

Water Drowning in the Golden Valley, Herefordshire  
in the Sixteenth Century

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## 1. Introduction

The number of disused weirs, sluices and trenches, found in the Golden Valley, Herefordshire are evidence that at one time widespread water control was employed and some of these systems were in use till the end of the 19th century.

These works lie on the west of the River Dore, between Peterchurch and Chanstone Court Farm which, together with other systems on the same and opposite sides of the valley, extend to Abbeydore. They were undertaken by Roland Vaughan (gentleman), as part of a project for the improvement of agriculture and for the benefit of the local population, particularly the poorer classes.

These waterworks were commenced at the close of the 16th century and involved twenty years of experiments in controlled flooding. They are described in a book by Roland Vaughan published in 1610 for the guidance of other landowners.

This paper summarises a research project undertaken in 1943.

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## Reference

Roland Vaughan's book (of which copies are rare) is entitled "Most Approved and Long experienced Water-Workes, containing the Manner of Winter and Summer Drowning of Medow and Pasture, by the Advantage of the least River, Brooke, Fount or Waterprill adjacent: thereby to make those grounds (especially if they be drye) more Fertile Ten for One. As also a demonstration of a Project for the great benefit of the Commonwealth generally but of Herefordshire especially" 1610. This book includes many interesting reflections on the times, but the wealth of anecdote tends to overshadow the actual description, construction and layout of the water-works.

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John Hodges, 39 Bedford Street, Strand, London

Printed by Ballantyne, Hanson & Co. 1 Plate

2. Physical Features of the Golden Valley

The River Dore rises in the parish of Dorstone and flows south east to join the River Monnow at the south end of the valley - near Pontrilas. The valley is bounded on either side by two roughly parallel hill ridges rising to over 1000 feet and extending some six miles in a north west - south east direction. The relief of the valley and natural drainage are shown in Figure 1 and a typical section across the valley is given in Figure 2.

Most of the tributary streams to the River Dore originate on the west side.

The valley 'floor' is about half to one and a half miles in width throughout its length and is widest where it is joined by the Slough Valley.

3. Roland Vaughan's Irrigation System

In winter sediment-laden flood waters were diverted from streams by means of trenches which together with levelling resulted in dispersal over a much greater area than would have been the case if the valley had remained subject only to natural flooding.

In summer the land was 'drowned' occasionally with clear water which prevented drought and maintained the meadows in a verdant condition.

4. Survey of the System

In 1943 many of the old trenches were recognisable in spite of their antiquity. In some places, however, all traces of them had been obliterated, as for instance in ploughed fields, or in the vicinity of farm and other buildings, and their courses were often not easily distinguishable from cart or timber tracks. These trenches at one time formed boundaries which were subsequently marked by hedges. However, as it is normal practice to dig ditches beside hedges, it was sometimes difficult to establish whether the ditch in question was originally a Roland Vaughan trench or not.

Many of the old weirs, sluices etc. remained, but others had long since disappeared. Only a few of the trenches, weirs and an occasional dam were shown on the 6 ins and 25 ins Ordnance Sheets. In order to locate weirs, sluices and diversions, the courses of the River Dore and its tributary streams were followed and the fields were surveyed for trenches.

Trenches attributed to Roland Vaughan were distinguishable from other ditches because they had been carefully levelled with a graded fall. In contrast to the banks of streams, the edges of the trenches were level with the fields because the spoil was spread over hollows ("forrows, reanes and slades") in the valley floor in order to obtain an even surface for 'drowning'. The trenches were constructed to a definite width and depth and, therefore, still retained a regular appearance in 1943. Where traversing the valley floor the trenches were usually straight, but, on the hillsides they followed the contours.

The weirs were solidly constructed, with masonry wing walls, separated by an evenly descending series of sand stone flags pitched on end forming the "sille" (Figure 3).

The sluices (Figure 4) consisted of short lengths of walling, either semi-lunar in shape or right angled. The oakwood flood gates were raised or lowered in stout frames, lodged in upright grooves in the wall. The position of the gate was altered by means of a peg slipped into the frame. Remains of these weirs and sluices could still be found in 1943 although many were in a very dilapidated condition.

The map indicates the position of such trenches, sluices and weirs etc. which existed, and alterations to the natural drainage. The contours were taken from the 6 ins Ordnance Survey.

This study of the main system of waterworks is based on direct observation supplemented by points gleaned from Roland Vaughan's book. However, his quaint account is very unsatisfactory since there is little mention of place names making it difficult to identify the trenches which he described, to understand the layout of the system, or how it was operated.

5. The Main System

The "Commanding" weir (40 feet wide), of which there is now no evidence, was constructed across the River Dore, a quarter of a mile below Peterchurch on a stretch from which the river was subsequently diverted to make way for a railway. From this point a considerable volume of water could be directed into the main 'master' trench, or "Trench Royal" as Roland Vaughan called it.

The amount of water drawn into this trench would have been regulated by a sluice and flood gate immediately above the weir. The weir served to dam the river and so maintained the water at the inlet level of the trench (Figure 5).

The "Trench Royal" was 3 miles long according to Roland Vaughan (probably an over-estimation). As constructed, the first half mile of the trench was 16 feet wide, 8 feet deep and the remainder 10 feet wide and 4 feet deep.

Roland Vaughan claimed to have had full "command" of the waterflow both forward and backward, i.e. water would run either way but this seems improbable since the trench fell some 40 feet along its length.

The "Stanke Royal" of Roland Vaughan which was 7 feet high was presumably a large dam at the lower end, probably situated where the "Trench Royal" met the Slough Brook near Chanstone Farm. The "Trench Royal" lies roughly parallel to the River Dore on the west side at rather less than a quarter of a mile. In parts it is now broader and deeper than originally as it has for some time been scoured by uncontrolled flood water.

Most of the land lying between the river and the "Trench Royal" was flooded from the latter. When the "Trench Royal" was full, water was run into "counter" trenches (running parallel with the main trench), without the necessity of a weir, by means of a sluice (Figure 6). Each "counter" trench served a predetermined area or water meadow. Dams were placed at intervals along the "counter" trenches, thus controlling the water, so that it could be diverted into smaller trenches, the aim being to dispose

the water evenly. The meadows were flooded by making slight gashes or "gouts" (local term) at intervals of a few feet along these ultimate trenches.

For convenience flooding could be limited to a certain watermeadow, or a portion of it, by means of embankments, or small "lists" as Roland Vaughan called them. In some cases the watermeadows were terraced. Few of the embankments remained to indicate the old enclosures but may be marked by contemporary hedges.

Once the sediment had settled, water was run off into drainage channels which opened into the river by sluices. Thus the water was under control from the time it entered the trench system until it was returned to the river.

Half a mile below the principal weir there was a second one on the River Dore from which water was drawn or "commanded" into the "Braving" trench. This trench was 2 feet wide, 1 foot deep and followed the course of the river at a distance of about 5 feet from the bank. The land immediately bordering the river was higher than the valley floor due to riparian sedimentation, and, therefore, could not be flooded from the "Trench Royal", but only from the riverside by means of the "Braving" trench. How this trench was carried across the drainage channels (which were quite broad and deep where they abutted on the river) is problematic - possibly by aqueducts. Earth excavated from the "Braving" trench was placed on the river side as an additional protection against natural flooding.

Roland Vaughan stated that there was a third weir one mile further down the river.

The "Trench Royal" intercepted three tributary streams of the River Dore, the Trenant, Shegear and Slough Brooks. An additional volume of water could be drawn into the Trench from these sources, or directed by means of sluices into the river.

Weirs were constructed on these streams which served a complexity of smaller trenches from which all the land on the west of the "Trench Royal" was flooded. These trenches may be divided into three categories:

- a) Trenches, which conveyed water to flood the valley floor west of the "Trench Royal", encompassed the hills at the limit of the valley floor or flood plain (roughly corresponding to the 400 foot contour). These trenches vary in width from 5 feet - 15 feet according to the area of ground to be flooded, and decreased in size as they proceeded from the "Commanding" weir; otherwise they closely resemble the "counter" trenches on the "Trench Royal" and flooding was carried out in a similar manner.
- b) Trenches conveying water to flood the gently rising ground or hillsides, was derived either from the same streams higher up the valley than the trenches in (a) above, or from springs. They were intended more for summer than for winter 'drowning' and were smaller (up to 8 feet wide at the most). Only a small volume of water was played on these slopes as any large volume would have caused soil erosion.
- c) In the Slough Valley there were also two trenches (6 feet wide) which not only served as 'drowning' courses, but also as "leats" or mill races.

All flood waters drained either into the streams at a lower level or into the "Trench Royal".

The Slough Brook was diverted from the original course, in the lower reaches west of the "Trench Royal", so as to enclose a greater extent of "flat-bottomed" land between the Brook and the River Dore. This diversion was connected by a short trench with the south end of the "Trench Royal" and the original course - presumably Roland Vaughan's "Everlasting Trench" which was the outlet for the "Trench Royal". The "Everlasting Trench" was widened and deepened to receive a greater volume of water than it would have held originally.

Operation of the system must have required skill and judgement: it was necessary to keep a close watch on the state of the weather; an unexpected convectional storm, or a miscalculation on the part of the operator, could have led to disaster involving destruction of trenches or sluices.

6. Extent of Water Control

There are traces of similar waterworks in other parts of the valley. For example, there is a well preserved aqueduct in Dorstone parish. There is also a diversion of the River Dore (east side) below Chanstone Court Farm, which now accommodates a greater volume than the original course: in former times it was probably only a mill race used for flooding purposes.

Some of these trenches were probably constructed by neighbouring landowners under Roland Vaughan's direction. It is evident that practically the whole of the Golden Valley could be 'drowned' artificially on the lines devised by this ingenious and resourceful gentleman. A good guide to the extent of this flooding is indicated by the roads, bridle and footpaths which are located outside the controlled area.

7. The Object of the Scheme

Apart from improving the value and productivity of his property, Roland Vaughan's main incentive appears to have been to improve the social conditions of the poorer classes of the valley, which had deteriorated after the suppression of the Abbey of Dore.

Returning home from the court of Queen Elizabeth, Roland Vaughan found the inhabitants of the valley unemployed and reduced to a state of idle beggary. His description of their normal occupation is of interest as a reflection of the times:-

"There bee within a mile and a halfe from my house every way, five hundred poore habitations whose greatest meanes consist in spinning Flaxe, Hempe and Hurdes. The people dispose the seasons of the yeare in this manner: in May, June and July (three of the merriest months for beggars) which yeeld the best increase for their purpose to raise multitudes:



Whey, Curdes, Butter, milke and such belly-provision abounding in the neighbourhood serves their *turne*". In August, September and October they gleaned (according to the custom of leazing) or rather pillaged the crops of "Wheate, Rye, Barley, Pease and Oates" on the property or 'demesnes' of the gentry. They also found it opportune to rob "Orchards, Gardens, Hop-yards and Crabtrees" which in all tided them over the winter. They led an idle life for the remainder of the year.

As a remedy to these miseries the excavation of the trenches provided occupation for the local people but skilled journeymen (carpenters, stone masons etc.) must have been employed to construct the weirs and sluices. Further employment was afforded in the maintenance of the system and also in its actual operation once completed. Roland Vaughan was a keen agriculturist and gave great attention not only to the improvement of his 'demesnes' by artificial flooding, but also to husbandry.

On the strength of his enterprises in this respect he proposed to establish rural trades and thereby *create* a ready market for his farm and other produce. No account of Roland Vaughan's waterworks would be complete without mention of his <sup>Proposed</sup> "Commonwealth" of tradesmen.

#### 8. Agricultural Benefits

Owing to the change from a sheep rearing to a cattle and corn economy, Rowland Vaughan's objective was to improve the fertility of the arable land and the quantity and quality of the grass crops. Meadows could be grazed up to 1 May before being put up for hay. Flooding immediately before cutting prevented the soil from becoming hard-baked and facilitated the growth of a second crop. There was a 'port' below Whitehouse and silt, compost and agricultural goods were carried by barge (20<sup>feet</sup> long by 3<sup>feet</sup> wide), to Newcourt (in Bacton parish), a great advantage in days when roads were in poor condition.

9. The "Commonwealth" of Tradesmen

Roland Vaughan hoped to found a "Commonwealth" of tradesmen run on the lines of a guild which is outlined in the following summary based on his book.

There was abundant timber on the hills on either side of the valley, sufficient for all Roland Vaughan's proposed buildings, also "Wallstone and Tyle" (sandstone), "Lime and Bricke". (Numerous disused lime kilns still exist on the outcrops, and there was a brickyard in Vowchurch parish until recent years. The timber was sawn by a watermill.)

Roland Vaughan proposed to build fifty habitations with shops to accommodate the artificers; together with a "Dining-roome, Kitchin, Pantry, Buttry, Larders, Pastry, Backhouse, Brewhouse, Sellors, Shambles, Garners, Malting-roomes, an Almshouse, Surveying-roome and Chappell" all of which are represented pictorially on an old engraving. Probably this block of "Commonwealth" buildings was to have been situated at Newcourt but Roland Vaughan sold this manor in 1614, four years after his book was published.

Closely adjoining were to have been the "under-shott-mill" for grinding corn and the cloth mill to house "twenty broad Loomes for the finest cloth; tenne narrow Loomes for courser Flax, Hempe and Hurdes: Tenne Fustian Loomes, with such Silk Loomes as necessity shall require". The mill was to have been run by a "Clothier with the aide of a Walker, Dier, Cottoner, Shermen, Carders, Sorters of Wooll, pickers and Quill-winders". A long list of other tradesmen was given.

It seems the proposed "Commonwealth" never materialised possibly owing to lack of funds or lack of support from Roland Vaughan's patrons. He must already have spent a fortune on the building of the waterworks. Roland Vaughan was born about 1559 and would have been over fifty years of age at the time his book was published. He is supposed to have held some four or more properties, i.e. the Manors of Bacton, Newcourt, More (or Whitehouse) and other land running into 1500 acres (much of which was woodland). He died in 1628.

10. Conclusions

For how long the system of waterworks described was actually functional is not known. It appears from a map of the Whitehouse Estate 1812, that the "Trench Royal" was then disused, as a road ran for a short distance north of Turnastone on the actual course of the trench. The fields below Whitehouse were, however, flooded artificially within the memory of my father Arthur Seward Wood (1880-1968).

With the advent of increased mechanisation in farming practice much of the remains of the irrigation system visible in 1943 have since disappeared, and can now only be elucidated by archaeological research, but that a very complicated system existed in the Golden Valley there is no doubt.

There is no evidence that the "Commonwealth" or series of buildings forming a guild described by Roland Vaughan ever materialised. Nevertheless the account by Roland Vaughan of the proposed guild throws important light on social conditions and farming practice in the Golden Valley in the 16th century.

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Fig. 1

Relief map of  
the Golden Valley

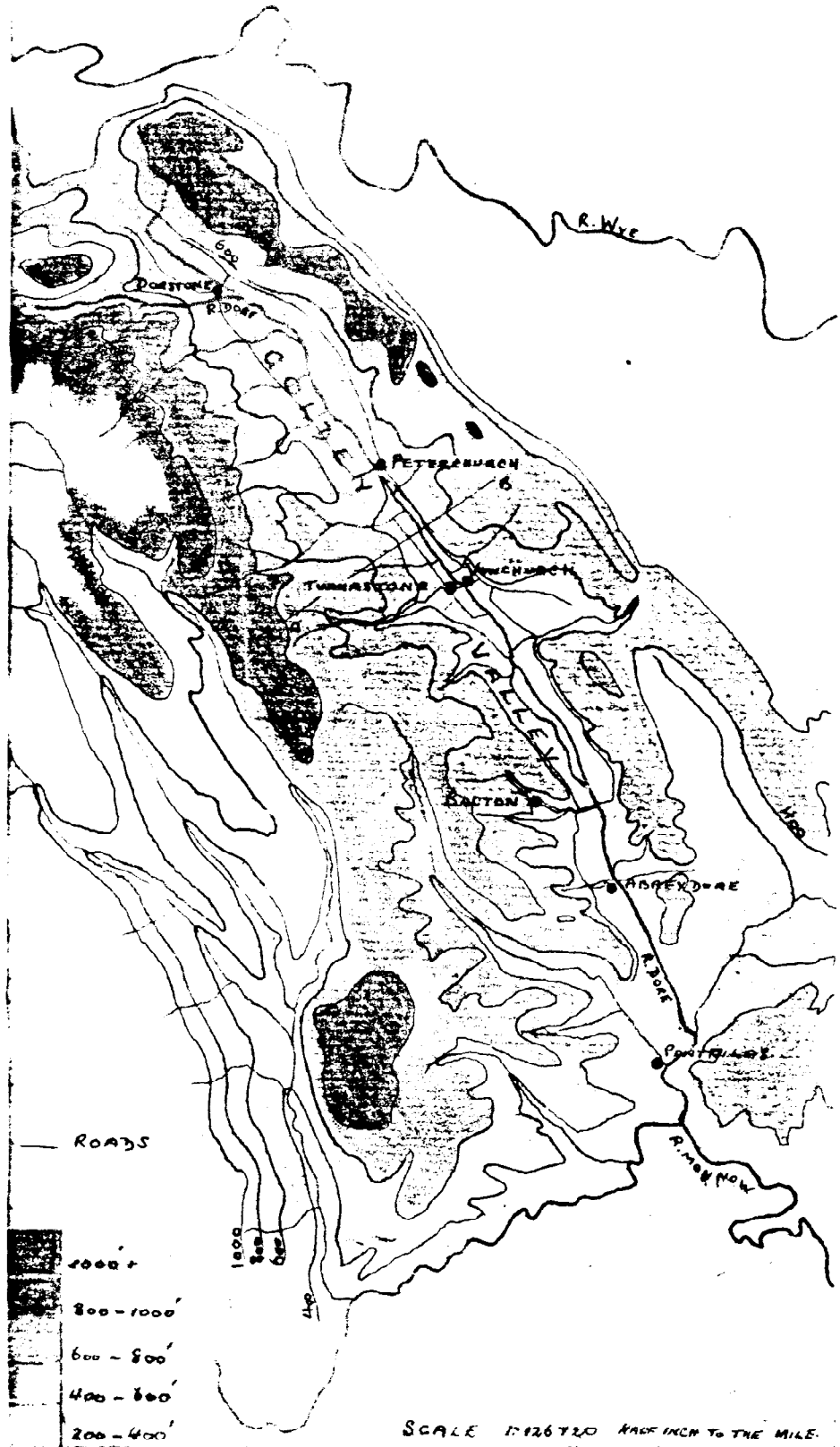


Fig. 2

Section A-B across  
the Golden Valley

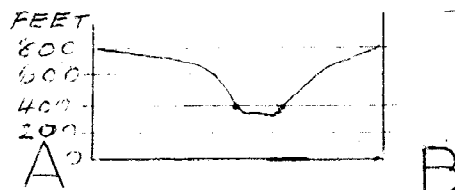


Fig. 3 - Construction of Weir

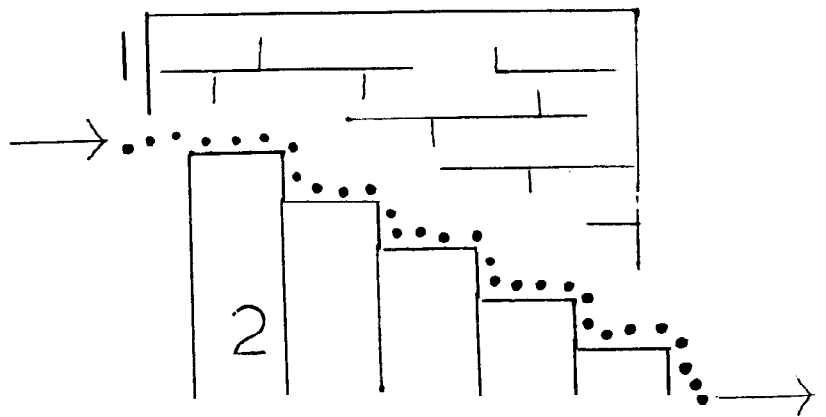
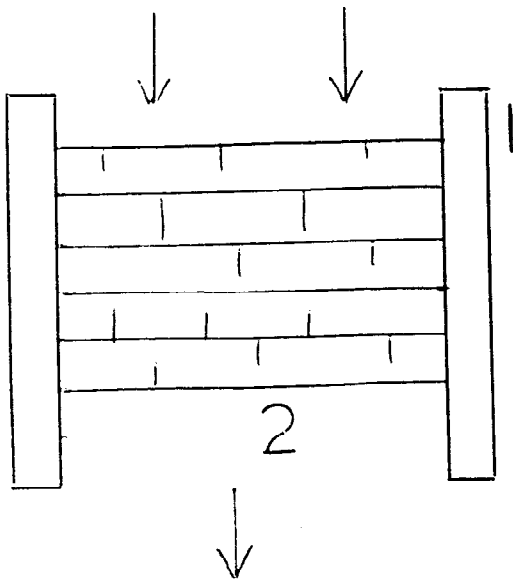
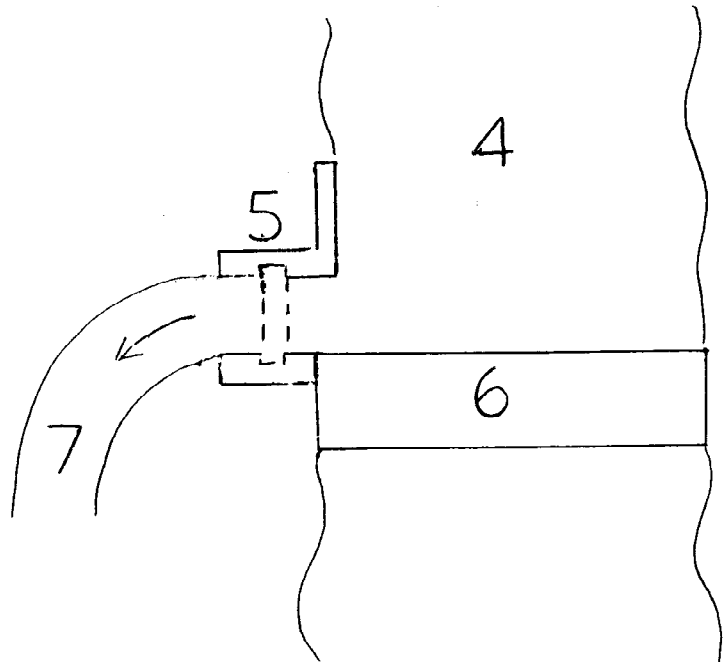
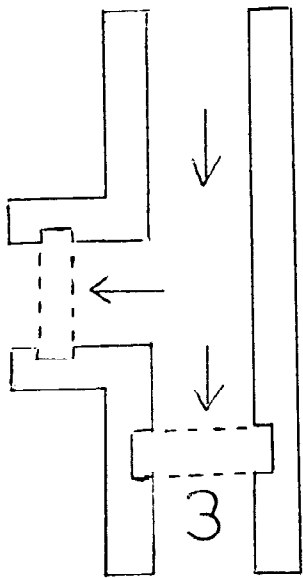


Fig. 4

Construction of Sluices

Fig. 5

Diagrammatic Reconstruction of "Commanding" Weir on R. Dore



Key:

1. Wing Wall

2. Descending series of flags

3. Flood gate

4. River Dore

5. Sluice

6. Weir (40 feet wide)

7. "Trench Royal" (16 feet wide)

Fig. 6 - Diagrammatic Reconstruction of Irrigation System

Key:

- 1. "Trench Royal"
- 2. Sluice
- 3. "Counter Trench"
- 4. Dam
- 5. Embankment
- 6. Watermeadow
- 7. Gouts
- 8. Drainage Channel
- 9. River Dore

