

# The Persian Gulf Shorelines and the Karkheh, Karun, and Jarrahi Rivers : A Geo-Archaeological Approach

A Joint Belgo-Iranian Project

## First Progress Report - Part 3\*

Edited by Hermann Gasche

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Fig. 75. Babylonian Map of the World (BM 92687). Courtesy Trustees of the British Museum.

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### 3. Documentary and Other Archaeological and Environmental Evidence Bearing on the Identification and Location of the Rivers of Lower Khuzestan and the Position of the Head of the Persian Gulf ca. 1200 BC – 200 AD

Steven W. Cole\* and Hermann Gasche\*\*

with a contribution by Carrie Hritz\*\*\*

*No arm of the sea has been or is of greater interest alike to the geologist and archaeologist, the historian and geographer, the merchant, the statesman and the student of strategy than the inland water known as the Persian Gulf*

Sir Arnold T. Wilson

In this chapter we treat the documentary evidence for the Lower Khuzestan Project area (see Figs. 64 and 65).<sup>69</sup> Because texts from this region are scarce, we have been compelled to rely almost exclusively on sources originating outside of it. We have also taken a preliminary step towards integrating the adjoining regions of the Lower Tigris-Euphrates basin and Upper Khuzestan.

In regard to the Lower Tigris-Euphrates basin, there are virtually no survey data available; the region is a veritable no-man's land from an archaeological point of view. Moreover, due to the present circumstances in Iraq, we were unable to carry out fieldwork here as we could across the border in Iran. For these reasons we have had to rely heavily on the interpretation of satellite imagery to reveal the location of settlements. The first stage of this work was carried out by Carrie Hritz, who provides details of her investigation below (see Appendix III). The sites that she was able to identify within this area are undated, however, and are included only to show that they were occupied during certain periods. The reader should bear in mind, therefore, that a settlement that is identifiable today using modern satellite imagery could have been subjected to inundation in earlier times, and because the dating of the vast majority of settlements within this basin is unknown, the conclusions that we reach about the extent and location of the sea, marshes, and lakes of this region during the period under scrutiny must be regarded as tentative.

Finally, we introduce in this chapter additional archaeological and environmental evidence to provide context for our interpretation of the textual data.

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\* Northwestern University. \*\* University of Ghent. \*\*\* Washington University in St. Louis.

<sup>69</sup> Continuation of Part 1 (*Akkadica* 125/2, pp. 141-215) and Part 2 (*Akkadica* 126/1, pp. 3-43).

The great bulk of the textual evidence<sup>70</sup> relevant to the identification and location of the ancient rivers of Lower Khuzestan ranges over a period of roughly fourteen hundred years. There are no data earlier than ca. 1200 BC which can be used to establish river nomenclature,<sup>71</sup> and there is little, if any, evidence from Classical sources dating later than ca. 200 AD that is of any value for historical geography.<sup>72</sup> Much of the important textual data bearing on the location of the northern shore of the Gulf also falls within this time span, that is, from ca. 1200 BC to ca. 200 AD. Because evidence from Islamic texts is beyond the competency of the authors to use authoritatively, it will be introduced only in a preliminary way. This evidence, however, constitutes a critical bridge to the earlier situation, especially in regard to the present courses of the lower Karkheh and the lower Karun, and therefore it will be subjected to a more thoroughgoing study in future.

The most significant information from this period of almost one and a half millennia stems from two relatively constricted time spans. The first of these intervals occupies the fifty years between the beginning of the reign of Tiglath-pileser III in 744 BC and the end of the sixth campaign of Sennacherib in 694 BC. During this period, the monarchs of Assyria campaigned on a regular basis against the Chaldean and Aramean tribes of southeast Babylonia and Susiana and commemorated their exploits in their inscriptions. Among these inscriptions, those of Sargon (721-705 BC) and Sennacherib (704-681 BC) present the most detailed and useful information in regard to the historical geography of the study region. The account of Sennacherib's naval campaign in 694 BC against the Chaldean exiles in Elam is particularly important. The second important interval, which is even more compact, corresponds with the fifteen-year period from 331 to 316 BC during which Alexander the Great extended and consolidated his rule over Babylonia and Persia and, after his death, Eumenes and Antigonos fought to succeed him.<sup>73</sup> Of this fifteen-year period the most important segment, from the point of view of historical geography, coincides with the first eight months of 324, when Alexander's fleet commander, Nearchus, carried out the king's commission to explore the

<sup>70</sup> The authors wish to express their gratitude to T. Boiy (Katholieke Universiteit Leuven) and J.A. Brinkman (University of Chicago) for providing references from the astronomical diaries and the letters and inscriptions of Ashurbanipal.

<sup>71</sup> The Ulāya and Idide (Ḫiṭḫite) rivers are first mentioned by name in inscriptions of Šutruk-Nahḫunte I (± 1190-1155 BC, following the regnal dates proposed by Steve and Vallat 1989, 234). The hydronym Uqnû is first attested in a document dating to the reign of Nebuchadnezzar I (1125-1104 BC).

<sup>72</sup> See our table "Chronological distribution of attestations of hydronyms ca. 1200 BC – 200 AD" on the next page.

After 200 AD, authors who mention the rivers of Khuzestan usually refer to the water of the Choaspes, which was said to have been preferred by the kings of Persia for drinking; or they derive their material from earlier authors, most commonly Pliny the Elder (23-79 AD) or Claudius Ptolemaeus (fl. second century AD). These later authors include, among others, Nicander of Colophon (ca. 197-130 BC), Tibullus (ca. 54-19 BC), Pausanias (ca. 120-180 AD), Lucian of Samosata (ca. 125-180 AD), Aelian (ca. 175-235 AD), Julius Solinus (third century AD), Ausonius (ca. 310-395 AD), Marcianus of Heraclea (fl. 400 AD), Nonnus of Panopolis (fifth century AD), and Isidore of Seville (ca. 560-636 AD). Such references are not particularly useful for the historical geography of the region in question and so have largely been omitted from consideration here.

<sup>73</sup> The main sources were written by Diodorus Siculus (ca. 80-20 BC), Quintus Curtius Rufus (first century AD), Plutarch (ca. 45-120 AD), Arrian (ca. 95-175 AD), and Justin (third century AD). The most helpful information in regard to the topic at hand is found in the narratives of Arrian, Diodorus Siculus, and Quintus Curtius.

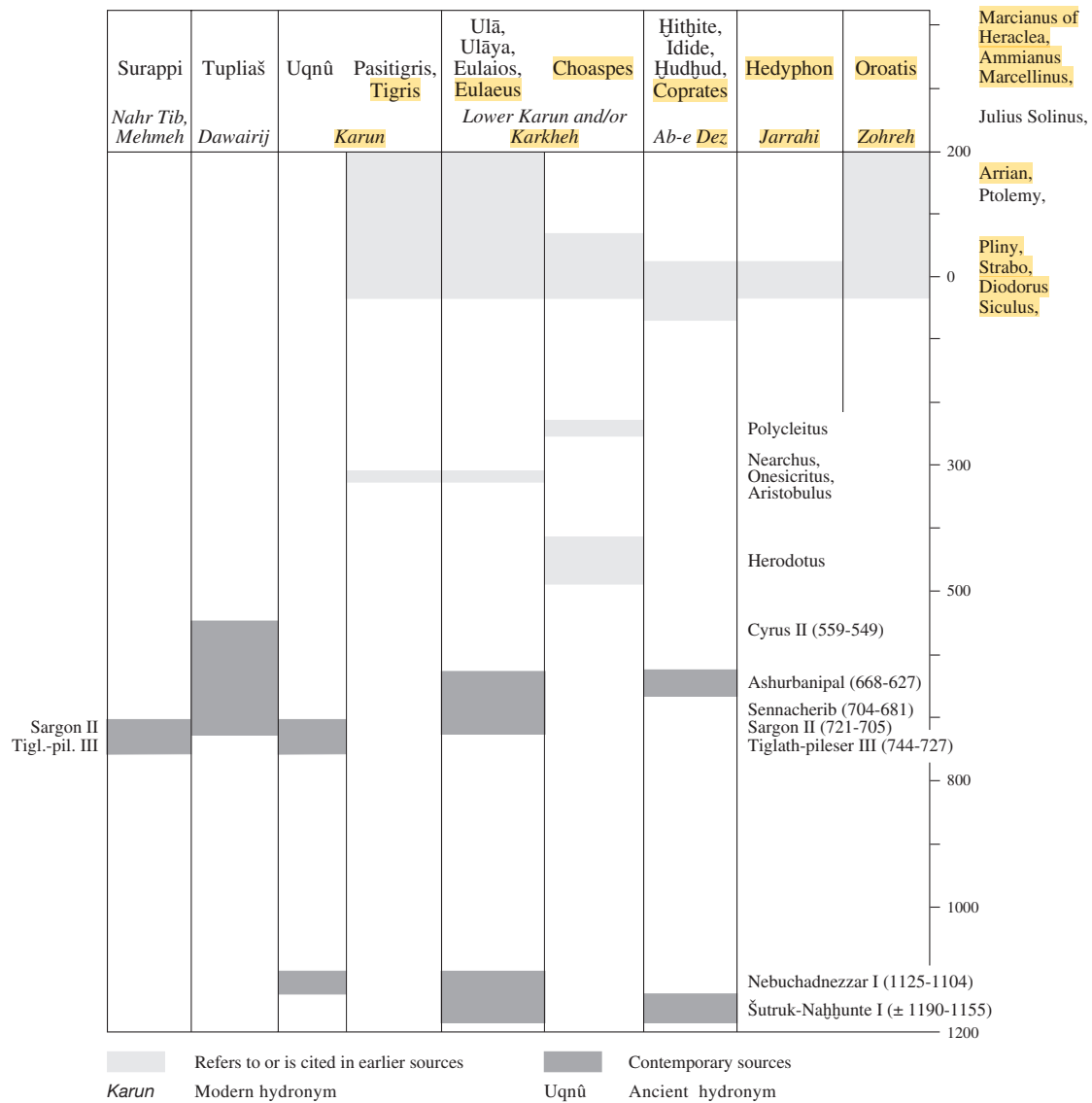


Table : Chronological distribution of attestations of hydronyms ca. 1200 BC - 200 AD

head of the Gulf, including the mouths of the rivers which emptied into it,<sup>74</sup> and when Alexander sailed from Susa to Opis, on the Tigris, to put down a mutiny among his Macedonian contingents.<sup>75</sup>

<sup>74</sup> Nearchus wrote an account of his explorations, apparently entitled *Indica*, which is now lost except for some fragments. Substantial portions of his important work, however, were used by Arrian and Strabo. Also important but lost is the account of Onesicritus, Alexander's chief helmsman, which was used by Diodorus Siculus and cited by Strabo and Pliny, as well as the account of Aristobulus, a member of Alexander's staff of engineers, whose writings were used by Arrian and cited by Strabo and Plutarch.

<sup>75</sup> Arrian II (trans. P.A. Brunt) 1983, VII.7.1-2.

It is important to note that the narratives about the time of Alexander that have survived were compiled between three and five centuries after Alexander's death and were themselves based on the accounts of earlier historians. Even these secondary sources were preserved through the manuscript and copying tradition, which may explain why there are sometimes inconsistencies among the various accounts. Despite these deficiencies, however, the accounts in question constitute the most detailed body of evidence for the historical geography of the southeastern Mesopotamian alluvial plain (including modern Lower Khuzestan) between 1200 BC and 200 AD and will therefore play a primary role in the reconstruction that follows.

We will first outline the evidence that underpins our analysis of the relevant textual data (section 3.1). We will then provide a brief sketch of the principal physical characteristics of the Lower Mesopotamian delta region (section 3.2) in order to provide background for the analysis which will follow this sketch. In this analysis, we will treat the location and identification of the ancient river systems of Lower Khuzestan and the adjoining regions during the period under study (sections 3.3 through 3.8); and we will also tackle the problem of the position of the ancient Gulf shoreline (section 3.9). We will generally give primacy to the

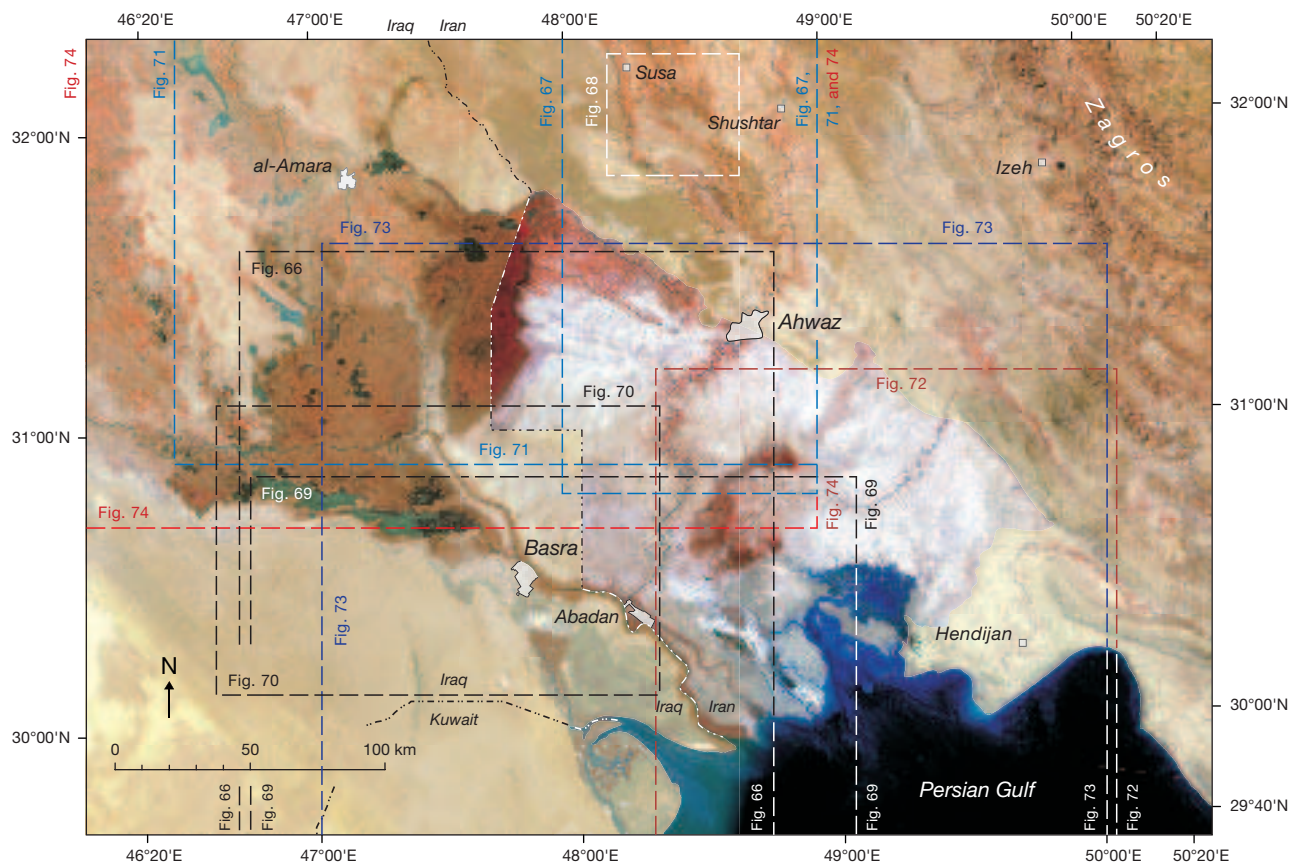


Fig. 64. Index map of the Lower Khuzestan Project (light-shaded region) and adjoining Lower Tigris/Euphrates Project areas (Fig. 65 covers the same area).



Hellenistic-Parthian evidence, because it is the most detailed, and only afterwards will we examine the less revealing evidence from earlier periods, particularly from the eighth-seventh centuries BC. We will see that the topographical picture that emerges from this earlier evidence is strikingly similar to the picture evoked by the evidence of the early Hellenistic period; that is to say, there is very little in the former that is inconsistent with the latter. However, during the later Hellenistic period or early Parthian period, the evidence points to a substantial shift in the course of the Lower Euphrates, and, over the course of the Parthian period, indicates that the position of the head of the Gulf may have also fluctuated.

### 3.1. CORNERSTONES OF THE PRESENT ANALYSIS

The following datums underpin our organization and interpretation of the textual data bearing on the historical geography of the study region during the period between 1200 BC and 200 AD and allow us to advance the *status quaestionis* in a significant new way.

#### 3.1.1. The Modern Site of Naisan Represents the Ruins of Ancient Alexandria-on-the-Tigris/Spasinou Charax

The identification of Naisan with ancient Alexandria-on-the-Tigris/Spasinou Charax was worked out in convincing detail by John Hansman.<sup>76</sup> For reasons that will become apparent below, this identification is critical to the localization of the ancient courses of the Lower Eulaios/Ulāya and Tigris rivers and also provides an essential datum on the position of the head of the Gulf during the first millennium BC (see section 3.1.3).

The ruins of the town are located some 45 km north-northwest of modern Basra, and approximately 5 km east of the Shatt al-Arab close to the point of confluence of two disused river channels, one of which is an old channel of the Tigris,<sup>77</sup> and the other of which is an older channel of the Karun (see Fig. 66 and section 3.1.5).<sup>78</sup> The site is enclosed by a trapezoidal embankment, of which the southern and northern walls measure approximately 2.9 km and 2.8 km in length, respectively.<sup>79</sup> The plan of the site is consistent with a town founded in the Hellenistic era; and while no Hellenistic pottery is evident on the surface, a few examples from the site are almost certainly Parthian in date.<sup>80</sup> A site called Maghlub, which exhibits roughly similar pottery types on its surface, is situated approximately 18 km southeast of Naisan, just a little to the east of the same old channel of the Tigris near which

<sup>76</sup> Hansman 1967; but see also Hansman 1978 and Hansman 1984.

<sup>77</sup> See Hansman 1967, fig. 3 and Pl. V. The comparative narrowness of this bed of the old Tigris (see Hansman's fig. 3, Channel 1, and our Fig. 66) indicates that the Euphrates had not yet joined the Tigris by the time of the foundation of Alexandria-on-the-Tigris in the fourth century BC; indeed we will show in section 3.1.5 below that the Euphrates flowed in a more westerly channel to the Gulf at this time, i.e., via a channel that passed through the Khawr Zubair/Sabiya and/or eventually through an older course of the Khawr Abd Allah (see Fig. 66).

<sup>78</sup> Hansman identified it as a canal from the Karkheh, but more on this question below.

<sup>79</sup> Hansman 1967, 41; Hansman 1984, 162.

<sup>80</sup> Hansman 1967, 39-45.

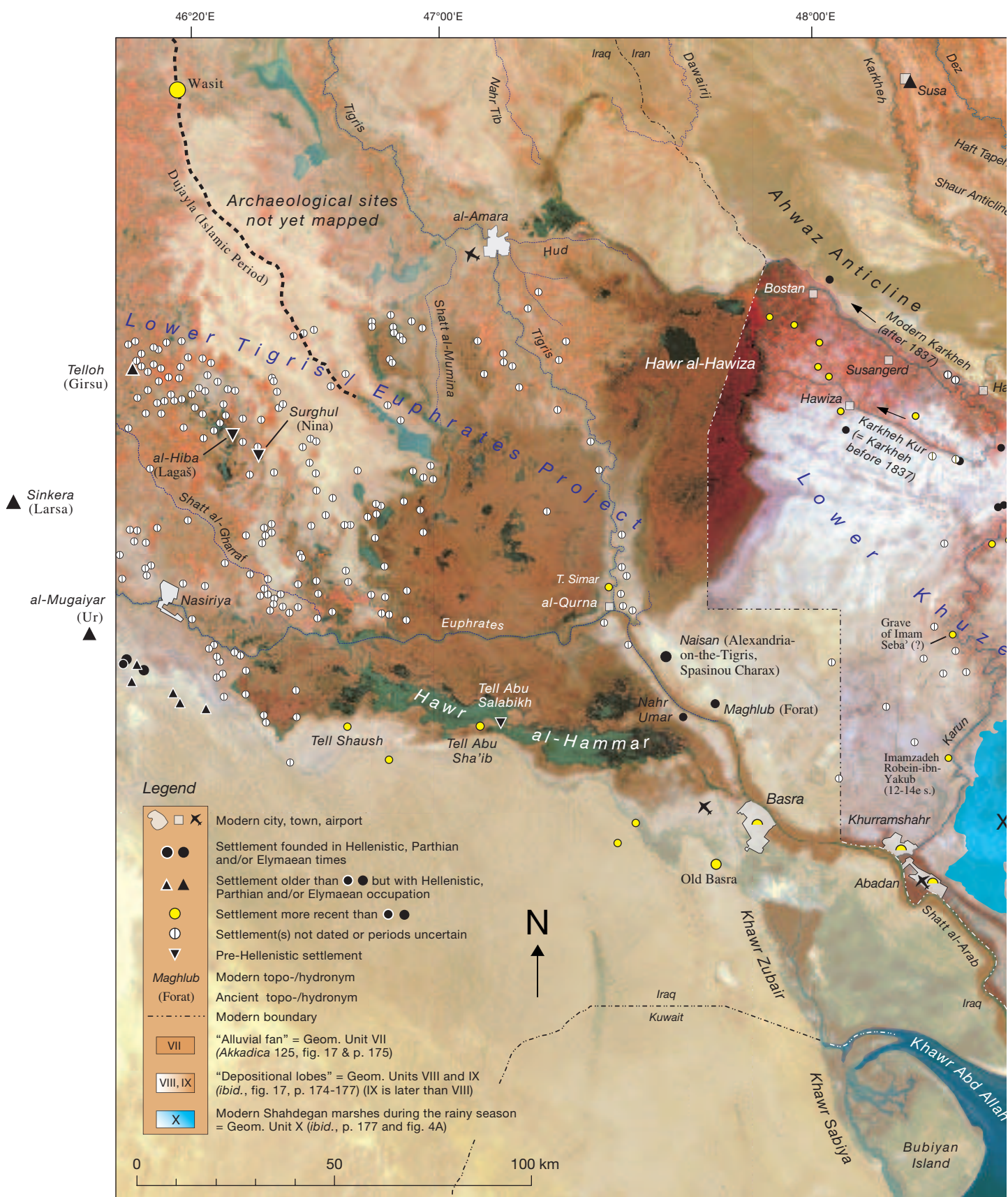
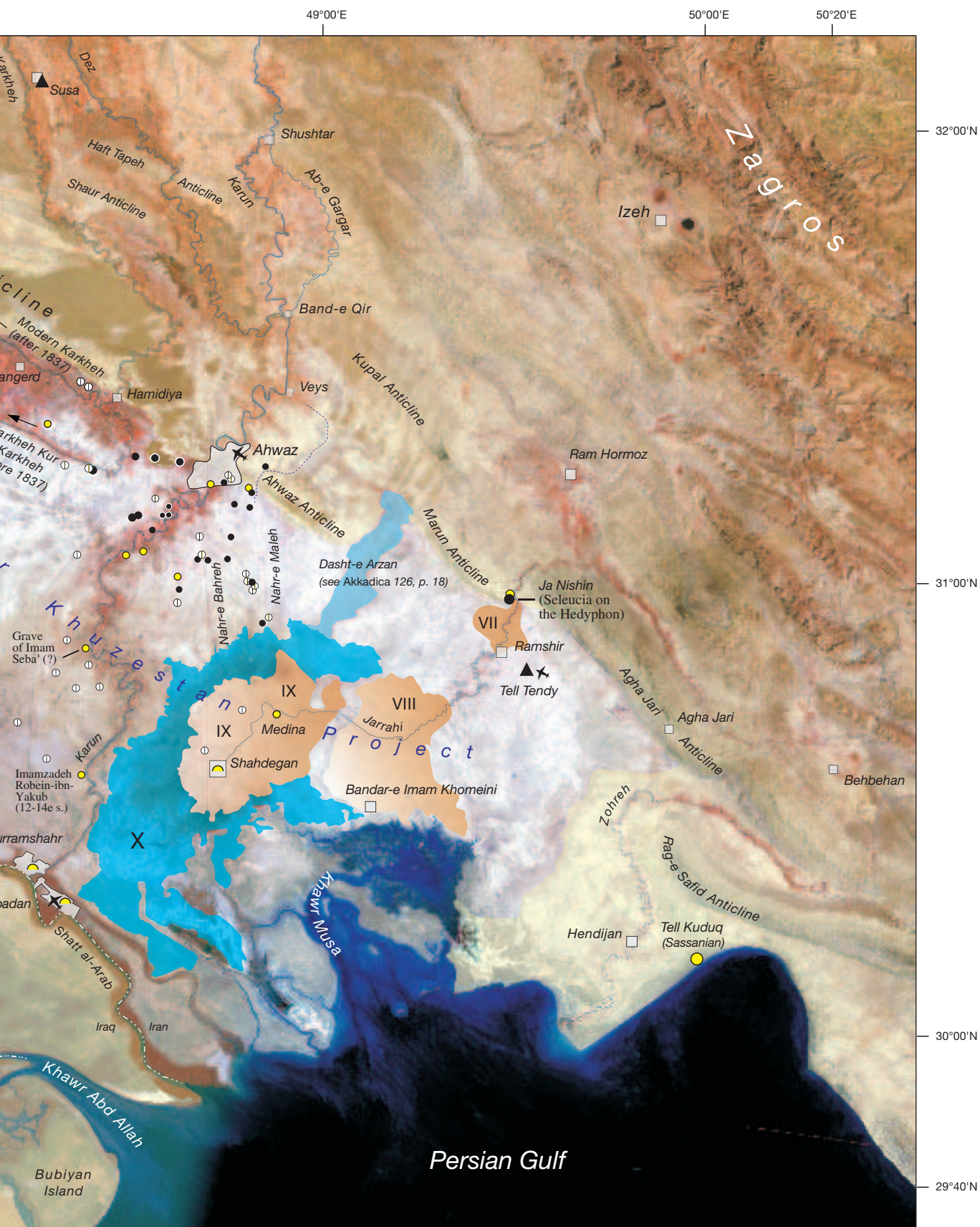


Fig. 65. Map of the Lower Khuzestan Project (light-shaded region) and adjoining Lower Tigris/Euphrates Project areas showing toponyms and hydronyms mentioned in the text.

“Modern Karkheh (after 1837)”: in this year the dam of the Karkheh built upstream from Hamidiya collapsed, which caused the Karkheh (now Karkheh Kur) to change its course to the bed of the “Modern Karkheh” (see *Akkadica* 126/1, p. 20 and n. 23). The arrows show the direction of modern flow.





Naisan is located.<sup>81</sup> With the possible exception of Nahr Umar, located on the right bank of the Shatt al-Arab, opposite Maghlub,<sup>82</sup> these are the only known ruins of pre-Islamic date that can be associated with the lower reaches of the old Tigris in the entire region.

Ancient Alexandria-on-the-Tigris/Spasinou Charax (later Karkh Maisan) was said by Pliny to have been located at the junction of the Tigris and Eulaios rivers.<sup>83</sup> Pliny states that the walls of Spasinou Charax measured two *milia passuum* or a little over 2.9 km in length.<sup>84</sup> Pliny also noted that there was a town called Forat *resorted to by people from Petra, who make the journey from there to Charax, a distance of 12 miles (= 17.8 km) by water, using the tide.*<sup>85</sup>

The identification of Naisan with the metropolis Spasinou Charax is almost certain. Not only is the site of Naisan located near the junction of two fossil river channels – one associated with the ancient Tigris and the other with the ancient Eulaios – but the dimensions of its surviving perimeter embankment are almost identical to the dimensions given by Pliny for the walls of the ancient town.<sup>86</sup> Also supporting this identification is the fact that the distance between modern Naisan and modern Maghlub is virtually identical to the distance between ancient Spasinou Charax and ancient Forat.<sup>87</sup>

The importance of Hansman's identification of Spasinou Charax with the modern site of Naisan for the reconstruction of the historical geography of the region under study cannot be overstated.

### 3.1.2. The Branches of the Karkheh Joined the Dez and Karun Rivers in the Vicinity of Modern Ahwaz, and the Watercourse Resulting from the Junction of these Rivers Entered the Tigris Near Alexandria-on-the-Tigris/Spasinou Charax<sup>88</sup>

The above-described riverine configuration was proposed already in the nineteenth century on the basis of the evidence provided by various Greek and Roman writers and was largely confirmed during the 1970s on the basis of the geomorphological research carried out by Michael Kirkby, who published his results in 1977.<sup>89</sup> Hansman was apparently unaware of Kirkby's work when he published his own seminal study on the Mesopotamian delta the following year.

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<sup>81</sup> Hansman 1967, 46-47; Hansman 1984, 164 and fig. 4.

<sup>82</sup> Roux 1960, 21-23. See also *Akkadica* 126/1, p. 34.

<sup>83</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.138.

<sup>84</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.138. One *mille passus* (plural *milia passuum*) is equivalent to 1.482 km.

<sup>85</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145.

<sup>86</sup> See, for example, Hansman 1984, 164.

<sup>87</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145; see also Hansman 1967, 46.

<sup>88</sup> Compare Kirkby 1977, 276-279, especially fig. 108 (Stage 1) on p. 277.

<sup>89</sup> The research was conducted on the Karkheh and the Ab-e Shaur river systems in connection with the Deh Luran Archaeological Project of the University of Michigan.

Kirkby determined – on the basis of the well-established relationship between bank-full discharge and meander wavelength<sup>90</sup> – that the ancient meanders one can detect extending immediately west-southwest from Ahwaz (see Figs. 66 and 67, meanders 1a) were of such magnitude that they could have been formed only by the Karun<sup>91</sup> after this river had been joined by the Dez and the Karkheh.<sup>92</sup> According to Kirkby's reconstruction, the ancient Karkheh turned to the southeast some 15 km south of Susa in ca. 1500 BC, and then joined the ancient Dez approximately 37 km downstream, near the point where the Dez crosses the Shaur anticline (see Figs. 67 and 68). According to Kirkby, this configuration continued until approximately 500 AD.<sup>93</sup> However, the extant archaeological survey data may present a different picture.

Evidence gathered by Adams (1962) points to the existence of settlements dating both before 3500 BC and between the late second millennium BC and 640 BC in the *talweg* of the modern Karkheh and in the area between the Haft Tapeh and Shaur anticlines (see Fig. 68), that is, in the land irrigated by Kirkby's old Karkheh some 15 km south of Susa. In addition, there are numerous Sasanian and early Islamic sites in the area between the anticlines, indicating that this ancient northern branch of the Karkheh, or a remnant of it (see Fig. 67, branch 2a + meanders 2b), was still in use in these later periods, perhaps as an irrigation canal. On the basis of these data we suggest that the Karkheh bifurcated some 15 km south of Susa. The ancient southern branch of this river (see Fig. 67, branch 2c) joined the old channel of the Karun about 30 km west-southwest of Ahwaz, where several fossil meanders belonging to an old course of the Karkheh are located (see Fig. 67, meanders 2d).<sup>94</sup> But there are traces as well of two other junctions of this ancient southern branch of the Karkheh with the old channel of the Karun, both of which are located upstream from the junction just described. At a point some 23 km northeast of Hamidiya, two waterways seem to have departed from "branch 2c" (Fig. 67, courses 2e), with the northernmost of the two joining the old course of the Karun approximately 20 km north of Ahwaz, and the other one heading more or less directly south from this point and joining the old Karun at Ahwaz itself.<sup>95</sup> The existence of the latter would explain, at least in part, the building of the Nahr-e Bahreh (Fig. 67, course 1c) sometime probably in the Hellenistic/Parthian era,<sup>96</sup> one of the functions of which was to divert the floodwaters of the Karun.<sup>97</sup> In this context it should be noted as well that the Ab-e Gargar, which was an eastern branch of the Karun that passed through Shushtar and Veys (see Fig. 67 course 1d), may have also functioned as an escape via its continuation, the Nahr-e Maleh, which, like the Nahr-e Bahreh, emptied into the estuarine region.<sup>98</sup>

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<sup>90</sup> Kirkby 1977, 273.

<sup>91</sup> See also now *Akkadica* 125/2, p. 182.

<sup>92</sup> Kirkby 1977, 274-276; see especially the note on Site (9) under Table 87 on p. 276. A similar configuration of rivers was still in evidence during early Islamic times; that is, the Karkheh still joined the Dujayl (= Karun) near Ahwaz; see Le Strange 1930, 241-242, and map after p. 24.

<sup>93</sup> Kirkby 1977, fig. 108: 1.

<sup>94</sup> See also the detail in *Akkadica* 126/1, p. 20, fig. 53, south of site No. 40 and site No. 41.

<sup>95</sup> Both the settlement patterns along these two watercourses and the Arabic sources about this area require additional investigation.

<sup>96</sup> See *Akkadica* 126/1, pp. 24-25.

<sup>97</sup> As already suggested in *Akkadica* 125/2, p. 174.

<sup>98</sup> See *Akkadica* 126/1, fig. 52 and pp. 31-32.



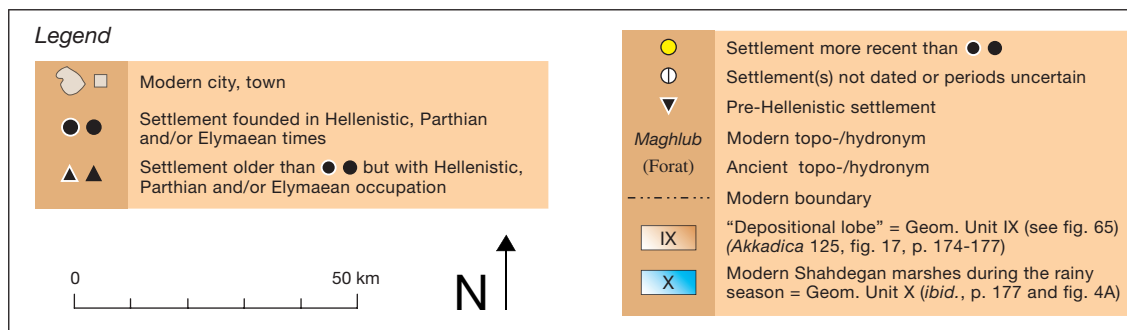
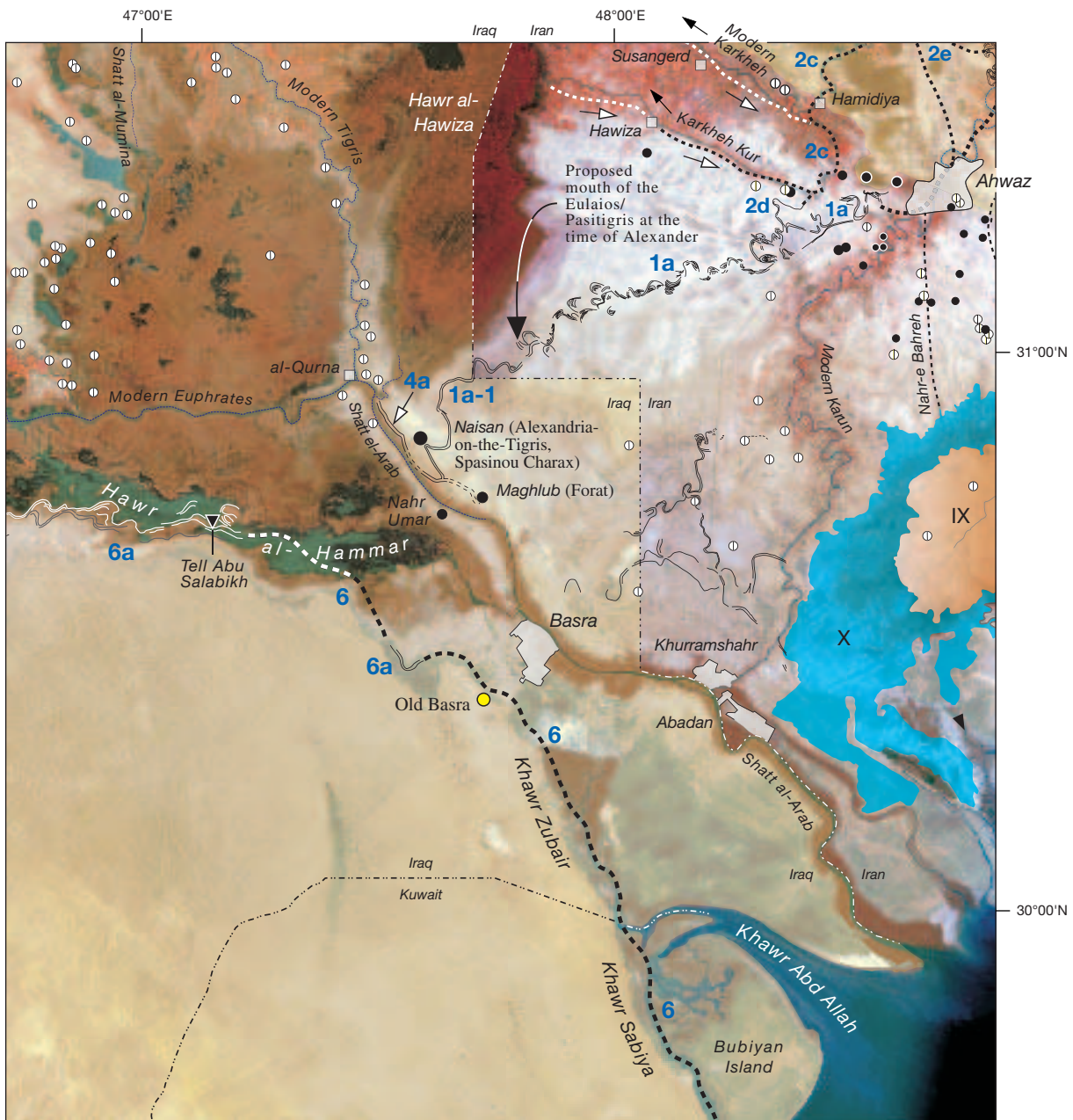


Fig. 66. Excerpt of Fig. 65 showing the area of the lowermost courses of the Karun, Tigris, and Euphrates rivers. The light-shaded area indicates the western part of the Lower Khuzestan Project area. For the old system of the lower "Modern Karkheh" and "Karkheh Kur," see Figs. 71 and 74.

The knowledge that the various branches of the ancient Karkheh joined the ancient Dez and Karun rivers in the vicinity of modern Ahwaz, when coupled with Hansman's identification of Naisan as Spasinou Charax, is fundamental to the reconstruction which follows and significantly enhances our understanding of the historical geography of the region under study.

### 3.1.3. According to Pliny and Arrian,<sup>99</sup> the United Streams of the Karkheh, Dez, and Karun Rivers Entered the Sea in the Area Between Modern Ahwaz and Ancient Alexandria-on-the-Tigris/Spasinou Charax

Building on Kirkby's investigations, Baeteman and her team identified extensive remains of the above-described channel in the course of their geomorphological investigations in the Lower Khuzestan area. In the publication of their findings, they stated that the course in question is visible over a distance of more than 100 km between Ahwaz and the Shatt al-Arab and is *characterised by a very high sinuosity and numerous scroll bars, which are of the same type as the present-day course of the Karun*<sup>100</sup> (see Fig. 66, meanders 1a). This is the lower reach of the paleo-channel which Kirkby had identified earlier and is clearly visible on Google Earth, especially near the Iran-Iraq frontier.

Pliny's testimony that Spasinou Charax was situated in the innermost recess of the Persian Gulf at a distance of 10 stades (= 1.85 km) from the coast<sup>101</sup> and Hansman's identification of Spasinou Charax with modern Naisan indicates that at least some part of the Gulf extended to approximately 20 km southeast of modern al-Qurna during the time of Alexander.<sup>102</sup>

<sup>99</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.139 ; Arrian II (trans. P.A. Blunt) 1983, VII.7.1-2.

<sup>100</sup> *Akkadica* 125/2, p. 182. See also *Akkadica* 126/1, fig. 52 (*Méandres fossiles du Karun*).

<sup>101</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.139.

<sup>102</sup> See Fig. 65 above for the location of these toponyms.

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|--|--|
| <p><b>1a :</b> Ancient meanders of the Karun WSW of Ahwaz (Uqnû/Pasitigris &amp; Ulā/Ulāya/Eulaios/Eulaeus/Choaspes)</p> <p><b>1a-1 :</b> Proposed reactivated bed of the ancient Karun leading to the Tigris (Pasitigris/Eulaios/Eulaeus/Choaspes)</p> <p><b>2c :</b> Proposed ancient southern branch of the Karkheh (Choaspes)</p> <p><b>2d :</b> Ancient meanders of the Karkheh associated with 2c (Choaspes)</p> | <p><b>2e :</b> Possible ancient waterways associated with 2c</p> <p><b>4a :</b> Ancient remnants of the Tigris West of Naisan (at least during the 4th century BC)</p> <p><b>6 :</b> Old Euphrates until sometime in the 3rd - 1st centuries AD</p> <p><b>6a :</b> Ancient meanders of the Euphrates associated with 6</p> |
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(Fig. 66)

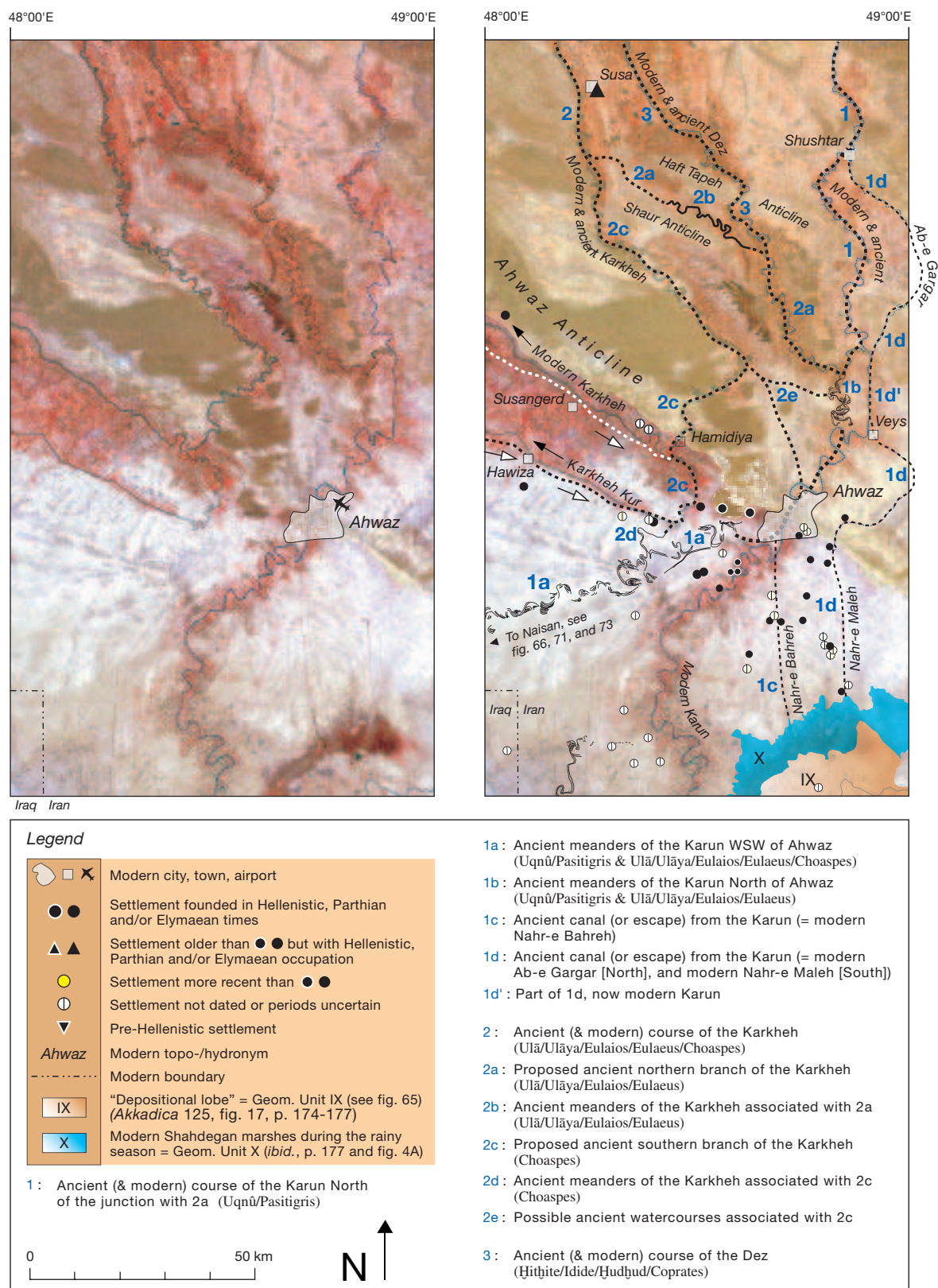


Fig. 67. Excerpt of Fig. 65 showing the area of the ancient Karun, Dez, and Karkheh river systems and proposed reconstructions of their courses north and west-southwest of Ahwaz. Left: view without enhancement. Right: the light-shaded area south and southwest of Ahwaz indicates part of the Lower Khuzestan Project area. The black arrows next to "Modern Karkheh" and "Karkheh Kur" show the direction of modern flow, while the white arrows show the direction of flow of what are possibly their old courses (the Tupliaš and Surappi, respectively).



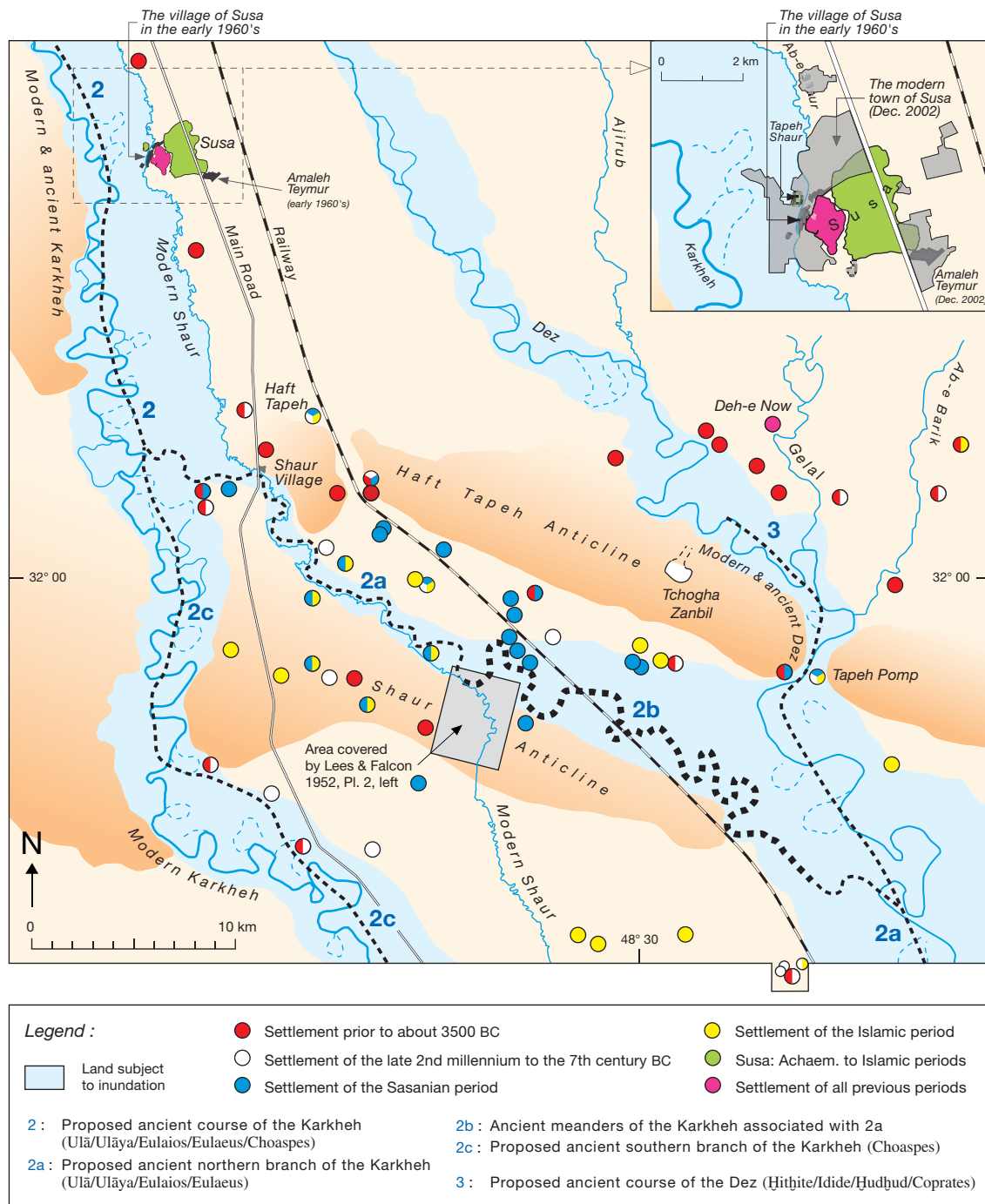


Fig. 68. The Karkheh and its proposed northern (Ulā/Ulāya/Eulaios/Eulaeus) and southern (Choaspes) branches south of Susa. We show only the known sites located along these proposed branches. In addition, we show the oldest sites located along the upper modern Shaur and the oldest sites located in the lower basin of the ancient Dez. The inset at the upper right illustrates the threat posed to the ruins of the ancient metropolis of Susa by uncontrolled urbanization.

3.1.4. North of the United Karkheh, Dez, and Karun Rivers was a Swampy Lake, Known to Greek and Roman Writers as *λίμνη* or *chaldaicus lacus*<sup>103</sup>

There was a physical boundary between the sea and the region north of the united streams of the Karkheh, Dez, and Karun rivers. Georges Roux, who worked in the Hawr al-Hammar area, cited geological evidence<sup>104</sup> for the existence of a topographical “hump” in the region northeast of the ruins of Nahr Umar (see Fig. 66). He remarked that this feature is *...at a sufficiently high level to preclude all risk of inundation, except perhaps in times of catastrophic floods*; and he also noted that it *...probably represents part of the threshold between the shallow basin of sedimentation where the Euphrates and Tigris pour their waters into extensive swamps, and the delta proper sloping towards the sea to the south*.<sup>105</sup> From a topographical point of view, this “hump” can only be the downstream end of the fossil bed of the Karun, which ran from Ahwaz to the Tigris near Naisan (see Fig. 66, meanders 1a + bed 1a-1).

There is a depression north of the barrier formed by this levee. According to Streck (1960, 1094), the origin of this depression, which is now occupied by the Hawr al-Hawiza, may be a syncline. The Euphrates, Tigris, Nahr Tib (called Mehmeh in Iran), and Dawairij rivers would have all contributed their waters to the great swampy lake that existed in this area during the period under consideration.<sup>106</sup>

<sup>103</sup> Strabo, citing Polycleitus and Onesicritus, respectively, reports that *... the Choaspes, the Eulaeus, and also the Tigris meet in a kind of lake, and then empty from that lake into the sea, and ... all the rivers empty into the lake, both the Euphrates and the Tigris; but that the Euphrates, again issuing from the lake, joins with the sea by its own separate mouth*; see Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4-5. According to Pliny, this lake was called *chaldaicus lacus*; see Pliny II (trans. H. Rackham) 1989 [1942], VI.31.134.

As Streck (1960, 1093) observed: *The existence of considerable swamps in southern Babylonia goes back to high antiquity. The alluvial plain is soft and almost flat, the river beds are shallow and exposed to rapid silting, the banks are soft and low, therefore the flood waters overflow the banks, causing extensive marshes; these would normally disappear but for the annual floods, and the rivers change their courses which, in turn, leads to new marshes. Even in the cuneiform inscriptions the agammê (swamps) and apparâtê (reedlands) are often mentioned.*

<sup>104</sup> Roux 1960, 22 n. 10.

<sup>105</sup> As Roux notes (p. 22 n. 11), the barrier in question is perhaps mentioned in a creation story found on a Neo-Babylonian-period bilingual tablet of the ritual series *mīs pī*, in which it is stated that *Lord Marduk built a terrace at the edge of the sea (bēlu<sup>d</sup> Marduk ina pāt tāmī tamlā umallī)*; see Hecker, Lambert, Müller, von Soden, and Ünal 1994, 608-609 line 31 (= King 1901, Pl. 35-38 line 31).

<sup>106</sup> According to the testimony of Strabo (citing both Polycleitus and Onesicritus), all the rivers emptied into this lake (Strabo VII [trans. H.L. Jones] 1983 [1930], XV.3.4-5), while Pliny tells us that the lake in the neighborhood of Charax was formed by the Eulaeus and the Tigris (Pliny II [trans. H. Rackham] 1989 [1942], VI.26.99).

In regard to the ancient equivalents of the Nahr Tib (Mehmeh) and Dawairij, these rivers did not begin to incise the plain until some time after 500 BC. Prior to incision, while they were still aggradating, their waters would have contributed directly to this lake, and thus they would have made a proportionately bigger contribution to the swamps of the region than they do at present; see Kirkby 1977, 283, 286.

3.1.5. The Euphrates Entered Directly into the Gulf Until After the Time of Alexander, When it Began to Flow into the Tigris

Strabo, citing Onesicritus, Alexander's chief helmsman, stated that *...all the rivers empty into the lake, both the Euphrates and the Tigris; but ... the Euphrates, again issuing from the lake, joins with the sea by its own separate mouth.*<sup>107</sup> In other words, the lowermost course of the Euphrates at this time must have followed the Khawr Zubair and then emptied into the Gulf via the Khawr Sabiya (see Fig. 69, course 6 + meanders 6a),<sup>108</sup> the mouth of which is presently situated less than 15 km northwest of the northern tip of Failaka Island and nearly 60 km west of the modern Shatt al-Arab (Fig. 69).<sup>109</sup> Arrian, relying on earlier material from Aristobulus, a contemporary of Alexander, stated that there was an island located one hundred and twenty stades (= 22.2 km)<sup>110</sup> from the mouth of the Euphrates and that Alexander commanded this island to be called Icarus.<sup>111</sup> The figure cited by Arrian approximates the distance between the mouth of the Khawr Sabiya and the northern tip of Failaka Island (see Fig. 69), which has been positively identified as ancient Icarus on the basis of inscriptional evidence found there.<sup>112</sup> The discrepancy in the distances between modern Failaka Island and the outlet of Khawr Sabiya on the one hand (approx. 15 km) and between ancient Icarus Island and the mouth of the ancient Euphrates on the other (approx. 22 km) is probably due to the fact that the Euphrates continued to build out its delta towards Failaka for one or more centuries after Alexander's time.

If indeed the Euphrates entered the Gulf via the Khawr Sabiya just north of Failaka Island, and if the Gulf extended to approximately 20 km southeast of modern al-Qurna,<sup>113</sup> then the river must have run virtually parallel to the ancient Gulf coastline from the latitude of modern Basra to the point of its debouchment into the sea.

We do not know precisely when the old bed of the Euphrates along the Khawr Zubair/Khawr Sabiya fell into disuse, but it probably occurred gradually during the third-first centuries BC. Pliny, who lived in the first century AD, relates that even before his time *...the Euphrates was dammed by the Orcheni (the people of Uruk) and other neighbouring tribes in order to irrigate their lands, and its water is only discharged into the sea by way of the*

<sup>107</sup> Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.5. Other passages which refer to the Euphrates entering either the sea or the Persian Gulf via a separate mouth or mouths include Arrian II (trans. P.A. Brunt) 1983, VII.21.3, Strabo I (trans. H.L. Jones) 1969 [1917], II.1.26, and Strabo V (trans. H.L. Jones) 1969 [1928], XI.12.3.

<sup>108</sup> See already Weissbach 1909, 1204-1205, seemingly followed by Hansman (1978, 56).

<sup>109</sup> Wilson (1925, 226) states that this old course of the Euphrates can easily be traced from the air all the way from Khawr Sabiya, past old Basra, to the neighborhood of Suq ash-Shuyukh, near ancient Ur; see also Hansman 1978, 55.

<sup>110</sup> One (Attic) stade is equivalent to 184.98 m (or 0.18498 km); see Engel 1985.

<sup>111</sup> Arrian II (trans. P.A. Brunt) 1983, VII.20.3, 5.

<sup>112</sup> The content of a Greek inscription uncovered in 1960 by Danish archaeologists working within a small temple on the island of Failaka proves the island's identification as ancient Icarus; see Jeppesen 1989, 82-103, esp. 102-103.

<sup>113</sup> As noted above, Spasinou Charax (= modern Naisan) was situated in the innermost recess of the Persian Gulf at a distance of 10 stades (= 1.85 km) from the coast (according to Pliny II [trans. H. Rackham] 1989 [1942], VI.31.139). The modern site of Naisan is located some 20 km southeast of al-Qurna.

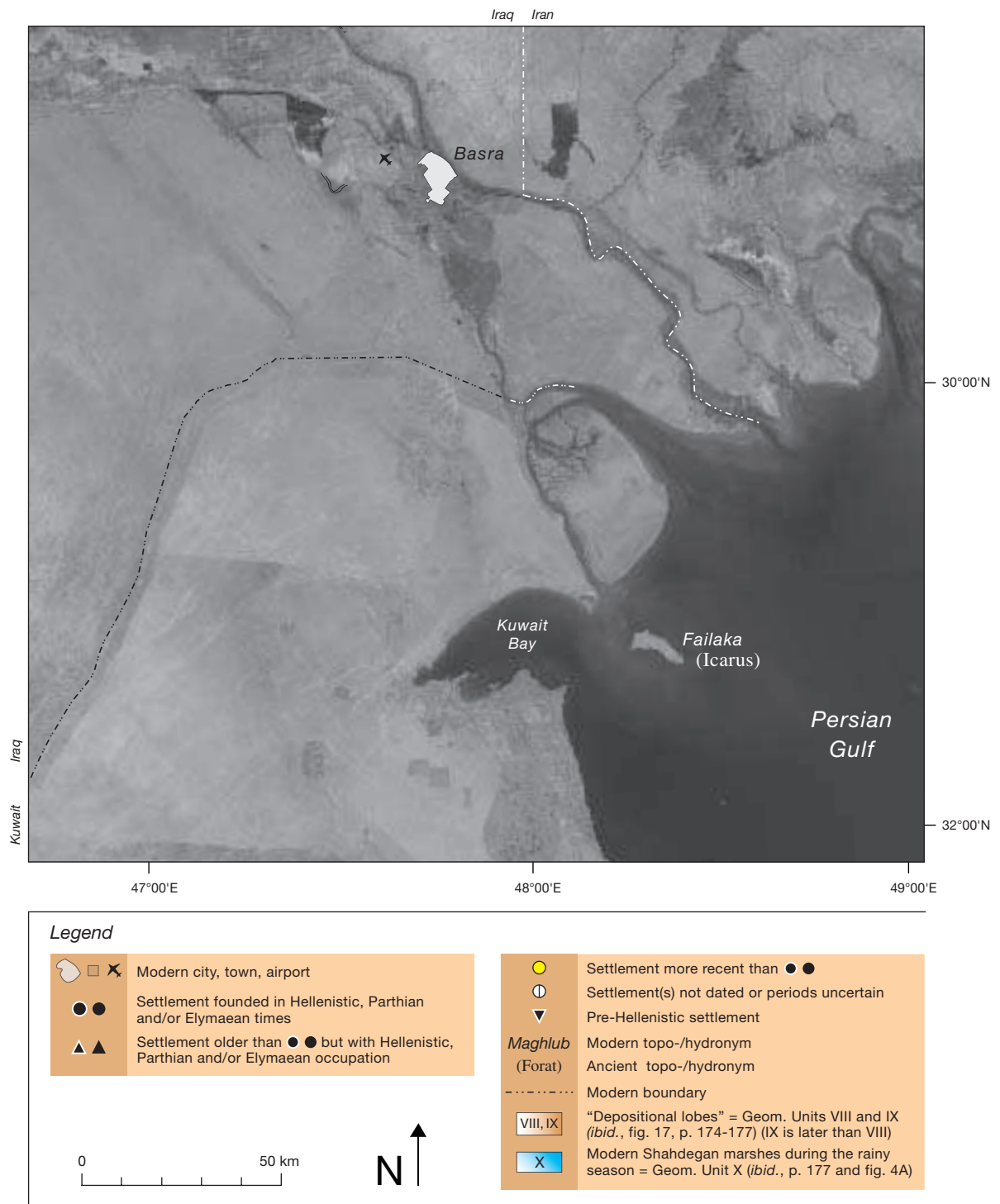
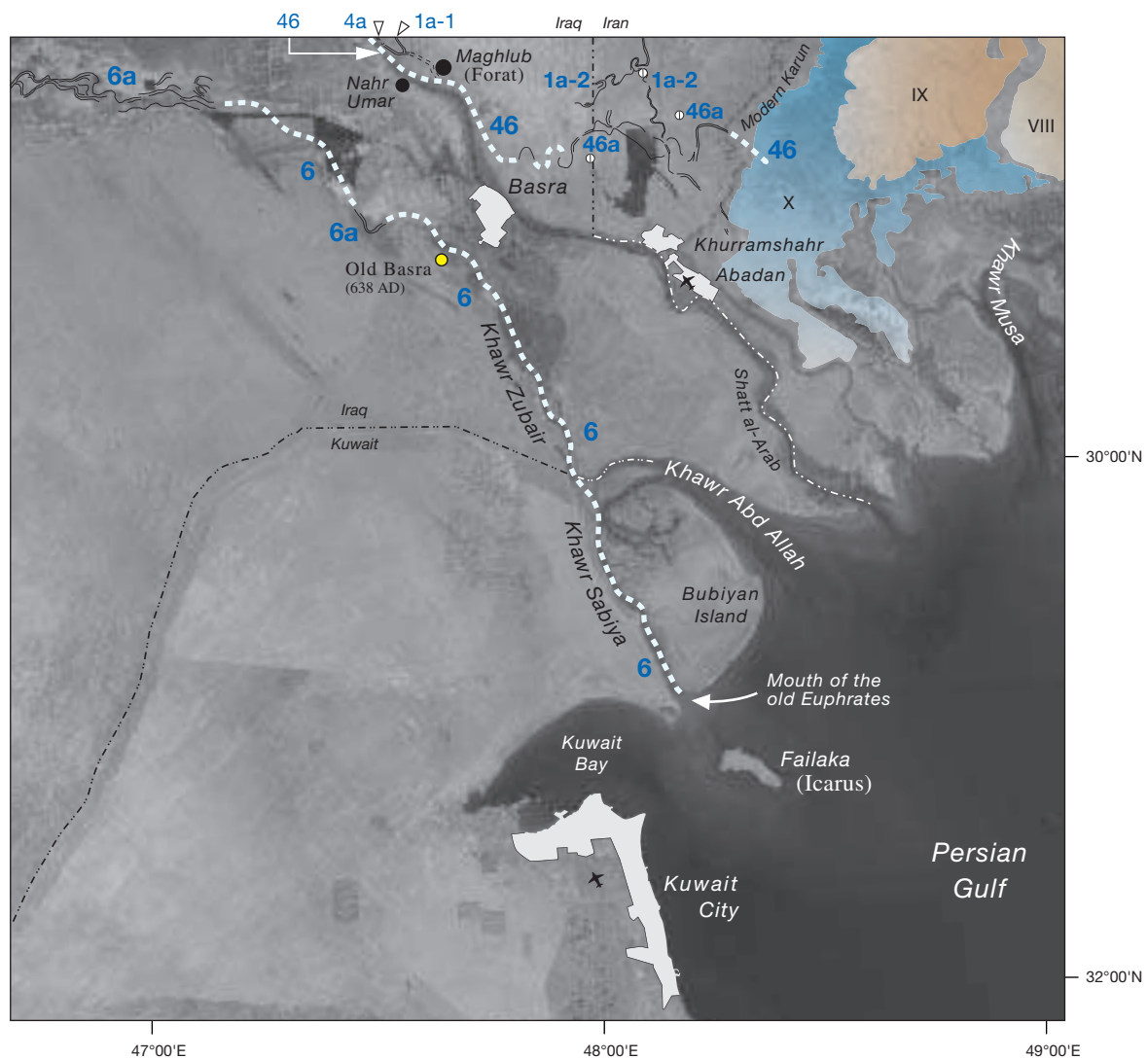


Fig. 69. Composite of four images showing the area of the lower Euphrates, Kuwait Bay, and Failaka Island (Icarus). Left: view without enhancement of morphological features. Right: with enhancement.

*Tigris*<sup>114</sup> (see Fig. 70). Pliny also tells us that, while the Euphrates was navigable from the Persian Gulf to Babylon during the time of Nearchus and Onesicritus (both contemporaries of

<sup>114</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.130. Compare also Pliny II (trans. H. Rackham) 1989 [1942], VI.31.126 and VI.32.145, both of which passages refer to the confluence of the Tigris and Euphrates. Finally, see Pliny II (trans. H. Rackham) 1989 [1942], VI.30.124, where it is stated: *Some report that it (the Euphrates) continues to flow in a single channel for a distance of 87 miles beyond Babylon before it is diverted into*



- 1a-1 : Proposed reactivated bed of the ancient Karun leading to the Tigris (Pasitigris/Eulaios/Eulaeus/Choaspes)
- 1a-2 : Ancient meanders of the Dujayl (Karun) (not discussed in Chapter 3; date to be established)
- 4a : Ancient remnants of the Tigris West of Naisan (at least during the 4th century BC)
- 46 : Possible ancient course of the combined Tigris and Euphrates (not discussed in Chapter 3; date to be established)

- 46a : Ancient remnants of the combined Tigris and Euphrates north of modern Khurramshahr (not discussed in Chapter 3; date to be established)

- 6 : Old Euphrates until sometime in the 3rd - 1st centuries BC
- 6a : Ancient meanders of the Euphrates associated with 6

Images : Global Land Cover Facility, <http://www.landcover.org>. U.S. Geological Survey, EROS Data Center, Sioux Falls, SD. The Center for Middle Eastern Landscapes, Oriental Institute, University of Chicago

(Fig. 69)

*irrigation-channels ...* Some accounts indicate that the Euphrates did not emerge from the swamps at all. Arrian, for instance, states that *...the Euphrates, coming to an end in little water, and that swampy, ceases to flow* (Arrian II [trans. P.A. Brunt] 1983, VII.7.5). This same author, however, seems to contradict himself later when he tells us that the Euphrates *...runs mostly into lagoons and thereafter into the sea by many unnoticed mouths* (Arrian II [trans. P.A. Brunt] 1983, VII.21.3), although he was probably referring to an earlier time.



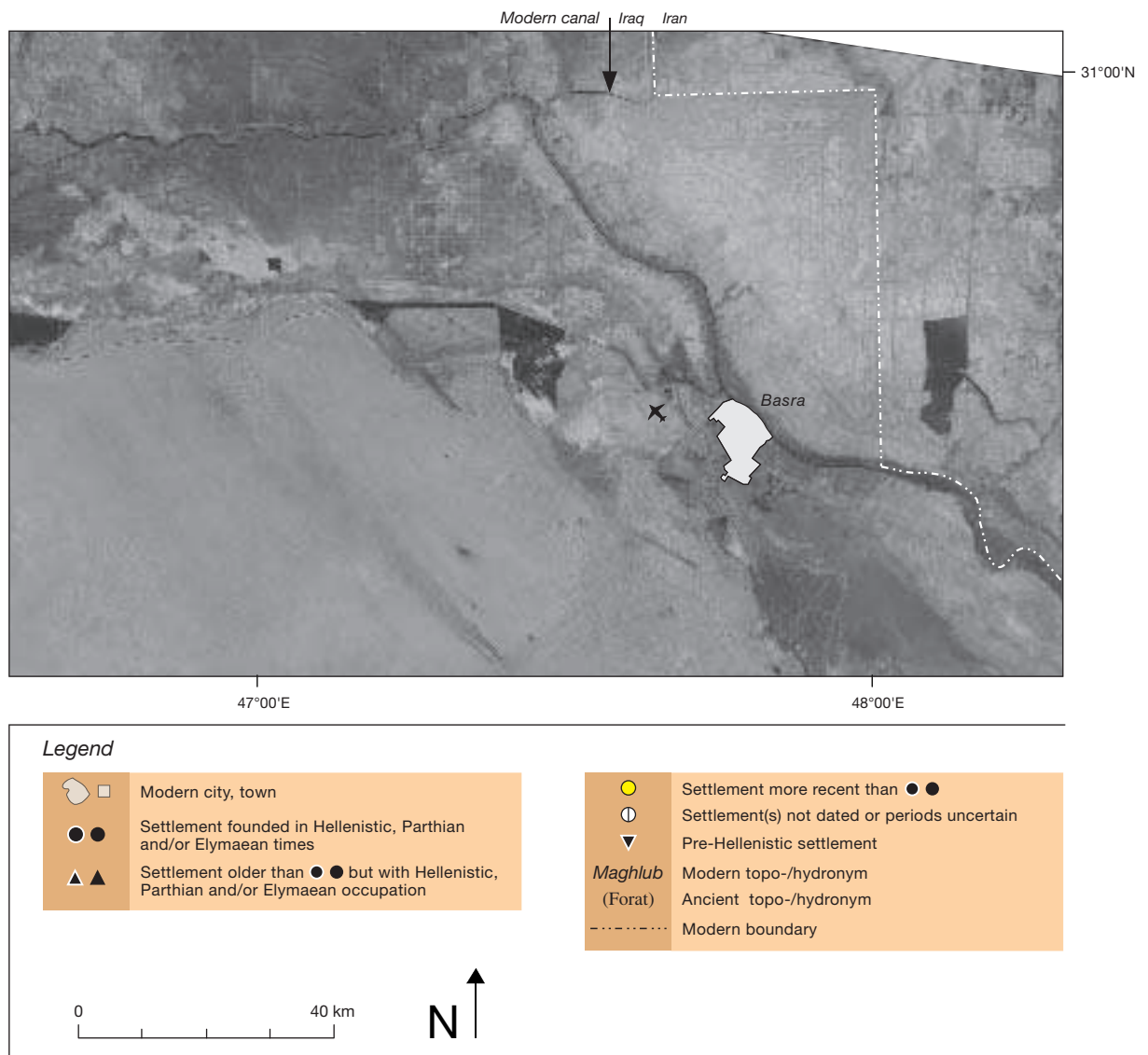
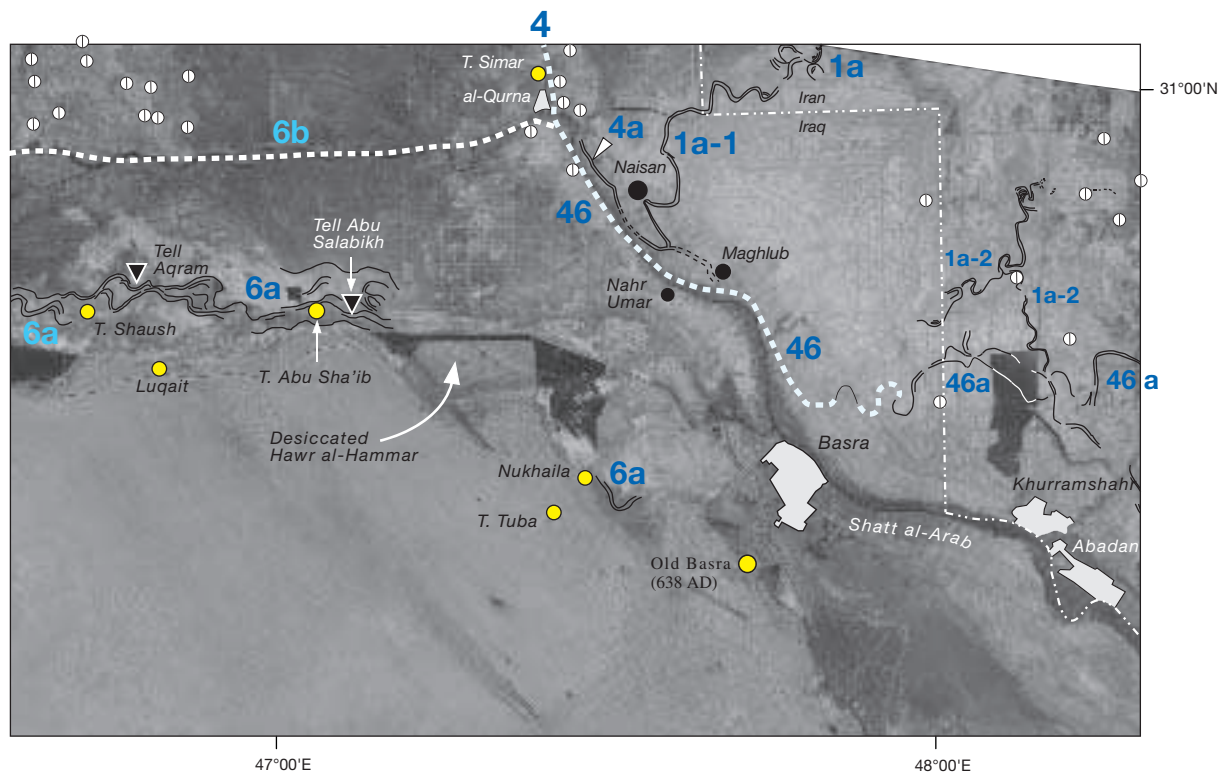


Fig. 70. Excerpt of Fig. 69 showing the detail of the lower course of the ancient Euphrates west of al-Qurna. Left : satellite view without enhancement of morphological features. Right : with enhancement.

Alexander), by the time of Juba,<sup>115</sup> who lived three centuries later, this river was navigable only between Charax and Babylon.<sup>116</sup> To reach the Euphrates from Charax one would have had to travel up the lower stretch of the Tigris. These passages indicate that the old bed of the Euphrates through the Khawr Zubair had been abandoned prior to the advent of the Christian Era.

<sup>115</sup> I.e., Juba II, king of Mauritania, ca. 48 BC-23 AD ; see Hornblower and Spawforth 2003, 799.

<sup>116</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.30.124. A later Roman author reports that *...the whole stream of the Euphrates empties into a marsh and from there somehow joins the Tigris* ; see Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.2.



- 1a : Ancient meanders of the Karun WSW of Ahwaz (Uqnû/Pasitigris & Ulâ/Ulâya/Eulaios/Eulaeus/Choaspes)
- 1a-1 : Proposed reactivated bed of the ancient Karun leading to the Tigris (Pasitigris/Eulaios/Eulaeus/Choaspes)
- 1a-2 : Ancient meanders of the Dujayl (Karun) (not discussed in Chapter 3; date to be established)
- 4 : Proposed ancient course of the eastern branch of the Tigris since at least Sasanian time
- 4a : Ancient remnants of the Tigris West of Naisan (at least during the 4th century BC)

- 46 : Possible ancient course of the combined Tigris and Euphrates (not discussed in Chapter 3; date to be established)
- 46a : Ancient remnants of the joint Tigris/Euphrates North of modern Khurramshahr (not discussed in Chapter 3; date to be established)

Images : Global Land Cover Facility, <http://www.landcover.org>. U.S. Geological Survey, EROS Data Center, Sioux Falls, SD. The Center for Middle Eastern Landscapes, Oriental Institute, University of Chicago

(Fig. 70)

### 3.2. SUMMARY OF THE PRINCIPAL PHYSICAL CHARACTERISTICS OF THE LOWER DELTA

Because the Lower Mesopotamian delta is virtually flat,<sup>117</sup> there may not have been a distinguishable shoreline during the period under consideration. As Robert McC. Adams expressed it :

*We may have to deal in the past, as to a lesser extent we still do today, not with a well-defined shoreline but with a progression of swamps and more and more open, more brackish or saline lagoons.*<sup>118</sup>

<sup>117</sup> The bed of the Hawr al-Hammar, for instance, which is located more than 125 km from the Gulf, is only about one meter above mean sea level ; see Willcocks 1911, 34.

<sup>118</sup> Adams 1981, 16.

The coast at the head of the Gulf is composed mainly of mud-flats and marshes which today extend more than 100 km inland.<sup>119</sup> Because of the low topographical profile here, any positive oscillation in sea level would have had significant repercussions far inland. According to MacFayden and Vita-Finzi :

*The fact ... that tidal waters can now penetrate 150 km inland is instructive in showing that the boundary between continental and marine environments can be exceptionally blurred and that a small shift in the general position of the coast or in relative sea level would enable marine influences to be felt as far as Amarah.*<sup>120</sup>

Of course, this would have been true in antiquity as well. Indeed, there is evidence that sea levels in the Gulf were higher in the first half of the first millennium BC. Wave-rounded potsherds of Kassite date have been found on Bahrain more than five dozen meters from the present shoreline and at more than one meter above the high-tide line. The sherds in question were overlain by Hellenistic and medieval Islamic occupation levels, while Neo-Assyrian and Neo-Babylonian pottery was absent. Curtis Larsen reasoned that *...the absence of Neo-Assyrian and Neo-Babylonian occupation levels tentatively argues for a period when sea level was somewhat higher than it is now.*<sup>121</sup> Larsen also reasoned that *...a somewhat higher sea level during the first millennium BC could easily account for the 'interior' shorelines delineated by De Morgan ...*,<sup>122</sup> to which Lees and Falcon (1952) and Hansman (1978) so vigorously objected.

Any landward extension of marine influence would have been enhanced by the tides, which can range up to five meters,<sup>123</sup> as well as by continuous southerly gales (*qaus*), prevalent from October to May, which can bank up water an additional one-half meter or more.<sup>124</sup> At the same time, any period of higher than usual annual floods would have resulted in substantial expansion of the swamp region from the other side, especially if maintenance of the levees had been neglected.<sup>125</sup>

We now turn to an examination of the documentary evidence itself. The general physical characteristics of the delta just described will provide the backdrop of our investigation, while the analytic cornerstones outlined in sections 3.1.1 through 3.1.5 will be the lens through which we will read the texts at our disposal.

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<sup>119</sup> British Admiralty, Naval Intelligence Division 1944, 151 and fig. 39.

<sup>120</sup> MacFayden and Vita-Finzi 1978, 290.

<sup>121</sup> Larsen 1983, 177. See also Sanlaville 2002, particularly fig. 4, for a summary of the evolution of the Lower Mesopotamian shoreline since the post-glacial transgression maximum.

<sup>122</sup> Larsen 1975, 56.

<sup>123</sup> See *Akkadica* 125/2, pp. 157-158.

<sup>124</sup> Wilson 1925, 235.

<sup>125</sup> Such conditions obtained during the final years of Sasanian rule and over the succeeding years when the Muslim armies began to overrun Mesopotamia. Because of neglect of the levees, Balādhuri states that *...breaches came in all the embankments, for none gave heed, and the Dihkâns* (namely the Persian nobles, who were the landlords) *were powerless to repair the dykes, so that the swamps every way lengthened and widened*; see Le Strange 1930, 27.



### 3.3. THE IDENTIFICATION OF THE KARKHEH RIVER AT THE LATITUDE OF SUSA

As noted above in Section 3.1.2, the available paleo-environmental and archaeological survey data indicate that the ancient Karkheh River bifurcated some 15 km below Susa during the period under study (see Figs. 67 and 68). The proposed southern branch of the river either joined the old course of the Karun approximately 30 km west-southwest of modern Ahwaz (Fig. 67, branch 2c + meanders 2d) or it joined the old course of the Karun at Ahwaz itself or directly north of this town (Fig. 67, branch 2c + courses 2e).<sup>126</sup> The proposed northern branch (Fig. 67, branch 2a + meanders 2b) joined the ancient Dez (Fig. 67, course 3) near the point where the Dez crosses the Shaur anticline. We suggest that the ancient southern branch of the Karkheh was called Choaspes, while the old northern branch of the river was known as Eulaios (+ cognates). Upstream, at the latitude of Susa, there was only one major river (Fig. 67, course 2), which passed the city on the west, and this river was the ancient Karkheh.<sup>127</sup> It was called here both Eulaios (+ cognates) and Choaspes.<sup>128</sup> A summary of the evidence follows, along with two possible explanations for why the river at Susa was known by both names.

The inscriptions of Ashurbanipal (668-627 BC) demonstrate that Susa lay on or very near the Ulāya (or Ulā) River in the seventh century BC.<sup>129</sup> Five hundred years later the city was said to be situated on the Eulaios, as demonstrated by a fragmentary Greek decree found at Susa by De Morgan in 1900.<sup>130</sup> But Herodotus says that Susa lay on the Choaspes,<sup>131</sup> making no mention of the Eulaios, while Strabo, citing the geographer Polycleitus, used both names,<sup>132</sup> leading scholars to believe that Susa was located close to two rivers. As we have seen, however, there is only one river here that is mentioned in ancient sources, and this river is the ancient Karkheh.

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<sup>126</sup> As noted above in section 3.1.2, this area needs more thorough investigation.

<sup>127</sup> The Ab-e Shaur, which also flowed past Susa, was a minor watercourse, probably artificial in origin; see Gasche and Cole 2003, 80-81. While the name Shaur is often associated with the name of the Sasanian king Shapur (who is supposed to have created major works in the area), there is also evidence that Darius I may have dug the canal in order to create a moat around the newly built palatial complex covering the Apadana, the Ville Royale, and probably the Acropolis (see the area in pink in Fig. 68; more on this point in a separate publication). This minor watercourse is not a serious candidate to be either the Eulaios or the Choaspes, *contra* Long (1842, 105) and Layard (1846, 92), who suggested that the Sha(p)ur was the Eulaios and the Karkheh was the Choaspes.

<sup>128</sup> The equation Eulaios = Choaspes for the river at Susa was first suggested by Dubeux (1841, 9), followed by Kirkby (1977). The matter was recently summarized by Potts (1999).

<sup>129</sup> See, for example, Borger 1996, 38 A iii 40-42, F ii 64-65; 104 B v 97-99, C vi 129-131; 104-105 B vi 10-16 C vii 3-9; and 305 35 iii 48-51, A 1 iii 24'-27'.

<sup>130</sup> The text is dated at Seleucia-by-the-Eulaios in the year 136 S.E. = 177/176 BC; see Steve, Vallat, Gasche, and Jullien 2002-03, col. 372, first paragraph of C.8. This discovery should have made it abundantly clear that Elamite Ulā, Akkadian Ulāya, and Greek Eulaios (along with Latin Eulaeus) were all cognates, and that these names can refer only to the Karkheh (not the Ab-e Shaur). Yet scholars continue to identify all these ancient hydronyms with the Karun instead, which is certainly an error; see Potts 1999, 32-33, and Potts 2005, 165-167, especially the table on p. 166. It is also an error to identify the Uqnû as an eastern arm of the Tigris as does Potts (2005, 167), following Fuchs (1994, 466-467 and map on p. 400).

<sup>131</sup> Herodotus I (trans. A.D. Godley) 1931 [1920], I.188; Herodotus III (trans. A.D. Godley), 1938 [1922], V.49, 52.

<sup>132</sup> Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4.

Potts, who accepted Kirkby's conclusion that there was only one channel of the ancient Karkheh above this river's confluence with the Dez, attempted to resolve the apparent dilemma by suggesting that Herodotus preserved the name used in the Achaemenid period (*Choaspes* derived from Old Persian *Huvaspa*<sup>133</sup>), whereas Strabo transmitted two names for the same river of different derivation (*Choaspes* from Old Persian *Huvaspa*, and *Eulaios* from Elamite *Ulā* or Akkadian *Ulāya*).<sup>134</sup> But there is a more likely explanation. If two principal branches of the ancient Karkheh existed south of Susa, as indicated by the geomorphological and archaeological survey data (one known as the *Eulaios* and the other as the *Choaspes*), then both names would have been used to refer to the river upstream north of its point of bifurcation, with the choice of names depending on downstream perspective.

### 3.4. THE IDENTIFICATION OF THE DEZ AND KARUN RIVERS ABOVE MODERN AHWAZ

The names of the ancient Dez River are clear. The Elamites of the late second millennium BC called it *Ḫiḫite*; the Assyrians of the seventh century BC used the cognate names *Idide* and *Ḫudḫud*; and Greek and Roman writers employed the hydronyms *Copratas* and *Coprates*.

Classical authors knew the ancient Karun River as either the *Pasitigris* or the *Tigris*.<sup>135</sup>

But what did the earlier peoples of Elam and Mesopotamia call this river? We believe that they called it *Uqnû*, but more on this question below.

Strabo is very explicit about the order and identity of the rivers that one would have encountered when journeying eastward from Susa during late first millennium BC. He states that *...after the Choaspes (= Karkheh), one comes to the Copratas River and the Pasitigris, which latter also flows from the country of the Uxii*.<sup>136</sup> Therefore, the *Copratas* (*Coprates*) must be identified with the ancient Dez (see Figs. 67 and 71, course 3), and the *Pasitigris* above modern Ahwaz must be identified with the ancient Karun (see Figs. 67 and 71, course 1 + meanders 1b).<sup>137</sup>

<sup>133</sup> On the Iranian etymology of *Choaspes* (= *Huvaspa*), see, for example, Schmitt 1991, 496; also Spiegel 1873, 623; Marquart 1896, 248; Weissbach 1899, 2354; Eilers 1964, 186 n. 22; and Hinz 1973, 29.

<sup>134</sup> Potts 1999, 35.

<sup>135</sup> The river was known by both names. According to Quintus Curtius I (trans. J.C. Rolfe) 1971 [1946], V.3.1, which refers to Alexander's journey from Susa to Persepolis: *...the king came at his fourth camp to the river Tigris; the natives call it Pasitigris*.

It is interesting to note in this context that later Arab inhabitants of Khuzestan referred to the Karun as the "Little Tigris." According to Le Strange 1930, 232: *The province of Khûzistân comprises all the alluvial lands of the river Kârûn, known to the Arabs as the Dujayl of Al-Ahwâz, with its many affluents. This river was called the Dujayl (Little Tigris) of Al-Ahwâz, past which city it flowed, in order to distinguish it from the Dujayl canal of the Tigris to the north of Baghdâd*.

(Arabic diminutives (i.e., nouns) usually have the consonant-vowel pattern /CvCayC/ where "v" is almost always "u"; e.g., *kût*, "fortress" > *kuwayt*, "little fortress.")

<sup>136</sup> Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.6.

<sup>137</sup> Apart from the question of whether or not the *Eulaios* and the *Choaspes* were separate rivers, the identification of the late-first-millennium BC names of the Karkheh, Dez, and Karun rivers was virtually settled by Long

Statements made by Quintus Curtius and Diodorus Siculus support this conclusion. Both authors assert that Alexander reached the Pasitigris on the fourth day after leaving Susa on his way to Persepolis.<sup>138</sup> Alexander almost certainly would have crossed the Pasitigris at or near Shushtar,<sup>139</sup> which would confirm Strabo's account that Alexander crossed the Coprates, that is the Dez, before reaching the Pasitigris. Diodorus' account of the battle between Eumenes and Antigonus over who would succeed Alexander also supports the identification of the Dez with the Coprates and the Pasitigris with the Karun.<sup>140</sup> In his account we read that when Antigonus arrived from Susa at the west bank of the Coprates, sending some of his infantry across to the east bank, Eumenes was positioned to the east of the Pasitigris, whereupon Eumenes crossed the Pasitigris and routed the army of Antigonus, who then retreated to Badake on the Eulaios.<sup>141</sup>

It is certain that the earlier Elamite hydronym *Ḫithite* is to be identified with the Dez. An inscription of Šutruk-Nahhunte I (± 1190-1155 BC) refers to *Dūr-Untaš on the Ḫithite*,<sup>142</sup> and since Dūr-Untaš is Chogha Zanbil, which is located very close to the modern course of the Dez, there can be little question about this. It follows, then, that the similarly named Idide, found in the inscriptions of Ashurbanipal (668-627 BC), and *Ḫudḫud*, found in contemporary letters, are also to be identified with the river Dez.

The identification of the Pasitigris with the Karun is certain as well. Diodorus tells us that the width of the Pasitigris *...in many places is three stades, and in some places even four ...*,<sup>143</sup> which is equivalent to 555 m and 740 m, respectively.<sup>144</sup> No other river in Khuzestan is so broad.

As to the earlier name of the Karun, there is no known Elamite hydronym that can be associated with it, even uncertainly. Because a major river such as the Karun must have been known by name in Babylonia (if not also in Assyria), the name of this river must be one of the hydronyms commonly mentioned in Akkadian texts referring to events transpiring in Elam or on the Babylonian-Elamite frontier. The only genuine candidates are the *Ulāya* and the *Uqnû*, but since, as we have seen, the name *Ulāya* refers to the ancient Karkheh, then the name *Uqnû* must refer to the ancient Karun.

When Ibn Baṭṭūṭa visited Shushtar in the fourteenth century, he observed that the inhabitants of the area called the Karun River the "Blue River" (*Nahr al-ʿAzraq*).<sup>145</sup> This is a

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(1842, 105), Layard (1846, 92), and Loftus (1857) already in the mid-nineteenth century AD; see also the discussion in Potts 1999, 30-32.

<sup>138</sup> Quintus Curtius I (trans. J.C. Rolfe) 1971 [1946], V.3.1; Diodorus Siculus VIII (trans. C.B. Welles), 1970 [1963], XVII.67.1.

<sup>139</sup> As also noted by MacDermot and Schippmann (1999, 287).

<sup>140</sup> Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.18-19.

<sup>141</sup> According to Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.18.3, the Coprates was a tributary of the Pasitigris, and it was about four plethra in width, or approximately 400 feet, and swift in current. These characteristics are consistent with those of the modern Dez.

<sup>142</sup> König 1965, 74-75 no. 20 v 9-11.

<sup>143</sup> Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.17.3.

<sup>144</sup> One (Attic) stade is equivalent to 184.98 m (or 0.18498 km); see Engel 1985.

<sup>145</sup> See Le Strange 1930, 235. It is interesting to note that the water of the ancient Karkheh must have been

compelling indication that the cuneiform graph used to represent the ancient hydronym (ÍD UG-*nu-ú*, UG-*né-e*, etc.) should be transcribed as ÍD *Uqnû* (“lapis lazuli,” “blue”), and therefore that the river was known in antiquity as the “Blue River” as well.<sup>146</sup>

### 3.5. THE IDENTIFICATION OF THE WATERCOURSE RESULTING FROM THE JUNCTION OF THE KARKHEH, DEZ, AND KARUN RIVERS

Long, Layard, and Loftus all recognized early on that the Eulaios must have joined the Coprates, which then joined the Pasitigris, and that downstream from the junction of the Eulaios/Coprates with the Pasitigris, the watercourse resulting from their junction could be called variously Eulaios (Eulaeus), Pasitigris, or even Choaspes.<sup>147</sup> As we have seen, the ancient Karkheh, Dez, and Karun rivers joined in a single river (see Figs. 67 and 71, meanders 1a), which would explain the alternative use of these names for the lower Karun and would also vindicate the views of Long, Layard, and Loftus.<sup>148</sup> It remains to be seen, however, whether or not the earlier hydronyms *Ulāya* (= Eulaios, Eulaeus) and *Uqnû* (= Pasitigris) can be reasonably associated with this course. We will take up the *Ulāya* first.

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greenish-gold in color. According to Pliny X (trans. D.E. Eichholz) 1971 [1962], XXXVII.56.156, a semi-precious stone of this hue, which was called ‘choaspitis,’ was said to have been named after the river Choaspes and to have been of a brilliant gold color mixed with green; see also Pliny I (trans. H. Rackham) 1979 [1938], I.37.56; and Isidore of Seville (trans. J. Oroz Reta, M.-A. Marcos Casquero) 1993, *Etymologiae* XVI.7.16: *Choaspitis a flumine Persarum dicta est, ex viridi fulgoris aurei*.

<sup>146</sup> *uqnû* = “lapis lazuli” and by extension “blue” (see W. von Soden, *Akkadisches Handwörterbuch*, sub *uqnû(m)*, “Lapislazuli, Lasurstein, Türkis”). The people of Mesopotamia used the word *uqnû* to specify the color blue, since the color words which they used to define the spectrum were ultimately based on semi-precious stones, such as lapis lazuli.

<sup>147</sup> Long 1842, 105; Layard 1846, 92; Loftus 1857, 127.

Among the passages in which these united streams are called either Eulaios or Eulaeus are Arrian II (trans. P.A. Brunt) 1983, VII.7.1-2, 6; and Pliny II (trans. H. Rackham) 1989 [1942], VI.31.138 (note that Rackham renders “Eulaeus” as “Karún” in his translation).

The united streams are once referred to as Choaspes; see Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129-130 (note that Rackham renders “Choaspes” as “Kerkhah” in his translation).

Among the passages in which this course is called Pasitigris (also once Tigris) are Arrian II (trans. P.A. Brunt) 1983, *Indica* 42.1-2, 4-5; Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.5; Pliny II (trans. H. Rackham) 1989 [1942], VI.31.134; and Pliny II (trans. H. Rackham) 1989 [1942], VI.26.99 (Tigris).

By the first century AD, the name Pasitigris was also used to designate the stream that finally entered the Gulf near Forat, a combination of the waters of the Tigris, Euphrates, and Eulaios/Pasitigris; see Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4; Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129-130; Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145.

<sup>148</sup> Kirkby 1977, 279. One should also note the following remarks by Rawlinson (1839, 90), which may reflect what was happening with river nomenclature in the earlier period: “[T]he united rivers of Dizfûl and Shuster are named *Dujeili-Ahwáz*; yet the eastern branch of the river frequently assumed the name of *Pasitigris*, or simply *Tigris*, and more frequently the united arms retained the title of *Eulaeus* in their southward course to the sea, precisely in the same way as the name of *Dujeil*, or *Diglah*, was usually applied, in the middle ages, to the eastern branch of the river as high as Shuster, and the title of *Kuran*, at the present day, continues to be given to the river after the confluence of the stream of Dizfûl, and as far even as the point of its disemboque in the Persian Gulf. This river, I must also notice, is stated by the Arabs to have been named by the old Persians *Dijlahi-Kúdak*, or the Little Tigris, and this was translated into Arabic by the diminutive form of *Dijlah*, *Dujeil*. With this indication, then, I have no difficulty in recognising in the Greek πασι the old Persian word *Pas*, signifying “low, inferior,” and in thus translating *Pasitigris*, like the Arabic *Dujeil*, “the inferior or little *Dijláh*.”

The most important texts dealing with the lower Ulāya are the inscriptions of Sennacherib (704-681 BC) recounting this king's 694 BC naval campaign against Chaldean exiles who had taken refuge in a settlement called Nagītu, which was said to have been located across the sea (= *tāmtu*<sup>149</sup> or *ÍD Marratu*,<sup>150</sup> "Salt-Sea"). The settlement in question, also called "Nagītu-the-turtle,"<sup>151</sup> was located on an island in the sea (*ša qabal tāmti*),<sup>152</sup> and therefore it was probably not unlike the settlements of the modern Marsh Arabs which are composed of reed dwellings gathered together to form floating islands in the deep and permanent marshes. Moreover, Nagītu was said to have been located on or near the bank of the Ulāya. In the most detailed account of Sennacherib's 694 BC campaign, we are told that the Assyrian king made offerings to the god Ea, king of the deep, at the mouth of the Euphrates,<sup>153</sup> which we have argued was located just northwest of Failaka Island. Sennacherib continues his account as follows :

*I had my ships make a speedy crossing over to Nagītu. At the shore of the fearful sea, which was unfit for riding and walking, exceedingly difficult ground, the people of Chaldea who lived at Nagītu and Nagītu-di'bina, the people of Hilmu, Pillatu, and Hupapānu, saw my warriors' ships and gathered together archers, wagons, horses, mules, a countless host, to oppose them. At the Ulāya, a river whose banks were good, the battle line was drawn up. Holding the elevated ground from my warriors they offered battle. My warriors reached the embankments (and) mooring places. From the boats to the riverbanks they swarmed towards them like locusts and defeated them.*<sup>154</sup>

Clearly the Ulāya flowed into the sea via an estuary near Nagītu, since after Sennacherib's ships had crossed the sea and landed at Nagītu, they fought a pitched battle with the Chaldeans along the river's banks, where they had moored. This is consistent with the location of the Eulaios in relation to the sea later in the first millennium BC. According to Pliny, it will be recalled, the sea extended to within a short distance of Spasinou Charax (modern Naisan), which he said was situated on the Eulaios<sup>155</sup> (see Figs. 66 and 71), while according to Arrian, Alexander is said to have

*...sailed down the river Eulaeus to the sea. Once he was near the estuary (τῆς ἐκβο-  
λῆς), he left most of his ships there including those which had been damaged, and with  
the faster sailers coasted himself by sea from the river Eulaeus to the mouths (τῶν  
ἐκβολῶν) of the Tigris, while the rest of his flotilla were brought back by the Eulaeus*

<sup>149</sup> E.g., Luckenbill 1924, 86 (Nebi Yunus Inscription H4): 19-21; possibly also Frahm 1997, 203 (T 172-173): 6'-13'.

<sup>150</sup> E.g., Luckenbill 1924, 78 (Bull Inscription F2): 28-30; 85 (Nebi Yunus Inscription H4): 6-10; and Grayson 1963, 90: 17-18.

<sup>151</sup> The Akkadian word in question is *raqqu*, "turtle," which is an apt image for an island. It is less likely that this word should be interpreted as the masculine singular adjective of *raqāqu*, "to be thin, shallow."

<sup>152</sup> Luckenbill 1924, 35 (OI Prism Inscription H2): 64-65; Heidel 1953, 142 (Iraq Museum Prism Inscription): 32-34; Frahm 1997, 200 (T 171 = DT 320): 4'.

<sup>153</sup> Luckenbill 1924, 74-75 (Bull Inscription F1): 79-80.

<sup>154</sup> Luckenbill 1924, 75 (Bull Inscription F1): 80-94.

<sup>155</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.138-139.

*as far as the canal cut between the Tigris and Eulaeus, by which they entered the Tigris.*<sup>156</sup>

The canal to which Arrian refers corresponds to the channel which begins about 30 km northeast of Naisan (see Figs. 66 and 71, bed 1a-1) and is a continuation of the meandering system labeled “1a” in Figs. 66 and 71.<sup>157</sup> Nearer to Ahwaz, the remains of this paleo-channel show typical scroll bars, a characteristic of old meanders; but the remains of the channel nearer to Naisan exhibit no such features, suggesting that the latter had been reactivated by man in a disused portion of the older Karun bed. The levee of the Karun – or the alluvial ridge of its paleo-channel<sup>158</sup> – formed a “barrier” between the freshwater swamps to the north and the extension of the sea to the south. The point where the artificial system departs from the larger meander system would be the mouth of the Eulaios/Pasitigris (see Figs. 66 and 71). We suggest that it was here that Alexander entered the sea on his voyage from Susa down the Eulaios to the mouths of the Tigris and thence upstream to Opis.

But returning to the seventh century BC, what, then, about the Uqnû? Everything that is said about this river in cuneiform texts during the Neo-Assyrian period is consistent with it being identified with the united streams of the Karkheh, Dez, and Karun rivers, the combination of which otherwise is called Ulāya, Eulaios, Eulaeus, or Pasitigris.<sup>159</sup> Inscriptions of Tiglath-pileser III (744-727 BC) state that the Uqnû, like the Ulāya, was located *along the shore of the Lower Sea*,<sup>160</sup> while inscriptions of Sargon II (721-705 BC) show that the Uqnû, like the Ulāya during the time of Sennacherib, served as a refuge for tribesmen from southern Babylonia because of the inaccessible reeds and canebrakes adjacent to the lower course of this river, which afforded them a secret refuge.<sup>161</sup> The Uqnû is not mentioned again after the reign of Sargon II.<sup>162</sup>

<sup>156</sup> Arrian II (trans. P.A. Brunt) 1983, VII.7.1-2.

<sup>157</sup> The channel in question is also illustrated in *Akkadica* 125/2, fig. 28-29 (but note that the inset square in fig. 29 top, which is meant to indicate the area shown in fig. 29 bottom, is incorrectly placed and wrongly sized). See also *Akkadica* 125/2, fig. 32.

<sup>158</sup> See *Akkadica* 125/2, fig. 29. This geomorphological feature is still visible on satellite images from the early 1990s, which show that the water of the Hawr al-Hawiza, expanded for military purposes, was stopped by it.

<sup>159</sup> This united streams are also once called Choaspes, and once Tigris.

<sup>160</sup> *a-aḥ/GÚ tâmti šaplīti*; see Tadmor 1994, 122 (Summ. 1): 6; and 160 (Summ. 7): 9. Note that Fuchs (1994, 466-467, map on p. 400) and Potts (2005, 167) identify the Uqnû with the modern eastern branch of the Tigris. However, this identification does not account for the inscriptions of Tiglath-pileser III that state that this river was located *along the shore of the Lower Sea*. Compare also Tadmor 1994, 130 (Summ. 2): 8-9; and 194 (Summ. 11): 8. According to Brinkman (1968, 242 n. 1551), passages such as these *...would seem to indicate that the swamps at the mouth of the Uknû were sometimes considered as an extension of the Lower Sea*.

<sup>161</sup> E.g., Fuchs 1994, 140 (Ann.): 273; 146: 282; and 148-149: 289-290.

<sup>162</sup> Smith (1921, 58: 14), and after him Luckenbill (1924, 49: 14), restore Uqnû in a broken passage of the Sennacherib cylinder BM 113203 describing the abode of the Hîndaru, Puqûdu, and other Aramean tribes. But as Brinkman (1968, 269 n. 1732) points out, this restoration *...is probably wrong, since Sargon specifically states that in the year 710 the Puqudu and Hindaru fled at his approach from their own locale to the Uknû – which would lead us to conclude that the two regions were distinct*. For a recent, still conjectural proposal to restore the hydronyms in lines 12-14 of this Sennacherib cylinder, see Frahm 1997, 44.

### 3.6. THE PROBLEM OF THE EASTERN BRANCH OF THE LOWER TIGRIS, THE SURAPPI, AND THE TUPLIAŞ RIVERS

Archaeological and textual data bearing on the eastern branch of the Lower Tigris in antiquity are sparse, and although Classical Arabic geographers describe the region in question, our only window on these sources for the time being is the secondary treatment of Le Strange (1930). Therefore, because the basic data are either missing or inaccessible to the non-Arabist, especially for the period under study, the treatment we are about to present should be regarded as nothing more than a preliminary approach to the problem.<sup>163</sup>

We know that the present channel of the Tigris from Kut through al-Amara to al-Qurna was occupied by the river in Sasanian times.<sup>164</sup> We also know that the floods of the early seventh century AD, especially the devastating flood of 628/29, coupled with neglect of the dikes, led to the breach of these dikes and the formation of the branch of the Tigris along which Wasit, the administrative and political capital of Iraq under the first Marwanids, would be founded some seven decades later (see Fig. 65).<sup>165</sup> This branch of the Tigris was operative for the next thousand years but gradually diminished in importance. When Tavernier traveled through the region in 1652, it was no longer navigable.<sup>166</sup> On the other hand, the eastern arm of the river became operative again sometime after the ninth century,<sup>167</sup> and by 1581 it was said to have been navigable.<sup>168</sup> Since at least the late sixteenth century AD, the Tigris has kept most consistently to this eastern bed through al-Amara.

Although the river has preferred its eastern bed for the last four centuries, there were still periodic, unregulated shifts of flow to more westerly channels – especially to the Shatt al-Gharraf (also known as the Shatt al-Ḥayy)<sup>169</sup> – prior to the construction seventy years ago of the regulator at Kut. In the early nineteenth century, Claudius James Rich, the East India Company's Resident at Baghdad, recorded a shift to the Shatt al-Ḥayy in his journal. In March of 1821, he sailed down the Tigris from Baghdad to Basra and noted upon reaching Kut that “...the Hye was impracticable, on account of the shallowness of the water.” Eleven months later, however, on another voyage to Basra, he found that “...the Hye was full,” and that “...the current was running from the Tigris to the Euphrates.”<sup>170</sup>

But did the Tigris begin to occupy its eastern bed prior to the Sasanian period? And if so, how long before? There are no definitive answers to these questions. However, two texts

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<sup>163</sup> Carrie Hritz will investigate settlement patterns in the area north of modern Basra, along the Shatt al-Arab and the modern Tigris up to al-Amara. She has already identified a number of sites along these waterways, but her work is still at a preliminary stage.

<sup>164</sup> See Le Strange 1930, 27.

<sup>165</sup> Sakly 2002, 165.

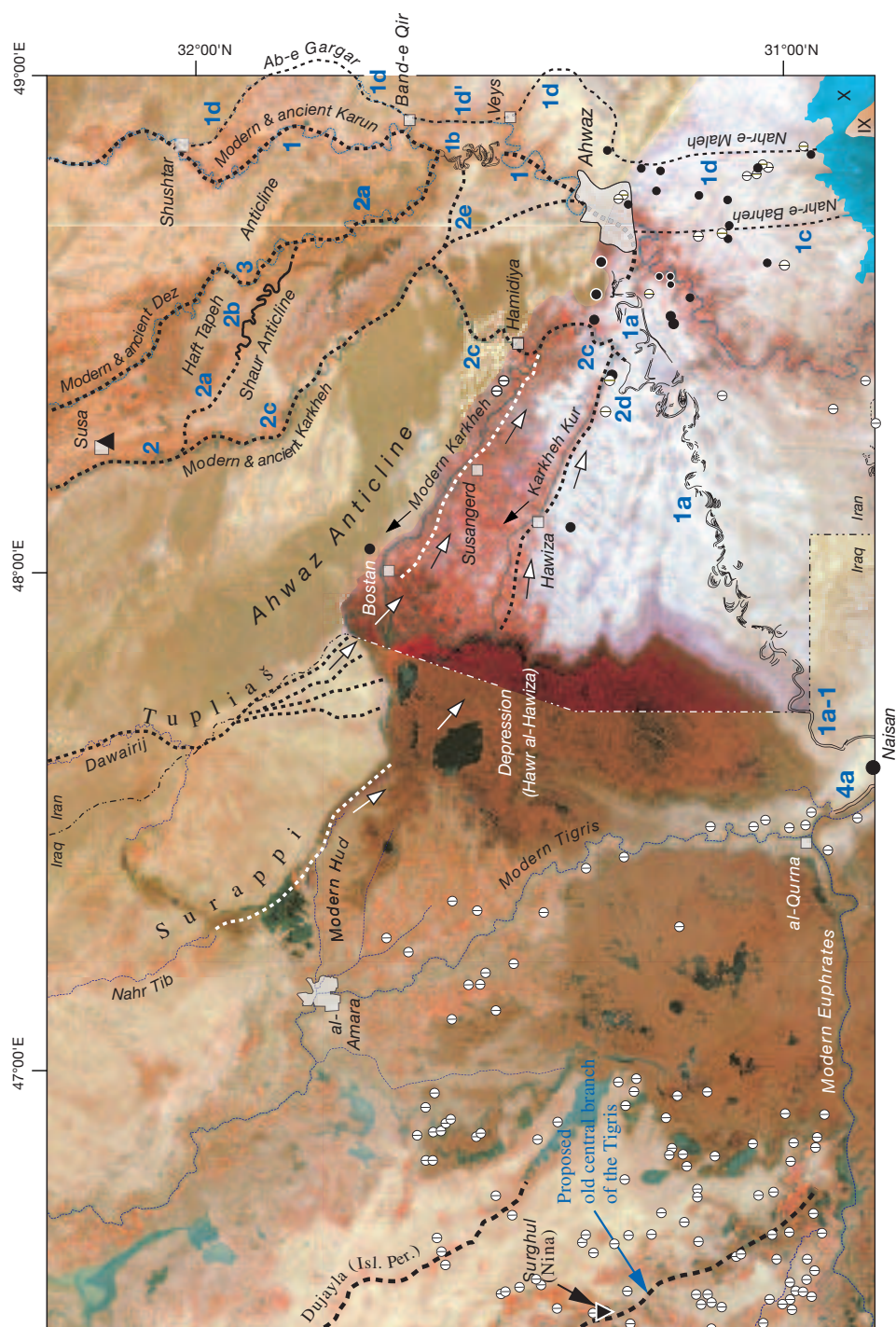
<sup>166</sup> Le Strange 1930, 28-29.

<sup>167</sup> This is according to Ibn Ruṣṭah; see Le Strange 1930, 28.

<sup>168</sup> This is according to John Newberie, who in 1581 traveled by boat from Baghdad to Basra via al-Qurna; see Le Strange 1930, 28.

<sup>169</sup> The Shatt al-Gharraf (Shatt al-Ḥayy) struck off southwards from Kut.

<sup>170</sup> Rich 1839, vol. 2, 388 and 401.



Legend of Fig. 71

	Modern city, town		Settlement more recent than
	Settlement founded in Hellenistic, Parthian and/or Elymaean times		Settlement(s) not dated or periods uncertain
	Settlement older than		Pre-Hellenistic settlement
	Settlement older than but with Hellenistic, Parthian and/or Elymaean occupation		Modern topo-/hydronym
			Ancient topo-/hydronym
			Modern boundary
			"Depositional lobe" = Geom. Unit IX (see fig. 65) ( <i>Akkadica</i> 125, fig. 17, p. 174-177)
			Modern Shahdegan marshes during the rainy season = Geom. Unit X ( <i>ibid.</i> , p. 177 and fig. 4A)

Fig. 71. Excerpt of Fig. 65 showing the area of the Surappi and Tupliaš rivers in relation to the ancient Karun/Karkheh complex. The black arrows next to "Modern Karkheh" and "Karkheh Kur" show the direction of modern flow. The white arrows indicate the direction of flow of the proposed courses of the ancient Surappi and Tupliaš. The whitish area shows the surface covered by the Lower Khuzestan Project.



from the archive of the Murašû family (ca. 454-414 BC) state that Larak, one of the ante-diluvian cities of Sumer, was located on the bank of “old Tigris,”<sup>171</sup> indicating that the river had indeed shifted by this time to a newer branch, either wholly or in part. This “old Tigris” is almost certainly to be identified with the enormous levee of the Shatt al-Gharraf upon which the ancient Sumerian cities of Lagash, Girsu, and Nina were situated (see Fig. 65),<sup>172</sup> and therefore the new branch of the Tigris, the existence of which is implied in these documents, may well have flowed along the bed of the later Dujayla, on the banks of which Wasit stood,<sup>173</sup> or even along the eastern bed through al-Amara and al-Qurna. Numerous settlements have been identified along both these beds (see Fig. 71), but especially along the eastern arm between al-Amara and al-Qurna. Unfortunately, these settlements are all undated.<sup>174</sup>

The identification of the ancient hydronyms Surappi and Tupliaš poses a number of difficulties, primarily due to the scantiness of documentary evidence. Nevertheless, we will venture some tentative proposals based on this evidence and on more recent hydrological configurations in the region that stretches from the Lower Tigris across the Hawr al-Hawiza marshes to the Ahwaz anticline in Iran.

We know that the Surappi was a major watercourse because it is nearly always mentioned alongside the Tigris and the Uqnû, and even the Euphrates, in constructions such as *...all the Arameans who are along the Tigris (and) Surappi, as far as the Uqnû*<sup>175</sup> or *...all the Arameans who are along the Tigris, Euphrates, and Surappi, as far as the Uqnû, which*

<sup>171</sup> The texts in question are BE 10 36 : 8 (= Clay 1904, pl. 21) and PBS 2/1 181 : 5-7 (= Clay 1912, pl. 92). Documentary evidence about Larak seems to point to a location somewhere north of Umma and east of Isin and Nippur, in the vicinity of the Shatt al-Gharraf; see Poebel 1914, 43, and Postgate 1976, 82.

<sup>172</sup> See Appendix II : Excursus on the Ancient Tigris.

<sup>173</sup> Sakly 2002, 165.

<sup>174</sup> The reader should note, however, that Fuad Safar (1964, 11 n. 7) suggested that Spasinou Charax might be identified with a site called Tell Pran (or Imm Pran) located along the bank of the Tigris some 70 km north of al-Qurna (see also *Akkadica* 126/1, p. 33 n. 51). His proposal was based at least in part on the discovery on the site of silver coins minted during the reign of Attambelos III (54-74 AD), which would point to an occupation during the Parthian period, which in turn would indicate that the Tigris was flowing along the eastern bed between al-Amara and al-Qurna by the beginning of the Christian Era.

<sup>175</sup> Tadmor 1994, 122 (Summ. 1) : 5-6, etc.

1 :	Proposed ancient course of the Karun North of the junction with 2a (Uqnû/Pasitigris)	2a :	Proposed ancient northern branch of the Karkheh (Ulā/Ulāya/Eulaios/Eulaeus)
1a :	Ancient meanders of the Karun WSW of Ahwaz (Uqnû/Pasitigris & Ulā/Ulāya/Eulaios/Eulaeus/Choaspes)	2b :	Ancient meanders of the Karkheh associated with 2a
1a-1 :	Proposed reactivated bed of the ancient Karun leading to the Tigris (Pasitigris/Eulaios/Eulaeus/Choaspes)	2c :	Proposed ancient southern branch of the Karkheh (Choaspes)
1b :	Ancient meanders of the Karun North of Ahwaz (Uqnû/Pasitigris & Ulā/Ulāya/Eulaios/Eulaeus)	2d :	Ancient meanders of the Karkheh associated with 2c (Choaspes)
1c :	Ancient canal (or escape) from the Karun (= Nahr-e Bahreh)	2e :	Possible ancient watercourse associated with 2c
1d :	Ancient canal (or escape) from the Karun (= Ab-e Gargar [North]; Nahr-e Maleh [South])	3 :	Ancient (& modern) course of the Dez (Hithite/Idide/Hudhud/Coprates)
2 :	Proposed ancient course of the Karkheh (Ulā/Ulāya/Eulaios/Eulaeus/Choaspes)	4a :	Ancient remnants of the Tigris West of Naisan (at least during the 4th century BC)

is along the shore of the Lower Sea.<sup>176</sup> The Surappi is most often mentioned in the same passage as the Tigris and the Uqnû,<sup>177</sup> and it is also found immediately between these two hydronyms.<sup>178</sup> One indicator of the location of the Surappi is a passage from Sargon's annals, wherein it is said that the inhabitants of the town of Dūr-Aṭḥara<sup>179</sup> cut a channel from the Surappi to surround the town with floodwaters when they came under threat of attack by Assyrian forces.<sup>180</sup> The Assyrians eventually took the town, and the inhabitants who escaped capture fled to the marshes of the Uqnû to hide.<sup>181</sup> Presumably these marshes were not too far distant.<sup>182</sup>

The Tupliaš is also associated with the Uqnû. According to Sargon's annals: *...the people of Ru'ua, Hindaru, Yadbūru, and Puqūdu heard about the conquest of Gambūlu and fled in the night, seeking refuge by the Uqnû. With a mound of earth and reeds I dammed the Tupliaš River, upon which they rely. I established two fortresses, opposite each other, causing them extreme deprivation, and as a result they came forth from the Uqnû ...*<sup>183</sup> Since Sargon was at this time marching from Dūr-Aṭḥara (where the inhabitants had cut a canal from the Surappi to flood the environs of the town), one imagines that he was moving from Dūr-Aṭḥara along the Surappi, and then along the Tupliaš towards the Uqnû. At Sargon's approach the local tribes fled from the Tupliaš to the Uqnû. At some point along the course of the Tupliaš, Sargon dammed the river and forced the tribesmen to capitulate.

It is clear from the evidence presented above that we should look for both rivers (that is, the Surappi and the Tupliaš) in the region between the Tigris and the Uqnû. It is also clear that the rivers in question either joined the lowermost course of the Uqnû or terminated in the nearby marshes. The only viable candidates are the modern Nahr Tib (called Mehmeh

<sup>176</sup> Tadmor 1994, 160 (Summ. 7): 9, etc.

<sup>177</sup> Tadmor 1994, 130 (Summ. 2): 7-9; 160 (Summ. 7): 9; and 194 (Summ. 11): 7-8.

<sup>178</sup> Tadmor 1994, 122 (Summ. 1): 5-6; Fuchs 1994, 77 (Saal XIV): 23-24; and 250 (S1): 13-14; see also Fuchs 1994, 252 (S2): 10-11; 256 (S3): 13-14; and compare also 273 (S5): 19-20. The Surappi and Uqnû (without Tigris) are mentioned together in Fuchs 1994, 195 (Prunkinschrift): 18-19: *...the people of Itu'u, Rubu'u, Ḥatallu, Labdūdu, Ḥamrānu, Ubūlu, Ru'ua, Litā'u who are along the Surappi (and) the Uqnû ...*; see also Fuchs 1994, 265 (S4): 71-75.

<sup>179</sup> The location of Dūr-Aṭḥara is unknown, but we know that it was a principal town of Gambūlu, a tribal region that was probably centered around the later town of Wasit and extended eastward across the Nahr Tib and southeastward to the Uqnû; see Brinkman 1984, 13 and n. 48; also Streck 1906, 20. The distribution of the Beni Lam tribe in the nineteenth century was remarkably similar; see Layard 1846, 45-47. For a summary of the population groups inhabiting the Elamite-Babylonian frontier region between 750 and 625 BC, see Brinkman 1986.

<sup>180</sup> Fuchs 1994, 139 (Ann.): 270-271: *They cut a canal from the Surappi and surrounded the environs of that town (Dūr-Aṭḥara) as if at high flood.*

<sup>181</sup> Fuchs 1994, 140 (Ann.): 272-274.

<sup>182</sup> Streck (1906, 3), followed by Forrer (1920, 97), identified the Surappi as the modern eastern branch of the Tigris; while Schiffer (1911, 119) suggested that the Surappi was a canal that connected the Tigris with the Uqnû; see Brinkman 1968, 269 n. 1731; also Zadok 1985, 65 and n. 230. While there is evidence of the existence of an ancient canal between the point where the fossil meanders of the Karun end and a point just south of Naisan, near the Shatt al-Arab (see Figs. 66 and 71, course 1a-1), it is unlikely that this is the Surappi, which should rather be a major watercourse on par with the Tigris and the Uqnû, as stated above. On the question of the Tigris system, see the excursus in Appendix II.

<sup>183</sup> Fuchs 1994, 146 (Ann.): 281-284).

in Iran) and the modern Dawairij (see Fig. 71). We propose to identify the Surappi with the Nahr Tib and the Tupliaš with the Dawairij.

The modern Dawairij takes a sharp turn to the west after passing through the Ahwaz anticline and then joins the Nahr Tib, with the combined rivers finally emptying into the Hawr al-Hawiza southeast of al-Amara. But this is a relatively recent configuration. Earlier, the Nahr Tib and Dawairij continued southeastward toward modern Ahwaz (see Fig. 71). In the case of the Dawairij, satellite imagery shows a number of dry river beds fanning out from the point where the river emerges from the anticline, including several which follow a south-southeasterly direction along the base of the anticline, one of which was used by the Turco-Persian Frontier Commission to demarcate the modern Iran-Iraq border over a distance of some 40 km.<sup>184</sup> This bed lines up with lowermost course of the modern Karkheh, just as the course of the Nahr Tib lines up with the course of the modern Karkheh Kur.<sup>185</sup>

The modern system, however, flows in the opposite direction, from southeast to northwest.<sup>186</sup> This is also a relatively recent configuration. We know, for example, that during the Middle Ages, the Karkheh is said to have received two affluents coming down from the province of Hawiza,<sup>187</sup> which means that the same system was flowing from northwest to southeast during the medieval era, and probably before it as well.<sup>188</sup> This inversion of the slope of the plain between the medieval and modern periods can be attributed to the occurrence of significant tectonic activity near the Ahwaz anticline, which is, after all, located in an area of considerable geological complexity, being situated precisely where the Arabian Plate plunges under the Eurasian Plate (see *Akkadica* 125/2, fig. 7).

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<sup>184</sup> C.H.D. Ryder, one of the Turco-Persian Frontier Commissioners, reported that after the demarcation party had left the Karkheh and had struck the Hawr al-Hawiza marshes, ...*The frontier now had to follow an old river-bed, the Shatt al 'Ama, which sounded easy enough, but the problem was to find it, for there were many. After following several which petered out, we at last got on to one which answered the purpose, and although the morning had begun with much disputation, the Persians wanting us to search farther west and the Turks farther east, the heat coupled with the obvious fact that the ground, a howling desert devoid of water and vegetation, was valueless, led all parties to an agreement, and to our great relief after a long two days we finally reached the Duwairij river...*; see Ryder 1925, 230.

<sup>185</sup> Although we are not qualified to address the interpretation of the sedimentological data by the geomorphological team associated with the Lower Khuzestan Project during our 2004 surveys, we are not inclined to accept their premature attribution of the analyzed sediments to ancient deposits of the Karkheh alone (see, e.g., *Akkadica* 125/2, pp. 201-202), since this was an area traversed by other rivers as well.

<sup>186</sup> The modern Karkheh and Karkheh Kur present, respectively, a difference in elevation of 10 and 7 m from the point of their departure near the modern town of Hamidiya to the point of their entry into the Hawr al-Hawiza, a distance of some 50,000 m (i.e., a slope of 2 cm/km and 1.4 cm/km, respectively).

<sup>187</sup> See Le Strange 1930, 241 and Map II after p. 24. The Karkheh Kur was formerly called the Shatt-e Nisan, which indicates that the water of this river once flowed in the direction of Naisan via, in turn, the southern branch of the Karkheh and the old channel of the Karun (see Fig. 71, branch 2c + meanders 2d and 1a, and compare the remarks in *Akkadica* 126/1, p. 20 and n. 23).

<sup>188</sup> Again, Carrie Hritz will be examining the settlement patterns in the region of these two rivers, after they cross the Ahwaz anticline.

### 3.7. THE IDENTIFICATION OF THE ZOHREH RIVER, THE JARRAHI RIVER, AND THE KHAWR MUSA

The Zohreh River is located in the southeastern corner of Khuzestan and enters the Gulf approximately 25 km southwest of the town of Hendijan (see Fig. 72). Greek and Roman authors knew the Zohreh as the Oroatis (but they also called it Oratis<sup>189</sup> or Zarotis<sup>190</sup>). Strabo tells us that the Oroatis marked the termination of the Persian seaboard when coming from the direction of Hormuz, along the coast of Carmania.<sup>191</sup> Ptolemy states explicitly that the Oroatis formed the boundary between Susiana and Persia,<sup>192</sup> while Pliny tells us that Persia began at the Oroatis, and that this river separated Persia from Elymais.<sup>193</sup> From these accounts there can be little doubt that the Zohreh was the ancient Oroatis. In addition, Arrian, relying on the now-lost account of Nearchus, informs us that Alexander's fleet commander began his exploration of the coast of Susiana<sup>194</sup> at the mouth of a river that is said to have been on the Persian border.<sup>195</sup> Based on the information provided by Strabo, Ptolemy, and Pliny, there can be no question that the river to which Arrian refers is the Oroatis. This hydronym is first mentioned in the writings of Strabo, who, however, based his account on the observations of Nearchus.

The Jarrahi is also one of the perennial rivers of Khuzestan. It enters the Lower Khuzestan plain through a gap between the Marun and Agha Jari anticlines some 20 km north-east of the town of Ramshir (see Fig. 72). It is traditionally identified with the ancient Hedyphon, which is mentioned by both Strabo and Pliny.<sup>196</sup> The identification of the Jarrahi as the Hedyphon was first proposed by Rawlinson.<sup>197</sup> As Layard aptly put it:

*The rivers which actually flow into the northern part of the Persian Gulf are, besides the Euphrates, the Kárún, the Jerráhi, and the Zohreh, or river of Hindián. The last has been generally assumed to be the Oroatis. If, then, the Kárún were supposed to be the Eulaeus and Pasitigris, the Jerráhi would have no representative in the lower part of its course, unless it be the Hedyphon ...*<sup>198</sup>

Finally, there is a river in ancient Susiana called Mosaeus by both Ptolemy<sup>199</sup> and Ammianus Marcellinus.<sup>200</sup> It is unclear where this river should be located. Layard reasoned

<sup>189</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.28.111 (note that Rackham renders "Oratis" as "Tab" in his translation); Pliny II (trans. H. Rackham) 1989 [1942], VI.31.136.

<sup>190</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.26.99.

<sup>191</sup> According to Strabo, the Persian seaboard is ...*burning hot, sandy, and stinted of fruits except dates (its length is reckoned at about forty-four, or forty-three, hundred stadia, and it terminates at the largest of the rivers in that part of the world, the Oroatis ...*; see Strabo VII (trans. H.L. Jones), 1983 [1930]: XV.3.1.

<sup>192</sup> Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1 (description of Susiana); VI.4.1 (description of Persia).

<sup>193</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.28.111; compare VI.31.136. See also the discussion in Alizadeh 1985.

<sup>194</sup> Both Arrian and Ptolemy considered the coast of the northern Gulf to belong to "Susiana." Strabo, on the other hand, considered it to belong to "Persis," stating that ...*the coast of Persis is covered with shoal-waters and that it ends at the Euphrates River ...*; see Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.5.

<sup>195</sup> Arrian II (trans. P.A. Brunt) 1983, *Indica* 40.8-11.

<sup>196</sup> Strabo VII (trans. H.L. Jones) 1983 [1930], XVI.1.18; Pliny II (trans. H. Rackham) 1989 [1942], VI.31.135.

<sup>197</sup> Rawlinson 1839, 85.

<sup>198</sup> Layard 1846, 91.

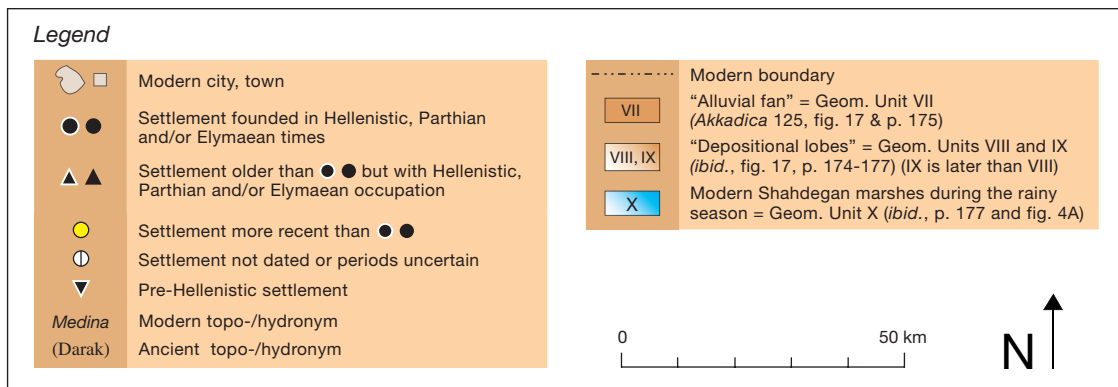
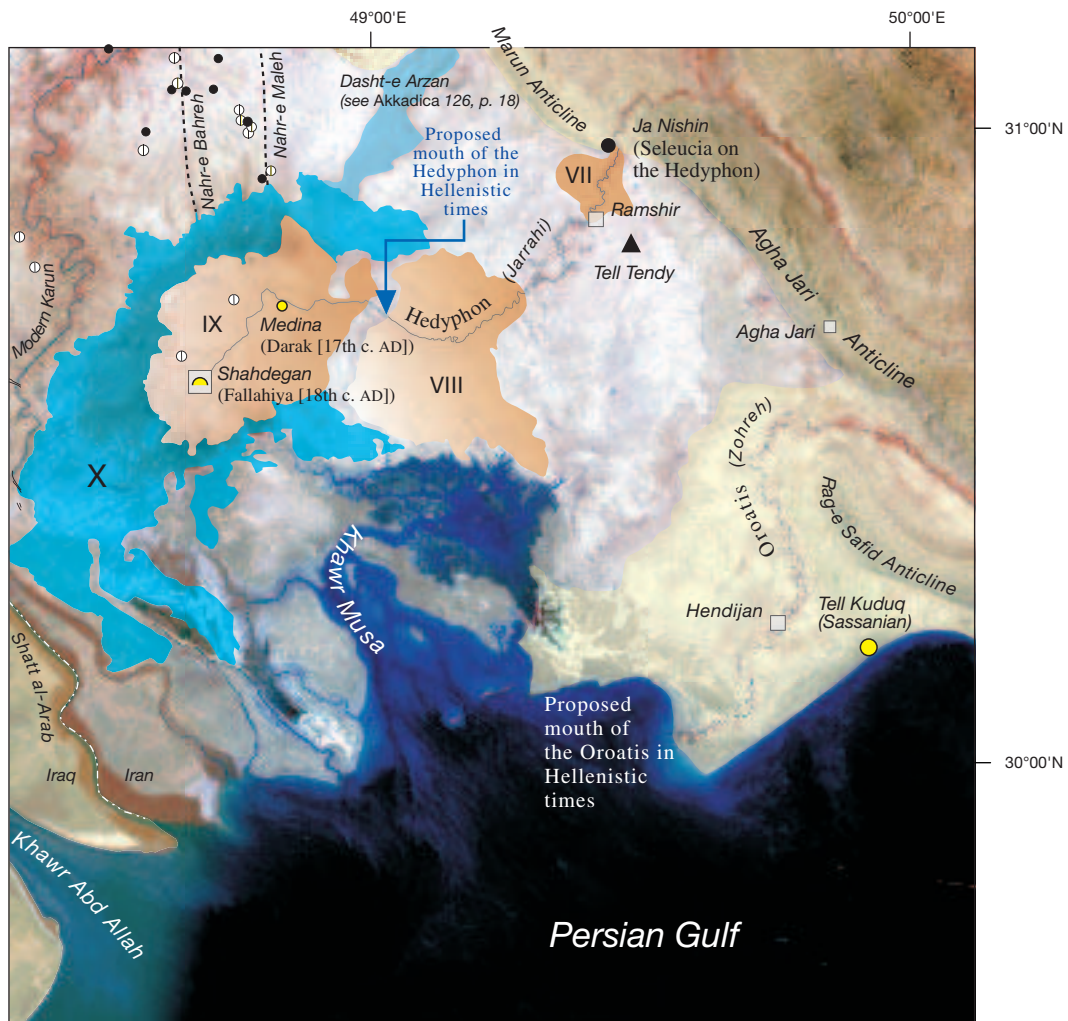


Fig. 72. Excerpt of Fig. 65 showing the region of the Hedyphon and Oroatis rivers, and the Khawr Musa. The light-shaded area indicates the southeastern part of the Lower Khuzestan Project area.

<sup>199</sup> Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.2.

<sup>200</sup> Ammianus Marcellinus II (trans. J.C. Rolfe) 1972 [1940], XXIII.6.26.

that the name Mosaeus might still survive in the modern name *Khór Músa* (= Khawr Musa), which, in our opinion, is one of the former mouths of the united streams of the Tigris and Euphrates rivers situated in the vicinity of modern Bandar-e Imam Khomeini.<sup>201</sup>

### 3.8. THE NORTHERN SHORELINE OF THE GULF AND THE CHALDEAN LAKE REGION

The most important sources bearing on the historical geography of the northern Gulf and nearby lake region in the period under study are the account of Nearchus' voyage along the coast of Susiana in 324 BC and the account of Alexander's subsequent voyage from Susa to Opis later in the same year. Also important are Sennacherib's account of his naval campaign in 694 BC and the eighth-century BC Babylonian "Map of the World." We will see that these texts from the eighth-seventh centuries BC present an image of the region's geography that is remarkably consistent with the picture evoked by later Classical accounts originating in the time of Alexander the Great. Other textual sources that deal with the configuration of the coastline and the mouths of the rivers during the period under consideration are the *Geography* of Claudius Ptolemaeus (fl. second century AD)<sup>202</sup> and the works of his imitators.<sup>203</sup> Because these accounts are somewhat confused for our area, however, they will be used cautiously and sparingly.<sup>204</sup>

Locating the mouths of the rivers is key to reconstructing the position of the head of the Gulf and delineating the region of lakes that characterized the lower reaches of the rivers of Babylonia and Susiana. Knowing that there was a single mouth for the Karkheh and Karun rivers during the first millennium BC, and knowing that the Euphrates emptied into the Gulf just northwest of Failaka Island until at least sometime in the third-first centuries BC, allows us to harmonize the great bulk of the documentary evidence on the position of the mouths of the rivers, which according to F.H. Weissbach is the most difficult problem in the historical geography of Mesopotamia.<sup>205</sup>

#### 3.8.1. The Voyage of Nearchus Along the Coastline of the Northern Gulf in 324 BC and the Voyage of Alexander from Susa to Opis Later in the Same Year

The most important documentary source bearing on the location of the mouths of the rivers in the first millennium BC is the account of the voyage of Nearchus, and the key to understanding the itinerary of his voyage is the commission given to him by Alexander, namely, to explore the coast of the Persian Gulf:

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<sup>201</sup> Layard (1846, 91) proposed to identify *Khór Músa* with an old mouth of the Karun.

<sup>202</sup> See the description of the coast of Susiana in Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1-2.

<sup>203</sup> Including Ammianus Marcellinus and Marcianus of Heraclea.

<sup>204</sup> Although Ptolemy's lists locate places by their geographical coordinates, it is clear that these coordinates did not all come from immediate observation but were worked out from whatever information was available, such as accounts of journeys giving distances from one place to another. This means that their appearance of great accuracy is often spurious. Ptolemy used data from most of his predecessors, particularly Marinus of Tyre.

<sup>205</sup> Weissbach 1909, 1203-1204.

*Nearchus says that ... he had to report to Alexander on the commission for which he had been despatched, that in fact he had not been sent to navigate the Ocean, but to reconnoitre the coast lying on the Ocean, the inhabitants of the coast, its anchorages, water supplies and the manners and customs of the people ...*<sup>206</sup>

Given this charge, it must be assumed that Nearchus was primarily interested in locating the rivers that ran into the Gulf, as they were almost the only sources of fresh water in the region, and they also served as avenues of communication with inland cities such as Susa, Opis, and Babylon. If so, the distances cited by Arrian for the individual stages in Nearchus' voyage would each correspond to the distance from one river mouth to another. Using this as our working hypothesis, we will see that the distances cited by Nearchus correspond remarkably well with the modern distances between topographical points that we can identify with reasonable certainty as ancient river mouths.

The most detailed account of Nearchus' voyage along the northern coastline of the Gulf is found in a work known as *Indica*, from which Arrian quotes extensively, and whom we, in turn, will also quote (see Arrian II [trans. P.A. Brunt] 1983, *Indica* 40.8 – 42.7). Bearing in mind that one Attic stade is equivalent to 0.185 km,<sup>207</sup> Arrian tells us that after the fleet of Nearchus reached the mouth of the river marking the Persian border:<sup>208</sup>

*(Ind. 40.8) From here the fleet passed along the Susian land. (Ind. 40.9) Nearchus says that he cannot describe this part of the voyage in accurate detail, except for the roadsteads and the length of the voyage. (Ind. 40.10) This is because the country is mostly marshy and runs out well into the sea, with breakers, and is very hard to get safe anchorage in. So their voyage was mostly in the open sea. (Ind. 40.11) They sailed out from the outlets of the river (= Oroatis) where they had encamped on the Persian border, and took on board water for five days, as the pilots said that water was lacking. (Ind. 41.1) After traversing 500 stades, they anchored at the mouth of a lake, full of fish, called Cataderbis, off which lay a small island called Margastana.*

Therefore, after Nearchus sailed from India and reached the northern end of the Gulf, he sailed 500 stades in a north-northwesterly direction from the mouth of the Oroatis, on the border of Persia, to the mouth of the Hedyphon, where this river emptied into Lake Cataderbis. 500 stades corresponds to 92.5 km, which is the distance from the mouth of the modern Zohreh (= Oroatis) to the western limit of "depositional lobe" VIII in Fig. 73, located east of the modern town of Shahdegan.<sup>209</sup> We suggest that it was here that the Hedyphon emptied

<sup>206</sup> Arrian II (trans. P.A. Brunt) 1983, VII.20.9-10.

<sup>207</sup> More accurately, one Attic stade is equivalent to 184.98 m (or 0.18498 km); see Engel 1985.

<sup>208</sup> The river in question must be the Oroatis, which Strabo, Ptolemy, and Pliny all state marked the Persian border; see Strabo VII (trans. H.L. Jones), 1983 [1930]: XV.3.1; Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1 (description of Susiana); VI.4.1 (description of Persia); and Pliny II (trans. H. Rackham) 1989 [1942], VI.28.111; compare VI.31.136.

<sup>209</sup> "Depositional lobe" VIII is Geomorphological Unit No. VIII of Baeteman *et al.* (see *Akkadica* 125/2, pp. 175-177 and fig. 17 [note that in their fig. 22 this same Unit is numbered "II"]). According to Baeteman *et al.*, "depositional lobe" VIII is older than "depositional lobe" IX. It must be noted, however, that only a handful of settlements are known to be on "depositional lobe" IX, including the town of Medina, founded

into ancient Lake Cataderbis, which may have filled the large depression that is today occupied by the great Shahdegan marshes. Arrian continues ...

*(Ind. 41.2) From there, they sailed about daybreak and in a single line ahead passed the shallows, which were marked on either side by poles driven in ... (Ind. 41.3) ...here there is mud on both sides of the channel, both deep and viscous; and no device could save them once aground there, (Ind. 41.4) as the punt-poles sank into the mud and gave them no help, and it became impossible for the men to disembark and push the ships off into the sailable water, for they sank up to their breasts in the ooze. (Ind. 41.5) So they sailed out with difficulty, traversed 600 stades, and after anchoring attended to supper on board, each in their own ships.*

In other words, from the mouth of the Hedyphon, Nearchus sailed 600 stades in a west-northwesterly direction to the mouth of the Pasitigris. 600 stades corresponds to 111 km, which is close to the distance between the western limit of “depositional lobe” VIII (mentioned above) and the point where the ancient meanders of the Karun (= Eulaios/Pasitigris) terminate (see Fig. 73), marking what we believe to be the mouth of the Eulaios/Pasitigris at this time. Arrian then tells us that ...

*(Ind. 41.6) During the night, however, they were sailing in deep water and next day also till the evening; they made 900 stades and anchored in the mouth of the Euphrates near a village of Babylonia called Diridotis; (Ind. 41.7) here the merchants gather together frankincense from the land of Gerrha and all the other sweet-smelling spices Arabia produces. (Ind. 41.8) Nearchus says it is a voyage of about 3300 stades from the mouth of the Euphrates to Babylon.*

Therefore, after reaching the mouth of the Eulaios/Pasitigris, Nearchus changed direction and sailed 900 stades in a south-southeasterly direction to the mouth of the Euphrates. Perhaps he sailed no further north at this time because a physical boundary, i.e., the old Karun levee, obstructed the way, so he turned around to sail to the mouth of the Euphrates (see Fig. 73). It turns out that 900 stades corresponds closely to the distance between the termination of the fossil meanders of the Karun (= the mouth of the Eulaios/Pasitigris) and the coast at Khawr Sabiya, just northwest of Failaka. In addition, we are told that it was a voyage of about 3300 stades from the mouth of the Euphrates to Babylon. This corresponds to 610.5 km, which is close to the distance today between the coast at Khawr Sabiya and Babylon if one follows, first, the now-disused Khawr Zubair, then a reconstructed course of the westernmost branch

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during the seventeenth century AD, and the town of Fallahiya, or Shahdegan, founded downstream on the Jarrahi about one century later (Carrie Hritz seems to have identified one or more) (see Hansman 1978, 155-156; see also *Akkadica* 126/1, p. 37, and Fig. 73 above). This indicates that “depositional lobe” IX was deposited by the Jarrahi River only a few centuries before the seventeenth century AD. Moreover, there are no archaeological sites in “depositional lobe” VIII.



of the Euphrates, and finally the Arahtu.<sup>210</sup> From this cited distance of 3300 stades from the mouth of the Euphrates to Babylon, it is clear that Nearchus visited the mouth of the Euphrates at Khawr Sabiya and not some other mouth further north, where, for instance, the Euphrates may have entered the lake region. This is also clear from the reference to the nearby village of Diridotis, which is otherwise called Teredon, and which Strabo located at the outlet of the Euphrates<sup>211</sup> not far from the island of Icarus (see Fig. 69).<sup>212</sup> We will see below that this is probably also the general location of the earlier settlement of Bāb-salīmēti. It was from this town, at the mouth of the Euphrates, that Sennacherib sailed across the sea to Nagītu, which was situated along the bank of the Ulāya River. Arrian continues ...

(Ind. 42.1) *There they heard that Alexander was on his way to Susa. They therefore sailed back themselves in order to sail up the Pasitigris and meet him.* (Ind. 42.2) *They sailed back with the land of Susia on their left and went along the lake into which the Tigris runs ...*

Therefore, while anchored at the mouth of the Euphrates, Nearchus heard that Alexander was approaching Susa and sailed off to meet him. But instead of proceeding straight back to the mouth of the Eulaios/Pasitigris in order to go upstream from there to Susa, he must have decided to explore the route by which the fleet could eventually sail to Opis via the Tigris (as actually happened a few months later), since he had a commission from Alexander to reconnoiter the routes and anchorages. The text says that he and his men sailed back from the mouth of the Euphrates with *the land of Susia on their left*, which is fine, because Arrian and Ptolemy considered the entire coastline of the northern Gulf to part of Susiana.<sup>213</sup>

<sup>210</sup> This route can be easily reconstructed on the map published by Gasche and Cole 2003, p. 75. Pliny tells us that according to Nearchus and Onesicritus, the Euphrates was navigable ...*from the Persian Sea to Babylon, a distance of 412 miles ...* (Pliny II [trans. H. Rackham] 1989 [1942], VI.30.124). This agrees with the account in Arrian, since 412 *milia passuum* corresponds to 610.6 km (one *mille passus* being equivalent to 1.482 km). Compare the remarks by Brunt in Arrian II (trans. P.A. Brunt) 1983, 427 n. 3.

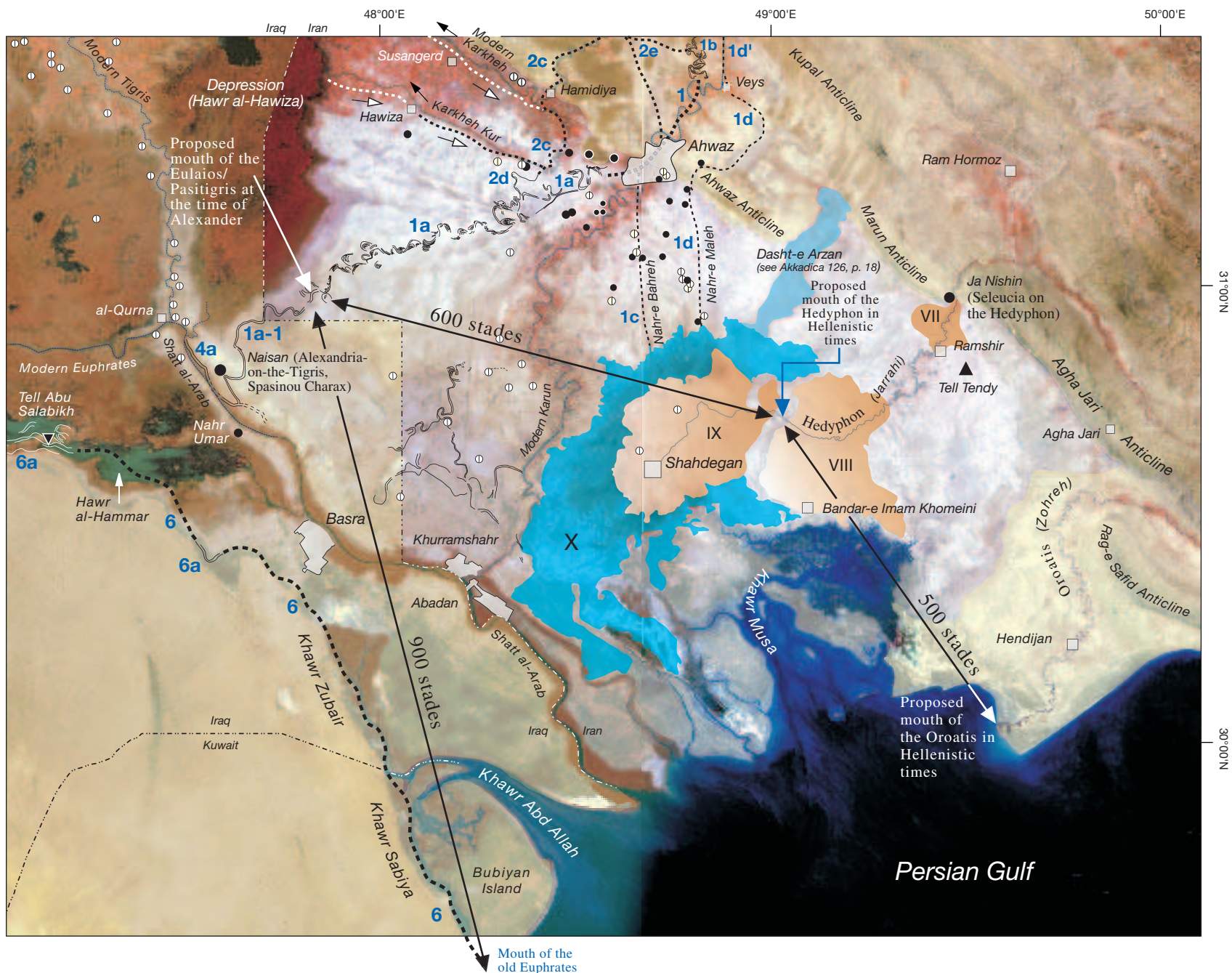
<sup>211</sup> In Strabo VII (trans. H.L. Jones) 1983 [1930], XVI.3.2, we are told that ...*the Persian Gulf is also called the Persian Sea; and Eratosthenes describes it as follows: its mouth, he says, is so narrow that from Harmoni, the promontory of Carmania, one can see the promontory at Macae in Arabia; and from its mouth the coast on the right, being circular, inclines at first, from Carmania, slightly towards the east, and then towards the north, and, after this, towards the west as far as Teredon and the outlet of the Euphrates ...* See also Strabo I (trans. H.L. Jones), 1969 [1917]: II.1.26, which also mentions ...*Teredon and the outlet of the Euphrates*, which river is said to empty into the Gulf.

Note, however, that when the Euphrates no longer emptied directly into the Gulf but instead emptied into the Tigris, Pliny (followed by Ptolemy) moved the location of Teredon to the location of the new outlet. Pliny states, for example, that to reach Charax ...*those travelling by water from the kingdom of Parthia come to the village of Teredon below the confluence of the Euphrates and the Tigris ...*; see Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145; also Ptolemy (ed. C.F.A. Nobbe) 1845-1887, V.20.5, where the coordinates given for Teredon are a little to the north and west of the Tigris mouth near Spasinou Charax (the latter coordinates are described in Ptolemy [ed. C.F.A. Nobbe] 1845-1887, VI.3.2).

<sup>212</sup> See also Strabo VII (trans. H.L. Jones) 1983 [1930], XVI.3.2, where we are told that ...*Eratosthenes says that Androsthenes, who sailed round the Gulf with a fleet, states that in making the coasting voyage, with the continent on the right, one sees next after Teredon the island Icarus and a temple sacred to Apollo in it and an oracle of Tauropolus.*

<sup>213</sup> Arrian II (trans. P.A. Brunt) 1983, *Indica* 40.8-11; Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1-2 (description of Susiana); and see also Marcianus of Heraclea (ed. S.F.W. Hoffmann), 1841, 63-66 (γ Σουσιανῆς περὶ πλοῦς).

Fig. 73. Excerpt of Fig. 65 showing the region traversed by Nearchus in 324 BC and a proposed reconstruction of his itinerary around the northern Gulf. For the old system of the lower "Modern Karkheh" and "Karkheh Kur," see Figs. 71 and 74.



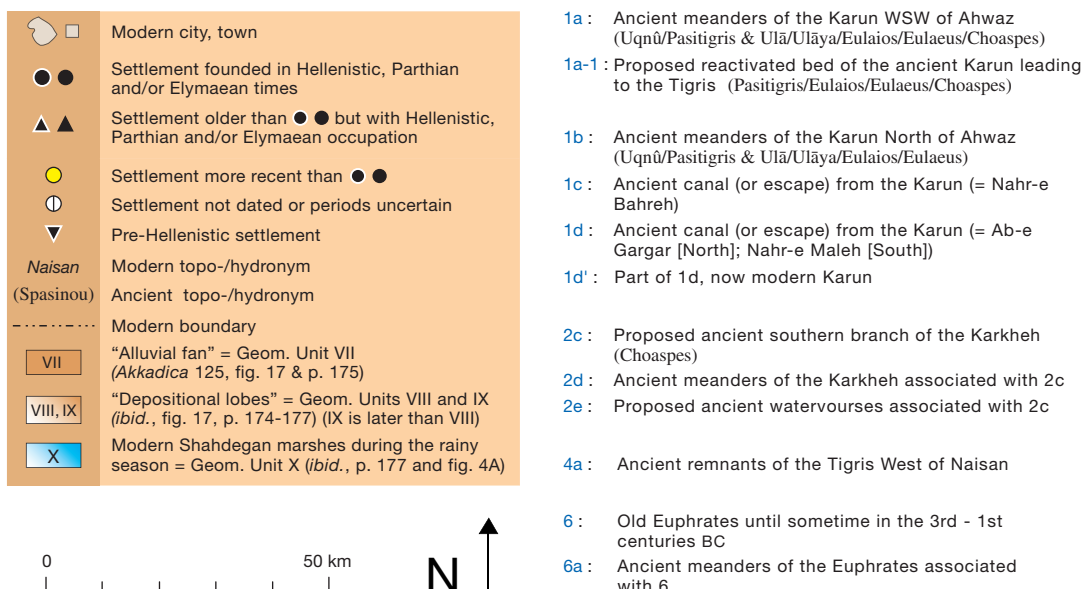
Nearchus must have first sailed to the mouth of the Tigris downstream from modern Naisan (Alexandria-on-the-Tigris/Spasinou Charax) and then up the Tigris in order to reach the Chaldean Lake, along which he sailed until he found the place where the Tigris entered the lake<sup>214</sup> and eventually made his way round again to the mouth of the Pasitigris. At this point, Arrian informs us that ...

(Ind. 42.4) *The voyage is 600 stades from the lake up to the river itself at a point where a village of Susia lies, called Aginis, 500 stades from Susa. The length of the coastal voyage along Susian territory to the mouth of the Pasitigris is 2000 stades.* (Ind. 42.5) *From there they sailed up the Pasitigris through inhabited and prosperous country. When they had sailed up about 150 stades, they moored, waiting for the scouts whom Nearchus had sent to see where the king might be ...* (Ind. 42.7) *And when news was brought that Alexander was actually approaching, they again sailed up river, and moored near the pontoon bridge on which Alexander intended to take his army over to Susa.*

Arrian tells us, therefore, that the voyage from the lake up the Pasitigris to a village called Aginis was 600 stades, and from this village it was another 500 stades to Susa. In other words, the distance from the mouth of the Pasitigris to Susa was 1100 stades. This corresponds to 203.5 km, which in turn closely matches the distance between the termination of

<sup>214</sup> We do not know precisely where the Tigris entered the lake region during the first millennium BC, but it is possible that it entered via a branch corresponding to the medieval Dujayla or even the modern eastern arm of the river (see the discussion in section 3.6 above).

Legend of Fig 73





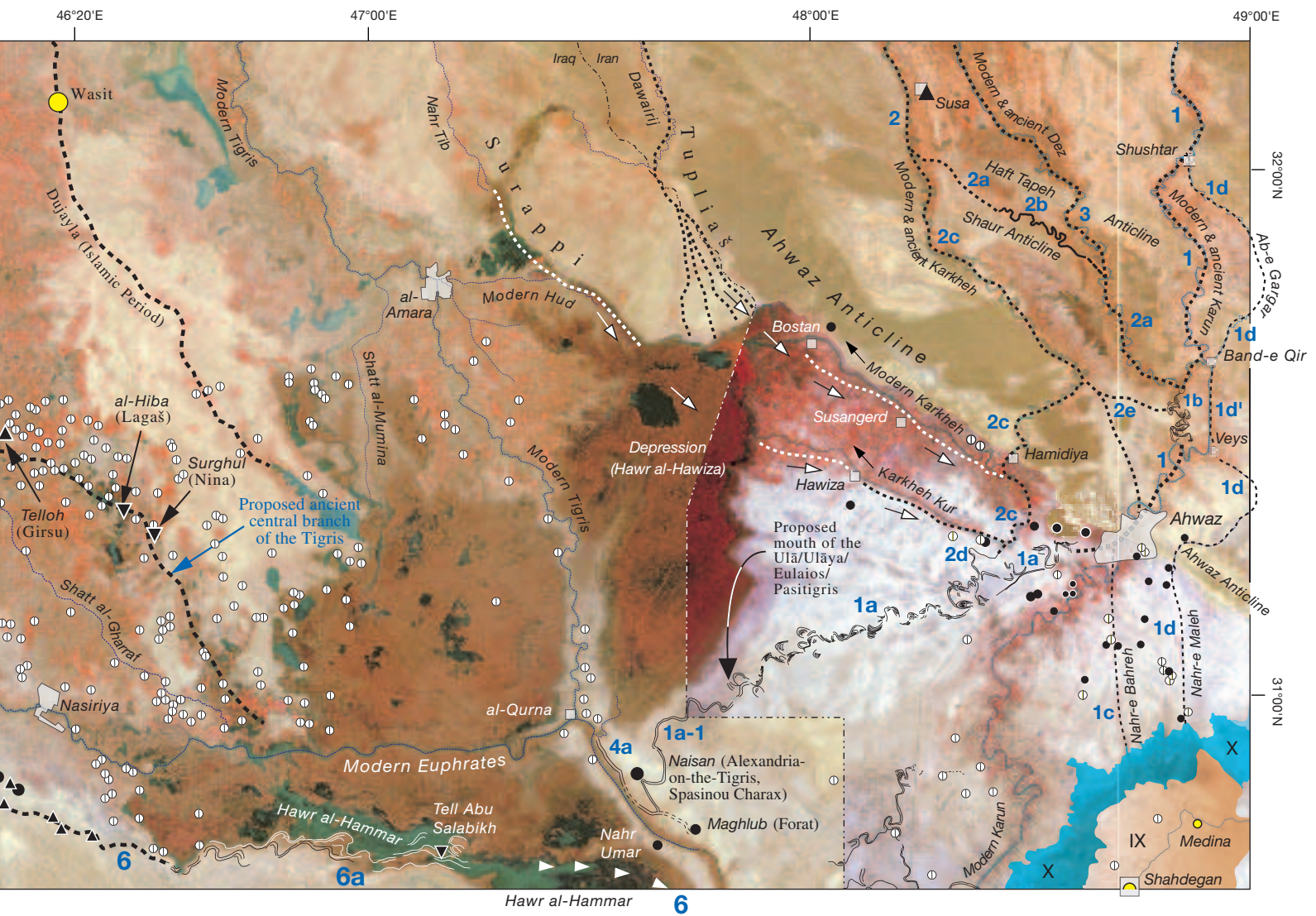


Fig. 74. Excerpt of Fig. 65 showing the region traversed by Alexander in 324 BC. The black arrows next to "Modern Karkheh" and "Karkheh Kur" show the direction of modern flow, while the white arrows show the direction of flow of what are possibly their old courses (the Tupliās and Surappi, respectively).

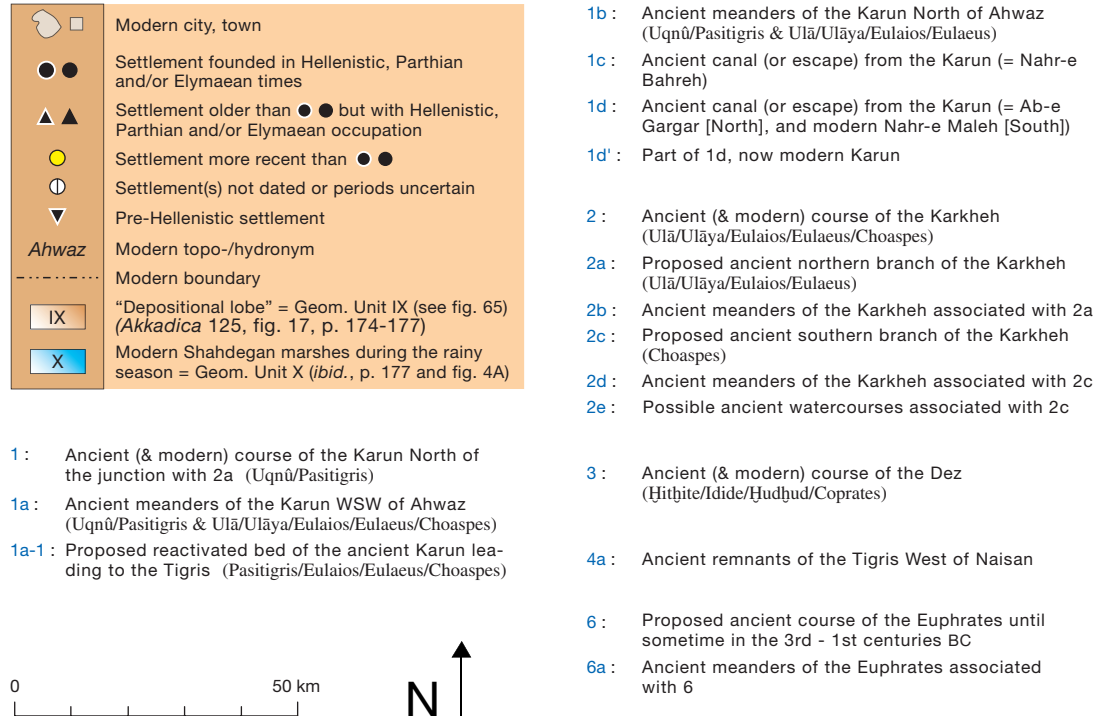
the ancient Karun meanders and Susa, following meanders 1a, course 2e, and course 2c (see Fig. 71).<sup>215</sup> Nearchus sailed upstream on the Pasitigris a distance of about 150 stades from the river's mouth and stopped to wait for news of the king's approach. When he heard that Alexander was approaching, Nearchus sailed upriver again and moored *near the pontoon bridge by which Alexander intended to take his army over to Susa*. There is near consensus that the bridge in question was located at Ahwaz.<sup>216</sup> Arrian also tells us that *the length of the coastal voyage along Susian territory to the mouth of the Pasitigris is 2000 stades*. It is clear

<sup>215</sup> On the other hand, Pliny states that it was 62.5 *milia passuum* (= 92.6 km) from a village called Aple, on the Chaldean Lake, to Susa, which may have been possible "as the crow flies" but impossible following any river, ancient or modern, since the anticline of Ahwaz would have blocked it from flowing directly southwest into the lake (Pliny II [trans. H. Rackham] 1989 [1942], VI.31.134).

<sup>216</sup> It is obvious that Strabo, who also cites Nearchus as a source, makes a number of errors in his brief summary of the fleet commander's voyage, and thus greatly confuses the picture (see Strabo VII [trans. H.L. Jones] 1983 [1930], XV.3.5). Since De Morgan (1900) relied heavily on Strabo's summary in his reconstruction of the shoreline of the Gulf in the first millennium BC, we will outline each of these errors here.

The passage in question reads as follows: *Nearchus says that the coast of Persis is covered with shoal-waters and that it ends at the Euphrates River; and that at the mouth of this river there is an inhabited village which receives the merchandise from Arabia; for the seaboard of the Arabians borders next on the mouth of the Euphrates and the Pasitigris, the whole of the intervening space being occupied by a lake, that is, the lake that receives the Tigris; and that on sailing up the Pasitigris one hundred and fifty stadia one comes to the*

Legend of Fig. 74



that Arrian meant the sum of the distances of the three stages which Nearchus had sailed around the northern end of the Gulf, that is, (1) from the mouth of the Oroatis (on the border of Persia) to the mouth of the Hedyphon, (2) from the mouth of the Hedyphon to the mouth of the Pasitigris, and finally (3) from the mouth of the Pasitigris to the mouth of the Euphrates (on the border of Arabia).<sup>217</sup>

We also glean important information on the historical geography of the region from Arrian's account of Alexander's journey from Susa to Opis in August 324 BC to quell a mutiny among the Macedonian contingents in Opis, several months after Nearchus had completed his exploration of the coastline of the northern Gulf. Arrian relates that :

*Alexander ordered Hephaestion to take most of the infantry force to the Persian Sea and, now that his fleet had put in to Susian land, embarked himself with the hypaspists, the agema and a few of the Companion cavalry, and sailed down the river Eulaeus to the sea. Once he was near the estuary (τῆς ἐκβολῆς), he left most of his ships there including those which had been damaged, and with the faster sailers coasted himself by sea from the river Eulaeus to the mouths (τὰς ἐκβολὰς of the Tigris, while the rest of his flotilla were brought back by the Eulaeus as far as the canal cut between the Tigris and Eulaeus, by which they entered the Tigris.*<sup>218</sup>

It is clear that Hephaestion sailed from the mouth of the Eulaeus/Pasitigris along the reactivated channel that led to the Tigris near Alexandria-on-the-Tigris (see Fig. 74, bed 1a-1). When he reached the Tigris he sailed upstream some distance until he reached the lake, which he crossed to reach the mouth of the Tigris on the north side of the lake, and following this river upstream again, he established his camp and waited for the king. Alexander, in turn, took other ships and sailed from the mouth of the Eulaeus/Pasitigris into the sea until he reached the mouth of the Tigris downstream from modern Naisan (see Fig. 74). He then sailed upriver, across the lake, and into the other mouth of the Tigris on the north side of the lake in order to meet Hephaestion before proceeding to Opis. Both Hephaestion and

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*raft-bridge that leads from Persis to Susa, being sixty stadia distant from Susa ; and that the Pasitigris is about two thousand stadia distant from the Oroatis ; and that the inland voyage on the lake to the mouth of the Tigris is six hundred stadia.*

The errors in question, when one compares the fuller account of Arrian, are the following : (1) the seaboard of the Arabians does not border next on the mouth of the Pasitigris, but rather on the mouth of the Euphrates ; (2) on sailing up the Pasitigris 150 stades one does not come to the raft-bridge that leads from Persia to Susa, because Arrian tells us that it was 150 stades to this bridge from the point where Nearchus moored after he had already sailed an unspecified distance upriver from the mouth of the Pasitigris ; (3) the bridge of boats, if located at Ahwaz, was not 60 stades from Susa but closer to 600 stades ; (4) it is definitely not 2000 stades from the Pasitigris to the Oroatis, but rather this is the distance of the entire coastal voyage – from the mouth of the Oroatis to the mouth of the Pasitigris, and from the mouth of the Pasitigris to the mouth of the Euphrates ; and finally (5) 600 stades is not the distance from the mouth of the Tigris across the inland lake to the Pasitigris, but rather, as Arrian states, it is the distance from the lake upriver to Aginis. Compare the discussion by Hansman (1978, 51-52), who himself made several errors in his criticism of De Morgan.

<sup>217</sup> I.e., 500 stades (mouth of Oroatis to mouth of Hedyphon) + 600 stades (mouth of Hedyphon to mouth of Pasitigris) + 900 stades (mouth of Pasitigris to mouth of Euphrates) = 2000 stades.

<sup>218</sup> Arrian II (trans. P.A. Brunt) 1983, VII.7.1-2.

Alexander knew the way to these mouths of the Tigris because Nearchus had already reconnoitered it for them.

### 3.8.2. Sennacherib's Naval Campaign Against the Chaldean Exiles in Elam in 694 BC

Sennacherib's sixth campaign was directed against Chaldean exiles in Elam, in and around Nagītu, who had fled across the northern end of the Gulf in the wake of an earlier Assyrian incursion into their homeland. The fullest narrative of the campaign – Luckenbill 1924, 73-76 (Bull Inscription F1): 48-100<sup>219</sup> – paints a picture of the northern Gulf region that is consistent with, though less detailed than, the picture of the region painted by Arrian for the time of Nearchus and Alexander.

In preparation for his campaign against the Chaldeans in Nagītu, we are told that Sennacherib ordered captive Syrian boatwrights to build ships in Nineveh, and that he then ordered Tyrian, Sidonian, and Cyprian sailors to sail the ships down the Tigris to Opis. Here they hauled the ships overland to the Arahtu, which they followed through the territory of Bīt-Dakkūri to the Euphrates.<sup>220</sup> At his point, the Assyrian king tells us that he embarked men and supplies on the ships and then proceeded on dry land while his ships continued down the Euphrates to a place called Bāb-salīmēti, which another inscription indicates was the southernmost point of Babylonia.<sup>221</sup> At some point in the journey downstream we are told that the shore of the sea was two double hours from the bank of the Euphrates. In other words, the river was running roughly parallel to shoreline of the Gulf at a distance of some 20 km, which indicates that Sennacherib and his men were following the old channel of the Euphrates along the Khawr Zubair/Khawr Sabiya (see Figs. 66 and 69). This would explain what happened next.

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<sup>219</sup> The text reads as follows :

<sup>(69)</sup>*My warriors went down the Euphrates on the ships while I myself <sup>(70)</sup>kept to the dry land at their side. I had (them) proceed to Bāb-salīmēti. <sup>(71)</sup>...from the bank of the Euphrates, to the shore of the sea, a distance of two double hours <sup>(72)</sup>...and the waves <sup>(73)</sup>of the sea ... <sup>(74)</sup>In that place I pitched my camp. Massive waves of the sea came up and <sup>(75-76)</sup>entered my tent, completely surrounding me while in my camp. All my people were forced to huddle for five days and nights in the strong(est) ships. My warriors' ships <sup>(77)</sup>reached the shallows at the river's mouth, where the Euphrates discharges its water in a straight line <sup>(78-79)</sup>into the turbulent sea. I myself stood opposite them along the shore of the 'Salt-Sea' (ĪD Mar-ra-ti). <sup>(79-80)</sup>To Ea, king of the deep, I made pure offerings, and with a ship of made of gold I cast into the sea a fish and crab, both made of gold as well. <sup>(80-82)</sup>I had my ships make a speedy crossing over to Nagītu. At the shore of the fearful sea, which was unfit for riding and walking, exceedingly difficult ground, the people of Chaldea <sup>(83)</sup>who lived at Nagītu and Nagītu-di'bina, the people of Hilmu, Pillatu, <sup>(84-88)</sup>and Hupapānu, saw my warriors' ships and gathered together archers, wagons, horses, mules, a countless host, to oppose them. At the Ulāya, a river whose banks were good, the battle line was drawn up. <sup>(89-90)</sup>Holding the elevated ground from my warriors they offered battle. <sup>(91-94)</sup>My warriors reached the embankments (and) mooring places. From the boats to the riverbanks they swarmed towards them like locusts and defeated them. (ll. 95-100 then describe the capture of the towns mentioned in l. 83 and the spoil that was carried back to Bāb-salīmēti.)*

<sup>220</sup> It would have been more direct to sail straight down the Tigris and across the lake region to Nagītu, but Sennacherib may have been feinting an attack elsewhere so that he could catch his enemies by surprise.

<sup>221</sup> Borger 1996, 40 A iii 96-100 (= Streck 1916, 30 iii 96-100); see Delitzsch 1881, 228-229; Streck 1916, 31 n. 5.



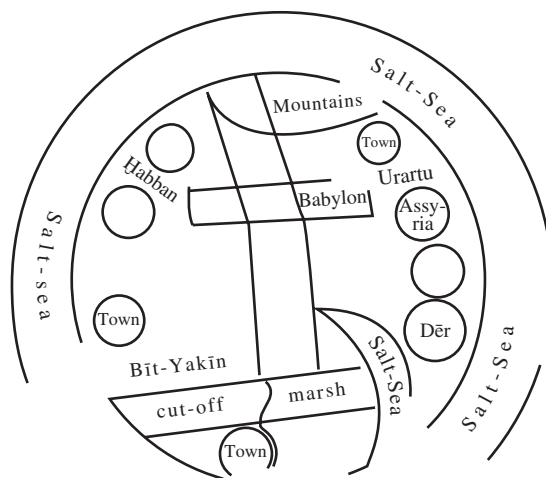


Fig. 75. Babylonian Map of the World (BM 92687). Courtesy Trustees of the British Museum.



Sennacherib relates that after he had pitched his camp in this place, massive waves of the sea came up and entered his tent, completely surrounding him, while his men were forced to take shelter in the ships. Since, in the early twentieth century AD, more than a foot of sea water could be driven 100 km up the disused Khawr Zubair when a steady southerly wind coincided with the spring tides,<sup>222</sup> there is every reason to suppose that something similar could have happened to Sennacherib, since he was most likely traveling in spring, when Assyrian monarchs traditionally mounted their military campaigns.

When the Assyrians finally reached the mouth of the river, Sennacherib made sacrifices to the god Ea and then directed his ships to cross over the sea to Nagītu, which, as we have already noted, was located on an island in the sea. Here Sennacherib tells us that his men defeated their Chaldean opponents in a pitched battle along the banks of the Ulāya at or near Nagītu, after which they returned to Bāb-salīmēti with captives and spoil. Nearchus would follow the same general route 370 years later in his voyage from the mouth of the Eulaios/Pasitigris to the mouth of the Euphrates. Nearchus' route, however, may have taken him a few miles further south than the path followed by Sennacherib's forces upon their return to Bāb-salīmēti from Nagītu, since over this 370-year interval the Euphrates would have continued to deposit sediments at its mouth, thereby building out its delta.<sup>223</sup>

### 3.8.3. The Babylonian Map of the World

We now turn to evidence from the so-called Babylonian "Map of the World,"<sup>224</sup> which most probably originated in the eighth century BC, since the toponyms shown on it – Babylon, Assyria, Urartu, Dēr, and Bit-Yakīn – were all prominent at this time. We will see that the map in question, while schematically drawn, is remarkably consistent with the reconstruction developed over the preceding pages.

Within the concentric circles drawn on the map, starting at the left and moving counter-clockwise, one can see written *ÍD Mar-ra-tum*, *Ma[r-ra-tum*, *Ma]r-ra-tum*, and *Mar-r[a-tum]*, "Salt-Sea." This label is also visible in the arm of the sea or very wide estuary that extends left of BĀD.AN.KI, "Dēr" past the region labeled *ap-pa-r[u]*, "marsh" to the line representing the Tigris. Note that both the Tigris and the Euphrates empty into a region labeled *bit-qu*, "cut-off," and *ap-pa-r[u]*, "marsh," which itself joins the northward extension of the sea just described. In addition, the photo of the tablet reproduced in Fig. 75 shows a

<sup>222</sup> Compare Wilson 1925, 234. A remarkably similar thing happened to Trajan during his campaign in 115/116 AD against the kingdom of Maysan, centered around Spasinou Charax. We are told: *He easily won over Mesene, the island in the Tigris of which Athambelus was king; but as the result of a storm, combined with the strong current of the Tigris and the tide coming in from the ocean, he found himself in serious danger ...*; see Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.4.

<sup>223</sup> The delta built by the combined streams of the Tigris and Euphrates rivers advanced some 60 km over the millennium following the tenth century AD, when Abadan was said by Muqaddisī to have been located at the mouth of the Tigris estuary and facing the open sea; see Le Strange 1930, 48-49; also Adams 1981, 15. The sedimentation rate of the Euphrates alone would have been smaller of course.

<sup>224</sup> Hand copy in Thompson 1906, Pl. 48 (obverse).

line representing the Euphrates emerging from this region and apparently continuing southward past a town or village towards the Gulf.<sup>225</sup> If this is the lower course of the old bed of the Euphrates, along Khawr Zubair, then the town or village in question would be Bāb-salī-mēti, which according to Borger 1996, 40 A iii 96-100, was the southernmost point of Babylonia. As we have just seen, Sennacherib in 694 BC used this town as the staging ground for his voyage across the sea to attack the Chaldean exiles on the bank of the Ulāya.<sup>226</sup> It was near here that the Euphrates was said to have discharged its waters in a straight line into the sea.<sup>227</sup> And it was to this town that Sennacherib's forces brought back captives and spoil from this campaign.<sup>228</sup>

The use of the label *bitqu*, or “cut-off,” points to the existence at this time of an escape or other major offtake<sup>229</sup> that channeled flow away from the main bed of the Euphrates (see Fig 75). As the reader may recall, Pliny tells us that a long time before his era the Euphrates had been dammed by the people of Uruk and other neighboring tribes in order to irrigate their lands and that this had resulted in the Euphrates emptying its water into the Tigris rather than into the sea.<sup>230</sup> This may have been the origin of the “cut-off” recorded on our map. We are told that in Pliny's time the Euphrates joined the Tigris north of the point where the Eulaios joined it,<sup>231</sup> and that this junction was *the confluence of the overflow of the Euphrates with the Tigris*.<sup>232</sup> Therefore, by the first century AD, the Euphrates joined the Tigris at about the latitude of modern al-Qurna. This is of course the line taken by the modern Euphrates (see Fig. 70). The Babylonian “Map of the World” indicates that this channel existed already in the eighth century BC and that it had originated as a canal or escape. This canal or escape then became the main bed of the river during the late first millennium BC.

The northern arm of the Gulf labeled ʾID *Marratu*, “Salt-Sea,” which the map shows extending to the Tigris north of the region labeled *appar*, “marsh,” may have existed for a

<sup>225</sup> Thompson's copy shows a break here, with nothing continuing to the town or village below the region labeled *bitqu* and *appar*. The photo, however, shows that the line was deliberately drawn, and exhibits clear evidence of a beveled incision produced by a stylus. Many of the breaks in the text occurred along deeply incised lines such as this.

<sup>226</sup> Luckenbill 1924, 74 (Bull Inscription F1): 69-70.

<sup>227</sup> Luckenbill 1924, 74 (Bull Inscription F1): 77-78. The Š-stem of *ešēru*, which is form of the verb used in this passage, has the sense “to cause to move in a straight line.” The Š-stem of *ešēru* is contrasted with the D-stem of *kašāru*, “to tie up in knots,” in Lambert and Millard 1999 [1969], 110 iv 61 = King 1902, Pl. 49 iii 61.

<sup>228</sup> Luckenbill 1924, 75-76 (Bull Inscription F1): 95-100.

<sup>229</sup> The Akkadian term *bitqu* survived into the Islamic period as Aramaic *bazzaq* (< *bedeq*). According to Morony 1984, 178: *Balādhurī speaks of a canal, old in his time, called Bazzāq near Wasit, and explains that in Aramaic the name means that the canal cuts off water from the other canals downstream and takes it to itself, in this case taking excess water from the reed thickets of Sib and from the Euphrates river* (quoting Balādhurī, *Fuṭūʿ*, p. 291).

<sup>230</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.130.

<sup>231</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129-130. The last reach of the present course of the Euphrates above al-Qurna was an artificial canal in Islamic times (known as the Abu-l-Asad canal), and, according to Yāqūt, this canal existed from Sasanian times; see Le Strange 1930, 42. The evidence of Pliny and the Babylonian “Map of the World” indicates that it was even older.

<sup>232</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145-146.

very long time before the map was originally drawn. A body of water called *ÍD Marratu* certainly existed in the ninth century BC, since the inscriptions of Shalmaneser III (858-824 BC) make frequent reference to it as *the sea of Chaldea which they call the 'Salt-Sea'*.<sup>233</sup> But there is also a tantalizing indication that a saltwater or brackish body of water existed in the third millennium BC that was roughly co-extensive with all or part of the northward extension of *ÍD Marratu* shown on the Babylonian "Map of the World." The evidence in question is found in the so-called "Geography of Sargon," in which it is stated the land of Emutbal – extending N-S from Maškan-šāpir to Larsa and W-E from Larsa to the Tigris and beyond into the country across the river<sup>234</sup> – reached as far as *me-e mar-ru-tú*, the "salt-water."<sup>235</sup>

Texts from the reigns of Tiglath-pileser III (744-727 BC), Sargon II (721-705 BC), Sennacherib (704-681 BC), and Esarhaddon (680-669 BC), like those from the reign of Shalmaneser III in the ninth century, connect *ÍD Marratu* with the Chaldeans, and specifically with the tribe of Bīt-Yakīn. An inscription of Tiglath-pileser III (744-727 BC) refers to the 'Salt-Sea' of Bīt-Yakīn as the southern boundary of this king's dominions.<sup>236</sup> Inscriptions of Sargon II (721-705 BC) tell us that Bīt-Yakīn was situated along the shore of the "Salt-Sea,"<sup>237</sup> and that Merodach-baladan, king of Chaldea and shaykh of Bīt-Yakīn, lived along the shore of the "Salt-Sea,"<sup>238</sup> on the *flatlands of the sea of the rising sun*,<sup>239</sup> and that he *trusted in the 'Salt-Sea' and its massive current*.<sup>240</sup> An inscription of Sennacherib (704-681 BC) refers to *...the cities Bīt-Zābidiya, Larsa, Kullab, Eridu, Kissik, Nēmed-Lagūda, Dūr-Yakīn, as far as Kār-Nabû, which is along the 'Salt-Sea' – in all eight strong, walled cities of Bīt-Yakīn...*<sup>241</sup> According to other inscriptions of Sennacherib, the opposite side of the sea was considered Elamite territory and included the districts Nagītu, Nagītu-di'bina, Hilmu, Pillatu, and Hupapānu.<sup>242</sup> Finally, a letter

<sup>233</sup> E.g., Grayson 1996, 44: 38-39; 101: 3-6; see also 37: 50-52; 46: 27'-28'; 66: 84; 76: 63'-65'; and possibly 116: 2-3.

<sup>234</sup> On the location of Emutbal/Yamutbal, see Stol 1976, 63-72; and compare Leemans 1960, 171-173.

<sup>235</sup> Grayson 1974-77, 60: 25; also Weidner 1952-53, 16-17. This text exists only in a first millennium BC copy. On its reliability, at least from the standpoint of Elamite historical geography, see Vallat 1991. It is interesting to note in this context that in the Early Dynastic and Ur III periods one could go from Susa to Lagaš by water; see Lambert 1953, 64-65 (DP 423), Scheil 1900, 152-153, and the discussion in Leemans 1960, 175. It has also been argued recently that boats traveled from Lagaš all the way to Adamdun, located some 6 km from Shushtar, in order to fetch shipments of copper; see Steve 2001, 15-17.

<sup>236</sup> Tadmor 1994, 158 (Summ. 7): 3; 194 (Summ. 11): 3; and 196 (Summ. 12): 3.

<sup>237</sup> Fuchs 1994, 196 (Prunkinschrift): 22; 251 (S1): 18-19; 252 (S2): 14-15; 256: (S3): 18-19; 266 (S4): 85-86; and 274 (S5): 25.

<sup>238</sup> Fuchs 1994, 77 (Saal XIV): 18; and 263 (S4): 45-46.

<sup>239</sup> Fuchs 1994, 135 (Ann.): 256. The Akkadian word in question is *sapānu*, which is derived from the verb *sapānu*, "to level."

<sup>240</sup> Fuchs 1994, 135-136 (Ann.): 255-256; and 225 (Prunkinschrift): 122.

<sup>241</sup> Luckenbill 1924, 53 (The First Campaign A1 = BM 113203): 48-49. Smith (1921, 24-25, followed by Dougherty 1932, 67) interpreted this passage to mean that all eight cities were located on the "Salt-Sea," while Weissbach (1936, 284) contended that only Kār-Nabû was. Weissbach's position was bolstered some three decades later by the publication of a Sennacherib inscription that names only Kar-Nabû as being along the sea (see Grayson 1963, 88: 8-9: *...in my four campaigns in which I went down to Chaldea and went to Kār-Nabû, which is along the 'Salt-Sea' [ÍD Mar-ra-ti] ...*).

<sup>242</sup> Compare Grayson 1963, 88-90: 15-19. According to Luckenbill 1924, 86 (Nebi Yunus Inscription): 20-21, these same districts were located across the sea proper (A.AB.BA).

dating to the reign of Esarhaddon (680-669 BC), seems to indicate that Chaldean territory extended from *the entrance to the 'Salt-Sea'* in the south to Sippar in the north.<sup>243</sup>

This *entrance to the 'Salt-Sea'* (*bāb ʾĪD Marrat*) played a prominent role in Ashurbanipal's attempts to control Elamite and Chaldean rebel movements during the period 653-646 BC. According to letters dating to the reign of Ashurbanipal (668-627 BC), we know that the Assyrians established a stronghold here,<sup>244</sup> where they stationed cavalry and archery forces,<sup>245</sup> and that such forces were dispatched by ship from here to conduct surprise raids on Elamite territory on the other side.<sup>246</sup> In reference to the Babylonian "Map of the World," the location of the *entrance to the 'Salt-Sea'* may correspond to the point where the "Salt-Sea" meets the line representing the Tigris, which is situated north of this line's intersection with the two horizontal lines passing through the region labeled "marsh" (*apparū*) (see Fig. 75). If the uppermost of these lines was indeed meant to represent a canal or escape (*bitqu*) from the Euphrates, and if, as we have argued, this canal or escape emptied into the Tigris at approximately the latitude of modern al-Qurna, then the arm of the sea represented on this ancient map extended north of the old levee of the Karun during the eighth century BC. We must not forget, however, that the map is schematically drawn.

Finally, by the sixth century BC, navigable channels through the shallows of the sea may have been marked – perhaps by poles driven in the mud<sup>247</sup> – since a Neo-Babylonian letter dating from this time refers to a *path through the 'Salt-Sea'* (*KASKAL<sup>II</sup> Mar-rat*).<sup>248</sup>

### 3.9. THE QUESTION OF THE GULF SHORELINE IN THE FIRST-SECOND CENTURIES AD

We now take up the difficult question of the limit of the delta in the first and second centuries AD. The difficulty lies in trying to reconcile several apparently discrepant accounts. We will now lay out the problematic descriptions and suggest possible interpretations.

Pliny (23-79 AD) relates that during his time the combined streams of the Euphrates and Tigris rivers flowed out of the Chaldean Lake in a vast channel, which was then joined by the Eulaios, and after passing the town of Charax on the right-hand side this vast stream discharged into the Persian Gulf, its mouth being ten *milia passuum* wide (= 14.8 km).<sup>249</sup> This description is consistent with the picture suggested by the evidence for eighth-seventh and fourth centuries BC, except for the fact that in the first century AD the Euphrates joined the Tigris in the lake region, as it does now, rather than debouching into the Gulf via the Khawr Sabiya estuary.

<sup>243</sup> Harper 1892-1914, no. 418 r. 4-7 = Reynolds 2003, no. 14 r. 4-7: *...the headmen of Chaldea from Sippar to entrance of the 'Salt-Sea' (bāb ʾĪD Marrat) bless the king, saying, 'He is the one who resettled Babylon.'*

<sup>244</sup> Harper 1892-1914, no. 462 r. 11-15 = de Vaan 1995, 262 r. 11-15.

<sup>245</sup> Harper 1892-1914, no. 520 r. 10-15 = de Vaan 1995, 266 r. 10-15.

<sup>246</sup> Harper 1892-1914, no. 1000 r. 5-7 = de Vaan 1995, 293 r. 5-7.

<sup>247</sup> Such as those encountered by the expedition of Nearchus; see Arrian II (trans. P.A. Brunt) 1983, *Indica* 41.2.

<sup>248</sup> Clay 1919, no. 79: 21-22.

<sup>249</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129-130.

Pliny continues this narrative by stating that *The mouths of the two rivers (Euphrates and Tigris) used to be 25 miles apart, or as others record 7 miles, and both were navigable; but a long time ago the Euphrates was dammed by the Orcheni (the people of Uruk) and other neighbouring tribes in order to irrigate their lands, and its water is only discharged into the sea by way of the Tigris.*<sup>250</sup> Hansman regarded this as evidence that the mouth of the Tigris at the time of Nearchus and Alexander was located either 37.5 km or 10.5 km from the old mouth of the Euphrates at Khawr Sabiya, and he then identified ancient Tigris courses west of the present Shatt al-Arab whose location, he argued, coincide roughly with the cited distances of the ancient mouth of the Tigris from the ancient mouth of the Euphrates.<sup>251</sup> On this basis Hansman concluded that the mouth of the Tigris in the fourth century BC was located approximately where it is now, and therefore the limit of the Mesopotamian delta itself has changed little over the past 2400 years.<sup>252</sup> It is possible, however, that the cited distances between the mouths of the Euphrates and Tigris referred to a point closer to Forat (Maghlab) at a time when sea and lake levels were sufficiently high to submerge the old Euphrates channel. Hansman did not acknowledge this possibility.

Moreover, Hansman seems to have ignored documentary evidence that contradicts his conclusion. As already noted, Pliny says that the combined streams of the Euphrates and Tigris rivers flowed in a vast channel out of the Chaldean Lake, and after receiving the Eulaios/Pasitigris it discharged into the Gulf after passing Charax.<sup>253</sup> Whether Pliny was speaking of his own time or a previous era is uncertain, but in another passage he states explicitly that in the fourth century BC the sea was located less than 2 km from Charax (see, for example, Fig. 74), while Arrian informs us that Alexander sailed down the Eulaios and entered the sea near this point.<sup>254</sup> Moreover, evidence from another text, referring to events in the early second century AD, points to a roughly similar position for the Gulf shoreline. Cassius Dio (ca. 150–235 AD) tells us that in the winter of 115/116 AD, after Trajan had resolved to travel from Ctesiphon down the Tigris to the sea, he eventually came to Maysan, *the island in the Tigris*, where *as the result of a storm, combined with the strong current of the Tigris and the tide coming in from the ocean, he found himself in serious danger*, and then, after leaving Spasinou Charax, he came to the ocean itself.<sup>255</sup> Moreover, Forat (see Fig. 74) seems to have been the southernmost settlement in the delta at roughly this period, and it was probably situated close to the coastline, since Pliny tells us that in order to reach Charax people from Petra came first to Forat, and then they made the journey from there to Charax, a *distance of 12 miles by water, using the tide.*<sup>256</sup> In his *Geography*, Ptolemy (fl. second century AD) places the mouth of the Tigris next to Charax.<sup>257</sup> Finally, Muqaddisī states unequivocally

<sup>250</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.130.

<sup>251</sup> Hansman 1978, 55–57.

<sup>252</sup> Hansman 1978, 57.

<sup>253</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129–130.

<sup>254</sup> Arrian II (trans. P.A. Brunt) 1983, VII.7.1–2.

<sup>255</sup> Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.3–4.

<sup>256</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145.

<sup>257</sup> Ptolemy (ed. C.F.A. Nobbe) 1845–1887, VI.3.2. The description in Ptolemy has two mouths of the Tigris: an eastern one (near Charax), which indicates a similar position for the coastline as in the time of Alexander, and

cably that in the tenth century AD, Abadan was located on an island facing the open sea.<sup>258</sup> Abadan is presently some 60 km inland from the present Gulf shoreline.

Moreover, what are we to make of Pliny's remarkable assertions about the recession of the head of the Gulf? After informing us that Charax was only 1¼ miles<sup>259</sup> from the coast in the time of Alexander, 50 miles from it in the time of Juba 300-325 years later, and finally 120 miles away 50-75 years after this, Pliny states :

*There is no part of the world where earth carried down by rivers has encroached on the sea further or more rapidly; and what is more surprising is that the deposits have not been driven back by the tide, as it approaches far beyond this point.*<sup>260</sup>

It is true that these historical references are difficult to reconcile with one another, which is perhaps why Hansman used only the sources which seemed to support the hypothesis of Lees and Falcon, i.e., that the coastline has remained much the same over the course of historical time. But these references cannot be ignored. In fact, when we take them at face value, one could even argue that the limit of the delta advanced, retreated, and advanced once more between the fourth century BC and the tenth century AD. It first moved southward from Naisan (Spasinou Charax) to approximately the latitude of modern Khurramshahr by the beginning of the Christian Era (when Juba wrote his account), and then it advanced approximately to its present position by the third quarter of the first century AD (when Pliny wrote his account). By 50 years later (115/116 AD), when Trajan passed through the region) it had apparently moved northward again. And by the time that Ptolemy wrote his *Geography* (probably around 150 AD) it was again near Charax. Finally, by the tenth century AD, the limit of the delta was at the latitude of Abadan, from where it has since advanced seaward another 60 km. Such dramatic fluctuations, if they occurred, must have been caused by unusual tectonic movements, changes in sea level, changes in the sediment loads brought down by the rivers, or by some combination of these processes.

In a forthcoming book, we will collect all the results stemming from our investigations of the Lower Khuzestan Project area and attempt a preliminary sketch of the changes in river courses and shorelines that occurred during Sasanian and Islamic times.

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a western one, which is situated precisely where we have argued that the old mouth of the Euphrates was located (at Khawr Sabiya just northwest of Failaka), since Ptolemy situates it close to the border of Arabia, near the interior bend of the Persian Gulf, next to a bay (Kuwait Bay). So this is probably an error. For the description of the location of *the western mouth of the Tigris*, see Ptolemy (ed. C.F.A. Nobbe) 1845-1887, V.19-20.

<sup>258</sup> Le Strange 1930, 48-49; also Adams 1981, 15. The mouth of the Karun was located east of Abadan at this time, indicating that this river no longer emptied into the Tigris near Naisan. This may have been the case already in Ptolemy's time, since he provides coordinates for *the mouths of the Eulaeus*, and locates them east and south of *the eastern mouth of the Tigris* near Charax; see Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.2.

<sup>259</sup> The text has "10 stades" (= 1.85 km = 1¼ miles).

<sup>260</sup> Pliny II (trans. H. Rackham) 1989 [1942], VI.31.139-140.

## APPENDIX I: THE DOCUMENTARY SOURCES AND THEIR CHRONOLOGICAL DISTRIBUTION

### 3.3.1. Ulā, Ulāya, Eulaios, Eulaeus, and Choaspes

#### 3.3.1.1. *Ulā, Ulāya*

##### *Late second millennium BC*

König 1965, 82 i 6 and 9	Šutruk-Nahhunte I (±1190-1155 BC)
van Dijk 1987, no. 87: 14 = Frame 1995, 22 (B.2.4.7): 14	Nebuchadnezzar I (1125-1104 BC)
King 1912, no. 6 col. i 28 = Frame 1995, 34 (B.2.4.11) col. i 28	Nebuchadnezzar I (1125-1104 BC)

##### *Neo-Assyrian period and later*

Luckenbill 1924, 75 (Bull Inscription F1): 87	Sennacherib (704-681 BC)
Johns 1898-1923, no. 469: 16 = Kwasman and Parpola 1991, 232 no. 288: 16	
Borger 1996, 38 A iii 42, F ii 65	Esarhaddon (680-669 BC)
Borger 1996, 104 B v 91, C vi 123	Ashurbanipal (668-627 BC)
Borger 1996, 104 B v 97, C vi 129	Ashurbanipal (668-627 BC)
Borger 1996, 105 B vi 13 C vii 6	Ashurbanipal (668-627 BC)
Borger 1996, 305 35 iii 49, A 1 iii 25'	Ashurbanipal (668-627 BC)
Harper 1892-1914, no. 281: 9 = de Vaan 1995, 243: 9	Ashurbanipal (668-627 BC)
Harper 1892-1914, no. 1430: 9	Ashurbanipal (668-627 BC)
George 2003, 650 Tablet VIII.18 (SB Gilgamesh)	
Farber 1990, 314: 5 (SB incantation)	
Daniel 8: 2, 16	second century BC ?

#### 3.3.1.2. *Eulaios, Eulaeus*

##### *First century BC – second century AD*

Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.19.1	ca. 80–20 BC
Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4	ca. 64 BC–25 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.26.99	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.31.135	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.31.136	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.31.138	23–79 AD
Pliny VIII (trans. W.H.S. Jones) 1963, XXXI.21.35	23–79 AD
Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1 fl.	second century AD
Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.2 fl.	second century AD
Arrian II (trans. P.A. Brunt) 1983, VII.7.1	ca. 95–175 AD
Arrian II (trans. P.A. Brunt) 1983, VII.7.2	ca. 95–175 AD
Arrian II (trans. P.A. Brunt) 1983, VII.7.6	ca. 95–175 AD
Ammianus Marcellinus II (trans. J.C. Rolfe) 1972 [1940], XXIII.6.26	ca. 325-395 AD <sup>1</sup>
Marcianus of Heraclea (ed. S.F.W. Hoffmann, 1841, 63-66)	fifth century AD

<sup>1</sup> Both Ammianus Marcellinus and Marcianus of Heraclea have in the place of 'Eulaeus' the hydronym 'Harax,' which in the context must refer to the Eulaeus / Pasitigris, which flows past the town of Charax (= Harax).

### 3.3.1.3. *Choaspes*

#### *Fifth century BC – second century BC*

Herodotus I (trans. A.D. Godley) 1931 [1920], I.188	ca. 484–430 BC
Herodotus III (trans. A.D. Godley), 1938 [1922], V.49	ca. 484–430 BC
Herodotus III (trans. A.D. Godley), 1938 [1922], V.52	ca. 484–430 BC
Nicander, of Colophon (ed. O.H.E. Schneider), 1856, <i>Theriaca</i> 890	ca. 197–130 BC

#### *First century BC – second century AD*

Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4	ca. 64 BC–25 AD
Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.6	ca. 64 BC–25 AD
Pliny I (trans. H. Rackham) 1979 [1938], I.37.56	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.31.130	23–79 AD
Pliny VIII (trans. W.H.S. Jones) 1963, XXXI.21.35	23–79 AD
Pliny X (trans. D.E. Eichholz) 1971 [1962], XXXVII.56.156	23–79 AD
Quintus Curtius I (trans. J.C. Rolfe) 1971 [1946], V.2.9 fl.	first century AD
Pausanias IV (trans. W.H.S. Jones), 1935, X.31.7	ca. 120–180 AD
Lucian, of Samosata (ed. E.C. Mackie) 1892, <i>Menippus</i> 7	ca. 125–180 AD
Aelian (trans. N.G. Wilson) 1997, <i>Varia historia</i> XII.40	ca. 175–235 AD
Solinus, Julius (ed. T. Mommsen) 1958 [1895], <i>Memorabilia</i> 37.6 fl.	third century AD
Ausonius, Decimus Magnus (ed. L. Di Salvo), 2000: <i>Ordo urbium nobilium</i> 156	ca. 310–395 AD
Nonnus, of Panopolis (ed. R. Keydell), 1959: <i>Dionysiaca</i> 23.277 fl.	fifth century AD
Isidore, of Seville (trans. J. Oroz Reta, M.-A. Marcos Casquero) 1993, <i>Etymologiae</i> XVI.7.16	ca. 560–636 AD

### 3.4.1. *Ḫithite, Idide, Ḫudḫud, Copratas, and Coprates*

#### 3.4.1.1. *Ḫithite, Idide, Ḫudḫud*

#### *Late second millennium BC*

König 1965, 74–75 no. 20 v 9–10 Šutruk-Nahḫunte I (±1190–1155 BC)

#### *Neo-Assyrian period and later*

Borger 1996, 49 A v 74, F iv 27	Ashurbanipal (668–627 BC)
Borger 1996, 50 A v 95	Ashurbanipal (668–627 BC)
Borger 1996, 50 A v 103	Ashurbanipal (668–627 BC)
Harper 1892–1914, no. 280 r. 18 = de Vaan 1995, 240 r. 18	Ashurbanipal (668–627 BC)
Harper 1892–1914, nos. 1311 + 1403 + 1464 : 28 = de Vaan 1995, 311 : 28	Ashurbanipal (668–627 BC)

#### 3.4.1.2. *Copratas, Coprates*

#### *First century BC – second century AD*

Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.18.3	ca. 80–20 BC
Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.6	ca. 64 BC–25 AD



### 3.4.2. Uqnû, Pasitigris, and Tigris (referring to Karun)<sup>2</sup>

#### 3.4.2.1. *Uqnû*

##### *Late second millennium BC*

Rawlinson and Smith 1870, pl. 38 no. 2 r. 9' = Frame 1995, 20 (B.2.4.6) r. 9 Nebuchadnezzar I (1125-1104 BC)

##### *Neo-Assyrian period and later*

Tadmor 1994, 122 (Summ. 1): 6	Tiglath-pileser III (744-727 BC)
Tadmor 1994, 130 (Summ. 2): 8	Tiglath-pileser III (744-727 BC)
Tadmor 1994, 160 (Summ. 7): 9	Tiglath-pileser III (744-727 BC)
Tadmor 1994, 194 (Summ. 11): 8	Tiglath-pileser III (744-727 BC)
Tadmor 1994, 204 (Summ. 14): 2'	Tiglath-pileser III (744-727 BC)
Fuchs 1994, 77 (Saal XIV): 24	Sargon II (721-705 BC)
Fuchs 1994, 140 (Annalen): 273	Sargon II (721-705 BC)
Fuchs 1994, 141 (Annalen): 272c	Sargon II (721-705 BC)
Fuchs 1994, 146 (Annalen): 282	Sargon II (721-705 BC)
Fuchs 1994, 146 (Annalen): 284	Sargon II (721-705 BC)
Fuchs 1994, 148 (Annalen): 289	Sargon II (721-705 BC)
Fuchs 1994, 149 (Annalen): 290	Sargon II (721-705 BC)
Fuchs 1994, 195 (Prunkinschrift): 19	Sargon II (721-705 BC)
Fuchs 1994, 250 (S1): 14	Sargon II (721-705 BC)
Fuchs 1994, 252 (S2): 11	Sargon II (721-705 BC)
Fuchs 1994, 256 (S3): 14	Sargon II (721-705 BC)
Fuchs 1994, 265 (S4): 74	Sargon II (721-705 BC)
Fuchs 1994, 273 (S5): 20	Sargon II (721-705 BC)

#### 3.4.2.2. *Pasitigris, Tigris (referring to Karun)*

##### *First century BC – second century AD*

Diodorus Siculus VIII (trans. C.B. Welles) 1970 [1963], XVII.67.1-3	ca. 80–20 BC
Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.17.3	ca. 80–20 BC
Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.18.3	ca. 80–20 BC
Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.18.4	a. 80–20 BC
Diodorus Siculus IX (trans. R.M. Geer) 1969 [1947], XIX.21.2	ca. 80–20 BC
Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.5	ca. 64 BC–ca. AD 25
Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4	ca. 64 BC–ca. AD 25
Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.6	ca. 64 BC–ca. AD 25
Pliny II (trans. H. Rackham) 1989 [1942], VI.26.99	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.31.134	23–79 AD
Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145	23–79 AD
Plutarch VIII (trans. B. Perrin) 1989 [1919], Eumenes XIV.2	ca. 45–120 AD
Quintus Curtius I (trans. J.C. Rolfe) 1971 [1946], V.3.1-2	first century AD
Arrian I (trans. P.A. Brunt) 1976, III.17.1	ca. 95–175 AD
Arrian II (trans. P.A. Brunt) 1983, <i>Indica</i> 42.1	ca. 95–175 AD
Arrian II (trans. P.A. Brunt) 1983, <i>Indica</i> 42.4	ca. 95–175 AD
Arrian II (trans. P.A. Brunt) 1983, <i>Indica</i> 42.5	ca. 95–175 AD

<sup>2</sup> Only those references to 'Tigris' which clearly refer to the Karun are included here.

### 3.6.1. Lower Tigris, Surappi, and Tupliaš

#### 3.6.1.1. Lower Tigris

##### *Neo-Assyrian period and later*

Tadmor 1994, 122 (Summ. 1): 5  
 Tadmor 1994, 130 (Summ. 2): 7  
 Tadmor 1994, 160 (Summ. 7): 9  
 Tadmor 1994, 194 (Summ. 11): 7  
 Fuchs 1994, 77 (Saal XIV): 23  
 Fuchs 1994, 250 (S1): 13  
 Clay 1904, pl. 21 (= BE 10 36: 8)  
 Clay 1912, pl. 92 (= PBS 2/1 181: 5-7)

Tiglath-pileser III (744-727 BC)  
 Tiglath-pileser III (744-727 BC)  
 Tiglath-pileser III (744-727 BC)  
 Tiglath-pileser III (744-727 BC)  
 Sargon II (721-705 BC)  
 Sargon II (721-705 BC)  
 ca. 454-414 BC  
 ca. 454-414 BC

##### *First century BC – second century AD*

Strabo I (trans. H.L. Jones), 1969 [1917]: II.1.23  
 Strabo I (trans. H.L. Jones), 1969 [1917]: II.1.26  
 Strabo V (trans. H.L. Jones), 1970 [1929]: XI.12.3  
 Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.4  
 Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.5  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.26.99  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.31.126  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.31.129  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.31.130  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.31.138  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.31.139  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.32.145  
 Pliny II (trans. H. Rackham) 1989 [1942], VI.32.146  
 Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1 fl.  
 Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.2 fl.  
 Arrian II (trans. P.A. Brunt) 1983, VII.7.2  
 Arrian II (trans. P.A. Brunt) 1983, VII.7.6  
 Arrian II (trans. P.A. Brunt) 1983, VIII.42.2  
 Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.1  
 Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.2  
 Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.3  
 Cassius Dio VIII (trans. E. Cary) 1925, LXVIII.28.4

ca. 64 BC–ca. AD 25  
 ca. 64 BC–ca. AD 25  
 ca. 64 BC–ca. AD 25  
 ca. 64 BC–ca. AD 25  
 ca. 64 BC–ca. AD 25  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 23–79 AD  
 second century AD  
 second century AD  
 ca. 95–175 AD  
 ca. 95–175 AD  
 ca. 95–175 AD  
 ca. 150–ca. 235 AD  
 ca. 150–ca. 235 AD  
 ca. 150–ca. 235 AD  
 ca. 150–ca. 235 AD

#### 3.6.1.2. Surappi

##### *Neo-Assyrian period*

Tadmor 1994, 122 (Summ. 1): 6  
 Tadmor 1994, 130 (Summ. 2): 8  
 Tadmor 1994, 160 (Summ. 7): 9  
 Tadmor 1994, 194 (Summ. 11): 8  
 Fuchs 1994, 77 (Saal XIV): 24  
 Fuchs 1994, 139 (Annalen): 270  
 Fuchs 1994, 195 (Prunkinschrift): 19  
 Fuchs 1994, 250 (S1): 13  
 Fuchs 1994, 252 (S2): 11  
 Fuchs 1994, 256 (S3): 14

Tiglath-pileser III (744-727 BC)  
 Tiglath-pileser III (744-727 BC)  
 Tiglath-pileser III (744-727 BC)  
 Tiglath-pileser III (744-727 BC)  
 Sargon II (721-705 BC)  
 Sargon II (721-705 BC)  
 Sargon II (721-705 BC)  
 Sargon II (721-705 BC)  
 Sargon II (721-705 BC)  
 Sargon II (721-705 BC)

Fuchs 1994, 265 (S4): 74

Sargon II (721-705 BC)

Fuchs 1994, 273 (S5): 20

Sargon II (721-705 BC)

### 3.6.1.3. *Tupliaš*

#### *Neo-Assyrian period and later*

Fuchs 1994, 145 (Annalen): 279k

Sargon II (721-705 BC)

Fuchs 1994, 146 (Annalen): 283

Sargon II (721-705 BC)

Harper 1892-1914, no. 906: 2 = Dietrich 2003, 132 no. 150: 2

Sargon II (721-705 BC)

Harper 1892-1914, no. 1112: 4 = Dietrich 2003, 133 no. 151: 4

Sargon II (721-705 BC)

Clay 1919, no. 117: 8

sixth century BC

Tremayne 1925, no. 86: 6 Cyrus II (538-530 BC)

### 3.7.1. Oroatis (and Variants), Hedyphon, and Mosaeus

#### *Oroatis*

Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.1

ca. 64 BC–ca. AD 25

Strabo VII (trans. H.L. Jones) 1983 [1930], XV.3.5

ca. 64 BC–ca. AD 25

Pliny II (trans. H. Rackham) 1989 [1942], VI.26.99

23–79 AD

Pliny II (trans. H. Rackham) 1989 [1942], VI.28.111

23–79 AD

Pliny II (trans. H. Rackham) 1989 [1942], VI.31.136

23–79 AD

Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.1 fl.

second century AD

Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.2 fl.

second century AD

Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.4.1 fl.

second century AD

Ammianus Marcellinus II (trans. J.C. Rolfe) 1972 [1940], XXIII.6.26

ca. 325–395 AD

Marcianus of Heraclea (ed. S.F.W. Hoffmann), 1841, 63-66

fifth century AD

Marcianus of Heraclea (ed. S.F.W. Hoffmann), 1841, 66-69

fifth century AD

#### *Hedyphon*

Strabo VII (trans. H.L. Jones) 1983 [1930], XVI.1.18

ca. 64 BC–ca. AD 25

Pliny II (trans. H. Rackham) 1989 [1942], VI.31.135

23–79 AD

#### *Mosaeus*

Ptolemy (ed. C.F.A. Nobbe) 1845-1887, VI.3.2 fl.

second century AD

Ammianus Marcellinus II (trans. J.C. Rolfe) 1972 [1940], XXIII.6.26

ca. 325–395 AD

Marcianus of Heraclea (ed. S.F.W. Hoffmann), 1841, 63-66

fifth century AD

### 3.8.4. *ÍD Marratu*

#### *Third Millennium BC ?*

Grayson 1974-77, 60: 25 (also Weidner 1952-53, 16-17)

Akkadian period?

#### *First Millennium BC*

Grayson 1996, 37: 51

Shalmaneser III (858-824 BC)

Grayson 1996, 44: 39

Shalmaneser III (858-824 BC)

Grayson 1996, 46: 28'

Shalmaneser III (858-824 BC)

Grayson 1996, 66: 84

Shalmaneser III (858-824 BC)

Grayson 1996, 76: 65'

Shalmaneser III (858-824 BC)

Grayson 1996, 101: 5

Shalmaneser III (858-824 BC)

Grayson 1996, 116: 3

Shalmaneser III (858-824 BC)

Cole 1996, 98 no. 33 r. 26 (AMBAR A.MEŠ <i>Mar-rat</i> )	Tiglath-pileser III (744-727 BC) or possibly earlier
Tadmor 1994, 158 (Summ. 7): 3	Tiglath-pileser III (744-727 BC)
Tadmor 1994, 194 (Summ. 11): 3	Tiglath-pileser III (744-727 BC)
Tadmor 1994, 196 (Summ. 12): 3	Tiglath-pileser III (744-727 BC)
Fuchs 1994, 77 (Saal XIV): 18	Sargon II (721-705 BC)
Fuchs 1994, 136 (Annalen): 256	Sargon II (721-705 BC)
Fuchs 1994, 196 (Prunkinschrift): 22	Sargon II (721-705 BC)
Fuchs 1994, 225 (Prunkinschrift): 122	Sargon II (721-705 BC)
Fuchs 1994, 251 (S1): 19	Sargon II (721-705 BC)
Fuchs 1994, 252 (S2): 15	Sargon II (721-705 BC)
Fuchs 1994, 256: (S3): 19	Sargon II (721-705 BC)
Fuchs 1994, 263 (S4): 46	Sargon II (721-705 BC)
Fuchs 1994, 266 (S4): 86	Sargon II (721-705 BC)
Fuchs 1994, 274 (S5): 25	Sargon II (721-705 BC)
Thompson 1906, pl. 48 obverse ("Babylonian Map of the World")	eighth century BC
Luckenbill 1924, 53 (The First Campaign A1 = BM 113203): 48	Sennacherib (704-681 BC)
Luckenbill 1924, 73 (Bull Inscription F1): 51	Sennacherib (704-681 BC)
Luckenbill 1924, 73 (Bull Inscription F1): 54	Sennacherib (704-681 BC)
Luckenbill 1924, 74 (Bull Inscription F1): 78	Sennacherib (704-681 BC)
Luckenbill 1924, 78 (Bull Inscription F2): 30	Sennacherib (704-681 BC)
Luckenbill 1924, 85 (Nebi Yunus Inscription): 10	Sennacherib (704-681 BC)
Grayson 1963, 90: 18	Sennacherib (704-681 BC)
Harper 1892-1914, no. 418: r. 5 = Reynolds 2003, no. 14: r. 5	Esarhaddon (680-669 BC)
Harper 1892-1914, no. 462: r. 14 = de Vaan 1995, 261-262: r. 14	Ashurbanipal (668-627 BC)
Harper 1892-1914, no. 520 r. 12, 21 = de Vaan 1995, 266 r. 12, 21	Ashurbanipal (668-627 BC)
Harper 1892-1914, no. 795 r. 3, 6 = de Vaan 1995, 290 r. 3, 6	Ashurbanipal (668-627 BC)
Harper 1892-1914, no. 1000 r. 7, 15-16 = de Vaan 1995, 293 r. 7, 15-16	Ashurbanipal (668-627 BC)
Harper 1892-1914, no. 1136: 8 = de Vaan 1995, 302: 8	Ashurbanipal (668-627 BC)
Clay 1919, no. 79: 22	sixth century BC

## APPENDIX II: EXCURSUS ON THE ANCIENT TIGRIS

For an illustration of the discussion which follows, the reader should consult the maps published in Cole and Gasche (1998), Gasche *et al.* (2002), and Gasche and Cole (2003).

The ancient network of the Tigris on the northeastern and central Mesopotamian alluvial plain has not yet been fully investigated. Our previous studies in this area, however, led us to the conclusion that the "Main Branch" of the ancient Euphrates – during the second millennium BC at least – joined the ancient Tigris/Zubi not far south of the later metropolis of Seleucia. We presented irrefutable evidence that "Zubi" is another name for "Tigris,"<sup>3</sup> and we also presented unquestionable data that the main branch of the Euphrates and the Tigris/Zubi joined south of Seleucia.<sup>4</sup> About 25 km south of this junction,<sup>5</sup> the combined rivers split, with one branch taking an easterly direction more or less toward the present bed of the Tigris, and the other branch taking a more westerly direction toward the heart of the country as far as Umma, as recently proposed by Steinkeller (2001). But if this latter branch continued any further on this trajectory it would have butted against the levee of the

<sup>3</sup> Cole and Gasche 1998, 17.

<sup>4</sup> Cole and Gasche 1998, 24.

<sup>5</sup> Cole and Gasche 1998, map 9 on p. 51.

Shatt al-Gharraf and been forced to turn south and join the Euphrates system. Because of this palaeotopographical constraint, it is difficult to accept the suggestion of Charpin (2003) that this branch of the Tigris continued up the slope of the old levee upon which the Shatt al-Gharraf now flows, and on which important cities such as Girsu, Lagash, and Nina were situated.<sup>6</sup>

In regard to the origin of the levee of the Shatt al-Gharraf, we observe that there is a topographical relation between this levee and the one on which flowed the more northerly and much later Nahrawan irrigation canal. Although we commenced but did not complete investigations in the Lower Diyala region, some general observations and indications permit us to formulate the following working hypothesis :

During at least part of the third millennium BC and all of the second, the lower courses of the ancient Ṭaban and Turran/Turnat rivers (Diyala region) flowed on – and with their sediment deposits raised – what is today the largest natural levee on the entire Mesopotamian alluvial plain. This levee was later followed by the Nahrawan Canal, which flowed for a long time along its summit.<sup>7</sup> Because the dimensions of this geomorphological unit are so impressive, it must be assumed that something else contributed to its volume beyond the deposition of sediments by the ancient Ṭaban and Turran/Turnat rivers. In fact, a first topographical approach to this problem in the area east and north of modern Baghdad shows that one cannot exclude the possibility that the levee in question was originally built by an older, more easterly course of the Tigris. However, this levee formation process must have ended before the middle of the third millennium BC because afterwards the Ṭaban and Turran/Turnat flowed on it, while the Tigris/Zubi ran more to the south.

When one considers the entire area of the Tigris and Nahrawan system, one can observe that the “Nahrawan levee” continues down to Kut, where it is in line with the modern Shatt al-Gharraf levee. In other words, both these levees could very well hide an old course of the Tigris. When the Tigris shifted to its bed near the later Seleucia, its lower branch along the Shatt al-Gharraf had to remain active because major cities such as Girsu and Lagash were located on the levee and remained inhabited until at least Samsuiluna year 10.<sup>8</sup> These cities could not have survived without water, and due to their topographical situation they could never have received water from the less elevated Euphrates system.

#### APPENDIX III : REMOTE SENSING OF SITES IN AND AROUND THE HAWR AL-HAMMAR AND HAWR AL-HAWIZA by Carrie Hritz

##### *Introduction*

Although large sections of the Mesopotamian alluvial plain have been surveyed by archaeologists (Adams 1981, Adams and Nissen 1972, Gibson 1972), much of the area considered lower Sumer has not been systematically surveyed. Lower Sumer can be described as the geographical area from the site of Warka in the north to the modern Persian Gulf head. Previous formal archaeological survey of lower Sumer, south and east of the modern course of the Shatt al-Gharraf, is restricted to Wright's 1965 survey (Adams 1981). This survey extended roughly 40 kilometers south of the site of Ur. The

<sup>6</sup> The same objection can be raised about Steinkeller's reconstruction of the Lower Tigris between Zabalam and Apīšal, which he locates directly north of Girsu ; see, for example, Steinkeller 2001, map 2 on p. 50.

<sup>7</sup> For the topography of this levee, see Cole and Gasche 1998, maps 1 to 3 ; for a speculative reconstruction of the courses of the Ṭaban and Turran/Turnat rivers, see Nashef 1982.

<sup>8</sup> See, respectively, Thureau-Dangin 1909, 341, and Thureau-Dangin 1910, no. 129.

boundaries of the survey were based on the limits of modern cultivation and the geology of the lower alluvium such as the Eridu escarpment in the west. The lack of systematic archaeological survey in the environs of the modern Shatt al-Gharraf and south has resulted in the creation of a settlement map of southern Mesopotamia which contains a large empty quarter in lower Sumer. However, the presence of archaeological sites farther south has been inferred from texts and travel descriptions. For example, Georges Roux (1960), when working for the Basra Petroleum Company, performed a small reconnaissance in the area of the Hawr al-Hammar and around the Shatt al-Arab as far south as Basra. This short limited survey demonstrated the presence of archaeological sites and made a general attempt at dating. He suggests the presence of both Islamic and “pre-Islamic” period sites within the marshes proper and skirting the edges of the desert.

Even further to the south and east, in Iranian Khuzestan, along the natural extension of the Mesopotamian alluvial plain, recent archaeological surveys conducted by Gasche *et al.* (see *Akkadica* 126/1, pp. 1-43) and Alizadeh (largely unpublished) have begun to shed light on the settlement and channel systems. The remote sensing and GIS research presented here hopes to complement and contribute to this effort of archaeological site detection.

### *Goals*

The aim of the present study has been to integrate past archaeological survey data and satellite imagery into a GIS Framework to begin the process of landscape mapping. The combination of natural and cultural transformations of the lower alluvial plain over many millennia of human occupation has resulted in an archaeological landscape that is composed of relict archaeological sites and pieces of abandoned channel systems. For example, the Iraq-Iran border area in particular has faced massive landscape transformation activities rendering comparisons of landscape from the 1960s-1990s difficult at best. Nonetheless, the detection of archaeological sites and relict canal and channel systems by methods of remote sensing allows for the reconstruction of ancient landscape systems in lower Sumer.

Using methods of GIS and remote sensing integration employed in past landscape studies in areas further to the north in the Sumerian heartland (Hritz and Wilkinson 2006), a picture of salient features of the southern Mesopotamian landscape has begun to emerge. By incorporating diverse data sets such as Corona satellite photography from the late 1960s, SPOT satellite imagery from the 1990s, geologic maps, and the few archaeological site maps from informal survey, it is possible to layer data sets and reconstruct past landscape systems comprised of archaeological sites and the associated channel systems. This project is in its preliminary stages.

### *Remote Sensing and GIS Methodology*

The present work has used satellite imagery to make a preliminary map of possible archaeological sites in the area south of the Eridu survey to Basra, across the border in Iranian Khuzestan and just west of the modern Euphrates to the west. It relies on the incorporation of archaeological survey data, in the form of site location maps from the *Joint Belgo-Iranian Project*, and maps from surveys of Roux (1960) and Wright (1981). The methodology first required a set of geo-referenced base images.

SPOT images from 1992-5, courtesy of the National Geo-spatial-Intelligence Agency, are publicly available and have proven to be precisely referenced in other areas of the Middle East (Ur 2003). These images were available geo-referenced at 10m resolution and incorporated into ArcGIS. To begin to trace past landscape features such as archaeological sites, images that record a landscape prior to the vast re-working of this landscape in the late 1980s and 1990s were needed.

Declassified Corona Spy Satellite photographs from the 1960s were available for most of the area. However, the northeastern portion of the survey area in the vicinity of Ahwaz south to Shahdegan was not covered by available Corona imagery at the time of this preliminary analysis and will be included in later reports. The Corona satellite operated from the late 1950s through the 1970s taking satellite photographs of areas of “strategic” interest to US national security ([www.usgs.gov](http://www.usgs.gov)). For this study, the Coronas were scanned at 1600 dpi, geo-referenced to the SPOT images, and layered in ArcGIS. The images date to 23/9/1966 and are at a resolution of roughly 1-3m. The images are particularly useful, because they present a landscape in southern Iraq which has been transformed by cycles of marsh development and destruction and large scale transforming military and civilian agricultural projects.

#### *Preliminary Analysis*

Once these images were geo-referenced, the maps in *Akkadica* 126/1, pp. 1-43, and in Roux (1960) were geo-referenced to the images. This allows for the layering of data sets in a GIS to compare landscape changes and site locations. I have been able to identify 8 of 13 sites from Roux’s map from the 1960 survey. There are two key reasons for this possible discrepancy. First, Roux’s map did not provide information on the coordinates or metadata used to create the map such as the map datum. Therefore, precise geo-referencing was impossible. It is also possible, in fact probable, that the location of the settlements presented on Roux’s maps was imprecise and hinders correlation between sites located on images and those presented in Roux’s map. Second, the lack of visibility of five of Roux’s sites may be the result of destruction of the archaeological sites between 1958 and 1967 or seasonality at the time of the Corona images.

I have also identified an additional 330 sites in the area south of the sites of Tello and Girsu to Basra north to south and between the Euphrates and Tigris rivers, roughly an area of 23,970 km\*. Sites seem to cluster within a kilometer on both the east and west sides of the modern Shatt al-Gharraf; roughly 175 of the 294 sites detected are located here. As one moves farther east from the Shatt al-Gharraf, sites become more dispersed with large gaps where no sites are visible on the imagery. A line of sites also clusters on the western side of the Tigris as it heads southwest.

The Hawr al-Hammar and Hawr al-Hawiza marshes contained few visible archaeological sites, but settlements were visible lining the present edges of the marshes proper. Within the 1960s boundaries of the marshes, few distinctive archaeological sites were visible, while modern settlement in the form of clustering houses was visible on a number of mounds within the marshes. Exercising caution, I have chosen not to map these settlements as possible sites without more precise ground information, although they are likely to contain the remains of ancient and modern settlements. The settlement pattern that has begun to emerge in the area from the Shatt al-Gharraf to the Iraq-Iran border (or the natural extension of the alluvial plain in the south) is similar to settlement patterns across the rest of the alluvial plain to the north, namely the settlements follow the relict topographic levees and natural drainage pattern of the alluvial plain. The sudden drop off in density of settlement in the vicinity of the Shatt al-Gharraf, apparent on past archaeological maps of Mesopotamia, seems likely a function of lack of archaeological survey rather than a genuine gap in ancient settlement.

Across the border in Iranian Khuzestan, the recent survey of the Belgo-Iranian project has provided a basis for the detection of archaeological sites. This survey has provided ground truthing for the identification of archaeological sites on satellite imagery and photography. I have been able to identify 11 of the 42 archaeological sites recorded by the survey. I have added 21 possible sites within this border area clustering in two primary locations. The first cluster of 11 sites is in the vicinity of Hawiza and Susangerd and identifies possible archaeological sites that were outside the boundaries of

archaeological survey in this area. They cluster both along the current Karkheh River and in between the modern and ancient courses of the river. The second cluster of 10 sites is located southwest of the modern Karun river course and adjacent to the Iraq-Iran border. This area was largely outside of the archaeological survey limits. The northern portion of this cluster appears to follow relict secondary channels from the Karun, while the southern portion of this cluster of sites seems to be associated with former possible Euphrates channels. At this stage, dating of any of these archaeological sites is not possible.

### Conclusions

This preliminary analysis of satellite imagery and the incorporation of past archaeological survey data has allowed for the addition of potential archaeological sites in lower Sumer. Using the recent Belgo-Iranian survey as a ground truthing, it has been possible to begin to fill in the settlement map of the lower alluvial plain. The next step in this analysis will be to map relict channels associated with archaeological sites and to incorporate dating information provided by the ongoing Belgo-Iranian survey project.

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\* Bibliography for Akkadica 125/2, 141-215, Akkadica 126/1, 1-43, and the present Chapter 3. For the abbreviations, see *Northern Akkad Project Reports* 8 (Ghent), 49-65.



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