

# Articles from Egyptological

## Solar Eclipse Events in the New Kingdom – Part 1: Texts and Funerary Material

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### Abstract

The sun played a central role in the religion and culture of Ancient Egypt. It is therefore surprising that there seems to be no unambiguous mention of solar eclipses in Ancient Egyptian texts. Eclipses would certainly have been witnessed by Egyptians and records of them would be expected to occur in the religious corpus.

This paper discusses a class of inscriptions appearing on eleven artefacts together with text and vignettes from five tombs and funerary material from Deir el-Medina, which may contain expressions made in response to eclipses. It is proposed that:

- a) these artefacts record the witnessing of a deep solar eclipse; and
- b) ill understood at the time, the eclipse was interpreted by witnesses as a form of punishment or omen and was consequently expressed in religious terms on stelae; protection against recurrences of the event was also included in tombs and on funerary furniture.

Traditional interpretations of the texts as detailing blindness or spiritual darkness, are plausible but scientifically incapable of verification.

Tentative dating of these potential references has been attempted so that they can be correlated with known eclipse events to assess the likelihood that the owners of the texts and tombs or their families may have been responding to an eclipse that they had witnessed. If further undated examples are found later, this hypothesis may be a useful indication of their absolute dating and contribute to an absolute chronology of New Kingdom Egypt.

### Foreword

I first published an article on this subject in 2007. Based on feedback, and with further research, it is re-published on Egyptological in much expanded form. With advice and assistance from Andrea Byrnes and Kate Phizackerley, the material is presented in two parts. This Part 1 identifies the source texts and reliefs. There have been no major discoveries reported since 2007: this part is largely unchanged and is re-published mostly for convenience and so that the two parts can be linked.

In the substantially new Part 2, I present the astronomical material based upon the latest NASA data and explore the links between the astronomical data and the Egyptian references. This analysis has been considerably expanded in the intervening period and I am particularly grateful to Rita Gautschy, Rosalind Park, Barbara Lüscher and Marcus Müller for their help and assistance in this phase of the research, although any errors in interpretation are mine own.

## **Introduction**

The sun played a central role in both secular life and in religion in Egypt. Given that cosmological and astronomical depictions, such as calendars and star clocks, are frequently found on monuments and in tombs (Parker 1974), it is surprising that there are no apparent references to solar eclipses in the surviving records. Today eclipses are generally regarded as dramatic and by some observers spiritually moving, but because of the absence of unambiguous references, solar eclipses in Ancient Egypt have received limited serious scholarly attention until fairly recently. My proposition is that references exist but have been mis-categorised and overlooked.

## **About Solar Eclipses**

Solar eclipses fall into three categories. The most common are termed “partial” when the moon’s trajectory does not pass directly across the centre of the solar disk. Less common are “annular” eclipses, when the moon’s trajectory does pass across the centre of the solar disk but the moon’s diameter appears less than that of the sun so a small annulus of the sun still shows around it. The rarest and most dramatic are those termed “total” where the moon obscures the sun completely. If the observer is just outside the path of a total eclipse the effect can still be as dramatic as a partial eclipse.

During a solar eclipse the intensity of sunlight can fall to a fraction of its normal daytime value – maybe providing about as light as under a full moon at night, depending on how much of the sun’s disk is still visible. Immediately before a deep eclipse a blanket of darkness seems to be racing over the land towards the observer, and planets, stars and the occasional comet may become visible. If the light from the sun is filtered through the leaves of trees, for example, many images of the eclipse become visible on the ground. The temperature may fall by several degrees centigrade during the eclipse (Jahn, J. 2006). Wildlife and domestic animals are often disturbed by the experience – in Lusaka in 2001, Smits (2001, p. 5) witnessed at first hand the chaos caused when horses panicked. One would expect observers in the ancient world to be startled and alarmed and in a world of solar discs and solar barques in which the stars exude significance, religion would be expected to explain, interpret and appease such events. In literate Egypt, some sort of record would certainly be expected. Brewer (1991, p.14) remarks , “it is hard to imagine that the spectacular recurrence of total solar eclipses could go unrecorded, especially in a culture that so worshipped the Sun,” suggesting that it “was preserved in symbolic form.”

He also notes that at certain phases during the 11-year sunspot cycle the halo of the solar corona during an eclipse is less intense, but extending to either side are long streamers of light, difficult to photograph but plainly visible to the naked eye. (Brewer 1991, p.15). A possible reference to this phenomenon will be shown later.

## **Recording Eclipses in the Ancient World**

From outside Egypt we have many unambiguous records of eclipses. One was recorded by Plutarch as

[N]ow, grant me that nothing that happens to the sun is so like its setting as a solar eclipse. You will, if you call to mind this conjunction recently which, beginning just after noonday, made many stars shine out from many parts of the sky and tempered the air in the manner of twilight (Cherniss and Helmbold 1975, Plutarch's *Moralia* XII, 117).

Brewer (1991, p.18) cites what he considers to be probably the most famous eclipse of ancient times when on May 28 585 AD a five year war between the Lydians and the Medes was ended when "the day was turned into night" and both sides stopped fighting and agreed a peace treaty, cemented by a double marriage. Sauneron (2000, p. 153) notes that it is said that when an eclipse terrified the soldiers of Alexander who were fighting the Persians under Darius, appeal was made to the explanations of an Egyptian priest to calm the panic that overcame the troops. From his writing in the third century B.C., Manetho is quoted as stating that "a solar eclipse exerts a baneful influence upon men in their head and stomach" (Waddell 1980).

Eclipses are highly predictable today given the computing power and knowledge of the dynamics of the solar system which we have, but these advantages were not enjoyed by the ancient Egyptians, although the Babylonians knew that solar and lunar eclipses occur in regular cycles, known nowadays as the "Saros cycles" (Neugebauer 1957, p. 119). However, because of the geometry of an eclipse, whereas lunar eclipses are visible from everywhere on Earth where the moon is above the horizon, solar eclipses are only visible in specific regions of the planet, if at all. Determination of these cycles was probably gained through detailed and extensive record keeping. Once understood, they can be used to predict lunar eclipses, but can only be used to identify times when solar eclipses are possible or exclude times when they are impossible; they cannot be used to predict the actual occurrence of a solar eclipse at a specific location. However, the fact that a solar eclipse can only occur immediately before the night of a new moon can scarcely have gone unnoticed – it was known by the Greeks as the following quotation shows "... and to crown all he will cite Homer, who says the faces of men are covered with night and gloom and the sun has perished out of heaven speaking with reference to the moon and <hinting that> this naturally occurs '[W]hen waning month to waxing month gives way'." (Cherniss and Helmbold 1975, Plutarch's *Moralia* XII, 119). This relationship between a new moon and a solar eclipse may indeed have been reflected in one of the Book of the Dead spells as will be seen later.

Early records of eclipses and of eclipse predictions survive from the late Babylonian period (c. 750 BC) and, later, from the Greek and Roman period, continuing into the Islamic Near East and India (Steele 2000, pp.5-7). The earliest Chinese astronomic records are somewhat older, dating from the middle of the second millennium BC and some references to solar and lunar eclipses have been found on oracle bones dating from the second half of the Shang (also known as the Yin) Dynasty (c. 1600-1050 BC) (Zhenatao et al. 1989, p. S64). The earliest explicit references to eclipses found in Egyptian material are on papyri dating from the Roman period (Jones 1994), most of which relate to time-keeping and the calendar. One notable exception is the Vienna Demotic Papyrus. This was written to advise the Egyptian priests how to interpret solar and lunar eclipses which were generally regarded as omens, either good or bad, but more usually the latter. Parker regards this papyrus as a copy, probably made in the late second century AD by a skilful scribe, of two separate books of earlier Babylonian material dating from the sixth century BC (Parker 1959). Later work by Parker and others confirms the likely dating of the original material. (Neuberger et al. 1981) During the late period there was an influx into Egypt of astronomical and astrological ideas and material from their Mediterranean neighbours, particularly from Greece, resulting in a growth in interest and work in this area, a notable example of which is that by the Egyptian astrologer Hephaisto in his astrologer's manual *Apotelesmatics*.

## **In Search of Egyptian References**

Within an Egyptian context it is proposed that a number of artefacts record the witnessing of a deep solar eclipse which, not being understood at that time, was regarded as a punishment or omen, and was consequently interpreted in religious terms. It is also suggested that in response Spell 135 of the Book of the Dead was used in a precautionary manner in the tombs of those who witnessed the event or their family.

The first step towards addressing the existence of possible records of deep solar eclipses in New Kingdom Egypt is to consider our existing state of knowledge about eclipse events in the New Kingdom. The second step is to consider the reasons why such references to eclipses have been missed and how those possible references have been interpreted. The third step is a systematic review of the occurrence of possible accounts in contemporary textual sources which might reasonably be thought to refer to solar eclipses and a correlation of those accounts with known solar eclipses.

The evidence used in this discussion fall into two groups. First is a set of inscriptions on artefacts and objects mostly from Deir el Medina and the surrounding area. Second are vignettes, sometimes accompanied by texts, in tombs of some of the workers at Deir el Medina and on a papyrus and a coffin fragment belonging to another of the workers there.

## **Recent Work on Egyptian Eclipses**

Solar eclipses in Egypt have been discussed by several researchers in recent

years. Sellers (1992) considered that there may have been a link between such events and Pharaonic accession, while Ibrahem (n.d., a, b & c) studied possible correlations of solar eclipses with key events or inscriptions, although the eclipse predictions he used are no longer accurate.

Aubourg (1995, pp. 1-10.), using the motions of the planets to study the dating of the Zodiac of Dendera, has noted that it shows two disks, both in the constellation of Pisces. One of these, he claimed, is clearly intended to depict the moon, while the other contains a *Wadjet* eye. He observed that a nearly total solar eclipse occurred in 51 BC, a date corresponding very closely to what he interpreted as the depiction of the positions of the planets in the constellations, and to the position of the disk containing the *Wadjet* eye. This research, however, has been disputed recently and a different dating (during the latter part of the reign of Augustus rather than by Cleopatra VII) and an alternative interpretation and explanation for the 'Zodiac' (in terms of a horoscope commissioned largely for political purposes) are proposed. (Park & Eccles, 2012)

McMurray (2003 & 2004), using the latest predictions, notes the possible influence of a solar eclipse on Akhenaten and has also been attempting to correlate lunar and solar eclipse dates with dateable inscriptions to try to develop an absolute chronology.

Ryholt (2011) has concluded that the association with astrology of Necho II (who gained the epithet 'the wise') may have been due to an historical eclipse marking the beginning of his reign – the same eclipse mentioned in the *Neue demotische Erzählung* (pBerlin 13588) but which was associated there with the earlier death of Necho II's predecessor Psammetichus. However, more recently Park (2012) has argued that Ryholt's analysis does not put forward sufficient evidence in terms of a specific date occurring on a public monument to justify this conclusion and has suggested instead that the annular solar eclipse of November 5<sup>th</sup> 380 BC passing over the delta area near Thonis and Naukratis may have been witnessed and also recorded at the time on the twin stelae, which contain unusual and enigmatic hieroglyphs, commissioned by Nectanebo I on his accession who "re-interpreted the traditional 'bad omen' to foretell that his reign would be one of beneficence."

Although this paper concerns work on eclipses in Ancient Egypt, it is worth noting in passing the related work on the Asiatic Campaigning of Horemheb (Redford 1973) which has implications for Egyptian chronology because of the political relationship and interaction between the Egyptian and the Hittite empires. Redford draws attention to the annals of Mursilis II's tenth year which mention an "omen of the sun", generally accepted as a solar eclipse. Drawing upon his earlier work in this area, he argues that this is likely to have been the eclipse of March 13<sup>th</sup> 1335 BC and proceeds to use this date to determine an absolute chronology of Thutmose III to Horemheb. Recent research has suggested that this date is too early and that there are other more likely candidates for this eclipse. The first is that of 24<sup>th</sup> June 1312 BC, which passed over Northern Anatolia close to Hattusa where Mursilis II and his men were likely to have been based (Bryce 1998). An alternative view has been put forward that the eclipse was instead that of 13<sup>th</sup> April 1308 BC (Åström

1993). A closer analysis of this eclipse is undertaken in Part 2 of this paper.

## Evidence for records of eclipses from the New Kingdom

The corpus of evidence which may contain witness accounts of eclipses is small but pertinent. There are a number of reasons why this number is so low. It is possible that such events may have been recorded on papyrus rather than stone and although many papyri have survived, the relative rarity of these events has left us with no record of eclipses. It is also possible that the proportion of the population witnessing a deep eclipse will inevitably be small because of the narrow trajectory of the eclipse path and its transitory nature. If an eclipse occurred when the sun was high in the sky and it was very hot, many potential witnesses may have been sheltering indoors. Of those who did witness it, the vast majority would have been peasant workers and, being illiterate, would not have recorded the event.

It is also possible that the detailed recording of such significant astronomical events was largely restricted to the *horologoi* (hour-priests) and recorded in specialist temple libraries which have not survived: these specialists would certainly have witnessed these events in the course of their duties (Sauneron 2000, pp 64 and 150). There might also have been deliberate reasons why eclipses were not recorded. The act of recording what was probably regarded as a bad omen may have been thought to endow this unsettling event with a degree of permanence, so if it were recorded at all, it may have been referred to obliquely. Such an event may not even have had a name and thus may have been referred to in terms of the way it was experienced or perceived, or in religious or metaphorical terms. Because of the 'official' view that such events were bad omens it is even possible that any surviving records of such events might be more likely to be found amongst material belonging to the more literate but ordinary people rather than on official monuments.



Illustration 1 – Stela  
BM589

## Texts on Stelae and other Objects

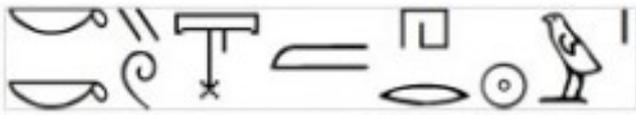


Figure 1

The first group of evidence we will consider are eleven texts from stelae, an ostrakon and a graffito, all from the New Kingdom. Some of these texts are penitential, expressing remorse for wrongdoing and seeking forgiveness, or the lifting of a punishment imposed by a god, while others are hymns and prayers. They all include a form of expression which seems to be trying to express the difficulty of seeing (such as blindness) or darkness at a time that was unusual. All but one of these texts use a rare determinative hieroglyph, or its hieratic equivalent, and this will be discussed later. Perhaps the most commonly quoted example of the form of this expression is that found on the reverse of Stela BM 589 (illustration 1), one of two attributed to Neferabou (figure 1) which may be transliterated as *kkw m hrw*.

[I] am a man who swore falsely by Ptah, Lord of truth; and he caused me to see darkness by day (Gunn 1916, p.88).



Figure 2

The front of Stela BM374, attributed to Amennakht and dedicated to Meretseger, shows an almost identical inscription (figure 2) which may be transliterated *kkw m ra*

[T]hou causest me to see darkness by day (Gunn 1916, p.87).



Stela BM374

The texts we will be considering are:

Stela Bankes No. 6 (KRI I, 413)

Stela BM 374 (KRI V, 645)

Stela BM 589 (KRI III, 771-2)

Stela Cairo JE 37463

Stela Turin 50046 (KRI III, 668-9)

Stela Turin 50050 (KRI IV, 338, B.VIII)

Stela Turin 50051 (KRI I, 373-4)

Stela Turin 50052 (KRI I, 390)

Stela Turin 50058 (KRI III, 772-3)

Ostrakon Cairo 12202

Grafitto Pawah (in TT139)

The precise form of these inscriptions varies from one artefact to another. Some are of poor workmanship while others show damage and these points must be borne in mind when considering the various transcriptions of them since scribal errors and difficulties in reading the hieroglyphs may have occurred. Most of the texts use the past tense in the particular section of text relevant to this paper, but a few use the imperative form. Whatever the form of darkness was to which the inscriptions were referring, it would not be unreasonable, after the event, for some people to be worried enough merely to record the event as having occurred while others might have been more concerned that it shouldn't happen again, perhaps permanently and to plead accordingly. These texts have all been studied by Egyptologists in the past and we will now consider their various interpretations of them.

## **Traditional Interpretations of the Texts**

The wealth of archaeological material found at or near Deir el-Medina, from which the examples being considered in this paper have (largely) been drawn, has given some rich insights into the beliefs of the workmen and women living there and texts from this corpus have been included in several general studies of the morals, religion and piety of the ordinary people in Ancient Egypt, for example by Gunn (1916), Erman (1911), Sweeney (1985), Baines (1987, 1992 & 2001), Lichtheim (1992 & 1996), Pinch (1993) and extensively over many years by Assmann (1969, 1975, 1984, 1994, 1995 & 2001).

Mahmoud (1999, pp. 315-327), covering all eleven examples listed above, considered these texts to be referring to actual blindness. He argued that the ancient Egyptians never used the words "blind", "blindness", or their synonyms in cases of literal blindness, probably for fear that such defects might adhere to them in their afterlife. He concluded that they used symbolic ways of explaining the meaning of blindness.

Gunn (1916, pp. 81-94) discusses a number of these texts. He notes that some describe physical ailments and in particular various forms of “blindness”. He considered it natural to take such expressions to describe physical blindness, bearing in mind that the working conditions and the incidence of water-borne parasites may both be detrimental to eyesight. He remarked (Gunn 1916, p. 89,) that “...it is very strange that this affliction should occur proportionally so often, and be at the same time the only one specified by the victims of divine retribution.”

Borghouts (1982, p. 7) has extensively researched references to “manifestations of the gods”, including several of these texts, and concludes “[I]t is generally agreed that, ‘darkness by day’ may sometimes indicate blindness – mostly only a temporary one – in such instances. Černý, considering Stela Bankes No. 6, noted the similarity of the text to those from elsewhere and refers to the work by Gunn (above). (Černý 1958) Posener (1975, pp. 195-210,) believed that the hieratic graffito on Ostrakon Cairo 12202 was written to give thanks to Amun-Re by someone who had previously experienced “blindness” but was cured and who clearly was alive and sighted at the time it was written.

Manniche (1978, p. 17), on the other hand, studying artistic material, noted that those said to “see darkness by day” are all represented as having a perfectly normal eye suggesting that the expression could be figurative, citing similar biblical passages where spiritual blindness may be being inferred.

Rowe examined one example of these texts on Stela Cairo JE 37463, found in the Karnak cache, attributed to Huy, Viceroy of Nubia during the reign of Tutankhamun. Whilst noting the similarity between this text and others from elsewhere, Rowe (1940, p. 49) commented that, “[T]he “darkness” perhaps refers to one of two things, either (1) that Huy was becoming blind or (2) that he was in darkness – metaphorically speaking – because of the absence of the king.....”

Gardiner (1928, p. 10) interprets the Graffito Pawah, written in hieratic and dating from the Amarna period, found in a chapel tomb in Thebes, as being a petition to Amun written by the brother of a blind man, However, Reeves (2001, p. 163-164) disagrees, arguing that it is an appeal to Amun to return, reflecting the despondency which had settled on the country during the reign of Akhenaten.

Pinch (1993, p. 257), studied the use of votive eyes and ears which appear on some of these (and similar) stelae recalled the suggestion by Wilkinson (1878) (actually made in relation to ears and possible deafness) and concluded that they were dedicated to deities by people who had been cured of blindness but conceded that this could also be referring to spiritual blindness, adding that, “[I]t is not clear whether such requests refer to seeing visions of the deity, perhaps as a mark of divine forgiveness, or to being in the presence of the deity in the afterlife.”

Galán (1999, p.29) also believed that the idea that such expressions refer to physical blindness is mistaken, arguing that in some cases, “... the alleged blind are dead; the stelae been dedicated by one or more relatives, who include themselves next to the honoured one in the tableau, praising the deity, and/or are mentioned at the end of the inscription.”

Assmann (1969, 1975, 1984, 1994, 1995 & 2001) has also discussed metaphorical blindness extensively in a wider range of other contexts. He too, did not consider such expressions as referring to blindness. Using Grafitto Pawah as a model, he coined the phrase “ocular desire” to cover the concepts expressed in texts such as these. Considering the expression to be metaphorical, whilst accepting that, in the context of Ancient Egyptian religion, actual blindness may also have appeared as a metaphor for banishment from the face of the god, he argued (Assmann 1994, p. 27) that the meaning of ocular desire

“extends into three different directions or contexts which are however, closely connected:

- the context of the feast: the visibility of the ‘coming god’, where invisibility refers to the absence caused by the abolition of the feasts during the Amarna period,
- the context of the pious life: the visibility of the god ‘taken to heart’, where invisibility refers to ignorance or even persecution, and
- the context of suffering and salvation: the visibility of the merciful god, who turns his face to the sufferer and illuminates his yearning eyes.”

All of these interpretations are, of course, plausible. Physical blindness would have been very common in Ancient Egypt where diseases like bilharzia were widespread. The cramped and dusty working conditions in the tombs would also have caused irritation and ulceration, in some cases leading to the permanent loss of sight. The depiction of normal eyes in accompanying imagery suggests, however, that permanent blindness does not seem to be an adequate explanation in all cases. If one accepts the view that religious beliefs pervaded the everyday life of the Ancient Egyptians, metaphorical interpretations of actual blindness are also possible.

So, no single explanation seems entirely adequate for all eleven expressions, despite their conceptual similarity, but there is no reason to assume that the explanations which have so far been offered are comprehensive or mutually exclusive. In the absence of physical explanations for the movement of the sun, moon, and stars, and everyday phenomena, like the annual flooding of the Nile, unusual occurrences and events would have been attributed supernatural causes and effects, in some cases perhaps being interpreted as a punishment. Even texts which seem strongly metaphorical may be grounded on physical events – Assmann (1995, p.6) has noted the spiritual change during the New Kingdom where, “[G]od translates his nature into actions and controls creation and order.”

The main problem with all the traditional explanations is that they are essentially untestable scientifically. An explanation which, if further examples were to be found, allowed a test of the validity of the explanation, would be of greater value. Such an explanation was hinted at by Rowe (1940, p.49), when commenting on Stela Cairo JE 37463 (see quotation above) when he added, “...(like the sun during the night or at an eclipse (?)).”

This paper therefore examines the hypothesis that these expressions were in fact recording the witnessing of a deep solar eclipse, whether or not they were incorporated into texts written for other purposes. It proceeds by moving outside the eleven texts to examine some additional evidence.

## **Deir el Medina tombs with Spell 135 Vignettes & associated funerary material**

The second group of evidence we will consider is found in six tombs in the workers village Deir el Medina, on a papyrus and a coffin fragment. They all contain instances of the unusual Spell 135 from the Book of the Dead.

Spell 135 is one of the groups of Spells 100-102 and 133-136 which focus on the journey of the deceased in the solar barque. This spell was intended to be recited on the day of the month when the new moon was due. (Recall that a solar eclipse can only occur at the time of a new moon.) It was also one of those spells meant to have been used by the living as well as by the dead, as indicated by a note which appears at the end of this spell (Taylor 2010, p. 34). It first occurs in the tombs of the workers at Deir el-Medina during the 19<sup>th</sup> Dynasty, and as far as is currently known those are the only tombs in which it is present. The spell, which may comprise a text and a vignette showing a varying number of deities (4 or 5), a disk and a varying numbers of stars (6, 7 or 8) against a dark background, is noted by Saleh (1984, pp. 72-74) as occurring in the various tombs as follows:

<b>Tomb</b>	<b>Owner</b>	<b>Spell 135 content</b>
TT1	Sennedjem	Vignette only
TT5	Neferabou	Vignette only
TT218	Amennakht	Text and Vignette
TT265	Amenemopet	Text and Vignette
TT290	Irynefer	Vignette only
TT356	Amenmuwia	Vignette only

Saleh does not actually illustrate the vignette in TT265 when discussing the text and there does not appear to be any reference to it in the main work on this tomb by Jourdain (MIFAO, lxxiii). During very deep eclipses some planets and stars may be visible. How many potentially might be seen (or 'remembered') would have been dependent on when, during the eclipse, their presence was noted as well as where and when the eclipse occurred and the current weather conditions. This might explain the variation in the numbers stars depicted in the vignettes.

Hodel-Hoenes (2000, pp 259-260) illustrates the vignette, with no associated text, which is prominently displayed in the tomb of Sennedjem (TT1) (figure 3), describing the vignette as showing a full moon, but she recalls Hornung's interpretation (Hornung 1979) that the spell is intended to fend off the menace of a solar eclipse associated with a new moon and so concludes that the spell must be understood as referring to the solar disk rather than the moon.



Illustration 3 – BotD Spell 135 in TT1 © Thierry Benderitter / [www.osirisnet.net](http://www.osirisnet.net)

Faulkner (2000, p 123) translated Spell 135 as follows:

[A]nother spell to be said when the moon is new on the first day of the month. Open, O cloudiness! The bleared Eye of Re is covered, and Horus proceeds happily every day, even he the great of shape and weighty of striking-power, who dispels bleariness of eye with his fiery breath.

This could be a reference to the flash of the solar corona and to “Bailey’s Beads”, flashes of light occurring at the precise moment of a total eclipse.

Davis (1894, p 147) translated a general form of the spell as:

[O]siris frees himself (different reading) : he opens the cloud that is the body of Heaven, he frees himself. Integrity is restored to Horus, radiant every day and the master of transformations. – Offering of the moment – The cloud is set aside from the face of the Osiris N who appears and comes as a wandering sun, who is the four gods, rulers of the upper sky; he comes with the help of the ropes of his assistants.

The earliest example of Spell 135 on papyrus is that of Neferrenpet, which is in two parts (Philadelphia E2775, 16720-22 and Brussels E5043). The Spell, which contains both a vignette and text, can be found on Brussels E5043, XVIII and can be dated by association with its known owner fairly accurately to the first half of the reign of Ramesses II. Milde (1991, p. 165), notes that the disk and stars are shown against the dark blue background which is decidedly different from the lighter background behind the deceased and his wife. Apparently not considering the possibility that the whole scene might reflect the transient darkness associated with

an eclipse, he concludes that the disk must be the moon but remarks on the same page that, “[T]he affinity between Neferrenpet and the Theban tombs (especially TT1) is abundantly clear.”

Spell 135 also occurs on a number of other papyri, all attributed to the 21st dynasty but these cannot be dated as precisely as Neferrenpet. Gatseschen is, perhaps, the best known of these, although its order differs slightly from Neferrenpet. Lucarelli (2006, p. 169), while analysing the structure of Gatseschen, describes the theme of Spell 135 as, “...to prevent the cloudiness of the sunlight, which may be the consequence of the appearance of a new moon.”

Allen (1974, p. 110) translates Spell 135 of Gatseschen as

[O]pen though, storm that clouds] the sky, clothing and keeping sound [the beautiful Horus every day. (O) stately of form,] weighty of might, who dispels [the cloudiness with his scorching breath, behold, I am come, (O) Re], sailing. I am (one) God of [these 4] God[s who are each] over a side of the sky. I attain to thee, (god) who is in his day. One who hauls on] thy ropes (thou) will not (repulse).

The reference to “boat tackle” and “ropes” could be references to the solar streamers which Brewer (1991, p.14) notes are visible on some occasions during a solar eclipse when the sunspot cycle is at its lowest.

Bruyère (1926, pp. 175-176) describes the fortuitous finding of a small fragment of Neferrenpet’s own coffin in the entrance to TT 335 which belonged to Nakhtamun, his brother – Neferrenpet’s own tomb (TT 336) is immediately adjacent. This fragment also clearly shows part of the vignette for Spell 135.

Although Spell 135 first occurs in the tombs of the workers at Deir el-Medina during the 19<sup>th</sup> Dynasty, and as far as is currently known was only used in those tombs, it recalls the earlier Coffin Text Spell 1112, translated by Faulkner (1978 pp. 161-162) as:

[O] storm, you who are cloudy! Re is covered, but Horus proceeds happily every day, (even he) the great shape and weighty of striking power, who dispels cloudiness with his fiery breath.

Eight coffins bear Coffin Text Spell 1112. These are all from el-Bersha and probably come from the 11th or 12th Dynasty, but cannot be dated more precisely (De Buck et al. 1961, pp. 442-443). None of the texts on these, which vary between the coffins, contain the rare determinative hieroglyph which we will discuss later. It is interesting to note, however, that the preceding Coffin Text Spell 1111 consists only of a flame and has the title “Gate of Darkness”.

These Coffin and Book of the Dead texts are notoriously difficult to translate, but it is significant that those translating these texts use similar terms. They are all terms which may also be used by an observer witnessing the dramatic and unusual event of a very deep or total solar eclipse. If the hypothesis being examined in this paper

is accepted, this could mean that solar eclipses were observed and recorded at least as early as the Middle Kingdom. The unusual hieroglyphic determinatives used in some of these inscriptions may lend weight to the argument that these inscriptions refer not to metaphorical expressions but are oblique references to eclipses and we will consider these now.

## The Use of Hieroglyphic Determinatives and their Possible Interpretation

All but one of the texts on the eleven stelae in the first group of evidence contains the unusual determinative hieroglyph (Gardiner N46b): 

This is normally used to depict “night” or “darkness” and was first used in this form in the New Kingdom. It does not occur on Stela Cairo JE 37463, but this is relatively small and the sculptor may have chosen to omit it for reasons of space. The graffito and the ostrakon are both in hieratic although those discussing these texts have interpreted them as using the equivalent of N46b. Maspero believed that N46b depicts a star suspended beneath the sky (Maspero 1895, p. 16), but Hornung (1956, pp. 6-10) and Chatelet (1920, pp. 21–31) have both studied the extensive evolution of this glyph and Chatelet argued that it is probably the determinative for “twilight” although even from its earliest uses scribes were probably not sure of its meaning.

Spell 135 also usually contains unusual determinative hieroglyphs. Allen’s translation of pGatseschen refers to “the storm that clouds the sky” and the glyph used by Wallis Budge (1999) in his copying of this spell is  (Gardiner N4) which means rain-storm or storm. However, in Milde’s (1991, pl. 31) illustration of Neferrenpet and also Saleh’s (1984, pp. 73-74) illustration of the spell from TT218 and TT256 the hieroglyph  is clearly shown

- this usually used to represent cloth, but is sometimes a determinative for covering / uncovering.

The structural similarity of all these three glyphs ought not be overlooked. Given the rarity of both eclipses and storms in Ancient Egypt and the possible uncertainty about the precise meaning of some of these rare hieroglyphs it should not be unexpected that the scribe may have been struggling to record the events and the form in terms of twilight, storm, covering/uncovering – all terms clearly relevant to an eclipse event – varied from scribe to scribe. Recalling Chatelet’s comment (above), it is interesting to note that the vignette for TT218 illustrated in Saleh’s paper seems to show that the scribe has drawn the glyph for S28 the wrong way round. Interpretations in terms of metaphorical or actual blindness seem also not to accord with glyphs that relate to weather conditions or anomalies in light levels.

## CONCLUSIONS

In this part of the paper the apparent lack of any unambiguous reference to solar

eclipse events amongst Ancient Egyptian records has been noted and possible reasons for this have been suggested. A number of texts and images for which traditional explanations do not seem wholly convincing or consistent have been considered. The link between Book of the Dead Spell 135 and earlier coffin texts has been discussed, particularly in relation to the unusual hieroglyphs used, and an alternative explanation suggested for their meaning.

This research aims to investigate and test the hypothesis that these artefacts in fact record solar eclipse events although they do so obliquely in terms which use metaphorical and sometimes spiritual concepts to describe these unusual and disturbing events.

Part 2 of this paper will therefore examine the geometry of solar eclipses and use state-of-the art mathematical techniques to predict their historical occurrence and the probability that these could have been witnessed during the lifetimes of the individuals and their families to whom these artefacts are attributed.

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