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The water-mills on the Lamas River in Cilicia

Abstract

A water-mill establishment on the Lamas River in Cilicia was reported by travellers in the 19th century. It consisted of a series of parallel, horizontal-wheeled mills along an oblique rock face. It was the subject of examination in 1990 and a brief publication shortly afterwards. Due to its interesting and rather rare construction a more thorough publication is given here.

Although Anatolia is often reckoned as the home of the water-mill,[1] the extant specimens of ancient water-mills in Anatolia are not numerous.[2] The scarcity of reported ancient water-mills is due to several factors: water-mills must be constructed in certain appropriate places, which are often different from where excavations are conducted, a water-mill constructed in an appropriate place has probably followers in later periods, so that its antiquity will be difficult to decide. Moreover, it is not always easy to identify the remains of a water-mill when all the loose parts have been removed. Finally, there is no instrument for listing new finds of establishments, so that remains of a mill discovered by early travellers or expeditions mainly intent on looking for other remains but mentioning the find in the travel or survey report may easily be overlooked in the future.

A recent example of this is an establishment which came to the attention of a French expedition surveying central Caria from 1989 onwards. In the heart of the district, south of the village of Yeniköy, a water-mill called Yediköydeğirmeni was found and reported very briefly.[3] It was described as ancient and was said to be situated just below the remnants of a Byzantine church. There is, however, no report of the water-mill in the index of the book and no note of whether a more extensive description of it will appear anywhere in the future. Will it ever find its way to a future list of Anatolian water-mills?

A century earlier, in 1892, an Austrian expedition surveying in Cilicia discovered an establishment which was identified as a water-mill. It was described in the expedition report[4] but not regarded by anybody dealing with ancient water-mills. After one hundred years it was the subject of a short reference by another Austrian expedition surveying Cilicia.[5] At the same time I observed the note with the original description and considered it interesting enough to make a journey to see it first-hand. I made the first visit in the spring of 1988. This visit was not easy: in spring, access to the place was flooded and the establishment could not be reached dry-shod. Nevertheless, I reached it and decided to study it more closely. Since much of it was rock-cut and the rest was not covered by earth, no excavation was necessary, only measurement and photographic documentation.

The work was completed during one week in June 1990. The team consisted of me and a representative of the Turkish government, Akif Yücel, the director of the Tarsus museum which was then a museum in its own right and had not yet been transported to Mersin. The work was reported in the *AST* in Çanakkale in 1991, and published the following year.[6] Nevertheless, it is my opinion that the establishment deserves a more thorough treatment than that short description; hence the article presented here.

The site is located one hour's walk from the sea on the western bank of Lamas River,[7] the modern Limonlu Çayı, which forms the frontier between *Cilicia Tracheia* and *Cilicia Pedias*. The road leads upwards from the shore and Limonlu village and runs on the western side for a few kilometres. The

1 See Roos 1989, 495.
2 See the maps in Wikander 1984, 16–17; 1990, 70–73. The number has of course grown slowly since then.
3 *HTC*, 48f.
4 Heberdey & Wilhelm 1896, 47.
5 Hellenkemper & Hild 1986, 123.
6 Roos 1992.
7 It is the place called Kayacı in Hild & Hellenkemper 1990, 246, see Abb. 276.

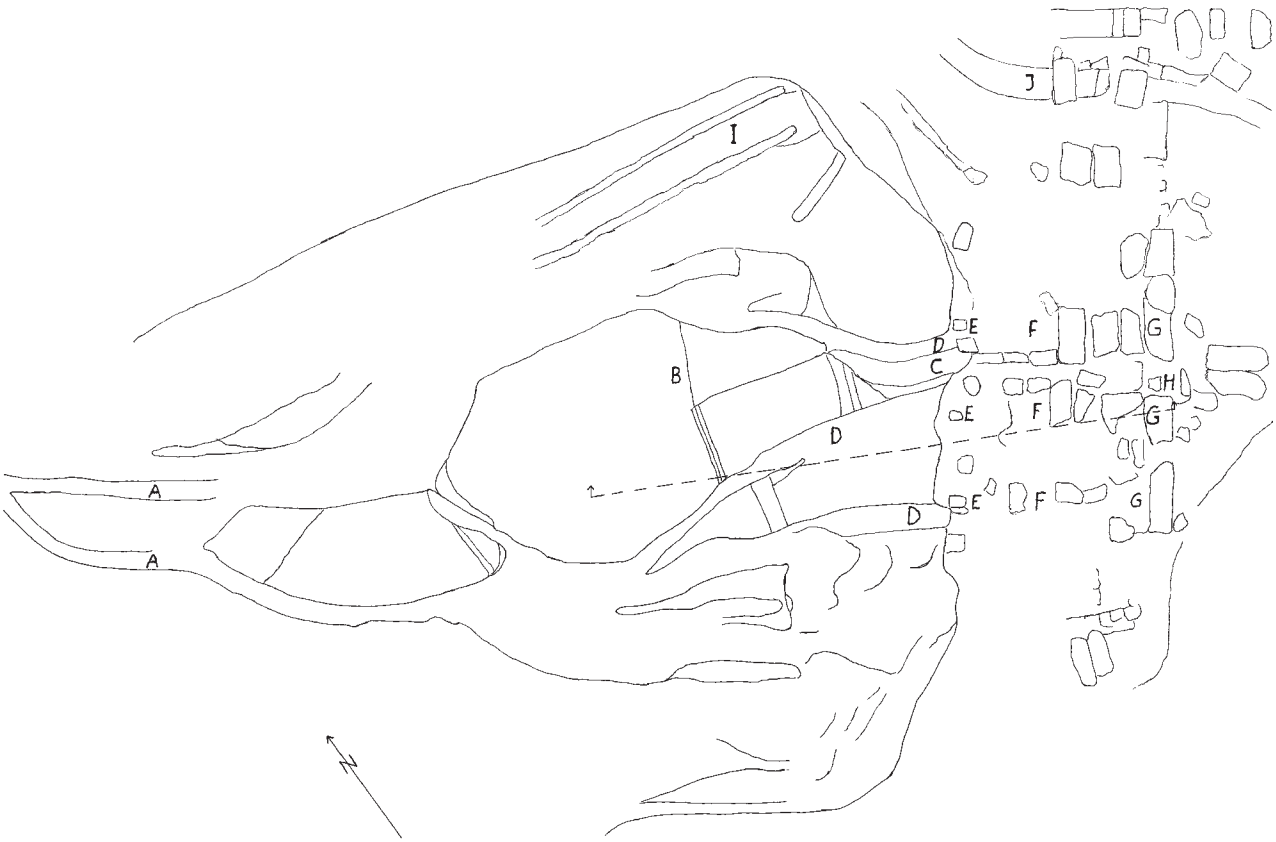

Fig. 1. Plan and partial section of the mill area. Scale 1:250.

A. Mill-race

B. Cliff

C. Projecting spur

D. Groove

E. Cone

F. Suggested place for mill wheel

G. Tunnel

H. Staircase

I. Channel now cut off

J. Channel containing water

road then crosses the river and continues upwards on a dwindling course on the eastern side of the river on a much higher level. On the western side is a path which is level with the river and therefore flooded on a seasonal basis. The establishment which was described by the Austrian scholars, but not the previous travellers Langlois and Bent, whom they refer to, can be located after roughly one kilometre. A good view is offered from a point above the river on the eastern side (*Fig.*

Fig. 2. View of the mill establishment, taken from across the river.

Fig. 3. The river, including the perpendicular western side with part of the gallery.

Fig. 4. The cliff with the spur, surrounded by grooves, and a niche in the lower part.

Fig. 5. The NW tunnel ends seen from the cliff.

2).[8] On the western side, the cliff is high and almost perpendicular (*Fig. 3*), and at certain points an aqueduct, in the form of a gallery cut into the rock, is visible.[9] In fact, it is a rather dangerous place and already the following year I noticed big boulders which had fallen down from above.

The establishment consists of a mill-race diverted from the river higher up and leading in a NW–SE direction to a narrow, triangular cliff in the middle of the path. It is 16 m long, 5.5 m wide at the SE end and 3 m high. It seems to have been the object of cutting activity, perhaps for cutting some of the blocks used for the floor mentioned below; in fact, the pattern of rectangles seen on the façade in *Figs. 2* and *4* are no doubt traces of this cutting activity. The mill-race has been divided into two channels, running on either side of the cliff and continuing to a precipice of a cliff, about 5 m high and sloping of ca 45°.[10] In the middle of it is a projecting spur along its whole height and about 50 cm wide (*Fig. 4*). In the south

[8] See Roos 1989, Abb. 4; 1992, fig. 1.
[9] See Hild & Hellenkemper 1990, Abb. 276.
[10] See Roos 1992, fig. 2.

corner of the spur, above 1.30 above the ground, is a slightly rounded niche, 20 cm high, 14 cm wide, and 10 cm deep. At the precipice, the mill-race has been divided into a number of grooves, ca 50 cm wide at the top and 30 cm at the bottom, and ca 50 cm deep. Their surface has become very smooth from the running water, which has continued to flow in tunnels under a floor made of big and rather smooth stones, some of these stones are ashlar blocks (*Fig. 5*). The SE ends of the tunnels, especially, are covered by big blocks. The floor is ca 1 m above the ground and measures ca 20 × 10 m, and parts of it are intact although many of the stones are missing in other parts (see

Fig. 6. The line of cones below the cliff.

Fig. 7a and b. The two tunnel openings flanking the staircase.

below). Its thickness is nearly 40 cm. The tunnels are partly cut into the rock, partly built of blocks. They are almost 1 m wide at the southeastern end, but narrower in the middle; the intervals between them are wider but not regular. The northwestern part of the floor does not extend to the cliff but leaves a gap of ca 3.5 m.[11] A line of rock-cut cones with rectangular bases are standing between the cliff and the floor (*Fig. 6*, see below).[12] The SE end of the floor has a marked edge, with an irregular staircase leading down to the ground in the middle (*Fig. 7*).[13]

The Austrian expedition found a stone pierced in the centre, in the form of a mill-stone, evidently in one of the tunnel openings towards NW. No measurements of the stone were given, but naturally they had no difficulty in recognizing the establishment as a water-mill, *hydraletes*, a term used by Strabo for the establishment in the Pontic capital Cabeira.[14] During my visit I found two pieces of mill-stones in a tunnel, but flat and not conical and thus not necessarily ancient mill-stones.[15] Both fragments had diameters of 68 cm, and the thickness was 37 and at least 27 cm, respectively. The underside of the upper stone had a 57 cm long and about 6 cm deep cutting, made for a rynd. The hole through the stone had a diameter of 20 cm. Evidently the establishment had been in use also in the 20th century, after the visit of the Austrians—as I mentioned above, a mill constructed in an appropriate place has a tendency to have followers, not always easy to separate from the original construction. In this case, there were few details that did not belong to the original construction, but it was difficult to obtain accurate information concerning the modern mill, which was reported to have been in use from 1940–1948 and had the puzzling name of "Dokuzocak".[16] It

[11] See Roos 1992, fig. 3.

[12] See Roos 1992, fig. 5.

[13] See Roos 1992, fig. 4.

[14] Strabo XII 556.

[15] Modern mill-stones are always flat, both on the upper and the lower side. Maybe, the ancient constructors were not sure that the grain would fall out between flat stones and instead used a construction where the lower stone had a conical upper surface and the upper stone a concave underside, Wikander 1980, 85. In Late Antiquity the stones, however, adopted the flat outlook used in modern times, Wikander 2000, 392.

[16] The name means "nine hearths" or "nine kilns", and of course the appearance of the tunnel openings can lead one's thought to kilns. The number (nine), however, is hardly appropriate; either it simply means "a big number", or the mills across the river (see below) have also been taken into account.

Fig. 8. Channel near the river, now cut off.

Fig. 9. Channel still containing water. To the left is one of the tunnel openings.

Fig. 10. View of the establishment showing water from the tail-race flowing into the river.

Fig. 11. Rock-cut handle for tying animals. The ruler is 50 cm.

is difficult to determine exactly what it looked like then, but evidently only a few channels were concerned.

There is an interesting detail concerning the establishment that also gives a clue to how the mill could have been worked. In front of some of the tunnels, very near the precipice, is a small cone about 0.5 m high and reaching above the floor level, with a roughly rectangular surface about 0.5 × 0.3 m but with a wider base. There are three of these cones in total *in situ* and a fourth one has been dislocated (*Fig. 6*). No doubt, the water was conducted to each mill through pipes (or half-pipes) made of wood or some other material, and the cones formed the support for the ends of the pipes. The grooves which are now visible on the face of the precipice have been formed by water running outside the pipes—and the water continued to run after the pipes ceased to exist. Each pipe conducted the water to a horizontal wheel below floor level. The water caused this wheel to turn, as well as a mill-stone at a higher level which was on the same vertical axis, situated above the floor, which may have been made of wood at that point. This type of horizontal-wheeled mill, formerly called a "Greek" or "norse mill", was rarer than the vertical-wheeled mill in Antiquity.[17] The water then continued in the tunnels beneath the floor and emerged on the other side of the floor.

As for the tail-race, it is important to discuss what features are ancient remains and what may be later changes. Since we have access to the description from the Austrian expedition, and we know that there was an establishment in the 20th century, we can draw certain conclusions concerning what cannot be later additions or changes since they are mentioned in the Austrian description. Moreover, rock-cut details are not easily modified, e.g. neither the cones nor the cliff can be later additions. The mill-stone fragments are, however, a red herring, since the one mentioned by the Austrians is certainly not the same as the mill-stones present there today (which may be modern).

[17] See Wikander 1980, 61; 2008, 146 fig. 6.2.

The relationship between the channels, tunnels and the floor is very complicated. As mentioned above, the water from the deviation channel is divided into separate channels running over the edge of the precipice in grooves, and some of the grooves in the middle lead to the tunnels with the cones mentioned above. However, how many grooves or channels there have been in all is not easy to decide. Altogether eight may be counted, some of them do not pass under the floor, but between the cliff and the river, and some are cut-off at various points (*Fig. 8*). Whether all are modern or existed also in Antiquity and were used to avoid too much water in the establishment is uncertain. At present, the channel next to the river is the only one that contains water (*Fig. 9*). When it reaches below floor level, it divides into two: one channel leading into the river (*Fig. 10*) and one continuing down between the path and the more or less vertical rock face. This latter channel now contains water, but it cannot have existed in Antiquity—then the water must have been conducted into the river at that point.

The Austrian expedition found an interesting device along the latter channel. In the vertical rock-face above it was a series of cuttings with handles in them and beside them a short inscription consisting of a few big letters flanking a cross.[18] The number of handles can be counted to seven, cut between 1 and 2 metres above ground-level, and located both vertically and horizontally (*Fig. 11*). The thickness of the handles is about 6 cm, and they are sunk into cuttings about 13 cm wide. Undoubtedly, they were used for tying draught animals during the stay at the mill, and it is obvious that the channel

Fig. 12. Rock-face with handles and the channel lining below.

Fig. 13. Blocks forming a sluice in the establishment across the river.

[18] Heberdey & Wilhelm 1896, 48. It has not been observed or commented on later. According to Prof. F. Hild, Wien (to whom I am grateful for the information), it may be a reference to a *consularius* .

Fig. 14. The large building from above.

Fig. 15. The large building: the window.

did not exist then—otherwise the animals would have been standing in the channel with their feet partly in the water, and partly on the stones of the channel lining (*Fig. 12*). Many of these stones have been taken from the floor of the milling establishment, another indication that the channel is of a later date.

A strange feature is that there are also a couple of mills on the other side of the river, ca 100 m further down, which are not mentioned by the Austrian expedition and thus perhaps did not exist then. They do not form a spectacular establishment—as the one on the western side—but are more irregularly connected. They were also reported to have been in use in the 1940s. Part of a polygonal wall is preserved below the mills. Among the jumble of stones is a part of a rock-cut groove, 30 cm wide and 30 cm deep, with a rectangular section. Parts of other grooves are also visible, all running parallel to the river. Two sluice-stones, with slots 6 cm wide and 4 cm deep are standing opposite each other, separated by an interval of 62 cm (*Fig. 13*), and a third sluice-stone can also be seen, though not in situ. The task of cleaning the area would

have been difficult and, thus, no attempt was made, and it was not studied in detail.

As for the date of the establishment I do not venture to suggest anything closer than Late Antiquity.[19] The big blocks certainly look ancient, and can hardly have been brought to the site for any other purpose than for the mill. In Western Europe, water-mills were often connected with monasteries,[20] but in the East there are few traces of such a connection. In the recently discovered mill at Yediköydeğirmeni, there are remains of a church, or a similar building, quite near,[21] and at the Lamas River, half an hour's walk up the river, there are ruins of a big building that may have been a church or monastery that the mill belonged to (*Figs. 14–15*). Bent calls it a large house or fortress but Heberdey and Wilhelm regard it as a monastery.[22] As Hellenkemper and Hild point out, even the crosses on the walls observed by Heberdey and Wilhelm are not definitive proof of its identification as a monastery.[23] Unfortunately, this building has never been the object of closer investigation.

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[19] In fact, horizontal-wheeled mills hardly existed earlier than the 7th century AD, see Wikander 1980, 61 and 2008, 144.
[20] See Wikander 1984, 30f; Roos 1992, 3.
[21] *HTC*, 49.
[22] Bent 1891, 217; Heberdey & Wilhelm 1896, 47; Roos 1992, 3, fig. 6.
[23] Hellenkemper & Hild 1986, 123: "Doch bedingen in dieser Landschaft Kreuzzeichen auf Baugliedern nicht zwingend Sakralbauten, da Kreuzzeichen vielfach auch an Privatbauten erscheinen. Sicher ist, dass der genannte Bau noch in frühbyzantinischer Zeit genutzt wurde."