

*Mr Anderson*  
*Blasindarroch*

ROYAL COLLEGE OF FORESTRY, STOCKHOLM

STUDENTS' TOUR

FORESTRY COMMISSION

EAST (SCOTLAND) CONSERVANCY

25th to 27th MAY 1966

Programme for the Tour

Wednesday, 25th May 1966

Morning - Visit to Craigvinean Forest.

Afternoon - Visit to Ledmore Nursery.

Thursday, 26th May 1966

Morning - Visit to Drumtochty Forest.

Afternoon - Visit to Glen Dye Estate.

Friday, 27th May 1966

Morning

and - Visit to Clashindarroch Forest.

Afternoon

Wednesday, 25th May 1966

Visits to Craigvinean Forest  
and Ledmore Nursery

Timetable and Itinerary

8.30 a.m. Leave Pitlochry.  
9.00 a.m. Arrive Dunkeld. Meet Mr. Donald at  
Car Park.  
Proceed to Craigvinean Forest.  
12.30 p.m. Pack lunch at the Hermitage if fine  
or Inverpark if wet.  
1.30 p.m. Proceed to Ledmore with Mr. Seal.  
4.30 p.m. Leave Ledmore.  
5.30 p.m. Arrive Pitlochry.

Craigvinean Forest

1. Supervisory Staff

Mr. F. J. Donald - District Officer  
Mr. E. D. Fraser - Head Forester  
Mr. C. R. Tracy - Forester

2. Situation and Climate

The forest lies on the western slopes of the River Tay valley stretching from the village of Birnam northwards. The River Braan, a tributary of the Tay, divides a small southern area (Ladywell) from the main block of Craigvinean and Dalguise sections.

Situated on the edge of the Highlands, about half way between the coast and the centre of the country, its climate is, as would be expected, oceanic with some tendency towards continental conditions. The average yearly rainfall is 38 inches (96.5 cms.) Summer rainfall i.e.,

May to September inclusive averages 16 inches (40.6 cms.) There is a relatively dry period in the spring but heavier rainfall during the peak growing season June to August.

The Tay valley is a well marked forest hollow. Late spring frosts are common. In 1962, an unexceptional year, temperatures of 28°F. (-4°C.) - low enough to damage sensitive plant tissues - were recorded on eighty-three days.

The prevailing wind is from the south west.

To sum up the climate is highly suitable for tree growth. It is reasonably warm with an average growing season and some danger from frosts. The rainfall is moderate and well distributed with high humidity and no risk of drought conditions. Most of the forest is well sheltered.

### 3. Area Statement

The first and principal acquisition making up the area known as Craigvinean Forest was from the Atholl Estates in 1937. Subsequent acquisitions have brought the total area to 4,088 acres (1,659 hectares).

#### Statement of Area

|                         | <u>Acres</u>   | <u>Hectares</u> |
|-------------------------|----------------|-----------------|
| Acquired Plantations    | - 395          | 160             |
| Planted by Forestry     |                |                 |
| Commission 1937 to 1945 | - 999          | 402             |
| Planted by Forestry     |                |                 |
| Commission 1945 to 1966 | - 2,385        | 973             |
| Total Woodland          | - <u>3,779</u> | <u>1,535</u>    |

|             | <u>Acres</u>   | <u>Hectares</u> |
|-------------|----------------|-----------------|
| Total Wood  | - 3,779        | 1,535           |
| Unplantable | - 241          | 97              |
| Other       | - 68           | 27              |
| Total Land  | - <u>4,088</u> | <u>1,659</u>    |

#### 4. Geology

Parent rocks, Dalradian metamorphic schistose grit and quartzite mica-schist.

There are boulder clay deposits and fluvio glacial deposits of sand and gravel on the lower slopes.

#### 5. Soils

Brown earths on lower slopes and podsoils on high ground. Some small areas of acid peat.

#### 6. Site Classification

Elevation - from 200 feet (65 metres) at Dunkeld to 1,600 feet (490 metres) at Elric Mhor.

Site classification is by soil type and altitude. Based on these two characteristics four broad zones have been selected up the hill-side wherein the soil types and soil fertility ranges vary only slightly and the crop types within a zone are not expected to vary much beyond one quality class.

The sites are as follows:-

Site 1

Mainly suitable for Douglas Fir  
Mean annual increment 175  
(15 cu. metres per hectare per annum).

Site 2

Mainly suitable for Spruces  
Mean annual increment 135  
(12 cu. metres per hectare per annum).

Site 3

Suitable for Spruces and Pines  
Mean annual increment 70  
(6 cu. metres per hectare per annum).

Site 4

Suitable for Pine (Pinus Contorta)  
Mean annual increment 45  
(4 cu. metres per hectare per annum).

7. Species and Age Class Distribution

(Hectares in brackets)

| Species                                     | Total<br>Acres | (ha.) | P. 61<br>to<br>P. 70 | P. 51<br>to<br>P. 60 | P. 41<br>to<br>P. 50 | P. 31<br>to<br>P. 40 | P. 21<br>to<br>P. 30 | Pre<br>P. 21 |
|---------------------------------------------|----------------|-------|----------------------|----------------------|----------------------|----------------------|----------------------|--------------|
| Scots Pine<br><i>Pinus Sylvestris</i>       | 537            | 217   | 17                   | 222                  | 211                  | 57                   | 4                    | 26           |
| Lodgepole Pine<br><i>Pinus Contorta</i>     | 267            | 108   | 136                  | 99                   | 32                   | -                    | -                    | -            |
| Larches ( <i>Larix</i> )                    | 776            | 314   | 40                   | 284                  | 166                  | 112                  | 168                  | 6            |
| Norway Spruce<br><i>Picea abies</i>         | 891            | 361   | -                    | 181                  | 524                  | 128                  | 30                   | 28           |
| Sitka Spruce<br><i>Picea sitchensis</i>     | 44.7           | 181   | 35                   | 12                   | 376                  | 24                   | -                    | -            |
| Douglas Fir<br><i>Pseudotsuga Menziesii</i> | 14.3           | 58    | -                    | 45                   | 68                   | -                    | 1                    | 29           |
| Other Conifers                              | 88             | 36    | 43                   | 9                    | 29                   | 4                    | 1                    | 2            |
| Pine/Spruce                                 | 368            | 148   | -                    | 258                  | 110                  | -                    | -                    | -            |
| Pine/Larch                                  | 102            | 41    | -                    | 90                   | 12                   | -                    | -                    | -            |
| Hardwoods                                   | 132            | 53    | -                    | 33                   | 9                    | -                    | -                    | 90           |
| Oak/Larch                                   | 28             | 11    | -                    | 28                   | -                    | -                    | -                    | -            |
| Total Acres                                 | 3,779          | -     | 271                  | 1,261                | 1,537                | 325                  | 204                  | 181          |
| (ha.)                                       | (1,528)        | -     | (110)                | (511)                | (622)                | (131)                | ( 81)                | (73)         |

## 8. Production Forecast

Present timber production is mostly from thinnings from acquired plantations and Forestry Commission plantations planted before 1945. The average annual outturn of about 100,000 h.ft. (3,600 cu. metres) is sold standing. By 1975 the average annual outturn is expected to be about 330,000 h.ft. (12,000 cu. metres) per annum.

Detailed forecasts are as follows -

|                   | 000s heppus feet<br>(cubic metres in brackets) |              |               |               |               |
|-------------------|------------------------------------------------|--------------|---------------|---------------|---------------|
|                   | <u>66</u>                                      | <u>70</u>    | <u>75</u>     | <u>80</u>     | <u>85</u>     |
| Pines             | 6                                              | 28           | 16            | 31            | 39            |
| Spruces           | 50                                             | 99           | 164           | 179           | 182           |
| Larches           | 20                                             | 55           | 105           | 68            | 116           |
| Other             | 10                                             | 20           | 46            | 34            | 46            |
| Total             |                                                |              |               |               |               |
| 000s h.ft.        | 86                                             | 202          | 331           | 312           | 383           |
| (M <sup>3</sup> ) | <u>3,101</u>                                   | <u>7,282</u> | <u>11,938</u> | <u>11,253</u> | <u>13,812</u> |

## 9. Roads

Thirty-five miles (56 Km) of roads have been completed or formed. It is estimated that another nine miles (14 Km) will be required before 1969. Requirements after that date will be met by the completion of another two miles (3.2 Km).

## 10. Houses

Twelve houses are let to forest workers and two are occupied by supervisors.

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# 11. Labour

The number of workers employed at present is ten. Timber Merchants who have contracted to purchase and work the timber employ a further six men.

## Notes on Stopping Places

### 1. Hermitage

Large Douglas Fir (*Pseudotsuga Menziesii*) and Silver Fir (*Abies grandis*) in 50 acres National Trust Woodlands.

|                       |   | <u>Height</u> |               | <u>Volume</u> |              |
|-----------------------|---|---------------|---------------|---------------|--------------|
|                       |   | <u>Feet</u>   | <u>metres</u> | <u>cu.ft.</u> | <u>cu.m.</u> |
| Douglas Fir           |   |               |               |               |              |
| Pseudotsuga Menziesii |   | 146½          | 44.6          | 450           | 16.2         |
| "                     | " | 133½          | 40.6          | 246           | 8.8          |
| "                     | " | 125½          | 38.3          | 327           | 11.8         |
| Silver Fir            |   |               |               |               |              |
| Abies Grandis         |   | 112           | 34.1          | 306           | 11.0         |
| Cedar                 |   | 98            | 29.9          | 480           | 17.3         |
| Douglas Fir           |   |               |               |               |              |
| Pseudotsuga Menziesii |   | 169           | 51.5          | 368           | 13.3         |

2. Compartment 21

Douglas Fir (*Pseudotsuga Menziesii*), P.49  
(Id. No. 46/1 USA).

|             | <u>Per Acre</u> | <u>Per Hectare</u> |
|-------------|-----------------|--------------------|
| Stems       | 1,080           | 2,667              |
| Basal Area  | 93 sq.ft.       | 27 sq. metres      |
| Volume      | 1,684 h.ft.     | 150 cu. metres     |
| Yield Class | 160 h.ft.       | 14 cu. metres      |

3. Compartment 24

View overlooking acquired Hybrid Larch  
(*Larix eurolepis*) Plantation P.22 and Ladywell  
area. Left hand section P.47 and on right  
P.38, 39. In foreground P.49. Tay valley  
and Atholl Estate across the river.

Leave and travel along road 5 passing P.49,  
P.48, P.42 and P.41 to Compartment 75.

4. Compartment 75

European Larch (*Larix decidua*) (P.41) die-  
back. Future treatment includes cutting out  
all diseased stems to leave stocking of  
approximately 100 overall per acre (247 per  
hectare).

|             | <u>Acre</u> | <u>Hectare</u>  |
|-------------|-------------|-----------------|
| Stems       | 900         | 2,224           |
| Basal Area  | 60 sq.ft.   | 17.5 sq. metres |
| Volume      | 594 h.ft.   | 53 cu. metres   |
| Yield Class | 40 h.ft.    | 3.6 cu. metres  |
| Thinning    | 396 h.ft.   | 35 cu. metres   |
|             | 600 trees   | 1,483 trees     |

5. Dalguise Acquisition

Through P.55, P.51, P.52 to Elric Mhor area P.63 and 64 to inspect ploughing on upper heights. No beating up has been required in this area. All bog areas planted received 2 oz. (60 grams) G.M.P. at time of planting. Elevation from fence to planting line 1,350-1,550 feet (400-470 m.)

6. Compartment 110

General view of basin comprising Norway Spruce (*Picea abies*) in flushes P.50 and P.55. Pines on knolls with Japanese Larch (*Larix leptolepis*) on higher slopes (P.51) looking towards Elric Mhor.

7. Compartment 119

Hardwood and amenity area. Old hardwoods felled in groups and replanted with oak, beech, etc. with a surrounding matrix of conifers mainly Norway Spruce (*Picea abies*) and a variety of Silver Fir (*Abies grandis*). The aim here has been to preserve amenity while increasing timber producing potential.

8. Compartment 83

*Abies Grandis* P.40 showing rapid growth.

|                | <u>Per Acre</u> | <u>Per Hectare</u> |
|----------------|-----------------|--------------------|
| Stems          | 450             | 1,112              |
| Basal Area     | 130 sq.ft.      | 38 sq. metres      |
| Volume         | 6,800 h.ft.     | 605.6 cu. metres   |
| Yield Class    | 260 h.ft.       | 23 cu. metres      |
| Thinnings P.67 | 730 h.ft.       | 64 cu. metres      |

9. Compartment 53

Acquired Hybrid Larch (*Larix eurolepis*)  
P.22 and Douglas Fir (*Pseudotsuga Menziesii*)  
1901 underplanted in P.61 with Norway Spruce  
(*Picea abies*) and Douglas Fir (*Pseudotsuga*  
*Menziesii*) at 1,100 per acre (2,720 per  
hectare).

Hybrid Larch (*Larix eurolepis*)

|               | <u>Per Acre</u> | <u>Per Hectare</u> |
|---------------|-----------------|--------------------|
| Stems         | 140             | 346                |
| Basal Area    | 70 sq.ft.       | 20.4 sq. metres    |
| Volume        | 2,718 h.ft.     | 242 cu. metres     |
| Yield Class   | 120 h.ft.       | 10.7 cu. metres    |
| Thinning P.66 | 84 trees        | 207 trees          |
|               | 1,390 h.ft.     | 124 cu. metres     |

Douglas Fir (*Pseudotsuga Menziesii*)

|               | <u>Per Acre</u> | <u>Per Hectare</u> |
|---------------|-----------------|--------------------|
| Stems         | 138             | 340                |
| Basal Area    | 132 sq.ft.      | 38.5 sq. metres    |
| Volume        | 4,974 h.ft.     | 440 cu. metres     |
| Yield Class   | 180 h.ft.       | 16 cu. metres      |
| Thinning P.66 | 18 trees        | 45 trees           |
|               | 720 h.ft.       | 64 cu. metres      |

## Ledmore Nursery

### 1. Supervisory Staff

Mr. D. T. Seal - District Officer  
Mr. A. Rose - Head Forester  
Mr. J. MacLean - Forester

Nearby Strathord Forest, 1,600 acres (640 hectares) is also under their charge.

### 2. Purpose

Ledmore provides six million plants annually for planting in the Commission's Forests in Perthshire, Angus, Kincardine and Fife. The nursery is centrally situated for delivering plants to these areas.

### 3. Establishment

The nursery is part of the former Ledmore Farm which was purchased by the Forestry Commission in 1950. The nursery was established in sections, a new section being taken in each year until the nursery reached its present size of 56 acres (22.7 hectares). The ground was infested with weeds and there was a plough pan. Each section was therefore deep-ploughed, subsoiled and well cultivated before being used for tree crops. Lay-out was designed to suit mechanised lining-out and each main section is 120 yards (109 metres) long.

### 4. Weather and Soil

Annual rainfall is about 35 inches (90 cms.) Unseasonable frosts are rare but the heavy soil is very subject to frost lift in winter and the main work - lining-out - is therefore confined to spring. The soil is slow to dry out and

this further concentrates lining-out into a period of six to eight weeks.

5. Fertility

Each section is rested under an oats/tares green crop and usually every third year. Inorganic N.P.K. fertilizers are prescribed by the Macaulay Institute for Soil Research in Aberdeen, following their periodic analysis of a sample of the nursery soil. Soil pH in the conifer sections averages 5.3. Some of the smaller sections of the nursery are reserved for hardwoods and these are given dressings of lime and of leaf mould when available. Broiler litter is used on both conifer and hardwood sections.

(One of the main conifer sections is never green cropped. There has been no appreciable effect so far.)

6. Production

Most of the planting stock produced is grown from seedlings imported from the Commission's Newton and Teindland nurseries in Morayshire. The main species handled and the ages at which they are imported and exported are as follows -

| <u>Species</u>                     | <u>Imported</u> | <u>Exported</u> |
|------------------------------------|-----------------|-----------------|
| Scots Pine<br>(Pinus Sylvestris)   | 2 years         | 2+1             |
| Pinus Contorta                     | 1 year          | 1+1             |
| Larches (Larix)                    | 1 year & 2 year | 1+1 & 2+1       |
| Norway Spruce<br>(Picea abies)     | 1 year & 2 year | 1+2 2+2         |
| Sitka Spruce<br>(Picea sitchensis) | 1 year & 2 year | 2+1 1+2         |

The average lining-out programme is six million seedlings.

Limited quantities of Scots Pine (*Pinus Sylvestris*) and Larch (*Larix*) planting stock are grown from seed.

The seed is sown by machine and in lines. The seedlings are undercut (root pruned) by machine instead of being transplanted. Undercutting is done in the spring of the second year and the seedlings exported for planting at two years old when they are termed "1 undercut 1's" or "1 u 1's".

Hardwood planting stock is produced by undercutting broadcast sown beds to produce "1 u 2" or "1 u 3" plants for export.

7. Labour

There are fifteen permanent workers in the nursery, and eighteen temporary workers (mainly women and boys) are employed from March to September on a 40-hour week. The use of temporary, unskilled workers succeeds because the main operations have been mechanised.

Most of the permanent workers occupy Forestry Commission houses in Bankfoot; temporary workers are drawn from Bankfoot and Perth.

8. Operations and Machines

- A. Lining-Out: The machine used is the Ledmore Lining-out Plough, developed by Mr. Rose and made by a local blacksmith, Mr. Black, of Redgorton, Perth, at a cost of approximately £130 (1,898 Kr.)

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The plough is mounted on the hydraulic lift of the Ferguson tractor (other tractors can be used). The plough opens one trench with a vertical edge on which loaded lining-out boards are placed. On its next pass the plough fills the trench and opens the next.

Each trench is filled and firmed in two stages so that the seedlings are firmly set and no voids are left. The plough cultivates in advance of trenching. Depth of furrow and alignment of plough with tractor are adjustable.

Method: Each plough attended by fifteen workers who work from three lining-out shelters. The lining-out boards are filled and placed ready for the plough, and retrieved when the plough has passed. In each shelter a master board determines the spacing of seedlings in the line. Lining-out boards are fitted with sorbo-rubber grips and quick release clips.

Performance: The machine makes lines at 9 inches (22.8 cms.) apart. Every sixth line is left without seedlings to provide paths for subsequent tractor work among the transplants. Within each line seedlings can be set 1,  $1\frac{1}{2}$  or 2 inches (2.5, 3.8 or 5 cms.) apart. Each machine and squad average 140,000 seedlings per day at 1 inch (2.5 cms.), 120,000 per day at  $1\frac{1}{2}$  inch (3.8 cms.) and 90,000 at 2 inches (5 cms.) spacing. Average labour cost (mainly at  $1\frac{1}{2}$  inch (3.8 cms.) are 5s. 6d. to 6s. 6d. (4 to 4.7 Kr.) per 1,000 seedlings.

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- B. Conifer Seed Sowing: The machine used is the Ledmore 6-drill seed sower, developed by Mr. Rose and made by Black of Redgorton, Perth, at £105 (1,533 Kr.). A grit spreader is used in conjunction with the seed sower. The machine is mounted on the hydraulic lift of the tractor and comprises a large roller, 6 seed hoppers each with an agitator, adjustable delivery disc, telescopic delivery tube and small roller.

Method: Seedbeds are thrown up by twin ridging ploughs and tilled by rotovator. The seed sower hoppers are filled and the rate of delivery of seed set according to germination capacity. The grit spreader can be towed behind the seed-sower so that sowing and gritting are done together.

Performance: The sower sets six single lines of seed 6 inches (15 cms.) apart and at a density aimed at providing 1 seedling per inch (per 2.5 cms.) in each line. Such beds are designed for subsequent undercutting to produce plantable seedlings without transplanting.

- C. Undercutting: Machine used is the Ledmore undercutter designed by Mr. Rose and made by Black of Redgorton, Perth, at £35 (511 Kr.) The undercutter is mounted on tractor hydraulic lift. The machine straddles the beds sown by drill sower. The blades pass at  $2\frac{1}{2}$  to 3 inches (60 to 75 mms.) depth and cut the tap roots. The depth of cutting is adjustable. The machine is also used for undercutting broadcast-sown hardwoods.

Conifers are undercut at the beginning of their second year's growth and respond by producing more lateral roots. Lateral root growth is sometimes also pruned by 'side-cutting' using vertical blades mounted on a tractor tool bar so as to pass between the lines of the drill-sown bed.

- D. Weeding: The machine used is the Inter-row cultivator assembled by Mr. Rose using agricultural cultivators. Available from Black of Redgorton, Perth, at £80 (1,168 Kr.) approximately.

The machine is mounted on the tractor hydraulic lift. The vertical spring tines travel between lines of transplants and each alleyway is hoed and raked at the same time. The number and spacing of the tines are adjustable. The central tines can be removed for weeding alleys only (e.g. broadcast seedbeds). The machine can be used at 3-4 m.p.h. (5 to 7 kms./hour) so that large areas can be covered quickly. It is very effective provided it is used frequently and before large weeds have become established. Weeds between plants in a single line of transplants are removed by hand. Chemical weedkillers are now being introduced.

- E. Lifting: The machine used is the Gunn Lifter. This machine is in use in many nurseries. That at Lodmore is made locally at £16 10s. (238 Kr.) The broad blade is set at an angle and drawn beneath the seedlings or transplants so as to raise and loosen them. A refinement used

at Ledmore is the fitting of vertical  
tines so that the soil between transplant  
lines is broken up ready for lifting.  
Once the lifter has passed the plants  
can easily be lifted by hand.

Ledmore - Production Costs  
(per '000 Plants - 1964)

|                                  | Kr.   |       |       |       |     |       |
|----------------------------------|-------|-------|-------|-------|-----|-------|
|                                  | 1     | 1 u 1 | 1 + 1 | 2 + 1 | 1+2 | 2 + 2 |
| <i>Pinus sylvestris</i>          | 17.50 | 52.50 | -     | -     | -   | -     |
| <i>Pinus Contorta</i>            | -     | -     | -     | 51    | 63  | -     |
| <i>Larix decidua</i>             | -     | -     | 60.50 | -     | -   | -     |
| <i>Larix leptolepis</i>          | -     | -     | 63    | -     | -   | -     |
| <i>Larix eurolepis</i>           | -     | -     | 46    | 60    | -   | -     |
| <i>Pseudotsuga<br/>taxifolia</i> | 45    | 56    | -     | 69.50 | -   | -     |
| <i>Picea abies</i>               | -     | -     | -     | 80    | 67  | 114   |
| <i>Picea sitchensis</i>          | -     | -     | 60    | 45    | 82  | 53.50 |
| <i>Quercus</i>                   | -     | 216   | -     | -     | -   | -     |
| <i>Fagus</i>                     | -     | -     | 112   | -     | 122 | -     |
| <i>Acer</i>                      | -     | -     | 148   | -     | -   | -     |

£1 to Kr. @ 14.60 Kr. = £1.

Thursday, 26th May 1966  
Visits to Drumtochty Forest  
and Glen Dye Estate

Tinetable and Itinerary

8.30 a.m. Leave Pitlochry for Drumtochty via  
Dunkeld, Blairgowrie, Brechin  
and Auchenblae.  
10.30 a.m. Arrive Drumtochty Sawmill.  
1.30 p.m. Pack lunch at Drumtochty or  
leave Drumtochty and have lunch  
at Cairn o Mount  
2.30 p.m. Arrive Glen Dye.  
4.30 p.m. Leave Glen Dye.  
5.30 p.m. Arrive Aberdeen.

Drumtochty Forest

1. Supervisory Staff

Mr. J. G. Chrystall - District Officer  
Mr. W. McDonald - Head Forester  
Mr. T. W. MacMillan - Forester  
Mr. M. Cruickshank - Trainee Forester

2. Situation and Climate

The forest consists of one main compact block of plantation and two small outlying areas. The main block occupies the land on both sides of the Glen of Drumtochty and extends northwards to cover Goyle Hill and Glenfarquhar where it marches with the Commission's forest at Fetteresso - southwards it includes Strath Finella Hill and the land sloping down to the arable land of the Howe of the Mearns. The outlying blocks are small, one of them, at Redhall, is a mile south of

Auchenblae, and the other, Arthurhouse, is about a mile east of Fordoun Station.

Rainfall and temperature are recorded at Glensaugh Farm (elevation 600 feet (180 metres)) which is situated about a mile west of the forest boundary. The average annual rainfall recorded there over the period from 1949-1962 is 40.3 inches (102 cm.) with a high of 52.4 inches (133 cm.) in 1958 and a low of 26.8 inches (68 cm.) in 1959. The driest period of the year is from March to June. Frost has been recorded at Glensaugh in every month of the year and it is noteworthy that a reading of 10°F. (-12° C.) was recorded in the last week of May 1961. Snowfall can be heavy. Prevailing winds are from the south-west but, except on the highest ground, exposure is moderate because of the protection from higher ground to the north and west.

### 3. Area Statement

The forest land was acquired in several lots over the years. The first lots were acquired in the period 1926-1928 and planting on these was completed by 1939. The remainder was acquired in the period 1950-1959 and planting of this area is now virtually completed.

#### Statement of Area

|                                              | <u>Acres</u> | <u>Hectares</u> |
|----------------------------------------------|--------------|-----------------|
| Acquired Woods                               | 283          | 114             |
| Planted by Forestry<br>Commission to 1946    | 2,072        | 838             |
| Planted by Forestry<br>Commission since 1946 | 4,208        | 1,703           |
| Still to Plant                               | 193          | 78              |
|                                              | <hr/>        | <hr/>           |
| c/f                                          | 6,756        | 2,733           |

|                          | <u>Acres</u> | <u>Hectares</u> |
|--------------------------|--------------|-----------------|
| B/F                      | 6,756        | 2,733           |
| Other Land - Agriculture |              |                 |
| etc.                     | 52           | 21              |
| Unplantable              | 2,382        | 964             |
| Total                    | <u>9,190</u> | <u>3,718</u>    |

#### 4. Geology and Soils

The forest extends over most of the Hill of Strath Finella and northwards across the Highland Boundary Fault into the edge of the Grampian Hills.

The Hill of Strath Finella is carved from sandstone and conglomerates of Lower Old Red Sandstone age and is overlain by glacial drift which may be divided into two parent soil types. The hill slopes up to 1,000 feet (300 metres) are covered by a light textured till derived from the underlying sandstones and conglomerates with a slight mixture of highland schist material. This material gives rise to soil whose podsollic characteristics may be locally partially obscured by strong colluvial erosion and deposition on the steeper slopes. Above 1,000 feet (300 metres) the glacial till is derived from highland schist material moved in by the sheet ice off the hills to the north with only a limited dilution of local sandstone and conglomerate material. Under the more severely exposed conditions podsol and peaty podsoles with thin iron pan are developed.

North of the Glen of Drumtochty the glacial drift on which the soils have developed is derived from Highland schists. Below 1,000 feet (300 metres) the soils are podsoles

in which a discontinuous thin iron pan may be present. Above this level podzols and peaty podzols with well developed thin iron pan are general.

On areas with moderate to steep slope and convex form the peat depth is from 3-9 inches (10-25 centimetres), the greater depths occurring on north aspects. As the degree of slope diminishes the depth of peat increases and on flats or where concave slopes level out depths of 3 feet (90 centimetres) and more occur. It is only on the very steep slopes that a peat covering is absent and even then only on the more fertile sites with a south aspect.

#### 5. Site Classification

The main limiting factor to tree growth is exposure to strong wind and, to a lesser extent, to poverty of soil and peat bog at higher altitudes. This is important as a large section of the forest is over 1,000 feet (300 metres) above sea level.

All land is ploughed before planting and, where conditions are particularly adverse to establishment of Spruce, Ground Mineral Phosphate is applied at the rate of  $1\frac{1}{2}$  cwt. per acre (190 Kg. per hectare).

## 6. Species and Age Class Distribution

(Lectures in brackets)

| Species                          | Total<br>Acres | Total<br>(ha.) | P. 61<br>to<br>P. 70 | P. 51<br>to<br>P. 60 | P. 41<br>to<br>P. 50 | P. 31<br>to<br>P. 40 | P. 21<br>to<br>P. 30 | Pre<br>to<br>P. 21 |
|----------------------------------|----------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|--------------------|
| Scots Pine                       |                |                |                      |                      |                      |                      |                      |                    |
| Pinus Sylvestris                 | 1,085          | (440)          | 353                  | 641                  | 2                    | 24                   | 52                   | 13                 |
| Lodgepole Pine                   |                |                |                      |                      |                      |                      |                      |                    |
| Pinus Contorta                   | 1,273          | (515)          | 575                  | 575                  | -                    | 85                   | 38                   | -                  |
| Sitka Spruce                     |                |                |                      |                      |                      |                      |                      |                    |
| Picea Sitchensis                 | 1,373          | (556)          | 348                  | 468                  | 125                  | 229                  | 199                  | 4                  |
| Norway Spruce                    |                |                |                      |                      |                      |                      |                      |                    |
| Picea Abies                      | 1,296          | (196)          | 30                   | 184                  | 23                   | 119                  | 125                  | 3                  |
| European Larch                   |                |                |                      |                      |                      |                      |                      |                    |
| Larix decidua                    | 373            | (151)          | -                    | 51                   | -                    | 151                  | 49                   | 122                |
| Japanese Larch                   |                |                |                      |                      |                      |                      |                      |                    |
| Larix leptolepis                 | 1,323          | (535)          | 61                   | 529                  | 16                   | 423                  | 294                  | -                  |
| Hybrid Larch                     |                |                |                      |                      |                      |                      |                      |                    |
| Larix europaeis                  | 268            | (108)          | 100                  | 138                  | -                    | -                    | 30                   | -                  |
| Douglas Fir                      |                |                |                      |                      |                      |                      |                      |                    |
| Pseudotsuga Menziesii            | 110            | (45)           | -                    | 30                   | 9                    | 24                   | 36                   | 11                 |
| Western Hemlock                  |                |                |                      |                      |                      |                      |                      |                    |
| Tsuga heterophylla               | 42             | (17)           | 2                    | -                    | -                    | 40                   | -                    | -                  |
| Other Conifers                   | 167            | (67)           | 7                    | 63                   | 2                    | 42                   | 40                   | 6                  |
| Hardwoods                        | 65             | (26)           | -                    | 13                   | 17                   | 5                    | -                    | 30                 |
| Total Acres                      | 6,563          |                | 1,476                | 2,692                | 194                  | 1,149                | 863                  | 189                |
| (ha.)                            | (2,656)        | (598)          | (598)                | (1,089)              | (79)                 | (465)                | (349)                | (76)               |
| Overstorey (Area Included above) |                |                |                      |                      |                      |                      |                      |                    |
| Scots Pine                       |                |                |                      |                      |                      |                      |                      |                    |
| Pinus Sylvestris                 | 9              | (4)            | -                    | -                    | -                    | -                    | -                    | 9                  |
| Mountain Pine                    |                |                |                      |                      |                      |                      |                      |                    |
| Pinus Mugo                       | 22             | (8)            | -                    | -                    | -                    | 13                   | 9                    | -                  |
| European Larch                   |                |                |                      |                      |                      |                      |                      |                    |
| Larix decidua                    | 217            | (88)           | -                    | -                    | -                    | 115                  | 13                   | 89                 |
| Total Acres                      | 248            |                | -                    | -                    | -                    | 128                  | 22                   | 98                 |
| (ha.)                            | 100            |                | -                    | -                    | -                    | (52)                 | (8)                  | (40)               |

## 7. Production Forecast

000s hoppus feet  
(cubic metres in brackets)

|                   | <u>66</u> | <u>70</u> | <u>75</u> | <u>80</u> | <u>85</u> |
|-------------------|-----------|-----------|-----------|-----------|-----------|
| Pines             | 7         | 7         | 12        | 11        | 29        |
| Spruces           | 37        | 38        | 87        | 117       | 182       |
| Larches           | 71        | 67        | 114       | 115       | 113       |
| Other             | 22        | 23        | 29        | 31        | 29        |
| Total             |           |           |           |           |           |
| 000s h.ft.        | 137       | 135       | 242       | 274       | 353       |
| (M <sup>3</sup> ) | 4,940     | 4,870     | 8,720     | 9,870     | 12,730    |

## 8. Roads

The whole forest road system has been laid out and surveyed. The total mileage of road in the road plan is 81 miles (130 Km.) of which 46 miles (74 Km.) have been built to formation stage or the metalled stage. The older block of the forest which is now almost all in the thinning stage has been completely roaded for extraction purposes. In the Glenfarquhar section a skeleton road system has been formed in conjunction with planting i.e., the main communicating roads are made for the transport of labour, plants and materials and for fire protection and administrative purposes. The development of the full road system will be delayed until the need for extraction and transport of produce arises.

## 9. Houses

There are houses for the supervisors and a number of the workers. In all there are

ten houses of which four are occupied by supervisory staff and four are forest workers holdings which consist of a house with a small area of land attached.

10. Labour

In addition to the supervisory staff detailed at 1. there are fourteen forest workers. Timber merchants who have contracted to purchase and work the timber employ a further twenty men.

Notes on Stopping Places

1. Compartment 154

Panoramic view of post-war plantations and road lay-out.

2. Research Branch Experiments

Compartment 141 (i) European Larch (*Larix decidua*) 'dieback' experiment.

Compartment 132 (ii) Japanese Larch (*Larix leptolepis*) thinnings and replacement experiment.

3. Compartment 118

Replanting of windblow.

## Glen Dye Estate

1.           Owner       - E. W. Gladstone Esq.  
             Factor       - L. A. Adam Esq.  
             Forester    - R. Beattie Esq.

2.   Situation and Climate

Glen Dye Estate covers the whole catchment area of the Water of Dye.

Rainfall is recorded on the Estate and the average rainfall over many years is 40.1 inches (102 cms.) Elevation of the forested area lies between 300 feet (90 metres) and 1,000 feet (300 metres). Snowfalls are heavy and winters are severe.

3.   Geology and Soils

The underlying rock is granite with intrusive bands of felsite but the soil is derived mainly from glacial tills and fluvio-glacial gravels and sands. Morainic knolls and ridges are common on the Estate. A peat covering is general and its depth varies between 3-9 inches (7-25 cms.) though greater depths are found where natural drainage is poor.

4.   History

Glen Dye Estate was purchased in 1854 by the late Sir Thomas Gladstone, Bart., of Fasque - a brother of the Rt. Hon. W. E. Gladstone. At this time there was very little timber on the Estate but the late Sir Thomas commenced planting operations on an extensive scale and this practice has been continued by his successors. Over 1,500 acres (600 hectares) have been planted since 1939. The

woodlands are almost entirely conifers, with the main species Scots Pine (*Pinus Sylvestris*).

A tree seed orchard has been laid out in the last few years and is being stocked with European Larch (*Larix decidua*) and Scots Pine (*Pinus Sylvestris*). The scions were collected from selected trees on the Estate.

#### 5. Area Statement

Glen Dye Estate is worked to a forest plan under the Forestry Commission's Dedication Scheme. The woodland area under Dedication is:-

|                   | <u>Acres</u> | <u>Hectares</u> |
|-------------------|--------------|-----------------|
| Stocked area      | 2,821        | 1,142           |
| Awaiting planting | 116          | 47              |
| Unplantable       | 10           | 4               |
| <b>Total</b>      | <b>2,947</b> | <b>1,193</b>    |

#### 6. Age Class Distribution

|              | <u>Acres</u> |       | <u>Hectares</u> |      |
|--------------|--------------|-------|-----------------|------|
| 1961-70      | 237          |       | 96              |      |
| 1951-60      | 886          |       | 358             |      |
| 1941-50      | 459          | 1,582 | 186             | 64.0 |
| 1931-40      | 93           |       | 38              |      |
| 1921-30      | 258          |       | 104             |      |
| 1901-20      | 180          | 531   | 73              | 215  |
| 1881-00      | 294          |       | 119             |      |
| Pre 1881     | 244          | 538   | 99              | 218  |
| Uneven Aged  | 170          | 170   | 69              | 69   |
| <b>Total</b> | <b>2,821</b> |       | <b>1,142</b>    |      |

7. Labour and Houses

The Estate workers are housed on the Estate and they do all the forestry work apart from the timber felling. The timber, thinnings and clear felling, is sold standing to timber merchants.

8. Sawmill Wood

One hundred and eighty years old Scots Pine (*Pinus Sylvestris*) underplanted with *Abies* 80 years ago after windblow and again about 40 years ago.

Pitadelphin Wood

- A. A stand of mature Scots Pine (*Pinus Sylvestris*) marked for thinning.
- B. Natural regeneration of Scots Pine (*Pinus Sylvestris*) and *Abies*.

A.

1. Species

Scots Pine  
(Pinus Sylvestris)

Age 1859

2. Number of Trees

per acre 300

per hectare 740

3. Basal Area

sq.ft. per acre 196

M<sup>2</sup> per hectare 57

4. Height

72 feet

22 metres

5. Estimated Volume

h.ft. per acre 6,300

M<sup>3</sup> per hectare 560

B.

1. Species

Abies, Scots Pine  
(Pinus Sylvestris)  
and European Larch  
(Larix decidua)

Age 1906

2. Number of Trees

|          |                |       |             |       |
|----------|----------------|-------|-------------|-------|
| per acre | Abies          | 60    | per hectare | 150   |
|          | Other Conifers | 250   |             | 620   |
|          |                | <hr/> |             | <hr/> |
|          |                | 310   |             | 770   |
|          |                | <hr/> |             | <hr/> |

3. Basal Area

|                 |                |                            |       |
|-----------------|----------------|----------------------------|-------|
| sq.ft. per acre |                | M <sup>2</sup> per hectare |       |
|                 | Abies          | 132                        | 39    |
|                 | Other Conifers | 63                         | 18    |
|                 |                | <hr/>                      | <hr/> |
|                 |                | 195                        | 57    |
|                 |                | <hr/>                      | <hr/> |

4. Height

|                |         |           |
|----------------|---------|-----------|
| Abies          | 92 feet | 28 metres |
| Other Conifers | 60 feet | 18 metres |

5. Estimated Volume

|                |                |                            |       |
|----------------|----------------|----------------------------|-------|
| h.ft. per acre |                | M <sup>3</sup> per hectare |       |
|                | Abies          | 8,070                      | 720   |
|                | Other Conifers | 1,560                      | 140   |
|                |                | <hr/>                      | <hr/> |
|                |                | 9,630                      | 860   |
|                |                | <hr/>                      | <hr/> |

Friday, 27th May 1966

Visit to Clashindarroch Forest

Timetable and Itinerary

8.30 a.m. Leave Aberdeen.  
9.30 a.m. Arrive Clashindarroch.  
12.30 p.m. Pack lunch.  
4.30 p.m. Leave Clashindarroch.  
5.30 p.m. Arrive Aberdeen.

1. Supervisory Staff

|                       |                    |
|-----------------------|--------------------|
| Mr. K. N. V. Townsend | - District Officer |
| Mr. D. Anderson       | - Chief Forester   |
| Mr. J. Allan          | - Forester         |
| Mr. P. White          | - Forester         |
| Mr. D. Cotton         | - Trained Forester |

2. Situation and Climate

The two large blocks of this forest are divided by the River Begie which runs parallel with the Huntly/Rhynie road (A.97).

The annual rainfall varies from 35 inches (88.9 cm.) to 40 inches (101.6 cm.) and is evenly distributed throughout the year. All plantations are above 700 feet (213 m.) above mean sea level. The altitude of the plantations with cloud cover, lower temperatures, high humidities and snow cover must contribute to the water supplies. The prevailing wind is westerly, but north and north-west winds can be severe. Snow drifts lie late in depressions and on north slopes.

Severe frosts are frequent in spring and

may occur in any month of the year. Bends and contractions in the long valleys probably dam up cold air and this may account for frost damage higher up the valley slopes than would be expected.

3. Area Statement

The main block was acquired from the Duke of Richmond and Gordon in 1929 during a period of agricultural depression. A number of smaller areas were subsequently acquired from adjoining proprietors and a number of agricultural subjects have been sold to sitting tenants.

|                    | <u>Acres</u> | <u>Hectares</u> |
|--------------------|--------------|-----------------|
| Forest Land        | 12,838       | 5,194           |
| Remaining to plant | 192          | 79              |
| Total              | 13,030       | 5,273           |
| Agricultural       | 913          | 370             |
| Holdings           | 82           | 33              |
| Unusable           | 2,738        | 1,108           |
| Other              | 134          | 54              |
| Total              | 16,897       | 6,838           |

Planting programme P.66 = 122 acres  
(49 hectares).

4. Geology and Soil

The following classes of rock are represented -

Metamorphic - knotted schists, phyllites, slates  
contact-altered schists, mica  
schists, quartzite and flags.

Igneous - norite, hornblende schists and  
serpentine.

Sedimentary - Old Red Sandstone.

The area is extensively covered by drift, the covering being thin or absent on the upper slopes, ridges and convex features generally. The drift is specially deep in the region of the hornblende schists, norite, contact-altered schists and pebbly bands.

Except on the ridges and plateaux there has been no serious podsolisation or pan formation. The fertility of the soils has not apparently been a limiting factor to tree growth, but surface conditions caused early failures, particularly of spruces.

#### 5. Site Classification

The forest is hilly and elevated. Approximately, 2,500 acres (1,012 hectares) of plantation lie above the 1,250 feet (381 m.) contour. It is trisected by the deep valleys of the Kirkney and Lag burns which run from West to East. These valley slopes are steep 20° to 30°. South facing slopes are dry but north facing slopes tend to be rather moist with considerable moss growth. Since enclosure stopped burning and grazing, mosses and peat have accumulated and establishment of a tree crop has been difficult on these unploughable slopes.

All aspects are found. The exposure is

greatly moderated by the high proportion of valley slopes within the plantable area. It is a serious factor on the upper slopes, ridges and plateaux.

Conditions are generally difficult for the establishment of Sitka Spruce (*Picea Sitchensis*), and Lodgepole Pine (*Pinus Contorta*) is used either as a nurse in frosty areas or to suppress calluna. Estimated mean annual increment of Sitka Spruce (*Picea Sitchensis*) is between 160 and 180 h.ft. per acre per annum (14 and 16 cu. metres per hectare per annum).

# 6. Species and Age Class Distribution

(Hectares in brackets)

| Species                                                               | Total<br>Acres | (Ha.) | P.61<br>to<br>P.70 | P.51<br>to<br>P.60 | P.41<br>to<br>P.50 | P.31<br>to<br>P.40 | P.21<br>to<br>P.30 |
|-----------------------------------------------------------------------|----------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Scots Pine<br>Pinus Sylvestris                                        | 675            | 273   | -                  | 18                 | 182                | 442                | 33                 |
| Lodgepole Pine<br>Pinus Contorta                                      | 1,660          | 671   | 96                 | 1,426              | 50                 | 88                 | -                  |
| Sitka Spruce<br>Picea Sitchensis                                      | 1,375          | 556   | 129                | 100                | 681                | 434                | 31                 |
| Norway Spruce<br>Picea Abies                                          | 1,698          | 687   | -                  | 355                | 492                | 803                | 48                 |
| European Larch<br>Larix decidua                                       | 630            | 255   | -                  | -                  | -                  | 599                | 31                 |
| Japanese Larch<br>Larix leptolepis<br>Hybrid Larch<br>Larix eurolepis | 2,139          | 866   | 155                | 1,130              | 504                | 349                | 1                  |
| Douglas Fir<br>Pseudotsuga Menziesii                                  | 43             | 17    | 43                 | -                  | -                  | -                  | -                  |
| Other Conifers                                                        | 198            | 80    | 8                  | 122                | 3                  | 60                 | 5                  |
| Sitka Spruce/Pine                                                     | 4,420          | 1,793 | 1,136              | 1,467              | 1,565              | 252                | -                  |
| Total Acres                                                           | 12,838         |       | 1,567              | 4,618              | 3,477              | 3,027              | 149                |
| Ha.                                                                   | (5,198)        |       | (634)              | (1,870)            | (1,408)            | (1,226)            | (60)               |

7. Production Forecast

|                   | 000s hoppus feet.<br>(Cubic metres in brackets) |           |           |           |           |
|-------------------|-------------------------------------------------|-----------|-----------|-----------|-----------|
|                   | <u>66</u>                                       | <u>70</u> | <u>75</u> | <u>80</u> | <u>85</u> |
| Pines             | 150                                             | 137       | 212       | 209       | 230       |
| Spruces           | 80                                              | 214       | 276       | 460       | 970       |
| Larches           | 70                                              | 134       | 215       | 231       | 273       |
| Other             | -                                               | 2         | 5         | 5         | 7         |
| Total             |                                                 |           |           |           |           |
| 000s h.ft.        | 300                                             | 487       | 708       | 905       | 1,480     |
| (M <sup>3</sup> ) | 10,820                                          | 17,562    | 25,528    | 32,630    | 53,364    |

8. Roads

One hundred and four miles (167 Km.) of roads have been completed or formed. It is estimated that another 63 miles (101 Km.) will be required before 1989. Improved methods of extraction may however permit this figure to be substantially reduced.

9. Houses

Thirteen houses are let to forest workers and three are occupied by supervisors.

10. Labour

Twenty-seven workers including one forest clerkess are employed.

In addition to workers employed by the Forestry Commission, the timber merchant to whom the timber is sold standing employs not less than thirty men during the spring, summer and autumn.

Comparison of Plots of Scots Pine Spruce (Picea Sitchensis)  
mixture and pure Sitka Spruce (Picea Sitkaensis) 194, 195, and 198  
(Basal area and volume measurements. B.H.Q.G. and over)

Common factors - each plot = 0.04 hectares - (planted on top of ridge - spacing approximately 1.37 m. x 1.37 m. - mixtures planted intimate) x 1 Scots Pine (Pinus Sylvestris) along the rows of trees - elevation between 305 m. posed with southern aspect.

| Con-<br>part-<br>ment<br>No. | Mixture<br>or<br>pure | Species                          | No. of<br>trees<br>planted<br>per<br>hectare | No. of<br>dead or<br>missing<br>trees<br>per<br>hectare | Average top<br>height of 4<br>largest<br>trees<br>metres | Average<br>B.H.Q.G.<br>of<br>crop<br>cms. | Yield<br>Class<br>based on<br>40 LTPH<br>M <sup>3</sup> /hectare | Tariff<br>No.<br>of<br>Crop | Total<br>Volume<br>M <sup>3</sup> | Average<br>Volume<br>per<br>tree<br>of crop<br>M <sup>3</sup> |
|------------------------------|-----------------------|----------------------------------|----------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------|-----------------------------|-----------------------------------|---------------------------------------------------------------|
| 194                          | Pure                  | Sitka Spruce<br>Picea Sitchensis | 4,422                                        | 300                                                     | 11.0                                                     | 8.9                                       | 12.4                                                             | 19                          | 66                                | 0.049                                                         |
| 195                          | Mixture               | Sitka Spruce<br>Picea Sitchensis | 2,100                                        | 0                                                       | 11.0                                                     | 11.4                                      | 12.4                                                             | 19                          | 58                                | 0.084                                                         |
|                              |                       | Scots Pine<br>Pinus Sylvestris   | 2,100                                        | 13                                                      | 9.1                                                      | 8.9                                       | 8.9                                                              | 18                          | 19                                | 0.043                                                         |
|                              | Total                 |                                  | 4,200                                        | 43                                                      |                                                          |                                           |                                                                  |                             | 77                                |                                                               |
| 198                          | Mixture               | Sitka Spruce<br>Picea Sitchensis | 2,025                                        | 28                                                      | 12.5                                                     | 12.7                                      | 16.0                                                             | 21                          | 63                                | 0.110                                                         |
|                              |                       | Scots Pine<br>Pinus Sylvestris   | 2,020                                        | 5                                                       | 10.4                                                     | 10.16                                     | 10.7                                                             | 18                          | 6                                 | 0.056                                                         |
|                              | Total                 |                                  | 4,070                                        | 33                                                      |                                                          |                                           |                                                                  |                             | 71                                |                                                               |

Notes on Stopping Places

1. Brownhill Gate

Walk to Compartment 128 to see checked pure Sitka Spruce (*Picea Sitchensis*) (P.42) and examine the soil profile. Site calluna, screeded and no manures.

2. Compartment 4

Fast growing Sitka Spruce (*Picea Sitchensis*) (P.30) mean annual increment to date approximately 178 m<sup>3</sup>/hectares but indicated yield class is about 16.2 m<sup>3</sup>/hectares.

3. Compartment 10

Lodgepole Pine (*Pinus Contorta*)/Sitka Spruce (*Picea Sitchensis*) (P.60) with Sitka Spruce (*Picea Sitchensis*) moving into check, 2 Lodgepole Pine (*Pinus Contorta*)/2 Sitka Spruce (*Picea Sitchensis*) mixed in the line, planted in the furrow, phosphated.

4. Compartment 198

Walk downhill past P.40 and P.48 on right and left respectively to measured stand of Scots Pine (*Pinus Sylvestris*)/Sitka Spruce (*Picea Sitchensis*) (P.40). See table of measurements herewith.

5. Compartments 194 and 195

Pure Sitka Spruce (*Picea Sitchensis*) and Scots Pine (*Pinus Sylvestris*)/Sitka Spruce (*Picea Sitchensis*) (P.40) measured stands - tables herewith. Note the pure Sitka Spruce (*Picea Sitchensis*) (P.40) on calluna below the road.

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6. Compartment 192

Mixed Sitka Spruce (*Picea Sitchensis*)/Scots Pine (*Pinus Sylvestris*) (P.41) 2 Sitka Spruce/1 Scots Pine in lines planted on ridges.

7. Compartment 243

Mixed Sitka Spruce/Scots Pine (P.48),  
2 Sitka Spruce/2 Scots Pine.

Note last 6 years growth above check level indicated by white boards.

8. Compartment 31

(a) Mixed Lodgepole Pine (*Pinus Contorta*)/Sitka Spruce (*Picea Sitchensis*) (P.37) one and one, thinned twice, 1960 and 1966.

(b) Mixed Scots Pine/Sitka Spruce (P.37) one and one, thinned once, 1964.

Walk to next point noting on route

(c) Pure Sitka Spruce (*Picea Sitchensis*) (P.37) on calluna.

(d) Pure Scots Pine (*Pinus Sylvestris*) (P.37) ~~adjoining~~.

9. Compartment 389

Mixed Lodgepole Pine/Sitka Spruce (P.59)  
2 Lodgepole Pine/ 2 Sitka Spruce in the line planted in the bottom of the furrow, phosphated.

10. Travel to main road (30 minutes) passing or in view extensive typical areas of all the other major species in the forest showing the problems and successes.
11. Compartment 100/104

Local experiments in replacing larch (Larix) with Norway Spruce (Picea Abies).

#### Notes

##### Theme of Visit

"The establishment and growth of Sitka Spruce (Picea Sitchensis) in marginal conditions of climate and ground vegetation".

The early plantations of larches (Larix) and Scots Pine (Pinus Sylvestris) showed their unsuitability for the major afforestation of Clashindarroch.

Some 1,500 acres (607 hectares) of Norway Spruce (Picea Abies) have been successfully established, but in general, moisture, adverse ground vegetation and severe frosts have limited its range while exposure in particular has precluded this species from higher elevations.

Calluna has covered very extensive parts of the forest and where there is no calluna severe unseasonable frosts have dominated the problems of establishing Sitka Spruce (Picea Sitchensis).

Early mixtures of Scots Pine (Pinus Sylvestris)/ Sitka Spruce (Picea Sitchensis) and Lodgepole Pine (Pinus Contorta)/Sitka Spruce showed Lodgepole

Pine/Sitka Spruce with cultivation by tine plough, phosphating and planting in the furrow bottom, to be highly successful once the Sitka Spruce had come out of check.

The excursion will demonstrate, not in order, Sitka Spruce planted with a screef, with ground cultivation, on heather, on grass, in mixture, in check, coming out of check, the rate of post check growth, and the productivity of Sitka Spruce both pure and in mixture with Scots Pine and Lodgepole Pine.

In addition, the Royal College of Forestry, Stockholm, will inspect techniques of replacing Larch crops with Norway Spruce (*Picea Abies*).



