Real and Literary Landscapes in Ancient Egypt

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During the past thirty years the Survey of Memphis and others have acquired more than two hundred borehole logs from the Capital Zone of Egypt. Combining these boreholes with maps and satellite images, we show that, during the past five thousand years, the geography of the Nile has been in constant flux with mean rates of migration around 2 m/y and one of its channels becoming extinct, by nature or through human intervention. Re-visiting ancient texts in the light of this changing environment, we show that the literary settings of both fictional and historical texts were real landscapes known to the authors. Hence we infer that ancient descriptions of landscape can be interpreted in a more literal way than before and that the authors were not as prone to writing of a metaphorical realm as was previously thought.

Landscape descriptions and imagery are comparatively rare in ancient Egyptian literature. Those that do exist are often difficult to place in the known landscape and have thus been characterized as mythical landscapes. Some geographical narratives are quite clearly fantastical, and were meant to be so (e.g. the 'Story of the Shipwrecked Sailor': Papyrus Leningrad 1115).

Recent studies of landscape evolution in the Memphite floodplain of northern Egypt (Fig. 1) allow us to redraw the maps of the region for each period. Thus literature such as the 'Prophecy of Amenemhat', the 'Tale of Sinuhe', and the later 'Stele of Piye' can be more confidently placed in the landscape in which they were written. Comparison of the ancient geography of the relatively well-known Memphite area with the landscapes of the texts reveals that they represent a more literal approach to landscape in ancient literature than previously supposed. In addition, some perceived difficulties with the texts can be clarified by reference to the local geography of the time. We note also that texts where the fullest landscape descriptions occur are generally assumed to have a fictional component and perhaps relied on their realistic setting for their credibility.

In this work we provide a context for the examination of selected texts by reviewing the geological and geographical evidence for landscape changes over the past 12,000 years since the last ice age. These lines of evidence include, detailed borehole records from Lake Yoa in Chad (Kröpelin *et al.* 2008), borehole studies by Stanley & Warne (1993) and geoarchaeological evidence collected by the Survey of Memphis (Jeffreys & Bunbury 2005).

The Memphite floodplain has been explored by the Survey of Memphis who have made around 140 borehole records during the period 1985–2009 that reveal the past geomorphology. The interpretation of satellite imagery (Lutley & Bunbury 2008; Hillier *et al.* 2007) and topographic maps also reveals the geometry of the changing floodplain and a model for the direction and rate of river migration. Typically for this part of the Nile, the bends migrate outwards and downstream with the channel migrating at a rate of around 2 km per millennium. Thus, since our earliest text from the Middle Kingdom, channels could have crossed the floodplain from one side to the other. Combining this evidence with that from the boreholes we can construct a map of these past landscapes and their waterways.

By focusing on texts that describe the Memphis area, the site of an important scribal school, through time we are able to compare the way in which the rapidly changing landscape is described by the texts and by the sediments.

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Figure 1. *Map of Egypt showing the principle locations mentioned in the text in relation to the Nile.*

River overview

A number of studies of the Nile Valley (Said 1993; Stanley & Warne 1993) have revealed that much of the geographic development of the delta and thus northern end of the Nile Valley has been controlled by climate changes since the end of the last ice age. Hence, global temperature rise melted the ice-caps causing sea level to rise and, at the same time, increased rainfall in the catchment area of the Blue Nile (Woodward *et al.* 2007). Rising sea level and increasing rainfall in the catchment area both push the river towards the production of more distributaries and will also push the point at which the river starts to divide inland. Classical geographic models of deltas show that after inundation they gradually grow again and hence, in antiquity, Egypt would still have been considerably more marshy than it is today. Work by Stanley & Warne (1993) shows that the number of distributaries reached a maximum around 6000 years ago and since then has gradually declined. Their observation may receive corroboration in the report of Herodotus (*c.* 440 BC) that 'in the time of Min the whole of Egypt, except for the Thebaïd province was a marsh'.

> ... I have only their word for the fact that the first man to rule over Egypt was Min. In his time, the whole of Egypt, except for the Thebaïd province, was a marsh and the whole present country below the lake of Moeris (which is a seven day sail up the river from the sea) was under water.
>
> (Herodotus *c.* 440 BC, trans. Waterfield 2008)

An additional factor noted by Stanley & Warne (1993) is that as a result of tectonic activity, the delta has tilted towards the northeast which has reduced the importance of the western branches of the delta and increased those to the east. The work of Fairbanks (1989) reveals that the end of the last ice age resulted in a global sea-level rise of 120 m, which would have driven the head of the delta considerably inland of its current position. Taking the current floodplain gradient of approximately 1 m per km the sea-level rise could potentially produce 120 km of flooding inland. After this period of inundation, perhaps the same as that whose end is referred to by Herodotus (Herodotus *c.* 400 BC), sediment build-up from the Nile would cause the delta to expand northwards again with the delta also migrating northwards. The precise location of the most southerly displacement of the head of the delta remains to be determined but we can assume that, with time, it has been broadly migrating northwards to its current position. Recent unpublished work by David Dufton (pers. comm.) suggests that the valley of the Bahr Libeini can be traced as far as Maidum and the entrance to the Faiyum and this may reflect the division of the delta at this point at an earlier time.

The map view

There has been a great deal of interest in interpreting muds and sands in the Nile Valley. From these sediments retrieved from a vertical borehole, we can read a detailed landscape history of a point in the valley but, without a regional context, little sense can be made of how this history relates to the rest of the region. Fortunately, agricultural and land-use patterns seem to have been persistent over much of Egyptian history until the dawn of the twentieth century (Willcocks 1889; 1904; Lyons 1906). Hence from maps and satellite images, we can define the geometry of landscape change (Hillier *et al.* 2007; Lutley & Bunbury 2008) while individual sections or boreholes provide time constraints for this developing geometry. Observations of Kom Firin (Spencer 2007), Memphis (Jeffreys 1985), Karnak (Bunbury *et al.* 2008; Graham & Bunbury 2005) and Giza (Bunbury *et al.* 2009) suggest a remarkably consistent set of patterns in the Nile Valley and delta with channel migration occurring due to meandering of the river around the outer part of a bend (oxbow-lake formation is a rar-

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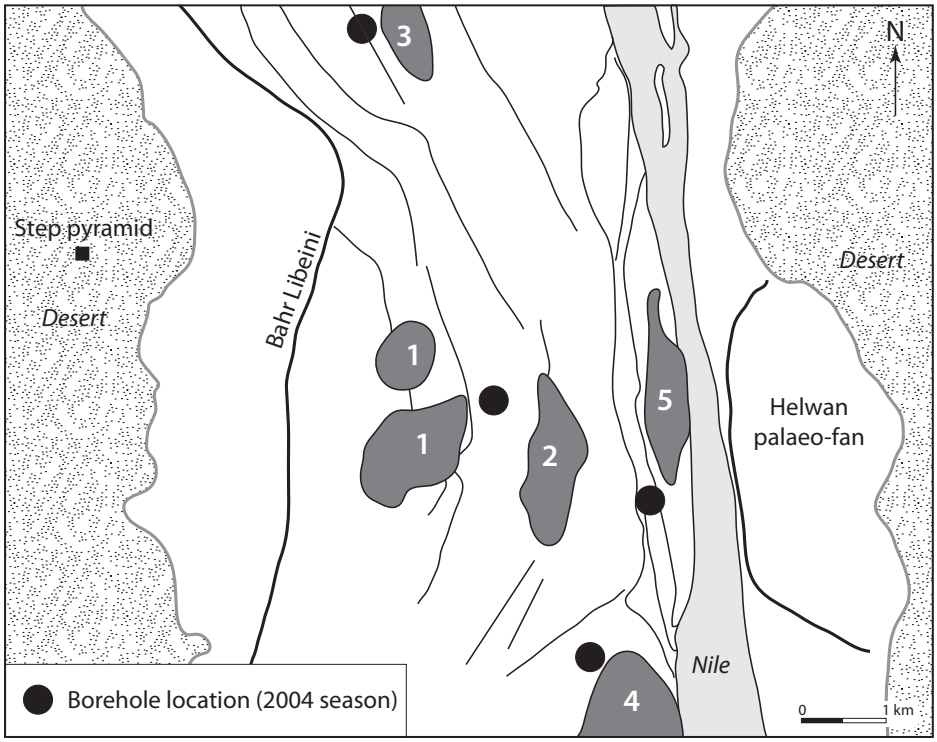


Figure 2. *Map of islands in the Memphite floodplain in order of appearance: 1) Memphis; 2) Bedrashein; 3) Tammuah; 4) Tarfaya; and 5) Gazirat Badrshein. Narrow lines show features including hod boundaries, tracks, roads and waterways that preserve the geometry of ancient waterways.*

ity). Bends are commonly associated with sandbars that form islands and these islands frequently form the nucleus of new settlements. A good example is Tarfaya, just south of Memphis, which formed during the nineteenth century (Jeffreys 2010, 87).

Wherever the river crosses the floodplain, it erodes the sediments that were previously there and deposits new material. The unbroken lines on the map show the orientation of features known to be related to river movements such as tracks and field boundaries and define the geometry of migration. The existence of a western channel is supported by a Ptolemaic papyrus dealing with flood-dyke preparations (Thompson 1988) which describes a waterway with its own quay on the west side of the city at that time. Since the channel identified to the west of Memphis cannot have crossed the part of the valley that still has the earlier turtleback sands, we can infer a second channel to the east of Memphis possibly branching from the Libeini further to the south. The western channel must have declined in size and was eventually formalized by a canal, the Bahr Libeini. The Bahr Libeini was also recently called the Bahr Yusuf, as further south and known at other times as *Bahet* and *Phkhet*. It was replaced in the twentieth century by a new canal, the Muhit or Mariyutiya. On the other side of Memphis, the eastern channel was at its furthest west during the New Kingdom (Jeffreys 1996). Later, after a period of easterly migration, a harbour wall and nilometer were built (Jeffreys 1985) and since this time the river has migrated to the far east of the valley.

The sub-surface sediments recorded in a series of boreholes undertaken by the Survey of Memphis (interim reports in *Journal of Egyptian Archaeology* 73 (1987) to present) have been interpreted on the map in Figure 3. The cores show that the settlement was founded on coarse sands in the area shown as island 1 in Figure 2. To the west, fining-upwards, river sands containing pottery demonstrate that there was a river channel to the west of the Memphite island. Although Bunbury *et al.*(2008) were able to constrain the ages of waterways at Karnak from abundant inclusions, in the case of Memphis there was no satisfactory dating evidence from the inclusions in the cores. However, the Survey of Memphis (Jeffreys 1985) described an Old Kingdom mound near to this location and to the west of the Mit Rahina ruin field from which we argue that the river cannot have crossed after the Old

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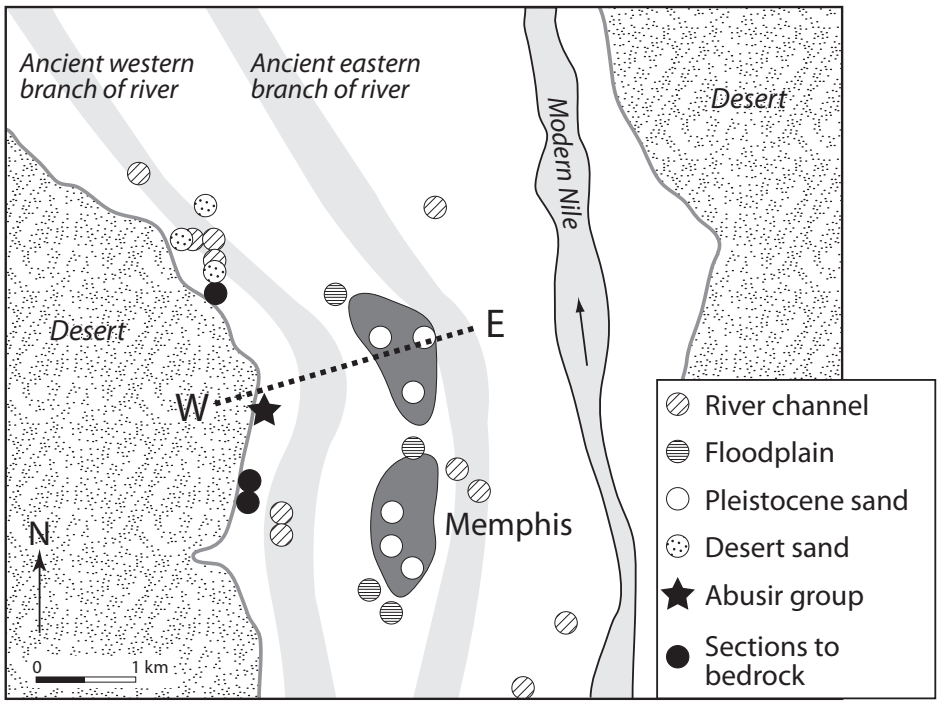


Figure 3. *Map of the Nile Valley in the Mit Rahina (Ancient Memphis) area showing representative cores of the Survey of Memphis and their interpretation. Two branches of the Nile can be identified, both of which have migrated eastwards through time. A more detailed view of the river position with time is provided in Figure 5.*

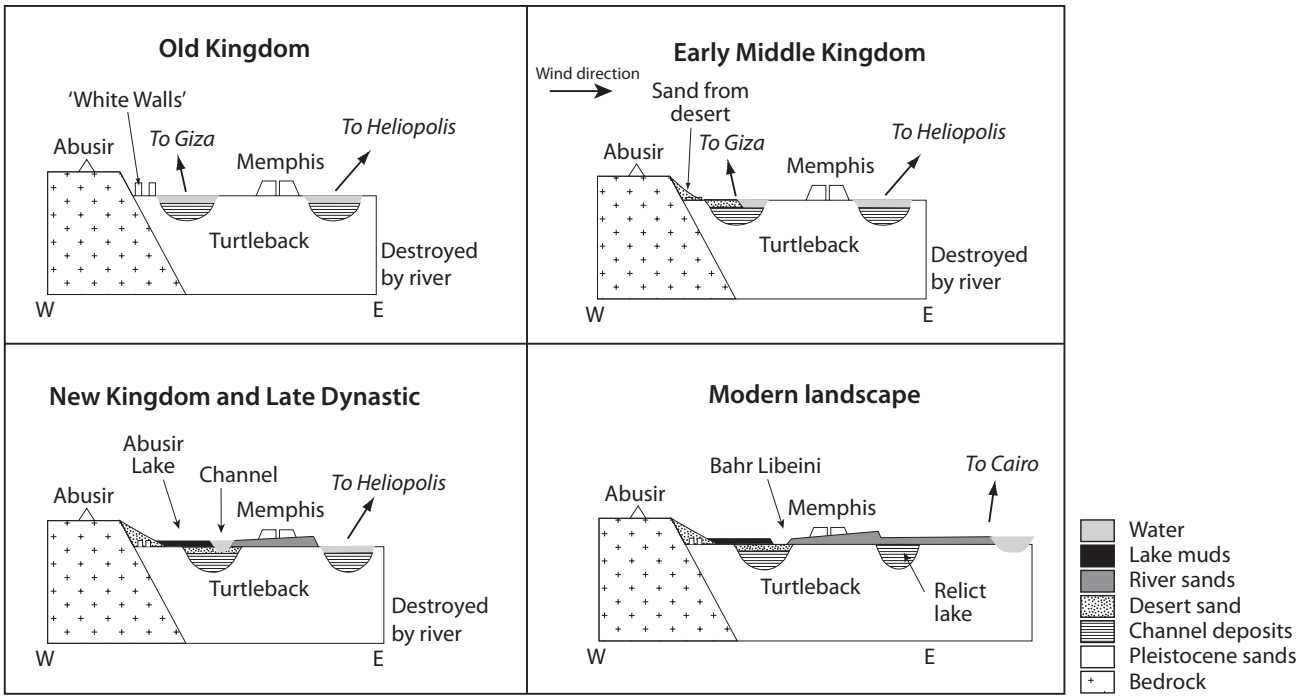


Figure 4. *Time sequence of sections for the Old Kingdom, Early Middle Kingdom, New Kingdom and Late Dynastic and the modern landscapes, showing a summary of the sediments encountered in boreholes of the Survey of Memphis and their interpretation in terms of two channels migrating around the Pleistocene sand mound (turtleback) of Memphis.*

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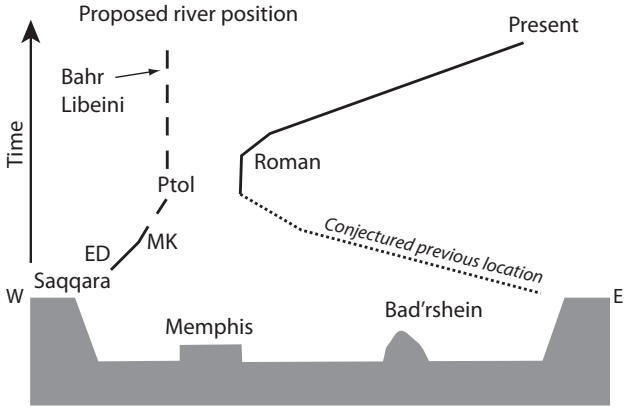


Figure 5. *Diagram (not to scale) to indicate the locations of the two branches with time. ED = Early Dynastic; MK = Middle Kingdom. Solid lines indicate the river positions deduced from the data, dashed lines the maintained course of the Bahr Libeini and the dotted line the inferred position in the past although the sediments from this period have now been eroded by the Nile.*

Kingdom without eroding the kom. A river channel, probably the downstream extension of this western channel has also been tracked to the north at Giza in the early Old Kingdom (Lutley & Bunbury 2008; Bunbury *et al.* 2009), which may be an extension of this channel northwards. Sands in the Dashur area (Nicole Alexanian pers. comm.), Abusir area (interim reports in *Journal of Egyptian Archaeology*) and at Abu Rawash to the north (Jones 1995) demonstrate that Early Dynastic and Old Kingdom settlement in the region was covered by 3 m (or more) of desert wind-blown sands, and it is likely that the neighbouring western channel became silted at this time. The deposition of wind-blown sand may be linked to the period of desertification of the Sahara (also described from Lake Yoa in Chad by Kröpelin *et al.* 2008). While the desertification recorded in Lake Yoa occurs between around 3750 and 2750 bp, work by Bunbury (2010) suggests that in the Memphis area this change was taking place some 800 years earlier.

Since the western branch of the river at Memphis was near the source of the sand, its flow would have been further reduced, with the production of a number of sand banks silting up the river, particularly if this were a time of low Niles. This process would also generate a greater flow in the eastern branch of the river.

The borehole and geometric evidence can be combined to produce the time series of schematic sections in Figure 4. Thus the Early Dynastic settlement at Abusir is on a narrow strip of floodplain between the ancient western branch of the Nile and the desert edge. With time, tilting of the floodplain due to tectonic activity (Stanley & Warne 1993) and then Late Old Kingdom sand incursion from the west lead to silting of this channel and the increased importance of the eastern branch. The eastern branch has now moved right across the valley destroying the counterpart record of this one until it is now at the extreme eastern edge of the Nile floodplain. Although the sedimentary record of a westerly transit of the eastern channel has now been removed by the river, a corollary of its current eastward track is that it was previously moving westwards. These river movements are reconstructed in the diagram in Figure 5, which shows the movements of the two branches of the river plotted against time. A significant change in the land-use pattern in the late Old Kingdom is that pyramid locations stabilize at the end of the fifth dynasty: from the time of Unis they are all found in the Saqqara area, and the corresponding stretch of floodplain becomes the core site of later dynastic Memphis. It is no coincidence that the very name Memphis (*Mennefer*) derives from the name of Pepi I's pyramid at south Saqqara.

Texts in context

The changing landscape of the Memphite floodplain is the setting for texts from the Middle Kingdom onwards. Although many make oblique references to the landscape ('Hymn to the Nile' or 'On the Memphis Ferry both from Foster (2001)) in this area, we have focused here on three texts that have more explicit landscape descriptions. These are: the *Tale of Sinuhe*, *The Prophecy of Neferti* and the Stela of Piye (Piankhi).

The view from the texts

The *Tale of Sinuhe* is thought to be a 12th Dynasty composition (1985–1773 BC) about the flight of the eponymous royal retainer who, fearing a palace coup, flees into exile. The route that the main protagonist, Sinuhe, takes is described in some detail although the translations of some of the symbols are problematic. A translation of the relevant part of the text appears below.

> But the royal sons who had been with him on this expedition had also been sent for. One of them was summoned while I was standing there. I heard his voice, as he spoke, while I was in the near distance. My heart fluttered, my arms spread out, a trembling befell all my limbs. I removed myself in leaps, to seek a hiding place. I put myself between two bushes, so as to leave the road to its traveller.
>
> I set out southward. I did not plan to go to the residence. I believed there would be turmoil and did not

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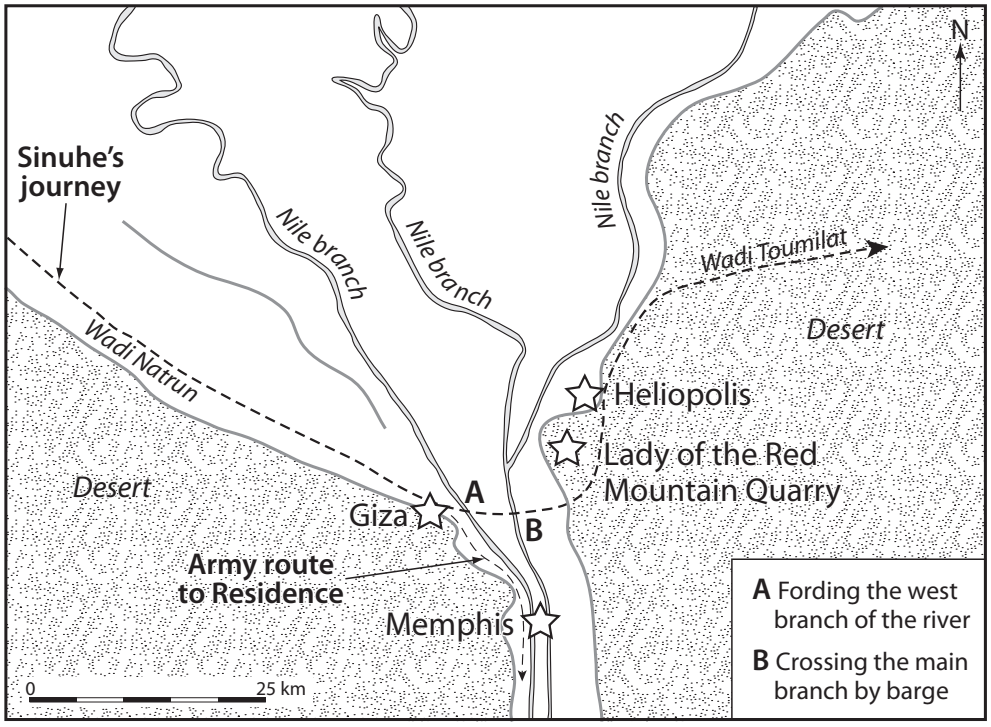


Figure 6. *Map of the Southern Delta and Giza-Memphis area showing Sinuhe's journey interpreted in the light of sedimentological evidence collected by the Survey of Memphis.*

> expect to survive it. I crossed Maaty near Sycamore; I reached Isle-of-Snefru. I spent the day there at the edge of the cultivation. Departing at dawn I encountered a man who stood on the road. He saluted me while I was afraid of him. At dinner time I reached 'Cattle-Quay.' I crossed in a barge without a rudder, by the force of the westwind. I passed to the east of the quarry, at the height of 'Mistress of the Red Mountain'. Then I made my way northward. I reached the 'Walls of the Ruler', which were made to repel the Asiatics and to crush the Sand-farers. I crouched in a bush for fear of being seen by the guard on duty upon the wall.
>
> I set out at night. At dawn I reached Peten. I halted at 'Isle-of-Kem-Wer'. An attack of thirst overtook me; I was parched, my throat burned. I said, 'This is the taste of death'. I raised my heart and collected myself when I heard the lowing sound of cattle and saw Asiatics. One of their leaders, who had been in Egypt, recognized me. He gave me water and boiled milk for me. I went with him to his tribe. What they did for me was good. (Lichtheim 1973)

Goedicke (1957) explored in detail the route taken by Sinuhe in the setting of our contemporary landscape and proposed that, initially, Sinuhe is travelling down the Western Edge of the Nile Valley and that he crosses to the 'Lady of the Red Mountain', a landmark cliff feature (Gebel al-Ahmar) to the northeast of modern Cairo. However, between these two points, Sinuhe seems to cross two bodies of water, rather than a single one, and from this Goedicke concluded that the landscape has metaphorical components and amends his translation in two ways to remove the anomalies.

The principle difficulty is with the location known as 'Isle-of-Snefru' and Goedicke points out that there is no known island in this area. To remove this difficulty, Goedicke interprets the original text as a copyist's error replacing the symbol for 'fortified enclosure' with the symbol for 'island'. However, using our reconstructed landscapes resulting from the Survey of Memphis borehole data set, we can remove the apparent difficulty in another way. Our reading of the borehole evidence (Fig. 5) suggests that at that time, there were two branches of the Nile; a sanded-up branch later to become the Bahr Libeini and a more vigorous channel to the east of Memphis. In this interpretation, the body of water crossed to reach the Isle-of-Snefru was known as the Maaty. While there are a number of versions of Maaty and a variety of possible translations, they include meanings related to multiple banks of the river or possibly areas of arable land (Katherina Zinn pers. comm.).

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The difficulties in translation are thus removed since the western branch, apparently known as the Maaty, was shallow and could probably be forded, particularly in the spring (Goedicke 1957) when the waters were low. Having forded the Maaty, Sinuhe found himself on the island in the Nile, known as the 'Isle of Snefru', and could proceed to Cattle Quay to cross the main branch with the aid of the west wind and the rudderless barge.

Our interpretation also removes another fantastical component of the story, since a journey of 20 km in one day to 'the residence' (thought to have been at Dahshur) is a long walk for someone terrified of detection and prone to 'crouching in bushes'. If Sinuhe travels as far south as Dahshur before he reaches 'Cattle-Quay' and then travels downstream to make a landfall at Gebel al-Ahmar he would have had a journey of around 10 km in his rudderless barge. Given the assistance of the west wind, 15 km seems a long way to travel downstream if the river along this stretch is only typically 500 m wide. Our interpretation of the journey reduces the length of Sinuhe's downstream journey significantly.

This part of the Sinuhe story is thus set in a landscape where Memphis lies on a portion of land between two branches of the river. The more westerly of the two branches is a minor one that, by the New Kingdom, seems to have become very minor and is extant today as the Bahr Libeini. The eastern branch evolved to become the Nile as we know it today.

Moving delta-head and the location of Itj-Tawi

The recognition that the delta head was south of the long-standing site of Memphis at this time throws light on the meaning and location of the place *Itj-Tawy* (two lands) as the head of the delta, and thus the traditional boundary between the two geographical areas and the two political states. The presence of the 12th Dynasty pyramid of Senusret I, known as *Sn.wsr.t ptr.i t3.wy* ('Senusret beholds the two lands') at Lisht (Arnold 1988; Lehner 1997), may provide textual evidence for the location of the delta head during the 12th Dynasty. The relocation of the seat of power to the south, closer to the important local power centre of Herakleopolis and to the strategically important delta head, may reflect the foreign threat from the Hyksos and their invasion of the delta as described in the Prophecy of Neferti. From a geographical point of view the western channel would have progressively less water in it as the floodplain tilted and the flow was diverted into the eastern branch, the minor channel that Sinuhe's story describes as the 'Maaty' would be a very stable channel, being smaller than the channel that constructed its river levees. Pro-gradation of the delta also forces the delta head northwards with time as it must have done for it to be now to the north of Memphis. Perhaps some of the ambiguity in the location of *Itj-Tawy* is a result of its having moved systematically northwards as the delta recovered from the dramatic sea-level rise at the end of the last glacial maximum (Fairbanks 1989).

Prophecy of Neferti

The prophecy of Neferti was probably written with hindsight during the time of Amenemhat I (*c.* 1985–1956 BC), the father of Senusret, as a justification for his kingship. It purports to be a prophecy delivered during the time of Snefru (*c.* 2613–2589 BC of the 4th Dynasty, Old Kingdom).

> I shall describe what is before me,
> I do not foretell what does not come:
> Dry is the river of Egypt,
> One crosses the water on foot;
> One seeks water for ships to sail on,
> Its course having turned to shoreland.
> Southwind will combat northwind,
> Sky will lack the single wind.
>
> A strange bird will breed in the Delta marsh,
> Having made its nest beside the people, …
>
> (Tr. Lichtheim 1973)

The text describes the 'river of Egypt' as dry with men crossing on foot — an event often related to the low Niles of the First Intermediate Period that has been cited as the source of much of the later pessimism literature, which has similar themes. The composition reflects the use of literary devices with the 'south wind opposing the north wind'. However, the results of Kröpelin *et al.* (2008) demonstrate from the appearance of Mediterranean pollen material in Lake Yoa, Chad, that the northwest trade winds that blow in Egypt today were not fully established until around 2700 bp. The description of the river as being dry is also of interest. In geographical terms it appears to describe the river at low water and with perhaps abundant sediment clogging the channel. The addition of sand to the river would change the hydrology and produce an increase in the number of islands and sandbanks until the excess sediment had been removed.

Further north, in the delta, the tilting of the land would also have the effect of making formerly wet land in the western delta dry and formerly dry land in the eastern delta wet with salt marsh. These landscape changes may have been factors in the occupation of the delta by the Asiatics (with whom the strange bird

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is equated by Lichtheim 1973) who took advantage of the confusion of the Egyptians. It is also possible that the 'strange bird' arriving in the marsh may have been a true bird that arrived to make use of the food source represented by the new salt marshes. Following recent reconstructions of the deltaic geography (Butzer 2002; Stanley & Warne 1993) the eastern branches, and sites along them, would also be closer to the open sea and vital maritime routes to the Levant.

Siege of Memphis from the Victory Stele of Piye

The Victory Stele of Piye (Piankhi) is dated to a later period (747–716 BC, Third Intermediate Period). By this time, our reconstructions suggest that the eastern channel had become the main Nile channel and that the western branch (the former Maaty) was smaller and perhaps used as a harbour in Ptolemaic times (Thompson 1988). The waterway was eventually formalized as the canal now called the Bahr Libeini. In the text, Piye, unsatisfied with the performance of his army dispatched to subdue the north, leads his own campaign. The season is one of high water, since Piye participates in the 'Feast of Opet', which is held during the inundation when the water level was high, on his way to join battle.

> First month of the first season, day 9, his majesty went north to Thebes. He performed the feast of Amun at the feast of Ipet. His majesty sailed north…

By the time Piye arrives the town is fortified and the defenders have concluded that the city is impregnable from the eastern waterfront. First the Chief of Sais arrives with troops to defend the town and then travels away north by horse and not by carriage (probably another indicator of the wet season).

> 'Look Memphis is filled with troops of all the best to Lower Egypt, with barley, emmer, and all kinds of grain, the granaries are overflowing; with weapons [of war] of all kinds. A rampart [surrounds it]. A great battlement has been built, a work of skilled craftsmanship. The river surrounds its east side; one cannot fight there. The stables here are filled with oxen; the storehouse is furnished with everything: silver, gold, copper, clothing, incense, honey, resin. I shall go to give gifts to the chiefs of Lower Egypt. I shall open their nomes to them. I shall be _ _ _, [in a few] days shall return.' He mounted his horse for he did not trust his chariot, and he went forth in fear of his majesty.
>
> At dawn of the next day his majesty arrived at Memphis. When he had moored on its north, he found the water risen to the walls and ships moored at [the houses of] Memphis. His majesty saw that it was manned in strength. No way of attacking it was found. Every man of his majesty's army had his say about some plan of attack. Some said: 'Let us blockade (91) ---, for its troops are numerous.' Other said: 'Make a causeway to it, so that we raise the ground to its walls for it. You should divide it this on each of its sides with ramparts and [a causeway] on its north, so as to raise the ground to its wall, so that we find a way for our feet.'
>
> …
>
> Then he sent his fleet and his troops to attack the harbour or Memphis. They brought his every ship, every ferry, every *shry*-boat, all the many ships that were moored in the harbour of Memphis, with a bow-rope fastened to its houses. (95) [There was not] a common soldier who wept among all the troops of his majesty. His majesty himself came to line up the many ships.
>
> His majesty commanded his troops: 'Forward against it! Mount the walls! Enter the houses over the river! When one of you enters the wall, no one shall stand in his vicinity, no troops shall repulse you! To pause is vile. We have sealed Upper Egypt: We shall bring Lower Egypt to port. We shall sit down in Balance-of the-Two-Lands!' (all excerpts of the text after Lichtheim 1980)

The most likely location for the harbour of Memphis is where there is now an area of low ground to the north of the city of Memphis and to the east of Kom Tuman (29°51'35.66"N, 31°15'34.77"E), where the Roman wall identified by Hekekyan (Jeffreys 1985) turns to the northwest. Combined, this evidence suggests that the harbour was to the north (downstream) of the main settlement, and in an area of slack water in the lee of the city mound of Memphis. Such a situation would allow boats to be moored bows to as the text describes. The stele goes on to describe how Piye's men cut the boats out of the harbour and Piye himself then lined them up ready to storm the eastern waterfront.

A borehole core just in front of this wall contained thin (50 cm–1 m) sandy deposits containing pottery (core 116) typical of a waterfront and of the type seen at the waterfront at Karnak (Bunbury *et al.* 2008). However, the area of low ground to the east of Aziziya was sampled by core 114 that contains silts, sands and clays with no pottery, suggesting that this area was further from the waterfront.

The Survey of Memphis (Jeffreys & Bunbury 2005) core 2004/04 bored sherd-bearing sand to a depth of 7.5 m. The pottery retrieved included material from the New Kingdom or later (Janine Bourriau pers. comm.) and thus places the Nile channel at this location at a time that agrees with the Stela of Piye. Between the surface and 2 m were a unit of stiff clay that also contained decayed pottery and gastropod shells that are interpreted as the remains of a body of still water. The Stela of Apries (early sixth century

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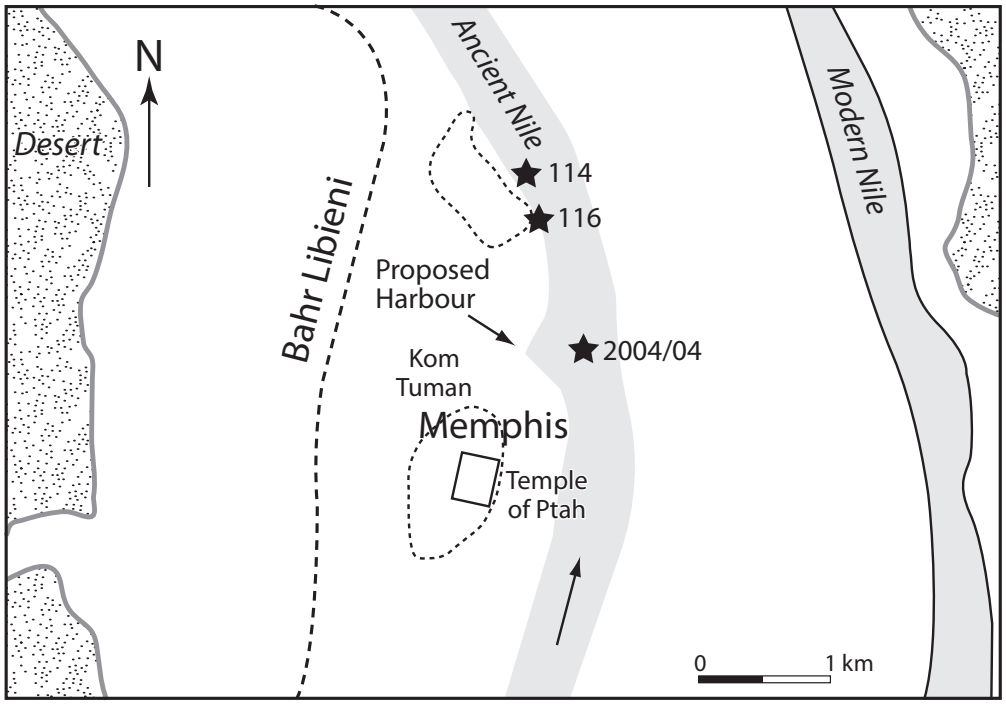


Figure 7. *Reconstruction of the Memphis area in the time of Piye (*c. *730* BC*) showing the extent of the Pleistocene sands (dotted lines), the course of the Bahr Libeini, the course of the Ancient Nile in Piye's time and the modern course of the Nile. Numbers indicate core numbers from the Survey of Memphis.*

BC), found at Memphis, describes an area 'between the waterways' (Gunn 1927) that may correspond to this wet region and, by the time we reach the more relied-upon witnesses, such as Strabo we also hear of a 'lake' and a 'grove' (Strabo *c.* 440 BC)

Discussion

We conducted a landscape analysis of the Memphite floodplain and surrounding area using satellite imagery, maps, boreholes and archaeological evidence. We examined three texts from different periods that referred to the landscape of Memphis and the delta and see that, in the case of the fictitious *Tale of Sinuhe*, a more literal interpretation of the text can be made than was previously thought. In another case, that of the Victory Stele of Piye, consideration of the text in its landscape context helps to clarify some of the details of the siege. On a broader scale, references to the delta environment by the informants of Herodotus and in the *Prophecy of Neferti* echo some of the longer timescale processes related to global climate change, such as the drying of the Sahara, inundation and tilting of the delta.

The reconstruction of a western channel, apparently known as the Maaty (from the landscape study and the *Tale of Sinuhe*), seems to indicate a channel that passed from the delta head between Saqqara and Memphis, on past the ancient sites of Abusir and the pyramids at Giza and hence a connection between the important sites of the Early Dynastic and Old Kingdom 'golden age'. The name of this channel has been the subject of some debate and it appears in a number of forms. Some texts suggest that it should be interpreted as the dual form of river-bank while in other redactions, the use of the determinative '2 feathers' is indicative of the 'revered dead' past which, perhaps the river flows in the Giza area. The root form of the river's name Maa(t) also implies 'truth' or 'stability' a shade that may not have been lost on the dwellers along its banks since this waning channel, although with reduced water-supply would have migrated slowly, if at all.

At this time, the western branch of the river, the waning Maaty, would also be prone to silting resulting from tectonic tilting of the floodplain diverting the water towards the eastern branch, particularly with the additional sand input resulting from desertification. The result of the drying of the Maaty was the abandonment of formerly important sites at Giza, Saqqara and Abusir. The abandonment of the sites at Abusir is particularly evident from the boreholes where the early pottery-rich deposits are overlain by

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desert sand and then mud without sherds. The settlement at Memphis was fortunately founded between the two branches of the river and survived (as is reflected in the Victory Stele of Piye) by migrating eastwards and southwards towards the remaining river branch that subsequently became the modern Nile.

Our results also suggest that toponyms such as *Itj-tawi* may be difficult to locate in a specific place as a result of their having moved with time.

Conclusion

Although ancient literary sources have often been thought to be unreliable, a re-examination of the Memphite floodplain in the light of the ancient landscapes identified from borehole records and satellite images shows that this small sample literature is more literal than previously thought. Indeed it seems only natural that narratives involving the Nile and its environs should betray a close observation of, and familiarity with, riverine conditions. The question should perhaps be not whether the authors of these accounts slipped readily into some kind of mythic mode, but whether it is credible that, living daily, yearly and indeed in the much longer term with the river, they and their audience were not acutely aware of its behaviour.

We have little in the way of specific reference to the Nile as a primary topic, but that is perhaps to be expected: it was an ever-present phenomenon rooted in the collective consciousness: the Nile — both in flood and in 'repose' — was deified, but paradoxically the kind of detailed information that would be so valuable to us today was thought unnecessary to include at the time. We might contrast though the rich and detailed vocabulary used at all times, in Egyptian and Arabic, for different parts of the floodplain, some of them only imperfectly understood today, which relate to physical properties, economic return, local landscape peculiarities, and cult association, and the extremely detailed descriptive terms for different soil types.

Future work

The literary canon, accessible in translation to the geologist, is generally limited to popular texts, often stories that were frequently re-told and, in the case of Memphis, re-copied by student scribes. Conversely, the mysteries of mud and the translation of the palimpsest of the Nile floodplain are not always included in the training of the Egyptologist. We hope that future collaboration on the translation of texts referring to landscape will lead to a clearer understanding of both the literature and the landscape.

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References

Arnold, D., 1988. *The South Cemeteries of Lisht*, vol. I: *The Pyramid of Senwosret I.* New York (NY): Metropolitan Museum of Art.

Bunbury, J.M., 2010. The development of the River Nile and the Egyptian Civilization: a Water Historical Perspective with Focus on the First Intermediate Period in *History of Water, A: Rivers and Society — From the Birth of Agriculture to Modern Times,* series 2, vol. 2, eds. T. Tvedt & R. Coopey. London: IB Taurus, 50–69.

Bunbury, J.M., A. Graham & M.A. Hunter, 2008. Stratigraphic landscape analysis: charting the Holocene movements of the Nile at Karnak through ancient Egyptian time. *Geoarchaeology* 23, 351–73.

Bunbury, J.M., K. Lutley & A. Graham, 2009. Giza geomorphological report, in *Giza Plateau Mapping Project Seasons 2006–2007: Preliminary Report*, eds. M. Kamel, M. Lehner & A. Tavares. (Giza Occasional Papers 3.) Boston (MA): Ancient Egypt Research Associates, 158–65.

Butzer, K.R., 2002. Geoarchaeological implications of recent research in the Nile Delta, in *Egypt and the Levant Interrelations from the 4th through the early Third Millennium* BCE, eds. E.C.M. van den Brink & T.E. Levy. Leicester: Leicester University Press, 83–97.

Fairbanks, R.G., 1989. A 17,000-year glacio-eustatic sea level record: influence of glacial melting rates on the Younger Dryas event and deep-ocean circulation. *Nature* 342, 637–42.

https://doi.org/10.1017/S0959774311000047 Published online by Cambridge University Press

Foster, J.L. (trans.), 2001. *Ancient Egyptian Literature: an Anthology*. Austin (TX): University of Texas Press.
Goedicke, H., 1957. The route of Sinuhe's flight. *Journal of Egyptian Archaeology* 43, 77–85.
Graham, A. & J.M. Bunbury, 2005. The ancient landscapes and waterscapes of Karnak. *Egyptian Archaeology* 27, 17–19.
Gunn, B., 1927. The stela of Apries at Mitrahina. *Annales du Service des Antiquités de l'Egypte* 27, 211–37.
Herodotus, *c.* 440 BC [2008]. Histories Book II, in *Herodotus the Histories,* trans. R. Waterfield. Oxford: Oxford University Press.
Hillier, J.K., J.M. Bunbury & A. Graham, 2007. Monuments on a migrating Nile. *Journal of Archaeological Science* 34, 1011–15.
Jeffreys, D.G., 1985. *The Survey of Memphis*, vol. I: *The Archaeological Report.* London: Egypt Exploration Society.
Jeffreys, D.G., 1996. House, palace and islands at Memphis, in *Haus und Palast im alten Ägypten,* ed. M. Bietak. Vienna: Verlag der österreichischen Akademie der Wissenschaften, 287–94.
Jeffreys, D.G., 2010. *The Survey of Memphis VII: The Hekekyan Papers and Other Sources for the Survey of Memphis.* London: Egypt Exploration Society.
Jeffreys, D.G. & J. Bunbury, 2005. Fieldwork, 2004–05: Memphis, 2004. *Journal of Egyptian Archaeology* 91, 8–12.
Jones, M., 1995. A new Old Kingdom settlement near Ausim: report of the archaeological discoveries made in the Barakat Drain improvement project. *Mitteilungen des Deutschen Archäologischen Instituts Abteilung, Kairo* 51, 85–98.
Kröpelin, S., D. Verschuren, A.-M. Lézine *et al.*, 2008. Climate-driven ecosystem succession in the Sahara: the past 6000 years. *Science* 320, 765–8.
Lehner, M., 1997. *The Complete Pyramids.* London: Thames and Hudson.
Lichtheim, M., 1973. *Ancient Egyptian Literature*, vol. I: *The Old and Middle Kingdoms.* Berkeley (CA): University of California Press.
Lichtheim, M., 1980. *Ancient Egyptian Literature*, vol. III: *The Late Period.* Berkeley (CA): University of California Press.
Lutley, K. & J. Bunbury, 2008. The Nile on the move. *Egyptian Archaeology* 32, 3–5.
Lyons, H.G., 1906. *The Physiography of the River Nile and its Basin.* Cairo: Egypt. Mas.lah.at at-A-tha-r. Survey Department.
Said, R., 1993. *The River Nile: Geology, Hydrology and Utilization.* Oxford: Pergamon.
Spencer, N., 2007. Kom Firin 2007 report at http://www.britishmuseum.org/research/research_projects/kom_firin,_egypt/project_reports.aspx
Stanley, D.J. & A.G. Warne, 1993. Nile Delta: recent geological evolution and human impact. *Science* 260, 628–34.
Strabo, *c.* 440 BC [1932]. Geography, Book 17, 32, trans. H.L. Jones. (Loeb Classical Library.) Cambridge (MA): Harvard University Press, 89.
Thompson, D.J., 1988. *Memphis under the Ptolemies.* Princeton (NJ): Princeton University Press.
Willcocks, W., 1889. *Egyptian Irrigation.* London: E. & F.N. Spon.
Willcocks, W., 1904. *The Nile in 1904.* London: E. & F.N. Spon.
Woodward, J.C., M.G. Macklin, M.D. Krom & M.A.J. Williams, 2007. The Nile: evolution, Quaternary river environments and material fluxes, in *Large Rivers: Geomorphology and Management*, ed. A. Gupta. Chichester: John Wiley & Sons, 261–92.

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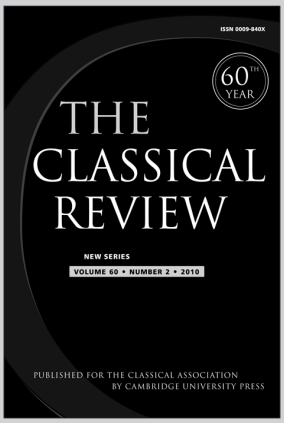
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