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Field excursion to the Clywedog Reservoir and Dam, and the Dylife Lead Mining area

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KRAUSE, J. (1983). Field excursion to the Clywedog Reservoir and Dam, and the Dylife Lead Mining area. *Proceedings of the Shropshire Geological Society*, **3**, 12-14. The field excursion visited the Clywedog Reservoir and Dam, and the Dylife Lead Mining area.

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A field excursion was held on Saturday, 12th March 1983 to the Clywedog Reservoir and Dam, and the Dylife Lead Mining area.

(a) The Glywedog Reservoir and Dam

The morning was spent in a guided tour of the dam, starting in the small exhibition room, continuing into the control room, and from there a descent inside the dam itself. Many unexpected aspects of reservoir control were revealed by our guide, Mr. Ray Lewis. For instance, because heavier rainfall is expected, on average, at certain times in the year, the level of the water on certain dates is statutorily controlled, so that there is no room for the exercise of judgement by the "men on the spot" on these occasions. Needless to say, the British weather does not always conform to statute, and the subsequent reservoir level may be higher or lower than intended. The dam operators can continuously monitor rainfall over a wide area, using meteorological radar on Clee Hill, and this enables them to calculate very accurately whether they need to release water from the reservoir in order to accommodate the storm runoff which is about to be generated from the catchment area.

The dam is widely believed to have controlled the extensive flooding which used to occur in the towns along the Severn down as far as Shrewsbury. Whilst this is quite true for Newtown and Caersws, it is a mistaken belief as far as Shrewsbury is concerned since only a very small proportion of the Severn catchment at Shrewsbury is controlled by Clywedog. It is quite possible that serious flooding could recur in Shrewsbury, and the Severn-Trent Water Authority is in the process of formulating alternative strategies to deal with this eventuality.

The dam and reservoir were constructed between 1964 and 1967 with the joint purposes of flood and river control and water supply, both to Welsh and Midland consumers. The dam appears unusual in that it curves downstream rather than upstream. This is a little misleading in that the internal structure of the dam curves upstream, but the design of the dam has been adapted to the local circumstances. The eleven independent buttresses are keyed into a band of resistant grit, but doubts about the load-bearing properties of the Silurian rock in the valley sides meant that it was essential that the full weight of water was not thrown onto the sides of the dam, which would have been the case if a single structure with an upstream curve had been constructed. The existing structure directs the thrust of water downwards to the valley floor.

Between the buttresses, the interior of the dam is hollow, and we were able to see the structure with its connecting concrete beams, and the release valves for the water from the reservoir. Occasionally the water is permitted to overflow the top of the dam, and its fall down the face is broken by a series of steps. The structure is continuously monitored by means of strain gauges in order to watch for any sign of deterioration, and there are mechanisms for instantly sealing any sudden cracks between buttress and concrete link. Inspections were taking place when we were there because there had been some seepage of rainwater into the dam, but no leakage from the reservoir, contrary to worried reports in the Birmingham Evening Post.

(b) The Dylife Lead Mining Area

After lunch we visited the now derelict lead mining area of Dylife, led by John Denton, who provided the following notes. Detailed information is available in No. 1 of a series of books on *The Great Metal Mines of Wales*, entitled "*Dylife*" by David E. Bick.

The "Red Wheel", of which the housing remains, was originally 63 feet in diameter and claimed to be the biggest in Wales, although the Pandora wheel in the Gwydyr Forest has a pit 68 feet across. With 5 feet more, it would give 2½ feet clearance for a 61 feet diameter wheel, and as this is more generous than one would expect, it is likely that Pandora was more like 65 feet or above. Because the spokes of the Red Wheel rotted in the outside sockets, Bick says they were sawn short and the wheel reduced in size, and thinks the step in the launder is the result of this.

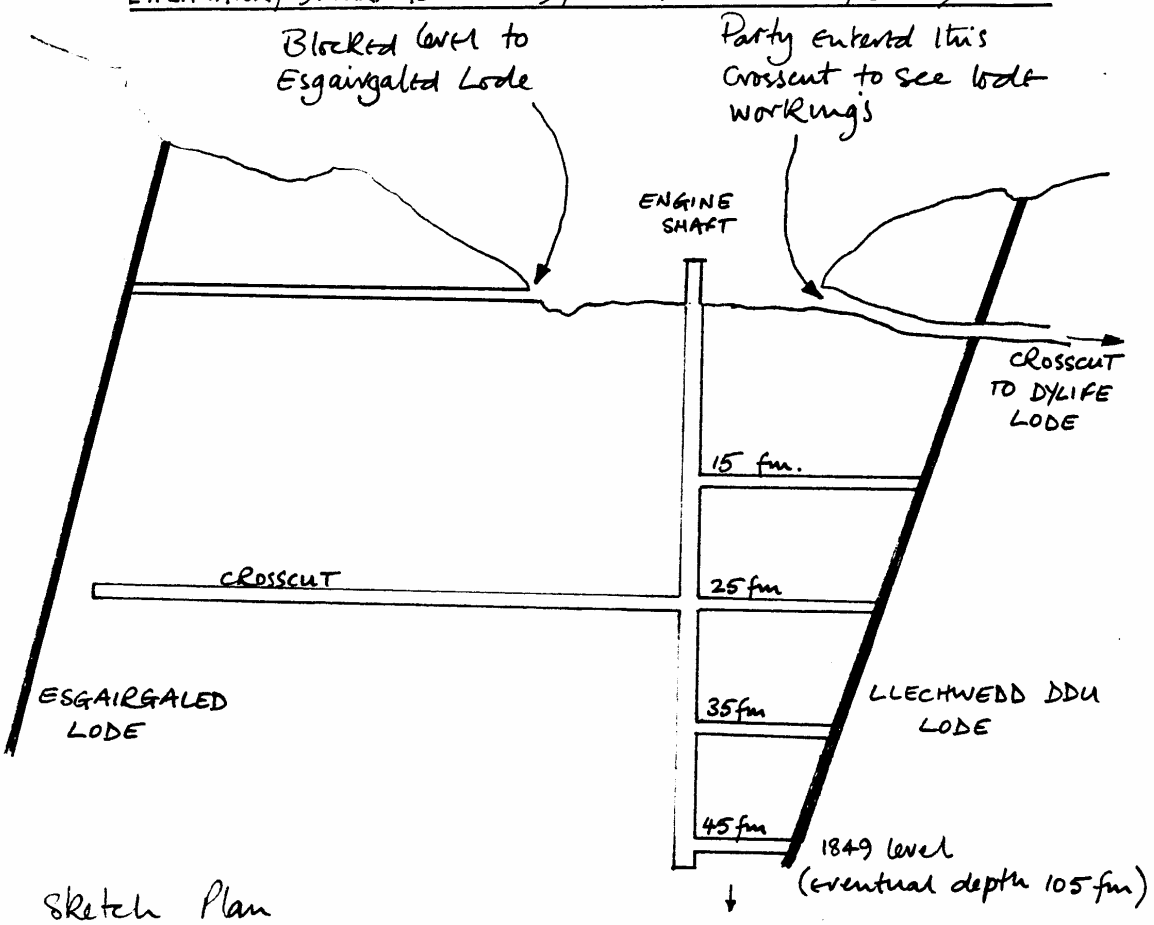
The wheel wound the Llechwedd Ddu engine shaft and also Bradford's shaft in the opposite direction, 25 fathoms deeper, the one going up while the other went down, and "balancing" the difference in distance by using drums of different diameters. The length of cable (horizontally as well as in the shafts themselves) was only possible after the introduction of the much stronger steel cable, though this would probably also have a hemp core. In addition to winding both shafts it also pumped them by oscillating rods traversing the ground on rocker beams and then at the shaft tops the motion would be turned from horizontal to vertical with the aid of a T-bob in all probability - the foundation of which we stood by before going into the adit.

At least two additional wheels operated the crushing and separating machinery near the main road and further wheels had been built near individual shafts before the Red Wheel was doing most of the winding and pumping for the two lodes.

An additional note on the Bryntail or Van Consols Lead and Barytes Mine, seen from on high if not in close up: The mine was started in 1845 and until about 1870 seems to have been simply a lead mine with one shaft adjoining the works and another high on the hill above. In this period the wheel would be used for crushing and separating the lead ore from the gangue by flotation. There was one long horizontal adit near the workings which intersected the shaft from high above while the lower shaft made contact with three further horizontal adits below. For the last 30 years of the workings, the surface "works" seem to have been occupied by barytes processing - bleaching in the so-called slate acid tanks, heating in kilns and crushing with wheels similar to ordinary dressed millstones. The barytes went for paper and paint fillers.

Jane Krause

EXPLANATORY DIAGRAMS OF THE DYLIFE MINING AREA BY JOHN DENTON



Sketch Plan