It was made easy by the devoted work of the council and especially the office holders who carry on the day to day work between council meetings.

It was a difficult year financially and I must mention especially the good work of Mr. Tom Moloney our Treasurer and Mr. Desmond Robinson the business editor who have kept the society solvent without the loss of our assets.

Our Society has now almost completed its first 25 years of existence. I think we have much in which to be proud and grateful as we look back and see the manner in which it has grown and developed.

We remember particularly the late Professor Mark L. Anderson whose successor in the Chair of Forestry at Edinburgh we are welcoming this evening and the other 30 Foundation members many of whom are still with us and quite a few still in office on the council. It is fitting that one of them has been re-elected as your president for this silver jubilee year.

Visit to Lough Fea Estate.

ON 28th May a small but representative cross-section of members spent a most enjoyable afternoon being taken round Lough Fea Estate in County Monaghan, by the owner Major J. Shirley. The afternoon was largely devoted to the problems facing an owner of a small property particularly where there was a desire to bring the woodland area into a state of maximum productivity. As a result the areas visited were all young plantations under 10 years of age.

The soils of the area are base rich and generally freely draining although they can be locally quite shallow. Many of the visitors were not particularly conversant with the problems of species selection, weed growth, etc., on soils including deep peat near the Lough with pH values of about 6.5. It was generally felt by the members that Scots pine and European larch, although they show early good growth, are not sufficiently productive and are too prone to disease for these generally good soils. On the other hand both Norway spruce and Douglas fir have been fairly extensively planted and have shown very good promise. There was some debate about which of these species should be planted; large Douglas fir poles presently provide a very remunerative market but young Douglas planted on the area are growing in a very twisted manner and are very prone to wind throw and need a lot of expense in staking and trying to firm them; Norway spruce is a more useful general purpose timber with a ready market for all sizes including thinnings. As both species should produce maximum mean annual increments of about 240 hoppus feet per acre on these soils the general consensus of opinion was that a matrix of Norway spruce with about 200 Douglas fir per acre interspersed to give a possible crop of 50 to 100 poles per acre should give the best financial returns on present market showing. Special attention can then be given to a limited number of the better Douglas fir to prepare them for the pole market.

Another of the problems facing an owner on this type of ground is the high cost of weeding and cleaning of coppice regrowth. All weeding on the Estate to date has been by hand but this year was

the first when they used 2, 4, 5-T on the stumps of areas which were cleared for replanting. There is no doubt the proper use of such sprays can considerably reduce these costs and it would probably pay Major Shirley to purchase an Arbogard or similar sprayer and do his weeding with paraquat or similar spray even though the total acreage to be weeded is small. It was stressed that care needs to be taken with chemical treatment to compare the prices of various brands on the basis of active ingredient and not gallon of mixture, to do the weeding much earlier than would normally be done with hand work, and to use the lowest concentration which will give sufficient and not necessarily 100 per cent kill. To determine this requires a certain amount of local experimental work.

A further problem where small groups are being replanted and edges of older trees left to preserve the amenity is the time when these older trees should be removed. Although there may not be too great a likelihood of wind throw damage in this area it was generally considered preferable to remove the bigger and older trees as soon as the replanted crop had obtained the appearance of a forest and before it had got more than 30 ft. high. Smaller hardwood trees on the margin could, of course, be left without any trouble to the end of the conifer rotation.

A small stand of fast grown (for Ireland) poplar was seen on deep peat although it was noticeable that there was quite a falling off in growth as one got nearer the lake and the water table was obviously nearer the surface. This stand had been very carefully pruned every year with epicormics removed when necessary every month and this led to a discussion on the possible certification of such stands. Three suggestions were made (a) the Government should supply a certificate confirming the location, number of trees, size of trees and treatment, (b) photographic records should be kept, or (c) the match manufacturers should be invited to inspect the stand and keep records themselves. It was agreed by all present that some form of certification of this nature was required if owners were going to be able to sell such produce at the best market price in future.

It is obvious Major Shirley has a very definite and specific plan of operation to bring the woodland into a largely conifer high yielding forest at least cost and to spread out this conversion over an approximate rotation. The Society must wish him well in this venture.

The visitors were entertained to tea and a conducted tour of the house with its many beautiful paintings and furniture and a very valuable library of Irish history.

W.J.

Annual Study Tour 1967.

Morning of Tuesday 13th June.

AT 9 a.m. on Tuesday the 13th June the members of the 24th Annual Study Tour assembled outside the hotel in Cahir and were taken by bus on the short trip to Cahir Park. There we were met by the District Officer Mr. Munnelly, who was accompanied by the Assistant District Officer Mr. Cremen. The Head Forester, Mr. Collins and the Forester Mr. Fenton. In the shadow of the well known 200 years old Swiss Cottage our President, Professor Clear, performed the opening ceremony. Mr. Munnelly then welcomed the party on behalf of the Minister for Lands and after a short description of the property, which was acquired in 1963 from the Charteris Estate, he led us to some fine old hardwood stands where here and there enchanting glimpses of the Suir could be seen as it meandered through the peaceful valley below.

Ballyheron Wood on a balmy morning in mid summer is not a good place for statistics (the wood carries 4.5 thousand h.ft. of Beech and 1 thousand h.ft. of conifers per acre) and speakers dwelt more on the amenity aspects of the stand, than on its value on a saw bench. When the President pointed out that here was not an elite stand, but a plus stand one felt that his intention was not to disparage, but to guard against the possibility of the crop becoming a timber merchants prize. Members were unanimous that management should continue to aim at the preservation of the scenic amenities of the woods even if such a policy caused a slight reduction in revenue.

Our second stop was at Cahir seed stand at Scartnagrane. This is a P.C. stand of a provenance which has proved to be most successful under our soil and climatic conditions. Mr. Hanan who apologized for the unavoidable absence of Mr. O'Driscoll (the officer directly concerned with the selection of seed stands) explained that seed stands were a temporary measure designed to produce seed of improved quality until such time as seed orchards came into production. Within a seed stand a seed tree is one which is free from all major defects, possesses a straight stem, fine branching habit and a moderately long crown. They should be fairly evenly scattered through the stand to allow for full crown development.

With the Scartnagrane seed stand are two plus trees. These are trees which possess all the provenance's best qualities of vigour and form. They will be used to provide scions for a seed orchard which when in production will supercede the seed stand and produce seed of a quality superior to that of the seed stand. In the seed orchard young trees of doubtful parentage will be decapitated and with the aid of the grafters knife the stems will be crowned with the scions from the elite trees. Steps will then be taken to ensure that only pollen of approved origin will fertilize the female flowers.

M. McN.

Afternoon of Tuesday, 13th June.

ON Tuesday afternoon we visited Glengarra Wood, a property of Glengarra State Forest and we were introduced to Mr. M. A. Crowley the Forester-in-charge.

Glengarra Wood lies on the Southern slopes of the Galty Mountains about 7 miles south-west of Caher. In 1934 Forestry division agreed to lease 1816 acres in the townlands of Hopkinsrea, Cullentragh and Toorbeg from the Ladies B. Pole-Carew and C. Butler. For acquisition purposes the offer was divided into 8 blocks. Blocks 1 and 2 containing 412 acres were taken over in 1934, and the remaining blocks were taken over at intervals of 1 year until 1940. The term of the lease was 150 years.

On the lower slopes we saw a fine plantation of S.P. and E.L. which was laid down by the previous owners and which is managed to favour the production of high quality transmission poles. Next we looked at a plot of *Abies pectinata* regenerated naturally from a sprinkling of parent trees acquired with the property. After a close examination of the young trees it was generally agreed that there was little hope of getting a tree crop from the regeneration because of the susceptibility of the species to *Adelges cooleyi* attack. Evidence of damage by the insect was to be seen in the young crop. Further up we saw a crop of *Pinus contorta* of Lulu Island origin which it was hoped by fertilizing to bring to a marketable pole crop. Next we inspected the damage caused to a P.C. crop by a recent fire and discussed the relative merits of ploughs and hydraulic excavators in the preparation of ground for the next crop in these circumstances. Here too we saw an ant hill of the ant species *Formica rufa* which in Ireland is now found only in the Glen of Aherlow area. It is believed that this species survived here through the Ice age and was associated with indigenous Scots Pine. It benefits the soil by aeration and by the breaking down of the raw humus of the pine needles.

The day concluded with a scenic walk along the rhododendron flanked mountain Lodge avenue. In this region we saw some Scots Pine plus trees which are reserved for scion collection for seed orchards.

M. McM. C.P.K.

Morning of Wednesday, 14th June.

The group left Cahir for the first stop of the day at Ardane property of Bansha forest. After introducing the forester in charge Mr. John Prior, the study tour leader, Mr. E. Munnelly went on to give a general outline of the whole Galtee region. The total forest area of 20,000 acres divided into six forests, four on the southern slopes and two to the North, consisting in the main of large blocks very vulnerable to fire and quite usual to have 10-20 fire outbreaks reported for each forest annually. In Ardane the predominant species, as elsewhere in the Galties, was again pine, with a little S.S.

On route to the first stop some vigorous natural regeneration of P.C. was observed and gave rise to a discussion on the profuse regeneration of pine which occurs where ever the soil surface is disturbed. In this instance regeneration had sprung up on the spoil from the road site. Professor Clear told the party of the achievements of the Forestry Commission in the pine areas of East Anglia, where by using heavy machinery to tear up the soil, dense natural regeneration of S.P. occurred such that a machine was then used to cut lanes through the young growth, to leave little groups of trees at the required spacing. This system was used with a view to producing a high class S.P. pole crop. As an alternative to machinery, it was felt that explosives might play an important role in soil disturbance. With modern techniques and skill it was found possible to get very precise clean cut drains, this type work being carried out in some Scandinavian countries and would appear to have a very bright future particularly in areas where it is difficult or sometimes impossible to use machinery. Some needle diffusion on P.C. was noticed here—a defect which causes the needles to remain short and not open in the usual way—Mr. N. O'Carroll said this appears to be related to a nutrient deficiency. Also observed here were some Diprion caterpillars feeding on the P.C. needles.

1st Stop :

First inspection was of very nice adjoining stands of S.P. & P.C., planted in 1935 at 4-500' above sea level, with a Northern aspect, on land which was formerly old woodland. The previous crop was a S.P. and larch mixture. Mr. McEvoy told the group that this area was traditionally woodland—Oak woods were recorded here in 1640 and the area was listed among the Six great woods of Munster in Elizabethan times.

The S.P. crop on view had some very fine clean stems—a striking feature was the clean forest floor with a sprinkling of Mountain Ash saplings. It was felt that the Northern slopes of the Galtees offered better conditions for the growing of trees than the southern gentle slopes—this in part was thought due to shelter and because of the steeper slope, there is better rejuvenation of the soil because of erosion and down-wash-with no pan formed. In contrast the less steep slopes offered conditions more favourable to podzolisation and pan formation. The economics of S.P. versus P.C. was the theme of discussion here. In this area stands of both species stood side by side—the S.P. at a lower elevation and perhaps on a better site—both were particularly good for the respective species but the P.C. had produced far greater volume. It was felt that it would be more profitable to grow P.C. and prune so as to produce tight knots—it was also stated that the question of knotiness being undesirable is now open to doubt, in view of the methods now developed where the knots are punched clear and a filler used at the sawing stage. It was also said that knotty P.C. is in good demand for decorative panelling. One shadow of doubt on the merits of this species was whether or not it would remain wind firm to saw—

log size. The value of good quality knot free S.P. is well appreciated in the timber trade, particularly for good class joinery work, but the cost of production is the main problem. This gave rise to the question of treatment of the species from thicket stage to final crop. In South Africa good results were obtained with species like *Pinus radiata* P. teada etc., where in the early thicket stage before competition had set in, selected crop trees were released so as to maintain vigour. These species however are known to respond well to cultivation and would die out if left to nature, on the other hand S.P. does well when left alone and it is not so definite that its response to opening up would be very great. On the contrary the Dutch have found that S.P. has stagnated because of too much light to the crowns. In the light of this information it was felt, that any drastic opening of the canopy should be avoided, the idea being to maintain good crowns on good trees from a knowledge of the climate and of the provenance—a narrow pyramidal compact crown can be more efficient in the process of photosynthesis than can a loose wide spreading one.

2nd Stop:

The route to the second stop brought us through an area planted in the diamond-bed formation similar to that at Forth mountain. The diamond beds were 13' across and 18' apart. Varying planting techniques were employed—pit and plant, mattock preparation and mounding also manuring with G.M.P., Slag and Semsol.

At this 2nd stop we were shown a stand of S.S. at 700' elevation, planted in 1937 on a flush molinia—the previous crop was S.P. The stand measurements from a prepared sample plot were as follows:—

Stocking 930 S.P.A.

Volume 2,780 cu. ft. (by 40% sample tree)

Top Height 41 ft.

The figure would compare with B.F.C. Yield tables quality class V on a top ht./age basis, but the volume is greater—the figure in the tables would be 1,900 cu. ft. with a total vol. production of 2,250. No figures were available for the plot thinnings which were removed 2 yrs. ago. The crop apparently suffered check from about 8-14 yrs. of age—it was felt this would have a depressing effect on Y.C., it was agreed that a reduction of 5 yrs in age would be appropriate in determining Y.C. By management table standards this would give a Y.C. of 180. Current height growth of a felled sample pole would bear this out having put on 20" height growth over the past 3 yrs. The question of the permissible expenditure to get an area out of check was raised and a figure of £1 per acre for every 1 cu. ft. increase in mean annual increment was regarded feasible.

This brought the activities of the forenoon to a conclusion and the party travelled on to Tipperary town for lunch.

W.L.

Afternoon of Wednesday, 14th June.

Stop 1:

HAVING lunched at the Royal Hotel, Tipperary, the tour travelled via scenic route to the Glen of Aherlow. A stop was made at a popular parking-place on the public-road, providing a "tourists'-eye view" of the Glen below, and proved an ideal setting for the discussion on amenity which followed.

This was commenced by Mr. Hanan with three main points. Firstly, there was the tourist aspect. The present trend was to get away from popular resorts to more remote areas. With £60 million per annum being spent on tourism, and this amount increasing greatly in coming years, forestry could provide this want, at little or no extra expense—people could just be allowed access to forests. Secondly, more sophisticated amenity could be planned, carefully, with forest parks containing good roads, seating, etc. Haphazard planting of exotic trees could be unsightly. Thirdly, landscaping of forests should be attempted to present a more natural appearance, as in natural forests in Europe, rather than the box-like pattern, much seen today.

The remainder of the discussion followed the trend set by this third point. Using the tableau of the forested lower slopes of the Galty Mountains across the Glen as an example, it was decided that the shape of the top line of a forest was important, and should, in most cases, be roughly parallel with the skyline formed by the peaks above. A squared lower edge to a plantation was acceptable, as it was not so conspicuous, and blended with neighbouring fields. A straight top line to a forest might be technically correct, but could be unpleasing to the eye, and whereas it might be said to be a waste of money pushing onto "unplantable land", as saving would follow, by keeping off spurs, to maintain the line. It was decided that fences along the tops of plantations might not be necessary, and that in acquisition, where it was the practise to take over small blocks at a time, that fencing might be postponed until a large block could be composed, and this might facilitate the outlining of the shape of a new property.

Again, it was suggested that where it was unavoidable to have jagged edges to a plantation, this aspect might be softened by the judicious use of colour, e.g. various shades of green. In some cases, corners could be filled with hardwoods. In either respect, felling could be carried out later to form a curve, if desired. The importance of the responsibility of Forestry, was stressed, in its long-term changing of the landscape. Its precise role was questioned, together with the economics of "amenity forestry", before the tour moved on to its next halt.

Stop 2:

Following a short drive through the forest, the tour stopped in an area of one of the biggest combinations of different provenances of *Pinus contorta* in the country. They were in three blocks,

each block being composed of one of either Inland, Coastal, or Lulu Island varieties. The main interest in the area was a manurial experiment, started two to three years ago. The original species had been Scots pine, planted in 1929, but the region was replanted in 1940 with *Pinus contorta* (Lulu Island provenance). Most stands there were ten years younger, and using these years, experimental data could be collected, and the results applied to the younger crop.

Mr. N. O'Carroll explained the various aspect of the research area. The fertilizers used were: Sulphate of ammonia, Ground mineral phosphate, Sulphate of potash, and Copper sulphate. There were sixteen combinations of N,P,K, and Cu, and these repeated, resulted in 32 one tenth of an acre plots. Application was broadcast. There was no result in the year of application; no decrease in flowering, no change in shoot die-back, and no darkening of foliage. With the application of Phosphate, there was found to be significant increase in height growth, but again, not in the year of application.

In the general discussion that followed, it was suggested that once the pine was above the height of the invading furze, Phosphate could be applied to both, and allow the legume to supply the Nitrogen. It was mentioned that manure and chemical weedkiller might be applied together, and this was said to be "on the programme." As to the question of quantity of manure, it was stated that a number of light applications were more effective than one heavy one, and the response on poorer sites more spectacular than on better ones. When estimating costings, planting cost would not be included, as the original crop would be considered a "failure".

Stop 3:

What was to have been only a brief pause on the last leg of the day's tour, turned into a vigorous discussion. The place was near the base of a steep, north-facing slope, running from the area of our previous stop, and about a mile distant. The problem was the defoliation of Sitka Spruce, planted in 1933, and 60-70 feet in height. With a volume of 5,000 H. feet, and Current Annual Increment of 240 H. ft., this was comparable to Quality Class II, B.F.C. Yield Tables, though somewhat overstocked. Various suggestions were made as to the cause of defoliation. Drought, caused by run-off on the steep slopes, and little penetration was not the reason, as trees with plenty of moisture were affected on the valley floor. Group-dying or *Rhizina inflata*, might affect several acres, but not a whole compartment. There had been no recent thinning, and *Fomes annosus* was no more common than in other woods. Repeated attack by aphids might have contributed to this.

One important question was: did Sitka spruce reach a critical stage at this age, and if so, what should be done? The question was not local, but could have national significance. There had been outbreaks similar to this in other forests. In Mountbellew forest, die-back had occurred. The trees, although dead, could be converted to boxwood,

but only if used immediately, as rot set in very quickly. At Ballygar forest, woods were healthy in 1958, and were affected in 1960. It was thought at the time to be caused by water excess. However, there had been two hurricane-force winds within four days of each other, and this could have caused "shock check." A similar condition was found in Europe due to the Dendroctonus Beetle, but this was not present in this country. It was recommended that the question be treated with urgency, and referred to Research Branch for a full investigation.

This concluded the tour for the day.

C.K.

Morning of Thursday, 15th June.

The fine weather continued, and the sun shone for the beginning of what was to prove the hottest of our three days of glorious weather.

The President opened the day's discussion by handing us over again into the capable hands of Mr. Munnelly, who introduced Mr. Blighe, Fortester-in-Charge, Clogheen Forest, to the party. Mr. Blighe told us that this forest of 4,400 acres included a 40 acre nursery, and that 80% of the total area was under pines.

Stop 1

Mr. Munnelly said that he felt that the seed stand in which we stood would redeem Scots Pine in this country, and asked Mr. O'Carroll to tell of the work done on it to date. From the latter we learned that the stand had been thinned and fertilized with a view to seed production. Some seed from the stand had been included by Research Section in a provenance trial. There were a number of "Plus Trees" in the stand, and scions from them had been used by the British Forestry Commission.

Professor Clear said that he felt that seed from stands such as this should be made available to private nurseries, but Mr. Blighe pointed out that we were ourselves still using considerable quantities of imported seed.

An interesting discussion then followed, during which the grade of thinning presently marked was discussed, together with the possible response of Scots Pine to manures, and the effect of this on the importance of the tree as a species here. Messrs. O'Carroll, Munnelly, Butler and Clear contributed. Before leaving the stand, Mr. O'Carroll showed us an example of *Peridermium pini*. Professor Clear referred to the disease as "Resin Tap" because of the accumulation of resin bursting out in blisters, and he emphasised the importance of sanitation in the control of the disease.

Stop 2

Mr. Munnelly then led us to the next stop, which was in a small stand of promising Corsican Pine, and in opening the discussion, he referred to the fact that this species was not acceptable to E.S.B. or Dept. of Post & Telegraphs. Mr. Mangan attributed this to the brittle nature of the timber which rendered the poles liable to snap clean across. The high ratio of sapwood and heartwood was cited as a further cause of this proneness to breakage. Professor Clear felt that the percentage of heartwood was not too important, but that the preservation possibilities were of more moment. A lively discussion along these lines followed, during which, time of felling as a factor in preservation was also discussed.

Mr. McNamara then queried pole prices in what he considered a limited market. Mr. Munnelly maintained that no sawmill price could compare with the 12/6d. per cu. ft. which the Dept. of Posts and Telegraphs and E.S.B. poles grossed, even allowing 2/- per cu. ft. for preparation and handling. Messrs. Clear and McEvoy, however, felt that there were considerable "hidden" costs involved in marketing these special poles, and referred to high road standards necessary as an example. Mr. Prior queried the high price paid for poles over and above sawmill timber, and Mr. Mangan replied that this level was fixed by the prices being paid for imported poles.

The discussion then extended to size of log for sawmilling, and Messrs. Brady, Clear and Munnelly were interesting contributors. Mr. Brady cited a test carried out at Dundrum in which large logs gave a 76% timber recovery as against 56% from small logs.

Stop 3

This stop was on an area which had been cleared of transmission poles, and the remaining trees sold standing, leaving a high cover of rhododendron to be dealt with. The ensuing discussion centred on the cost of rhododendron clearance.

Mr. Hanan declared that simple clearance without following control was a waste of money. Research Section had Ammonium Sulphamate on trial, and Mr. Hanan recommended complete cutting followed 24 hours afterwards with Ammonium Sulphamate brushed on to the stumps. He quoted the cost of this control as £20-£30 per acre for material and labour.

Mr. Prior and others queried the use of brushes because of the high cost factor. Mr. Hanan defended the "cause of the brush", and Mr. Mannion referred to the high mortality rate among plants where the chemical was sprayed on. This fact had been found to necessitate a delay of nine to 10 weeks after spraying before planting could be undertaken.

An interesting discussion followed on the possibility of using mechanical means to deal with the problem, and the trial of other

weedicides was suggested. Professor Clear made a case for declaring rhododendron a "noxious weed". He stressed the importance of protecting uninvaded areas by the ruthless eradication of small pockets of the plant as they appear. Mr. McEvoy raised the importance of the distance and means of seed spread in any control of the plant.

The discussion then concluded, and the party moved on to the famed Vee for the last stop before lunch.

Stop 4

Having taken time to absorb and enjoy the view, the party then entered into a discussion on the relative merits of the Vee and the Glen of Aherlow as scenic attractions. Many members contributed eloquently, and the growing importance of amenity became obvious, though some members thought it was becoming an over-used word. Miss Furlong felt we should keep out the invading hordes of foreign visitors who spoil the pleasant scenery and detract from the enjoyment of our own people. The party, however, generally acknowledged the importance of the tourist, and his permanent influence on the future of Irish Forestry in many areas seemed assured.

The President then thanked Mr. Blighe and his assistants for their help and interest, and all present responded suitably. The party then moved on to Cappoquin Forest for lunch.

M. P. G. H.

Afternoon of Thursday, 15th June.

THE party enjoyed a good pack lunch in the open air in Cappoquin Forest, in an area of 1,300 acres acquired from the Duke of Devonshire in 1960.

The land lay on an open plateau of old Red Sandstone "till" at about 600 ft. elevation. The soil profile was a mature podsol, with an iron pan at one to two feet depth.

Mr. N. O'Carroll described the difficulties met with in attempting to grow productive plantations on this type of site, large areas of which are to be formed in Waterford, Cork and Tipperary. The Dept. were carrying out a comprehensive investigation of forestry possibilities, and two series of trials plots had been laid down in this plantation in 1961.

In the first of these the land had been completely ploughed, with a Clark subsoiling plough, and three to four hundredweights of slag broadcast. A series of plots was laid out in which the effects of various fertilisers were tried, with and without broom (*Sarothamnus scoparius*), and tree lupin (*Lupinus arboreus*), on the growth of S.S. and P.C.

The lupins had grown well for three seasons and then gradually died off. Broom had been eaten back by hares until special fencing was provided, after which it had grown well.

At the present stage, (the seventh growing season), the experiment had come to an end and the principal trends to emerge had been :

1. Complete ploughing did not in itself give adequate amelioration of the unfavourable condition.
2. The site vegetation improved more or less in line with the completeness of the range of fertilisers added, and S.S. had been quite promising on the best treatments, but was going into check, and appeared unlikely to continue to grow for much longer.
3. Addition of lime benefitted the lupins.
4. The strain of P.C. used (seed from an inland region of Oregon), was not vigorous enough for the purposes of the experiment.

The second trial consisted of a number of plots of various conifer species planted in 1961 on a slightly less exposed slope which had also been ploughed with the Clark subsoiling unit and fertilised.

The species used were P.C. (Inland strain) *P. radiata* (from Scotland), Corsican pine, S.S., J.L., Lawson cypress D.F. (seed obtained from Denmark). *A. alba*, *A. procera*, *A. grandis*.

Under the conditions J.L. had done the best and all the others were either poor or very poor.

The party became scattered through the experimental area, as small groups discussed various aspects of the problems which attracted their attention and it was not possible to obtain any consensus of opinions, before it was time to leave.

The Society's gratitude for their guidance and help, and particularly for their happy organisation of lunch are due to Mr. J. Egan, F. i/c and his assistant foresters Messrs Corbett and Brennan.

The rest of the afternoon was occupied by a tour through beautiful countryside with visits to Lismore, Cappoquin and the Capuchin Monastery at Mount Mellary.

J. E. J.

Day Excursion to the Fermoy Area.

ON Sunday 9th July, a small party led by Mr. P. Verling, visited two areas of interest in this North Cork District.

In Ballyhooley Forest, on a water-catchment area, Mr. Verling demonstrated an area of 20 acres, which had been cultivated with a "ripper". This implement, which consists of three 26 inch vertical cutters, is mounted on the back of a D.7 tractor. The rippers are 3 feet apart and the grinding action in the soil, particularly where large stones are present, gives an almost complete breaking up of the soil. Where pan occurs, this is also broken. Mr. Verling found that the machine working up and down hill, which was as steep as 1 in 6 in places, could cultivate 20 acres for a hireage cost of £39. Planting is in the ripper fracture which is a ready-made "pit" and the plants are well-firmed in. In spite of a particularly dry season the Sitka Spruce, Contorta pine and Birch planted here looked very healthy in their first growing season with no suggestion of dying off. It is hoped that run-off of surface water will be reduced by absorption into the spongy tilth left by the ripper. Mr. Verling also has trials of cross-ripping, ripping with rotovating, and planting regardless of the fracture. It was thought by some members that broadcast manuring would suit this type of cultivation. It was shown that a heather or gorse vegetation must be burned off before ripping, or clogging of the implement occurs.

The main point of interest at Walshtown Property of Killeagh Forest was the behaviour of *Abies procera* under varying planting methods. The species was seen planted pure in the side of the furrow, following Clark ploughing. After two years it was not showing the usual slow starting characteristic. However *Larix leptolepis* treated similarly was already almost twice as tall, though suffering from wind-lean. At another stop we saw *Abies procera* in groups of nine trees in a matrix of *Pinus contorta*. The Fir comprised 25% of the crop but had been left behind by the Pine and in places almost swamped by it. However, the Pine was almost all badly butt-swept and it was felt that a lot of it could be sacrificed to let the Fir away. Large areas of *Abies Procera* were seen as strip and pure planting and some members were doubtful of the future growth of the species and also of the saleability of the final product.

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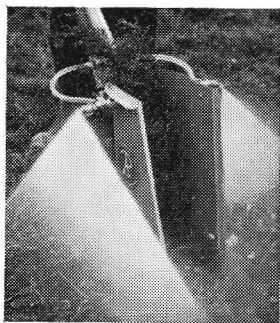
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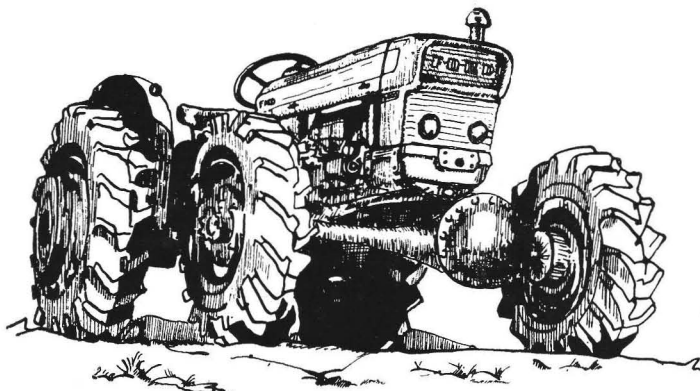
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