## **EIGHTH ANNUAL EXCURSION**

THE 8th Annual Excursion of the Society was held in the Cowal district of Argyllshire, Scotland, and proved a most enjoyable and instructive trip. All arrangements for travel, accommodation, meals, etc., were looked after by our very capable and efficient Excursion Committee so that members were free to enjoy every moment.

For this Excursion the party split into two groups; one group travelling by air to Glasgow, and the other by boat. From remarks overheard it would appear that the idea of air travel has been 'sold' to more than a few who were making their first flight. "I'll never travel overseas any other way in future" was a typical reaction from members who had previously done their cross-channel trips by boat. Remembering our Holyhead-Dun Laoghaire trip of two years ago the recorder is inclined to agree with the air converts. At any rate the journey to Dunoon was smooth and enjoyable in spite of the fact that we were 'smuggling' one man who was minus passport or travel permit, but who was enabled to make the trip through the courtesy and co-operation of the emigration officials at Collinstown and at Glasgow.

From the comprehensive notes supplied by the Forestry Commission we had already learned that the configuration of the ground in the Cowal peninsula is typical of the western Highlands of Scotland, being formed of a series of hill ridges and intervening glens. The main lie of the glens is in a north and south direction and they are generally narrow with steep slopes on either side. The peninsula is deeply cut into by four arms of the sea which penetrate for a considerable distance from the Firth of Clyde. These again run more or less north and south. From east to west they are Loch Goil, Holy Loch, Loch Striven and Loch Riddon. One fresh water loch, Loch Eck, occupies a fairly central position in the district.

The climate is also typical of the western seaboard of Scotland with no extremes of heat or cold but with very high rainfall. Annual figures show the average rainfall to be between 80 and 90 inches. Snow is infrequent and does not generally lie long below 1,000 feet. Late frosts are frequent and damaging however, and winter gales are common and are to be feared from the thinning stage onwards due to the heavy rainfall and the proximity of rock to the surface.

Exposure on western slopes can be very severe. There is no land mass between the majority of forests and the Atlantic Ocean and therefore no break to the strong prevailing winds. The limit of planting is thereby much reduced in comparison with eastern localities and it is seldom possible to plant higher than 900 ft. even when the quality of the ground above that elevation is sufficiently good for conifer species.

The rock formation is mainly metamorphic—quartzites and schists with some igneous intrusions. The metamorphic rocks were originally sediments such as impure sandstones, shales, limestones, etc. but their mineral composition and structure have been greatly altered by intense heat and pressure. They may be recognised by the presence of marked cleavage or foliation which causes them to split very readily in one direction. The primary rocks have been formed by the consolidation of molten material and may be distinguished from the metamorphic rocks by their more homogeneous nature. Apart from glacial deposits, which are still loose and uncompacted, the region has no rocks other than these two.

The soils of this region may be divided into three main classes; (a) deep fine loams derived direct from the parent rock and carrying a vegetation of scrub, bracken and the finer grasses; (b) gritty or rocky loams or clays of glacial origin and carrying calluna and hill grasses; (c) peats, generally shallow, over gritty or rocky loam and clay and with molinia-juncus associations if of better quality, and scirpus, erica and vaccinium if of inferior quality.

Prior to the establishment of the Forestry Commission the greater part of the lands of this district were used for hill sheep farming. Private woods were few and far between. Apart from the woodland areas at Benmore, Glenfinart and Ardkinglas with smaller lots forming policy woods adjoining the residences of the lairds, there was very little timber grown, or artificial plantations formed. Much of the lower hill slopes, however, were under a natural scrub of oak, birch and alder.

There are now eight State Forest units established in this district. They comprise a total of 66,342 acres of which 17,500 acres have been afforested to date. The forest units of Ardgartan, Glenfinart, Glenbranter, Benmore, and Loch Eck, together with the Glasgow Corporation estate of Ardgoil, constitute the Argyll National Forest Park—the first of the National Forest Parks to be established by the Forestry Commission.

At the conclusion of our tour of the State Forests and as a mark of appreciation our Society entertained the members of the Forestry Commission staff and all others who had been associated with us on this excursion to dinner. Among the guests, also, was Very Rev. Canon McLean, of Dunoon. Mr. McEvoy, our President, in thanking the Forestry Commission staff for their kindness, and hospitality, and the great trouble and pains they had taken to make our trip the wonderful success it was, paid tribute to the foresight and energy with which they tackled their problems and to the *esprit de corps* noticeable in all ranks.

## First Day, 22nd May. (Reported by D. Mangan).

The excursion opened with a visit to Benmore Forest. Here we met Mr. Stuart M. Petrie the district inspector, who of course was renewing friendships with the many members who had known him during his time in Ireland. We were introduced by him to Mr. James, conservator, Mr. Dier, divisional officer, Mr. Watson, who is in charge of Benmore Forest School, Mr. McPherson, assistant district inspector, and Mr. Jackson, the forester. We were also glad to welcome to our party Mr. McNeill of Aberdeen University. It is worth remembering in passing that Mr. Petrie, who was acting as convenor for this excursion, was also convener for our first annual excursion, that to the Clonmel district in 1944.

Our first stop at Benmore was to admire the magnificent conifers growing beside the main road. These were part of the plantings carried out by Duncan in 1870 on a fairly rich alluvial soil and in a well sheltered situation. They were a mixture of Douglas fir, Sitka spruce, Silver fir, Thuja, and Cupressus, but fellings during the 1914-18 war greatly depleted the original plantation. As we examined these fine trees we were given figures for some of the more outstanding specimens planted in 1870; here they are.

| Species       | Total Height | Volume          |
|---------------|--------------|-----------------|
| Sitka spruce  | <br>100 ft.  | <br>437 cu. ft. |
| Thuja plicata | <br>100 ft.  | <br>375 cu. ft. |
| Abies Lowiana | <br>105 ft.  | <br>455 cu. ft. |
| Abies nobilis | <br>102 ft.  | <br>243 cu. ft. |
| Douglas fir   | <br>136 ft.  | <br>480 cu. ft. |

This last Douglas fir was 120 ft. to timber height and 24 ins. Q.G. at half timber height.

When we had admired these forest giants a discussion arose as to the treatment of the different species and Mr. Dier raised the question of getting natural regeneration of Sitka by longer rotation. 'If,' he said 'the current increment per cent. is increasing rapidly at 50 years there should be no pressing reason for felling.'

This estate was gifted by Mr. Younger (not unconnected with a stimulating beverage carrying his name) to the Forestry Commission, part of it in 1925 and the remainder, including the mansion house, in 1929. The Commission immediately turned the mansion into a Forest School. I am sure many members of the party regretted, as I did, that we had not sufficient time to inspect this school. However, we consoled ourselves by admiring the magnificent rhododendron display along the avenues and on the lawn. In addition, Mr. Watson took advantage of a short halt to give us some facts about the general running of the school.

It was at this stage that we were joined by those excursionists who had come by sea, some looking perhaps a shade green around the gills but otherwise in good order.

Having admired a 78 years old drive of Sequoia (Wellingtonia) with heights around 100 ft. we visited a plot of S.S./D.F. also 78 years old which had an underwood containing most of the North American Pacific coast conifers. Mr. Watson here mentioned the importance of side light for natural regeneration and pointed out how the removal of some very large Abies nobilis in 1941 gave openings for prolific seedlings. Members who have recently visited the Silver fir plots at Avondale will have seen this experience duplicated there.

From the Pinetum and Gardens we proceeded to Cruach Wood

which had been planted with a mixed crop of Thuja plicata, Silver fir, Douglas fir, European larch and Scots pine and which had received frequent thinnings. One 5-acre block had yielded 12,000 cu. ft. in thinnings representing about  $\frac{1}{3}$  of the stand volume. The crowns are now quite free and Mr. Petrie was in favour of leaving the remaining stems to see if natural regeneration can be obtained.

Leaving Cruagh Wood we took the buses to the Coylet Hotel where we had a very pleasant lunch. Having fortified ourselves for the afternoon session we drove by Holy Loch and Loch Long to Glenfinart forest.

Our first stop here was in a P/27 Sitka stand from which light poles had been extracted to the road side. The first thinning yielded 320 cu. ft. per acre and the second thinning 550 cu. ft. Mr. Petrie considered the first thinning too light and the second too heavy.

We then proceeded through the woods to a small colony of timber houses by the shores of the lake. These were the Swedish type of prefab. house and were occupied by forest labour.

We then proceeded to Shore Nursery. This nursery of 18 acres on thin gravelly soil requires plenty of 'bulk' manure, such as F.Y.M. leafmould and seaweed. However it is an easily worked soil and on that account seed sowing is done here in preference to at Benmore nursery. In this nursery they aim to get larch and Scots Pine to the lining-out stage at one year leaving spruce to remain two years as we do here in Ireland. Weed control embraces the use of the paraffin blow-lamp and the party saw it in action on seed-beds sown one week earlier. Another novelty to Irish foresters was the sight of girl-workers weeding and hoeing the lines. The question of board-lining versus hand-lining of transplants came in for serious discussion; apparently board-lining is the sole practice in this part of Scotland.

We left the nursery after debating the possible causes of a leafdiscoloration in D.F. plants and inspected a Bailey bridge in the forest. It appears that a Conservancy contains in addition to the forest branch, a Land Agency branch, a Private Woodlands branch, and an Engineering branch. Professional engineers are employed for road making, bridge building, etc. The bridges are designed to carry maximum loads, but the roads at present are only constructed for extraction of thinnings, fire protection, etc.

Our final stop was to watch a chute about 400 yds. long extracting light poles from the upper part of the hill to a central dump lower down. This concluded our outdoor activities for the day and we returned to our base at Dunoon.

## Second Day, 23rd May. (Report by H. M. FitzPatrick).

WRITING in the "Empire Forestry Review" of June, 1951 on "Extraction of thinnings", R. F. Wilson says "The Engineering Research Branch of the Forestry Commission are at present working on this problem, and are engaged in the development of a powered aerial ropeway, which is undergoing experiment in the Cowal district of the west of Scotland. The growth of timber in this area is very great, and the extraction difficulties enormous. The results of these experiments to date are most encouraging."

Our party had an opportunity of inspecting these ropeways at Glenbranter Forest on the second day of the excursion, and hearing details of their construction and usefulness from Mr. James, the Conservator. The first seen was on the Wyssen system and was being used for the carriage of Sitka Spruce poles down a steep slope. It had a span of 450 yards without intermediate supports, made possible by the concave profile of the hill, and consisted of a strong carrier cable of woven wire rope  $\frac{34}{7}$  diameter, on which ran a double carriage. The speed of the carriage downward was controlled by a lighter cable attached to a small winch, with brake, at head of ropeway, and the winch was powered by a small motor engine which was used to draw back the carriage after each run. The main cable was kept taut by a monkey winch at the bottom, which was anchored to several plates, each held fast by eight spikes driven into the ground.

A demonstration of the use of the cable was given. Eight poles, twenty feet or so long, were dragged to the starting point by the engine and winch on the end of the control wire. They were then hoisted to the carriages by means of a block and tackle operated by endless chain, the control rope was attached and off they rushed downhill. The despatch was notified to the men at the roadside dump by means of a field telephone, and within a minute of the warning signal and the "go ahead" response, down came the load with a screech of pulleys, and was brought to rest over the dump by the control rope. The poles were let down from the carriages by operating the endless chains and unhooked, the signal was given and the carriages were pulled up again for a further run.

Mr. James explained that the control rope and engine could be used to pull in poles to intermediate points along the main carrier wire. This is done by running the rope through a pulley block attached to a tree at the selected point, attaching the load and winding up the winch. This use is the main feature of the Wyssen system.

Later on there was a demonstration of another form of aerial ropeway. This consisted of a carrier cable of 300 yards, a return wire and a control rope. The poles, 3 to 10 according to size, were hitched on to the carrier cable with slings and pulleys, and released down the slope, the speed of descent being controlled by a brake drum. Two sets of slings and pulleys were used, and the descending load pulled up the spare tackle on the return wire.

Glenbranter Forest, we are told by Mr. S. M. Petrie the District Officer, consisted of 3,357 acres of plantations, which stretched for several miles along Glenbranter, Glenshellish and Glensluan, steepsided glens which are typical of the West Highlands. The main block is one of the Commission's earliest acquisitions, and originally comprised four sheep farms belonging to Sir Harry Lauder. Planting was commenced in 1921-22 with Spruces mainly and, as at that time it was considered the hardier species, Norway was kept to the higher ground and Sitka was planted below. Mr. Petrie commented that the reverse would be present day practice.

The absence of roads was a serious handicap, said Mr. Petrie, until recently, when the Engineering Branch opened up the area by constructing a total length of twelve miles of roads into all parts of the forest.

On the slopes above Glenshellish farm we heard a strange tale of mice and men. In the early thirties, said Mr. H. Dier, Divisional Officer, when the grass clad valley of this farm was being planted, there occurred a plague of voles, which did considerable damage by eating the buds and nibbling the bark of the newly planted trees. In the years 1930 to 1934 the "wee sleekit, cow'rin', tim'rous beastie" which excited so much sympathy in the poet Burns, became a formidable forest pest, and we were told fearsome stories of an army of mice which followed the squad of planters day by day, seeking what they might devour.

The Forestry Commission shared none of Burns' sentimentality, and were not laith to rin an' chase with every weapon at their command. Virus disease was planned; Edinburgh University was asked to advise on the best methods of attack, whilst all the time the numbers increased. They built up to a peak in 1934 and then, suddenly, they died out. Later, there was a mild epidemic and the same thing happened. Owls and kestrels came in at peak periods and lived on the voles, but they never wiped them out, and there is a certain number there still.

Down by the river we walked through a spruce plantation, which was originally 50% Sitka and 50% Norway formed in 1924 with the idea of selling the Norway as Christmas trees in the Glasgow market. By the time of the first thinning in 1943 the Norway was badly suppressed and suffered severely during the work. A second thinning in 1946 and a third in 1950 removed most of the Norway, and a further thinning is planned for 1953. Measurements made at the time showed that an average of 450 cubic feet per acre was removed in the second thinning and from 600 to 700 cubic feet per acre in the third thinning. At the present time the remaining trees average 6 to 7 cubic feet each.

Thinning and extraction and the fire hazard are the three great problems of the area, explained Mr. Petrie. Owing to the rapid growth of spruces, thinnings must be heavy and repeated at short intervals. The large annual planting schemes which were comparatively easy to do twenty odd years ago are now coming in for thinning, and when it is remembered that this must be done at three or four yearly intervals the build-up of the work year by year is colossal. Glenbranter Forest is under the charge of two Grade II Foresters, Messrs. A. MacLean and A. Gillies, and employs fifty workers for maintenance and thinning operations. Last year the thinning was eased by the disposal of 16,000 cubic feet on the stump to a timber merchant, who supplied his own labour for its removal, and it is hoped to extend this method of sale.

The new roads, the aerial ropeways, chutes, slides, caterpillar tractors, and other methods of getting out felled material are gradually overcoming the second problem, but with the increase in quantity and in the weight of individual poles, it will continue serious for many years.

The party heard a lot about fire and its danger, and examined with interest the fire notices and literature prepared by the Commission. Fire is an annual menace to the plantations situated as they are in a National Park, which is open to the public, and with a dry spell commonly occurring at Eastertime. As well as educative steps, such as the notices and literature, practical measures to prevent fire-spread consist of firelines and stacks of birch brooms at points along the roads and paths.

Strathlachlan Forest on the shores of Loch Fyne was next visited. This area runs to 7,616 acres and was formerly four hill sheep farms. It was taken over by the Commission in 1946, and already 826 acres of planting has been done, consisting of Sitka and Norway Spruces, Japanese and Hybrid Larches, and Pinus Contorta on the highest and poorest ground. On heather-molinia covered soils Sitka Spruce has been mixed in lines with Scots Pine, and growth so far has been good.

The principal interest for the visitors was the demonstration of mechanical draining by Cuthbertson plough. Mr. James pointed out that the use of this plough was now standard on peaty land of the type seen, and that its advent had changed their ideas about plantability. The large wheels on the plough, he explained, act as a stabiliser, and the plough is attached to them in such a way as to permit it to move up and down to suit the ground. The usual spacing for sheep drains, said Mr. James, is 21 feet apart, and it is usual to run them on a slant across the slope and to use the sod to make mounds spaced at 5 feet apart. On pan ground, he added, the drains may be as close as 5 feet and the planting is done on top of a continuous sod. In all cases, however, he commented, close ploughing may not be good, as it can result in a quick start in growth followed by a slow down.

The plough seen in action cut a wide sod with ease across the slope of the ground, cutting deeply into the soft patches and more shallowly into the hard ribs, and turning out small boulders without any difficulty. Traction was by caterpillar tractor, and we were told that two types are used, the TD9 and the D2, the latter being preferred on the softer kinds of ground. It is hoped later to get a special tractor, the 'Water Buffalo,'' for really wet and boggy terrain.\*

In the course of a discussion on the positioning of drains, Mr. T. Dalgleish, Forestry Consultant, said that he favoured main drains

<sup>\*</sup> NOTE: — The TD9 and D2 are both Diesel engined crawler tractors, the former being manufactured by the International Harvester Co. of Chicago, U.S.A., and the latter by the Caterpillar Tractor Co. of Peoria, Illinois, U.S.A. The 'Water-Buffalo' has been developed by Cuthbertson of Scotland — Ed.

running straight down the slope as being most efficient. Mr. Dier mentioned that vertical drainage had been discarded by the Commission, as they found in the course of their operations that drains made in that manner led to erosion in times of heavy flooding. Mr. James added that the Commission's experience was all in favour of contour lay-out as contour drains were better than vertical ones for trapping soakage, and that they carried off the maximum amount of water with the minimum yardage of drain.

Other features of Strathlachlan Forest of which we were told, were that three of the four original sheep farms will be retained as permanent farm units with their existing arable ground, and with access to the unplantable ground for sheep. Planting is being done in blocks to suit the economic working of the farms, and fences are being erected so as to provide safe passages, "downfalls," for sheep passing from the high to the low ground in times of snow. One of the farms, Lephinmore, has been taken over by the West of Scotland College of Agriculture, as an experimental hill sheep farm, and a good deal of research work on stock, crops and grass is being carried out.

## Third Day, 24th May. (Report by D. McGlynn and J. Ryan).

The skies were downcast as we departed from Dunoon on the final day of our Scottish excursion. The weather experts, however, were optimistic, and so we sped along through magnificent rugged Highland scenery to Inveraray. In this old world town, we halted and as on the previous days there was that surprise cup of tea or coffee provided on this occasion by Mr. and Mrs. Dalgleish.

A short distance beyond Inveraray we dismounted to inspect a giant Silver fir (Abies pectinata) stated to be a largest conifer in these islands. It was taped at 21 ft. in circumference B.H. and had an estimated height of 168 ft. giving a volume of some 1,600 cu. ft.

On our arrival at Cumlodden we were warmly welcomed by our host, Sir George Campbell. Light refreshments were provided and later in a heavy mist we commenced our tour of the estate. In some excellently prepared notes, supplied by Sir George, we learned that Cumlodden Estate was a typical small Highland property of some 6,000 acres except that the forest area is larger than is usually found. The climate generally is mild often humid. Rainfall averages 75 inches. The prevailing winds are from the south-west with gales not infrequent. Tree growth often persists to December/January and there is a danger from spring frosts.

The woodland areas here would appear to have been of natural oak grown first for charcoal; later used for smelting and lastly coppiced for "bark". The last of this oak was only liquidated during the last war when it was converted into pit props for use in the Welsh mines.

The reafforestation of Cumlodden was started only in 1919 and by

the present owner, and to date a total of 378 acres out of a final target of 500 acres has been planted. All heavy timber has been felled so that the woods now being established contain nothing older than 30 years. Sir George is an advocate of early and comparatively heavy thinning and since 1939 his woods have yielded 105,000 cu. ft. in thinnings.

In the Flagstaff section of Compartment 1 we inspected a 14 year old stand of S.S. planted on turves at 5 ft. spacing. First thinning had been the previous year when the stand was only 13 years old and some 280 cu. ft. realising 1s. 2d. per cu. ft. were removed. Thinning did not appear to have been too early and development was satisfactory.

In compartment 2 a small plot of hybrid larch did not appear promising. Sir George suggested that the poor crowns and general stagnation might be due to delay in thinning. Mr. Clear pointed out some stems which were average for the species and age while Mr. McEvoy questioned the wisdom of planting larch on what appeared to be a dry vaccinium site.

On arrival at the Forest Garden the party split into two groups. Here we saw a very interesting variety of the lesser known conifers. This garden contains 93 plots each of a different species of conifer. The first plots were laid down in 1932/33 and all plants had been raised from seed in the estate nursery.

In Compartment 10 we inspected the first plantings carried out by the present owner and also the first plantings of S.S. in Cumlodden. The S.S. was planted at  $3\frac{1}{2} \times 3\frac{1}{2}$  ft. and thinnings commenced at 10 years. Mr. Dalgleish, who was forester at Cumlodden, when the early thinnings were carried out, pointed out a small area which he said had been thinned according to Schlich's prescription, most of the trees on this area had blown over and the method had not been a success.

Passing through Compartment 8 we arrived at a small plot of Silver fir (Abies grandis) planted in 1920. To date 242 stems per acre remain with a volume U.B. of 3,514 cu. ft. per acre. Thinnings to date have yielded 1,492 cu. ft. per acre. This gives a mean annual increment of 162 cu. ft. U.B. Sir George invited discussion on the future treatment of the stand. Mr. Clear suggested that the aim should be to reduce the number of stems to about 80 per acre in 10 years. Mr. McEvoy remarked that at Avondale it was observed that Abies grandis tended to 'sway' to a greater extent than most of the common conifers and suggested heavy thinning to promote well-developed crowns.

It was at this stage that we had regretfully to bid good-bye to some of our party who were returning to Ireland by sea.

We then proceeded to inspect an area showing group 'die-back' of S.S. and N.S. which is at present occupying the attention of the Research Branch of the Forestry Commission. The first symptoms are retarded crown growth with heavy coning often accompanied by bleeding from the stem. Mr. O'Beirne found the mycelium of Honey fungus on an affected stem but as Honey fungus was also present on most stools in this area its presence as a saprophyte and not as a parasite could not be overlooked.

Proceeding downhill we arrived at a stand of Jap larch planted in 1922 but which had in 1939 been heavily thinned and underplanted with Tsuga. An interesting discussion took place as to the merits and demerits of underplanting and the view was put forward that a definite volume of timber per acre could be produced on a given site and that the introduction of an understorey would reduce the yield of the main crop. Mr. Davidson, however, held that the understorey could not depress the main crop because the root systems were at different levels and not in competition. Mr. Deasy held that underplanting at that age could only be justified where the main crop was an inferior one and therefore was not justified in the present instance.

The next item inspected was a plot of S.S. planted at  $6\frac{1}{2}$  ft. spacing in 1923. A brashing in 1936, pruning of elite stem in 1937 and thinnings in 1941, '43, '44 and '48 all had for their aim the greatest possible volume production in the shortest possible time. The success achieved is shown by a comparison with the British Forestry Commission Yield-tables.

No. of Age Height stems/acre Volume U.B. Cumlodden 27 yrs. 67 ft. 274 4,750 cu. ft. B.F.C. Yield Tables 30 yrs. 69 ft. 505 5,800 cu. ft. The periodic mean annual increment (23 to 27 yrs.) for the Cumlodden stand is 544 cu. ft. U.B.

In a discussion on future treatment Mr. Dalgleish suggested further heavy thinnings. Replying to the point that there might be a danger of windthrow he said he deprecated the "solid wall" idea and would advocate an "open formation to let the wind through." He also said he was convinced that 8 ft. or even 12 ft. spacing of S.S. was desirable. Messrs. McEvoy and Johnston supported him in the view and quoted instances of the success of wide spacing in Ireland.

The party then passed through the well-stocked nursery to Crarae Lodge where we were entertained to tea by our host. In thanking Sir George for his hospitality and for a most instructive and interesting tour Mr. Clear paid tribute to the foresight and energy shown by him in his forestry operations and said he was glad to see that the sylviculture as practiced by Sir George vindicated his oft repeated plea for wider spacing when planting and heavier thinnings.

And so we came to an end of our second excursion outside our own shores, and returned treasuring memories of new friendships and of the hospitality received in the Scottish Highlands.