Introduction

The two most interesting water conveyance systems constructed by the great architect Sinan are the Kırkçeşmeler system of Istanbul and the Taslimüşeble system of Edirne. Sinan gave an account of most of his construction activities to Nakkas Mustafa Çelebi, who wrote them down in two works (Sinan, n.d.). In these texts he cites the works related to Kırkçeşme, but not at all those related to Edirne.

Kırkçeşmeler, is one of the three ancient large water-supply systems of Istanbul (Nirven 1946, Özänd 1968, Çeşen 1979, Özis 1983 and 1984 b). The oldest system, Halkali, dates from Roman times and conveys the water of various springs from the north-west of the city. The most recent system, Taksim (Yüngül 1957) dates from 1731.

Kırkçeşmeler and Taksim convey the waters of various creeks in the forest area north of Istanbul (Gülersoy 1978). In the period of 1620-1818 four dams were added to the Kırkçeşmeler system and, during 1750-1839, three to the Taksim system (Özis 1977 and 1981; Çeşen 1979).

Both systems, including these dams, have been mistakenly dated to the Roman period (Moltke 1836; Forchheimer and Strzygowski 1893; Dalman 1933). Only the origins of the Kırkçeşmeler system are early Byzantine and go back to Justinian in the 6th century. It might even be considered Roman, going back to Hadrian in the 2nd century AD.

Until recently, it has been assumed that the entire Kırkçeşmeler system existed at the time of Justinian, destroyed by the sieges of the city and rebuilt thoroughly by Sinan. It is, however, most likely that only the part up to Cebeci village formed the Byzantine system, and the extension has been genuinely constructed by Sinan in 1554-60 (Özis 1983).

The new section encompasses four noteworthy aqueducts (Çeşen 1979 and Özis 1983), being the Uzun (26 m. high, 710 m. long), Egri (35 m. high, 342 m. long), Maglova (Muglava) (35 m. high, 528 m. long) and Güzeloce (Gözüçüce) (35 m. high, 165 m. long). The sizes of the aqueducts are remarkable. If their precedents had ever existed, they should have been mentioned in texts of the 6th to 16th centuries, which is not the case.

With the exception of the vicinity of Cebeci village, there are also no signs that the Byzantine conduit closely followed the contour lines and crossed valleys with structures significantly modest in size. Furthermore, in the Sultan Ahmet IIrd library in the Topkapı palace there is a plan, drawn presumably by Sinan (Çeşen 1979, Özis 1983), tracing these new sections. Only the adjacent part of the Byzantine conduit, including the now obsolete Cebeci village branch, which was then the main supply source, is indicated.

According to Sinan's own citation (Sinan n.d.), the existing Maglova (Ayverdi 1976; Göksoy 1980) and Uzun aqueducts were damaged and rebuilt by himself before the entire system became fully operative in 1564, lasting for more than four centuries.

The 35 km. long Edirne system, also constructed by Sinan according to the history of Ata, is attributed to Hurrem Haseki, the wife of Sultan Süleyman the Magnificent (Akmandor 1968). It is reported that the Sary bridge in Edirne, constructed by Sinan in 1553-54 over the Tunca tributary of Meriç river, served also to further convey the water of Taslimüşeble waters, controlled there by a water tower equipped with a special sightseeing room (terazi kasri), as well as at the Fatih Bridge (Adalet kasri) (Tosyavişade 1927, 1957; Aslanapa 1949; Çulpan 1975).

In this respect, the Taslimuşeble system, though somewhat less monumental than Kırkçeşme, can be regarded as a predecessor. According to another opinion, at least a part of it dates to the later period of the construction of the Selimiye mosque in Edirne in 1574. Beyond these two large systems, Sinan built the Süleymaniye water conveyance system in accordance with the construction of the same named mosque during 1550-57 in Istanbul. This system, with a length of 17 km., forms one of the 16 waterways of the Halkali group; some of these originate in earlier periods (Çeşen 1979).

Furthermore, it has been argued, although not historically proven, that the Bozdoğan aqueduct of the Halkali system to Istanbul, dating from the Roman period (Dalman 1933), has been partly transformed by Sinan into an inverted syphon in order to free the view between the Süleymaniye and Sehzade mosques, the latter already constructed in 1544-48 for his son, who died at the age of 22. In 1583 Sinan, and a group of colleagues under his supervision, prepared a report to divert the Sakarya river, through the Sapanca lake, to Marmara by a canal of 25 km. total length (Akmandor 1968; Çeşen 1981). This was a multi-purpose project aiming at flood control, water power (mills), navigation and the construction of a large arsenal in Sapan-
THE TASLIMÜSELLİM WATER CONVEYANCE SYSTEM TO EDIRNE.
ca lake. The implementation of this extremely interesting project was not carried out successfully. It should be noted that there are still alternative projects dealing with the same diversion today.

**General Layout**

This water conveyance system of 35 km. length fed from the Taslimûsîllîm springs (elevation 150 m.), with an additional branch of 5.5 km. fed from Pravadi springs (elevation 115 m.), has gradients varying between 0.5 m. and 1.6 m., until reaching the main reservoir (elevation 90 m.). There are five tunnels with a total length of 3.9 km. along the system; twelve aqueducts of modest heights and various lengths serve to cross the creeks encountered; the most noticeable being the Yedigöö aqueduct of 105 m. length (Akmandor 1968; DSI 1984). This system, still in operation, supplies a modest amount of water, at 35 l/sec., out of which over 10 l/sec. originates from Taslimûsîllîm, less than that from Pravadi, and the rest from several nearby small springs added to the system along the alignment of the conduit.

**Water Collection Works**

The Pravadi springs are collected by underground galleries; the only visible sign of which is a patch of green cover. The site is almost adjacent to the Şınanköy cement factory, and the conveyance canal has been once damaged during its construction. The Taslimûsîllîm springs are collected by lateral drains reaching a central chamber. There are two large chambers (Kümbet), one rectangular, the other heptagonal, and two small ones. Also in the vicinity is a sort of shallow weir formed of large size stones, serving as a water barrier in the alluvium of a small creek.

Along both branches, as well as along the common part, there are numerous diversions constructed at later periods, adding their water to the main system. Most of these branches, however, have become obsolete in the meantime.

**Aqueducts**

The system includes twelve aqueducts most of them of modest heights and single spans, with the exception of Yedigöö, having seven openings as its name implies. Their lengths vary from 20 m. to 105 m., totalling 520 m. (Akmandor 1968).

The Pravadi branch has only one aqueduct; that of Taslimûsîllîm four, and the common section seven. The conveyance canal is primarily rectangular, crowned by a vaulted top.

**Tunnels**

There are two long tunnels with lengths over 1.5 km. each, and three shorter ones; so that their total length amounts to 3.8 km. (Akmandor 1968). The Pravadi branch has no tunnel; that of Taslimûsîllîm has a long one; the common section one long and the three short tunnels.

**Conclusion**

The Edirne water conveyance system is not mentioned by Sinan, quoting his own works (Sinan n.d.); although he cited the construction of Hürem Haseki mosque and related buildings (around 1530) as well as the great Selîmiye mosque and related buildings (1567-74).

Badi (1890) refers to the histories of Pecevi (I 427) and Ata (I 126), that Sinan constructed the Taslimûsîllîm system to provide water for the Haseki buildings. Peremeci (1940) gives a detailed description of the system, dating it to the reign of Sultan Süleyman the Magnificent, and mentioning some later repairs.

Rıfat Osman Tosayvize does a somewhat detailed description of the system (1920), without dating the origins. On the other hand, he mentions (1927, 1957), with regard to the construction of the Saray bridge over Tunca during 1553-54 by Sinan, that he extended the Taslimûsîllîm system to the palace through this bridge and further through the earlier Fatih bridge, each equipped with water towers (Terazi and Adalet Kasrî). Aslanapa (1949) expresses doubts whether the latter, still existing, was a specific water tower.

The Terazi Kasrî, undoubtedly the specific water tower as its name also implies, has been demolished during construction activities in 1895 (Tosayvize 1920; Aslanapa 1949).

Sinan may have planned the Edirne system in three phases: (a) first, around 1530 with regard to the Haseki buildings; (b) second, around 1554 with regard to the Saray bridges; and (c) third, around 1570 with regard to the gigantic Selîmiye mosque and related buildings.
Under consideration of the layout and the profile, the Paravadi and Taslimüsellim branches appear to date from different periods. The steep tunnel on the Taslimüsellim branch to short-cut a junction with the Pravadi branch, may be indicative of a later period of construction, so that the writers believe Pravadi was the first branch constructed around 1530; due to the additional fact of its simplicity and directness. However, with regard to the construction peculiarities of the aqueducts, the contrary hypothesis cannot be definitely rejected.

Whether the Taslimüsellim branch was added around 1554 or around 1570 is hard to identify; but the definite extension of the system to the palace area, crossing the Tunca river, would have also been accompanied by an extension of water collection works. Thus, it is more likely that this branch dates from the middle of the 15th century. Some of the numerous additions on either branches, might have been constructed by Sinan to provide more water for the Selimiye complex in 1570s.

The possibility that such additions were carried out at the Tunca crossing stage, and the Pravadi section added during the construction of Selimiye, is, however, not out of question.

Thus, the Edirne water conveyance system of Pravadi and Taslimüsellim, can be regarded as a forerunner of the monumental Kırkçesmeler system of Istanbul, both witnessing the hydraulic engineering genius of the great architect Sinan, deserving a special place in the history of hydraulic technology not only of the Turkish-Islamic region but of the entire world.

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