

Saturday, 21st July

Maps $\frac{1}{4}$ " Sheet 4
 1" Sheet 65

Returning to Loch Fyne at Strachur a line of Populus trichocarpa will be seen. They are very badly infected with the bacterial canker Pseudomonas syringae, although probably of the same clone as those which are free of canker at Crarae.

PRODUCTION IN THE COWAL FORESTS

District Officer for N. Cowal: J.F. McGarva

The Forestry Commission forests of Glenbranter, Loch Eck, Benmore and Glenfinart in the Cowal peninsula make a compact block totalling 4,600 ha. of plantations. Since the war there has been a rapid rise in the area of plantations which have reached the thinning stage; and, owing to difficulties with labour and equipment, it was not always possible to organise a smooth flow of forest produce. To some extent felling tended to run ahead of extraction, as is shown in the table below. The figures reflect the heavy production, but also the arrears of thinning due to the war, and the check in utilisation as the extraction organisation struggled to keep up with the thinning programme.

Production in Cowal Forests

	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Area thinned (hectares)	223	569	774	456
Volume felled (cu. m.)	7,780	15,400	22,500	13,360
Volume sold (cu. m.)	7,157	6,630	8,330	19,700

The great majority of this produce was utilised for pit-props. Much of the smaller saw-timber was converted to mining timber on local circular-saw benches, which are not designed for sawing such small diameter logs economically. The increasing flow of small saw-logs from the Cowal forests, from Ardgarten, and from Inverliever, presented an opportunity for testing other conversion methods and to cope with this supply a Swedish Ari sawmill was set up. This has provided valuable experience in management of the forests to co-ordinate supply of timber to the mill with normal silvicultural thinning needs. Initially it has been necessary to bring timber from as far as Inverliever, but it is envisaged that at a later stage all the timber will come from the Cowal forests and eventually Glenbranter forest alone will be able to keep the mill supplied.

THE ARI SAWMILL

Owners: The Cowal Ari-Sawmilling Co. Ltd.
Mill Manager: Mr. McCreath

The "Ari" system was developed in Sweden where special attention has for many years been given to the technique of handling and sawing small-sized logs. Basically the success of the system depends upon three sawing units - slabbing saw, re-saw and edger - designed to match each other and linked by an ingenious arrangement of conveyors.

Logs are brought in by a conveyor, timber passes automatically from one machine to the next and sawn wood and waste is removed by conveyors. The whole is geared to provide for a steady flow of material through the mill. The equipment of the Strachur mill was installed under the supervision of the manufacturers, A.B. Maskinfabriken, Ornskildsvik. The mill building was constructed of home-grown timber.

The Cowal Ari-Sawmilling Co. Ltd. was formed in July, 1953; finance was provided by Adam Wilson and Sons, Ltd., Troon, timber merchants working in the area, and the Forestry Commission, which is, of course, particularly interested in expanding the markets for thinnings. The two parties have nominated the board of directors of the company, and an independent chairman has been appointed.

When considering the type and location of the mill the directors felt that a comparatively small unit situated within the forest area was preferable to a large unit in an industrial area far from the source of raw material. In addition, it was considered desirable, in view of the depopulation of the highland areas, to create further community life around a forest industry. Despite difficulties in obtaining suitable labour, mainly because of lack of houses, sawing started in 1954, and production has progressively increased to date. The mill is at present producing at the rate of 5,200 cu. m. per annum and consumers are satisfied with the quality. There are 31 employees, including sales and office staff.

All the raw material is brought to the mill by road transport and the logs are unloaded on to the storage bank. They vary from 15-45 cms. (6-18 ins.) in diameter and from 1.8-7.3 m. (6-24 ft.) in length, the average log being 4.5 m. long by 19 cms. top diameter.

From the storage bank the logs are rolled on to the mechanical chain log conveyor and are conveyed into the mill at approximately 1.8 m. above ground level. Any twisted logs are cross-cut on the storage bank by electric chain saw, prior to being rolled on to the conveyor. The logs are automatically stopped at the first breakdown bench (slabbing saw). This saw makes the initial cut in the log which is then mechanically conveyed to the resaw. The resaw then breaks down the slabbed log into dimension sizes and for this purpose the slabbed log is returned and passed through the re-saw until it is completely utilised. This stock is mechanically conveyed to the edger. Square-edged timber is conveyed by gravity conveyors to the outlet end of the mill.

The average output is at present 18.2 cu.m. of sawn material per day, of which 30 per cent. is boards 2.5 cms. (1 in.) or under. The working of the mill is a team operation and a bonus scheme, based on output, is in force which covers all men employed both inside the mill and outside.

Slabs from all benches fall down on to a mechanical conveyor operating beneath the mill floor at right angles to the benches and are then conveyed to an endless belt which carries them out to the boiler which supplies steam for the kiln. Saw-dust is extracted by a normal suction plant to a cyclone at the boilerhouse, or exhausted to the open.

The kiln is of the progressive type, with three compartments, and is unlike most units used in this country in that conditions remain stationary whilst the timber moves through the chambers, as opposed to the normal compartment type where conditions have to be altered and the timber is stationary. This system has the advantage of simplicity. Drying conditions remain unchanged, and no daily sampling and weighing, with attendant laboratory and recording equipment, are required. All steam valves, ventilation adjusters and air circulating fans, once set, remain untouched or run at constant speed. In other words, a kiln operator is not needed and in this mill two men do all the loading, unloading and cross-cutting. The use of a progressive kiln is confined to those cases where species of similar drying characteristics are being handled, the thickness and initial moisture content of the timber varying only slightly. The moisture content of timber entering the kiln is approximately 80 per cent. and the moisture content after kilning is about 20 per cent. The output is $8\frac{1}{2}$ cu.m. of timber (5 cm. thick sizes) per 24 hours. The internal length of the progressive kiln installed at Strachur is 22.8 m. divided into three zones each 7.6 m. in length. Timber loads 1.35 m. wide and 2 m. high are accommodated.

Conditions in the kiln when Picea sitchensis 3.8 cms. ($1\frac{1}{2}$ in.) and 5 cms. (2 in.) thick is dried are as follows:- first zone - dry bulb temperature 43°C , wet bulb 40°C , relative humidity of 81 per cent; second zone - dry bulb 49°C , wet bulb 43°C , relative humidity 72 per cent; third zone - dry bulb 52°C , wet bulb 43°C , relative humidity 61 per cent. Steam pressure used is .25 kg. per sq. cm. No steam jets are employed.

On leaving the kiln timber is squared with a "Wadkin" pull-out cross-cut saw and is later stacked and loaded to road transport with a fork-lift truck. The timber is sold mainly for case and crate making and housing construction, the sales area covered being Glasgow - Edinburgh and as far south as Lincolnshire. The company has its own transport with specialist equipment for bringing the logs to the mill and for deliveries of sawn timber to consumers.

Problems encountered at present are almost entirely concerned with labour, due to inadequate housing to attract men into the area. The Argyllshire County Council has commenced building houses in Strachur and it is hoped these will soon be completed. Operators have rapidly mastered the technique of handling the Swedish machinery.

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The delegates then re-enter the bus and drive to Whistlofield and so up the Larach Pass into Glenfinart forest. As we climb uphill it will be noticed that the ground becomes increasingly less fertile and near the top, on land considered too poor for Picea sitchensis, Pinus contorta has been planted. Like the majority of the older stands of this species in Britain, it is the Inland form, from the interior of British Columbia. It will be noticed how rapidly the ground type changes from a reasonably fertile forest soil to acid peat-bog and then back again within a short distance. This extreme variability of terrain is characteristic of the West of Scotland and results in the need for frequent alteration of species.

GLENFINART FOREST

District Officer: Mr. M. Macpherson
Forester: Mr. J.M. Ferguson

The chief reason for the visit here is the "Group Dying" of Picea sitchensis. "Group-dying" was first reported in Great Britain in 1936 and since then has been found in several areas chiefly in the west of the country. Trees die in small groups, each group enlarging radially from the centre. Observations on groups have shown that they become static after about three to five years so that usually not more than 0.04 ha. is involved. The root systems of diseased trees are necrotic and inspection shows dead patches of cortex on the roots, when the bark scales are lightly rubbed away.

It is not known how long the disease has existed at Glenfinart, but a survey in 1954 disclosed the presence of at least thirty groups in an area of about 56 ha. which included several species of conifers. The disease is best known on Picea sitchensis, but it has been found also in stands of Picea abies, Larix leptolepis and L. decidua; and Pinus sylvestris, P. nigra var. calabrica and P. contorta have been killed where they occurred in groups of Picea sitchensis.

The fungus, Rhizina inflata, is the only likely pathogen found associated with roots and inoculation tests of the fungus are being carried out. It has appeared in abundance in certain years, notably 1955, and both its spread in the soil and production of sporophores, may be favoured by high summer temperatures. In the literature, the fungus is often described as being associated with the sites of fires and examination of many groups of dead trees in Britain has disclosed the presence of fire residues. Experiments on this aspect of the disease are in progress also.

The hypothesis is that sites of fires lit by workers engaged in thinning are colonised by the fungus, which thence attacks the roots of adjacent trees. No experimental evidence exists to justify this explanation yet, but the circumstantial evidence is so strong, that pending experimental results, certain measures limiting the lighting of fires in plantations where "group-dying" exists have been put into force.

Leaving Glenfinart, we come out to the shore of Loch Long and carry on to Benmore via Strone Point.

BENMORE FOREST

West (Scotland) Conservancy.

District Officer: Mr. M. Macpherson
Forester: Mr. J. Jackson

Benmore Estate was given to the nation in 1925 by the late Harry George Younger. The greater part of the area is now under the administration of the Forestry Commission, but the policies are controlled by the Royal Botanic Garden, Edinburgh; they occupy an area of about 40 ha. in the immediate surroundings of Benmore House.

Since the handing over of the estate the development of the policies has continued upon a definite plan. The idea was that it would be a wild garden in the modern sense - a place where trees, lending their canopy, make shelter for well-chosen specimen plants brought from all parts of the world. At Benmore we have the ideal setting, and new exotic plants, and particularly Rhododendrons, of which there are 200 different species, flourish as in their native home, adding interest to the woodlands and an attractive richness of colour.

In 1929 Mr. Younger also gave Benmore Mansion House to the nation for the furtherance of forest education. A school was started and used for the training of Foresters. The Chief Instructor is Mr. R.C. Gough. 375 Foresters have been trained here since 1929.

The Arboretum. The Arboretum was the first piece of planting carried out by James Duncan in 1871-72. It is situated in a fertile well sheltered part of Glen Massan and the growth of the individual trees is ample evidence that the choice of species for the site has been well repaid.

Measurements of the numbered trees are as follows:-

No. of Tree	Species	Total Height <i>metres</i>	b.h. 1.3 metres Diameter <i>cms</i>	Volume <i>cu. metres</i>
1	Abies procera	32.3	104	11.9
2	Picea sitchensis	39.3	81	6.1
3	Pseudotsuga taxifolia	43.0	114	12.9
4	Abies lowiana	37.5	109	14.5
5	Abies procera	35.9	86	10.2
6	Picea sitchensis	40.5	141	16.8
7	Thuja plicata	35.9	103	6.4
8	Pseudotsuga taxifolia	47.2	94	14.3

Travelling to Dunoon the party takes the steamer across the Firth of Clyde to Gourock. The Firth of Clyde has always attracted many people for their holidays and yachting is very popular. A traditional custom of the Glasgow folk is to take a pleasure steamer "doon the watter" to Rothesay or other towns.

Glasgow is the largest town in Scotland and the Firth of Clyde is famous for its maritime trade, and its shipbuilding, which easily leads the world in tonnage produced annually. Some of the shipbuilding yards will be seen from the train on the journey to Glasgow.

The party will be received in Glasgow by the Lord Provost of the city. The host at the final dinner in the Central Hotel will be Professor Walton, Head of the Botany Department, Glasgow University, and lately one of Her Majesty's Forestry Commissioners.