

FORESTRY  COMMISSION

LIBRARY
(410.5d)
H.M. Forestry Commission

902

HISTORY
OF
CYNWYD

FOREST
N(W) CONSERVANCY

FOR
REFERENCE ONLY

Forestry Commission
ARCHIVE

902 (410.50)

FORESTRY COMMISSION

HISTORY

of

CYNWYD FOREST

1927 - 1951

NORTH (WALES) CONSERVANCY

HISTORY OF CYNWYD FOREST

	<u>Contents</u>					<u>Page</u>
<u>GENERAL DESCRIPTION OF THE FOREST</u>	1
Situation	1
Area and Utilisation	1
Physiography	2
Geology and Soils	2
Vegetation	3
Meteorology	3
Risks - fire, animals, insects, fungi	3
Roads	5
Labour	8
<u>SILVICULTURE</u>	8
Preparation of ground etc	8
Choice of species	8
Planting	10
Ploughing	11
Beating up	11
Weeding	11
Underplanting	12
Past treatment of established plantations	12
Brashing	12
Pruning	12
Thinning	12
Conclusions	13
<u>APPENDICES</u>						
I Notes from Inspection reports	14
II Record of supervisory staff	16
III Treatment of European larch - extracts from Inspection reports	17
IV Report on pine/spruce mixtures	19
V Note on experimental underplanting of European larch	20

HISTORY OF CYNWYD FOREST

GENERAL DESCRIPTION OF THE FOREST

Situation

The Forest is situated on the northern slopes and spurs of the Berwyn Mountains, occupying a somewhat long and narrow strip of country between Carrog in the East to Corwen, and extending southwards up the Cynwyd Valley. It takes its name from the village of Cynwyd, where planting was first started.

Area and Utilisation

Present Utilisation

Acquired from	By	Date	Plantations Acquired	Plantable excl. Col. 4.	Nurseries	Agricultural	F. W. H.	Unplantable excl. Col. 4.	Other Land		Total
									Description	Area	
1.	2.	3.	acs. 4.	acs. 5.	acs. 6.	acs. 7.	8	acs. 9.	10	11	acs. 12
E. & R. J. Jones	Lease	25.3.27	-	28	-	-	-	-	-	-	28
Sir Henry Beyer-Robert	Conveyance	12.4.27	-	158	-	-	-	-	-	-	158
R. Longueville and Others	Lease	15.7.30	-	1410	-	-	-	104	-	-	1514
R. C. M. V. Wynn	Lease	8.1.51	-	129	-	-	-	-	-	-	129
Total Acquired				1725				104			1829
None Disposed Of											
Net Total				1725				104			1829

Negotiations for the lease of the area for planting were commenced in the latter part of 1924, arrangements to enable the Commissioners to start planting being pressed on with all possible expedition as it was considered very desirable to set a footing in the district, which is generally very suitable for afforestation.

It was hoped that by planting up even a small area during the season 1924-25, the possibilities of planting up waste moorland would be made evident and induce local land owners to come forward with offers of more land.

A further 128 acres were acquired from Mr. Michael Wynn at Craig Arthbry in 1950 to be planted in P.52/53.

The forest is divided into 4 Blocks viz:-

1. Carrog, situated south of the main A5 road by the village of Carrog.
2. The main Corwen block which lies south of Corwen itself, and borders the main A.5 road.
3. The Cynwyd Valley Block, which lies $\frac{1}{2}$ mile to the south-east of Cynwyd Village.
4. The Craig Arthbry Block situated about $\frac{1}{2}$ mile south of Bettws - Gwerfil-Goch.

Corwen is the nearest town and there are railway stations at Corwen, Cynwyd and Carrog. The main London-Holyhead road follows the foot of the northern Berwyn slopes and down to this road all timber from Carrog and Corwen blocks will be eventually extracted.

Physiography

Altitudes vary from 500 ft. to nearly 1400 ft. in the Corwen Block and up to 1600 ft. in Cynwyd Valley.

Slopes are gentle to steep; those directly overlooking the River Dee on the north side are broken frequently by outcrops of rock, and divided by steep mountain streams. There are many rocky outcrops at Craig Arthbry.

The general aspect of the Carrog and Corwen Blocks is north, while in Cynwyd Valley both north-east and south-west aspects exist; Craig Arthbry is westerly.

Exposures vary, but none of the land is severely exposed, the main Berwyn Range providing shelter from the prevailing south-west wind. The upper slopes of Craig Arthbry are open to south-west gales.

Geology and Soils

The underlying rock formation is Ordovician in the western half, with Silurian on the high ground in the eastern half of the Corwen Block and Carrog. The whole of Cynwyd Valley is Ordovician, while Craig Arthbry is Silurian.

Soils are mostly reddish or greyish (particularly in Cynwyd Valley and Craig Arthbry) loams of varying depth. The subsoil is generally stony, particularly in the valley bottom in Cynwyd Valley and Carrog, and on the higher ground at Craig Arthbry.

Mild peat occurs in places, particularly on the mountain boundary on the west of Cynwyd, and above Llangar.

Vegetation

Bracken covers most of the lower slopes, gradually giving way to heather and ling, bilberry and crowberry on the moors above the forest boundary. There are considerable areas of fine grasses, particularly Nardus stricta, and smaller areas of Molinia, on the upper slopes.

In the valley bottom in Cynwyd Valley, and Carrog, there are areas of Juncus and Calluna bog.

Meteorology

The average annual rainfall is about 40 in. The climate is not very severe, though late spring frosts may do damage. There is no record of any snow damage, as the topography helps the crowns to shed the snow, which normally never exceeds 3-4 in.

Wind has done little damage except on the high boundary to the south of the Carrog Block.

Risks

Fire. The greatest danger to the forest is fire. Situated as it is (apart from Craig Arthbry) on the edge of grouse moors, where, apart from intentional burning by the estate keepers, accidental fires are likely from trippers.

The main road which borders the edge of the Carrog and Corwen Block is becoming safer as the forest is getting older, but damage is always likely here.

Penyfigyn and Cynwyd Valley are both visited by large numbers of trippers, and will always be a source of danger.

The greatest danger is during the dry periods in the months of February, March and April when the dried vegetation is in an inflammable condition before the fresh vegetation has started to come up green.

There is no danger from railway trains.

The whole forest is well served with water supplies from the mountain streams, but until better access routes and forest roads are constructed, difficulty will be experienced in getting men and equipment to any fire on the higher ground.

No serious fires have occurred within the plantations.

In March 1948, a fire, presumed to have been started by a local sheep farmer when burning gorse, threatened the forest from Henfaes Mountain. Help was obtained from the N.F.S., the local YHA., estate keepers, and troops from Oswestry and the fire was under control by 4 a.m. the following day.

Liaison with the estate staff during controlled heather burning was established in 1948, after an incident which necessitated the calling out of F.C. employees after a fire started by estate keepers had got out of hand and threatened the plantations.

Agreement was reached with the owner as to responsibilities which briefly are:-

1. Forestry Commission to be responsible for burning any fire traces adjacent to the boundary and to inform and co-operate with the keepers.
2. Rug Estate to be responsible for all other burning but Forestry Commission will render active assistance up to 300 yards from the forest boundary. Local F.C. officers to be informed of intention to burn.

In 1949, a fire was started on the moors 1 mile east of Compartment 51 Cynwyd Valley, which burned for a fortnight in the peat. It was necessary to use F.C. labour, the N.F.S. and local troops to help extinguish it, as the wind changed to the west and it became a serious threat to the forest.

Sheep. Boundary fences if kept up, do keep sheep from the plantations except at Cynwyd Valley. Here, there is a sheep driving road which runs through the length of the block, and unless the sheep farmers are supervised, they are apt to lose sheep while driving and the stray sheep get left behind in the plantations.

Rabbits. There are numerous rabbits on the neighbouring agricultural land, and unless the fences are kept up, rabbits will always be a nuisance

in the area. There is a small population within the forest boundary, and continuous trapping is necessary, particularly if any planting, beating up or underplanting is to be done in any block.

Trespass. There has been a few cases of theft of Christmas trees, but little other damage has been reported. As the forest borders a main road in places, some system of protection against theft of Christmas trees will have to be maintained.

Game. Some damage by blackgame in the nursery has been caused, but co-operation with the Rug Estate keepers should ensure that any damage caused is negligible. Pheasants and grouse are preserved by the Rug Estate, but there are no reports of serious damage.

There are no deer at Cynwyd.

Foxes. There has been a marked decrease in the number of foxes caught annually since 1942, when 70 were killed. In 1951 only 3 were killed. This is probably due to the return of Rug keepers who were away during the war.

There has been a marked increase in badgers since the war. Hares are also on the increase.

Insects. There are no records of serious insect attack, although cases of attack by Myelophilus, following the thinning of Scots pine in mixtures has been noted. Mild attacks of Neomyzaphis on spruces have been noted.

In 1949 a bark beetle Trypodendron lineatum was found on Sitka spruce in dense shade; Dr. Chrystal stated it had not proved to be markedly injurious. Trapping of Hylobius was carried out at Bryntirion after planting, but the attack died out without serious damage being done.

Fungi. There are no records of any damage caused by fungal attack, apart from Dascyspha willkommii on European larch (details of which are recorded later).

Roads

At some time in 1947, an engineering branch was formed in the Directorate to construct roads and maintain its own plant. Roads were planned in the forest based on the rights of way granted in the lease and work started on F/1 at Pen y Pigyn, with a small labour gang.

In 1948, the engineering branch was decentralised under the Conservators working through their own engineers. Work was continued on F/1 with a labour gang but using no mechanical plant. During this year it was realised that none of the road accesses granted in the lease were practicable for any mechanical transport and negotiations were started with the landlord to obtain serviceable ones.

The landlord proved difficult and took advantage of certain infringements of the terms of the lease by forest workers notably the incorporation in the road of some stone from a wall, to stiffen the terms under which he would grant alternative rights of way.

In 1949 the roads gang was taken off F/1 and put to work at Carrog (F/4) but here again the landlord discovered and brought to our notice that the path actually used by all forest workers to get into the plantation was not the one granted in the lease and raised his demands still further. The roads gang was then diverted entirely to the Cynwyd valley where there were no legal or physical obstacles to access.

Throughout 1950 and 1951 roads progressed slowly, mechanical plant was not available, but the gang might be required at any time to go back to the important F/1. The County Council widened the road from the village of Cynwyd up to the plantation and surfaced it with tarmac. This road has a very steep gradient rising to as much as 1 in 4. This improvement allowed it to be used during most seasons of the year except in periods of frosts and heavy snow.

Road work continued until most of the more important tracks were finished and it seemed possible that the negotiations for the way-leaves would reach finality, when the gang were again switched to F/1. The way-leave across the Corwen Water supply area had in the meantime, been acquired so this portion involving a bridge and much stone walling was put in hand. Dozer plant is available but was employed at Clocaenog till it could get into the forest.

A situation has now been reached in which planning must wait for acquisition of rights of way. Construction progresses slowly but expensively. There is a sense of frustration imparted to all who have any work in connection with this forest, but it is hoped it will shortly be dispelled.

Table of Road Progress, Labour and Costs attached.

Road No.	Locality	1949 £			1950			1951			up to 1952 May (incl.)			Total		Rate per mile
		Complete Miles	In hand Miles	Cost £	Complete Miles	In Hand Miles	Cost £	Complete Miles	In Hand Miles	Cost £	Complete Miles	In Hand Miles	Cost £	Complete Miles	In Hand Miles	
F/1	Pen y pigyn	-	.6	600	-	-	-	.1	358	-	.7	4380 ⁺	-	1.4	5338	3800
F/4	Carrog	.2	.4	1830	-	-	12	-	-	-	-	-	.2	.4	1842	4600
F/7	Cynwyd Valley	.1	1.1	120	1.1	-	3232	-	-	-	-	18	1.2	-	3370	2800
F/8	Cynwyd Valley	.2	.5	2230 ^x	.2	1.2	1807	1.0	4254 ^o	-	-	26	1.4	-	8317	5900
F/71	Cynwyd Valley	-	-	-	.2	-	401	-	-	-	-	-	.2	-	401	2000
F/81	Cynwyd Valley	-	-	-	-	.5	200	-	-	-	-	-	-	.5	200	400
		.5	2.1	4780	1.5	1.7	5652	1.0	4612	-	.7	4424	3.0	2.3	19468	3890

£ 1949. These figures are cash costs. From 1950 onwards rates are costed for use of dumper etc.

x Includes walling and blasting round reservoir

+ Includes walling across Catchment area

o Generally bad weather conditions. Work on ill-drained ground.

LABOUR AND PLANT

Year	Skilled	Unskilled	Dumper	Tipper	Roller	Warsop Drill
1950	5	12	1	1	1 (pt. time)	1
1951	4	11	1	1		1
1952	3	10	1	1 (pt. time)		1

Labour

Sufficient rural labour has always been available, and men have been loaned from Cynwyd for seasonal work at Aberhirnant, Coed Penllyn and Glyn y Groes.

A maintenance staff of from 5 - 7 was maintained during the World War II, but only slight arrears of cleaning and thinning accumulated.

The present labour staff is 17, which is drawn mostly from Corwen and Cynwyd village, and is considered adequate if standing sales of thinnings is the policy.

SILVICULTURE

Preparation of Ground, etc.

Apart from parts of Bonwm, Bryntirion and Carrog, which consisted of birch scrub with some conifer belts, the ground was previously Calluna or bracken sheep grazing. The woodland and scrub areas were cleared by merchants, and lop and top burned.

All plantations were fenced against rabbits except some short stretches of the mountain boundary, and where dry stone walls exist. Rabbits were cleared after fencing.

Turf drains were cut prior to planting on peaty ground from 1927 on. Main drains were cut in wet places.

Choice of Species

Planting was commenced in 1925 when Norway and Sitka spruce were planted in Cynwyd valley, the Sitka spruce being planted on the lower and wetter sites, and Norway spruce on the dryer and more exposed sites. This was revised from 1929 onwards.

Some old European larch stands owned by the Primavera estate in Compartment 45, and by Rug Estate below F.W.H.1, showed that excellent European larch could be grown. An attempt to obtain the same strain seed (thought to be Scottish) was made, but eventually the European larch introduced was of Italian Tyrol origin and it has failed everywhere.

Again there were many very fine Scots pine on the Rug Estate, on the rocky outcrops above Bonwm, and these no doubt influenced the choice of Scots pine in this area.

European larch was planted pure on the bracken slopes in P.26 in Cynwyd Valley and at Penarth, but like all European larch in the area it has done

badly and is now underplanted after heavy thinnings. This treatment will be carried out wherever European larch has failed to make a satisfactory crop. (See separate note at the end of this section).

Douglas fir was introduced at Carrog in P.27 in a sheltered basin, with Norway spruce and Sitka spruce above, and both have shown excellent growth.

Alternate lines of mountain pine and Norway spruce and one line of mountain pine to two of Norway spruce were planted in exposed sites in Cynwyd Valley, but the Norway spruce shows little benefit from the mixture; there appear to be two distinct strains of mountain pine there and in several places the mountain pine has suppressed the Norway spruce.

In P.29 Japanese larch was planted pure on bracken ground, and for the first time mixtures were introduced.

Scots pine and Norway spruce were planted on Calluna/Vaccinium ground; Japanese larch and Sitka spruce single line mixture, in bracken with heather. The Scots pine/Norway spruce mixture forms a subject which is dealt with in Appendix IV, a Report by Research Branch.

Although early treatment of the Japanese larch/Sitka spruce mixture consisted of removing Japanese larch in thinnings to save suppressed Sitka spruce the present treatment is to treat each tree on its merits, and this has resulted in about 50/50 mixture, the Sitka spruce dominating any damp areas.

Douglas fir was again planted on the lower and more sheltered slopes at Bonwm and Carrog in P.36, and all show excellent growth.

Abies grandis and Tsuga were planted on a small scale both pure and in mixture and have shown the largest increment of any species at Cynwyd.

European larch

The species of greatest interest is probably European larch which, because of its failure to establish a full crop, received the greatest attention.

It was confirmed by 1939 that the P.26 European larch on the west side of Cynwyd Valley would not form a well stocked plantation. (See D.O.'s Inspection Report of 10.3.39). These three compartments 21, 22 and 23 had been beaten up with Tsuga in 1930.

The European larch was badly cankered, of poor growth and misshapen. In 1941 the European larch in Compartment 20 Cynwyd Valley was the subject of an experiment to find the best and most economical method of treating such areas.

Three blocks each of 4 acres were set out alongside the road at the top of Compartment 20.

Three separate treatments were prescribed by the Chairman, the Director of Forestry for Wales, Mr. A. P. Long, and Mr. R. H. Smith N(W), respectively. These are described in the Note in Appendix V dated May 1953, together with the results obtained up to that date.

Planting

Spacing has varied from 6 ft. x 6 ft. for Douglas fir to 4 ft. x 4 ft. for Scots pine and Norway spruce.

The wide spacing of Douglas fir has resulted in rough growth at Carrog, and the narrow spacing of European larch and Scots pine at even less than 4 ft. x 4 ft. in a small area at Carrog has produced a plantation of predominantly Scots pine whips between poor European larch.

The present practice is 5 ft. x 5 ft. for Sitka spruce and pine, 4½ ft. x 4½ ft. for Norway spruce and 6 ft. x 6 ft. for Japanese larch.

All planting has been done with transplants, the majority of the plants coming from Delamere Forest before 1928 when a nursery was started at Bonwm.

It is interesting to note that in Compartment 39, very small Sitka spruce less than 6 in. were used. These were turf planted on turfs sliced to 2 in. thickness with a hay knife; the compartment now compares favourably with any other Sitka spruce area.

Up to 1927 all trees were mattock planted, after screefing. In Compartment 13, where the vegetation consisted of a mat of Sphagnum, the trees were planted by hand; the moss was lifted aside, the plant inserted and the moss pressed back in place. After 1927, turfing was started, both the turf and the debris from the drain being used.

The following table shows the rate of planting:-

P.25	183
26	162
27	217
28	264
29	203
30	134
31	109
32	103
33	28
34	22
35	8
36	22
37	1.5
38	5
39	
45	nil
46	3
48	12.6
	<hr/>
	1475.

No manuring has been carried out on a large scale, but 1 acre of Norway spruce in Compartment 6 was treated experimentally. The area was a wet frosty hollow, and one spoonful of Kennett was added after planting to each tree. Reports show that there was no apparent benefit in this treatment.

The whole forest has established itself well, apart from odd damp hollows of $\frac{1}{2}$ acre or less on the higher ground, where Norway spruce and some Scots pine have remained in check. With the shelter of other trees, these areas are now beginning to show signs of improvement.

Ploughing

No ploughing has been done at Cynwyd.

Beating up

Very little beating up has been necessary with Norway spruce, Sitka spruce and Douglas fir.

The P.26 European larch has been subsequently beaten up with beech and Tsuga after 3 years, and again in P.35 with Tsuga.

The European larch on the river gravel was beaten up with Norway spruce on turves in 1934, and subsequently beaten up with Pinus contorta in 1935 which now tops both the Norway spruce and European larch.

Some failed P.28 Norway spruce on the higher ground in Compartment 17 was beaten up in P.32 with Scots pine which soon established itself on this drier heather ground.

Weeding

Weeding costs have been heavy, in the bracken areas which were weeded twice annually for 4 to 5 years. The heather areas were weeded once only, in most areas.

Weeding costs were particularly heavy in the Carrog area, in the sheltered and on better soils.

The most interesting mixture at Cynwyd is the Scots pine/Norway spruce 1:1 mixture, details of which are given in Appendix IV. A full report is available at N(W) Conservancy office. A similar result is shown in a small Scots pine/Sitka spruce area by Llangor, where the Scots pine is suppressing the Sitka spruce on all dry areas.

Where a mixture of Norway spruce and Sitka spruce in alternate lines is planted, the Sitka spruce is dominant in almost every compartment

except in a few damp frost flats, and vastly superior on the higher and more exposed sites.

Underplanting

Underplanting has been carried out in the poor European larch areas, but is not yet established in any large area.

Past Treatment of established plantations

Brashing was commenced in 1938, when racks were brashed, giving access for inspection and for fire protection.

Brashing of all but suppressed and whippy trees is now carried out, and is done 2 to 3 years in advance of first thinnings.

A chain wide belt has been brashed on all boundaries adjacent to the moors, and alongside main access routes as a fire precaution. The brash is removed into the plantation.

Brashing is carried out with curved saws.

Pruning has only been carried out in the Tsuga/Abies grandis mixture at Bonwm, this being done to a height of 25 ft.

Thinning was commenced in 1941 and although the aim has been to put a 3 or 4 year Thinning Plan in operation, this has proved impossible owing to the access problems.

Arrears of thinnings have accumulated, particularly in the Bonwm block, where it has been impossible to extract timber; in several compartments it has been necessary to thin and leave the poles on the ground.

The following table gives the area thinned per year:-

<u>Year</u>	<u>Acres</u>	
	<u>1st Thin.</u>	<u>2nd Thin</u>
1941	3	
1942	85	
1943	42	2
1944	12 $\frac{1}{2}$	58
1945	73 $\frac{1}{2}$	2
1946	75 $\frac{1}{2}$	46
1947	77 $\frac{1}{2}$	42 $\frac{1}{2}$
1948	79 $\frac{1}{2}$	41
1949	74	60
1950	76 $\frac{1}{2}$	37 $\frac{1}{2}$
1951	74	36

The policy at Gynwyd is to sell all 2nd thinnings standing to merchants, but lack of access has meant that much of the work has had to be done departmentally.

Most of the thinnings have gone for pitwood, mainly to the Wrexham collieries.

There is a good market for Christmas trees, and the following table shows the quantities sold since 1947.

<u>Year</u>	<u>Trees</u>	<u>Value £'s</u>
1947	5929	381
1948	3856	882
1949	6543	1219
1950	9536	1553
1951	15215	2094

There is a good local market for fencing stakes, rails and rustic poles. Other sales have included 40 telegraph poles from the Tsuga/Abies grandis stand at Bonwm, 2 in. Top rails for fenders for the Manchester Ship Canal, and an annual sale of 4 to 5 loads brush for the Grand National Course at Aintree.

Conclusion

The forest has shown it is capable of growing a fully stocked crop of conifers, even on the higher ground.

Douglas fir and Sitka spruce will probably give a final crop of at least Quality II class, while there is every hope that the Tsuga and Abies grandis planted in the sheltered hollow at Bonwm will be Quality I.

The Scots pine except on the dry heather ground above Corwen, where it is probably the only possible species, is rough and of poor growth.

European larch has failed everywhere when planted pure, although it has shown a great improvement when heavily thinned and underplanted. Care in origin of seed is of great importance and possibly only Scottish seed would succeed here.

The difficulties in treatment which arise with spruce/Scots pine mixtures are well shown at Cynwyd, and this will almost always be an unsatisfactory mixture here.

When full access is obtained, Cynwyd should provide a steady and very marketable flow of thinnings, in view of its proximity to a main road, and its nearness to the market at Wrexham.

History of Cynwyd Forest

APPENDIX I

Notes from Inspection Reports

<u>Date</u>	<u>Inspecting Officers</u>
August, 1929	Assistant Commissioner
October, 1929	Technical Commissioner
May, 1938	Assistant Commissioner
March, 1939	Divisional Officer
September, 1941	Divisional Officer
July, 1942	Divisional Officer
June, 1944	Divisional Officer
March, 1945	A/Divisional Officer
April, 1946	Chairman
September, 1946	Director for Wales
January, 1947	S.F.O.
April, 1947	Conservator
August, 1947	"
September, 1947	"
December, 1947	"
April, 1948	"
August, 1948	Mr. W. L. Taylor
October, 1948	Conservator
January, 1949	S.F.O.
April, 1950	Chairman
November,	S.F.O.
May, 1951	S.F.O.
March, 1952	Director for Wales

In the years 38/42 the Norway spruce/Scots pine mixture was the subject of many instructions. In particular the view has been expressed that it was a waste of money to cut back the Scots pine branches in most cases; in an attempt to save Norway spruce, the final instruction being that each tree was to be treated on its merits.

Instructions re European larch are given elsewhere - Appendix III.

Access problems have been appreciated since thinning commenced, and various methods suggested to help extraction viz:- gravity wire rope ways, sulkies, power rope ways.

History of Cynwyd Forest

APPENDIX II

Supervision

<u>Conservators</u>	1945/47	Mr. R. H. Smith
	1947	Mr. F. C. Best
<u>Divisional Officers</u>	1924/25	Mr. D. W. Young
	1926/30	Mr. O. J. Sangar
	1931/37	Mr. A. P. Long
	1937/39	Mr. A. H. Popert
	1939/41	Mr. C.E.L. Fairchild
	1941/45	Mr. R. H. Smith
<u>State Forest Officers</u>	1947/51	Mr. W. A. Cadman
	1952	Mr. J.H. Hampson
<u>District Officers</u>	1925/26	Mr. A. H. H. Ross
	1927/28	Mr. G. Lowe
	1929/36	Mr. R. H. Smith
	1936/39	Mr. F. C. Best
	1939/46	Mr. J. L. Shaw
	1946/51	Mr. J. R. Hampson
	1951	Mr. B. D. Hughes
<u>Foresters</u>	1925/26	Mr. A. H. H. Ross
	1926/29	Mr. J. W. Anderson
	1930/38	Mr. W. T. Edwards X
	1938/40	Mr. C. P. Carr
	1940/	Mr. R. H. Roberts

~~X~~ Forester Edwards died 3.10.38 whilst on duty in the forest. He left his home in the afternoon, to visit the plantations, and failed to return; a search party which included Forester R. H. Roberts searched during a heavy gale, and eventually found Forester Edwards in the plantation above Bonwm. He died from heart failure.

History of Cynwyd Forest

APPENDIX III

Treatment of European larch in Cynwyd Valley

Extracts from Inspection Reports

Conservator F.C. Best's visit of 25.10.47

P.26 European larch. This block was inspected and particular attention paid to the experimental underplanting. The best European larch trees have improved surprisingly. The removal of suppressed and badly shaped European larch is now required throughout to assist the under crop. The Conservator will take this up with the Chairman before any action takes place.

Conservator F.C. Best's visit of 13.12.47

European larch Experimental Plots

Silvicultural treatment to proceed; dead and dying to be cut out and badly formed stems to be thinned out to relieve underplanted crop.

In plot 3 (RHS.) further underplanting (preferably with conifers on the site) could be done when plants were available. Careful recording of costs and receipts to continue, together with note of number of dead, dying and suppressed cut out of each plot at each thinning.

Hardwoods such as rowan, would be treated on their merits as part of the crop, and retained where suitable.

Forestry Commissioner Mr. W.L. Taylor - Visit of 6.8.48.

European larch Experimental Plots

Confirmed that thinning would be done in all plots this season. The underplanted Tsuga in the Chairman's plot were particularly in need of relief from overhead shade.

State Forest Officer's visit 15.1.49

P.26 European larch Compartment 20.

It is agreed that further underplanting should take place but please see memo to Director (Wales) of 19.1.48 file 3/12/AB. asking for authority to plant Douglas fir in the untreated gaps.

The following plants are available ex Corris - Douglas fir, 1+1 2.5.

In addition the District Officer should be able to find Lawson cypress 1.5 out of the allocation of 8.7, already made to Clocaenog and St. Asaph.

Little damage has been done to the Tsuga in the thinning. Too many sheep have been allowed in this area; it is understood that the tenant undertook not to put sheep in his field whilst the fence was being moved and that he did not fulfil this undertaking.

Chairman's visit 21.4.50

The development of the remaining European larch was very promising, particularly in the Chairman's plot. In this plot the underplanted Tsuga now need more room to develop and to prevent leader damage.

About 100 of the best European larch stems per acre should now be marked to remain and thinning commenced to remove the remainder. The 100 best trees would act as a guide to thinning, and the actual number left would depend upon the appearance of the crop as the work proceeded. The ultimate aim should be to reduce the European larch to about 50 stems per acre over a period of some 20 years - the rate depending upon future development.

The underplanted beech in Mr. R.H. Smith's plot were looking well but it was not thought that the sycamore would come to much. The European larch here was of poorer form and growth; probably a reflection of the less favourable soil conditions.

History of Cynwyd Forest

APPENDIX IV

Report on pine/spruce mixtures at Cynwyd, being a precis of two reports made in 1939 and 1941 by Research Branch.

This mixture was planted in 1928/29 along the northern slopes of the main Corwen block. The mixture is a line mixture, mattock planted, and is planted on a variety of vegetation varying from Pteris-Deschampsia flexuosa-Festuca dominant soils, to Vaccinium - Erica tetralix on the poorer sites. There are a few areas of deep peat, in the area, which show good growth of pure spruce.

The general conclusions are that:-

- a) The alternate row mixture is not suitable on difficult ground. The Scots pine gets away and soon suppresses the Norway spruce without early treatment of the mixture, which may mean complete removal of the Scots pine. It is suggested that a group system might be better.
- b) It may be better to retain Scots pine where they have suppressed the Norway spruce as they should form a crop.
- c) On better sites, where the spruce is keeping pace with the pine, trimming of the side branches of the pine would assist the spruce.
- d) Complete brashing of the pine would be a waste of money, as it would help the spruce but little, and also let in too much vegetation.
- e) Care should be taken to vary the mixture and species with the ground; pure spruce may well succeed on the better sites in the area, a 2 row or group mixture on the poorest sites, and the single row mixture used on the intermediate sites only.

History of Cynwyd Forest

APPENDIX V

A Note on the Experimental underplanting of Moribund European larch Compartment 20, P.26, Cynwyd Valley.

This work was started in P.42 according to the following prescriptions and with the following results, to date:

(a) Lord Robinson: After a minimum of preparatory work (no thinning or brashing) underplant throughout with stout Tsuga transplants at 5 ft. spacing mid way between the larch lines. No treatment, other than necessary weeding, for 5 years, and thereafter according to developments. The procedure was to be kept as simple as possible and it was expected that a proportion of Tsuga would not get through the European larch. The European larch canopy (living and dead) was intended as a protection against frost.

(b) Mr. A. P. Long: Fell and remove dead and dying larch and segregate the remainder into groups by removing isolated trees so as to form gaps. The objective should be to allow about one third of the existing crop to remain standing in groups.

Brash the dead branches of the outer trees of the groups.

Interplant the gaps at $5\frac{1}{2}$ ft. spacing, keeping 10 ft. from the nearest tree with pure:

Tsuga, Abies grandis, Norway spruce, each occupying one third of the plot area.

Weed as required and at the time of final weeding remove any larch branches damaging or likely to damage the interplanted trees within the next few years.

(c) Mr. R. H. Smith: The trees to be brashed up to normal height and dead specimens removed. Any tree that looks like recovering to remain.

No weeding or any other treatment. When a proper development has taken place and canopy is complete, the question of underplanting with Tsuga will be considered. In P.43 1,000 Beech and 1,000 Sycamore were used to underplant the upper half of this plot.

On assessment in May 1947 the following points were noted:

1. The Tsuga in Lord Robinson's plot were growing well, free of frost damage throughout and evidently later flushing than other Tsuga on the area. Average height 3'9". In Mr. Long's plot the Tsuga were growing well on the upper ground but were frosted on the lower, average height 4'6"; Norway spruce were uneven, and early flushers had been repeatedly frosted throughout the area and were stunted; Abies grandis were badly frosted and only 8% were making growth. In Mr. Smith's plot the sycamore and beech were growing well and free from frost damage; a forking habit was frequent. From earlier underplanting near the riverside, and the above, it was evident that planting under the larch gave protection from late Spring frosts.
2. The European larch showed no significant differences in deaths, health or vigour from one plot to another. Lord Robinson's plot is probably on better soil, which gradually deteriorates up the valley to Mr. Smith's plot.

Thinning of the European larch in all the plots was completed at the end of F.Y.48 and the remainder of Mr. Smith's plot underplanted with Douglas fir and Norway spruce in P.49.

On his visit of 21.4.50, Lord Robinson gave instructions for about 100 of the best European larch to be marked in his plot as a guide to subsequent thinnings. Thinning was commenced to remove the remainder and by early 1952 the European larch stood at 200 per acre.

The balance of Mr. R. H. Smith's plot was underplanted with Norway spruce in P.48 and Douglas fir in P.49.

A costed statement of operations has been kept since the commencement of the experiments in P.42 but nothing conclusive is yet available.

In general, the following results have appeared:

1. Lord Robinson's Plot:

- (a) Frost damage to the underplanted Tsuga has not occurred and the dense canopy of the untouched European larch was effective in producing this immunity. Flushing was noticeably later under this canopy, possibly as a result of the reduced amount of light and warmth getting through to the undercrop or because of differences in seed origin of the Tsuga.

(b) The remaining European larch are strong and vigorous and promise to grow on to make excellent mature trees.

(c) No difficulties were experienced in planting through with Tsuga in preparatory work or in keeping the Tsuga growing strongly under and through the canopy. Negligible damage was caused by the felling and extraction of the dense overwood European larch.

2. Mr. A. P. Long's Plot:

Frost damage to the interplanted Abies grandis was severe for the first 5 years and kept this species in check; early flushing Norway spruce suffered similarly and Tsuga were frosted on the lower slopes. Since 1947 there have been no damaging late spring frosts and growth of all species has improved to a very high standard. The Tsuga groups on the upper ground have never been frosted and are taller than those in Lord Robinson's plot.

3. Mr. R. H. Smith's Plot:

(a) The dense overhead canopy of retained European larch protected the underplanted beech and sycamore from frost damage.

(b) Some of the poorest European larch show signs of recovering their crown vigour.

Suggestions for the future:

1. The out-turn of produce from each plot continue to be recorded but by the common standard of volume. Records by cash returns are misleading as markets vary from year to year.
2. The record of costs of operations be converted to man/hours to allow for variations in wages from year to year.
3. Treatment of similar European larch areas in frosty localities should take heed of the severe damage that can be caused to interplanted groups, and the European larch canopy should be maintained dense enough to give as much protection as is commensurate with light demands.

J. R. HAMPSON

for Conservator N(W)
14. 5. 53

Cynwyl