**Ergene Dere**

During the first week we were concerned to resolve outstanding problems relating to the channels and aqueduct bridges located in the western part of the system between Binkılıç (Çatalca), Safaalan (Saray) and Çakılı (Vize).

The first of these to be investigated was the ruined bridge over the Gökcəsu (Çeçen K51), a tributary of the Ergene. The bridge had been visited in previous years, but there remained questions about the relative dating of the pair of narrow channels visible in the part of the bridge that remains on the east side of the stream.

Following a survey using a total station it was possible to establish that the north channel had been blocked and that a second parallel channel had been established to the south. This alteration is perhaps to be associated with the extensive rebuilding seen on the part of the bridge that survives on the west side of the stream. There, the north side of an arch had been filled up and strengthened with mortared rubble, probably following flood damage (Fig. 2).

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1 Prefixes K and G refer to the annotation of the bridges and channels in Cecen 1996
In addition to studying the bridge we were able to follow the main channel towards the west, adding further GPS points to those taken last year. To the east of the bridge, the channel could be followed as a broad platform. A small ruined bridge was noted at the crossing of a small valley, but beyond this a forest road had cut through the single channel and revealed the base of the narrow channel. Although we had been uncertain whether the two channels at the Gökcesu bridge had been contemporary or successive, this discovery confirmed there had been only been one main channel, which at the bridge was seen in two successive phases.

Moving east, we entered the valley of the Ayvacık Dere (Fig. 1), a tributary of the Ergene dere. Here the width of the tributary valley forces the main channel to divert from the main valley side. Two bridges are known. The first over the Gelin Dere (K6) consists of an abutment on the north-west side and the robbed out remains on the south-east. A sinter sample from here was taken in 2002. The main valley of the Ayvacık dere is crossed by a wider bridge, but few traces survive (K7). On both the north and south sides, the remains of the abutments are difficult to interpret but seem to indicate that the channel had been constructed in more than one phase. Certainly, there were clear traces of a later build on the downstream side of the bridge (Fig. 3). A feature of the surviving work on the bridge was the use of small stone facing-blocks as part of the upper stonework associated with the channel (cf. the bridge at Talas).
Saray to Binkılıç

North of Saray the line of the main channel moves beyond the catchment of the Ergene Dere and having crossed the broad valley of the Galata dere (K8) it proceeds to cut across the broad ridge running east towards Safaalan (Fig. 1). There are few known traces of the channels or bridges. In places the line must have been cut across headlands in a deep trench rather than a tunnel. We were able to locate Çeçen’s observed channels at G15 and G16 and to make one new observation of a small collapsed section of the narrow channel to the west of it.

Beyond this point the line must have then entered a tunnel below the ridge to the south of Safaalan village. Beyond this the line is known immediately west of Binkılıç where field clearance has destroyed the foundations of a large aqueduct bridge (Manganez Dere, K9) seen in 2002 in the level ground west of the river (Fig. 4).

The extensive piles of cut stones and rubble with pink mortar attest the total destruction of the upstanding remains and the buried foundations of the bridge (Fig. 5).

The channel is visible to the east of the river, and we were able to revisit the Broad channel, which leads to the east and follows the catchment of the Stranca Dere towards the village of Aydnlar. In addition to drawing our attention to the newly damaged remains near to Binkılıç, the local Jandarma also described possible damage at Binkılıç kale (previously visited in 1997). Construction work had not affected the archaeological remains. However, we did observe that some of the ancient stone work included the large, re-used limestone blocks with clamps, no doubt derived from the aqueduct bridge in the valley below.
Belgrat to Çiftlikköy
From the catchment of the Stranca Dere we moved east to investigate more fully the line of the channels and aqueduct bridges in the valleys on the north and east sides of the peaks of Kuşkaya, located between the villages of Belgrat, Çiftlikköy and Kalfaköy (Fig. 6).

Fig. 6. Map of the central section of the Byzantine water supply system, also showing the Anastasian Wall.

The bridges at Talas (K21, K22) had been visited before on a number of occasions, however we needed to check for masons’ marks and to compare the construction of the various phases of the two bridges in this valley.

The earlier southern bridge (K22) was constructed on long blockwork with rustication (bossage) from a metamorphic rock. Only the two piers of a single arched opening survived. Traces of the narrow channel (associated with this phase) were located on the north-west side of the valley, north of the main aqueduct bridge.

The northern aqueduct bridge (K21) is significant since it reveals clear traces of a major restoration on both the north and south faces (Fig. 7).

Fig. 7. Talas: northern bridge (K21).

Due to dense vegetation growth it was not possible to carry out a detailed instrument survey, however we did check the earlier elevation published by Dirimtekin in 1959. A distinctive feature of this rebuilding programme is the use of buttresses on the north face and a prominent outward and downward sloping stringcourses. An additional arch was noted on the SE end of the bridge and we were able to measure the dimensions of the surviving channel crossing the bridge.

The restoration to the facades of the bridge covered an earlier construction phase of large rusticated blocks, characteristic of the major bridges at Kuşunlugerme and elsewhere. At Talas,
however, the builders had used a softer limestone. No masons’ marks were noted. The traces of small bridge across a narrow tributary valley were located north-west of the main aqueduct.

From Belgrat Köy we were shown aqueduct bridges and channels to the south and west of the village at Ortabel, Maçkadere (in previous reports referred to as Kemik Harman) and Elkafdere. Ortabel lay due south of the village of Belgrat köy, and in places the channel followed a raised embankment (substructura). The ruined bridge had not been previously recorded and comprised a single arch with clear evidence for rebuilding with stringcourses and blockwork similar to Talas.

The next bridge to the east was not visited, but we followed the channels to the north-west to Maçkadere. Here two bridges were known from previous visits, the earlier (north-east) bridge was constructed of long blockwork facings, similar in size to Talas, but of limestone. To the north of this bridge was a high abutment for a second period of construction. The earliest masonry did not survive and had been very extensively rebuilt with facings of coursed rubble and re-used blockwork. The upper part of the east pier of the south-west bridge had collapsed since our earlier visit to reveal clear traces of timber cribwork in the rubble core of the pier. We have identified this phase as belonging to the fourth-century aqueduct of Valens and it is important to note that this construction technique was already in use at this time. On the west side of the valley narrow and broad channels were identified leading to the south-west and north-east bridges respectively.

From Maçkadere we crossed over the line of the Anastasius Wall into the valley of Elkafdere. Here we were able to revisit the small bridge with an inscription of Longinus, prefect of Constantinople under Justinian recorded in 1997. In an adjacent valley we saw a similar sized bridge constructed differently of blockwork with rustication, characteristic of the second major building phase in the fifth century. A feature of the Longinus bridge was a distinctive arch-springing (chamfered downwards and outwards), reminiscent of the construction of the major rebuilding at Talas (K21), Ortabel, Luka Dere and elsewhere.

From Belgrat we moved south-east into the village of Çiftlikköy, the best-known aqueduct in the district at Büyükgerme (K29) had been visited and recorded in previous years. In the next valley east of Talas we were able to locate the aqueduct at Leylekkale situated in a dense and impenetrable section of forest and which, like Talas, had two major building phases (Fig 8). The initial building was of rusticated blockwork probably with a single arch, however later erosion and robbing had completely removed traces of this phase in the valley bottom, and the shell of the later work was all that survived. This later work was of blockwork with buttresses on both sides, similar to the later phase at Talas and with similar chamfered stringcourses. A significant feature of the aqueduct was the remains of a rectangular settling tank located at the west end of the bridge.

Fig. 8. Leylekkale aqueduct bridge (K29).
Keçi Germe & Kumarlı Dere

Fig. 9. Keçi Germe aqueduct bridge, east side (K30).

Further east we were able to visit the last two major surviving bridges before the open country towards Istanbul: Keçi Germe and Kumarlı Dere. Keçi Germe (K30) occupies a narrow, steep sided valley and is amongst the higher surviving bridges in the system, with three tiers of arches (Fig. 9). It is constructed of large rusticated blockwork and is best preserved on the east side. There is some evidence for decoration with crosses, and the masons’ marks were recorded. A detailed plan of the structure was made. There was no direct evidence for later rebuilding although there were clear indications of major earthquake damage on the downstream, north-west side. The high-level, narrow channel could be followed to the north-west of the bridge and the line could be followed to the south on both sides of the valley leading to an earlier single arched narrow bridge, similar in construction to those located in the first phase at Talas (K22) and Maçka Dere. Significantly the narrow channel on the east side of large bridge was not carried across it (as noted at Kursalıgerme), but appeared to by-pass it without any turn. In this instance, the narrow channel and the earlier bridge would have appeared to have remained in use at the same time as the new large bridge was functioning.

In the next main valley to the east, the long bridge at Kumarlı Dere crosses a wide valley with high built-up embankments (substructura) clearly visible from air photographs. Identical in construction to Keçi Germe, the bridge is amongst the longest known, but is only two tiers of arches in height. A large number of masons’ marks were recorded, as well as some decorated crosses. On both the west and east sides of the valley the remains of the narrow channel were apparent running across the bridge on the north-east. It was also clear from evidence on both sides of the valley that this was later abandoned and walled up. At the north-west end of the bridge, as the channel turned to the north, was the rough outline of a settling tank. Remains of the narrow channel were also seen leading towards the south indicating the existence of earlier bridges. Remains of these were located: there was a main bridge across the valley, with the single arch still surviving; a second bridge was also noted in a valley to the east. Significantly, at the primary bridge over the Kumarlı Dere, the channel on the east side could be followed up the valley, showing that there was either a higher stream or that the narrow valley was dammed and the overflow led into the channel.
Conclusions and Acknowledgements

The main conclusions of this season concerned the narrow channel in the Vize – Saray – Safaalan sector. Although some traces of broad channel had been noted at the Büyük Galeri there was no other evidence for this gauge in the western sector. In previous years we had noted major restoration from the bridges seen between Belgrat – Çiftikköy – Kalfaköy and there was clear evidence that this occurred after the main building phases in the fourth and fifth centuries. Comparison with the Longinus bridge in Elkafdere suggests that this phase of rebuilding could be identified with work late in Justinian’s reign, probably after the composition of Procopius’ Buildings.

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