FROM SOURCE TO HISTORY

Studies on Ancient Near Eastern Worlds and Beyond

Dedicated to Giovanni Battista Lanfranchi on the Occasion of His 65th Birthday on June 23, 2014

Edited by

Salvatore Gaspa, Alessandro Greco, Daniele Morandi Bonacossi, Simonetta Ponchia and Robert Rollinger

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Lo studio della Storia Antica è sempre stato, per Gianni, piacere intellettuale, dovere sociale e morale e prosecuzione di quell'idea di "uomo di studio", imparata dal padre Luigi e così ben impressa nel suo cuore e nella sua mente. A lui, Gianni fa riferimento, quando studia, quando insegna, quando scrive. Fonti, documenti, testi, sono imprescindibili punti di partenza delle sue analisi, con il pensiero che guarda sempre al mondo dell'Oriente Antico. Uomo integerrimo e puro, non conosce la competizione e forse per questo, arriva sempre tra i primi. Ha molto a cuore i suoi allievi: di loro, non esita a metter in luce le qualità positive, soffocando in un "sono giovani" le intemperanze e gli umani difetti. Lo ammiro perché non conosce invidia, ira, malizia, sospetto: lo amo perché mi ha insegnato a guardarmi da questi subdoli amici.

Ines

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RIVER NAVIGATION AND TRANSPORT IN NORTHERN ASSYRIA. THE STONE QUAY-WALLS OF THE RIVERS GOMEL AND AL-KHAZIR IN THE NAVKUR PLAIN, IRAQI KURDISTAN*

Daniele Morandi Bonacossi

Introduction

Between the second and first millennium BC the Middle Assyrian and (especially) Neo-Assyrian empires carried out extensive re-organization projects which deeply transformed the landscape of northern Mesopotamia through the creation of territorial infrastructures. Besides the establishment of new capital cities,[1] these interventions involved the construction of massive state-created regional networks of canals that supplied water to the Assyrian capitals and their hinterlands (Assur, Kar-Tukulti-Ninurta, Kalḫu, Dūr-Šarrukin and Nineveh), as well as to major provincial centres, such as Arbail and Dūr-Katlimmu in the Lower Khabur. Their construction enabled irrigation and agricultural production intensification in large parts of the "Assyrian dry-farming belt" and made available navigable waterways for the transport of goods and people. These hydraulic structures have been investigated especially during the last thirty years, by means of archaeological surveys and the extensive use of remote sensing, as well as through the study of cuneiform sources.[2]

Much less known from the archaeological point of view, however, is the infrastructure created by the Neo-Assyrian empire to facilitate river navigation and the transport of goods and materials, although cuneiform sources—in particular the epistolary texts—[3] and the Assyrian palace reliefs[4] amply illustrate the use of rivers in northern and southern Mesopotamia for this purpose. Structures such as riverside

* This article benefited from references and critical comments by Robert Rollinger.

[1] See, most recently, Pedde 2012.

[2] See, for example, Bagg 2000; Dalley 2001–2002; Davey 1985; Ergenzinger – Kühne 1991; Ergenzinger *et al*. 1988; Geyer – Monchambert 2003; Morandi Bonacossi, forthcoming; Oates 1968; Reade 1978; Safar 1947; Ur 2005; Ur *et al.* forthcoming; Wilkinson – Rayne 2010. For a review of textual sources on canals in the Assyrian rural landscape, see Fales 1990 and 2008.

[3] Fales 1993 and 1995; Rollinger 2013, 48–57.

[4] For river navigation scenes in Neo-Assyrian reliefs, see e.g. Botta – Flandin 1849, 33–35; Layard 1849, 383; Layard Original Drawings I, 57 (see also SAA I, fig. 19b), IV, 49 and 78 (see also SAA I, fig. 19c, 13); Meissner 1920, 252; Rawlinson 1876, pls. 62 (fig. 2) and 73; SAA I, figs. 17a–b; Rollinger 2013, 34–44.

quay-walls and mooring piers are almost unknown in the archaeological literature, with the only notable exceptions of the monumental stone quays of Aššur[5] and Nimrud.[6]

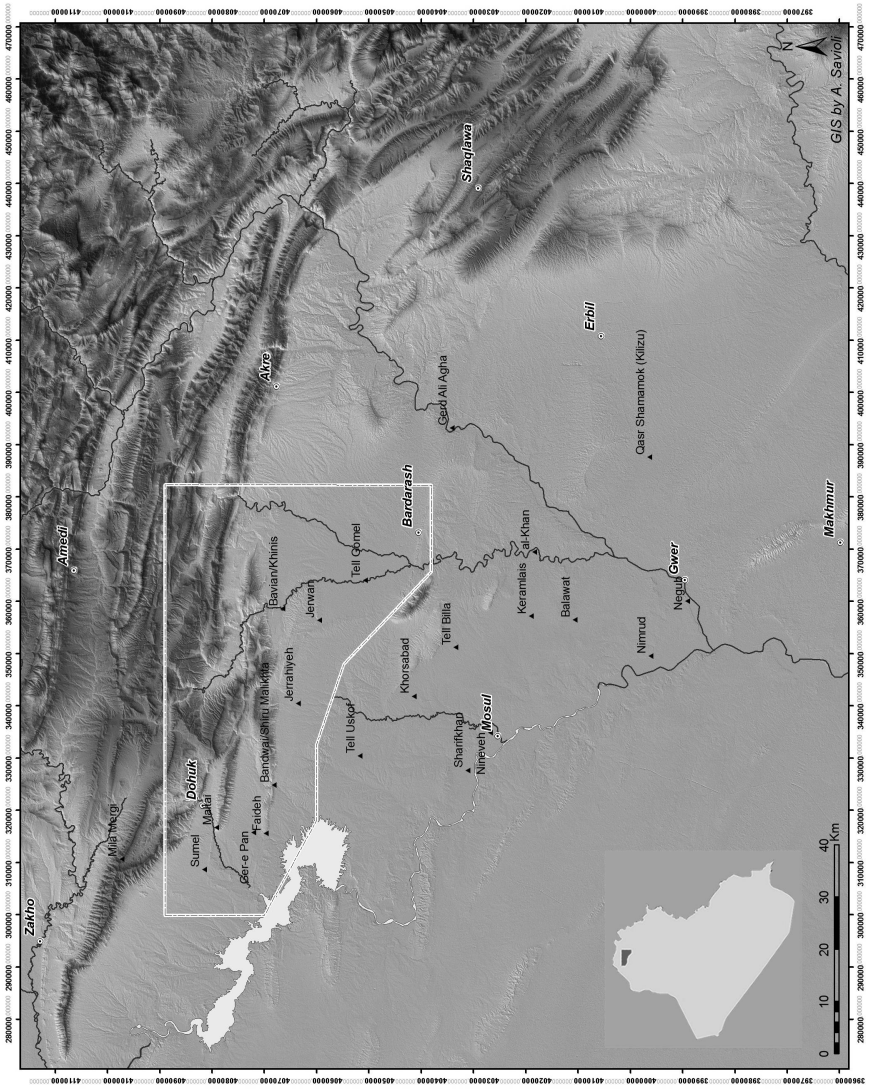

Fig. 1. Location of the Land of Nineveh Regional Project (LoNAP) survey area in Northern Iraq and the core territory of the Assyrian Empire with major sites (© Italian Archaeological Mission to Assyria, University of Udine).

The "Land of Nineveh Archaeological Project" (LoNAP), initiated in 2012 by the Italian Archaeological Mission to Assyria of the University of Udine, has detected

[5] Andrae 1938, 67–68 and pl. 29.
[6] Mallowan 1966, 76–81.

the first extra-urban archaeological evidence which can be related to the use of the rivers of the Assyrian core region as waterways (Fig. 1). I hope that Gianni, a native Venetian acquainted since his childhood with inland watercourses, will enjoy this article on quays, waterways and river navigation as a token of friendship and gratitude for many years of collaboration and fruitful discussions on the Assyrian Empire.

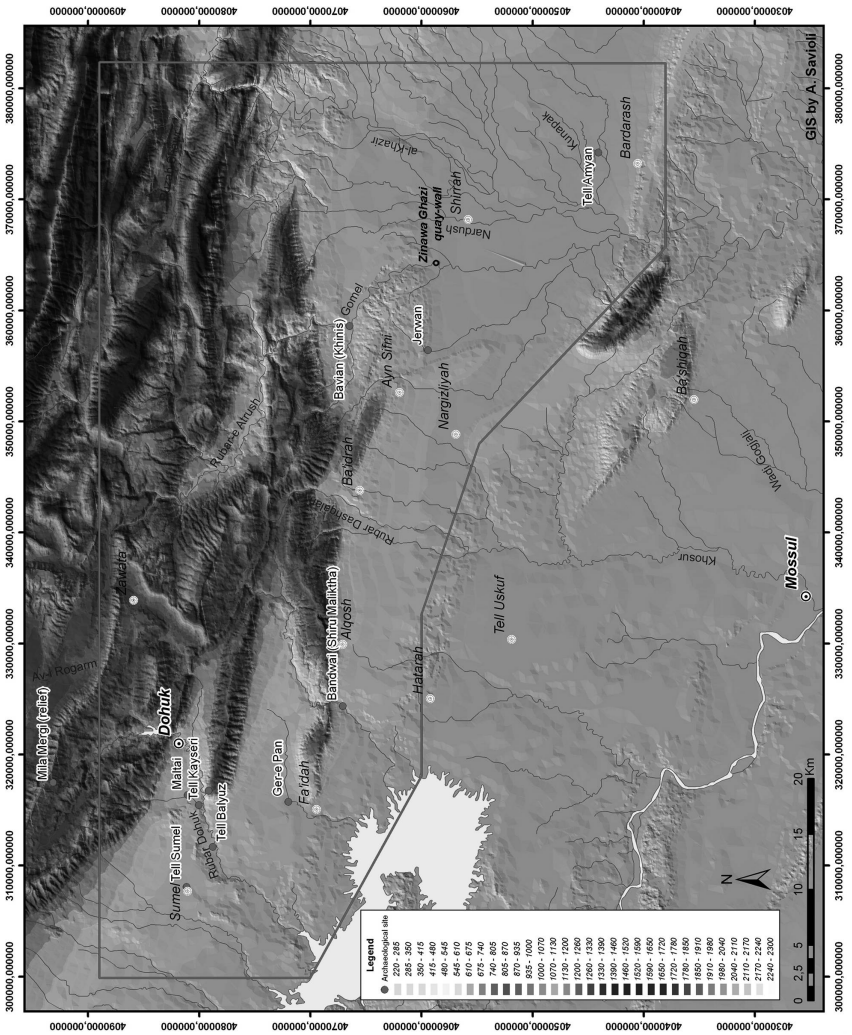

Fig. 2. Map of the LoNAP survey area with location of the Zinawa Ghazi quay-wall (© Italian Archaeological Mission to Assyria, University of Udine).

The stone quays of the Rivers Gomel and al-Khazir

The region studied by the LoNAP encompasses more than 2900 km^2 and consists of the area delimited by the plain of Dohuk and the foothills of the Zagros to the north, the lake formed by the Eski Mosul dam to the west and the Navkur Plain that

extends from the Jebel Maqloub to the River al-Khazir Valley with its tributaries and the Bardarash region to the south and east (Fig. 2). The project aims to understand the formation and transformation of the cultural and natural landscapes of this central region of Northern Mesopotamia and to provide for their protection and management in innovative ways. The research is based on a regional archaeological field survey, to be combined with the future archaeological excavation of the site of Tell Gomel, and a geo- and bio-archaeological reconstruction of the ancient natural landscape and its evolution as a result of global climatic fluctuations and human impact.[7]

The first two fieldwork campaigns have led to the identification on the ground of 493 archaeological sites. Of these, 281 sites have yielded surface pottery and/or lithic assemblages and can be classified as habitation sites, whilst the rest consist mostly of archaeological evidence related to the hydraulic system built by Sennacherib in the "Land behind Nineveh" (channel sections, embankments, sluices, aqueducts, weirs, but also rock reliefs and karst springs captured to feed the channels) and other anthropic features, such as funerary cairns, rock-cut tombs, watermills and indeed quays.

The winter of 2013 was particularly wet in Iraqi Kurdistan. The hard rainfall, together with a bulldozer quarrying the River Gomel bed for gravel, in February 2013 exposed a stone quay-wall along the upper course of the river, which feeds into the River al-Khazir, in its turn a western tributary of the Upper Zab.

The quay is a structure of limestone blocks measuring ca. 28.9[8] x 3.1 m located on the right bank of the River Gomel, opposite the village of Zinawa Ghazi on the left bank (Figs. 3–4). It stands approximately 300 m east of the small site of Ashka Krab (no. 265) on the right bank of the Gomel[9] and about 600 m north of the larger site of Tell Taleb (site no. 266), a tell heavily eroded by a meander of the Gomel located on the same bank and occupied mainly in the Middle Bronze Age, Middle Assyrian, Neo-Assyrian and Hellenistic periods.

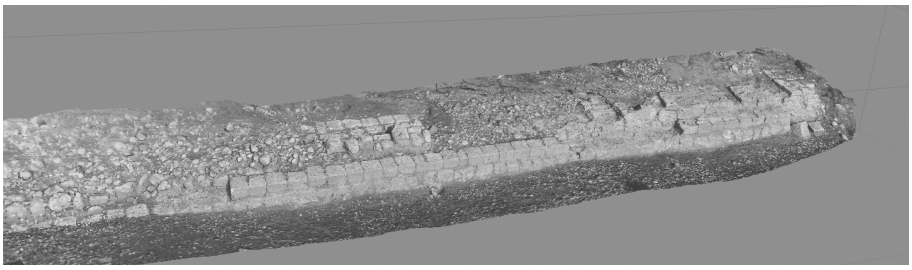

Fig. 3. Digital photogrammetric 3D restitution of the quay seen from the east (© Institute for Technologies Applied to Cultural Heritage, National Research Council, Rome).

[7] For a preliminary presentation of the survey results, see Fales – Del Fabbro 2012–2013, Morandi Bonacossi 2012–2013 and Morandi Bonacossi, forthcoming.

[8] The overall length of the quay is not yet known, since its southern end is still covered by river deposits.

[9] The site was settled during the Parthian, Sasanian and Middle Islamic periods.

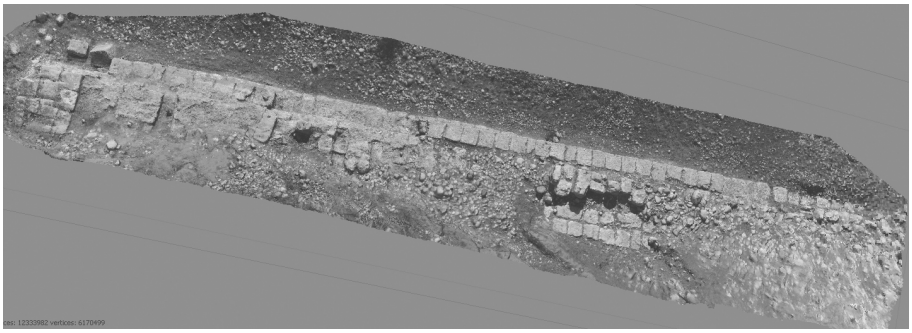

Fig. 4. Digital photogrammetric 3D restitution of the quay seen from the west (© Institute for Technologies Applied to Cultural Heritage, National Research Council, Rome).

The quay-wall was covered by approximately 2 m of coarse-grained gravel, sand, finer gravel and river pebbles, some large in size. Since it was not possible to conduct an archaeological excavation of the structure or even a thorough cleaning of the visible part, and given that the river quay is located in an area which is highly endangered by the excavation of the Gomel bed gravels used in the numerous cement plants that dot the courses of the Gomel, Nardush and al-Khazir, it seemed urgent to produce preliminary photographic (including 3D photogrammetric) and graphic records of this monument, although some of it (in particular the central and southern portions) is still covered by large river pebbles deposited by the Gomel floods.

The quay was thus partially cleaned and prepared for documentation. During this work the foundation level of the structure was partly exposed. It consists of small blocks of roughly hewn limestone (25 x 15 cm) set in a mortar bed about 10 cm thick, with calcareous inclusions rich in ash and charcoal that might be amenable to radiocarbon dating. The foundation limestone blocks and mortar layer rested on a compact surface of clay and pebbles.

Above the first course of small roughly-hewn stones, on the front of the wall (east-facing elevation) there was a revetment of three courses of well-fitted carefully dressed blocks of ashlar masonry (54 x 54 x 40 cm – 57 x 57 x 40 cm), each set in a slightly backward position with respect to the course below (Figs. 5–6).[10] Two ashlars in the two lower courses of the quayside were rusticated. The intermediate course, which in the southern part of the structure is the highest preserved, was covered by large river pebbles deposited by the Gomel. The structure is five blocks of limestone wide and the wall-core consists of massive blocks which were left undressed; the interstices were filled with limestone chips and river pebbles. The dressed blocks of ashlar masonry were set in a mortar layer 3–5 cm thick, with limestone and charcoal inclusions.

[10] The same technique is seen in the impressive stone quay-wall of Nimrud, probably built by Ashurnasirpal II, which is 220 m long and 6.5 m wide and rises to a height of about 10 m above the Tigris bed (Mallowan 1966, 78–81).

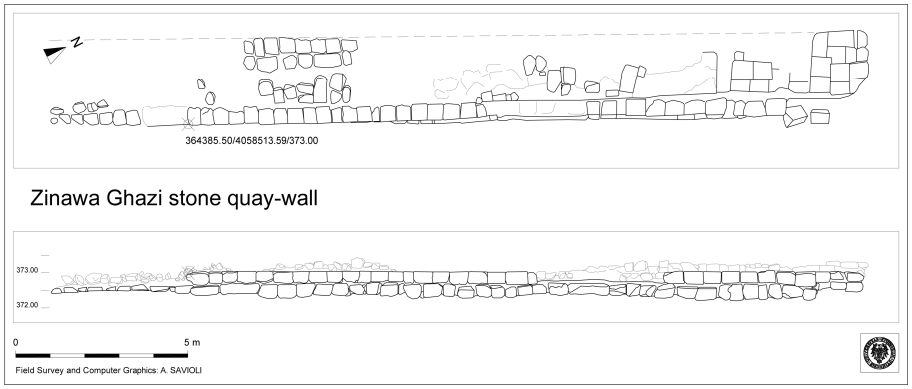

Fig. 5–6. Plan of the quay (© Italian Archaeological Mission to Assyria, University of Udine); East-facing quay elevation (© Italian Archaeological Mission to Assyria, University of Udine).

At the north end of the structure, above the third course of blocks, there are 12 paving slabs of irregular dimensions set into the mortar. These slabs are of the same type as those used to pave the Jerwan aqueduct. Four contiguous rows of paving slabs survive (Fig. 7), although immediately south of these the imprints left in the mortar by another ten such slabs that have been removed by river erosion are visible.

Though partially eroded, the northern end of the quay appears complete, whilst to the south it is still covered by a large quantity of river deposits, which it has not yet proved possible to remove. In the absence of excavation it is therefore impossible to establish the overall length of the structure.

Fig. 7. Detail of quay paving slabs (© Italian Archaeological Mission to Assyria, University of Udine).

In the top of one of the blocks in the upper course there is a groove perpendicular to the structure, perhaps a guide for the mooring ropes of boats that used the quay.

Several blocks have been transported ca. 100–200 m downstream by river floods; one of these has a square-profiled groove cut into one face, similar—though slightly wider —to that recorded on the *in situ* block just described.

The archaeological evidence available allows us to interpret the structure as an Assyrian river quay. The building technique (well-fitted dressed blocks of ashlar masonry and rustication) and the materials used (mortar, limestone blocks, paving stones) are similar to those found in the Jerwan aqueduct, which makes plausible that the construction dates to the Neo-Assyrian period.

The river quay is not directly connected with the nearby "Canal of Sennacherib" which starts from Khinis, since it is located a few kilometres south-southeast of the point where the canal, running over the Upper Bakhtiari conglomerate formation south of Khinis, turned 90° to the west in the direction of Mamrashan and Jerwan (Figs. 8–9). It is therefore clear that the quay was linked to river navigation on the Gomel.

Worthy of note in this context is the discovery during the 2012 campaign of a possible quay-wall of fired bricks in the Gomel riverbed in front of Tell Gomel itself, several kilometres downstream, in all probability dating to the Middle Bronze Age. River navigation on the Gomel may therefore already have been practiced during the first half of the second millennium BC.

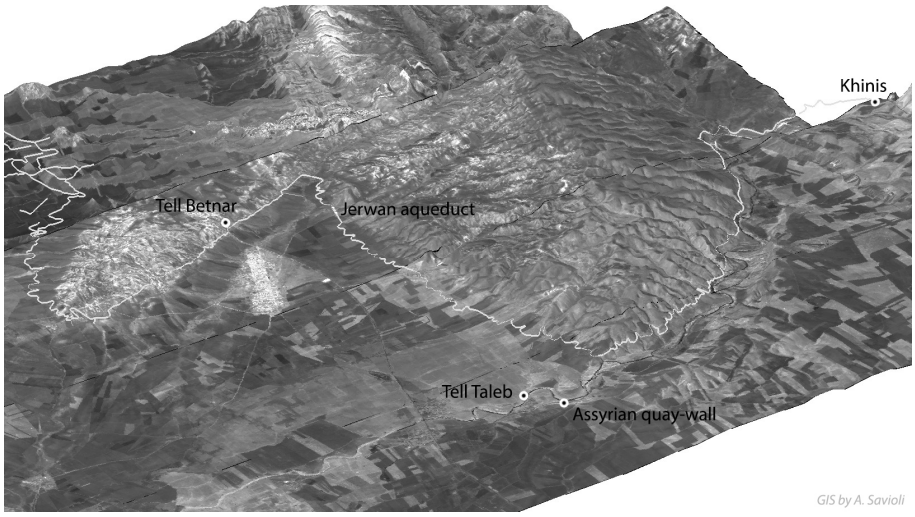

Fig. 8. Orb-View3 images with course of the Canal of Sennacherib and quay location (© Italian Archaeological Mission to Assyria, University of Udine).

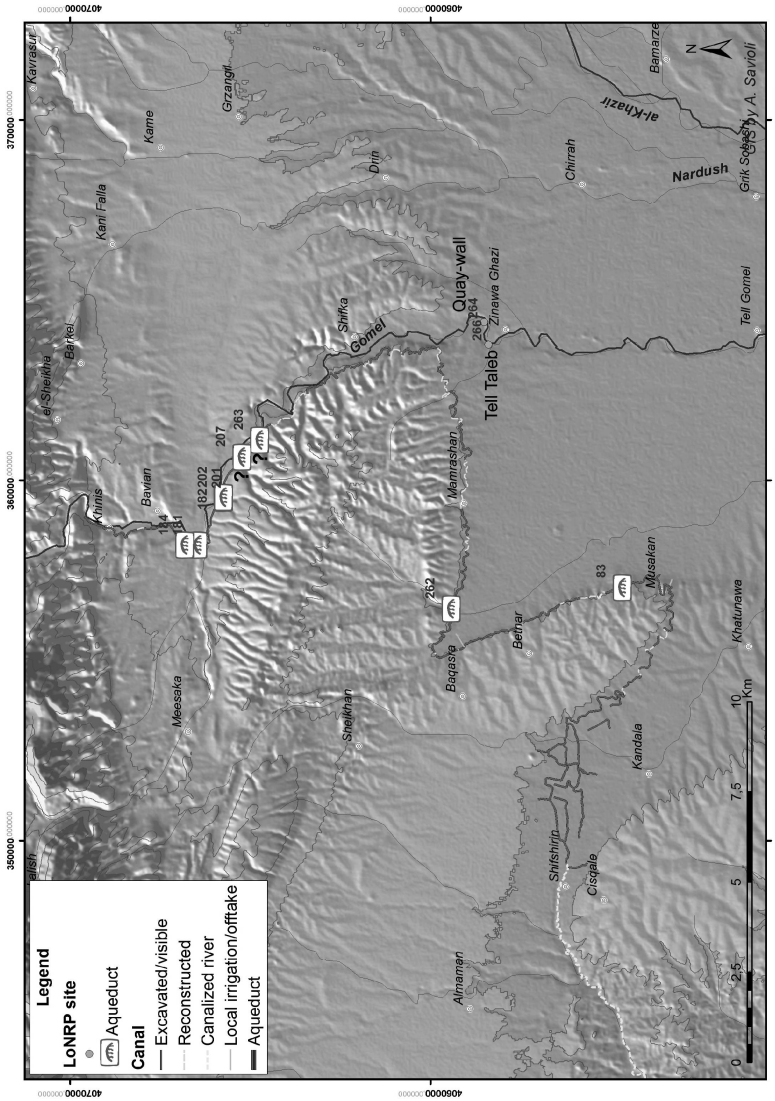

Fig. 9. Map with course of Sennacherib's Canal and location of the Assyrian quay and aqueducts (© Italian Archaeological Mission to Assyria, University of Udine).

Scattered heaps of dozens of dressed blocks of limestone ashlar masonry were identified during the LoNAP survey on the left bank of the River al-Khazir, about 1 km south of the Hasaniyeh Bridge (site no. 267). The blocks (more than 100) have been dug from the al-Khazir bed by gravel diggers and piled up in a nearby cement-brick plant (Fig. 10). It seems plausible that these square blocks belonged to another river quay of the kind found along the Gomel opposite the Zinawa Ghazi village.

Approximately 60 dressed blocks of limestone ashlar masonry were used to build the foundations of a house in the village of Kalakji (site no. 268). One block pre-

serves part of a Neo-Assyrian cuneiform inscription. According to the villagers the blocks were in fact transported to Kalakji from site no. 267 on the al-Khazir.

Fig. 10. Heap of dressed limestone ashlar masonry blocks piled up in a cement-brick plant on the left bank of the River al-Khazir (site no. 267; © Italian Archaeological Mission to Assyria, University of Udine).

Conclusions

The conditions of ancient navigation along the different tracts of the main rivers of northern Iraq (Tigris, the Eastern Khabur, the two Zabs and their tributaries) may have been quite varied due to the instability of the river courses.[11] During the wet season (between February and May), when the melting of snow in the Zagros foothills and mountains and heavy rains can cause sudden and violent rises in the discharge rates of the main rivers and their tributaries, the accessibility of these for navigation would not have always been guaranteed.[12] However, seasonal watercourses like the Gomel and al-Khazir, which during the dry season today carry water only in their upper and lower courses (but not in the central portions), would have become temporarily navigable precisely during the winter and spring months.

Assyrian cuneiform sources, in particular Sargon II's epistolary corpus, contain precious information on river navigation and transport and the accessibility of rivers as waterways during the year.[13] For instance, a letter sent by an official stationed in Mazamua, an Assyrian province on the northwestern slopes of the Zagros mountain range in the region of the modern city of Suleimaniyah in Iraqi Kurdistan (and thus possibly referring to the Lower Zab),[14] warns the king that the river waters are "con-

[11] Ionides 1937, 240; Rzoska 1980, 44.
[12] See also Fales 1995, 205–206.
[13] For a discussion of these topics, see in particular Fales 1993 and 1995.
[14] Parpola – Porter 2001.

stricted (between mountains) and the current is strong, not fit for using either *maš-kuru*-rafts or keleks".[15]

A letter sent to Sargon by the governor of the province of Aššur, Ṭab-ṣill-Ešarra, states that in the province of Arrapḫa the "wadis are permanently filled with reed".[16] From this and other letters[17] we learn that the beds of seasonal watercourses (like the Gomel and al-Khazir) could be occupied by exceptional growths of canebrake, thus preventing or making difficult their use as waterways.

The epistolary and sculptural documentation concerning river transport under Sargon also provides us with information on transported materials and goods. A number of letters, for example, mention the widespread availability of timber along the rivers of Assyria,[18] whilst a famous series of reliefs from Sargon's palace at Khorsabad shows the transport on boats of timber destined for Dūr-Šarrukin or other major building projects of the king.[19] The reliefs have long been interpreted as depicting the transport of cedar logs by Phoenician boats along the Mediterranean coast.[20] More recently, however, a Mesopotamian riverine setting for the scene has been convincingly suggested on the basis of the flora, fauna and type of boats portrayed in the reliefs.[21]

Another famous example of the shipping of heavy loads destined for monumental royal building projects regards the transport of *lamassus* from the Balaṭai quarry in the Upper Iraqi Tigris Valley (north of Nineveh) to the capital city during Sennacherib's reign.

Reade and Russell have already exhaustively discussed the reliefs on the north and east walls of Court VI of the Southwest Palace, which depict the quarrying of the winged male human-headed bull colossi (slabs 63–68), their hauling on sledges based on wooden rollers and finally their transport through mountains and then beside a marsh and a river, presumably the Tigris (slabs 44–62).[22] Russell concluded that although the transport of the colossal *lamassus* by boat would have been possible, the larger blocks were probably hauled overland due to their enormous size and weight (height 6 m; weight 40–50 tons), whilst smaller pieces went by boat to Sennacherib's "Palace Without Rival".[23] However, one may just note that Victor Place transported the two colossi that he had excavated at Khorsabad to Basra on eight *keleks* composed of 6.800 inflated goat skins. Each of the two colossi weighted about 32 tons (see Rollinger 2013, 18 with footnote 7).

Sargon's letters again offer important evidence to support the reconstruction of the river transport of heavy *lamassus* by boat, stressing at the same time the extreme difficulties posed by moving heavy loads on barge-type vessels or large rafts. A letter to the king by Aššur-bani, governor of Kalḫu, reports the sinking of boats

[15] SAA 5 200, 8–13.
[16] SAA 1 97, 10–11.
[17] SAA 1 144, Rev. 3–11.
[18] SAA 1 4, Obv. 7'–9'; 62, Obv. 7–8; 101, Rev. 3'–6'.
[19] Botta – Flandin 1849, 32–35.
[20] Albenda 1983.
[21] Linder 1986.
[22] Reade 1978, 55–60; Russell 1991, 52, 94–116.
[23] For instance the smaller winged bulls, the female human-headed winged lions mentioned in the king's inscriptions as *apsasāte* and made with fine quality stone from Mount Nipur (Judi Dagh), and the relief slabs; Russell 1991, 99 and 115.

under the weight of bull colossi: "Aššur-šumu-ke'in called me to help and loaded the bull colossi on the boats, but the boats could not carry the load (and sank). Now, although it cost me a great trouble, I have now hauled them up again".[24]

In another letter the same Aššur-šumu-ke'in (an official of unknown status who had been responsible for the sinking of the bull colossi just mentioned) reminds to the king, who requested that he obtains twelve-cubit sized *lamassus*, of his great experience in transporting bull colossi downriver: "I[f the kin]g my lord so orders, I could bring down (the river) two bull colossi [that have been *fini*]*shed*, one in [the city of…], the other in Tastiate. Now, [I have (already) brou]ght down to Adia [one] bull colossus of Zeru-ibni; another one belonging to the Treasurer [is in Ur]zu-ḫina".[25] Urzuḫina was located on a tributary of the Lower Zab, whilst Adia may possibly correspond to Eski Kalak on the lower course of the Upper Zab, thus not far from the area where the Zinawa Ghazi Assyrian quay-wall has been found.[26]

The textual and archaeological evidence briefly reviewed here exemplify how common the use of river transport on the Euphrates-Tigris system was during the Neo-Assyrian period and gives an idea of the general background against which the new discoveries of an Assyrian stone quay-wall on the Gomel River—and a possible second one on the al-Khazir—should be seen.

Obviously the discovery of a quay on the upper Gomel does not explain per se the specific function of a mooring structure at this point on the river. Its close association with the 0.3 ha site of Tell Taleb, located about 600 m downstream and settled during the Neo-Assyrian period, might suggest that the quay also served this settlement.

However, its location further upstream than the Assyrian site and its geographic position very close to the Khinis canal's westward turn toward the Jerwan aqueduct and along the Gomel's west bank (Figs. 8–9) mean that the quay might have been particularly convenient as an unloading place for the limestone ashlar blocks quarried at Khinis,[27] and as an intermediate station with respect to their final destination, i.e. the Assyrian aqueduct construction sites located along Sennacherib's Canal.[28] During the spring floods the building material might have been transported on the Gomel on barges or rafts to Zinawa and other possible quays—not yet found—along the canal. From the Zinawa Ghazi quay, the limestone blocks would then have been moved overland on wooden rollers to Jerwan—perhaps, as suggested

[24] SAA 1 119.
[25] SAA 1 150, 5–11.
[26] Assyrian Empire Builders, http://www.ucl.ac.uk/sargon/peoplegodsplaces. Fales (1993, 91) has proposed the identification of Assyrian Adia as the village of Sheikh 'Adi/Lalish, some kilometres to the north of the Kurdish town of Sheikhan. This suggestion relies upon the assonance of the ancient toponym with the modern name of the village. The latter, however, does not derive from the ancient Assyrian toponym, but rather from the name of Sheikh 'Adī b. Musāfir (AD 1070–1162), an Arab ascetic of Umayyad descent who established himself at Lalish, was buried there and became the central figure of the Yazīdism (Talmon-Heller 2013).
[27] On the Khinis quarry and the origin from it of the limestone blocks used to build the Jerwan aqueduct, see Bachmann 1927, 4; Jacobsen – Lloyd 1935, 13 and 46; Morandi Bonacossi 2012–2013, 200–201.
[28] On the four new aqueducts (in addition to that at Jerwan) uncovered along the Khinis canal by the LoNAP, see Morandi Bonacossi 2012–2013, 197 and Morandi Bonacossi forthcoming.

by Jacobsen and Lloyd, making use of the level and still dry bed of the canal itself as a causeway.[29]

If we bear in mind that for the construction of the Jerwan aqueduct alone more than 440,000 limestone blocks were used[30] and that at least another four, smaller aqueducts have been recorded along the canal by the LoNAP survey (Fig. 9), it may be readily appreciated to what extent the erection of these monumental hydraulic infrastructures would have been facilitated by river transport of the building materials. Probably this was possible only on a seasonal basis, at the time of the spring floods, when the Gomel's discharge was high enough to allow the passage of huge loads on barges or rafts to their destinations.

The possible presence of a second Neo-Assyrian quay on the larger al-Khazir further shows that river transport was extensively used, not only on the main rivers such as the Tigris and the Upper and Lower Zab, but also on the network of seasonal watercourses of the "Land behind Nineveh", whenever they were suitable for this purpose.

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[29] Jacobsen – Lloyd 1935, 13.

[30] Fales – Del Fabbro 2012–2013; Jacobsen and Lloyd (1935, 6) overestimated the amount of blocks needed for its construction, reaching a figure of more than 2 million.

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