

4 Osiris and the Egyptian Civilisation of Inundation: The Pyramids, the Pharaohs and their Water World

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INTRODUCTION

The Great pyramid of Khufu (the world's largest and the last of the existing seven ancient wonders of the world), the pyramids of Khafren and Menkaure at Giza, Djoser's Step pyramid in Saqqara and Sneferu's Bent and Red pyramids in Dashur are all built close to the Nile in a desert landscape. The Nile was the artery of life in Egypt. The living King and Pharaoh was Horus, and when he died he became Osiris, the dead King of the Nether World. Osiris also appeared as the divine power immanent within the Nile, and particularly within the waters of the flood. The low Nile was the disappearance of the god and this was mourned, and the coming of the flood was Osiris' revitalisation and restoration. When the Nile's inundation took place the event was celebrated with great festivals. Hence, Osiris was both the King of the Nether World and the god of the life-giving inundation creating fertility. However, it was not water as such that was worshipped, but the inherent power of rejuvenation and recreation. Compared to other river civilisations, it is a striking and noteworthy fact that the Nile was not worshipped as a supreme deity, particularly since the whole of Egypt and all living there were dependent upon this life-giving water. In ancient Egypt, there have never been 'Nile gods' although the term has been used since it was introduced by Champollion in 1844 (Champollion 1844: 297–8). On the other hand, 'The crown prince, born a man, became Horus not before his father had become Osiris. Osiris and Horus were by their very nature the royal deceased father and his living royal son', and consequently, as Anthes argues, 'it was the king's transition from Horus into Osiris which confirmed his existence as an eternal being' (Anthes 1959: 175, 180).

Thus, through the funeral ceremonies the deceased King became Osiris – the God of the Nether World but also the divine and life-giving power in the Nile's inundation. The size of the pyramids testifies that this transformation was the most important one in the Egyptian civilisation, which involved the whole prosperity and wealth of Egypt and her inhabitants through a successful flood and harvest. The question is how these two aspects of Osiris relate to each other. Alan H. Gardiner formulated the main problem as early as 1915: 'What Egyptologists wish to know about Osiris beyond anything else is how and by what means he became associated with the process of vegetable life, if originally he was a king; if, on the other hand, he was originally a spirit of vegetation, how and by what means did he become connected to kingship?' (Gardiner 1915: 122).

Through a water perspective emphasising the Nile and the different physical characters of the water in the river one may address these questions from another perspective, and hence my aim is to analyse the ancient Egyptian civilisation by emphasising the annual inundation with implications for an understanding of the role and function of the Pharaohs and their mortuary cult. Or, in other words: how and why was the Nile religiously the most important event and rejuvenating power for the Pharaohs and Egypt when the river was not a 'Nile god'?

In order to pursue this approach, a hypothesis will be proposed: it was the actual character of the Nile, its seasonal fluctuations, changes in colours and physical properties, which literally was the source for the ancient Egyptian mythology and the constitution of their culture and cosmology. By using an inter-disciplinary approach combining archaeology, climate data/hydrology, and written sources/mythology with a particular emphasis on the river Nile itself, the aim is to illuminate the possibilities of a water-perspective as an entrance to new understandings of the past and, in this particular case, the ancient Egyptian civilisation.

A WATER PERSPECTIVE

My approach, although I am not an Egyptologist, is an archaeological, inter-disciplinary and comparative-water perspective, which is a continuity of previous cross-cultural and comparative studies of the roles death- and life-giving waters had in the constitution of society and cosmos in parts of Nepal, Bangladesh, India and the Indus valley in today's Pakistan (Oestigaard 2005a), together with comparative studies aiming to enhance the understanding of the role water plays in religion and the constitution of society in history

(Oestigaard 2003, 2005a, 2005b, 2009a, 2009b; Tvedt and Oestigaard 2006, 2010).

Water studies is an approach where water is a perspective but also the primary data in itself. In order to understand the role of water in societies it is necessary with an inter-disciplinary approach transcending disciplinary boundaries. As a perspective, this analysis will use already excavated archaeological material and the subsequent interpretations, paleobotanic or geoarchaeological and hydrological data, and written sources. Consequently, this will include a mixture of primary materials and syntheses, drawn from varying traditions of scholarship over about a century, which by nature will be of varying reliability, but still sources for re-interpretations and re-contextualisations.

As primary data, water and the River Nile are the main sources for interpretations. Osiris was intimately connected with the annual inundation. Given the premise that the overall hydrological parameters have not changed significantly since the Pharaonic times, although the changing qualities and characteristics of the Nile cannot be seen in Egypt today due to the Aswan Dam, the fluctuations of the flood which were fundamental for the ancient Egyptians are still visible in Sudan and Ethiopia. Importantly, which will be elaborated and also discussed by references to travellers and researchers by the early twentieth century, during the flood the Blue Nile was not blue, but red-brownish. When the flood started, the White Nile was not white, but green. These fundamental qualities and characteristics of the Nile, it will be argued as a hypothesis, were the basis for the Osiris mythology and in particular the red waters of the flood: they were mythologically the blood of the slain Osiris.

OSIRIS IN MYTHOLOGY

The evidences for the Osiris cult are both archaeological objects and written texts. When the Osiris cult started is uncertain, but it seems evident that it was widespread as early as the First Dynasty. When the record first unfolds in the early centuries of the Egyptian state it yields a single pantheon of gods (Quirke 1992: 73). Evidence for the Osiris-cult prior to the Unification is obscure, but Abydos was most likely its first centre (David 1981: 120). The cult of Osiris may have begun in or before the First Dynasty (c. 3000 BCE), but it was Sneferu in the Fourth Dynasty (2613–2494 BCE) who accepted the Osiris myth as a part of the royal dogma (Ricke 1950: 218ff.). Sneferu (2613–2589 BCE) was the father of Khufu (2589–2566 BCE) and the greatest pyramid builder throughout all times, and consequently,



Figure 1. Khufu's pyramid at Giza. Photograph: Terje Oestigaard.

when Khufu (Figure 1) ascended the throne as the King his father became Osiris. A unique source for an understanding of the Osiris cult and mythology is the *Pyramid Texts* (Faulkner 1969), which date to the Fifth and Sixth Dynasties, and the first of these spells were found inscribed on the walls of the inner chambers in the pyramid of Unas (2375–2345 BCE).

There are two myth-themes that relate to these facets of Osiris as a fertility god and as a deceased king (e.g. Hornblower 1937a, 1937b, 1941, 1945; Griffiths 1960; Darby et al. 1977a, 1977b). According to a central myth Seth drowned his brother Osiris in the Nile. Originally, Seth was a rain and storm god (Figure 2) – ‘a god of the blessed yet dangerous storms’ (Bell 1971: 24). That Seth murdered Osiris by drowning is evident in the classical sources, but also in the *Pyramid Texts*: ‘You [Isis] have come seeking your Brother Osiris, for his brother has thrown him down on his side in yonder side of Ghsty’ [Pyr. 972], ‘They have found Osiris, his brother Seth having him laid him low in Nedit...’ [Pyr. 1256] and ‘Osiris was laid low by his brother Seth, but He who is in Nedit moves, his head is raised by Re...’ [Pyr. 1500].

The drowning is generally related to his role both as the god of waters and as the ruler of the Nether World (e.g. Blackman 1924, 1925; Wagner 1967; Lindsay 1968; Antelme 1998). Osiris possessed



Figure 2. A rare occasion with rain and heavy wind in Egypt, which in ancient Egypt was believed to be work of Seth. Photograph: Terje Oestigaard.

generative powers as the personification of the falling and rising Nile. Osiris was the first who died, and his transfiguration through the inundation was the key to eternal life. As the god of arable land he was drowned with the soil in which he lived and worked. He was a dying god when the water decreased, and the sowing of grain was celebrated as his death or burial. The seed corn had to die in the earth to raise the crops, and it was from the Nether World, which was Osiris' realm, that life re-emerged (Figure 3). Regarding the resuscitation of Osiris there is another myth-theme linking the god to the divine kingdom. Seth struck down Osiris, but his son, Horus, killed Seth and gave his father the Solar Eye. Horus was identified with the rising sun and the solar complex, and the Solar Eye contained the rejuvenating powers which gave Osiris life (Frankfort 1948; see Oestigaard 2009b; Tvedt and Oestigaard 2010). Osiris personified natural vitality, but not a kind of general generative force which is present in all kinds of plants and animals. Osiris' power was both larger and more specialised; his power was connected to those forms of life which arose periodically from earth: the grain, the moon and the constellation Orion.

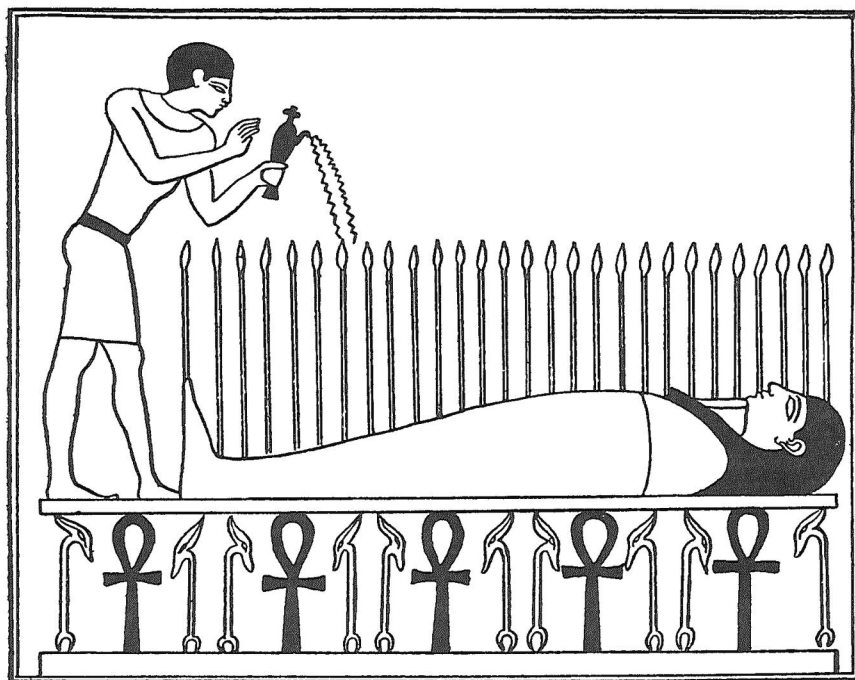


Figure 3. Osiris with wheat growing from his body. From Budge 1911: 58.

Osiris

was a dying god in so far as the decrease of the water in the Nile, and the sowing of the grain was celebrated as his death or burial. But the realm of death is precisely the sphere of Osiris' power, because it does not represent the antithesis of life but a phase through which all natural life passes to emerge reborn. The seed-corn must die in the earth to raise the crops, the Nile must dwindle in its bed to rise in the fertilizing flood, the moon must wane and even the sun sink each night in the west to enter the nether world. It is the nether world from which life re-emerges, which is Osiris' realm. (Frankfort 1958: 146)

According to the myth, Seth inflicted a wound on Osiris' leg from where the annual inundation poured out, and the leg was connected with Elephantine. In later versions of the myth Osiris' body was dismembered into 42 parts identical to the 42 nomes of Egypt, which symbolised the body of Osiris (Assmann 2005: 361), and Osiris is sometimes called 'the dismembered one' (Te Velde 1967: 5). The 42 districts were seen as the limbs of Osiris, and Egypt as his body. The

embalming ritual of Osiris included and applied the whole country and united, inspirited and renewed it (Mojsov 2005: 109).

The outcome of water and agriculture is successful harvests or in general terms; life in its widest sense. 'Osiris is manifest in the life-giving waters rising from earth when land and people need them most' (Frankfort 1948: 191). It was these immanent powers of procreation which were celebrated and venerated, and there was a close intimacy in Egypt between kingship and nature's generative forces (Frankfort 1948: 136). The power of the buried king was seen as breaking forth from the earth where he rested; the plants were sprouting, the Nile waters flooded the banks, and the moon and Orion were rising from the horizon (Frankfort 1948: 34). Osiris was killed but became rejuvenated and the most important identification and character of Osiris was the relation between water and death. He was buried in the Nile, but Osiris was also perceived as a personification of the Nile.

THE EYE AND THE EFFLUX

In Spell 943 in the *Coffin Texts* the refrain 'I have appeared as the Eye of Horus, the Eye of Horus has appeared as I' (Faulkner 2004) occurs several times, indicating that 'the Eye of Horus and the deceased could be regarded as interchangeable' (Faulkner 1982: 27). There is a very close relation between the Eye and the flood. The classical libation spell in Egyptian history is Spell 32 of the *Pyramid Texts* [Pyr. 22–3], which is attested a hundred times throughout all periods (Assmann 2005: 356–7), and emphasises this:

This your libation water, Osiris,
 this your libation water, O Wenis,
 has come out from your son,
 has come out from Horus.
 I have come to bring you the Eye of Horus,
 that your heart may be radiant by means of it.
 I have brought it beneath you, under your feet.
 Take the discharge that has issued from you,
 may your heart not be weary of it.¹

The spell is divided in three parts. The first stresses that the water comes from Horus, seemingly restoring and cementing the bond between father and son – Osiris and Horus. The second part calls the water the 'Eye of Horus', aiming to make the deceased's heart 'radiant' by restoring what has been lost during death. The third part

emphasises that the water is the discharge of the deceased himself, 'a reference to the deceased in his mythic role as Osiris. If the deceased is Osiris, then the water poured out to him has flowed out of himself as Osiris. The water symbolises life force as a life-fluid that has flowed out of the deceased and is restored to him by means of the libation' (Assmann 2005: 357). The libation aims to bring the dead the water which is the life-endowing substance, and in many tombs from the Old and Middle Kingdoms there have been made devices, which led the libation water offered in the cult room down into the sarcophagus chamber (Assmann 2005: 357). The above-quoted spell is immediately followed in the *Pyramid Texts* by another libation spell (Spell 33, [Pyr. 24–5]) where the water unites the dead with the gods (Assmann 2005: 357–8):

Osiris Wenis, take your libation!
 May it be cool for you with Horus
 in your name 'He-who-came-from-the-cool-place.'
 Take the discharge that issued from you.
 Horus has caused the gods assemble for you
 at the place to which you have gone.
 Horus has caused the Sons of Horus to gather for you
 at the place where you were drowned.
 Osiris Wenis, take your incense, that you may become divine,
 for Nut has cause that you be divine
 for your enemy in your name of 'God'.
 Horus the rejuvenated has recognized you
 in your name 'Rejuvenated-water.'²

Thus, it is a cyclic water-world where the libation is the life-substance which originates from and returns to the gods and, consequently, the Pharaoh. 'Divine bodily secretions of the gods, tears and sweat specifically, were then consumed by other gods and literally became *self-sustaining* substances. The god ate themselves' (Meskell and Joyce 2003: 95). The flood is the actual exudations of Osiris' corpse and the inundation is called 'rejuvenated' or 'fresh' water. The spell ends with connecting the dead as Osiris, and thereby it is from the Pharaoh's own body that the life-giving inundation flowed. It was from death that life emerged, and this conception, which pervaded all of Egypt and her religious life, was inevitably bound to the Nile, Osiris and monumental sepulchres. The relation between death and life-giving waters was fundamental in Egypt. According to Plutarch in his *On Isis and Osiris*, the Egyptians called not only the Nile, but all water in general, 'the discharge of Osiris (*Osiridos aporrhoe*)' or Osiris' 'efflux'. 'And they call not only the Nile, but also without

distinction all that is moist, “Osiris’ efflux”, and the water-vase always heads the processions of the priests in honour of the God’ (Plutarch 36.1).

Osiris was equated with every known body or type of water – the Aegean Sea, the Ocean, the Bitter Lakes, and so on (Frankfort 1948: 191), although Plutarch refers to the sea as Seth: ‘But the more wise of the priests call not only the Nile Osiris, and the sea Typhon; but [they call] without exception every source and power that moistens, Osiris – considering [him] cause of generation and essence of seed, and Typhon everything dry and fiery, and of a drying nature generally and one hostile to moisture’ (Plutarch 33:1). Moreover, the Nile was seen as originating from the first cataract at Aswan, ‘O King, receive this pure water of yours which issued from Elephantine, your water from Elephantine...’ [Pyr. 864]. Thus, Osiris may appear in the function of Nun, the primeval waters. These waters were also underneath the earth and, as the origin of everything that existed, they were an immeasurable source of fertility.

The Nile water was supposed to have special life-giving virtues (Aldred 1984: 59). The vitality emerging from earth, either in plant or the water of the Nile, was seen as a manifestation of Osiris. Moreover, the different types of waters had specific qualities, and in particular the inundation: ‘The water of inundation which carried the silt was called the “pure water” or the “young water”, and it is this water that was thought to be brought by Osiris or to emanate from him or to take its power from him’ (Frankfort 1948: 190). This embodiment of the Nile was believed to be real and intimately connected to death, and in fact, the waters were the divine blood and life-juices from which everything and all life arose. The inundation was seen as the liquids running from Osiris’ decaying corpse. The Nile and the flood was the efflux of Osiris, which is testified in numerous spells and hymns in *The Pyramid Texts*: ‘You have your water, you have your flood, the fluid which issued from the god, the exudation which issued from Osiris’ [Pyr. 788] and ‘Raise yourself, O spirit of this King! Your water is yours, your flood is yours, your efflux which issued from the putrefaction of Osiris is yours’ [Pyr. 1360]. It is even more directly expressed that the flood was the blood of Osiris: ‘You have your water, you have your efflux, you have your flood which issued from Osiris’ [Pyr. 2031]; ‘Your water is yours, your flood is yours, your efflux which issued from Osiris is yours’ [Pyr. 1291] and ‘The King is the blood which issued from Re, the sweet which issued from Isis’ [Pyr. 1263]. The Nile and in particular the flood was designated as Osiris’ efflux or discharge. It was the blood of the deceased Pharaoh as Osiris.

We thus see that a correspondence of microcosm and macrocosm underlay the designation of water as the 'discharge of Osiris'. The world – or Egypt, at least – was conceived as a body, and the water of the Nile as an elixir of life that gushed forth from it ... Elephantine ... was the place where the life-juices flowed out of Osiris and flooded Egypt, giving rise to all the means of life. When it was offered to him in the cult, the water of the inundation, which had flowed out of the body of the slain god, made it possible to restore life to him, as well as to all dead, who were equated with him. (Assmann 2005: 361)

This identification of Osiris with the flood and the flood as his efflux, discharge and blood is by no means a coincidence. Although it has been claimed that 'As we know Osiris, he is purely a figure of thought, but of speculative mythopoeic thought – and figure concretely and of manifold significance' (Frankfort 1948: 211), it will be argued that the mythology of Osiris has its basis in the character of the Nile itself and annual changes it underwent throughout the seasons, as Plutarch noted; 'the efflux of Osiris [is] reflected in seasons and temperatures and periods' (Plutarch 49.3).

CLIMATE AND THE GREEN, RED AND WHITE NILE

The Blue Nile provides on average 68 per cent of the maximum monthly discharge, but only 17 per cent of the minimum monthly discharge. The White Nile, on the other hand, provides only 10 per cent of the maximum monthly discharge but a vital 83 per cent of the minimum monthly discharge. The Atbara, the other Ethiopian tributary, is even more seasonal. For eight months a year it dries up, but during the flood it provides 22 per cent of the maximum monthly flow to the Nile as well as huge amounts of silts. 'Put concisely, the Blue Nile and the Atbara provide Egypt with its summer floods and flood silts but the White Nile provides the bulk of the water to the main Nile during the dry winter months' (Williams et al. 2006: 2653). Normally, in dry years, the White Nile has been the guarantor of perennial flow in the Nile and the swamps in southern Sudan, and hence played a crucial role in buffering seasonal fluctuations in Nile discharge, but this has not always been the case (Williams et al. 2006: 2653).

Climatically, the rise of the civilisation in Egypt has to be seen in relation to the end of the Neolithic Wet Phase and the general decline of the Nile's flood levels. In Egypt it was a rainy interlude which ended in the 'early predynastic period' (c. 4000 BCE) (Butzer 1959, 1976, 1995). The Holocene Wet Phase affected the area from the Senegal

River to the Nile River of what today is within the 100–500mm rain zone. In Egypt and the eastern Sahara the rains probably never exceeded 200mm a year. During the Holocene Wet Phase the Nile's catchment area became larger, and consequently the river became more vigorous than earlier seasonal rivers (Said 1993: 55), and the Nile was a mightier river than it is today, carrying many times the present discharge (Said 1993: 128–9). In Egypt the maximum of moisture took place around 5000–4000 BCE, and the overall ecological conditions worsened dramatically around 3500–2800 BCE (Butzer 1995: 132–3). The substantial decline in the Nile levels during the Early Dynastic period (c. 3000–2800 BCE) would have implied a 30 per cent reduction in the volume of water before stabilising during the Third to Fifth Dynasties at a slightly higher level (Butzer 1995: 135). From c. 3050 to c. 2480 the floods averaged 0.7m (Bell 1975: 226).

If one assumes that the measurements on the Palermo Stone give the height of the flood in the Memphis basin, then a reasonable estimate of the floods had a magnitude of 130 billion cubic meters (bcm) during Dynasties III–V (somehow equal to the discharges of 1878 and 1887), and the average raise of the river in the basin was in range of 1.8m. The flood of the First Dynasty, however, would have been around 50 per cent higher and in the range of 200bcm per year. In the Second Dynasty, on the contrary, the floods were low and the discharges in the range of 80bcm per year, and consequently large areas of land must have been left uncultivated (Said 1993: 138). The rains of the Holocene Wet Phase terminated around the end of the Fifth Dynasty, and the level of rain equals today's levels. There were periodic fluctuations, but not the great and sustained rains of the previous period. Consequently, the Nile discharge was also reduced to levels around those today (Said 1993: 138). The lowest discharge of the Nile seems to have been reached around 2200 BCE, and for a 200-year period the Nile fluctuated frequently (Bell 1971; Hassan 1997, 2004).

Thus, the level of the inundation could vary dramatically from one year to another, and even though the Nile flowed throughout the year it shows a significant variation with regards to both the amount of water and, not least, the different colours of the waters. Although the two main branches of the Nile are usually called the White and the Blue Nile, these colour descriptions are not accurate for the physical properties of the river during the inundation: in Egypt the river was green, red and white. The early travellers and researchers were well aware of the changing colours of the Nile. The contrast between the Blue and White Nile was remarkable during the flood: the Blue Nile was red-brown and the waters of the White Nile yellow-green (Hume 1906: 55). The water of the Blue Nile was

remarkably clear and limpid when the river was low, and it reflected the brilliant blue sky. During the period of flood, it changed character totally, becoming turbid and heavily charged with deposits and of a deep chocolate colour. The water of the Sombat during floods had a creamy-white tinge, from which the White Nile takes its name (Garstin 1909).

At the beginning of the rise, Lyons noted, 'the season of the lowest Nile is marked by the unusual greenness of the water, which has a marshy and putrid taste and smell, which boiling or distilling only increases' (Lyons 1905: 252). The green colour is due to large quantities of algae and decaying vegetation, which flows with the river. In May the White Nile supplies most of the Nile's water and the green water fills the river. In the marshy lands in Uganda the White Nile had also a poisonous odour (Long 1876: 285). When the Blue Nile started rising and flowed with a greater velocity, the green colour of the water suddenly changed to the muddy red-brown or reddish flood. Although the Blue Nile is almost clear during the winter, in the flood period from June to October it changes colour and becomes reddish-brown and highly charged with alluvium (Budge 1912: 169).

The first Aswan dam was completed in 1902. Work started on the high dam at Aswan in 1960 and the dam came into operation in 1971 (Swain 1997: 677, 680). After the dam-building these changing processes and qualities of the Nile have hardly been visible in Egypt (Figure 4), but one may still see the differences in the Nile at the confluence in Khartoum in Sudan, where the Blue and the White Nile meet. Until the White Nile reaches Khartoum, it flows at a lower level than the Blue Nile, and there is a pronounced slope between them (Berry and Whiteman 1968: 15). The Blue Nile reaches its seasonal peak flow in between July and September (Walsh et al. 1994: 268), and thus suppresses the White Nile's flow. The White Nile is clearly green and smells whereas the Blue Nile is red-brown or reddish during the inundation season. Importantly, the time when these changes in the colour took place has been incorporated into the Egyptian mythology.

The rise is felt at Khartoum about May 20, and at Aswan about June 10, and the green water announcing this rise is seen at Cairo about June 20. About June 5 the Blue Nile begins to rise quickly, and it reaches its ordinary maximum by August 25; its red, muddy water reaches Aswan about July 15. Whence once the red water has appeared the rise of the Nile is rapid, for the Atbara is in flood shortly after the Blue Nile; the Atbara floods begins early in July and is at the highest about August 20. The Nile continues to rise until the middle of September ... In



Figure 4. The Nile at the First Cataract in Aswan, Egypt. Photograph: Terje Oestigaard.

October it rises again, and attains its highest level. From this period it begins to subside ... (Budge 1912: 172–3)

The Atbara River has also a reddish-brown colour during the inundation. Finally, there is one more change in the Nile's colours before it turns clear and blue again. When the Blue Nile has subsided for some time, the river turns white and muddy. The White



Figure 5. The confluence of the White Nile and the Blue Nile in Kartoum, early September 2006. The light-coloured water was the green colour of the White Nile whereas the dark-coloured water was the red-brownish colours of the Blue Nile, heavily charged with silt. Photograph: Terje Oestigaard.

Nile has got its name from the fine, whitish clay that colours the water (Budge 1912: 167), but this whitish colour stems basically from the Sobat River. At the Ethiopian border the Sobat River is formed by its two headstreams – the Baro and the Pibor. The Sobat is a major tributary to the Nile and joins the river above Malakāl in Sudan, and the river's distance from the Baro–Pibor confluence to the White Nile is 354km. The river has its flood season in November and December, and then it carries enormous discharges of whitish sediments. The flood of the Sobat River is delayed by the plains and marches of the Pibor, which are gradually drained after the summer rains. With its maximum in December, this volume of water reached and ran through Egypt in January and February, and from then on the water would rapidly decrease (Lyons 1908: 454, 459). As mentioned, although I have not seen the Sombat River during its flood in December, the hydrological qualities of the Blue and White Nile as red and green also correspond to my own observations during my fieldworks in Sudan and Ethiopia during the flood period (Figure 5), and given that these physical and

natural qualities of the Nile are hydrological and geomorphological, it seems reasonable to assume that the same processes took place in the past.

One intriguing aspect of this cycle of the changing colours of the Nile, which may have been of vital importance for the ancient Egyptians, is that it corresponds more or less to the human pregnancy span with just minor deviations. The Green Nile reached Cairo in mid-June and the Red Nile would have arrived in the end of July or beginning of August. The White Nile *being* white reached Cairo in January or February, and from June to February it is nine months or a pregnancy. These physical characteristics of the Nile were, as a hypothesis, the basis and origin for the Osiris mythology as it is testified in the *Pyramid Texts* and later traditions.

OSIRIS' EFFLUX AND ISIS' TEAR AND BREAST MILK

Following legend, it was a single tear of Isis which gave the inundation and the blessing to all Egypt, and Isis has been described as the mistress of the region of the eye. The tears of Isis made the Nile swell, and there are different stories of why she cried. The most common is that she was so forlorn of the loss of Osiris that she shed a tear which caused the Nile to flood (Mojsov 2005). According to the Greeks, the inundation of the Nile was due to the tears of Isis when she discovered that she was pregnant when Hapi arrived in the summer, and 'her tears turned to joy' (Mojsov 2005: 37). Even today in Egypt, the night in the summer when the Nile started to rise is known as the 'Night of the Teardrop'. According to MacKenzie, as one of the few who has studied the qualities and consequences of the changing colours of the Nile, 'The fertilising star-tear that fell into the Low-Nile on the "Night of the Drop" was evidently a malachite tear. The Green Nile was made green with malachite from the god-pools of green malachite in the celestial regions. The Green Osiris of the Green Nile was ... the personification of malachite. The celestial malachite in the Green Nile made vegetation green. It also made the dead "grow green again"' (MacKenzie 1922: 162). This is evident in the *Pyramid Texts*: 'O you who stride out greatly, strewing green-stone, malachite, turquoise of(?) the stars, if you are green, then will the King be green, [even as] a living rush is green' [Pyr. 567], and in the sarcophagus room in the tomb of Unas the stars are green (MacKenzie 1922: 162).

The 'Green Nile' was evidently of primary importance. Its greenness was the source and substance of life in human beings, in animals and

vegetation. The Green Nile substance renewed life each year in the land of Egypt; it renewed life after death in Paradise. Blood and milk animated and nourished, but the green substance originated new life. (MacKenzie 1922: 160)

In the earliest versions of the *Book of the Dead*, the deceased says of himself: 'I am Osiris, I have come forth as thou [that is, 'being thou'], I have entered as thou ... the gods live as I, I live as the gods, I live as "Grain", I grow as "Grain" ... I am barley' (quoted in Breasted 1959: 22–3). With the *Pyramid Text* 589, the identification of Osiris with the Green Nile is complete: 'Horus comes and recognizes his father in you, you being young in your name of "Fresh Water"; Horus has split open your mouth for you' [Pyr. 589] where fresh also means green water. Osiris is 'the Green One' whose life-substance is the Green Nile. It is the Green Nile which makes vegetation green. This is described in the *Pyramid Texts* when the King became the crocodile-god Sobk: 'I have come today from out of the waters of the flood; I am Sobk, green of plume, watchful of face, raised of brow ... I have come to my waterways which are in the bank of the flood of the Great Inundation, to the place of contentment, green of fields, which is in the horizon' [Pyr. 507–8].

The Green Nile was succeeded by the Red Nile. When the river started raising the water changed colour and became red as blood, which was the 'Red Nile'. The substances in the Nile which changed colour were obviously life-giving substances for the Egyptians, and, as blood is 'the life thereof', the Red Nile was seen as the blood of the slain Osiris (MacKenzie 1922: 156–7). The red hue, which is brought on by oxide sediments in the inundations, has been compared with blood up to this day (Mojsov 2005: 7). This Red Nile was also believed to purify the land: 'The canals are filled, the waterways are flooded by means of the purification which issued from Osiris' [Pyr. 848]. During 'The Great Hoeing of the Earth in Busiris', there are references that the earth is hoed with blood. The companions of Seth changed themselves to goats, which were sacrificed, and the blood might be Seth's because the mixing of the storm-god's blood with the soil is not a unique example (Wainwright 1938: 13). Rain-chiefs' blood when sacrificed and killed was mixed with grain, and this seed was believed to gain immense fertility (Seligman 1934: 30–1).

The rebirth of Osiris was also part of the inundation: 'the cutting of emmer wheat has been performed twice; first to indicate the death of the god manifest in vegetation ... and second the rebirth of the god, who gives to his people a plentiful harvest' (Meyerowitz 1960: 184 fn. 1). According to Plutarch, Isis realised that she was

pregnant some time in October, and 'Osiris is buried when the sown corn is hidden by the earth, and comes to life and show himself again when it begins to sprout' (Plutarch 65.1).

When the Red Nile was replaced by the White Nile in January/February, the Nile changed character, and became white, muddy and creamy. This whitish, muddy Nile may have been seen as milk, and the Nile waters flowed also from the breasts of Hapi (Baines 1985: 112). Hathor is said to have created Nut, and Hathor was also regarded as the mother of Osiris ([Pyr. 466]; Meyerowitz 1960: 31, 44). Nut provided celestial milk – the milk of 'the Milky way' – and she had 'long hair and pendant breasts' (MacKenzie 1922: 157–8). Finally, the white colour of the Nile is also seen as Isis' nursing breast milk: 'Raise yourself, O King! You have your water, you have your inundation, you have your milk which is from the breasts of Mother Isis' [Pyr. 734]. Libations symbolically represented divine milk, and the image of the 'nursing of the child-god' most likely had its origin in the royal coronation ritual or, perhaps more correctly, as an initiation rite prior to kingship, which took place before the actual coronation (Assmann 1989: 141). 'The deceased, now reborn through the sky-goddess as a god himself, is subsequently breast-fed by divine nurses and elevated to the heavens' (Assmann 1989: 140).

Thus, it is possible to argue that it was the nature and characteristics of the Nile and its annual inundation which were the basis for the mythology. As Barth (1975) has pointed out, material metaphors are not totally arbitrary, and these natural changes in the water ways were 'good to think with' whereby people spun webs of significance (Geertz 1973: 5). The inundation started when Osiris was killed and Isis shed a green tear and fertilising star from heaven. Osiris was reborn through the funeral rites and the Red Nile was his efflux as blood. As he was now a newborn child and rejuvenated, Isis was breastfeeding him with the Nile as milk.

THE FLOOD AND THE CORONATION OF THE PHARAOH

The Pharaoh was a fertility-king responsible for people's health and wealth in relation to agriculture, and he controlled the activities of the sky (Wainwright 1938: 25). The king had the power and capacity to dominate and further natural processes, in particular the inundation. The king produced food and prosperity by maintaining Maat, the cosmic order, which allowed nature to function for the benefits of humans (Frankfort 1948: 57). King Amenemhet referred to himself: 'I was one who produced barley and loved the corn-god. The Nile respected me at every defile. None hungered in my years,

nor thirsted in them. Men dwelt [in peace] through that which I wrought ... All that I commanded was as it should be' (Frankfort 1948: 57). On the Nubian King Taharka's stele is described a great flood in 683 BCE, which sums up the religious role of the Pharaoh: 'Now a wonderous thing occurred in the time of His Majesty ... His Majesty prayed for an abundant Nile ... his father Amon-Re makes it reality ... When the time came for the flood of the Nile, it began to increase greatly every day ... The land was like an inert primordial Ocean, the banks could not be distinguished from the river ... Everyone in Nubia was rich in everything, and Egypt was also plentiful ... Everyone thanked the king' (Bell 1975: 244). Thus, this links the living Pharaoh as Horus to Osiris as the dead king in the underworld. In the *Pyramid Texts*, the Nile is identified with the dead king. King Unas says: 'I have inundated the land which came forth from the lake, I have torn out the papyrus-plant, I have satisfied the Two Lands, I have united the Two Lands, I have joined my mother the Great Wild Cow' [Pyr. 388].

The king is renewed by the river: 'The fields are content, the irrigation ditches are flooded for this King today. There has been given to him his power thereby, there has been given to him his might thereby' [Pyr. 857]. Thus, the king 'partakes of the essence of these natural phenomena ... The king "produced barley", not merely in an indirect way, for instance by caring for farmers or furthering agriculture, but through his own actions – by maintaining Maat, the right order which allowed nature to function unimpaired for the benefit of man. Hence the Nile rose effectively at the inundation so that the arable land reached its maximum extent and the people prospered' (Frankfort 1948: 57). The king had defeated falsehood and established Maat, and as a consequence there were abundant inundations where the seasons, months, days and nights followed in orderly procession. Plenty or famine was ascribed as qualities of the king in his success as an organ integrating and combining the humans with the divinities. Hence, there has been a fundamental link between controlling the flood and the divinity of the king (Bell 1971: 21). In the *Pyramid Texts* it is written:

O King, receive this your cold water, for you have coolness with Horus in your name of 'Him who issued from cold water'. Receive your natron that you may be divine, for Nut has caused you to be a god to your foe in your name of 'God'. Receive the efflux which issued from you, for Horus has caused the gods to assemble for you in the place where you went. Receive the efflux which issued from you, for Horus has caused his children to muster for you in the place where you drowned. [Pyr. 765–6]

O King, your cool water is the great flood which issued from you. [Pyr. 868]

You have your water, you have your flood, you have the efflux which issued from Osiris. (Faulkner 1969: 2007, 2031)

Although the deceased king became Osiris and the forthcoming flood, the death of a king was cosmologically dangerous since, when he died, it was a temporary victory of the malignant powers threatening order (Wilkinson 1999: 209). According to Herodotus, the time between the death and the interment was 70 days. However, from the earlier periods, and in particular the Old Kingdom, the intermediate period was not necessarily 70 days. Rather, the contrary: there are several sources documenting that this period was substantially longer. In the tomb of the Fourth Dynasty Queen Meresankh III the period between ‘the resting of her ka, her departure to the mortuary workshop’ and ‘her departure to her beautiful tomb’ was 272 days. In the tomb of the Fifth Dynasty vizier Senedjemib he recalls the burial of his father: ‘[I] brought for him a sarcophagus from Tura for this tomb of him, which I made for him within one year and two thirds, while he was in the mortuary workshop...’ (Wilson 1944: 202).

After the death of a Pharaoh, the succession to the throne consisted of two stages: the ‘accession’ and the ‘coronation’. The coronation was the last rite, which sealed the transfer of power, and this only took place when the dangers of the interregnum were solved. This directly related to the Nile and the coronation could not take place at any time. Kingship was not only a political institution, but involved cosmos and the progress of nature, or in other words the flood. ‘Hence, the coronation was made to coincide with one of the renewals of nature, in early summer and autumn’ (Frankfort 1948: 102). This could be the New Year’s Day, which according to the Egyptian calendar was the first day of the first month of the ‘Season of Inundation’ (1 Thoth). This day was originally the day when the Nile started to rise. When the inundation started to recede four months later, there was a new beginning, and the first day of the first month of the ‘Season of Coming Forth’ (1 Tybi), was also a day of coronation. The new crops were sown and this day marked a rite of passage and a new beginning. This coincided with the Interment of Osiris, which took place the last day of the month Khoiak, which was the last month of the ‘Season of Inundation’. Thus, the ‘late king was interred ... just before the new king was crowned ... On the day before the coronation the burial rites were concluded by a celebration of the dead king’s resurrection in the Beyond’ (Frankfort 1948: 104, 110). It is said about Tuthmosis I when he indicated the

coronation of Hatshepsut: 'He knew that a coronation on New Year's day was good as the beginning of peaceful years' (Frankfort 1948: 104). The rising of the Djed pillar concluded the funeral rite, ensuring the late king's resurrection in the Otherworld (Frankfort 1948: 128). The rising of the Djed pillar was part of the royal coronation rite, but it was also an annual event together with the Interment of Osiris, which

actively expressed its concern over the vicissitudes of a god whose 'resurrection' – the rising Nile or the growing grain – [It] was a prerequisite for its own welfare during the coming year. Moreover, these recurring celebrations of the revival of Osiris' power in the earth obtained added significance if, in the preceding year, a king had died ... The revival of these forces of nature were never more intimately related to the hope of resurrection; the expectancy and promise of prosperity, than when the erection of the Djed pillar was followed by the festivities of the new king's coronation. (Frankfort 1948: 194)

Thus, Osiris died, but he was reborn and rejuvenated with the flood, and the water in the flood which was brought by or had been emanated from Osiris was called 'pure water' or 'fresh water' (Frankfort 1948: 190). Moreover, in Egypt water and time were closely associated as the New Year started with the onset of the inundation during the summer, and, indeed, the Egyptian word for 'year' meant 'the rejuvenated/rejuvenating one', which designated the inundation (Assmann 2005: 359).

THE NILE AND REJUVENATION

Jan Assmann (2005) has in *Death and Salvation in Ancient Egypt* analysed and emphasised the role of water in death for rejuvenation and further life, and although most of his examples are later than the Old Kingdom, they reveal structural insights into the dynamics and transfiguration from death to life in ancient Egypt, which most likely is a historical trajectory from earlier periods although modified and continuously developed and changed. Nevertheless, for analytical purposes it is possible to treat the Egyptian religion as ahistorical or phenomenological in order to illustrate certain points by using sources from the *Pyramid Texts* to the Graeco-Roman documents (Assmann 2001: 149). Water rituals, libations and purifications were fundamental and crucial throughout the history of ancient Egypt. One water ritual was 'Uniting with the Sun', which was first of all the

purification of the mummy whereby water was poured over the body from *nemset*-jars. In a mortuary spell in Theban Tomb 23, the rite is described (Assmann 2005: 323):

May you stand up on the sand of Rasetau,
 may you be greeted when the sun shines on you,
 and may your purification be carried out for you as a daily performance.
 May Nun purify you,
 may cool water come forth for you from Elephantine,
 may you be greeted with the *nemset*-jar.

Water from Elephantine is also mentioned in other spells for purification of the dead (Assmann 2005: 333). In the New Kingdom there are texts mentioning that the transfigured should drink water from the 'altar of Re' and thus at Heliopolis. Moreover, the Nile's water was aimed to reach the tomb through the power of spells and the offerings. Such wishes were very common in the New Kingdom, and it was also believed that Nun, the primeval ocean from which the Nile's inundation arose, was also flooding the tomb (Assmann 2005: 346–7). Thus, in death the dead came in contact with the primeval and cosmic origin. In other contexts the inundation is seen as a stream of liquid being poured from a libation vase (Assmann 2005: 346–8). Designating water as '*the discharge of the corpse of Osiris*', particularly when they offered water to the deceased in the form of libation in the mortuary cult, was the central rite in the funeral rites (Assmann 2005: 355, my emphasis). This is also evident in the *Pyramid Text* Spell 436:³

May your water belong to you,
 May your inundation belong to you,
 the discharge that comes out of the god,
 the foul exudation that comes out of Osiris.
 Washed are your hands, opened are your eyes,
 transfigured is this mighty one for his ba.
 Wash yourself, may your ka wash itself,
 may your ka sit down to eat bread with you,
 without cease, forever.

'It was believed that, with its annual rise, the Nile was rejuvenating itself, even as it rejuvenated the fields', Assmann argues. 'The Nile inundation was the central symbol of cyclical time, which did not flow irreversibly toward a goal but rather ran back into itself in a cycle, thus enabling renewal, repetition, and regeneration. For this reason, water was the most important of the libation

offerings. In water lay the power of return' (Assmann 2005: 359). On a late bronze libation vessel, this is explicitly stated (Assmann 2005: 359–60):

To be spoken by Nut:

O Osiris N.,

take the libation

from my own arms!

I am your affective mother,

and I bring you a vessel containing much water

to satisfy your heart with libation.

Inhale the breath that goes out of me, that your flesh may live thereby,

for it is I who give water to every mummy

and breath to the one whose throat is empty,

who cover the corpses of those who have no tomb.

I shall be with you and unite you with your ba,

I shall not depart from you, forever.

O Osiris N.,

take this libation

that comes from Elephantine,

this discharge that comes from Osiris,

which Sothis [the goddess of the new year] brings with her own arms

as she associates Khnum with you.

A great Nile inundation has come to you,

its arms filled with rejuvenated water,

to bring you gifts

of all fresh things at their time,

with no delay ...

Thus, following the myth, the annual inundation came from a wound on Osiris' leg. The injury was inflicted by Seth when he murdered Osiris. The leg itself was connected to Elephantine. This correlation between Osiris' body and the actual parts of Egypt was developed and elaborated in later periods, when the 42 nomes of Egypt were identified with the 42 body parts of Osiris. This is similar to the Pauline concept of the Church, which is seen as the body of Christ; in Egypt the 42 nomes constituted Osiris' complete body (Assmann 2005: 361).

The Nile had its origin in Nun, the primeval waters of origin, but also the water that surrounded the world on all sides. Since this primeval water was ever present in this world, and because everything emerged and was created from this water, it also encompassed cyclical time, reversed processes, and enabled complete rejuvenation. The sun bathed in this primeval water each morning and it was this

very cosmic water which was poured on the deceased. Through the water the dead came in contact with the original powers of creation, impulses and energies, and it was from here that all life had its ultimate beginning and end. Hence, these capacities could be explicitly proclaimed, as with the purification of the king, which was expressed in a spell as such (Assmann 2005: 363): 'Pharaoh is Horus in the primeval water. Death has no power over him. The gods are satisfied with Pharaoh's purity'. To sum up the cosmic qualities and capacities of the primeval water and the Nile, in the words of Jan Assmann again:

Whoever immersed himself in the primeval water escaped death and gained strength for new life. Death was a consequence of pollution that could be erased by means of the primeval water. This water regenerated all that was decayed, and it turned back the hours. A world in which this water was effective needed no creator, for it was itself creative, divine and holy, carrying within itself the mysteries of redemption. (Assmann 2005: 363)

The inundation was truly the elixir of life, as evidently shown on depictions where the water flowing out of libation vessels is simply a chain of hieroglyphs for 'life' (*ankh*) (Assmann 2005: 362). Moreover,



Figure 6. 'Baptism of the Pharaoh', where ablutions of ankh signs were poured, Karnak, Egypt. Photograph: Terje Oestigaard.

during the coronation there was a 'baptism of the pharaoh' whereby streams of vivifying ankh signs were poured over the Pharaoh's head (Gardiner 1950: 3). This type of representation dates back to the end of Twelfth Dynasty (Gardiner 1951), although most are later (Figure 6). Water was everything, and the very creator of cosmos and the world, and it was self-generative and procreative. The Nile was hence the origin and source for everything, linking this world with the cosmic spheres, and its annual inundation not only secured life and prosperity for the living, but it also secured and renewed cosmos. This process was also linking death to life or, more precisely, life *through* death, which necessitated proper funeral rites and preparations of the dead.

CONCLUSION

This article started from a hypothetical position, which includes numerous disciplines and sources of empirical data aiming to be holistic. Obviously more research has to be done if one pursues this approach, which I think has potentials for new knowledge, and based on the presented hypothesis and discussion it is possible to present some preliminary interpretations of the Egyptian civilisation from a water perspective.

The pyramids at Giza from the Fourth Dynasty were built in a time of climate change when the amount of water in the Nile declined. It was a transition period where the life-giving water changed from rain to the river, upon which the society became totally dependent. The pyramids can therefore be seen as the utmost testimony of the importance of incorporating the river religion and the annual inundation in the Pharaonic mortuary cult. In a desert, water was truly life, and the Pharaoh was responsible for providing the life-giving substance to his people: the annual inundation. This happened through death and the monumental pyramids. Death was inevitable, and the challenge for the Pharaohs was to transform the sterile desert into fertile fields and consequently life.

Hence, there was a double transformation, which had the same point of departure: through the mortuary rituals and in particular the water ablution the dead king attained eternal life, and through water the barren desert became fertile fields, giving life to people. The forthcoming King demonstrated his cosmic powers by conquering death and restoring life. It was Horus the Son who killed Seth and made his father Osiris eternal and rejuvenated him through the life-giving waters in the Eye. Therefore, the actual funeral ceremonies had a double function. The deceased Horus became eternal as

Osiris and Horus the Son became the new Pharaoh by killing Seth and transforming his father into the Nile and the annual, life-giving waters. Horus the Son as the Pharaoh was the living God who mastered and controlled all life through the waters and the successful inundation.

The annual inundation was the actual efflux of Osiris – his deceased father. As the river turned red-brownish during the summer, this was the blood of the rejuvenated Pharaoh, who was transformed into Osiris and the annual flood, which gave life and prosperity to all of Egypt. It was the deceased's son, the new Pharaoh as Horus the King, who was responsible for this transformation, and the new king was not coronated before his father was successfully transformed into the life-giving flood when his efflux covered the whole of Egypt. The discharge of Osiris thus gave life to the dead king and to his people, rejuvenating Egypt and her inhabitants, and the source of all life had its origin in the Nile itself and the physical characteristics of the river which changed throughout the year. Therefore, one may rephrase Herodotus when he said that 'Egypt is the gift of the Nile'. The presence of the Nile was not simply seen as a gift, but it necessitated that all forces in cosmos worked together in the process of rejuvenating the dead Pharaoh into Osiris and the inundation through the mortuary cult. Egypt *was* the Nile, and ancient Egypt was identical with the inundation.

NOTES

- 1 Assmann's translation of this spell, not from Faulkner's (1969) translation.
- 2 Ibid.
- 3 Ibid.

REFERENCES

- Aldred, C. 1984. *The Egyptians*. London: Thames & Hudson.
- Antelme, R.S. 1998. *Becoming Osiris. The Ancient Egyptian Death Experience*. Vermont: Inner Traditions.
- Anthes, R. 1959. Egyptian Theology in the Third Millennium B.C. *Journal of Near Eastern Studies* 18/3: 169–212.
- Assmann, J. 1989. Death and Initiation in the Funerary Religion of Ancient Egypt, in W.K. Simpson (ed.), *Religion and Philosophy in Ancient Egypt*. Yale Egyptological Studies 3. New Haven, CT: Yale University Press: 135–59.
- Assmann, J. 2001. *The Search for God in Ancient Egypt*. Ithaca, NY: Cornell University Press.

- Assmann, J. 2005. *Death and Salvation in Ancient Egypt*. Ithaca, NY: Cornell University Press.
- Baines, J. 1985. *Fecundity Figures*. Warminster: Aris & Phillips.
- Barth, F. 1975. *Ritual and Knowledge among the Baktaman*. New Haven, CT: Yale University Press.
- Bell, B. 1970. The Oldest Records of the Nile Floods. *The Geographical Journal* 136/4: 569–73.
- Bell, B. 1971. The Dark Ages in Ancient History. I. The First Dark Age in Egypt. *American Journal of Archaeology* 75/1: 1–26.
- Bell, B. 1975. Climate and the History of Egypt: The Middle Kingdom. *American Journal of Archaeology* 79/3: 223–69.
- Berry, L. and A.J. Whiteman. 1968. The Nile in the Sudan. *The Geographical Journal* 134/1: 1–33.
- Blackman, A.M. 1924. The Rite of Opening the Mouth in Ancient Egypt and Babylonia. *The Journal of Egyptian Archaeology* 10/1: 47–59.
- Blackman, A.M. 1925. Osiris or the Sun-God? *The Journal of Egyptian Archaeology* 11/3–4: 201–9.
- Breasted, J.H. 1959. *Development of Religion and Thought in Ancient Egypt*. Gloucester, MA: P. Smith.
- Budge, E.A.W. 1912. *The Nile. Notes for Travellers in Egypt and the Egyptian Sudan*. London: Thos. Cook & Sons.
- Butzer, K. 1959. Environment and Human Ecology in Egypt during Predynastic and Early Dynastic Times. *Bulletin de la Societe de geographie d'Égypte* 32: 43–87.
- Butzer, K.W. 1976. *Early Hydraulic Civilization in Egypt. A Study in Cultural Ecology*. Chicago: University of Chicago Press.
- Butzer, K. 1995. Environmental Change in the Near East and Human Impact on the Land, in J.M. Sasson (ed.), *Civilizations of the Ancient Near East*. New York: Scribner: Vol. 1, 123–51.
- Champollion, J.F. 1844. *Notices descriptives 1*. Paris: Firmin Didot.
- David, R. 1981. *A Guide to Religious Ritual at Abydos*. Warminster: Aris & Phillips.
- Darby, L., P. Ghalioungui and L. Grivetti. 1977a. *Food: The Gift of Osiris. Volume 1*. London: Academic Press.
- Darby, L., P. Ghalioungui and L. Grivetti. 1977b. *Food: The Gift of Osiris. Volume 2*. London: Academic Press.
- Faulkner, R.O. (trans.) 1969. *The Ancient Egyptian Pyramid Texts*. Oxford: Clarendon Press.
- Faulkner, R.O. 1982. A Coffin Text Miscellany. *The Journal of Egyptian Archaeology* 68: 27–30.
- Faulkner, R. 2004. *The Ancient Egyptian Coffin Texts*. Oxford: Aris & Phillips.
- Frankfort, H. 1948. *Kingship and the Gods. A Study of Ancient Near Eastern Religion as the Integration of Society & Nature*. Chicago: University of Chicago Press.
- Frankfort, H. 1958. The Dying God. *Journal of the Warburg and Courtauld Institutes* 21/3–4: 141–51.

- Gardiner, A.H. 1915. Reviewed work: The Golden Bough: Adonis, Attis, Osiris; Studies in the History of Oriental religion by J.G. Frazer. *The Journal of Egyptian Archaeology* 2/2: 121–6.
- Gardiner, A. 1950. The Baptism of Pharaoh. *The Journal of Egyptian Archaeology* 36: 3–12.
- Gardiner, A. 1951. Addendum to 'The Baptism of Pharaoh', *The Journal of Egyptian Archaeology* 36, 3–12; *The Journal of Egyptian Archaeology* 37: 111.
- Garstin, W. 1909. Fifty Years of Exploration, and Some of Its Results. *The Geographical Journal* 33/2: 117–47.
- Geertz, C. 1973. *The Interpretation of Cultures*. New York: BasicBooks.
- Griffiths, J.G. 1960. *The Conflict of Horus and Seth. From Egyptian and Classical Sources*. Liverpool: Liverpool University Press.
- Hassan, F.A. 1997. The Dynamics of a Riverine Civilization: A Geographical Perspective on the Nile Valley, Egypt. *World Archaeology* 29/1: 51–74.
- Hassan, F. 2004. *Water and Ethics. A Historical Perspective*. Paris: UNESCO International Hydrological Programme.
- Hornblower, G.D. 1937a. Osiris and His Rites: I. *Man* 37: 153–8.
- Hornblower, G.D. 1937b. Osiris and His Rites: II. *Man* 37: 170–8.
- Hornblower, G.D. 1941. Osiris and the Fertility-Rite. *Man* 41: 94–103.
- Hornblower, G.D. 1945. The Establishing of Osiris. *Man* 45: 59–63.
- Hume, W.F. 1906. Notes on the History on the Nile and Its Valley. *The Geographical Journal* 27/1: 52–9.
- Lindsay, J. 1968. *Men and Gods on the Roman Nile*. New York: Barnes & Noble.
- Long, C.C. 1876. Uganda and the White Nile. *Journal of the American Geographical Society of New York*, Vol. 8: 285–304.
- Lyons, H.G. 1905. On the Nile and Its Variation. *The Geographical Journal* 26/3: 249–72.
- Lyons, H.G. 1908. Some Geographical Aspects of the Nile. *The Geographical Journal* 32/5: 449–75.
- MacKenzie, D.A. 1922. Colour Symbolism. *Folklore* 33/22: 136–69.
- Meskel, L. and R.A. Joyce. 2003. *Embodied Lives. Figuring Ancient Maya and Egyptian Experience*. London: Routledge.
- Meyerowitz, E.L.R. 1960. *The Divine Kingship in Ghana and Ancient Egypt*. London: Faber & Faber.
- Mojsov, B. 2005. *Osiris. Death and Afterlife of a God*. Oxford: Blackwell.
- Oestigaard, T. 2003. *An Archaeology of Hell: Fire, Water and Sin in Christianity*. Lindome: Bricoleur Press.
- Oestigaard, T. 2005a. *Death and Life-giving Waters – Cremation, Caste, and Cosmogony in Karmic Traditions*. BAR International Series 1353. Oxford: Archaeopress.
- Oestigaard, T. 2005b. *Water and World Religions. An Introduction*. Bergen: SFU & SMR.
- Oestigaard, T. (ed.) 2009a. *Water, Culture and Identity. Comparing Past and Present Traditions in the Nile Basin Region*. Bergen: BRIC Press.
- Oestigaard, T. 2009b. The Egyptian Civilisation and the Sun Cult in a Water Perspective, in W. Østreng (ed.), *Transference. Interdisciplinary Communications 2008/2009*. Oslo: Center for Advanced Study.

- Oestigaard, T. 2010. *Transference. Interdisciplinary Communications 2008/2009*. Centre for Advanced Study. Oslo. www.cas.uio.no.
- Oestigaard, T. In prep. *Holy Water after the Reformation: The Works of God or the Devil?*
- Plutarch. 2001. *Concerning the Mysteries of Isis and Osiris*, trans. G.R.S. Mead, in G.R.S. Mead, *Thrice Greatest Hermes Part 1*. York Beach: Reed Wheel.
- Quirke, S. 1992. *Ancient Egyptian Religion*. London: British Museum Press.
- Ricke, H. 1950. *Bemerkungen zum ägyptischen Pyramidenkult*. Cairo: Beiträge zur ägyptischen Bauforschung und Altertumskunde 5.
- Said, R. 1993. *The River Nile. Geology, Hydrology and Utilization*. Oxford: Pergamon Press.
- Seligman, C.G. 1934. *Egypt and Negro Africa. A Study in Divine Kingship*. London: George Routledge and Sons.
- Swain, A. 1997. Ethiopia, the Sudan, and Egypt: The Nile River Dispute. *The Journal of Modern African Studies* 35/4: 675–94.
- te Velde, H. 1967. *Seth, God of Confusion. A Study of His Role in Egyptian Mythology and Religion*. Leiden: E.J. Brill.
- Tvedt, T. and T. Oestigaard. 2006. Introduction. In Tvedt, T. and Oestigaard, T. 2006. (eds.). *A History of Water Vol. 3. The World of Water*: ix-xxii. London: I.B.Tauris.
- Tvedt, T. and T. Oestigaard. 2010. A History of the Ideas of Water: Deconstructing Nature and Constructing Society, in T. Tvedt and T. Oestigaard (eds), *A History of Water Vol. 1. Series 2: The Ideas of Water from Antiquity to Modern Times*. London: I.B.Tauris: 1–36.
- Wagner, G. 1967. *Pauline Baptism and The Pagan Mysteries*. Edinburgh and London: Oliver & Boyd.
- Wainwright, G.A. 1938. *The Sky-Religion in Egypt. Its Antiquity and Effects*. Cambridge: Cambridge University Press.
- Walsh, R.P.D., H.R.J. Davies and S.B. Musa. 1994. Flood Frequency and Impacts at Khartoum since the Early Nineteenth Century. *The Geographical Journal* 160/3: 266–79.
- Wilkinson, T.A.H. 1999. *Early Dynastic Egypt*. London: Routledge.
- Williams, M. et al. 2006. Abrupt Return of the Summer Monsoon 15,000 Years Ago: New Supporting Evidence from the Lower White Nile and Lake Albert. *Quaternary Science Reviews* 25: 2651–65.
- Wilson, J.A. 1944. Funeral Services of the Egyptian Old Kingdom. *Journal of Near Eastern Studies* 3/4: 201–18.

5 The Maya Collapse: Water, Drought and Volcanoes

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INTRODUCTION

Between AD 760 and 930, millions of Maya disappeared from the Earth. In this chapter, we examine the role of water in the Classic Maya Collapse. Most Maya cities depended on surface water reservoirs which needed to be replenished annually. The most severe drought of the last 7,000 years devastated the Yucatán Peninsula at the time of the Collapse. Large Maya cities collapsed in four phases of abandonment spaced about 50 years apart around AD 760, 810, 860 and 910. A marine core from the Cariaco Basin off Venezuela precisely dates four severe drought episodes to 760, 810, 860 and 910, coincident with the four phases of abandonment of the cities. The long-term drought appears to have lasted from 760 to 930 in the Cariaco Basin. Other palaeoclimatic studies from lake sediment cores, stalagmites and marine cores confirm the period of drought. The climatic changes were the most drastic the Maya had faced in the preceding 1,500 years and the most severe of the preceding 7,000 years. We look at the geology and hydrology of the Maya Lowlands to see why water was so critical to their survival and the possible role of volcanism in driving the droughts.

Human beings cannot live without water for more than a few days. One of the most essential duties of any civilization, therefore, is to provide water. For those cultures fortunate enough to live in areas of stable, copious rainfall or near large, stable sources of fresh water, the provision of fresh drinking water is taken for granted. In areas of the world like the Maya Lowlands, however, water had to be planned for and stored. The Maya lived in a seasonal desert. During the rainy season there was ample rainfall, but for six months of the year there was practically none at all. For most of the Maya Lowlands, there were no rivers or lakes which would consistently supply drinking