

# Dinorwig Slate quarries

By Allan.

## Introduction:



Until recently Dinorwig was one of the largest slate producers in Europe and at its peak was producing 100,000 tonnes a year and covered a total area of just over 4 square km. Dinorwig was first developed in the late 1700's, and prior to this was being worked on a small scale by locals. Like many early slate quarries when Dinorwig saw its first days it was a small working being worked by locals who rented out the land on which the vein was situated. Dinorwig was worked on a large scale from 1780 onwards; and by 1788 the first inclines and major tramway systems were in position. Dinorwig was to become a quarry where gravity inclines were essential, as the highest workings on Dinorwig were at an altitude of 2500 ft.

### General planning:

Two separate methods of extracting slate were deployed at Dinorwig. Although Dinorwig is usually considered as a gallery kind of quarry, there are a great number of non galleried pit workings within the middle and upper reaches of the quarry. Slate removed from these workings was by Blondin ropeway, lift incline or by tunnel. At Dinorwig: - several lift inclines were assembled; the lift inclines at Dinorwig were usually of a short and steep design. There are still two obvious examples of these inclines in good condition; these inclines can be found at Penrhyn Bach gallery; - and at New York level. These inclines can be clearly identified by the steep dry-stone embankments on which they are situated. Like most of the inclines at Dinorwig, - these were built of gravity lift design and were used for transporting the thousands of tonnes of slate, both slate waste and the finished product.

The different incline systems seemed to have different purposes. It is believed that the 1<sup>st</sup> inclines were the lower 'A'- inclines. These inclines were created from the late

1780's to about 1795. The original A – inclined plain was believed to terminate with Llyn Peris for shipment down Llyn Padarn. In the early years of the quarry, transport would have had to have been by sleigh. Several sleigh tracks/inclines used to lead down the edge of Llyn Peris. These tracks ceased to be used by the early 1800's and have since been replaced by inclines.

One of the most outstanding inclined-plain is the C-plain. These obvious dry-stone walls which reach above Llyn Peris are one of two huge plains which were used to transport the finished slate down from the mills. In the case of the C inclines, this mill would have been Australia mill. Australia Mill is situated on Australia Level which served as the upper terminus for the C5 incline; and the lower terminus for the C6 table incline. Above C5 all the C inclines would have been of transporting/table design. Apart from C8, - all these inclines were under-drum, meaning that the incline drum 'which would normally be situated in a drum-house,' would in this case be below ground level.

All the C inclines have changed over time, mainly because they are situated on what was one of the major tipping areas for the quarries, 'hence the embankments'. The 'C4' incline was the longest in the quarry from quite early on with a length of well over 500 ft. It will be noticed by anyone who might recognise the 'C' - inclines that the lower three have more than one embankment. Although not confirmed by the writer it is believed that these multiple embankments might be the cause of the changing tip-face. For e.g.: - the C3 incline has two obvious embankments, however the drum-house was obviously deployed on the more westerly of the two 'in the more recent times, which becomes obvious by the way of which the house is situated. The C1 incline was also moved just as were inclines C2 & C3, although the original C1 embankment has been largely destroyed. At a time during the last century the C1 incline was believed to have four rail lines, being operated by a twin drum at the incline summit. Although the drum is now completely obliterated, it is still possible to see the drum-house, which would have housed the double drum.

The other main incline system was the A inclined plain. These can be seen stretching above Park Padarn up to the highest reaches of the quarry. The original A inclines have already been mentioned, but the ones so obviously standing today are situated more northerly. The reason for this change was probably for the dying significance of the Llyn Peris shipment scheme. By the mid 19<sup>th</sup> century almost all shipment was stopped, and with the developing mills at lake level, it was thought that the quarry would be better off constructing a replacement lower section for the A-inclines from the mid levels of the quarry down to the dressing sheds at Llyn Padarn. For these inclines to be as straight as possible, - cuttings had to be constructed for the lower three inclines. The upper A inclines were on an huge area of tipping and serviced the higher levels of the quarry and many of the pits such as Sink Juliet and Sink Australia. Like many of the inclines at Dinorwig 'the inclines of A5, A6, A7 & A8 were built on the enormous mass of waste rock, which the quarry produced over its 180 years of operation. These inclines become obvious to anyone looking at the quarry due to large amounts of 1980s installed concrete tubing on the inclines. According to some sources, - this tubing has been constructed to cover cables for the electric PowerStation; although not confirmed.

## **The Power Station**



In the 1980s a plan was made to build a hidden hydroelectric PowerStation underneath Elidir Four. This plan eventually led to the development of the first underground pumped-storage scheme hydroelectric PowerStation in the world. The turbines and other vital equipment was to be housed in enormous chambers inside the mountain. To develop this enormous undertaking much of the old quarry workings had to be tampered with; for e.g. - : several air shafts were constructed within the regions of the quarry as well as an access road over the higher areas of the quarry; Several access tunnels were blocked off by the power station, 'often for unknown circumstances. The powerstation are very strict about the security of their power station and the Dinorwig quarries, and it was only within the last 19 years that people have been able to walk through the quarry once again.

### **Tunnels & Transport in the pits**



As has already been explained 'the Dinorwig quarries were worked as both terraces and as pits. It is most probable that many of Dinorwig's terraced workings were once pit workings opened out from the side; but in the majority of cases slate was removed by either a Blondin ropeway or by tunnel. When any sizeable pit quarry being worked from about 1878 – 1960 would have had some need for a ropeway of some sort. This was even the case in Lakeland where blondins or blondin cranes 'as they were known' were positioned at Hodge Close pit quarry and at the Old Man slate mines 'although of a different design. At Dinorwig the blondins were typically of a very steep design and usually descended directly into the pit working. The blondins' running cables were generally looped over a cone shaped structure before being clamped onto the ground. The haulage cables were looped over the same cone structure on a pulley, before leading down to the level below to the winding-drum.

#### Tunnels & other methods:

For an opencast quarry Dinorwig had a large number of tunnels. Anyone walking through the central part of the quarry will notice a lot of dark holes in the sides and bottoms of the pit workings. Most of these tunnels would have had the sole purpose of being used for access to the pit workings, although some of these tunnels may have had some other use. For instance there is one tunnel which carries a water canal,

and several others provide drainage. There is even one with a small chamber at it's end, which opens out into the base of a pit quarry.

**Conclusive notes:** some regions of Dinorwig have been studied quite extensively, for instance: the Allt Ddu area; but some regions have come of little attention, like the underground parts for instance. This will have to be looked at in the future, before these areas are totally lost forever.

References:

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