TIMBER EXTRACTION BY CHUTE AT GLENMALURE

By WILLIAM SHINE.

Owing to extensive planting operations in Glenmalure Forest in the early twenties large areas are now in urgent need of thinning. To carry out the thinning programme for 1947-'48 many obstacles had to be surmounted, not the least of which was the scarcity of labour in the district. Although good progress had been made from scratch during the previous 4 years in the construction of a forest road system, the areas to be thinned were still far from being reached, and extraction, therefore, presented the greatest difficulty.

The topography is such that road construction is a slow and expensive operation, involving continuous boring and blasting of rock obstacles, deep excavation, banking-up of hollows and bridging of gullies and ravines. As the equipment so far available consists solely of picks and shovels, " jumpers " and geliginite, road construction cannot keep pace with thinning operation; in other words thinning operations are held up on account of the number of workers that must be employed continuously on road construction.

This article endeavours to describe how one particularly awkward and roadless area, where thinning could not be delayed, was dealt with, and how the problem of extraction was solved there.

THE PROBLEM.

The area in question is that shown on the accompanying map as compartments 2, 5 and 8 of Ballyboy Property. These compartments were planted in 1926 with Spruce and Larch mixed. The Larch was used as a sylvicultural species, i.e., with the object of giving shelter to the Spruce on this exposed height. The Larch, however, had outgrown and was badly suppressing the Spruce, so it was necessary to carry out a heavy thinning of the Larch, which was coarse and leaning. Compartment 8, which had been planted with Japanese Larch and Sitka Spruce, needed treatment more urgently than Compartments 2 or 5, which had been planted with European Larch and Norway Spruce.

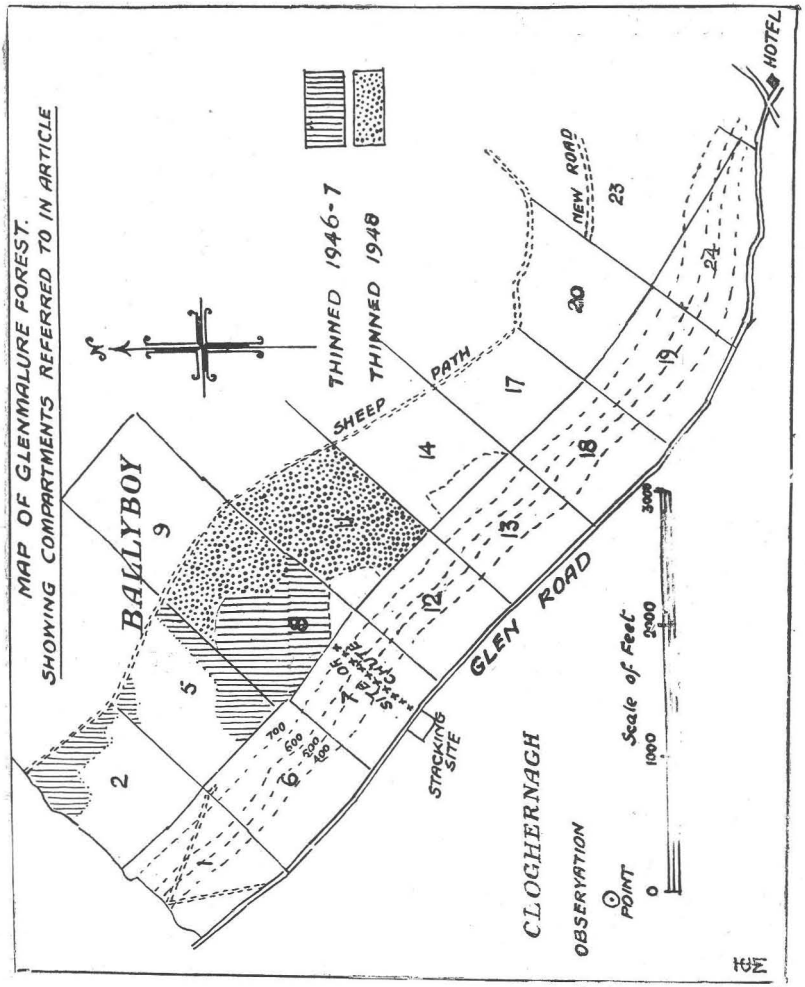
In 1939 the Larch in Compartment 8 was first thinned, and as there was no means of extraction, the felled poles, except those used to fence the adjoining Ballinafunshogue planting area, had to be left on the ground, where they rotted.

At this thinning the poles were approximately 12 to 15 feet long and 3-inch breast height, quarter girth, i.e., nearly 4-inch diameter at that height.

In passing, it is of interest to note that the Sitka Spruce patches then liberated from the " nurse " turned " wolf " made a splendid recovery and are now making a first-rate crop.

In 1947 the remainder of Compartment 8 and Compartments 2

and 5 were tackled, and by the end of March, 1948, all necessary thinning in these compartments was completed. In the meantime the problem of extracting the felled timber was studied. A road which is being constructed through Compartments 29, 27 and 23, and which will eventually serve this area, was still 1½ miles away,



and, as other urgently needed roads were also being constructed, extraction by road was out of the question for at least two years. It was disconcerting to realise that unless some means of extraction were devised, thousands of poles, pit props and box-wood logs, so urgently needed for the saw bench and the collieries, would rot on the ground. Already 3,000 felled trees had been lying here for a

year and a half. The bark was beginning to fall off these logs and in another six months decay would have set in.

The nearest public road to these compartments is 800 feet below. A glance at the close contours on the map will give an idea of the steep gradient all along this face. A reconnaisance was made in all compartmeats along the Glen road in an attempt to get a " sling " path down the face of the cliff. It was hoped to get a zig-zag path or a path running diagonally across the slope in order to get a gradient favourable to " slinging " by horses (or " sligging," as it is called locally). However, this idea had to be abandoned in Compartments 6, 7, 12 and 13 on account of the huge massing of rock or " scree," which blocked every approach to the thinned area.

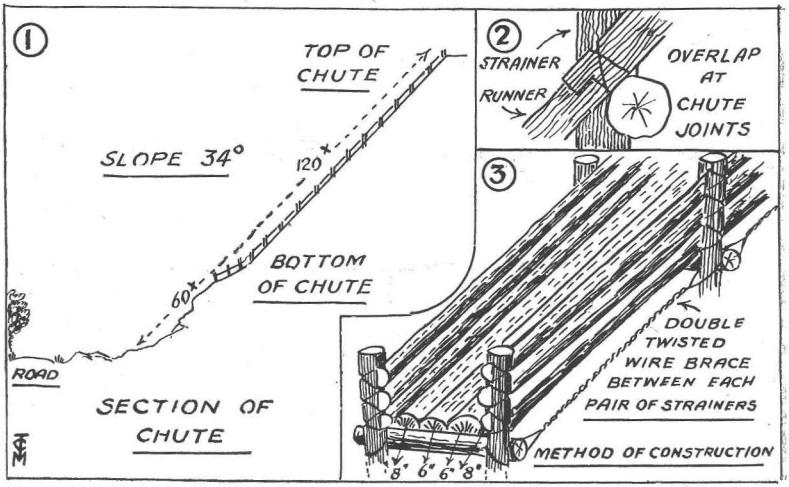
In a final effort to solve the problem a reconnaissance was made from the heights of Cloghernagh, on the opposite side of the glen. Hopes were raised on seeing in the rocky face in Compartment 7 a narrow strip of Spruce leading straight up to Compartment 8. Seeing no gap in the canopy of this strip of 20-feet high Sitka Spruce, the opinion grew that a path might be found there. The gradient, of course, was such as to dispel any hopes of hauling with horses, but at this stage that method had, in any case, been abandoned finally and the construction of a timber chute was under consideration.

On " brushing-up " this strip of Spruce it seemed that a chute could be erected by careful siting amongst the rocks.

CONSTRUCTION.

In November, '47, chute building was commenced. The question arose as to whether the rocks underlying the surface would prevent the setting of the uprights deep enough. Having to blast would have slowed up operations considerably. Fortunately, this proved unnecessary, as in clearing the site many trees were left standing, and they provided admirable uprights when sawn off at a height of about 5 feet.

The construction plan adopted was as follows: To place uprights along the steep portion of the path in two rows about two feet apart and approximately three yards apart in the rows. As far as possible, the uprights were set opposite one another except where rock occurred, when they had to be staggered slightly (for construction details, see sketch). They were of 9-inch diameter, sunk to a depth of three feet in the ground and well tamped in. The length of upright used varied from 7 to 9 feet, being cut on the spot to suit the ground. When all uprights were in position the cross-pieces to support the runner poles were sighted in so as to get an even gradient. The chute was not built to follow the actual slope of the ground, but was made to run in a smooth curve conforming to the general slope but nowhere rising more than a few feet above ground level. The cross-pieces were mortised in on the upper side of the uprights and held in position with wire, all wiring being counter-sunk to prevent the skidding logs from injuring it. The " runners " were



joined by a " scarf " or overlap joint to prevent fouling by the descending logs. The heavy side runners were " shouldered " against the uprights. As far as possible, runner poles were joined at and wired to the cross-pieces. Light poles were used as side rails to prevent the skidding logs from " jumping " the chute.

The bottom or running surface of the chute was built broadly U-shaped. This was arranged by using the thicker runners on the outer edge. In deciding on the sizes of the logs to be used in the structure, allowance was made for the very heavy wear and tear which would occur through friction and vibration. Experience has since proved the wisdom of the strong construction. Before leaving the actual construction it may be mentioned that draw knives (which are a heavy type of spokeshave) proved very effective for quick paring of tenons to give a good tight fit in the mortices.

Surplus Army stores wire cutters were found to be very effective for fast cutting of the wire used in binding all joints. All poles used were peeled; no nails were used in the construction, staples and wire only being utilised. The idea behind this was that when the chute had completed its work it could be dismantled easily and quickly and all good logs used as pit props or box-wood, being free from nails—the bane of the saw-miller's life.

TESTING.

Construction work was completed in June, 1948, and the chute was then tested. The first log travelled at 34 miles per hour and the second at 29 m.p.h., and the average speed worked out around 30 m.p.h.

It was found from this and subsequent tests carried out in wet and dry weather that the construction was sound. At this stage the

side rails had not been placed in position, but it was found that, even in their absence, no log " jumped " the chute. There was one big obstacle, however, which had to be surmounted. The logs were travelling far too fast, and some system of braking had to be devised if the timber were to be extracted undamaged. This was not surprising when it is considered that the angle of elevation of the structure is 34 degrees or, in other words, that the gradient is 1 in 1½, approximately.

It was decided to find the best brake by trial and error. Logs skidded without braking were striking the ground at the base of the chute with such force that they rebounded high into the air and smashed themselves against rocks, or shot off into the plantation on either side for a distance of at least twenty yards. This was disappointing, and it was anything but pleasant to hear the rending crash and to gaze on the remains of sizeable Larch logs!

Among the methods frequently used for checking the speed of the descending logs is one in which the runner poles are bored and fitted with adjustable spikes. The chief disadvantages of this scheme are the cost of the spikes, the labour of boring, and particularly the fact that the runner poles would be spoiled should the structure be stripped and the material put to other uses. Another method is to let the logs run down under control, using steel cable and a winch. The disadvantage of this method is the time taken to tie and rewind the cable after each run.

We first tried trailing logs hanging from overhead cross-bars into the chute. The descending logs, it was hoped, would be slowed down on brushing through a series of these trailers.

On experiment it was found that the speed of descending logs caused these trailers to be wrenched from the ground, tearing the sides and some of the posts clean away. With an easier gradient this brake would prove most effective, having the added advantage that the degree of braking required could be regulated by allowing trailer logs to hang over the sides in fine weather or when the logs were small, when little braking would be required.

After this failure we hit on another idea for preventing damage. The end of the chute was about 2 feet overground, and it was decided to build an addition to it with the gradient flattened out somewhat, and thus cause the logs to plunge into the ground at a lesser angle—approximately 30 degrees. The ground leading directly from this extension was then scooped or hollowed for about twenty yards, from which point the ground fell away steeply. It was not considered advisable to make the extension longer than 12 feet lest the logs should be hurled as far as the public road. A test was carried out as soon as these alterations were completed, and the result surpassed expectations.

All logs, irrespective of size, were slowed up sufficiently after passing over the soil channel to pile up about forty or sixty yards from the glen road.

WORKING.

No log was damaged and it was then a simple matter to haul them with horses from the landing ground to the stacking site on the other side of the Glen road, where, with a portable sawmill, they were converted into stakes, road poles, tripod poles, pit-wood and box-wood. When all details had been attended to, e.g., the enclosing of a stacking area, the erection of warning notices and danger flags for the safety of the public, chuting operations were commenced on a large scale, the head of the chute being fed by a system of drag-paths through Compartments 8, 5 and 2. It was found that the chute extraction rate was one log per minute. The maximum number of poles which can be allowed to pile at the bottom of the chute is 200. If the piles are allowed to get bigger, breaking occurs. As can be readily understood, a couple of hours' chuting is the most that can be done at any one shift. Horses are then switched to the bottom for a day and the timber at the bottom is cleared. By switching the horses a steady flow of timber to the portable sawmill is maintained.

At the time of writing all thinnings have been completed and cleared from Compartments 2, 5 and 8, and Compartment 11 is being dealt with. Compartment 9, which also needs thinning, will also be served by the chute.

COST.

Approximately 300 Japanese Larch poles were used in the construction of the chute, value £10. The labour cost of construction was £65. Allowing £5 for wire and staples, the total outlay was £80.

RESULTS.

The following table gives an idea of the results in the first two months' service:—

TABLE OF MATERIAL EXTRACTED BY CHUTE.

Type of Material	Amount	Value
Used in construction of chute ...	310 Larch poles ...	£10 0 0
Light poles sold locally	280	8 3 4
Stakes produced	3,265	106 6 8
Pit props	1,809	122 15 3
Box-wood	2,500 c.f., U.B.	156 5 0
Firewood (waste ends & off-cuts)	22 cords	32 14 6
Do. (blocks)	2 do.	5 10 0
Road poles	112	4 4 0
Tripod poles	280	4 13 4
Miscellaneous light poles	... ...	10 0
	TOTAL	451 2 1

Note: The above materials were produced from 4,000 poles.

It must be remembered that the usefulness of the chute is far from being at an end. We can look forward to continued results over several years, so that the capital cost, spread over its period of service, will be insignificant. Financially, therefore, it must be considered an unqualified success. In addition, it has enabled a necessary sylvicultural measure to be carried out at a profit and has eased the pressure on road construction and released our labour staff for other essential maintenance and development work in this rapidly-growing forest.

In conclusion, it is only fair to state that the success of the chute is in no small way due to Head Labourer Thomas Murphy, whose enthusiasm, hard work and practical suggestions inspired all to keep going, even when the poles were smashing to pieces and all the work seemed to have been in vain. Acknowledgment is also due to another Mr. Thomas C. Murphy, who kindly prepared the sketches of the construction.