
River Wye at Lancaut, Gwent

[ST 532 965]

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Highlights

This is a site with incised meanders which exhibits evidence of staged incision during the development of this major river system. Although not recently researched, this area provides valuable evidence for long-term landscape development as well as being a notable example of a type of river landscape.

Introduction

The lower Wye between Ross and Chepstow has the best examples of entrenched incised meanders in Wales. The river has eroded through tilted layers of Carboniferous rock laid upon Devonian sandstones such that outcrops of Carboniferous Limestone formed cliffs in the gorges, such as the Piercefield Cliffs [ST 532 958].

The origin of the meanders was discussed by Miller (1935, 1937), who suggested that the Wye has entrenched through an original meander plain at 1000 ft (300 m) through rejuvenation. This meander plain was at a higher level than that of the present plateau surface of the highland of the Forest of Dean. It was during a period of peneplanation that the latter surface was formed. The 500 ft (150 m) plateau was, in turn, entrenched very rapidly. Finally, Miller hypothesized, entrenchment was interrupted at a base level 200 ft (60 m) above that of the present day, producing extensive peneplains around Ross-on-Wye. Subsequent submergence of the lower reaches of the river led to a widening of the valley.

Description

The large meander loop at Lancaut is an excellent example of the features produced by the rejuvenation that has taken place on the lower Wye. On the outside of the meander loop the river has tended to undercut the steep slopes, creating rocky precipices (e.g. at Wyndcliff, Piercehead Cliffs and at Wintours Leap). It was suggested by Dreghorn (1968) that the river initially meandered across a broad plain approximately 600 ft (190 m) higher than the present level. A subsequent uplift of the Forest of Dean plateau forced the river to cut down more vigorously, thus creating the gorge and its incised meander loops. However, there were intermittent pauses and it was during such periods that the river deposited sands and gravels on the inside of the meander, building up terraces — the remains of these can be seen in the Lancaut peninsula — thus creating an asymmetrical-shaped valley. This bench is approximately 250 ft (80 m) above the present valley bottom and can be correlated with the Liveoaks bench to the north (5397). Thus flatter land, more than 60 m above river level (250 and 300 ft contours), occurs inside each bend between Tintern and Chepstow, with steeper slopes on the north than on the south side of each spur. A cross-section through the Liveoaks meander, for example, shows that the west side of the valley has a marked break of slope at 90 m (300 ft contour) with the steep slopes of Wyndcliff rising above the more gently inclined spur within the meander curve. In addition to such terrace remnants, there is also evidence of the earlier evolution of the Wye in the form of two abandoned meander loops — one at Newland (5408) which is 370 ft (115 m) above the present level of the Wye at Redbrook and which has a meander core at 500 to 600 ft (150–190 m) representing the Forest of Dean plateau, and the other at St Briavels (5404) which is at a height of only 100 ft (30 m) above the river at Bigsweir, indicating a much more recent formation.

Interpretation

The earlier detailed investigation of the formation of such entrenched meanders on the lower Wye was carried out by Miller (1935, 1937). It was proposed that there was evidence of three and perhaps four cycles of development in the

lower Wye Valley (with stages at 450–500 ft, 400 ft, 200–250 ft and the present level). It was suggested that the Wye provides an excellent example of superimposed drainage whereby the courses of the river and the tributaries show virtually no adjustment to the geological outcrops shown on the present-day map. The river system has evolved on a cover of more recent rocks (Jurassic or Cretaceous) which have subsequently been removed by erosion. Thus it was suggested that: 'The uplift at the close of the Carboniferous initiated a prolonged episode of erosion during which thousands of feet of sediments were removed. By Triassic times an irregular surface had been produced on which patches of Triassic sands and breccias can be seen resting today' (Miller, 1935).

Miller suggested that the present plateau surface of the Forest of Dean could not have been the original meander plain, since such a surface would need to be more extensive. It was thus hypothesized that the original surface was of Mesozoic deposits at a higher level than the existing plateaux of the Forest of Dean, although not much of this 900 ft stage was preserved. Entrenchment, leading to the formation of the gorge-like sections of the lower Wye, was into the 500 ft peneplain, which is well-preserved on Tidenham Chase as well as in most of the high land of the Forest of Dean. Miller (1935) also suggested that the abrupt break in slope at the 500 ft level between Ross and Chepstow indicated that such a rejuvenation was rapid. This was particularly marked in the longitudinal profiles of tributaries entering this section of the Wye, with such streams becoming entrenched in gorges themselves. The third stage of derivation noted by Miller is represented in the Liveoaks and Lancaut meander core 'benches' at the 200–250 ft level and in the longitudinal profiles of tributaries. The last stage in the process occurred with the melting of the ice caps and the subsequent rise in sea level, resulting in the submergence of the lower Wye, thus causing the tides to extend up to Bigsweir. Vertical erosion has been reduced, whereas the widening of the valley has been accelerated.

Little work has been carried out on the entrenched meanders of the Lower Wye in recent times. However, there is evidence of at least three stages of erosion in this section of the river, namely: (1) the 900 ft plateau, of which today only a few small patches remain; (2) the 500 ft stage in which the river entrenched; (3) the 250 ft stage represented in the meander core at Lancaut.

The Lancaut meander of the Wye is an excellent site demonstrating the rejuvenated nature of the river, with rocky scarps on both banks. The river flows independently of the main controls of structural geology, suggesting that the pattern is a good example of superimposed drainage.

Conclusion

The large valley meanders of the River Wye are spectacular features which have developed in a complex manner over a long period of geological time. Clues as to their origin are provided by their relationship to the surrounding relief, their relationship to the bedrock and the nature of their morphology and deposits, including high-level abandoned meander loops. The features are a fine example of superimposed drainage and incision due to rejuvenation of the river system.

[References](#)