Perceptions of Meteorological Phenomena in Ancient Egypt

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In memory of the Jensens



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Abbreviations

Berlin ÄM	Neues Museum (Berlin), Ägyptisches Museum und Papyrussammlung.
BM EA	British Museum (London), Department of Egypt and Sudan.
Cairo CG	Egyptian Museum (Cairo), Catalogue Général.
Cairo JE	Egyptian Museum (Cairo), Journal d'Entreé.
Cairo TR	Egyptian Museum (Cairo), Temporary Registers.
CDD	Johnson, J. H. (ed.) 2001, *Chicago Demotic Dictionary*. Chicago: The University of Chicago. Available at https://isac.uchicago.edu/research/projects/chicago-demotic-dictionary-cdd-0.
CT	de Buck, A. 1935–1961, *The Egyptian Coffin Texts*, 7 vols. Chicago: The University of Chicago Press.
Dendara	Chassinat, É., F. Daumas, S. Cauville, 1934–2008, *Le temple de Dendara*, 15 vols. Cairo: Institut Français d'Archéologie Orientale.
Edfou	Chassinat, É. 1933–1987, *Le temple d'Edfou*, 2nd ed., 14 vols. Cairo: Institut Français d'Archéologie Orientale.
Garstang	Garstang Museum of Archaeology (Liverpool)
KIU	Karnak Identifiant Unique. *Projet Karnak*. Luxor: Centre Franco-Égyptien d'Étude des Temples de Karnak. Available at http://sith.huma-num.fr/karnak.
K*RI*	Kitchen, K. A. 1975–1990, *Ramesside inscriptions, historical and biographical*, 8 vols. Oxford: Blackwell.
L*D*	Lepsius, R. 1849–1859, *Denkmäler aus Aegypten und Aethiopien*, 12 vols. Berlin: Nicolaische Buchhandlung.
Leiden	Rijksmuseum van Oudheden (Leiden)
LEM	Gardiner, A. H. 1937, *Late-Egyptian miscellanies*. Bibliotheca Aegyptiaca 7; Brussels: Fondation Égyptologique Reine Élisabeth.
LES	Gardiner, A. H. 1932, *Late-Egyptian stories*. Bibliotheca Aegyptiaca 1; Brussels: Fondation Égyptologique Reine Élisabeth.
LGG	Leitz, C. (ed.) 2002, *Lexikon der ägyptischen Götter und Götterbezeichnungen,* 8 vols. Leuven: Peeters.
MMA	Metropolitan Museum of Art (New York)

OED	Simpson, J. A. and E. S. C. Weiner (eds.) 1989, *The Oxford English dictionary*, 2nd ed., 20 vols. Oxford: Clarendon Press.
Penn.	University of Pennsylvania Museum of Archaeology and Anthropology.
PM	Porter, B. and R. L. B. Moss, 1968–2012, *Topographical bibliography of ancient Egyptian hieroglyphic texts, reliefs, and paintings*, 2nd ed., 8 vols. Oxford: Griffith Institute.
Pushkin	Pushkin State Museum of Fine Arts (Moscow)
Pyr.	Sethe, K. 1908–1922, *Die altägyptischen Pyramidentexte: Nach den Papierabdrücken und Photographien des Berliner Museums*, 4 vols. Leipzig: J. C. Hinrichs.
TLA DZA	*Thesaurus Linguae Aegyptiae*, Digitalisiertes Zettelarchiv. Available at https://thesaurus-linguae-aegyptiae.de.
Vienna ÄS	Kunsthistorisches Museum (Vienna), Ägyptisch Sammlung
Wb.	Erman, A. and H. Grapow (eds.), 1926–1931, *Wörterbuch der ägyptischen Sprache im Auftrage der Deutschen Akademien*, 5 vols. Leipzig: J. C. Hinrichs.

Abstract

Perception of landscape has become crucial for how we recreate ancient experience, linking landscape to concepts of embodiment, identity, and dwelling, but the perception of weather has been absent from these discussions. While historical climatology has reconstructed past climates using quantitative methods, limited research has been done on the impact of weather phenomena, both mundane and extraordinary, on cultural experience and expression. This dissertation applies landscape theory to the weather of ancient Egypt, studying how ancient Egyptians perceived, conceptualised, and interacted with their weather, through archaeological, representational, and textual sources.

The first chapter discusses the anthropological approach to weather as part of a culture's landscape, which forms the theoretical backbone of this dissertation. The following chapter provides an outline of Egyptian climate and weather patterns, creating a baseline from which to build when discussing ancient perception and conceptualisation. My aim is not to reconstruct the palaeoclimate, but to define the meteoric possibilities. The third chapter examines the archaeological and representation evidence for engagement with the weather, whilst the fourth chapter explores the lexicon of weather, refining our understanding of these terms by adding nuance. Finally, the discussion brings together all the evidence in order to appraise the perception of weather in ancient Egypt holistically.

The dissertation has a broad scope, considering evidence from the Old Kingdom to the end of the New Kingdom, in order to maximise the potential of the fragmentary evidence. These varied sources indicate the practical, religious, and cultural relationships the Egyptians had with their weather: they built structures to both utilise and mitigate against weather, incorporated weather into cosmogonies and their conceptualisation of the ongoing maintenance of the universe, and used weather terminology in metaphorical language, among other aspects. I argue that the Egyptians were deeply entwined with their weather, just as they were with the rest of their landscape.

1 Introduction

Weather engulfs us. As we roam through our environment, we encounter cool air, or warm and blinding sunbeams; the wind sweeps past us, sometimes weak, sometimes strong, whistling as it goes; we feel the 'stickiness' of humid air; the shadows of clouds high above drift over the ground, providing both relief from heat and shade for the eyes in the hot seasons, but exacerbating our awareness of cold in other seasons. As storm clouds roll in, darkness deepens; we see the bright flashes of lightning in the distance, and hear the grumble of thunder getting closer, louder; with the first drops of rain, we smell the peculiar scent of petrichor. We feel the rain, as it changes from small needles pricking the skin to large blobs that splash on the ground. After the storm has passed, the air becomes clearer than before, adding vibrancy to the landscape, and perhaps even a rainbow overhead. This imagined scene illustrates how the weather surrounds us in our daily lives, as we move through what might be called a 'weatherworld', as coined by Tim Ingold (2005). These experiences of weather not only impact individuals, but also entire cultures. Why should ancient Egypt be an exception?

As the effects of anthropogenic climate change take hold, many different disciplines have turned their attention to the topic of 'climate' (e.g. art, botany, ethnography, geology, geography, history, legal studies, medicine, meteorology, palaeontology, psychology, sociology: Weart 2013). Past, present, and future climates are all embraced: palaeoclimatology measures and recreates past climatic conditions, while anthropological and geographical studies document how people are coping with current changes, and economists predict future costs (Peterson and Broad 2009: 71). Anthropological, as well as archaeological, studies also mention climate and weather conditions to frame the discussion, or as a mechanism for cultural change (Howe 2015: 206; e.g. Sinha *et al.* 2019), but research into how different cultures actually interact with and perceive their weather is surprisingly sparse. Several popular books have appeared on the topic of (American-European) weather perception in the 21st century, such as *Weatherland* by literary critic Alexandra Harris (2015), *Rain: A Natural and Cultural History* by author Cynthia Barnett (2015), and a series of books released by the Cloud Appreciation Society (Pretor-Pinney 2006, 2019).

A distinction between weather and climate must be maintained: weather refers to the atmospheric conditions of any particular moment; climate is the generalised pattern of weather over extended periods of time (Hulme *et al*. 2009: 197–98).

This thesis examines the 'weatherworld' (see §2.2) of the ancient Egyptians, to probe into how the Egyptians experienced weather phenomena, how they interacted with them, and how their perceptions influenced weather conceptualisations. These questions are addressed through combining anthropological methods, and both archaeological and textual data. This thesis focuses on sources from the Old to New Kingdoms, with occasional reference to some sources outside these parameters when relevant. While Ptolemaic Egypt has many more archaeological and textual sources for weather than the preceding periods, the multi-cultural aspects of the period can make it difficult to untangle what are specifically Egyptian conceptualisations of weather.

The first chapter discusses the theoretical backbone of this dissertation, the anthropological approach to weather and climate that places them within a culture's landscape. Examples of how other ancient and modern cultures define, interact with, and experience weather are provided, as well as how they permeate into local identities. Possible methods for accessing these 'weatherworlds' are also introduced. Finally, this chapter discusses how people have used weather and climate to support racist and colonialist ideologies as a cautionary note towards reconstructing weatherworlds of marginalised groups.

The second chapter sketches the scientifically measured Egyptian climate (20th–21st centuries), as well as more subjective accounts of weather events from visiting Westerners and embedded Egyptians since the Middle Ages. Outlining the climate is an important first step because it helps to reconstruct the affordances given by the landscape, in order to grasp possible ancient Egyptian conceptualisations in later chapters. Finally, this chapter breaks down Egyptian climate into several zones (Delta, Middle Egypt, Upper Egypt) to observe the differences between weather affordances in the Delta compared to the far south, for example, in relation to the ancient Egyptian seasons.

The third chapter deals with archaeological and, to a limited extent, representational evidence of how the ancient Egyptians interacted with their weatherworld. These include domestic (houses, towns), religious (temples, mortuary complexes), and rock-cut mortuary contexts. Representational sources are very rare, as landscapes generally were not prominent in visual art (Baines 2013: 44–45), and images of temples, towns, or houses, where one might expect to see practical responses to weather (e.g. waterspouts or wind-catchers), are frequently idealised. This chapter asks how the ancient Egyptians mitigated against, and occasionally profited from, their weather.

The fourth chapter analyses textual references. It is divided into two sections: lexemes that take the  determinative (Gardiner sign N4), and lexemes that take the  determinative

(Gardiner sign P5). Textual attestations were gathered into a database and analysed using qualitative data methods and software (MAXQDA: Verbi Software 2021). The database, with over 3000 entries, has been published on zenodo.com (DOI: 10.5281/zenodo.13143870). This chapter considers the perceptual world of the ancient Egyptians through the textual sources, and how the weather was incorporated into their web of conceptualisations.

The final chapter draws together these strands to offer an interpretation of how the ancient Egyptians experienced, interacted with, perceived, and conceptualised their weatherworld.

2 Anthropological Background

2.1 Culture and Landscape

'Landscape' is an ambiguous term that has been given many popular and academic definitions over the years (Gosden and Head 1994). Before the 1990s, researchers frequently viewed landscape as external to society and immutable, the scientifically measurable background that grounded cultural interpretations (Thomas 1996: 235; O'Keeffe 2007: 3–4). In the collective American-European psyche, 'landscape' conjures up images of landscape paintings in the idealised Romantic style (Layton and Ucko 1999: 3); for a Chinese audience, the spiritual 山水画 ('mountain-water paintings') might come to mind (Suk-mun Law 2011: 370). While there are many anthropological definitions of landscape, the majority describe how humans experience, perceive, and interact with the world (Alcock 2002: 30). Here, I am guided by the idea that the ontological engagement of people with their environment constructs a specific landscape (cf. Levinson 2008: 357). Once a landscape has been established in an environment, a cognitive web is continuously spun between culture and landscape. Through this web we experience and interact with the world. There may be threads in the web unique to an individual, but it is traceable on a cultural scale (for similar views, see Gosden and Head 1994: 113; Darvill 1999: 106; Wylie 2007: 7; Basu 2015: 28; Hoaen 2020: 167). Following ontological arguments, all landscapes are valid and should be taken seriously as equal to our own landscapes. This relatively recent concept of landscape can be applied to non-European societies and cultures, including ancient Egypt. This section contains examples from well-documented living cultures and communities, in order to provide a sense of how landscape can be conceptualised, and in particular the variety of ways weather can be conceptualised.

2.1.1 *Interactions with the landscape: Taskscape*

Since every landscape is embedded in a unique environment, the physical and conceptual opportunities that arise within each are not identical (Lash 2020: 132). According to the archaeologist Christopher Tilley (2010: 21), 'each landscape has its own particular identity and characteristics that affect experience and perception, prompting different kinds of narratives'. These affordances, or possible opportunities, in the environment mould the 'taskscape', which encompasses the variety of activities and interactions that a culture has with their landscape (Garnett 2016: 237). The Gunditjmara people of southeastern Australia, for example, have a complex relationship with the volcano Budj Bim. The centre of their

landscape, Budj Bim is responsible for the basalt that the Gunditjmara once used to build houses and intricate eel-farming systems (see Builth *et al.* 2008; McNiven *et al.* 2015). Gunditjmara people conceptualise Budj Bim as part of the landscape created through the ancestral actions that take place in the Yakinitj (the 'Dreaming'). Budj Bim dominates in both ritual and social activity (see Smith 1999: 195; Strang 1999: 210). These aspects are unique to the Gunditjmara, and are not found in other Indigenous peoples across the continent. The local landscape fashioned the Gunditjmara, but this should not be mistaken for a deterministic relationship with no human agency, since the Gunditjmara also fashioned their landscape (Howes 2003: 163). Ingold (2000: 225) notes that disconnecting a living culture from their landscape would separate 'traditional knowledge from the contexts of its production in the environmentally situated experience of practitioners'. This also applies to ancient cultures.

Anthropologists have described this ongoing connection between an individual and their culturally construed landscape as 'dwelling' (e.g. Ingold 2000: 193; Cloke and Jones 2001: 651; Dalglish 2012: 334) or 'wayfaring' (e.g. Hamilakis 2013: 97; Ingold 2017: 12); the latter is frequently employed when taskscapes are prioritised, as 'wayfaring' evokes more movement and active engagement with the world. Though as Schnegg (2019: 840) explains, these two concepts are not mutually exclusive, and can be combined. A dweller-wayfarer crossing their landscape draws on individual and cultural experiences, to discover meanings in the contours of the land, plant and animal life, the sky above them, and so on. For example, the Nile had a range of religious, political, and social meanings and uses which the ancient Egyptian dwellers imbued in it, yet the Nile also impacted (but not determined) the shape of Egyptian culture and history in turn (Butzer 1984: 102; Hassan 1997; Bard 2017: 23). However, the existence of an environmental feature does not mean that it automatically has practical or symbolic significance for the local society (Allen *et al.* 2013: 42).

2.1.2 *Landscape and identity*

A culture in an ongoing dialogue with their landscape by individuals moving and dwelling within it, all the while imparting meaning to certain features, develops an attachment to that landscape, and eventually that landscape becomes incorporated into self and collective identity (e.g. Bender 1992: 735; Thomas 1996: 238; Knez 2005: 217; Basu 2015: 34). Current anthropologists have maintained that neither individuals nor cultures can be compartmentalised separately from the environment that underlies their landscape, because it constitutes a crucial part of their identities (e.g. Ingold and Kurttila 2000; O'Keeffe 2007: 3;

Vadjunec *et al.* 2011: 10–11; Ellis and Albrecht 2017: 162). This identity is predicated on social activity, as memories and experiences of the landscape link people together (e.g. Halbwachs 1992: 200; Schama 1995: 15; Yoffee 2007: 3). Childhood landscape in particular contributes to this identity, even if the individual has since moved away from that environment, and especially in the case of traumatic relocation (Gonzalo 1999: 259). One example of local identity from recent history concerns the South African apartheid period, when the government demolished the mixed-race District Six in Cape Town in order to accommodate a purely white suburb, scattering the original inhabitants. Decades later, former residents still remember the landscape as it was, and they congregate to the museum that holds remnants of District Six, thereby upholding a collective identity that is defined by that landscape (Bohlin 1998: 165–75). Likewise, members of the Nubian diaspora have expressed longing for their now submerged landscape underneath the Aswan High Dam, following their forced departure in the 1960s (Abbas 2014: 150). In terms of national identity, stereotypical local landscapes have often been deliberately used to reinforce the distinction between 'us' and 'them' (e.g. Archetti 1998: 183; Lovell 1998b: 52; van de Noort 2011: 1045). Both consciously and unconsciously, individuals identify with their meaning- and memory-saturated landscape.

Any understanding of a society, past or present, involves understanding the environment they occupy. Such studies need to be wary of how a researcher's landscape may influence their interpretation of other landscapes and cultures (Tilley 1994; Lovell 1998a: 1). As the above applies to all human beings, a researcher's own practices and perspectives are deeply connected with their particular landscape. If these biases are taken uncritically into the study of people distant in time and place, academics risk transferring modern experiences onto them, simply 'peopling the past with people like us' (R. Beck, reported in Day 2013: 20).

2.2 Weather as a Component of the Landscape

Many 20th century anthropological studies have excluded, or forgotten, weather phenomena from discussions of landscape, since they are arguably ephemeral and not permanent (Peterson and Broad 2009: 81, n. 1). This is especially true in archaeological practices, where the subjective experiences of everyday weather have been subsumed by palaeoclimatic research that seeks to scientifically reconstruct long-term climatic patterns (Pillatt 2012: 573). In reality, however, every part of the environment is ephemeral when compared to Earth's lifespan. The ground under our feet is only unchanging on human time scales, not geologic ones (e.g. Lovell 1998a: 11; Ingold 2000: 201; Dalglish 2012: 337). With regards to the study

of past cultures, a noteworthy article by English historian Paul Brassley (1998) recognised landscape's dynamism, being constantly in flux and transformed by tectonic plate movements, erosion, seasons, tides, and so on (see also McGlade 1999). If the landscape was truly permanent, human society would probably not survive, as trees and plants would not grow, and rivers would not flood.

Weather, in particular, can be an agent of change in the landscape. Not only do its actions create long-term change, by erosion or weathering, but it also enacts ephemeral change. The perceived character of landscape evolves with the weather (Bonacina 1941: 305). The moment-to-moment play of light and shadow from clouds, the wind rattling through the leaves, puddles forming from rain—all are examples of ephemeral change that people notice and respond to in their daily lives (Brassley 1998: 120; Ingold 2017: 119; Dowd 2020: 194). On an outcrop next to Rock Lake in Ontario, First Nations rock-art shimmers from the reflected sunlight in calm conditions, vivifying the figures in a way that is difficult to express in academic writing (Allen *et al.* 2013: 33). A foggy day dampens both sound and light, creating a distinctive experience (Allan 2019: 56). In other words, weather alters our perception of a landscape and artefacts within it (Knez 2005: 209; Randerson 2018: xvii; for more on perceptual changes, see Nyord 2013: 143–48).

Furthermore, weather not only affects how we view the landscape, it is also itself part of the landscape. Since ephemerality is an aspect of landscape, with even the ground being ephemeral, then weather must also be included in a culture's landscape. Any given environment has a climate and suite of weather phenomena that characterises it—a weatherworld that touches and tangles with the rest of the landscape (Pillatt 2016: 588; Ingold 2017: 74). Another way to visualise our relationship to the weather is that we walk on the bottom of the sky, like a crab scuttles about on the ocean floor (see Sloane 2005: 15); it is the medium that surrounds and supports us. The Navajo landscape is particularly illustrative of the connection between people and weatherworld, for in their conceptualisation, everyone is born with an 'indwelling wind' that communicates and interacts with the external winds sent by the Holy People, thus connecting individuals with the weather (McAllester 1982: 468). Like any other aspect of landscape (see §1.1.2), weather is given meanings by cultures, and affects cultures in return.

2.2.1 *Weather interactions with the taskscape*

If weather is part of the landscape, it is also part of the taskscape (see §1.1.2). With its unpredictable nature, weather can bring about advantages or disadvantages, life or death,

impacting human lives dramatically or subtly (Hulme 2015: 237). In modern urban societies, we make hundreds of small decisions based on weather conditions, affecting our already established behaviours (Hassan 2000: 122; Knez 2005: 209; de Vet 2013: 199; de Freitas 2015: 56)—what will I wear, do I need an umbrella, will I slip on the ice, will it matter if I get wet, is it safe for me to go out, is it too hot to play sport, do I need to wipe away condensation on the windows, should I put the fan on, the list is endless. Every day, ordinary people around the world discuss the current weather and wonder what the weather may bring tomorrow, next week, next month, or the entire year (Strauss and Orlove 2003: 3).

Depending on occupation, more specialised questions and decisions might arise (Jankovic and Barboza 2009: 12). In particular, resource extraction workers, in fields such as agriculture, fishing, or tree-felling, frequently have weather on their mind (Uekötter 2009: 278). Modern crab fishermen of Chesapeake Bay (eastern USA) constantly evaluate how the weather might impact their job, or what the weather conditions tell them about the probable location of their quarry (Paolisso 2003: 62). Meanwhile, the Kenyah Badeng rice farmers of Sarawak assess coming weather against a cultural knowledge bank in order to prepare their farms (Garay-Barayazarra and Puri 2011: 21). Questions of weather would have been more prevalent in past societies, when more of the population was engaged in these types of livelihoods. While many modern jobs are set in climate-controlled rooms, leisure activities might still depend on the vagaries of the weather. If you gamble on horse racing for entertainment, knowing whether the track is wet or dry is crucial, as each horse might perform better on one or the other (e.g. Eddy and Bishop 2019). Ritualised and religious activity can also be predicated on weather conditions. For example, shamans in the Uws district of Western Mongolia perform a ritual in order to quell strong thunderstorms (Birtalan 2001), while many cultures have rituals to summon rain, for instance in ancient and modern Greece (Håland 2001), the Ihanzu people of Africa (Sanders 2003), and the Yokut people of North America (Parkman 1993: 93).

Weather and climate are also resources that humans have used in various practical ways: rainwater for drinking, sunlight for growing plants, wind for bringing yeast to bread dough and sunlight to make it rise, wind for stoking the forge's fire, fog for hiding invasion, snow for easier overland travel. The occurrence, or non-occurrence, of certain weather events can inspire a ritualised response that links with a culture's specific beliefs, such as prayers to the gods in thanks, or for cessation or commencement. We also interact with the weather in terms of mitigating its effects—building lightning rods, dykes, drainage, wind breaks, and forming plans of action for disastrous weather. Weather phenomena also provide resources for

enjoyment: freezing temperatures transform rivers to ice for skating or spontaneous fairs (as in the Elizabethan frost fairs: e.g. Bowen 2018: 60), children splash in puddles left by rain, lightning creates natural light shows, and the cool change brings relief at the end of an oppressively hot day. Enjoyment of these sorts of weather phenomena is dependent on cultural and social circumstances; lightning storms are only fascinating to watch when the perceived danger to the watcher is low.

The weather, linked to a specific environment, impacts an individual's occupations and lifestyle as they actively or subconsciously make choices. Moreover, all behavioural interactions with the weather, whether in daily life, ritual, resource extraction, or enjoyment, depend on cultural and social expectations, perceptions, and experiences in conjunction with the affordances provided by the environment. In other words, weather is a component of the taskscape (Vannini *et al.* 2012: 368). If weather were not part of the taskscape, none of the above interactions would be possible, and people would not modify their behaviours according to weather conditions or use the resources weather provides.

2.2.2 *Weather, cultural identity, and place*

Weather also cultivates a sense of place and belonging. Since specific weather events and climates are unique to specific places, societies form attachments to their weather, just as they are linked to the land they occupy (see §1.1.3; Knez 2005: 209; Sriratana 2012: 1; Pillatt 2016: 34; Geoghegan *et al.* 2019: 5). An individual may not necessarily rejoice in their landscape's weather—most British people grumble about the intermittent drizzle—but it is part of their identity nonetheless. In the case of the British, that drizzly rain is intrinsic to the culturally perceived 'British' landscape (Golinski 2007: 58). Meanwhile, modern Australians are strangely proud of the high temperatures that they endure every year; in popular culture, blazing hot summers are a component of what makes the Australian continent 'home' (see e.g. Wilson 2018: 27; similar in USA: Ott 2010: 736, and UK: Hall 2022: 5). The weather enables the building of social bonds through shared experience of place, whether that be hardship or enjoyment (Thomashow 1995: 7; Strauss 2003: 54; Petek-Sargeant and Lane 2022: 5).

Sometimes, this cultural or social identity is visible in the naming of both negative and positive recurring weather phenomena. Knowledge of these local terms reinforces an individual's membership to a particular group, and ignorance signals that they are an outsider (Friede 2018: 203–11). Winds in particular are frequently given names that describe where they blow, which deity/spirit is responsible, or their characteristics: the '*shamal*' of the

Persian Gulf that blows from, and is named after, the north (شمال: Yu *et al.* 2016: 289); the cooling afternoon sea breeze of the 'Fremantle Doctor' in Western Australia that 'heals' the air (Kepert and Smith 1992: 2042; see also the similar 'Cape Doctor' of South Africa: Faber and Rull 2017: 429); the '*cordonazo*' of western Mexico refers to a 'lash' of St. Francis bringing agony (Faber and Rull 2017: 438); the cold '*piteraq*' of Greenland that translates to 'that which attacks you' (Cappelen *et al.* 2001: 96); Boreas, the ancient Greek god of the north wind, is the etymological root of the cold '*bora*' wind of the Adriatic region (Romanic 2019: 4); the 'Helm Wind' of Cumbria whose storm clouds inspired locals to name it after a helmet (Strachan 2005: 331); the '*karaburan*', or 'black storm', of central Asia named for its appearance (Faber and Rull 2017: 437); and the southerly '*khamsin*', or 'fifty', that is expected in a period of fifty days in the Egyptian spring (El Fandy 1940: 324; Veale *et al.* 2014: 26; see §3.2.1). Societies have named these winds because they are part of the local character of a landscape, whether they are dangerous or pleasant (Pillatt 2016: 587). From such names we gain some insight into the perception of weather phenomena (Faber and Rull 2017: 425).

Conversely, weather can sometimes inspire the names of other landscape features. New Zealand's Māori name is Aotearoa, which today has a folkloric etymology of 'long white cloud' (the actual etymology is uncertain). This name supposedly originates from the islands' appearance when the Polynesian peoples first glimpsed them, or perhaps in reference to clouds that build up above islands and make them visible to sea travellers (Randerson 2018: xvi). For the Mixtec peoples, rain is so culturally important that their self-given name is 'Ñuu Savi', 'the people of the rain' (Jiménez Osorio and Santoyo 2016: 450). Both New Zealanders and Mixtec peoples have endonyms that reflect how their weather has built part of their identity. These names also tell us something about how they interact with their weather, and how they perceive it.

2.2.3 *Homeworld and alienworld*

When someone lives in a single weatherworld for a long time, and develops an attachment to it, this weatherworld then underpins a framework that moulds how the outside world is perceived. The philosopher Janet Donohoe (2016) has suggested the terms 'homeworld' and 'alienworld' for these lenses through which we view a landscape and its weather. 'Homeworld' describes the physical and cultural area in which any given person is embedded, frequently is part of their identity, and forms the basis of their ongoing interactions with the world. It dictates what weather they perceive as 'normal' for their

climate at a specific time of year (Hulme 2015: 238). Such expectations allow people to be more mentally and physically resilient (Lin 2009: 2020; see e.g. Spinney and Pennesi 2013: 6). After all, forewarned is forearmed.

Weather preferences are linked to the homeworld, but are not wholly dependent on it. The definition of 'unusual', 'dangerous', or 'pleasant' weather is subjective, but made with reference to your perception of 'normal' for your homeworld (Gergis *et al.* 2010: 503; Faber and Rull 2017: 430; e.g. Meze-Hausken 2004: 30). For instance, the perceived 'pleasant' temperature depends to some extent on location—people from Thessaloniki in Greece prefer a temperature of 25°C on average (Nikolopoulou and Lykoudis 2006: 1466), Taiwanese prefer between 26 and 30°C (Lin 2009: 2019), and in western Spain 21 to 23°C is considered best (Andrade *et al.* 2011: 676). Social practices surrounding certain groups of people within a culture can impact weather preferences and comfort ranges (e.g. men and women in Taiwan: Lin 2009: 2023). Finally, individuals often have varying preferences. Someone who grew up in a temperate climate might believe their homeworld to be their ideal climate, or they might prefer a more tropical climate than their homeworld. Regardless of an individual's attitude towards their homeworld's weather, it is their point of comparison with the outside world.

If someone travels outside their homeworld, they encounter the alienworld, which seems unfamiliar by contrast. Dorothea Mackellar (1885–1968), an Australian poet, composed 'My Country' when travelling through England in 1904, which articulates her strong emotional attachment to the Australian landscape and climate: she acknowledges that some prefer the 'grey-blue distance, brown streams and soft dim skies' (l. 5–6) of England, but her love is for the 'sunburnt country' (l. 9), with its 'far horizons' (l. 13), the 'sapphire-misted mountains' (l. 19), 'the hot gold hush of noon' (l. 20), and how the 'pitiless blue sky' (l. 26) gives way to the 'steady, soaking rain' (l. 32) when a drought breaks (Mackellar 1985 [1908]). As a personal example from my own experience, during my first year of living in England (2017), I was constantly aware of the climatic differences between England and my homeworld, Melbourne (Australia). I could not escape the feeling that the weather was 'wrong' (see also Toth 2003 and Donohoe 2016: 21 for experiences of climate-shock). Although climate-crossing travel has become increasingly available to more extensive demographics in the last few centuries, the experience of climate-shock is still felt, and it is entirely feasible that ancient peoples also had homeworlds and alienworlds of weather.

Even if an individual has been living in a different climate for many years, their homeworld may still be based on the weatherworld of their childhood (Donohoe 2016: 21).

However, there are exceptions. The letters of Captain Arthur Phillips (1738–1814, Watson 1914: 57, 75, 144) reveal that two years after settling in Australia, he had reversed his opinion about that particular climate, claiming that 'a finer or more healthy climate is not to be found in any part of the world' (Day 2007: 3). Regardless, the captain made this assertion with reference to the British climate—however much he preferred the eastern Australian climate, it still was more of an alienworld than a homeworld for him. Not everyone's homeworld is based on their childhood landscape, but they are generally the exception rather than the rule.

Extreme weather events, that are discordant with the local rhythm, are most likely to reverberate throughout collective memory (Hassan 2000: 131; Ingold and Kurttila 2000: 190). For example, the Great Storm that battered England in 1703 was actively remembered by the public for at least 30 years afterwards, because it did not match their perceived homeworld (Golinski 2007: 44), and when a strong storm hit England in October 1987, the media compared it to the 1703 storm (Clow 1988: 140). In order to collectively process the event, the English interpreted it as the anger of the Christian God, with priests incorporating the Storm into religious services (Golinski 2007: 44; likewise the extreme conditions in the Midwest USA remembered by Toth 2003: 4–7). Such extreme conditions are specific to place; one location's extreme could be another's norm, since 'normal' is based on the expectations of the homeworld. Typhoons are an expected reality of living in the Philippines, and Filipinos grin and bear them (the principle of *bahala na*), having made what provisions they can, and accepting what fate might throw their way (Bankoff 2004: 104). These extreme events can create trauma, but they are still part of the Filipino homeworld because of their repeated nature and their inclusion in cultural practices.

Memories of extreme weather events rarely match what meteorologists record, since humans have a tendency to collapse memories into each other and modify them over time in order to create personal and communal narratives (Roncoli *et al.* 2009: 97; Holmberg 2013: 59). In the oral history of the Māori, for example, storms are remembered by replicating older narratives whose circumstances were similar, merging them together (King *et al.* 2007: 61). Daily weather conditions that fit within the homeworld paradigm, on the other hand, are quickly subsumed into the general expectations and memories for that area, with specific details forgotten (Meze-Hausken 2004: 27–28; Sherratt 2005: 2; Hulme *et al.* 2009: 200; de Vet 2013: 199). Those collective memories help create a repertoire of weather associations for a homeworld, which people draw on for creative work of all sorts, creating a window into that homeworld (Brown *et al.* 2015: 200).

Not all unusual climatic events that are discussed and remembered are negative. Minor variations in the weather can be positive while also being unexpected (Orians 1986: 19; Brassley 1998: 124). In the remote Canadian town of Ocean Falls, sunshine is rare; in 2009, they had three consecutive days of sunshine, and the residents were pleased by this unexpected turn of events, though by the end people wanted their normal weather back (Vannini *et al.* 2012: 371). Snow is not a common occurrence in Baghdad, Iraq, and so the snowfall in February 2020 excited locals, as reported in news bulletins (e.g. Egypt Independent 2020). These sorts of events straddle the line between homeworld and alienworld. Inhabitants of Baghdad know that snow is possible there, since it falls about once in a decade, but it is hardly part of their regular expectations for their weather. Because unusual weather events depart from the local norms, they can provoke strong emotions, ranging from fear (as in the case of the Great Storm), to appreciation (as in the case of Ocean Falls' sunshine).

In short, these well-documented examples suggest that an individual's specific homeworld plays a large role in how they perceive and interact with the world, and also forms a part of their identity. This comes about due to the connection between place and climatic conditions, with the weather shaping the land and people's perceptions of it, affecting their activities, ideas, and decisions, and becoming a familiar part of the landscape's rhythm. This weather homeworld is the reference point for comparison, not individual preference.

2.3 Conceptualisation and Bodily Experience

I now discuss how people experience the weather physically, how this bodily experience impacts their conceptualisations of their world, and how those experiences and conceptualisations can be accessed.

2.3.1 *Senses*

People experience the world through bodily senses, and from this create a cognitive world. Physiologically, senses are how people receive the external world (Hamilakis 2002: 122; Bingley 2003: 334; Hamilakis 2013: 6). However, assuming that all humans have the same sensorium ignores cultural and social factors (Geurts 2002: 3; Howes 2003: 14). According to the dominant American-European model the sensorium is made of five senses—sight, smell, hearing, taste, touch—but the recognised senses and their number vary from culture to culture (Classen 1997: 404; Day 2013: 3; Howes and Classen 2019: 4). Sometimes, the sensorium of

a culture has a single sense where the Western model would divide it into two separate senses; for example, the 4th century BCE Greek philosopher Aristotle concluded that taste was a form of touch (Hamilakis 2013: 73; Holmberg 2013: 50). Or the sensorium might be partly recognisable, but also incorporate some aspects that a modern Western audience would rarely consider as senses; the Anlo-Ewe people of Ghana include '*agbagbagogo*' ('balancing'), '*azolizozo*' ('kinesthesia'), and '*seselelame*' ('feeling within the body') in their sensorium (Geurts 2002: 46–47).

Within any sensorium, senses can be given elevated or lowered importance on a sensory hierarchy. However, this is notoriously difficult to pinpoint, since a sense might be prioritised in one context, but neglected in another (Ingold 2000: 250). For the Inuit, sight is paramount in hunting contexts, while hearing has more symbolic power in spiritual contexts (Howes and Classen 2019: 4). A single culture can also have multiple hierarchies relating to socio-economic distinctions. When dealing with the ancient Egyptian sensory experience, we lack the necessary sources to be able to determine a hierarchy of senses, or what sensory experiences were most impactful (Strong 2019: 377; Parkinson 2020: 415). However, we can reconstruct the possibilities, or affordances, based on the environment and archaeological work.

Dividing the senses of the sensorium into isolated categories is only a construct for ease of thinking. Instead, the senses are complexly intermingled, so that a single sensory experience is cross- and multi-modal (Tilley 2010: 28; Hamilakis 2013: 79). Multi-modal, in that each sensory experience is synaesthetic, with multiple senses providing information at once (Ingold 2000: 283), and cross-modal, in that the information provided by one sense can impact the other senses (Fulkerson 2013: 366; Allan 2019: 62). This synaesthesia is particularly relevant for weather, since each weather condition brings with it a host of sensory experiences that contribute to an individual, societal, or cultural perception of the world, which in turn affects conceptualisation (e.g. Ingold 2005: 97; Hsu 2007: S130; Vannini *et al.* 2012: 362; Frølund 2018: 160; Allan 2019: 52). For example, a cool breeze is felt on the skin, heard moving through bushes, smelt in wafts of pleasant or unpleasant odours, and perhaps seen picking up leaves on the ground. Weather events do not happen in isolation; the wind can make it feel colder than the recorded temperature would suggest (Gaull 2009: 116). In a single place, the collective society experiences the same weather conditions, which over time slots into a general conceptual definition of that place, which then contributes to identity (Roncoli *et al.* 2009: 90; see §2.2.4). However, there is probably more than one sensory

profile for weather in any culture, as with any aspect of sensory experience (Auliciems 1976: 312; Adamson 2015: 605).

2.3.2 *Conceptualisation*

The cognitive brain receives sensory information, which is already influenced by the cultural sensorium, and then organises and interprets those signals based on a range of factors (including culture, society, class, ethnicity, age, gender, abilities, profession, religious beliefs, and aesthetic taste), giving meanings to the perceived world (Ingold 2012: 16; Hamilakis 2013: 10; Howes and Classen 2019: 4). The generation of Britons who lived during the Second World War disliked the smell of wintergreen (methyl salicylate), but for the same generation of Americans, wintergreen was a positive odour. The historical context explains these opposing reactions, since wintergreen was used to flavour medicines in Britain, but confectionery in the USA (Herz 2002: 162; Smith 2007: 123). Essentially, we form an ever-changing, complex web of associations and conceptualisations from our individual and collective sensory experiences of our landscape combined with our cultural beliefs and habits.

Therefore, it would be surprising if weather events and overall climate were not part of this conceptual web on individual and cultural levels. Indeed, being in the weather is an inherently multi-sensual experience (see §2.3.1), processed with reference to the conceptual web that results in cognitive, emotional, and behavioural responses specific to a locality (Geoghegan *et al.* 2019: 5). The artist Olfur Eliasson based his installation *The Weather Project* (2003–2004) on the idea that experiences of weather are not universal. When visitors entered the space that embodied his weather conceptions, he asked them this pertinent question: 'Do you think the idea of weather in our society is based on nature or culture?' (Randerson 2018: 93). The answer becomes clearer when two different cultures living in very similar climatic conditions can create different weather associations due to their specific cultural webs of knowledge (e.g. modern Chinese and Korean conceptualisations of 'rain': Jun 2017: 86; the perception of the dry season for the Lele and Bushong: Douglas 1962; see also Burenhult and Levinson 2008: 142).

As with other stimuli, while an individual's response to weather stems primarily from culture, it is also affected intra-culturally by personal beliefs, specific local conditions, and membership to socioeconomic groups (Auliciems 1976: 312; Veale *et al.* 2014: 26; Adamson 2015: 605). This intra-cultural variation can be illustrated by the politicised interpretation of an aurora in 1716. When the English Lord Derwentwater was executed for his participation in

the Jacobite Rising, an aurora appeared in the sky. Sympathisers of the uprising reported the aurora as a sign of divine support for the Jacobites; opponents saw the aurora as the gates of hell opening (Jankovic 2000: 71; Golinski 2007: 48).

Because of these factors, the perception of weather is not the same as the scientifically recorded weather. Memories of weather can be influential long after their relevance has disappeared. The idealised 'White Christmas' still holds fast in the modern British imagination, propagated by cultural artefacts, despite the fact this has rarely occurred in the past century (Harley 2003: 109; Hulme *et al.* 2009: 200; Rayner 2009: 21). Stranger still is that 'White Christmas' is also an ongoing part of Caucasian Australian culture, as a remnant of Australia's colonial past, despite it being at odds with the climate (Winchester and Rofe 2005: 266). As mentioned earlier (§2.2.5), memories of past weather events can also be conflated or folded into each other, so that the cultural memory does not reflect objective records (Meze-Hausken 2004: 28; Roncoli *et al.* 2009: 97; Holmberg 2013: 59).

The etic perspective can impose connotations onto the weatherworld of others, particularly in the words that are used to describe climate. For example, the English language has some weather words with an implicit value judgement. The word 'arid', for example, has a scientific definition, but it also carries negative connotations in the English language, so that when a location is labelled as 'arid', English speakers perceive it in terms of the frequent rain and green pastures that it lacks. However, for the people who live in those areas, 'aridity' is not necessarily a useful concept. They may not negatively perceive their landscape as arid or devoid of life because their culture grew around this homeworld (Biagetti and Chalcraft 2012: 80); scientific 'fact' is not always reflected in cultural perceptions, as illustrated throughout this chapter. In sum, culture shapes weather terminology to such a point that representations and language may not be drawing on an objective reality. While palaeoclimatology is invaluable for establishing past climatic conditions, it does not elucidate what the weather *was* in the collective mind of past cultures.

All environmental terms are socio-cultural artefacts created by a particular culture, with specific meanings and histories behind them. Weather terminology in one language (or in some cases dialect) will not map perfectly onto another. For example, Arabic has the word غيث (*ghayth*), which could be translated simply as 'rain', but carries the extra meaning of 'life-giving rain', in contrast to other sorts of rain. English has no individual word that carries these connotations (Shehab 2009: 882; Thawabteh 2017: 255). Not only are words full of meaning, but the context behind the choice of each word provides access to a culture's cultural knowledge base (Gergis *et al.* 2010: 503; Faber and Rull 2017: 419–20).

Classification of the world is linguistically and culturally specific, and this becomes more apparent when dealing with classifier languages and scripts like Ancient Egyptian (for more on cognitive linguistics and its application in Egyptology, see Aĭkhenvald 2000: 312; Goldwasser 2006: 25).

Recent anthropology has highlighted a wide array of cultural specific understandings of weather that are embedded in the experience of landscape (Ulloa 2019: 68). Firstly, understanding of the mechanisms behind weather, as well as what constitutes weather, is culturally based. In Aztec tradition, rain was perceived to be stored underneath the mountains in the dry season, and in the rainy season Tlaloc, their rain-god, would draw rainwater from these mountain containers (Saunders 1994: 174; Milbrath 2017: 166). The Matsigenka people of Peru would declare that a flooded river allows more subterranean demons to enter the world, and these demons consequently cause the rain; therefore, rain does not create floods, floods create rain (Rosengren 2018: 612). Among the Damara people of Namibia, the rainbow is a colourful fire, burning the rain until it is all consumed (Schnegg 2019: 836). In several Melanesian societies, a *mali* (a type of heat-haze) of the dry season is created by the smoke of cooking fires in the surrounding ghost villages (Harrison 2001: 260). For the Wola people, another Melanesian group, smoke from their own campfires creates clouds. They also perceive rain as coming from a pool up above stricken by the sky woman (*Sabkabyintem*), and do not link clouds to the rain (Sillitoe 1994: 258).

While weather was not personified in some cultures (e.g. McAllester 1982: 468; Haines 2012: 107), many weather deities have existed across the entire spectrum of human belief. Some take care of the entire weather system (e.g. Inuit faith: Laugrand and Oosten 2010: 143), while other concern broad categories of weather (e.g. wind, Shinto faith: Chang and Hasegawa 2007: 59), and others only a single localised phenomenon (e.g. southeasterly wind, inhabitants of Rossel Island: Levinson 2008: 283). In many cases, human relationships with these deities are crucial, with weather being a reflection on human actions, sent by gods who took a keen interest in human morals and behaviours. Droughts can be punishments (e.g. Wagedu people: Tegola 2000: 186; Matisgenka people: Rosengren 2018: 613), but rain floods (e.g. in Ladakh: Butcher 2017: 5), strong winds (e.g. Islam faith: Thawabteh 2017: 254–55), thunderstorms (e.g. in England: Golinski 2007: 26; Kenyah Badeng people of Sarawak: Garay-Barayazarra and Puri 2011: 23), and so on could also be retribution or warning. Weather deities can show emotion, like rain being the grief of clouds in reaction to human misfortune (e.g. Māori: Randerson 2018: 89), or have personalities, like the mischievous north wind (e.g. Huave people: Friede 2018: 95). Alternatively, human action

plays no role in what the weather deities/spirits do, though those entities can range from benevolent (e.g. Damara people: Schnegg 2019: 835) to dangerous (e.g. Matsigenka people: Rosengren 2018: 611), or switch between the two according to mood changes (e.g. Mbuti people: Strauss and Orlove 2003: 4). Sometimes humans can affect the outcome of weather through ritual or prayers (e.g. in Acatlan: Saunders 1994: 175; in China: Hsu 2000: 210; in South Africa: Schoeman 2006: 153; Nahua people: Ulloa 2019: 72), but in other cultures this is impossible, and the weather is accepted as inevitable (e.g. Filipino people: Bankoff 2004: 104; Sakha people: Crate 2009: 142; Inuit people: Spinney and Pennesi 2013: 8). Weather omens are prevalent in many cultures for determining non-climatic outcomes, where weather is a vessel for divine messages (e.g. ancient Rome: Jankovic 2000: 21). The divine explanation for weather is arguably common across human cultures because it creates a sense of certainty and provides an object of blame in case of disaster (Heymann 2009: 101; Taddei 2009: 291).

Each culture associates certain weather phenomena with other concepts in a specific way, mixed with various intra-cultural associations that can be contradictory. Some weather phenomena are praised (e.g. by the Aztec people: Saunders 1994: 175), others hated (e.g. in Middle Byzantium: Frugoni 2011: 519; Matisgenka people: Rosengren 2018: 611), others seen as necessary for balance in the world (e.g. by the Sakha people: Crate 2009: 139). Broad categories of weather phenomena (like rain or wind) can be subdivided into distinctive types that each have their own associations within a single culture, so that one type of rain could be positive, but another negative (e.g. by the Ihanzu people: Sanders 2003: 95). Different weather can cause (e.g. in Bavaria: Lüdecke 2009: 215) or cure illness (e.g. by the Khoisan peoples: Low 2009: 241). In some cultures, specific weather phenomena impact individual personalities, characteristics, and abilities, inducing violence (e.g. in ancient Greece: Rayner 2009: 19; in San Carlos: Haines 2012: 107), fertility (e.g. in ancient China: Hsu 2007: S117), melancholy (e.g. in Melanesia: Harrison 2001: 257), or connectedness with animals (e.g. among the Khoisan peoples: Ingold 2017: 121). Alternatively, a phenomenon heralds a particular seasonal change (e.g. in the Marquesas Islands: Cablitz 2008: 207), a change in living conditions (e.g. by the Damara people: Schnegg 2019: 839), or the start of certain rituals (e.g. by the Huave people: Friede 2018: 96). These multiple associations can also be in conflict with each other within cultures. One social class might see hot weather as a positive, whilst another social class gives it negative associations, due to differences in lived experience (e.g. lower vs middle class Americans: Rayner 2009: 21).

While these cognitive associations might not always be apparent to those experiencing the weather, they are articulated in various forms of art or other traditions (Jankovic 2000: 3; Randerson 2018: xxxiii). Weather can appear as a primary subject, as a setting, or in metaphor, within music, art, and literature, occasionally referring to distinct historical events, but more frequently drawing on the cultural understanding of the weather (Brown *et al.* 2015: 204). In the British tradition, paintings and literature use storms to give a sense of foreboding, of impending danger (Appleton 1996 [1975]: 20). In contrast, storms evoked different associations for Bedouins of the 6th century CE: the poet Imru al-Qays used storm imagery to describe the reweaving of society and the promise of fertility in his renowned Mu'allaqa poem (l. 77–88: see Stetkevych 1983: 94; Farrin 2011: 22). The metaphorical use of weather terms in English also reveals our weather associations: when something is 'foggy', it is unclear (*OED* V, 1131); if someone is 'cold' or 'icy' towards you, they are unfriendly (*OED* III, 461–62); if you succeed at 'weathering the storm', you have survived hardship (*OED* XX, 58); and a 'rainy day' is a misfortune (*OED* XIII, 136). Etymology also illustrates the associations that earlier cultures had with the weather. For example, the word 'cloud', as we know it today, only appeared in 13th century England, derived from the word that meant 'mass of rock', because that was the most salient comparison for those people when they saw an irregular cumulus cloud (*OED* III, 357).

These examples of how weather has been and is perceived and conceptualised in living or well-documented earlier cultures demonstrate the extent to which examining cultural differences in weather perceptions is significant, even though its complexity creates difficulties. Ancient Egyptians almost certainly had culturally embedded views of the weather, with distinct understandings of how weather phenomena work, how they are connected, how they interact with and impact people, and their cognitive associations.

2.4 Phenomenology

How then should researchers access the landscape, sensorium, and the consequent conceptualisations that arise for different cultures? An anthropologist would immerse themselves in a culture and talk to members of that group in order to tease out how that culture perceives the world (Howes 2003: 50), but that is not available to historians and archaeologists. Any discussion about the conceptualisation and perception of the world through bodily experience in past cultures must confront the field of phenomenology and its criticisms. Phenomenology derives from a philosophical method that aims to better understand our place in the world (Barrett and Ko 2009: 276; Bannon 2016: viii).

Archaeologists studying prehistoric Britain adopted phenomenology as part of the post-processualism movement, particularly influenced by the works of philosophers Maurice Merleau-Ponty (1962 [1945]) and Martin Heidegger (1971). In doing so, they rejected universal historical processes, strict objectivity, and the subject/object ontology (Barrett and Ko 2009: 280). In theory, phenomenological archaeology is centred around the embodied engagement of cultures within their landscape, allowing us to delve into how those landscapes were experienced, perceived, and conceptualised (Van Dyke and Alcock 2003: 5–6; Wylie 2007: 166; Day 2013: 6–7). Every object encountered in the landscape has meanings that can be discovered in or layered on the object, built up from individual and cultural experiences (Donohoe 2016: 18). On a practical level, phenomenological archaeology involves walking through a landscape and attempting to emulate what someone might have sensed and perceived in it long ago. Phenomenological practices have now been adopted by a greater range of area-specialists, including Egyptologists (e.g. Nyord 2009b; Gillam 2020; Price 2022; Budka *et al.* 2023), though sometimes under a different guise.

There have been major criticisms of phenomenology, especially concerning the work of archaeologist C. Tilley (1994), one of the first archaeologists to adopt an explicitly phenomenological approach (for the history of these criticisms, see Moyes 2023). The most significant criticism is that this approach can conflate all possible intra-cultural differences into a single embodied person who is not representative of that culture (Allen *et al.* 2013: 42; Hoaen 2020: 166). As noted earlier (see §2.3.1), there can be a plurality of sensory experiences in one culture, including those relating to differences in age, class, education, gender, profession, religion, or ethnicity (Smith 2007: 12; similarly Howes and Classen 2013: 12; Allan 2019: 63). In the case of ancient Egypt, the overwhelming predominance of evidence is from elite sources, and as such, the conclusions we draw only apply to the elite experience, with a few exceptions (as noted by e.g. Baines 2013: 20; Bussmann 2015: 5; Parkinson 2020: 415).

Even if a single person could represent the many facets of society, a visiting researcher would have a very different experience to a dwelling inhabitant, someone who is embedded in a landscape filled with culturally-specific meanings (Barrett and Ko 2009: 279; Day 2013: 7; Tringham 2013: 183). Tilley's early works (1994, 2004) assumed that his body could feasibly be representative of all past bodies, regardless of varying social and cultural factors, because all humans inherit the same basic physiology. Yet as discussed earlier (see §2.3.1), the sensorium is not universal. Many phenomenological archaeologies have prioritised vision to the detriment of other senses, since sight plays such a large role in

English-speaking sensoriums (Hamilakis *et al.* 2002: 5; Nyord 2013: 135), but this is not always authentic to the studied culture.

Phenomenology can also assume that an experience or landscape feature was culturally significant just because of its presence in the environment (Allen *et al.* 2013: 42; Oestigaard 2020: 180). Furthermore, the environment as it is preserved today is not the complete picture of the past; elements of the landscape that were crucial for past experience and held meaning for people may be missing now (e.g. Parkinson 2020: 416). For example, the Nile has shifted and changed many times, creating new land and cutting into the old repeatedly, bringing water closer or further away, as with the island beginnings of the Temple of Karnak (Bunbury *et al.* 2008); and the abandonment and inundation of Piramesses (Bietak 1975). Some opposing scholars argue that phenomenological methods in historical studies are not empirical, objective, or scientific because the results cannot be repeated or tested with a living culture (Day 2013: 7; Howes and Classen 2019: 48). While this is true, most other aspects of archaeological research contain interpretations based not only on the available evidence, but also the perspectives, opinions, and backgrounds of the modern researcher (Bender 1998: 7; Johnson 2012: 276; Hamilakis 2013: 6; Bannon 2016: 7). Archaeologists work with an imperfect dataset.

2.5 Sensory Archaeology and Philology

Sensory archaeology is partly a response to these criticisms of phenomenology, interrogating any insights gained from phenomenological practice through the archaeological, representational, and, whenever possible, textual evidence (Lash 2020: 132). It is a balancing act between embodiment of the person and examination of the traces that they left behind (Day 2013: 6). From the sensory affordances, one can reconstruct physical and emotional experiences, and then possible meanings in those experiences qualified by other lines of evidence, whilst taking into account the myriad facets of society that can produce a myriad of responses. Sensory archaeological research has seen rapid growth in many fields, looking at visual (e.g. Nyord 2013), aural (e.g. Meyer-Dietrich 2018; Elwart and Emerit 2019), haptic (e.g. Zinn 2018), olfactory (e.g. Herz 2002; Price 2018; Goldsmith 2019; Strong 2019), gustatory (e.g. Twiss 2012), and other sensory experiences that past individuals may have had in their landscape (e.g. Goering 2019), and how it contributed to their cultural conceptualisations.

Within Egyptology, Rune Nyord (2009b: 63; 2015: 5) has argued that phenomenology can also be applied to philology, despite the apparent gap between experience and linguistic

abstraction, since conceptualisation is grounded in embodied experience (for similar studies, see Goldwasser 1997; Köhler 2011; see §2.3.2). Therefore, we can use phenomenology to investigate the conceptual reasoning behind lexical choices. These sensory archaeological and philological practices enable my approach to weather in ancient Egypt, which explores the possibilities for their experience of the weather, given their local landscape and the archaeological remains and textual sources, and reconstructs their weatherworld as far as is possible.

2.6 Colonialist Weather

Anthropology has historically had a difficult relationship with the weather. From the 17th century CE onwards, climate and weather often featured in cultural studies, but this topic disappeared almost entirely from anthropological research from the mid-20th century, in a large part due to backlash against racism (Peterson and Broad 2009: 72). Below, I briefly review the history of this relationship between climate and culture in anthropological research.

For most of American-European philosophical tradition, climate was believed to have an impact on the quality of a civilisation, an idea that began with Greek philosophers (notably Hippocrates, Herodotus, and Aristotle), who asserted that their climate was perfect for mankind (Livingstone 2012: 567). This tradition was carried on through Arabic scholars before its transmission to Europe through the 15th–18th centuries, which adopted and adapted this climatic philosophy (Palmer 1984: 163; Mahony and Endfield 2018: 2). The perceived ideal climate then shifted to the western European climate, where it stayed until the 20th century (Golinski 2007: 56; Peterson and Broad 2009: 70). It is unsurprising that each group imagined their own climate to be ideal, as that was their homeworld (see §1.2.5), and the climate with which they were most familiar. Consequently, it created an 'us vs them' mentality, which is a strong catalyst for the formation of national identity (Mahony and Endfield 2018: 3; see §1.1.3 and §1.2.4). In Wordsworth's *A Description of the Scenery of the Lakes* (1822: 36), he evokes the English landscape by comparing skies:

> 'Such clouds … will often tempt an inhabitant to congratulate himself on belonging to a country of mists, and clouds, and storms, and make him think of the blank sky of Egypt, and of the cerulean vacancy of Italy, as an unanimated and even a sad spectacle'.

When European empires started to expand in the 16th century, they frequently encountered a climate different from their own, and climate became one way in which Europeans justified

imperialism, slavery, and social inequality (Mahony and Endfield 2018: 2). The premise was that if Europe had the perfect climate, and had produced so many people of intellect and tenacity, then hotter or colder climes must stunt the intellectual development of the people living there (see Peterson and Broad 2009: 72; Adamson 2015: 604). A similar argument was also made for aspects of personality, whereby people of colder climates were represented as brutal and antisocial, but people of hotter climates were exoticised as being wildly passionate or lazy (Palmer 1984: 163; Golinski 2007: 58; Hill 2012: 313; for an example concerning Egypt, see Madox 1834: 409). The climate was so entangled with notions of 'civilisation' that a number of geographers even claimed that as more of North America was 'civilised' by the colonists—with the creation of towns and removal of the indigenous peoples—the climate became more moderate and mild, closer to European norms (Golinski 2007: 5; White 2015: 51; Grevsmühl 2019: 51). In a similar manner, the extreme droughts of Australia were blamed on Indigenous practices and beliefs (i.e. not European or Christian: Mahony and Endfield 2018: 11). While Europeans suffering from tuberculous or mental health issues were sent to the Middle East, and particularly Egypt, for the supposed health benefits of the drier climate (Knox 1879: 667; see Morris 2018: 52), the European climate was considered advantageous for healthy people, and long-term residence or physical labour in the tropics or subtropics was thought to cause physical and moral deterioration (Livingstone 2012: 568; Mahony and Endfield 2018: 6; e.g. St John 1852: 39–40). Slaves did the manual labour in the tropics, most notably in America, because such a climate was supposedly deadly for white people to work in, while the African slaves were meant to be acclimatised—or at least slave-owners were unconcerned with this risk (Stewart 2009: 125; e.g. Cartwright 1860: 720–21). Almost all research concerning weather in alienworlds in this period was steeped in climatic determinism, a philosophy that insisted the nature of man was determined by the local climate (e.g. Chardin 1711; Du Bos 1719; Montesquieu 1749; Jefferson 1788; Huntington 1915), although there were rare exceptions (such as Hume 1758: 198–213), and today these views are considered racist and colonialist. The 18th century historian William Robertson (1809: 415) was representative of this trend, and wrote that mankind can only achieve 'a superior extent of capacity, greater fertility of imagination, more enterprising courage, and a sensibility of heart' in the temperate parts of the world. The last bastion of climatic determinism would be found in early 20th century Germany, bolstering ideas of Aryan superiority (Murphy 1999: 125).

This mindset was still present in the 1940s, though increasingly shunned (e.g. Mills 1942, for criticism, see Ogburn 1943). As anthropologists realised that other cultures were of

equal worth to American-European cultures, climatic determinism was dismissed as a tool of racism and imperialism that removed human agency from cultural development (Rayner 2009: 20; Livingstone 2012: 581). However, as anthropology distanced itself from climatic determinism, broader concerns of how weather and cultures interacted were also largely ignored for much of the 20th century (Peterson and Broad 2009: 72). Only in the 21st century has weather has become a topic in anthropology once again, partially due to the looming effects of modern climate change (e.g. Crate and Nuttall 2009).

2.7 Meteorology and Modernity

When examining the weatherworld of another culture and time, researchers need to be aware of their own associations and conceptualisations that they bring to the weather. They have to take seriously the conceptualisation of the landscape that ancient peoples were embedded in, and not base interpretations on modern worldviews (for ontological practices, see e.g. Nyord 2018: 73). Egyptologists today have a very different conceptualisation and understanding of the world than the ancient Egyptians, not only in terms of lacking physical experience in the same space and of different cultural backgrounds, but also in terms of modernity. We are now increasingly isolated from the outside world, working and relaxing inside climate-controlled rooms, and outdoor workers exposed to the weather make up a smaller percentage of our population than in earlier times (Jankovic and Barboza 2009: 12; Rayner 2009: 29; Hitchings 2011: 179). This is particularly true for agricultural professions; in Europe, they took up ~70% of the workforce in the 16th century CE, but this figure is now only ~4% (Allen 2000: 11; International Labour Organization 2020). Ancient Egyptians would have spent far more time in the weather, and weather was part of the experience whilst inside as well (see in particular §4.1.2). In addition, the prevalence of weather reports and predictions that have been made with scientific instruments, and not from embodied experience, have heavily influenced the modern perception of weather. This practice of recording everyday weather at a global scale in order to develop climatic patterns only emerged in the 19th century; beforehand, only extraordinary events (‘meteors’), were recorded (Berland 1994: 104; Jankovic 2000: 32). More often than not, we read media to discover what the weather is doing, in the present, past, and future (Rayner 2009: 30; Randerson 2018: 46; Diaconu 2022: 70). Our engagement with the weather has fundamentally changed.

Furthermore, modernity has affected the environment itself. The construction of roads and buildings in Egyptian cities impacts experience; flooding frequently happens in modern Cairo due to insufficient water infrastructure and the lack of absorptive surfaces, leaving cars

stranded and buildings damaged (e.g. Anon. 2020). While similar heavy rains might have happened in ancient Memphis (see §3), the effects and experience would have been different. Moreover, human-induced climate change has almost certainly affected weather patterns in Egypt, if only in frequency and intensity (Zaki and Swelam 2017: 24; Nashwan *et al.* 2019: 457; see §3.1.4). This means that the experience of a modern Egyptian is somewhat different to that of an ancient Egyptian, though much closer than an American-European academic, which is why I interrogate a broad range of primary sources for exploring Egyptian weather and climate below.

3 Assessing Egyptian Climate

This chapter provides a brief outline of Egyptian climate and weather patterns, in order to reveal the affordances (see §2.1) that are later used to discuss ancient Egyptian weather conceptualisation. It discusses the mechanisms behind weather events, possible differences between ancient and modern climate, and recorded experiences from more recent history. This chapter draws on combination of palaeoclimatic data, current climatic records, and qualitative accounts. My aim is not to fully reconstruct the palaeoclimate, rather, this chapter seeks to add vital contextualising background, since understanding the landscape in which the ancient Egyptians were embedded is integral to any attempt to access their perceptions and conceptualisations.

This overview also attempts to dispel the popular modern perception of Egypt being mono-meteoric, and only hot and arid (as with many deserts, see Warner 2004: 1). Maintaining this view leads to inaccurate assessments of the archaeological, representational, and textual material (e.g. Eigner 1999: 303). What can appear unchanging at first glance is a fairly dynamic climate, with variation according to season and latitude (Warner 2004: 1). Compared to, for example, the British climate, the Egyptian climate is notable for being comparatively static, an opinion expressed by many 19th century European travellers (e.g. Dearborn 1819: 333; Lane 1871 [1860]: 2; Manning 1875: 80), but this is culturally subjective. The ancient Egyptians were not founding their understanding of climate on the European framework. Though rife with problems, Herodotus does provide a counterpoint, with a glimpse into how the Egyptians might have responded to other climates, through a Greek lens (for further discussion on Herodotus see Burstein 1996: 593–97). Upon hearing of how the contemporary Greeks relied on rain for agriculture, the Egyptians supposedly exclaimed:

> one day the Greeks would be let down by what they counted on, and miserably starve: meaning that, if heaven send no rain for the Greeks and afflict them with drought, the Greeks will be overtaken by famine, for there is no other source of water for them except Zeus alone.
> (Hdt. *Hist.* 2:13)

However, Herodotus is not fully reliable in his descriptions of Egypt; at one point, he claims that it had never rained in Thebes until the reign of Psamtik II (Hdt. *Hist*. 3:10), which is demonstrably incorrect geologically, archaeologically, and textually (see e.g. §3.3.3, §4.1.1.1, §5.2.2.1). This anecdote does, however, demonstrate that there is a wide array of weather

perspectives influenced by an individual's climatic homeworld (see §2.2.5). What seems mono-meteoric to one person may be full of complexities for another.

The first part of this chapter examines the possibilities and problems that modern data, historical accounts, and palaeoclimatic proxies can create when trying to define past climate. This section concludes with an overview of the main climatic changes that are relevant to this study and that are largely agreed upon by the academic community. After discussing the issues surrounding the reconstruction of palaeoclimate, the main climatic features that impact Egyptian weather patterns are explained. These features include the Azores High, the Sudan Monsoon Low, and Siberian High, and their interactions produce the characteristic Egyptian climate and its anomalous weather events.

3.1 Issues

Evaluating past weather conditions in Egypt is challenging in several ways, most of which can be linked to one broad question: how much has Egyptian climate changed over the last five millennia? The first attested measured record of observed daily weather in Egypt is from the 2nd century CE, compiled by Claudius Ptolemy from reports of 'Egyptians' in *Phaseis* (see Hellmann 1916). There are only scattered earlier mentions of specific weather events, which are most likely exceptional and not regular. With an overall paucity of primary data, the climate has to be reconstructed from multiple strands of evidence. However, each of these strands have their own complications, which this section investigates.

3.1.1 *Use of modern meteorological data*

Meteorology and climatology are 'young' sciences, as systematic recording of conditions only began in the 17th century CE, with the creation of the thermometer and barometer, and the formation of national weather services (Golinski 2007: 55). Such record-keeping reached Egypt in the late 18th century. Earlier, there were accounts in Arab historiographies and annals of exceptional weather events, such as those by al-Ayni (14th–15th centuries), al-Makrizi (14th–15th centuries), al-Mufaddal ibn Abi al-Fada'il (14th century), al-Damurdashi (17th–18th centuries), al-Jabarti (18th–19th centuries), but nothing recognisable as modern meteorology that records minimum daily temperatures, pressures, rainfall quantities, and so on, to be collated for long-term climatological analyses. The first specifically designed meteorological station was built in the late 1890s, in Abassia (Cairo) (Keeling 1907: 149; Deebes and Heileman 1999: 7), although there has been some coverage from Alexandria since 1859 (Nicholson *et al.* 2012a: 1220).

Another problem for a comprehensive overview is the scattered placement of modern monitoring stations. The northern part of Egypt is well represented, particularly with Cairo and Alexandria, but Upper Egypt is limited to tourist centres and major cities, and consequently Egypt is considered a poor coverage region for climate databases (El Kenawy *et al.* 2010: 163). This is problematic since some weather events, notably rainstorms, are extremely localised and sporadic in their nature. The weather station at Luxor Airport might not report a single drop of rain, whilst across the river there is severe flash flooding in the wadis (Weeks 1995: 126). Alternatively, a wadi under a cloudless sky might flood with rainwater that fell far away, carried through the catchment system (Jones 2016: 551–52). For localities with meteorological stations, data resolution quality is another problem. Some have had consistent recording since the start of the 20th century, but others are relatively recent; some stations have inconsistent or missing data created from changes in methodology, moving the station, and equipment turnover (Gado *et al.* 2019: 28231). Finally, the data is not easily accessible outside the Egyptian Meteorological Authority.

Because of these factors, climatologists are still debating major elements of modern Egyptian climate, particularly those deriving from atmospheric patterns over the Red Sea (Labban *et al.* 2020: 2). Thus, this data already has significant issues in itself before even being applied to the past. Modern climate is not a one-to-one representation of ancient climate, since climate has changed even within the last century (see §3.1.4).

3.1.2 *Use of historical proxies*

Other sources of information available to us for reconstructing the palaeoclimate are historical accounts made by ancient and modern Egyptians, medieval Arab scholars, European travellers, and archaeological reports or journals.

Historical climatologists frequently use early accounts to examine how changing climates impacted human history. This often involves creating quantitative data from qualitative, non-standardised original sources, so that long-term climate changes can be analysed (Adamson 2015: 602; Glaser *et al.* 2016: 4). Where Jenny Lane (1835–?), a maid travelling with Amelia Edwards (1831–1892), wrote in her diary that there was a ‘rather cold wind’ in Egypt (Lane MSS.2.143), a historical climatologist might create a relative scale for her diary, with ‘cold winds’ at one end and ‘hot winds’ at the other, so that it could be tabulated as data (see Pillatt 2012: 574). However, while valuable, this strategy loses the perceptions of the author, and the evocative descriptions of their experiences (Pillatt

2016: 590; Hall 2022: 3). I focus on these experiences in these weather accounts, in order to illustrate how certain weather events have been experienced by individuals.

There are other issues with the use of historical proxies to reconstruct climate that become more prevalent the further back in time we reach. The way in which those authors report weather might be different from our modern conventions, or have different priorities in what should be recorded (Glaser *et al.* 2016: 2). John E. Oliver (1991) compares modern records of Egyptian rain days per year to those given in *The Chronology of Ancient Nations* by Arab scholar al-Biruni (translation by Sachau 1879), but while he acknowledges some issues, his discussion overlooks others. *The Chronology* was completed in 1000 CE, but used Egyptian sources from probably ca. 100 BCE–100 CE, which al-Biruni merely labelled as 'Egyptian'. At first glance, it appears as though the number of rain days per year in Graeco-Roman Egypt was double that of modern climate reports. However, modern records count a day with only a few drops of rain as a rain day, while it is possible that earlier sources did not. As another example, since prevailing subcardinal winds were rarely recorded in the 'Egyptian' sources, it is unclear whether they categorised a northwesterly wind as northerly or westerly. How can we compare the modern wind directions if we do not know how their categories worked? Furthermore, al-Biruni did not specify crucial facts concerning his 'Egyptian' sources: the provenance, date, genre (e.g. annals, magic calendars), or whether the descriptions for each day are long-term composites or single extraordinary events. These factors combined make al-Biruni a problematic but fascinating source for ancient Egyptian climate.

While Ancient Egyptian texts that mention general or specific weather events seem ideal for reconstructing past climate, they are severely hampered by their scarcity and the context of recording. Determining the exact date of described weather events is a major line of inquiry. Even when the basic problems of dating are overcome—such as with the rock inscriptions in the Valley of the Kings (Leblanc 1995; Dorn and Müller 2006: 91–92), the Rhind Mathematical Papyrus (Foster *et al.* 1996: 10), work journals (Janssen 1961: 49), and letters (Demarée 2008: 51)—what can these sources actually tell us about climate? Understanding the motive for including weather data in a text is not straightforward, since the texts belong to different genres with different purposes and audiences. The western Thebes rain graffiti (TMG no. 1736, 2868, 3012, 3013) could be commemorating a regular occurrence (though this possibility is unlikely), an extraordinary event, or an event that resulted in the scribe sheltering and having time to write (Dorn 2016: 3). Depending on the

interpretation of *mw m pt*, 'water from the sky', the inscription may even be referring to the aftermath of the rain, up to several days later (Leblanc 1995: 203; see §5.2.2.1).

The Calendar of Lucky and Unlucky Days (e.g. P. Sallier IV, P. Cairo JE 86637; see Leitz 1994) include some days with weather-related divinations, but these are usually generalisations (Porceddu *et al.* 2008: 328), such as we might expect in European farmer's almanacs that are derived from folklore, religious observances, and celestial movements (Lawrence-Mathers 2010: 34–49). The weather data that is included might also be fossilised, information that was true when the contents of the text was first conceived, but are no longer particularly accurate because of shifts in climate and calendar drift.

In the jottings on the verso of the Rhind Mathematical Papyrus (P. BM EA 10057, no. 87: Peet 1923: pl. 21), rain and thunder are described in the epagomenal days, but this could be likely metaphorical, either as a metaphor for the troubles in Tjaru (Sile) mentioned in the preceding column, or a more general mythological statement about the dangers of the epagomenal days (Ventker 2012: 12; contra Foster *et al.* 2009: 10; Gnirs 2015: 138–39; see §5.2.1.3–4). The Tempest Stela of Ahmose (Karnak Inv. K41: Helck 2002 [1975]: 104–10) is an ideologically motivated work of monumental discourse. The stela chronicles Ahmose's attempts to restore order in Egypt following a great storm, and the timing of this event has been linked to the Theran eruption in the mid 2nd millennium BCE (e.g. Foster *et al.* 1996: 10), or more generally to another storm not connected to volcanic activity (e.g. Allen and Wiener 1998: 21). However this overlooks the potential ideological motivations for the text, since it has striking similarities to other royal decrees that describe how a new king restored *ma'at* in an Egypt engulfed in chaos. The existence of a storm, whether exaggerated or not, on its own tells us little about Egyptian climate or a particular event, but rather articulates something about ancient Egyptian conceptualisations of weather.

Historical climatology aims to reconstruct past climate and weather events from personal reports, and gain insights into how climate affected the lives of past people and impacted the course of history. This is valid for more recent history, but is more problematic the deeper into the past we look. Historical climatologists who deal with the past five centuries or so have access to multiple overlapping primary sources, whilst none of the ancient Egyptian records coincide with each other, and only rarely for the later Arabic records. In addition, issues such as different standards of weather reporting, and political or religious influences are difficult to separate from the potential underlying data. However, these sources can be used to check whether weather events and climate of modern Egypt were at least feasibly possible in earlier periods. Furthermore, non-ancient historical reports of climate in Egypt are

valuable as they can present it from a lived perspective, regardless of cultural differences, compared to the utilitarian scientific descriptions that must otherwise be the starting point for assessments.

3.1.3 *Use of palaeoclimatological proxies*

Apart from textual and archaeological proxies, there are also scientific proxies analysed through palaeoclimatology. Palaeoclimatologists use a variety of these proxies for studying ancient Egyptian climate, including dendrology (e.g. Gebrekirstos *et al.* 2014), palaeobotanical material (e.g. Bubenzer and Riemer 2007), shellfish (e.g. Abell and Hoelzmann 2000), microfossils (e.g. Ryan *et al.* 2012), animal bones (e.g. Brewer 1991), sedimentary deposits and features (e.g. Moeyersons *et al.* 1999; Nicoll 2004; Welc and Marks 2014), and isotopic analysis (e.g. Manning *et al.* 2014). These methods have identified a number of climatic oscillations in Egypt's past (for a full overview, see Creasman 2020).

However, these techniques do not produce fine chronological resolution, since they have error margins from hundreds to thousands of years (Moeller 2005: 153). It can also sometimes be difficult to determine which variable produced the change in the proxy (Nicholson *et al.* 2012b: 14). Researchers have also preferentially studied some climatic periods more than others, such as the Holocene Wet Phase, which has been a focus of palaeoclimatic research in Egypt: the conclusion of this Wet Phase and the following desiccation in the Sahara, in particular, is a popular topic due to its implications for the formation of the pharaonic state (e.g. Hassan 1986; Linstädter and Kröpelin 2004; Nicoll 2004; Bubenzer and Riemer 2007), as well as for the end of the Old Kingdom (e.g. Bell 1971; Moeller 2005; Welc and Marks 2014; Höflmayer 2015). Furthermore, just like modern weather records, Egyptian palaeoclimatological records have significant temporal and spatial gaps compared with other parts of the world, and this restricts our understanding of Holocene climate changes.

3.1.4 *Known climatic changes*

According to palaeoclimatological research, there have been a number of major and minor climatic changes in Egypt. These oscillations are now briefly outlined, starting from the Neolithic and moving through to the present day, focusing on moisture changes, which are one of the most visible, and most researched, aspects of Egyptian palaeoclimate.

Firstly, the Holocene Wet Phase (or African Humid Period) began at ~13,000 BCE and started weakening by 4000 BCE, and was characterised by increased rainfall compared to

later periods, up to 300mm/year, throughout Egypt (deMenocal *et al.* 2000; Nicoll 2004: 565; Welc and Marks 2014: 125). There were some dry intervals within it, but the wet periods dominated in frequency and strength (Hassan 1986: 64). These circumstances were a result of the summer International Tropical Convergence Zone (hereafter ITCZ) being 700–1000km further north than today (Bubenzer and Riemer 2007: 609; see §3.2.2). Such conditions probably created savannah or steppe environments in what is now desert, with monsoonal rains in summer, and possibly a prevailing westerly wind (Brookes 2003: 165). The end of the Holocene Wet Phase is not clean-cut, as the climate gradually became drier, with lingering bursts of moister weather. Hyperarid conditions were firmly established after the 4.2 kiloyear dry event occurred in 2100 BCE (Nicoll 2004: 572; Revel *et al.* 2015: 213). This remains the most controversial period of Egyptian palaeoclimate. Aridification started in the north and travelled south over time, as the ITCZ moved south and the precipitation belt shifted (Bunbury 2019: 65). As the land dried and sediment became deconsolidated, any rain that did occur produced more intense wadi flash floods than had happened before (Bunbury and Rowe 2021: 16). These events are visible through stratigraphy and archaeological damage at various sites in Middle Egypt, including Saqqara (Sowada 2006; Welc and Marks 2014: 126–30), Tabbet el-Gesh (Dobrev 2006), Abusir (Cilek *et al.* 2012), Sadd el-Kafara (Garbrecht 1995: 16), and Giza (Butzer 2001; Lehner *et al.* 2009). The First Intermediate Period could be causally linked to this drying event, though debates are ongoing (for criticisms, see Moeller 2005; and more generally Livingstone 2012: 593). The Old Kingdom began well after drying and aridification had commenced, but before the full regime shift to a predominantly hyperarid climate. In the 6th Dynasty, there was a final spell of wetter weather before the end of the Holocene Wet Phase, as documented by the lithology at Saqqara, for example (Welc and Marks 2014: 129; Hassan *et al.* 2017: 62).

For the next three millennia, hyperarid conditions prevail, somewhat similar to present conditions, with no more than 25mm/year in rainfall in Upper Egypt (Butzer 1976: 26; Bubenzer 2007: 19). Any rain that did come no longer fell in summer, and was sporadic but intensive in nature (Welc and Marks 2014: 125). There is a short moist period with milder temperatures from 1230 BCE to 1165 BCE, and another longer one from 75 BCE to 480 CE (the so-called Roman Warm Period: Hassan *et al.* 2017: 62; Bunbury and Rowe 2021: 46). Unlike the Holocene Wet Phase, these moist periods were characterised by increased short-term intense rain in spring, rather than consistent rain in summer, as well as increased temperatures (Hassan 1986: 65; Bunbury 2019: 122). Westerly winds may have been more common than today, but the prevailing wind was northerly (Brookes 2003: 165). Another

period, recently named the Late Antique Little Ice Age (550–660 CE), followed the Roman Warm Period as a time of cooler summers (Büntgen *et al.* 2016: 234). From 1000 to 1200 CE, a dry and cool phase was felt in Egypt during the Medieval Climatic Anomaly, in contrast to its warming effect in Europe (Cook *et al.* 2015; Lüning *et al.* 2018: fig. 4).

From the 13th century CE, conditions became more humid, particularly in the north (Lüning *et al.* 2018: fig. S5). After the mid-18th century, we notice fairly rapid oscillations in climate connected to the same synoptic conditions that gave rise to the Little Ice Age in Europe. A drier climate prevailed for about a century (~1750–1850 CE), after which approximately 50 years of wetter and cooler weather followed (~1850–1900 CE), before arid conditions again prevailed by the 1920s (Mann 2002: 304; Nicholson *et al.* 2012b: fig. 7; Cook *et al.* 2016: fig. 5; Nicholson *et al.* 2018: 117; Felis and Mudelsee 2019). Most relevant Arabic historiography, as well as the travel journals by Europeans/Americans, comes from this period of oscillating climate, which makes it especially important to recognise its peculiarities. In the late 19th century, there were a few European travellers who reported that local Egyptians had said that they had never seen rain before. These reports were all from Upper Egypt, as would be expected, and given the sporadic and highly localised rain pattern (see §3.3.3), a local may well have not experienced rain before, as probability dictates a low chance of being exactly in the right spot at the right time.

Finally, within the last century the effects of anthropogenic climate change have been felt in Egypt. Temperatures have been rising in summer, particularly in Upper Egypt and urbanised areas, while there has been an increase in the frequency and severity of both rain- and dust-storms (Domroes and el-Tantawi 2005: 63; Met Office 2011: 1, 22; Robaa 2013: 3215). It is not always clear whether the increased frequencies of these weather events are caused by anthropogenic climate change or decadal oscillations. Some of these changes are likely linked to multidecadal scale variability driven by the North Atlantic Oscillation (NAO; see §3.2.1), but this cannot account for the whole (Nicholson *et al.* 2018: 117; Nashwan *et al.* 2019: 470). While extreme weather events are more frequent and severe than they once were, they were not unknown prior to the mid-20th century (Zaki and Swelam 2017: 23), as is confirmed by a large quantity of firmly dated historical accounts; I have recorded more than 200 events documented in more than 40 separate sources, from the 15th to mid-20th centuries CE.

3.1.5 *Conclusion*

According to palaeoclimatological studies, the mechanisms behind Egyptian climate have remained essentially the same since the end of the Holocene Wet Phase, with oscillations in severity or frequency of extreme weather events. Northwesterly to northeasterly winds have been the prevailing winds since the formation of pharaonic Egypt. Desiccation of the surrounding landscape was already underway in the early Old Kingdom, and that overall aridity has since remained fairly constant. These factors justify the use of historical accounts and modern data as a means of corroborating the palaeoclimatological data and illustrating climatic lived experiences. Therefore, I am collating a number of different sources in order to build up a picture of what the ancient Egyptian climate most probably involved, using modern weather records, historical accounts, and known palaeoclimatic shifts. The historical accounts presented are drawn from my collated database that includes personal anecdotes about the weather from more than a hundred residents, travellers, artists, excavators, and other scientists, in addition to early Arab historiographers, over the last two millennia.

3.2 Weather Systems Relevant to Egypt

A basic understanding of the dynamic processes that control weather in Egypt improves our ability to find affordances in the landscape that can be applied to ancient Egyptian experiences. An understanding of modern mechanisms provides a springboard to understand seasonal and daily experiences, rather than the average of an entire year, which is not how people experience their weather.

Nevertheless, those generalising climatic facts as documented in modern times are where any analysis must begin. Most of modern Egypt has a hot desert climate (BWh) in the Köppen classification, while the Mediterranean coast has a hot semiarid climate (BSh) (Domroes and el-Tantawi 2005: 52). Temperature increases while precipitation decreases on a north-south gradient through the Nile Valley (Embabi 2018: 27). The Western Desert is more arid than the Eastern Desert. As with many desert locales, Egypt's temperature is diurnal, with a hot day but cold night, due to the thermoregulation properties of the desert (Warner 2004: 72). Early morning radiation fog can be generated by the Nile, Mediterranean, or by cultivation (Robaa 2003: 164). The prevailing wind is northwesterly to northeasterly throughout Egypt, with winds from other directions increasingly less likely further south in Upper Egypt (probably due to increasing narrowness of the valley), but with more varied winds in the Delta (el-Wakil *et al.* 2001: 102; Graham 2005: 43; Robaa 2013: 3207; Cooper 2015: fig. 8.2).

3.2.1 *The Azores and Saharan Highs*

The Azores (or Bermuda) High has a significant impact on Egyptian weather, despite being centred over the Atlantic Ocean (between 25ºN and 35ºN). It is a major synoptic scale anticyclone that is indirectly responsible for a number of contradictory features: generally high atmospheric stability, northerly and southerly winds, Mediterranean depressions, and *khamsin* depressions.

Firstly, atmospheric stability defines the baseline of Egyptian weather, and also its popular perception. The Azores High extends over the Saharan desert (thus locally known as the Saharan High), providing a 'cap' of high pressure, descending air in the upper atmosphere (Rodwell and Hoskins 1996: 1386; Camberlin 2009: 308). The air below this cap tries to ascend, having been warmed directly by the sun and indirectly through surface irradiation (a thermal low), but cannot ascend past the cap. Without air rising to the upper levels of the atmosphere, adiabatic cooling cannot occur, and rain-bearing cumulus clouds will not form; however, low level stratus clouds are possible, particularly in the morning (Zaki and Swelam 2017: 10). Furthermore, since this hot air is trapped beneath the high pressure cap, it is responsible for hot temperatures during the day (Rodwell and Hoskins 1996: 1388). In late spring and summer, the Saharan High spreads further to the north, bringing higher temperatures to the Delta, and inhibiting any ocean-fed rain (Robaa and Hasanean 2007: 791). Thus, the Azores/Saharan High drives high levels of atmospheric stability in Egypt, particularly in summer.

While the thermal low in the lower atmosphere raises temperatures, it is also partly responsible for the cooling northerly sea breezes. As it acts as an area of low pressure, the centre of the thermal low draws in air from nearby surface high pressure areas—which in this case, is the cool air above the sea, which itself originated from the Balkan High (Reiter 1975: III-88). The prevailing north breeze is how we experience this movement of air. When the north wind stops blowing overnight, relative humidity rises, resulting in dew the following morning (el-Geziry *et al.* 2021: 1937). Because the thermal low is strongest in late spring and summer, when the solar radiation is highest, the north wind is also generally stronger and more frequent at this time of year. In comparison, the north breeze occurs less in the winter months (Cooper 2015: 130).

In winter, when solar radiation is lowest and so the former thermal low is practically non-existent, the air above the sea is warmer than that over the land, creating a new low pressure area over the sea (Robaa and Hasanean 2007: 791). Unlike the summer thermal low, there is no Saharan High to prevent air from ascending, so rising air can trigger maritime

thunderstorms that are visible from the Mediterranean coast, but these only rarely reach Egypt (El Afandi *et al.* 2013: 3). This low draws air from the south, creating a southerly wind in Egypt. This type of wind is more likely to occur at nighttime, following a diurnal pattern, because the desert cools quickly at night and creates a steeper pressure gradient (el-Geziry *et al.* 2021: 1931, fig. 3). These southerly winds can be just as cool as the northerly wind (Robaa and Hasanean 2007: 792). There are other reasons why a northerly or southerly wind can blow as well (explored below), but these are the most common causes of daily wind in Egypt.

Winter in the Delta is disturbed by roaming Mediterranean depressions and Cyprus Lows. A Cyprus Low is driven by polar air rather than the Azores High, and so creates exceptionally cold conditions in Egypt (el-Asrag 2005: 53). While the Low is developing, surface winds are southerly to southwesterly and cool. Once it has formed, however, the wind veers west to northwest, and the temperature plummets. In successive cold fronts, cumulus clouds form, showers frequently develop, with occasional thunderstorms on the coast and gale-force winds. The Low can stay stationary for quite some time, and the longer it stays, the colder northern Egypt becomes (el Fandy 1946: 292; Robaa and Hasanean 2007: 791). If this system is anomalously strong, extremely cold temperatures invade Egypt for a few days due to meridional blocking; the cold snap of 2013, when snow fell in Cairo, is an example of this (Hafez and Almazroui 2016: 409; Hochman *et al.* 2019: 3). Cyprus Lows can also occur in autumn, when they interact with or are formed by RST events (Ziv *et al.* 2022: 594; see §3.2.2).

The Mediterranean depressions are created by the interaction between the Azores High and Icelandic Low (the North Atlantic Oscillation, or NAO: Hassan 2007: 106; Zaki and Swelam 2017: 10). Westerly winds blow from this interaction. In some cases, cyclogenesis takes place, creating an enclosed area of low surface pressure that travels east along the southern Mediterranean coast, following the westerly storm track (Bubenzer and Riemer 2007: 19; Camberlin 2009: 308). On reaching Egypt, southerly winds blow first, then switch to northerly or northwesterly as the low passes over Egypt (el-Asrag 2005: 52). Depending on the location and strength of their centre, the depressions can bring rain or sandstorms (Middleton 1986: 61). Rain development is favoured when they coincide with an upper atmospheric trough, but this rain is almost always lighter than the rain produced by Cyprus Lows (Soliman 1953: 389; El Afandi *et al.* 2013: 3–4). When the Azores High and Icelandic Low are stronger (in a ‘positive phase’), the winds and storms are also stronger (Cullen and deMenocal 2000: 856; Brandimarte *et al.* 2011: 1274). These rain-bearing depressions have

the strongest effect on the coast, and decrease in prevalence further south, and have no role in the weather past Minya (i.e. 28ºN; see Bubenzer 2007: 19).

When the Saharan High begins to creep northwards in spring, it has the potential to unleash a dramatic weather event, the '*khamsin*' (Arabic: خمسين). The word *khamsin* is first attested in 1685 in non-Arabic sources (written '*camsim*': Boyle 1685: 74). As there is no published Arabic etymological dictionary, it is difficult to say how much further back the word might have been used. *Khamsin*'s literal translation of 'fifty' has created a generally accepted explanation for the word: that it refers to the fifty days the *khamsin* is liable to blow between the Coptic festivals of Easter Sunday and Pentecost (Cooper 2015: 312). The annual Sham al-Nassim holiday is said to announce the start of this weather, with it being the last day to 'smell the zephyrs', which is the popular but false etymology of the name (el-Gendi 2014: 326). *Khamsin*s typically originate from the Saharan desert southwest of Egypt, where the temperature changes of spring—and more rarely in autumn (but never summer or winter)—induce surface depressions that travel towards Egypt (Tucker and Pedgley 1977: 23; Camberlin 2009: 308; Zaki and Swelam 2017: 13). As the *khamsin* approaches, there are hot easterly to northeasterly winds from air being drawn into the low pressure centre of the *khamsin* (Robaa and Hasanean 2007: 791). When it arrives in Egypt, the wind veers to the south/southwest, with increasing heat, dryness, and dust encroaching. 'Dry' thunderstorms, where rain evaporates before reaching the ground, can produce thunder and lightning (Middleton 1986: 95). *Khamsin*s frequently, but not always, cause sandstorms. These sandstorms block the sunlight, so that a red-tinged darkness covers the land, with the sand and dust getting into every crevice (Tucker and Pedgley 1977: 17; Robaa 2003: 163; de Vries 2017: 5). In Upper Egypt, temperatures can exceed 45°C, though temperature readings alone do not convey the discomfort felt (Nashwan *et al.* 2019: 457), as described by Richard R. Madden (1798–1886) in 1826:

> At eight o'clock the wind set in with a vengeance: the sun was obscured by yellow clouds; the air was loaded with particles of sand; breathing became difficult, the mouth parched, the skin dry, and a feeling of universal debility prevailed. I could hardly lift my head from the ground, and the sand was driving in furiously with the wind through every crevice in the tent. The sensation was inexpressibly distressing: it was not the degree of heat which occasioned it; for in Upper Egypt I had experienced an equally high temperature; without any such prostration of strength and spirits. (Madden 1829: 192–93)

After a few days (~1–3) of these conditions, the *khamsin* passes out of Egypt, and northerly winds start again. In some cases, the temperature drop after a *khamsin* can be just as dramatic as the initial temperature rise (Reiter 1975: I-14; Robaa and Hasanean 2007: 791). *Khamsin*s in autumn are slower and weaker overall, but they are more likely to cause rainstorms when they leave Egypt because of increased relative humidity levels during autumn (El Fandy 1940: 31; el-Asrag 2005: 55). However, the *khamsin* winds are at present most associated with the months of April and May, and historical accounts since the 9th century CE agree with this connection (Goudie 1983: table 3; Mikhail 2011).

3.2.2 *The International Tropical Convergence Zone*

The second major climatic system revolves around the International Tropical Convergence Zone (ITCZ). This is a roughly equatorial band of low pressure created by the converging trade winds, and it migrates north or south seasonally (Kutzbach and Liu 1997: 440; Onyutha 2016: 174). The segment of the ITCZ that affects Egyptian weather is known as the Sudan Monsoon Low (Baseer *et al.* 2017: 4218). As the ITCZ oscillates, the centre of the Sudan Monsoon Low shifts from north in summer to south in winter.

When the Sudan Monsoon Low is at its furthest north, it has little to no impact on weather, since the Saharan High is suppressing atmospheric instability in summer (Tyrlis *et al.* 2013: 1110). The transitional periods of autumn and spring, when the Low is centred over Sudan, are most heavily impacted by the ITCZ's movement. The Sudan Monsoon Low typically has a northerly extension, known as the Red Sea Trough, which follows the trajectory of the Red Sea, as the name implies (Saaroni *et al.* 2019: 3608). The length of this extension varies, and this drives Red Sea Trough (RST) events (Goudie 1983: 507; Awad and Mashat 2019: 1545).

RST events come in two varieties: dry (or non-active) and wet (or active) (for other schemas, see Labban *et al.* 2020: 2). The latter are characterised by devastating storms that tend to be highly localised, discharging a large amount of rain in a short time span, thus frequently creating flash floods, as well as hail (Awad and Mashat 2019: 1546). Active RST events can only happen when the trough is overlaid with a cold upper air trough coming from the northeast, laden with moisture (el Fandy 1947: 33; Krichak *et al.* 2012: 962–63). These can happen in spring and early winter, but are more common in autumn (de Vries *et al.* 2013: 7088). While active RST events impact multiple localised parts of Egypt each year currently, this frequency is higher compared to mid-20th century records, although they were still present (Alpert *et al.* 2004: 1007). In fact, the traditional Coptic calendar warns of rains

and storms in the months of Tut, Phaophi, and Athyr (= October–November), and the Bedouin of the Western Desert also warn of heavy rain at this period (Weeks and Hetherington 2014: 45). These traditions most likely describe active RST events.

In comparison, inactive RST events are dry but more frequent. These typically happen when the Sudan Monsoon Low is weaker, creating a shallower Red Sea trough that is more stable, together with the weakening or absence of the cold upper air trough (Krichak *et al.* 2012: 966; Awad and Mashat 2019: 1551). The characteristic conditions of an inactive RST are hot temperatures with an east-southeasterly wind (el Fandy 1947: 37; Onyutha and Willems 2015: 2235).

3.2.3 *Conclusion*

The Azores High and Intertropical Convergence Zone are the main influences on Egyptian climate and weather, but they are not self-enclosed. Like all synoptic features, there is a complex series of teleconnections that link them to the broader global climate system, and thus also to each other. Some of those interactions have been outlined above. This overview is not exhaustive, and only the most important factors have been discussed here, and these are referenced in later discussions of the ancient evidence.

3.3 Regional Expressions of Egyptian Climate

The final part of this chapter focuses more specifically on regional subdivisions of Egyptian climate, and the experience of being in the weather for those areas. For the purposes of this thesis, the subdivisions are the Delta, Middle Egypt, and Upper Egypt (see fig. 1). Within each of these are numerous smaller climes that are highly specific and localised, and identifiable by the people who live there as their weatherworld. However, it is disingenuous to ancient experience, since on a local scale much may have changed in the landscape: a moving Nile, creation and destruction of the land, growth and decline of vegetation, location of settlements, and so on. Hence, the modern experiences given below are broadly accurate for that region given the general character of its landscape.

3.3.1 *The Delta*

The Delta is defined here as the Nile north of modern Cairo, including the Mediterranean coast. In the current 30-year average (the standard method for climatology), based on data from 1970–2000, Alexandria's winter ranges from a 9.1°C minimum to a 24.1°C maximum, while summer ranges from 16.6°C to 30.4°C. However, temperatures increase as you move

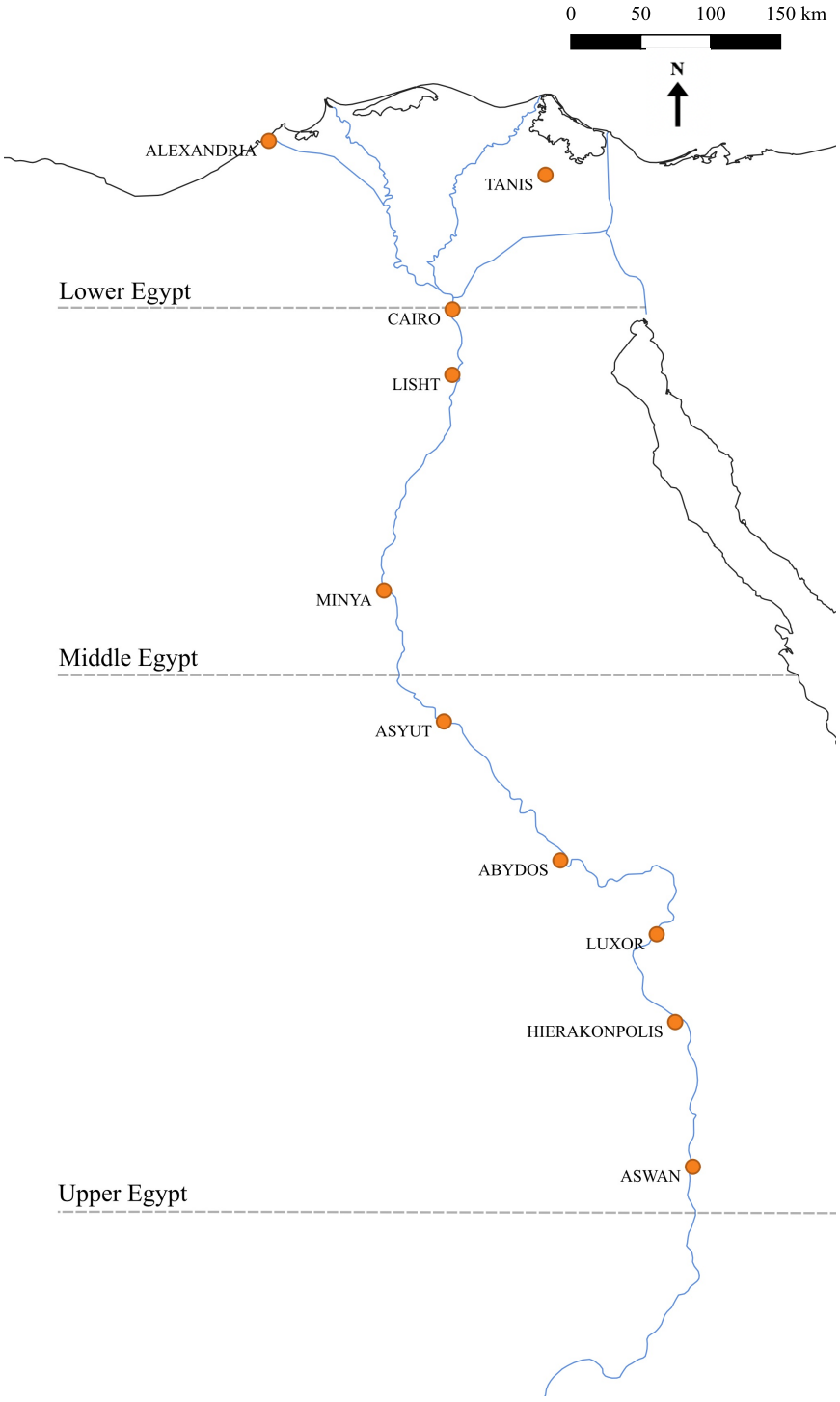


Figure 1: Map of Egypt, showing divisions between Lower, Middle, and Upper Egypt.

away from the Mediterranean (Robaa and Hasanean 2007: 791). Annual rainfall is 195.9mm, most of which falls in the winter months, with a few remaining showers in autumn and spring (Egyptian Meteorological Authority 2018). This is consistent with pre-1945 averages of 150–200mm/year (Soliman 1953: 390, fig. 1). Two other characteristics of Delta climate are also consistent in both datasets: the western Delta often receives more rain than the eastern half,

and there is also a fairly sharp rainfall gradient from north to south, as rainfall drops to 25mm/year at the southernmost parts of the Delta (Soliman 1953: 393; Zaki and Swelam 2017: 30). Morning dew and fog are common, with increased prevalence in winter and summer (el-Wakil *et al.* 2001: 95). However, evening dews due to the inundation's floodwaters also used to occur (as noted by Murray 1888 [1873]: 9). The prevailing winds are northeast to west, particularly in summer, but other directions are not uncommon, since the flatter topography allows for a greater range of wind direction (el-Geziry *et al.* 2021: fig. 2).

Winter and autumn rains are an expected part of life in the Delta. It frequently makes an appearance in fiction written by Egyptian authors from the Delta (see *City of Saffron* and *Girls of Alexandria* by Edwar al-Kharrat [1926–2015], and *Miramar* by Naguib Mahfouz [1911–2006]), however, one example will suffice here. In Ibrahim Abdel Meguid's *Birds of Amber*, an ex-Alexandrian laments about missing the city in winter:

> I've read about the heavy rains that have fallen on beautiful Alexandria. Rain is good anyway. We are used to it at the end and beginning of every year, the Christmas storm, even though that seems strange this year. Helwan is rainless and dry and even though it is totally suitable for my health, I miss Alexandria's rain very much. I miss the sun after the rain … whereupon the light of the day sparkles. (2005 [2000]: 356)

This fictional account draws on the lived experiences of Abdel Meguid. In contrast, Arab historiographies only mention the winter rains when they do not arrive, or are delayed, because they are part of the expected weather (Vogt *et al.* 2016: 313, ID 120282–3). In one particularly interesting example, in 1373 CE Egyptians apparently prayed for rain in autumn, so that they could subsequently plant clover (Vogt *et al.* 2016: 138, ID 119252). In general, the westerly winds associated with the winter rain are strongest on the coast, whipping up the sea, and in certain conditions, the westerly winds carry dust from the northern Sahara instead of rain (Camberlin 2009: 310).

Probable ARST events in the Delta have been chronicled since 1300 CE in Arabic historiographies, where they are recorded for the damage done to crops, animals, or buildings, particularly that done by hailstones. One hailstorm in autumn 1492 CE is said to have hit Damietta with ostrich egg-sized hailstones (Mujani 2011: 406). ARST storms are sudden and unexpected; the Egyptologist Ahmed Nakshara comments on a spring storm by saying:

> Early in the afternoon a fierce storm broke over the site. The sky turned black, and the heavy rains lasted for two hours, with thunder and hail … As a

> resident of San el-Hagar, I must confess that this strange phenomenon is rarely observed … whilst rain is to be expected in the winter, it is relatively unusual in the area during May. (2015: 26)

Similar storms in the same area were also noted by Petrie in 1884 (Petrie MSS 1.3.173–75), and Montet in 1945 (Nakshara 2015: 25). Petrie's description is particularly evocative:

> It thundered almost continuously, & rained & hailed heavily … The hail was so thick that at one time I estimated that half the ground was covered by it, large stones 3/10 & 4/10 inch diameter … The thunder was remarkable, the best defined discharges being first a loud & sudden bang like a large gun, followed by a rushing sound which lasted perhaps two or three minutes … it was just like a tearing high wind in its sound, but yet there was no wind to speak of, & it was loud enough for me to hear it above all the clatter of a furious hail storm on a bare metal roof. … There was never a single break in the noise. … 1¼ to 1¾ inch rainfall in the two hours. The results of such a downpour are tremendous; there was a rushing torrent in the plain below the house, dashing over obstacles, & roaring like a Dartmoor river … the temple is a lake.
>
> (Petrie MSS 1.3.173–75)

In the case of inactive RSTs, warm northeasterly winds are the catalyst for early morning fog during autumn (el Fandy 1947: 37; Robaa and Hasanean 2007: 792).

Spring *khamsin*s have created dust- or sandstorms in the Delta since at least the 15th century CE. Al-Maqrazi (1364–1442) reported a *khamsin* darkening the sky so much that a hand in front of one's face was not visible (Vogt *et al.* 2016: 323, ID 120340). Because of the increased humidity in the Delta, *khamsin*s are more likely to produce rain showers in their wake (as described by e.g. Petrie MSS 1.3.138–41).

3.3.2 *Middle Egypt*

The Nile Valley from Cairo to Asyut is here defined as Middle Egypt. This section of Egypt is a transition zone, maintaining some traits of the Delta climate while Upper Egyptian traits become increasingly prominent further south. In the current 30-year average, Cairo ranges from a 9.0°C minimum to a 20.4°C maximum in winter, while summer ranges between 20.1°C and 34.7°C (Egyptian Meteorological Authority 2018). In comparison, Asyut ranges

from a minimum of 4.7°C to a maximum of 21.7°C in winter, and from 21.3°C to 37.1°C in summer (Egyptian Meteorological Authority 2018).

In Cairo, annual rainfall amounts to 25mm on average, falling mostly in winter, late autumn, and early spring (Egyptian Meteorological Authority 2018). The pre-1945 averages agree with this figure (Soliman 1953: table 1). Asyut's precipitation is an outlier; it is the driest city in Egypt, due to its particular landscape, even though the general trend would suggest that a city further south would be drier (Mostafa *et al.* 2019: 8). Instead, we can look at Minya, where precipitation is 5mm/year currently, and pre-1945 averages give 2mm/year (Soliman 1953: table 1). Because of the localised and sporadic nature of rain outside of winter, these events are poorly represented in averages. Soliman (1953: table 1) noted the highest amount of rainfall in a single 24-hour period on record for Cairo was 43.2mm, 13.2mm for Minya, and 20.0mm for Asyut. Morning dew or mist is most prevalent in summer (~50% of days) and early autumn for Cairo, but in winter for Minya (~50% of days) and Asyut (~0.05% of days).

While winter rains occur, they are typically less frequent, of shorter length, and less intense than the Delta; though there are exceptions (Soliman 1953: 393). Arab chronicles from 1605 CE imply that rain was normal and expected for this time of year in Cairo (Vogt *et al.* 2016: 445, ID 121179; see also Robaa 2013: 3207). Rains are also more likely to incorporate sandstorms too:

> Das schlechte Wetter dauerte den ganzen Tag über an. Sandstürme wechselten mit Regenfällen, sodass die Arbeit zeitweise unterbrochen werden musste.
>
> (10 February 1927: Junker MSS 5.19)

Unlike *khamsin*s, these sandstorms do not involve a dramatic temperature rise, but rather can be quite chilly:

> The wind was still ahead and blowing strong, and the air was very cold …
> The wind was blowing down with a fury I have never seen surpassed in a gale at sea, bringing with it the light sands of the desert.
>
> (January 1836, Minya: Stephens 1837: 59)

Also in winter, cold south winds can blow; in 1404 CE, multiple historical records note that such a wind was responsible for many deaths that year (Vogt *et al.* 2016: 267–68, ID 119988–90). In *The Harafish*, Naguib Mahfouz describes winter in a fictionalised Cairo:

> The winter wind wailed mournfully … In the morning, a light rain had begun to fall, breathing the pure, capricious, rebellious spirit of the late winter season, and the cold chilled people to the marrow of their bones.
> (1994 [1977]: 344)

*Khamsin*s, on the other hand, are begrudgingly expected in spring (Zakey *et al.* 2004: 1583). A modern Cairene, Thoraia Abou Bakr, wrote in an article titled 'The Delights of *Khamaseen*' in the *Daily News Egypt*:

> You go to sleep one lovely spring day; the weather is clear and not too hot … You wake up and the world has turned into a yellow canvas of doom. Congratulations: you have witnessed the *Khamaseen* winds. … The *Khamaseen* winds come bearing gifts: a hefty number of insects, including mosquitoes and moths, as an added bonus. In addition, while the dust blocks out the sun so it does not beat mercilessly on our heads this certainly does not mean the weather is fine. It is usually hot and sweaty, with winds that push you off the sidewalk. So, by the end of the day, your hair is all puffed up and dirty, your nose is filled with horrendous dirt and you still cannot really see the other end of the pavement … In conclusion, while Shakespeare warns you of the Ides of March, here in Egypt you should beware the end of March and the beginning of April.
> (Bakr 2013)

The earliest possible reference to the *khamsin* known to me in Middle Egypt is from March 998 CE, given as a 'black sandstorm' (Vogt *et al.* 2016: 53, ID 118725). Other early Arab accounts talk of how the hot wind killed crops (Vogt *et al.* 2016: 92, ID 118950), and of its connection to the plague (Mikhail 2011: 217). In these accounts, the *khamsin* is only referred to as a south or west wind, but is recognisable as a *khamsin* through their focus on visibility and visual changes to the atmosphere, the extreme heat, and the occasional rain after the sandstorm passed through, as well as the timing.

ARST events in Middle Egypt can involve hailstones, as in the Delta, but their main consequence is flash flooding linked to sudden heavy rain. George Reisner's diaries record that:

> About 6 p.m. it began to rain heavily with the usual accumulation of water in the courtyard, damage to mud floors in the roads, etc. The water torrent in the wady south of the third pyramid roared like a cataract and about 1 a.m. in the

night the torrent in the great wady north of us came down like a river for several hours.

(19 November 1925, Giza: Reisner Vol.14.P.005)

The earliest known secure reference to an ARST event dates to October 1337 CE, which describes walnut-sized hailstones (Vogt *et al.* 2016: 106, ID 119050), and a similar well-reported event in November 1381 CE involved flash floods from the Muqattam hills (Vogt *et al.* 2016: 160, ID 119347). Inactive RST events are seldom mentioned because they blend in with expected climate, but extreme cases can be recorded, as in the autumn of 1427 CE, when the heat and lack of rain spoiled the crops (Tucker 1981: 217; Vogt *et al.* 2016: 336, ID 120425).

3.3.3 *Upper Egypt*

Upper Egypt, south of Asyut, is not influenced at all by the Mediterranean or Cyprus depressions. In the current 30-year average, Luxor ranges from a 5.7°C minimum to a 25.2°C maximum in winter, whereas summer is between 22.8°C and 41.1°C (Egyptian Meteorological Authority 2018). Aswan, being further south, is warmer still, ranging from 8.7°C to 25.2°C in winter, and 25.2°C to 41.4°C in summer. Records for Upper Egypt are both more and less extensive; there are more reports by European travellers and archaeologists who focused on the Upper Egyptian monuments, but Upper Egypt is rarely mentioned by Arab historiographers, who were based in the north.

Luxor currently has an average of 2.6mm/year of precipitation, and Aswan has 1.4mm/year, both mostly in autumn, though rain in spring can happen. These rain events are not regular, and in a single location, heavy rain might only fall once every ten years, so their impacts are obscured in these averages (see el-Didy 2006: 161). The pre-1945 averages are similar, at 1mm/year for Luxor, and 3mm/year for Aswan (Soliman 1953: table 1).

In winter, rains are unusual, unless they arrive with an early *khamsin*. The northerly wind is less prevalent in winter (Robaa and Hasanean 2007: 791), but the southerly wind brings cold air into Upper Egypt at this time. This wind can reach gale force and start sandstorms:

A bright, cold morning, and a breeze sprung up which, soon freshening into a gale … the horizon was misty with clouds of dust, the poor palm trees, blown all on one side.

(20 December 1858, Qena: Holland 1864: 64–65)

The unsettled conditions of spring bring *khamsin*s into Upper Egypt. Just as further north, *khamsin*s are unpleasant for everyone involved, lasting from a few hours to a week, rarely with an added rainstorm. The Egyptologist Arthur Mace recorded the progress of a *khamsin* in 1899 at Hu:

> From the feel of the air I should say we were in for a *khamsin* … In the morning the burst of hot weather we have been indulging in came to a climax in a thunderstorm, accompanied by real rain … Then in the afternoon, just to level things up, we were treated to a blinding sandstorm. We lost the sun at about two o'clock.
>
> (18 March 1899, Hu: Mace MSS 1.1: 36)

Without any indication of wind direction, it is impossible to say why exactly a rainstorm came before the sandstorm in this case, but it was probably due to the site's specific landscape and the *khamsin*'s storm track. The heart of a *khamsin* can reach 45°C, but even when it is cooler, it still manages to parch the throat:

> The Simoom [=*khamsin*] has lasted nine days, and is very trying; the tremendous sweating thins us all. The glass keeps at 98[°F], which is very pleasant with the north wind, but the Simoom parches one; it is awful,—so dark and depressing.
>
> (15 May 1864, Thebes: Gordon 1865: 281–82)

Many European travellers of this period used 'simoom' to refer to all sand-laden hot winds of the Middle East, regardless of local differences in names and effects.

ARST events in Upper Egypt are mostly an autumn phenomenon, but do sometimes happen in spring as well (Soliman 1953: 389). Because of their localised nature, flash floods can come down wadis without there being any rain at the wadi outflow:

> While we [were] dry as a bone, the larger valleys suddenly became seething rivers … a terrific storm was evidently raging northwest. Far away at the back of the hills, incessant lightning was visible amongst great ominous clouds … but so far away that only faint rumblings of distant thunder were to be heard. Then, gradually the rush of water became audible—this grew to a roar—when suddenly, tidal waves came rushing down the valleys … The torrent cut wide furrows as much as four feet deep, and stones as large as two feet in diameter rolled before the waters
>
> (25 October 1918, Valley of the Kings: Howard Carter, cited in Jones 2016: 548)

The intensity of rain-fed floods varies: some are described as carrying large boulders, while others are gentle flows. Flash flooding in the wadis is also known to force scorpions and snakes out of their homes in the desert and into inhabited areas of the Nile valley (e.g. at Aswan: Anon. 2021). The best description of experiencing the storm itself is Ray Johnson's report of the torrential rain that hit Thebes in 1994 (e.g. 'all those heavy black clouds started screaming toward us. In seconds the storm hit, with great claps of thunder, lightning, and an absolutely torrential rain': Johnson 1994: 1), and he also records the loss of life and destruction of mud-brick homes that it caused.

3.4 Conclusion

These scientific and experiential descriptions of weather and climate are based on conditions in the past 700 years, and so they are parallels, not mirrors, of ancient Egypt. Palaeoclimatology provides some explanations, particularly with regards to the distribution of rain at the start of pharaonic history, but it cannot tell us how ancient individuals and groups perceived that rain. The processes that control Egyptian weather today are very probably the same as those in ancient times, but the timing and intensity of the features they create are likely to have changed. This chapter has provided no climatological model, but an overview of the types of weather experienced in Egypt in relation to their regional and seasonal variation.

The evidence reviewed, whether fictional or actual, has demonstrated that modern Egyptians care about their weather. Devastation, annoyance, and joy are among their responses, based on their past experience with their weather. They know when to expect certain phenomena and what that means for them. While not highlighted here, Egyptian domestic architecture is designed for their weatherworld, with *mulqaf*s (wind-catchers) being the most well-known example, but also in the differentiation between roof construction in Lower Egypt compared to Upper Egypt (Correas Amador 2013: 112). This strongly suggests that we should be looking for ancient responses and perceptions to their weather, as it clearly is an integral part of Egyptian life today. There is every reason to assume that ancient Egyptians would have responded to their weatherworld to a similar extent, and this assumption should guide any attempt to assess ancient responses and perceptions to weather.

4 Archaeological and Representational Evidence for Engagement with Weather

The previously outlined weather and climate that might have been prevalent in ancient Egypt can be compared with surviving archaeological evidence of how ancient Egyptians interacted with their weather throughout the Pharaonic period. In this section, these features are categorised broadly according to context: domestic architecture (including houses, towns, and palaces), monumental cultic and funerary architecture (temples and tombs), and rock-cut tombs. Different usages of these cultural spaces result in different priorities, as well as requiring the use of different technologies. While evidence is discussed with a chronological perspective, a diachronic approach compensates for relatively low preservation rates.

The academic response to the evidence for ancient Egyptian engagement with their weather has been mixed. Lion-shaped waterspouts (§4.2.1.2.3) have received the most attention due to their sculptural design, temple context, visibility, good preservation, and their clear relationship to rain drainage (e.g. Garnot 1937; de Wit 1951; Deaton 1998; Thiers 2008; Ventker 2012). However, many other features have been neglected after initial publication, or have remained unpublished, such as complex drainage channels carved into temple roofs (§4.2.1.2), and walls to divert flash floods (§4.3). With only a few exceptions (e.g. Neumann 2008; Jun 2020; Köpp-Junk 2019), these structures have not been analysed as a cohesive group, and even then have been limited to only 'water' or 'wind' mitigation domains, but a holistic assessment can enhance our understanding of the ancient weatherworld.

Knowledge of ancient weather mitigation has often been hampered by preservation and excavator bias, particularly in the earliest excavations. Many architectural elements such as spouts, gutters, windows, and wind-catchers are lost, as many would have been found in the upper parts of walls or on the roof, areas that are inherently less likely to survive millennia due to erosion, collapse, or even reuse (Kemp 1987: 150). For instance, one fallen waterspout was initially reported at the shrine of Amenhotep III at Wadi Hellal (Tylor 1898: 17), but has now vanished (Garnett 2017: 102). To a lesser extent, this is even a problem with funerary model houses ('soul-houses'), as the top half is often missing (Petrie 1907: 19). Temples in the Delta, where one might expect a higher rate of rain mitigation, are less well preserved than their Upper Egyptian counterparts. Later additions and reconstructions of temples often obscure earlier features (Ventker 2012: 18). In the Valley of the Kings, early excavators of the 19th century ignored traces of dam walls and removed them in their haste to find tombs (Leblanc 1995: 203); further examples have probably been obliterated by repeated flash

floods earlier. Other features, like a slight slope on a floor, were more likely to be overlooked since early excavators did not publish elevation levels (Sullivan 2017: 1235). Due to excavators' priorities, the full extent of enclosure walls of towns or temples have rarely been exhaustively excavated, but these features are where, for example, ground drainage systems are more likely to be present.

Textual sources for physical engagement with the weather are slim and often controversial. In terms of drainage, an 18th Dynasty ostracon mentions *nt*(*iw*) *m sṯȝ ḥw*, 'those who are at the flowing of rain' among its list of workers, which might refer to people who work with a drain, but this is debatable, as it could relate to the inundation (see §4.2.7) or even be an unknown toponym (O. Gardiner 42, l. 9: Černý and Gardiner 1957: pl. 17). The first certain reference to waterspouts is in the Annals of Amenemhat II, which list a total of 26 sycamore waterspouts (*sn-mw*, determined by a unique sign, see fig. 2) shared between two new temples (M l. 15; P l. 2: Altenmüller 2015: 60). A much later demotic judicial text has a man complaining about his neighbour's waterspout (*ḫȝᶜ-mw*, 'that which throws water') splashing his house (P. Cairo JE 89127, rt. 8.16–18: Ventker 2012: 17; Jordan 2015: recto 8). Graeco-Roman gargoyles have inscriptions that make reference to their lion forms with the words  *šnᶜ*, 'lion-spout' (*Wb*. IV, 506.2) or  *qn*, 'lion' (*Wb*. V, 47.14–15), both of which are determined with a lion hieroglyph. Presumably there were other, unrecorded words for features of this type, but this is the extent of our current knowledge of Egyptian terminology from written sources.

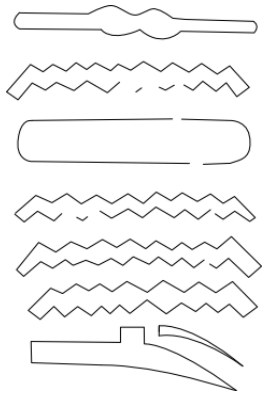


Figure 2: Line drawing of the word sn-mw, 'waterspout', from the Annals of Amenemhat II as preserved in the Memphis copy (l. x + 15). After Altenmüller and Moussa 1991: pl. 2.

4.1 Domestic Architecture

For the purposes of this study, 'domestic architecture' encompasses buildings that are mostly made of mudbrick, with some occasional stone features, which were associated with the sphere of the living, as opposed to religious or mortuary structures. Accordingly, this section includes houses (both elite and non-elite), towns, and palaces (as defined by Koltsida 2007: 3). These were spaces that centred around living residents, places that were associated with safety and familiarity for those residents, but that also lacked the eternal permanency associated with (usually stone) tombs and temples. Weather-related elements are present in

similar forms throughout this category, although they become more elaborate in constructions of higher social status.

I here present archaeological evidence of engagement with, and mitigation of, rain first (e.g. drains, waterspouts, placement; see §4.1.1), and then examine archaeological features that deal with wind (e.g. wind-catchers, sand blocks, orientation; see §4.1.2). This separation follows the ancient Egyptians own division of their weatherworld (for which see §5). The corpus includes all of Egypt, including Egyptian sites in Nubia, from the Predynastic to the New Kingdom. Lower Egypt is the least represented, probably because environmental conditions in the Delta are not ideal for the preservation of mudbrick structures, as well as the historic lack of interest in the archaeology of this area (Spencer 1979: 1).

4.1.1 *Mitigation of rain and flash flooding*

In domestic architecture, rain mitigation could have four main forms: town location and walls (§4.1.1.1), ground drain systems (§4.1.1.2), and roof drainage (§4.1.1.3). Most domestic constructions were made of mudbrick, which is particularly susceptible to rainwater damage, and so these mitigation techniques were invaluable (Correas Amador 2013: 346).

4.1.1.1 *Town placement and walls*

It seems intuitively logical that both state-planned and organically-formed towns would avoid wadi-beds because of the risk of flash flooding, but this is not always so clear cut. Most state-planned towns were not built in a wadi flood path. However, there are exceptions: the Old Kingdom pyramid town at Giza, Heit el-Ghurob (fig. 3), is located on the southern edge of a wadi fan, and as such was impacted by flash floods, which excavations confirm (Lehner 2001: 64–65). The location was arguably chosen because of the wadi, which had cut a path through the hills that was ideal for the movement of supplies and people to the construction and quarry sites (Lehner and Tavares 2010: 175). The so-called Wall of the Crow formed the major boundary between the town and the wadi, and so this wall would have been able to deflect wadi floodwaters. This was probably not its main function, as it clearly controlled the movement of people, as in other state-planned communities (see Moeller 2016), but geological evidence suggests that the wadi floodwaters were diverted by the wall (Lehner *et al.* 2006: 30; Butzer *et al.* 2013: 3364, fig. 5; Lehner and Hawass 2017: 385). Further anthropogenic changes upstream also aided in reducing flood strength around the settlement

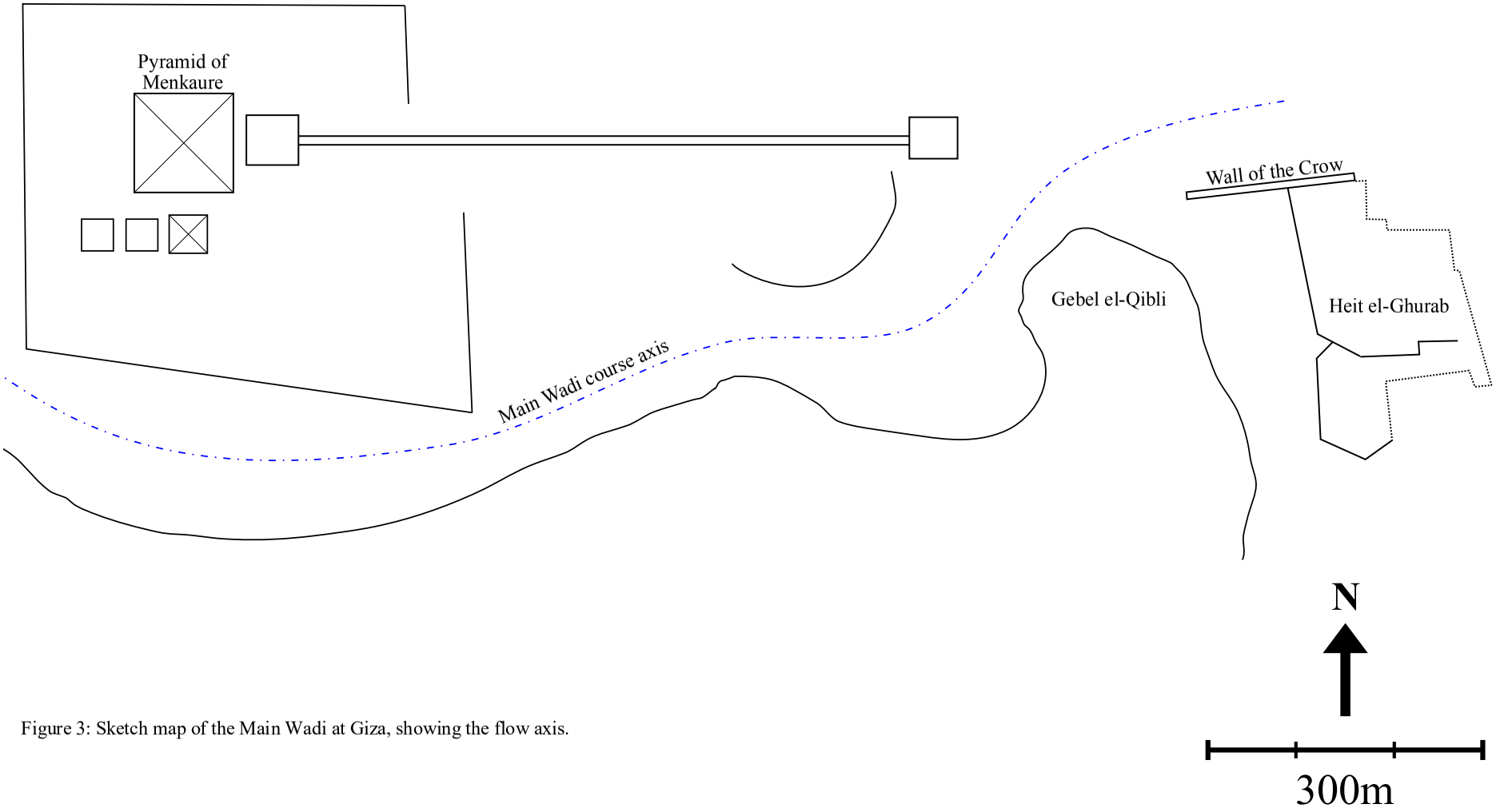


Figure 3: Sketch map of the Main Wadi at Giza, showing the flow axis.

(Lehner 2020: 201). Many towns had boundary walls of a similar nature, but evidence for their roles in diverting flash floods is lacking, simply because the necessary geological investigations have not yet been carried out (e.g. with the 'Double Walls' of Old Kingdom Elkab: Hendrickx *et al.* 2010: 160–64).

In some state-founded towns, there is evidence of the inhabitants making collective changes to their settlement as well. At the New Kingdom mining settlement of Dunqash, the houses lie on an outcrop just above the wadi-bed, and a retaining wall was built to deflect any water (Sidebotham *et al.* 2019: 213). At state-founded Deir el-Medina, the inhabitants modified the orientation of their town's enclosure walls over time to reduce damage from the inevitable flash floods coming from the northwest (Gobeil *et al.* 2023: 185, 189, 192, 194).

Other state-founded towns were established either on plateaus above wadis, or well away from the wadi-beds; such as Lahun, Qasr el-Sagha, and Wah-Sut (Moeller 2016: 262, 271, 290). In contrast, 'organic' towns, which from their beginnings were not designed by the state and instead developed irregularly (Lehner 2010: 88–89), were not planned with this foresight and frequently developed on wadi-beds (e.g. Akoris: Kawanishi 2016: 3–4). People who live in desert areas can be drawn to wadis for the potential food, but also because they are ideal locations to dig or find wells, since the water table in a wadi-bed is consistently higher than elsewhere in the desert (e.g. Megahed *et al.* 2023: 15). While ancient Egyptians had access to the Nile for their water needs, a nearby and safe source of water was valued (e.g. Franzmeier 2010: 16). The alluvial fan at a wadi-mouth is also of higher elevation than the rest of the valley, having been built up from flash floods depositing sediment, and so that area was protected against the annual Nile floods (as at e.g. Nekhen: Hoffman *et al.* 1987: 11). In addition, wadis provided easy access into desert areas for resources and were convenient routes for overland travel, as with the settlement of Coptos at the mouth of the Wadi Hammamat (Sidebotham *et al.* 2008: 2). These factors especially influenced the location of towns whose foundations can be traced to the Predynastic Period, as the wetter conditions of that time (see §3.1.4) meant that wadis were host to even more consumable resources (Moeller 2016: 84). After a town was well established, even if a flash flood swamped it occasionally, people would rebuild in the wadi again, because it was their home. As a modern example, Cairo in more recent documented history has been hit by numerous flash floods from the eastern hills, which destroyed the suburbs of el-Qobbah (1895), Zeitoun (1913), al-Helmiya (1913), and Manshiet el-Sadr (1919) (Hume 1925: 93–95), but in all cases these areas were rebuilt soon afterwards. It seems that a wadi flood once or twice a decade was an

acceptable risk, just as many people have lived on volcanic slopes and still do, such as around Mt. Etna (Duncan *et al.* 1981: 164–65).

4.1.1.2 *Ground drainage systems*

Within towns, houses, and palaces, drains of varying designs were sometimes installed to remove rainwater. However, most of these drains were apparently multifunctional, taking away not only rainwater, but also libation water, waste water, and bodily fluids. In order to assess these features, analysis must consider the slope of the drain, as what looks like a drain could in fact be a water supply line, as in some excavated palaces (e.g. at the 15th Dynasty palace of Tell el-Daba: Bietak *et al.* 2001: 50). Generally speaking, any system that was open to the sky when it collected liquid would have also accepted rainwater, even if this was not its primary intended function (Liszka 2008: 65). On the other hand, if a system only collected water from a roofed area, and then ran under the floor to the exterior, it could not have been used for rainwater falling on the ground. A single surviving segment of the drainage system is thus not sufficient to determine whether it could have drained rainwater.

At its simplest, drainage could be achieved by a slight (artificial) slope in the soil, mud plaster, or pavement. In the 12th Dynasty mansions of Lahun, open paved courtyards sloped towards a centre point, where basins once stood, sometimes termed an *impluvium*, a word derived from Roman architecture (F. Arnold 2005: 98; Frey and Knudstad 2007: 27). The late Middle Kingdom palatial complexes of Bubastis and Tell el-Daba likewise have basins in their open courts ([R2] and [H] respectively) to collect water, with the addition of pottery and brick pipes that would remove that water to the exterior of the complex (Eigner 1996: 77; Bietak 2019: 214). In comparison, however, none of the extant New Kingdom palaces have obvious basins in their open courts, although some have much larger pools or lakes in their open spaces that could have collected rainwater. The artificial lake attached to the palace of Malqata, Birket Habu, is located on the path of Wadi Bariya, and almost certainly filled when the wadi flooded (Litherland 2018: 3); this even happened in 1994 (Leblanc 1995: pl. 38a). Meanwhile, the open court in earlier houses often was replaced with a pillared hall in New Kingdom houses (F. Arnold 1989: 80), eliminating the need for rain mitigation to be present. In streets, a slope in the ground might lead water to a drain that ran down the centre line of the street. Some of these drains were cut into the natural ground surface without adding any additional material: the workmen's town at Giza had a concave channel some 36–40cm wide and 4cm deep running down 'Main Street' (as labelled by the excavators: Lehner and Wetterstrom 2007: 123–24) that had no trace of any additional stone; similarly a shallow

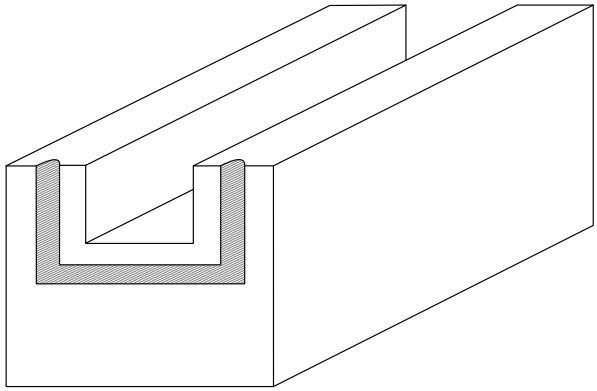


Figure 4: Schematic illustration of a drainstone, with a U-shaped depression for plaster (shaded area).

gutter was found cut into the unpaved surface of a side-street of Ramessid Amara West (Alley E13.12: Woodward *et al.* 2017: 243).

In many cases, however, such channels were lined with plaster or stone, or even specifically carved drainstones. The workmen's town at Giza also had another channel, 55cm wide and 14cm deep, on the northern edge of RAB street, lined with clay and bordered by unworked limestone blocks (Lehner *et al.* 2006: 65; Lehner and Wetterstrom 2007: 124). Further evidence for lined drains survives from the Middle Kingdom, in the town of Lahun (Petrie 1891: 8), and the fortress-towns of Buhen (Emery *et al.* 1979: 8) and Askut (Badawy 1966: 25), whose streets all incorporate drainstones. A drainstone is a rectangular block of stone (often limestone), with a U-shaped gully carved down its centre lengthways (fig. 4). When multiple stones were laid end to end, frequently bound with plaster (Di. Arnold 1991: 123), they formed an effective water channel. While not finely carved stonework, the use of drainstones nevertheless represents a significant expenditure. They are almost exclusively attested in towns with an orthogonally planned layout, and so drainstones on major streets were probably a desirable element in an ideal town, but were perhaps unfeasible in organic towns with unstandardised streets and without state funding (compare Moeller 2016: 2).

While ground drainage features have been found in settlements in Middle Egypt, the Western Desert, and Nubia, the exception of Upper Egypt is notable: there are no preserved domestic rainwater drains south of Lahun until Buhen at sites with Egyptian material culture. Even the state-funded towns of Wah-sut, Amarna, and Deir el-Medina appear to have had no ground rain drainage. While this could be because of that region's drier climate, this explanation cannot account for their attested use in many Nubian fortresses and in the towns of Dakhla Oasis, as these sites were certainly arid by the Middle Kingdom (§3.1.4).

The New Kingdom is very sparsely represented in the evidence, with only the lake of Birket Habu, and a drain running through the centre of the open court of Merenptah's Memphis palace (O'Connor 1991: 176). This lack of evidence is curious, since according to the palaeoclimatology it was apparently a slightly moister period (§3.1.4; Hassan *et al.* 2017: 62). Furthermore, if we look beyond the New Kingdom, domestic drainage was a feature of many towns and houses of the later Graeco-Roman periods (e.g. Hermopolis Magna: Spencer and Bailey 1985: 3) that are evolutions of the forms used in earlier periods. So once again, it appears the gaps in the evidence are due to uneven preservation. When Petrie first excavated Lahun, he commented that it had 'by far the earliest example of street drainage known' (Petrie 1891: 8); more than a century later, the much earlier Old Kingdom drainage system at Heit el-Ghurab was discovered (Lehner and Wetterstrom 2007: 123). New Kingdom examples might well yet be found.

4.1.1.3 *Roof drainage*

Roof drainage is a particularly problematic aspect of weather mitigation for research because of the limited dataset. Houses and palaces were commonly made of mudbrick, with occasional stone elements, and so the upper parts of such buildings have collapsed and disappeared more extensively than with stone-built cultic structures (see §4.2.1.2). Discussion around roof drainage is dependent exclusively on funerary representations such as clay soul-houses and wooden tomb models, all from the Middle Kingdom, and these artefacts are not accurate mirrors of reality (Do. Arnold 2005: 7). The apparent absence of waterspouts on 2D representations might be due to simplification in the process of schematising domestic buildings (Baines 2007: 211; for simplification in 3D models, see Do. Arnold 2005; Di Biase Dyson 2022a: 420).

Through model house representations, it appears that waterspouts were part of the ideal concept of a 'house'. The early 12th Dynasty high steward Meketre had two house models (Cairo JE 46721; MMA 20.3.13) and a cattle census model (Cairo JE 46724) that epitomise this (fig. 5; Winlock 1955: 18–20, pl. 9–15). In the house models that represent a portico facing onto an Egyptian garden, which itself was perhaps the most prestigious aspect of an elite house complex (e.g. Shaw 1992: 151), three waterspouts were incorporated. The central spout on both models would deposit the water directly into the pool below; the side spouts directed water towards the trees, perhaps to maximise the benefits of an unanticipated rain shower. The spouts on one model house are even functional at their small scale; conduits have been made from the roof to the spouts, and the spouts are pierced (Cairo JE 46721: see



Figure 5: House model of Meketre, MMA 20.3.13. Creative Commons Zero, available at https://www.metmuseum.org/art/collection/search/544256. Rogers Fund and Edward S. Harkness Gift, The Metropolitan Museum of Art, New York.

Winlock 1955: 19, pl. 9; Roik 1988: fig. 40a). However, the presence of spouts was not determined only by the presence of a pool or garden: spouts were also included on the model of the cattle census, where they project into an open space from a portico in which Meketre is seated to inspect the passing produce, without any indication of a pool (Roik 1988: fig. 41).

While Meketre's waterspouts are relatively well discussed (e.g. Roik 1988: 32; Skalec 2023: 60–63), the waterspouts present on the less prestigious soul-houses have received little attention. Two examples, both probably from Deir Rifeh, clearly have waterspouts: BM EA 32610 (Budge 1925 [1893]: 467; Stead 1986: 12–13) and NMS A.1907.713.4 C (fig. 6; Petrie 1907: pl. xvii, no. 128). These spouts could conceivably have contributed to a water-pouring ritual, which was the function of the spout on the base of soul-houses (see Lundius 2020: 88–89). However, this would not automatically exclude the possibility that they were also representing spouts that were used on real houses. Given the schematic nature of soul-



Figure 6: Detail of soul house from Deir Rifeh, NMS A.1907.713.4 C. Photo by Margaret Maitland. © National Museums Scotland.

houses, their positioning on the house and their form are not necessarily naturalistic, but their presence articulates the idea that water could be drained from roofs of dwellings. Waterspouts 'belonged' with houses.

In terms of the material represented by Meketre's waterspouts, most academic uncritically follow Winlock's assessment (1955: 18), who suggested that their white colour indicates that they would have been made of limestone (e.g. Kemp 2006 [1991]: 215; Koltsida 2007: 14; Neumann 2008: 19; Skalec 2023: 60). Limestone is a possible material, but wood or ceramic is also conceivable. Two words for 'waterspout' are connected to wood; '*sn-mw* (waterspouts)' were listed as made of sycamore in the Annals of Amenemhat II (M l. 15; P l. 2: Altenmüller 2015: 60), and the Demotic '*ḫ3ʿ-mw*' uses the wood determinative (Gardiner sign M3; Skalec 2023: 59). Local Egyptian trees that were not suitable for building material could still produce wood that would suit this purpose (for wood availability in general, see e.g. Cooney 2006: 50; Creasman 2013: 167). Ceramic drains are known from wastewater installations (e.g. at Middle Kingdom Tell el-Dab'a: Bader 2001: 220), so this material might also have been used for waterspouts. Both of these options would be cheaper and lighter than limestone, and would suit the cylindrical shape of Meketre's

waterspouts, since limestone waterspouts found on Middle Kingdom temples, such as the pyramid complex of Senwosret I at Lisht (Di. Arnold 1992: pl. 28), are square, not rounded, on the exterior (see §4.2.1.2.3). The white colour on the models could then represent an applied plaster or paint on the wooden or ceramic originals.

Waterspouts might have only been present on elite households, and depictions on soul-houses were possibly aspirational, reflecting a desire to display a desired higher social status. Roik (1988: 32) suggested that the domestic waterspouts were copied from temples, where lion-shaped waterspouts have specific apotropaic qualities, in addition to having implicit elite connotations (see §4.2.1.2.3). On the other hand, with scarce preservation of lower-class housing roofs, it is also possible that simple waterspouts were used throughout Egyptian society. One possibility for domestic roof drainage is a simple hole in the parapet of the roof without any adjoining waterspout, which would be the easiest and cheapest way; however, this is speculative, as such a feature has not been found in any archaeological or representational sources. Representational evidence suggests that at least some elite domestic buildings had waterspouts, but this is confined to the Middle Kingdom, and any extrapolation is tentative.

4.1.2 *Mitigation and utilisation of wind*

Domestic settings engaged with the wind in various ways: it was both utilised and mitigated against, as a mild, cooling wind is very different from a strong, sand-bearing wind. The former can provide respite from the heat of the day (§4.1.2.1); the latter can eat away at the walls of a house, and blow sand inside (§4.1.2.2), so multiple responses were necessary.

4.1.2.1 *Utilisation*

The Egyptians utilised the wind in domestic contexts, particularly the north wind. In many excavated settlements, the houses predominantly open towards the prevailing northerly wind, for example at Lahun (Badawy 1958: 123), Tell el-Daba (Müller 2015: 245), and Amarna (Spence 2004b: 127); this is also true of palaces like the south palace of Malqata (Bietak 2005: 132). In elite residences, doorways leading to the living spaces were likewise placed on the southern side of courtyards to receive the north wind (e.g. at Lahun: F. Arnold 1989: 78; the palace of Merenptah at Memphis: Fisher 1917: fig. 79). While openings towards the north may have been preferred, house orientation was also determined by surrounding buildings and the layout of the town (Endruweit 1994: 116). When opening to the north was impossible, the rooms were arranged differently, so that any southerly wind did not blow

straight through the house; this can be seen by comparing north- and south-facing elite residences at Lahun (Quirke 2005: 55).

Industrial areas and waste dumps were often positioned south of towns (as well as palaces and temples) so that the prevailing northerly winds did not blow malodours into living spaces. In some towns kilns were located in the southernmost parts (e.g. Old Kingdom Buhen: Odler 2023: 273; and New Kingdom Pi-Ramesses: Bietak and Forstner-Müller 2011: 45), and community rubbish dumps for organic refuse were preferentially located on the southern edges, as at the worker's village of Amarna (Shaw 2012: 322–24).

Bringing cool air inside was achieved with high windows and wind-catchers. Small, grilled windows positioned high in the wall (or even as a clerestory), provided not only light (Di. Arnold 1994: 80–82), but also allowed warm air to leave the room, encouraged air circulation, and reduced the amount of sand blowing inside under normal conditions (Endruweit 1994: 70–72). In the *Instructions of Ankhsheshonq*, the speaker advises that 'a window with a large opening gives more hot air than cool air' (P. BM EA 10508, 20.14: Thissen 1984: 33); the 'opening' could be the whole window, or just the gaps between the grille. This text was written at earliest in the Late Period (Devauchelle 2003: 41), but it matches the earlier archaeological record. In excavated settlements, a number of window grille fragments made of stone, wood, mud, or reeds have been found within collapsed houses (e.g. in Amarna house P.46.11: Peet and Woolley 1923: 34; and house V.37.6: Frankfort and Pendlebury 1933: 9–10; in Deir el-Medina house C.VI: Bruyère 1939: 309). A Ramessid ostraca from Deir el-Medina requests four windows, each four palms (~30cm) wide and five palms and two fingers (~41cm) high (Helck 1980: 1200), with an accompanying illustration of the window grille (Louvre E 23554: Andreu and Barbotin 2002: 75). In palace sites, ornately carved stone windows have been discovered that were probably based on simpler versions used in non-royal contexts (e.g. Penn. E13564, from the palace of Merenptah at Mit Rahina: Silverman 1997: 167).

Another method for cooling the house was through using wind-catchers, which were devices built on top of roofs to catch the cool breeze that travelled above the settlement, and funnel it downwards into the centre of the house (first suggested by Perrot 1881: 625; see Nessim *et al.* 2023: 2). This would be particularly useful for rooms which did not have an external wall for windows or were without clerestories, as it would be the only way to directly bring cool air into that space. Furthermore, wind-catchers could guide the north wind into any room, regardless of house orientation or room layout.



Figure 7: Soul-house from Deir Rifeh, Leiden F 1939/1.17. Creative Commons Zero, available at https://hdl.handle.net/21.12126/18279. Rijksmuseum van Oudheden.

From visual depictions and medieval parallels, they are generally reconstructed as right-angled triangular prisms, sometimes with a slightly concave top. Wind-catchers are also well known by the modern Egyptian Arabic term *malqaf* (الملاقف, lit. 'catcher': Nessim *et al.* 2023: 1), although there is another earlier term for the same feature, *badahanj* (باذاهنج, lit. 'drawer of wind', derived from Persian: Rosenthal 1977: 2). These two terms relate specifically to the wind-catchers which were prevalent in Egypt during the medieval period (Daniel 2010: 138); only a handful survive today, and building them is no longer common practice (King 2020: 29). It is uncertain whether these wind-catchers are direct descendants of ancient ones, as other Arab cultures also developed wind-catchers, which are closer in appearance to many medieval Egyptian ones (Rosenthal 1977: 4–5). However, the presence of ventilation shafts at the Apa Jeremias monastery (500–850 CE) might suggest that there was a continuous Egyptian tradition (for a full discussion, see Daniel 2010: 141–43).

The first ancient evidence for wind-catchers is from Middle Kingdom soul-houses with preserved roofs. As noted earlier (§4.1.1.3), soul-houses are not particularly reliable sources, although some researchers have used them as such (e.g. Badawy 1958: 123). Petrie (1907: 16) suggested that arched openings on the roof of many soul-houses may represent wind-catchers, albeit in a highly stylised way (see also Roik 1988: 50; Endruweit 1994: 100). Most house models have two or more of these wind-catchers (e.g. Leiden F 1939/1.17,

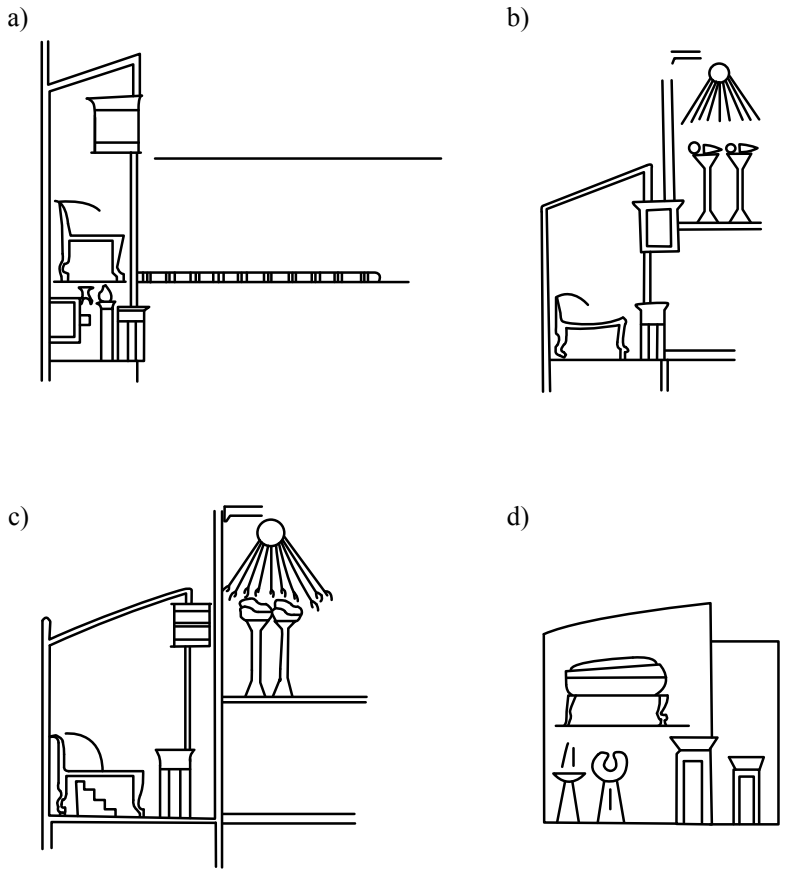


Figure 8: Slanted and curved wind-catchers above royal apartments in Amarna-period reliefs. a) House 1, Temple of Aten, Karnak. After Traunecker 1988: fig. 3; b) House 2, Temple of Aten, Karnak. After Traunecker 1988: fig. 2; c) House 3, Temple of Aten, Karnak. After Traunecker 1988: fig. 1; d) Tomb of Meryre I, hypostyle hall, west wall, Amarna. After Davies 1903: pl. 18

fig. 7), but this symmetrical arrangement is not necessarily an accurate reflection of architectural realities. Depending on the size of their house, a single wind-catcher might have been sufficient to fill the functional need. In the tombs of Ahmose (no. 3: Davies 1905: pl. 33) and Meryre I (no. 4: Davies 1903: pl. 18) at Amarna, reliefs of the royal household have a curved or slanted roof above the king's bedchambers, which might represent wind-catchers, since slanted roofs are not normally attested in Egyptian architecture (Schäfer 1974 [1919]: 133, fig. 8; Kemp 2012: 143; similar scenes from the Gem-pa-Aten of Karnak: Lauffray 1973: fig. 3. See fig. 8). The location of these slopes above the king's bed is also suggestive of wind-catchers, since archaeological investigations of elite houses at Amarna have indicated the presence of wind-catchers above the bed niche (F. Arnold 1989: 78; Spence 2015: 88): in these houses, while roof plaster was consistently found throughout the bedroom, it was not on the sleeping dais in the niche (Frankfort and Pendlebury 1933: 25, 33; Endruweit 1994: 90). Wind-catchers are more angularly depicted in the New Kingdom tomb paintings of Nebamun (TT 90; fig. 9), and a vignette from Book of the Dead spell 15 of



Figure 9: House of Nebamun (TT 90). Detail from painting by Charles K. Wilkinson, MMA 30.4.57. Creative Commons Zero,, available at https://www.metmuseum.org/art/collection/search/545114. Rogers Fund, The Metropolitan Museum of Art, New York.



Figure 10: House of Nakht. Detail from his Book of the Dead papyrus, P. BM EA 10471. Creative Commons BY-NC-SA 4.0, available at https://www.britishmuseum.org/collection/object/Y_EA10471-21. © The Trustees of the British Museum.

Nakht (P. BM EA 10471; fig. 10), which probably comes from Thebes. The representations of curved-top wind-catchers come from Amarna (fig. 8d) and Deir Rifeh (fig. 7), which are both in Middle Egypt, so perhaps there might have been regional varieties of wind-catchers, or different representational styles. The inclusion of wind-catchers in these funerary scenes and on funerary soul-houses might also have been related to funerary wishes for the deceased to receive the north wind (Spence 2011: 901–3; see §5.1.3.2.1.6).

The majority of houses at Amarna are reported to have north- or west-facing wind-catchers, based on the orientation of the bedroom (Spence 2004b: 129). Most wind-catchers apparently faced towards the north, the same direction as the entrance to the house, apart from in areas where the north wind was undesirable (see §4.1.2.2). The wind-catchers represented in Nakht's vignette appear to be open in the same direction as the door, which in an idealised space should face north (see above). In contrast, Nebamun's wind-catchers appear to face opposite directions, but this could be an artistic choice to create symmetry, matching the two palm trees and two windows (Davies 1929: 248), or to fully represent the house (Roik 1988: 60). It is also possible that they faced opposite directions so that one side would let in cool air, and the other let warm air out (Nessim *et al.* 2023: 4), or that only one was open at any time, depending on the wind direction (see below; Endruweit 1994: 102–3).

The materials used to construct wind-catchers are unknown, and could have varied. They could have been 'temporary', needing to be replaced every few years, made of plant-based

materials (wood, palm leaves, reeds) or fabric. Alternatively, they could have been more permanent structures, built of mudbrick or stone, perhaps vaulted as suggested by the curved tops in some representations; all these materials are also attested for medieval wind-catchers (Nessim *et al.* 2023: 6). Permanent forms were perhaps more likely for elite residences and palaces, but the evidence is limited. Nakht and Nebamun's depictions of wind-catchers show them in the same white as the house exterior, possibly suggesting the application of plaster to the base material, or that they were made of linen.

Wind-catchers were effective devices for funnelling wind into the house, but there are times when this would be a detriment, particularly during a sandstorm. It is logical to imagine that the Egyptians had some way of blocking or covering the wind-catchers relatively quickly when they saw a sandstorm approaching, to prevent their home being filled with windblown sand. Textiles or matting, which are known to have been used to close windows and decorate domestic spaces (Picton *et al.* 2010: 341), could have been fixed in place around the opening at the top. Alternatively, wooden shutters could have been used, similar to those found with windows in royal contexts, as in the ceremonial palace of Medinet Habu (Hölscher 1939: 34, fig. 40–41). On one Amarna period talatat block from Karnak, a window-like shape is depicted within the form of a wind-catcher that could be interpreted as shutters, but this is the only known evidence for a closing device (now in the Luxor Museum: Lauffray 1982: 79–80, fig. 5; Endruweit 1994: 101). Some medieval *malqaf*s are known to have had shutters or curtains (Jaubert 1995: 191; King 2020: 167), and wooden shutters are attested for windows in some ancient houses (e.g. at Amarna: el-Saidi and Cornwell 1986: 11, fig. 1.10), so it is possible that similar objects were in place for wind-catchers. Once again, there is no definitive answer to this problem, only speculation.

4.1.2.2 *Mitigation*

Wind mitigation would have been highly dependent on location. The shape of the Nile valley and Delta at any given point produces slight variations in wind strength and direction, which may change the quality of the wind as well. While the north wind was generally favoured, at Amara West it was detrimental in the later phases, because before reaching the settlement the wind travelled over desert sand, and blew that sand across the town (Woodward *et al.* 2017: 228).

Natural windbreaks seem to have been utilised in planned settlements, or at least to have produced beneficial side-effects. The dunes around Mersa Matruh and Amara West (initially, at least) prevented the undesired north winds from impacting the towns (White 2002: 37;

Woodward *et al.* 2017: 240). At Mersa Matruh, the settlement was located on the Mediterranean coast but with the desert lying to the west; the northwesterly wind was bitterly cold in an area already milder than Upper Egypt, and also carried sand (White 2002: 37). Naturally, dunes themselves would eventually become detrimental if they came too close to settlements, as seen in the dune encroachment of Giza and nearby areas at the end of the Old Kingdom (Moeller 2005: 159). Natural trees or planted gardens must also have reduced wind speeds, and thus both retarded sand incursion from outside and prevented strong gusts that might damage the structures behind and be detrimental to the owner's enjoyment, as well as providing shade. The climatic modifications provided by gardens were probably a factor in the value placed on gardens by elites, as well as their role as displays of status (Kristensen 2015: 237).

State-funded settlements as a whole could be protected from winds by mudbrick enclosure walls, whose primary function was arguably security and control (Spence 2004a: 269). When a wall needed to be erected cheaply, easily, temporarily, or quickly, and yet still be stable, a sinusoidal wall with single-brick width was used from the Middle Kingdom onwards as these wavy walls are stronger than straight walls of the same thickness against wind force and sand accumulation (Spencer 1979: 113; Arnold 1994: 140; Moeller 2016: 334; Siegel 2016). These walls have been documented in domestic areas (e.g. Tell el-Retaba: Rzepka *et al.* 2014: 58), around building sites (e.g. southern Mazghuneh pyramid: Jéquier 1933: 56), and even in temple complexes (Hermopolis: Roeder *et al.* 1937: plan 1). Sometimes walls themselves were given extra protection from wind erosion: Lahun's northern enclosure wall features a secondary sloping brick layer (90–100cm tall: Arnold 2005: fig. 4), which was added after the town was expanded, probably in response to undercutting winds that might have led to sheet wall collapse (Moeller 2016: 336; contra Petrie 1938: 7, who interpreted this layer as a rain fender). Such collapse of Egyptian mud-brick buildings is evidenced in Amarna House P.46.33 (Kemp 1987: 151–53). At Amara West, a low dry stone wall was instead built ~10m in front of the north part of the brick enclosure wall to stop undercutting winds (Woodward *et al.* 2017: 247).

Low walls also could stop windblown sand encroaching into individual houses. A number of residents in the western suburb of Amara West (i.e. outside the town walls) built retaining walls out of mudbrick or repurposed stone in front of their main doors (Woodward *et al.* 2017: 247–48). These retaining walls were not part of the original architecture of the house, and were added when the environment changed in the latter half of the settlement's history (Woodward *et al.* 2017: 250). However, in urbanised settlements, buildings in close

proximity to each other can affect the wind patterns felt at ground level in unexpected ways (Kemp 1987: 150), and so these low walls were not a consistent feature in unwalled settlements.

It was once thought that the winding non-axial access to the inner chambers of a house, or other buildings, was to prevent sand incursion (e.g. Ricke 1932: 15; Crocker 1985: 58), but more recent research has argued that this feature was designed to create a sense of privacy (e.g. Spence 2010: 297; Kamel 2015: 68; Spence 2015: 89), as is also seen in palaces and temples (Brovarski 2011: 111–13).

Overall, the evidence is limited, but suggestive of an active dialogue between Egyptians and the wind, which we can see through town placement, planning, wall bolstering, and additional low walls.

4.1.3 *Summary of domestic evidence*

The archaeological and representational data available for the reconstruction of domestic engagement with the weather and climate is very incomplete, but I give a summary of the evidence, and the conclusions drawn from it.

State-planned settlements provide more evidence of precautions against rain and flash floods than unplanned settlements, because the state chose the site where town would be founded, even if not the particularities of individual buildings. There are multiple reasons why Egyptians might have congregated in wadi-beds when settlements were organically formed, in spite of the risk of occasional flash floods. Planned settlements also apparently enabled the laying of stone drainage systems at their foundation, following straight roads and passing under enclosure walls. However, towns built up organically over time, including many of Egypt's capitals, would rarely have had this opportunity. It seems that street drainage was an ideal feature that was not a viable addition except in newly founded towns.

Ground drainage in houses often centred around open courtyards, which could have a basin in its centre, and in very prestigious buildings this basin could also have an outflow. These drainage features are only attested in post-Old Kingdom sites. The only evidence for waterspouts comes from Middle Kingdom wooden models and soul-houses, and so it is uncertain how extensively they were used on real houses. Those models that come from Qurna and Deir Rifeh also form the only current archaeological evidence for any domestic rain mitigation in Upper Egypt. However, this is arguably an accident of preservation rather than evidence for a lack of a mitigation tradition for rain, since ground drainage systems have been found further south in the Nubian forts, including those closest to the Egyptian border.

Even in relatively well-preserved settlements, roofs do not survive well; there are, for example, still ongoing debates about whether any given house had multiple floors (see Moeller 2016: 370), let alone waterspouts.

For individual houses or complexes, there is strong evidence, albeit secondary, for the use of wind-catchers in the Middle and New Kingdoms, but none earlier. Either wind-catchers were a development in Egyptian architecture after the Old Kingdom, or they existed earlier, but no archaeological or representational evidence has survived; in addition, there is also no direct evidence for wind-catchers in the Delta before the medieval period. Not every wind was enjoyable, and it seems likely that there would have been means of closing the wind-catchers when necessary, but concrete evidence is lacking. In all periods, entrances into the house optimally faced north, with some exceptions based on the local conditions and surrounding architecture. In some atypical cases, occupants modified their houses' initial design in order to prevent sand incursion, suggesting that keeping wind-blown sand out of the house was an important consideration for residents. Town walls were also modified in response to local weather outcomes.

Overall, the evidence presented here suggests that the Egyptians had well-established mitigation strategies for rain and wind, and that they adapted these to new or changing situations, as is particularly exemplified at Amara West. They made use of the wind to modify their indoor environment, encouraging cool air to push out the warm. In other words, they were fully aware of, and engaged with, their weatherworld in a domestic setting.

4.2 Monumental Cultic and Funerary Architecture

This section deals with monumental ritualised architecture, and thus includes cultic and mortuary complexes, both state and private, royal and non-royal. These buildings share similar techniques for rain mitigation with those previously discussed, with some variation, but were largely constructed from stone, which has led to better preservation compared to their domestic counterparts. Because of the ideological and religious basis for monumental buildings, it is more difficult to differentiate between features resulting from environmental practicality and those from religious ideas.

The archaeological evidence for rain or flash flood mitigation is the main focus of the first section (§4.2.1). Interactions with wind are then considered (§4.2.2). Monumental architecture has the best-preserved record of weather mitigation strategies, simply because it was usually constructed in more durable materials. However, there are still some preservation biases (discussed below). The available corpus spans the whole length of the Nile, from

Zawiyet Umm el-Rakham and Tell el-Balamun in the north, to the furthest southern example at Soleb. Overall, preservation is invariably poorer in the Delta. Monumental architecture attests to techniques of weather mitigation that were used since the Old Kingdom and into the Ptolemaic Period.

4.2.1 *Mitigation of rain and flash flooding*

In monumental architecture, rain mitigation took two main forms: ground drainage and roof drainage. Protective embankments are also attested, such as were added to the north and west walls of the second valley temple of Menkaure in the 6th Dynasty in response to destructive flash flooding (Reisner 1931: 44–48, pl. 28a, plan 8), although these could equally have been protection against erosion from the predominant northwesterly wind, similar to the protective layer on Lahun's town wall (§4.1.2.2).

4.2.1.1 *Ground drainage systems*

Knowledge of ground drainage in monumental architecture is restricted, exacerbated by survival rates and early excavation practices. While excavation of temples was prioritised in the 19th century, recording practices were not consistent (e.g. Petrie: Stevenson 2019: 32). In some cases, a drain was mentioned in the text briefly, but without measurements or images (e.g. Tylor 1898: 17; Saleh 1996: 189); a drain might be labelled on a plan, but without any commentary in the text (e.g. Quibell and Green 1902: pl. 65); or the drain was visible in a photo, but without any mention in the text (e.g. Naville 1896: pl. 31; Vercoutter 1970: 95, fig. 41). Furthermore, the most likely location for drains in a temple complex was underneath the enclosure wall, which was frequently only partly excavated due to the constraints of time or funding (see further below).

As in domestic contexts (§4.1.2.2), a drain in monumental architecture could have multiple functions; a basin in an open courtyard would collect water from ritual activities, but also could catch rainwater falling directly into the courtyard or from the surrounding roof. Some temple drainage systems were certainly only for wastewater, in cases where there was no possibility for rainwater to have entered the system (e.g. the temple of Karnak: Charloux 2007), but the remains of a drain system are often too fragmentary to be certain.

Rainwater could have entered a drainage system in monumental architecture in two ways: through a stone basin, or through the open end of a drainage canal. Basins could be placed in a courtyard with no associated channels (e.g. at the temple of Pyramid IIIa at Giza: Reisner 1931: 58), but many also had a connection to an underlying drainstone. The peristyle

courtyard of Niuserre's pyramid temple had a rectangular sandstone basin at its centre that immediately drained water out through a drainstone into an extensive system (Borchardt 1907: 21). A similar system in a private tomb is found in the Old Kingdom complex of Ptahshepses at Saqqara (Krejčí 2009: 127). The courtyard in the 12th Dynasty temple at Ezbet Rushdi is equipped with a basin that has both inflow and outflow, and this basin is split into two levels, possibly to allow sediment from the inflow to settle to the bottom, while the water in the visible basin and outflow channel would remain clear (Czerny 2015: 114–17). There are also a few rare instances of basins in New Kingdom temple courts, such as at Zawiyet Umm el-Rakham (Snape and Wilson 2007: 28).

Another better attested method was for the surrounding ground to slope towards the open end of a drainage canal. This technique for draining occurs in a range of architectural contexts, including courtyards, enclosure walls, open corridors, and roof inlets. In the peristyle hall of Senwosret I's mortuary temple at Lisht, a drain hole opens up on the northern side of the central unroofed space and takes liquid away via a channel below the surface (Di. Arnold 1988: 44–45, pl. 81). A closely similar case is found in the temple built by Amenhotep III at Soleb, although there the small drain channel remained at ground level (Schiff Giorgini 2003: fig. 145–46). Horemheb's tomb at Saqqara has two open courtyards with *impluvia*, and two separate drains leading from them (Martin 1989: 15–16). Many examples of a short stretch of drainage channel installed crosswise underneath enclosure walls are attested: these include the pyramid complexes of Djedefre (Valloggia 2011: 37, fig. 108), Pepi I (Leclant and Clerc 1998: 358), Pepi II (Jéquier 1938: 8, n. 1), Senwosret I (Di. Arnold 1988: 74, plan 4), Senwosret III (Di. Arnold 2002: 90); and the New Kingdom temple of Balamun (Spencer 2003: 14).

The late 12th Dynasty temple of Ezbet Rushdi provides a unique application of drainstones (first reported by Adam 1959, but misattributed by him as a post-Pharaonic addition). This tripartite temple was originally built with a corridor leading behind the shrines, which was probably used to access the roof. In the second phase of its construction, later in the late 12th Dynasty (Czerny 2015: 114), this corridor was blocked off by new walls in the forecourt. This resulted in a long stretch of corridor with an open staircase at one end, which could have potentially led to rainwater pooling in the corridor and thus weakening the entire mudbrick structure (Czerny 2015: 110). A drainstone conduit, made from reused limestone blocks, was installed underneath the newly built wall, and this lead to a basin in the courtyard (fig. 11), and from there out towards the river (see Czerny 2015: 110–17). When

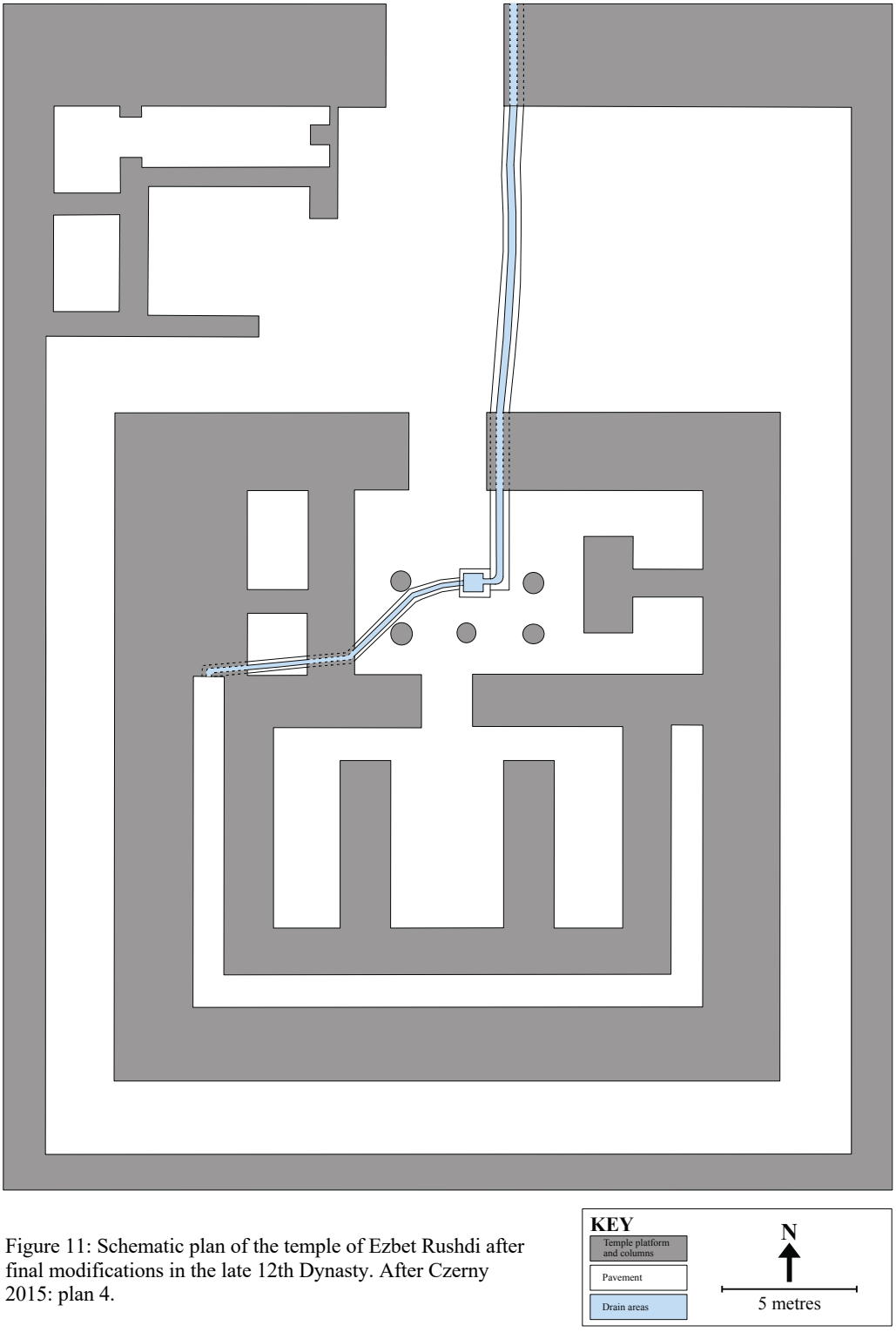


Figure 11: Schematic plan of the temple of Ezbet Rushdi after final modifications in the late 12th Dynasty. After Czerny 2015: plan 4.

the builders blocked off the corridor, it seems that they were aware of the potential water problems, and incorporated this solution into their plans.

The final destination of many drains has remained unknown, as drains have often not been excavated to their endpoint, as with those in the pyramid complex of Senwosret III (Di.

Arnold 2002: 90–91). A few, however, end in well-crafted basins (e.g. the pyramid complex of Niuserre: Borchardt 1907: 21, pl. 6), while others abruptly ended in the sand (e.g. the tomb of Horemheb at Saqqara: Martin 1989: 15–16), some used older tomb shafts (e.g. the pyramid complex of Senwosret I: Di. Arnold 1988: 84–86), and a handful had purpose-built wells lined with brick or stone (e.g. the pyramid complex of Pepi I: Labrousse 2000: 6, fig. 14). The rationale behind this is straightforward: the water was taken to an area where it could safely be absorbed into the ground or, if unroofed, evaporated by the sun. Sites near the Nile sometimes have drains that head towards the river, where it is assumed they would have discharged its water, as at Ezbet Rushdi (Czerny 2015: 110).

Most surviving drains in monumental contexts consist of drainstones placed into ditches, sometimes with a layer of gravel or stone blocks below, but many are conduits lined with stone blocks (e.g. in the Senedjemib Complex at Saqqara: Brovarski 2001: 2; the pyramid complex of Djedefre: Valloggia 2011: 37; the temple of Sesebi: Spence and Rose 2009: 41). However, there is one example of copper pipes being laid inside the drainstones, in the drains of Sahure's pyramid temple (Borchardt 1910: 78; Ventker 2012: 17). Traces of green deposits in the drainstones of Niuserre's pyramid temple suggest that his drains might have also incorporated copper pipes (Borchardt 1910: 82). These 5th Dynasty pipes are unique and as such one of the most discussed drainage systems. Researchers have offered various possible explanations for their apparent absence in later constructions (e.g. Megahed *et al.* 2017: 51; Köpp-Junk 2019: 75), suggesting that the pipes were probably ineffective at their job for two reasons. Firstly, the inner diameter was only 4.7cm, which has been deemed too small to cope with both rain- and wastewater drainage (e.g. Neumann 2008: Kat. Nr. 027). Secondly, some tributary pipes entered the main pipes at an angle unconducive to the flow direction (Borchardt 1910: 83). Furthermore, they might not have been worth the necessary investment of materials and craftsmen when drainstones alone probably worked as effectively or perhaps even better.

There has been debate over the effectiveness of all types of ground drainage, and not just these unique copper pipes. Many drains have been discovered clogged with mud and debris (see e.g. Di. Arnold 1988: 44–45; Di. Arnold 2008: 40), and while this might be taken as evidence of their ineffectiveness, another, more plausible, explanation is that these blockages had built up after the complexes were no longer maintained. Libation and purification water would not flow in temples after they had been abandoned, but rainwater would still impact the drainage system. Even effective modern drains, after hundreds of years of further design

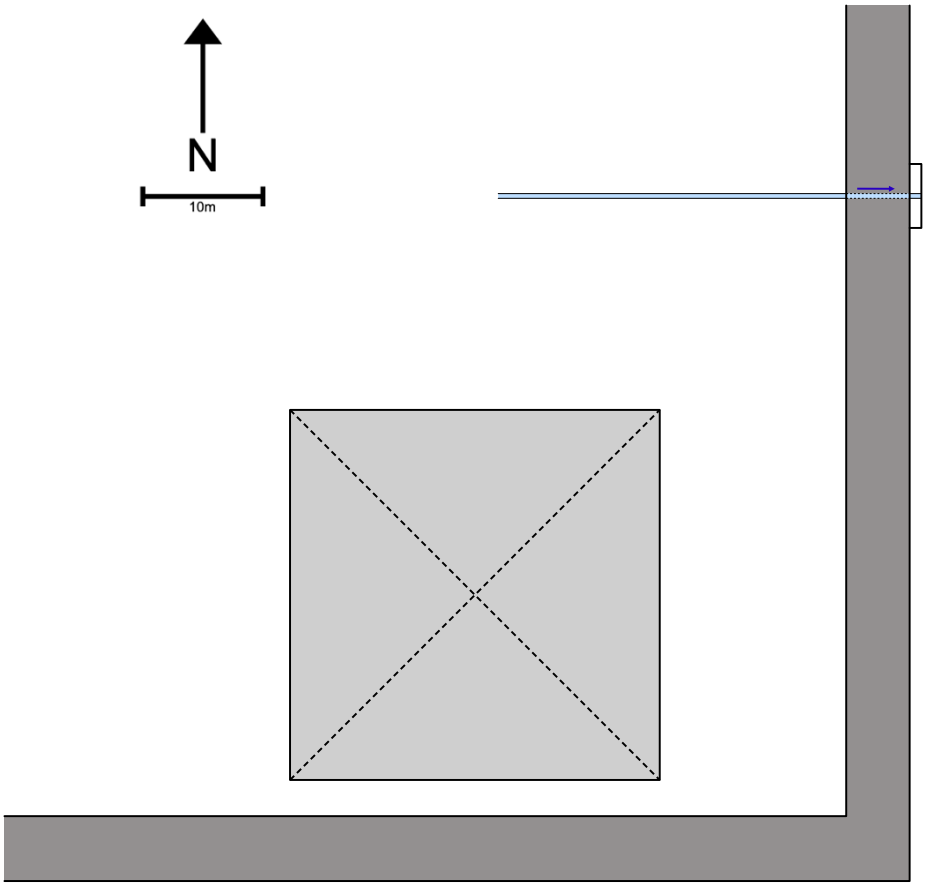


Figure 12a: Schematic plan of Senwosret I's *ka*-pyramid. Phase A: initial construction, drain in east wall. After Arnold 1988: fig. 28, foldout 4.

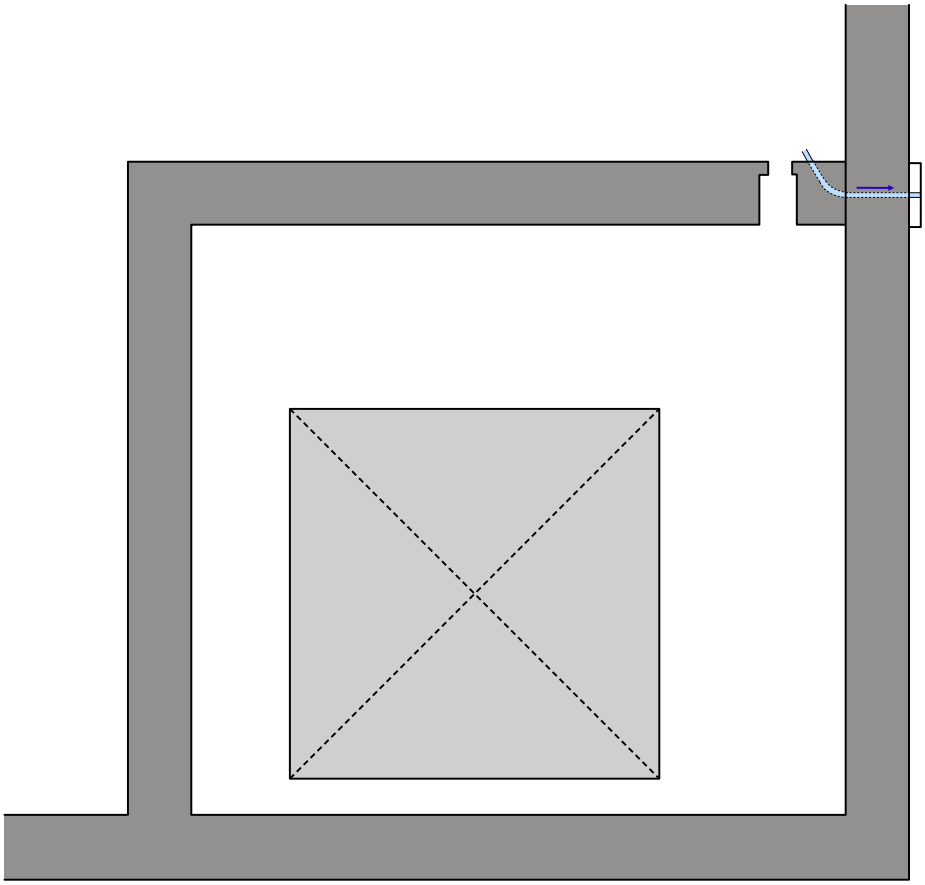


Figure 12b: Schematic plan of Senwosret I's *ka*-pyramid. Phase B: enclosure wall for *ka*-pyramid built, east drain modified. After Arnold 1988: fig. 28, foldout 4.

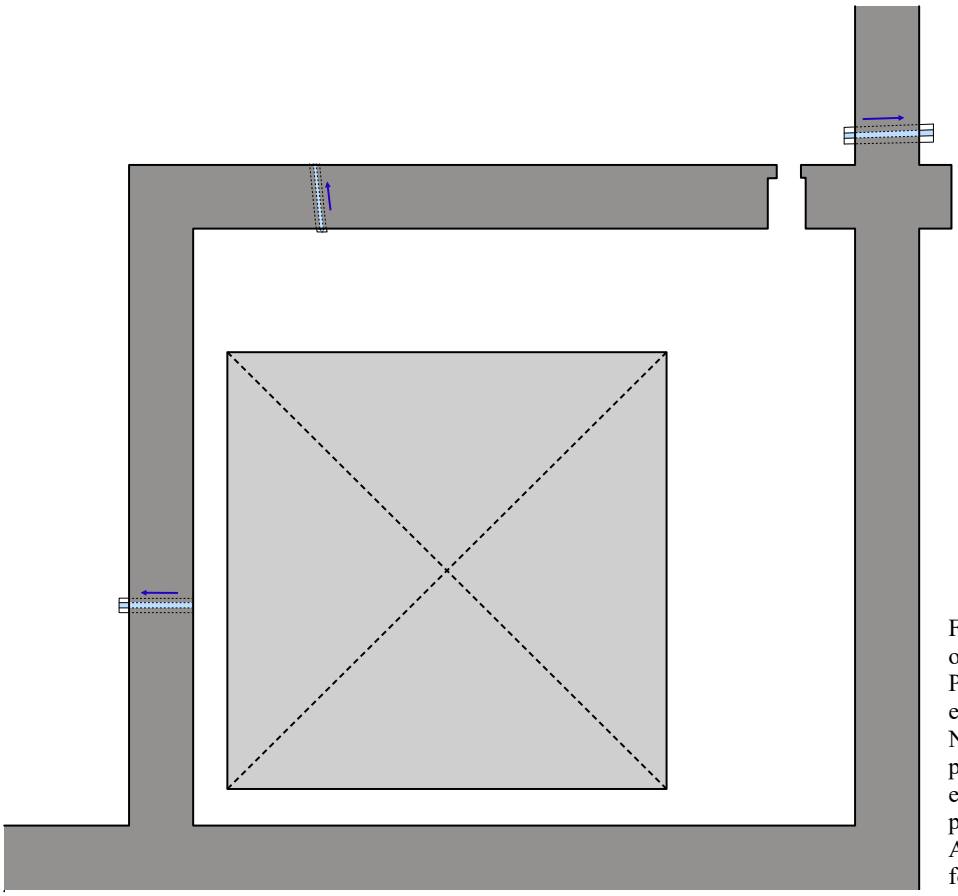


Figure 12c: Schematic plan of Senwosret I's *ka*-pyramid. Phase C: *ka*-pyramid expanded, pavement raised. New drains in west and north parts of enclosure wall, new east drain outside the *ka*-pyramid enclosure walls. After Arnold 1988: fig. 28, foldout 4.

development, can become choked with debris without maintenance, or after a particularly heavy rainfall (see e.g. Chatzis 1999).

Any suggestion that drainstones were not suitable for the task accords badly with their ongoing usage in both major and minor monuments from the Old Kingdom to the New Kingdom. In the courts surrounding pyramids especially, where a large quantity of rainwater could fall and be hemmed in by the walls (Lauer 1947: 259), a lack of effective drains would have damaged the sacred area. The pyramid complex of Senwosret I at Lisht provides evidence for the ongoing interest in and upkeep of the drains. When his *ka*-pyramid was first built, it was located within the inner enclosure walls of the main pyramid, and so there was no problem with a drain running underneath the eastern enclosure wall directly next to the *ka*-pyramid (fig. 12a; Di. Arnold 1988: 72). In the second phase of construction, the *ka*-pyramid was given new northern and western enclosure walls to separate it from the main area surrounding the pyramid, and the new northern wall met the eastern enclosure wall directly on top of the pre-existing drain (fig. 12b; Di. Arnold 1988: 73). Water gathering in the southeast corner of the pyramid court, presumably from both the court and the temple roofs, then had nowhere to go, and would have been damaging to the structures. However, the

architects added a new diagonal drainage canal underneath the northern wall of the *ka*-pyramid's enclosure, in order to reconnect the drainage system and remove that water (fig. 12c; Di. Arnold 1988: 73, pl. 75, fig. 28). Some time later when the pyramid was enlarged, further adaptations were made: a third drain was built 2.5m to the north of the older drain (Di. Arnold 1988: 84). The drainage was adapted using the same techniques as the complex evolved, suggesting that the system was considered both necessary and effective.

It could conceivably be argued that the presence of drains in monumental structures were a fossilised remnant from earlier periods of heavier rainfall when such drains were necessary, but which subsequently were transformed into standard architectural elements that were ideological parts of a temple, and no longer practical components. However, rain was still a significant threat in pharaonic Egypt, and indeed arguably more of a threat because it was sporadic (Warner 2004: 439–43; see §3). If drainstones had become purely symbolic by the Middle Kingdom, one might expect standardisation, a consistent positioning from temple to temple, or even external references in religious texts to their symbolic interpretation, but this is not the case. Instead, it appears as though each building had a unique drainage plan that best suited its own structural goals and location.

This pragmatic rationale does not exclude any religious or ritual aspects. In the 19th Dynasty temple at Zawiyet Umm el-Rakham (fig. 13), the open peristyle forecourt has two rectangular depressions (~2 x 5m, 10cm deep) on either side of a central walkway in the temple axis. Each depression was fed by a line of drainstones coming from the open passage encircling the temple's sides and back, and which probably caught rainwater that drained from the now lost roof. Once water in the depressions had reached a certain height, it was then led via drainstones to a small basin underneath the central path, and then out of the temple enclosure through more drainstones (Snape and Wilson 2007: 28, fig. 2.3), possibly towards water tanks (Snape 2013: 446). This elaborate system was not the most efficient way to remove rainwater in purely pragmatic terms, and so it probably had other functions, perhaps aesthetic, ritualistic, or ideological. Zawiyet Umm el-Rakham is located on the Mediterranean coast, an area which receives plenty of winter rainfall (§3.3.1), thus it is reasonable to assume that there would be times when the depressions were full of water. Between these two pools, a barque stand stood on the central walkway, perhaps evoking a scene reminiscent of divine barques on sacred lakes (see e.g. Geßler-Löhr 1983; Blyth 2006: 85) in a temple that was otherwise too small for its own lake. This example suggests that the roles of ground drains were often more complex phenomena than has often been assumed.

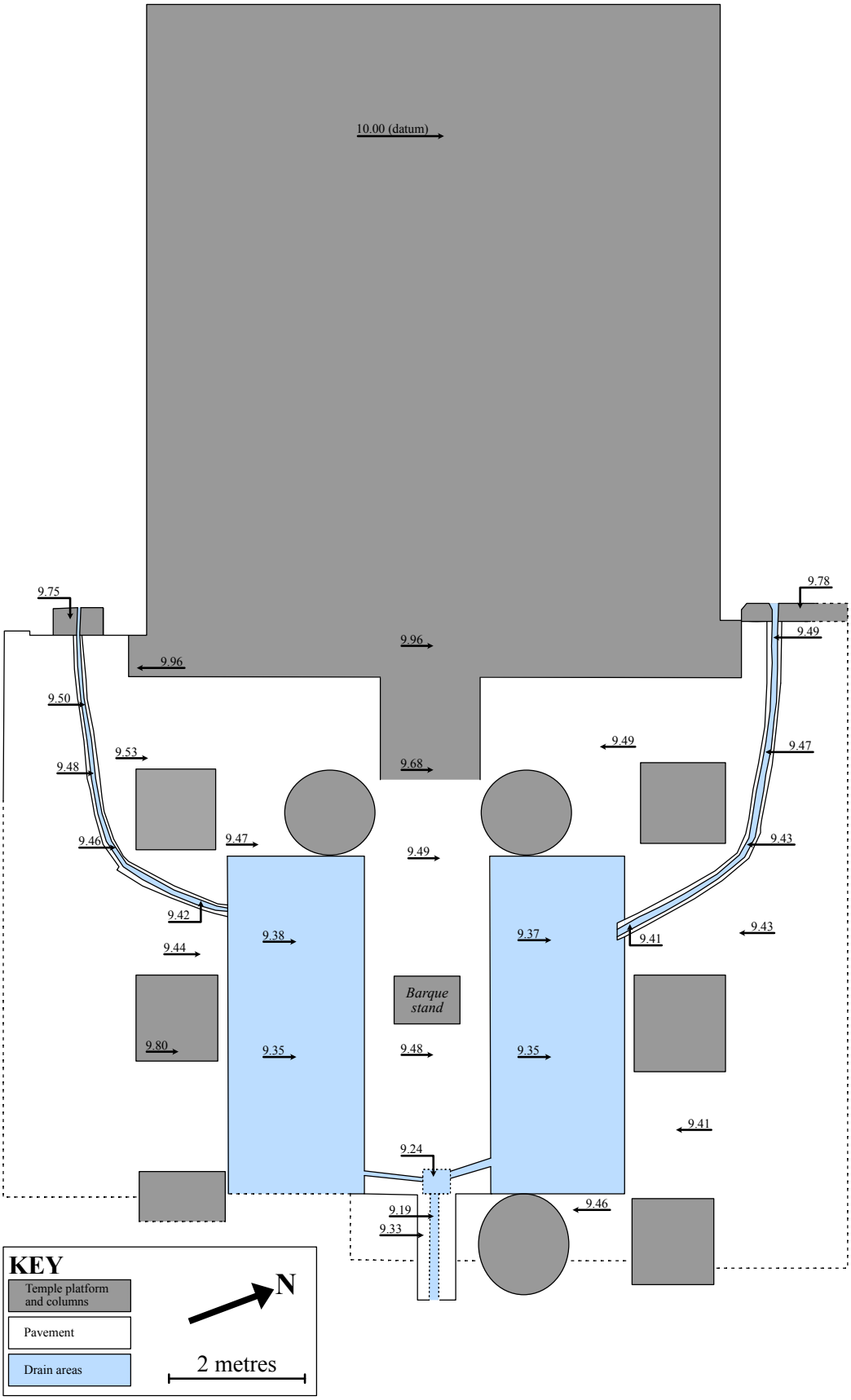


Figure 13: Schematic plan of the Ramessid temple of Zawiyet Umm el-Rakham. Spot heights are relative to height of flooring block in central sanctuary, which is given as 10m. After Snape and Wilson 2007: fig.2.3, 2.33.

4.2.1.2 *Roof drainage systems*

The poor preservation and incomplete mapping of the upper surface of roofs are major issues when discussing roof drainage systems. In many monumental buildings, the roof slabs have not survived intact due to the sheer tension placed on them (e.g. Clarke and Engelbach 1990 [1930]: 153). And when the upper parts of buildings have survived, the roof has historically not been of major interest to archaeologists, which has resulted in only brief mentions concentrated on the most obvious features (i.e. waterspouts) as isolated elements, without the context of the broader drainage system. For example, waterspout(s?) that originally adorned the temple of Amun at Luxor were only briefly mentioned by Ludwig Borchardt in a footnote (1896: 130, n. 1), which stated that they were lost when the roof collapsed during excavation (an incident reported in Grébaut 1889: 329), along with other roof blocks that had carved gutters. No measurements or further details are known, and Borchardt's footnote is the only published reference of this entire roof drainage system. Even lion-spouts are sometimes underpublished: the three lion-formed waterspouts on the temple of Hatshepsut at Deir el-Bahari were not discussed in Naville's publication series (1895–1908), despite at least one being clearly visible in his photographs (e.g. EES negative DB-HAT.NEG.C.51) and drawings (e.g. Naville 1896: pl. 31); these have only been recently described (Iwaszczuk 2016: I, 10, 29), but without detailed drawings or measurements. Once again, Lower Egypt has fewer surviving temples overall, and so most information about roof drainage systems comes from the drier south (Ventker 2012: 46).

4.2.1.2.1 Waterproofing

Most temples apparently used some form of waterproofing on the roof to avoid rain seeping inside through the vertical joins of the stone masonry. Common techniques included the use of plaster, raised edges around openings, and fillet stones. Plaster was often added between blocks, sometimes taking advantage of small channels in their sides (Di. Arnold 1991: 123; compare to plaster channel in drainstones, fig. 4), and also as a top layer to secure and seal the blocks (Clarke and Engelbach 1990 [1930]: 155; Ventker 2012: 155). A similar application can be seen in the roofing of Khufu's boat pit, where a layer of plaster was laid over the top surface to prevent any liquid getting in (Hawass 1990: 112).

Another technique was the use of fillet stones, which were generally long rectangular or trapezoidal stone shafts that slotted into a corresponding groove wherever two roof blocks met (fig. 14; Monnier 2013: 30). The top surface of these fillets had two permutations: flush with the roof, or with a top that flared out over the two adjacent blocks (a 'mushroom' fillet

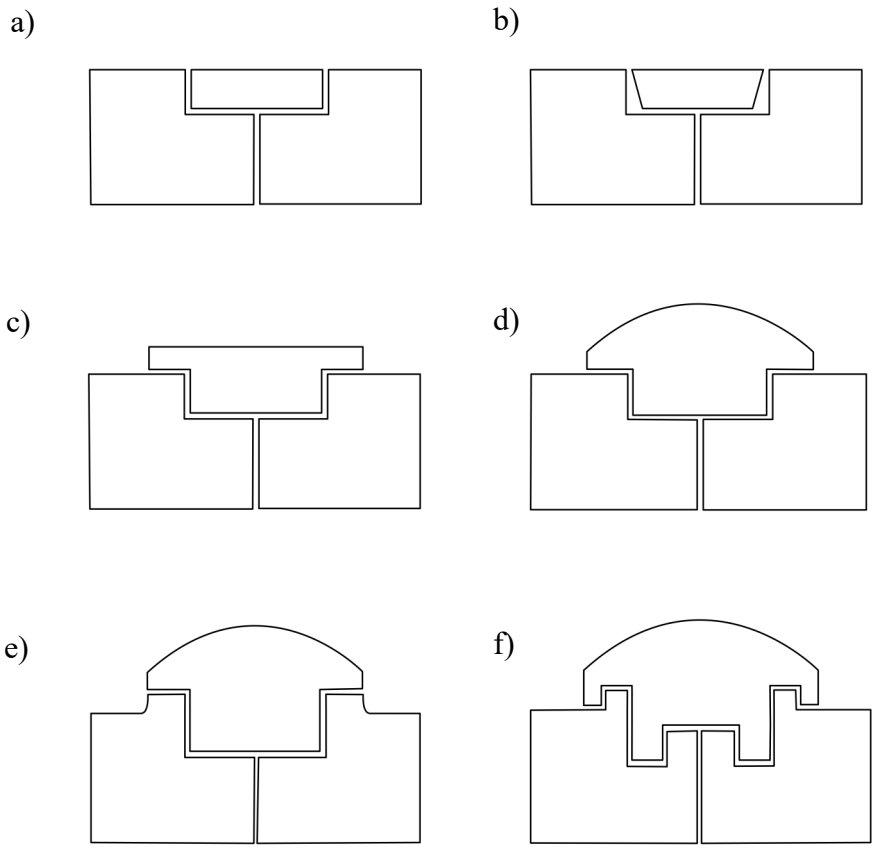


Figure 14: Schematic illustrations of fillet stones: a) simple flush stone; b) trapezoidal stone; c) flat-cap stone; d) rounded-cap stone; e) rounded-cap with ledge stone; and f) peg-like stone. The central plug width varies between 10 to 30cm.

stone). Some roof slabs also had raised edges next to the groove as well (Clarke and Engelbach 1990 [1930]: 155). There does not appear to be a chronological development of forms; the earliest surviving attestations from the reign of Senwosret III used a rounded top (e.g. Di. Arnold 2002: 52, 102), and flat tops are first known from the 18th Dynasty (e.g. Borchardt 1896: 130). In the Ramessid Period, either was used, normally maintaining consistency within a single building project (e.g. Chevrier 1933: 8; Ventker 2012: 30), but occasionally combining multiple styles (e.g. Ramesseum: Lecuyot 2022: 65–72). It is possible that the flat fillet stones were chosen in cases when the bulges from rounded fillets were visually or practically undesirable, or judged to be not worth the additional resources. In one case, the South Temple of Senwosret III at Dahshur, the bottom of the fillet stones was carved into a 'peg'-like shape (fig. 14f; Di. Arnold 2002: 102, pl. 144b). The South Temple was built after the pyramid temple (Di. Arnold 2002: 117), where the fillet stones had a more

straightforward ‘mushroom’ design; this suggests that perhaps the architects decided that a more effective waterproof fillet stone was required and adopted this new shape. Fillet stones are not attested from the Old Kingdom, but this could be due to poor preservation of temples. While they were used in the Middle and New Kingdoms, there are intact temples with no indication of their presence, so fillet stones were not invariably used.

Light wells in the roof were a clear risk for water ingress; while there was nothing to stop rain falling directly through the hole, the edges around the aperture had a raised rim that would have stopped gathered rainwater on the surrounding roof flowing into it. There are many examples of this: at the pyramid temple of Unas (Labrousse *et al.* 1977: fig. 21), the sun temple of Niuserre (von Bissing 1905: 32), the *Akhmenu* of Thutmose III (Carlotti 2001: 188, fig. 114), and the temple of Ramesses III at Karnak (Chevrier 1933: 8), and also in some non-royal mastabas (e.g. Cooke 2020: 106, fig. 4.1). In at least one case, at the pyramid temple of Senwosret III in Dahshur, the interior side of a light well had a shallow indentation (‘throating’) surrounding the opening underneath, which separated the decorated ceiling from any water droplets that might roll onto the ceiling due to water tension (Di. Arnold 2002: 53, pl. 36c). Any rain that did fall directly through the light well would fall on the undecorated floor, and when present, drain systems intended for ritual liquids would have removed this (e.g. in the mortuary temple of Senwosret III at Abydos, fig. 17: Wegner 2007: 119, fig. 50).

4.2.1.2.2 Gutters

Sloped roofs and gutters transported water that had fallen on top of a roof to waterspouts. When such systems were used, they covered the entire roof, which argues against them being used primarily for catching water from roof-top rituals that would have specific locations on the roof (contra Ludwig 1989: 108–11; Watterson 1998: 40).

Since the incline needed to direct the flow in a desired direction can be quite small, sloped roofs have been easy for excavators to overlook, and so this might have been a feature on more temples than publications suggest. Recorded examples of varying sizes include the White Chapel (Lacau and Chevrier 1956: 8), the *Akhmenu* of Thutmose III at Karnak (Carlotti 2001: 236), and Ramesses III’s temple of Medinet Habu (Hölscher 1951: 33).

Gutters are shallow depressions carved into roof slabs that guide water away, presumably to waterspouts, although these have not often survived *in situ*. The most complex—and best-preserved—gutter systems are those on the roofs of the temples of Seti I at Abydos and Qurna (fig. 15; Clarke and Engelbach 1990 [1930]: fig. 179, 180). In these, each roof block had a depression carved so that water would be ‘funnelled’ into a long gutter cut across slabs,

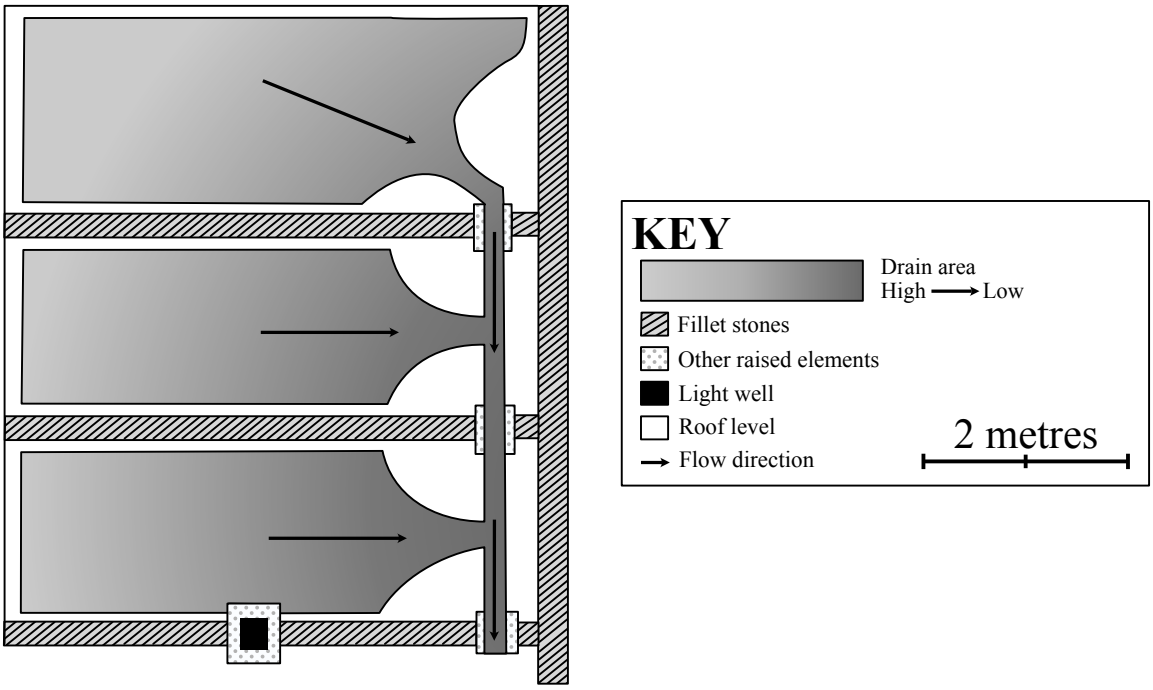


Figure 15: Schematic plan of the gutter system on the roof of the Abydos temple of Seti I, with arrows indicating flow direction. After Clarke and Reginald 1990: fig. 180.

and then towards an outlet. A similar shape is seen on a single roof slab directly behind the waterspout of the much smaller White Chapel at Karnak (Chevrier 1943: 226), and this is the only surviving pre-New Kingdom example. Simpler gutters ran parallel to the parapet at the Ramessid temple of Medinet Habu, with water directed there via a gentle slope (Hölscher 1951: 33, fig. 37).

On temple roofs that used flared top fillet stones, every roof slab was in effect a basin without any escape for rainwater. In order to counteract this danger to waterproofing, special drainstones were sometimes installed to cross the fillet stones at crucial spots (Di. Arnold 2002: 104). Specially formed roof drainstones have been found at Senwosret III's pyramid temple and south temple at Dahshur (Di. Arnold 2002: 103–4, pl. 144), and the Abydene temple of Seti I (Clarke and Engelbach 1990 [1930]: 156, fig. 180).

4.2.1.2.3 Overhangs, waterspouts, and vertical drainpipes

This section discusses overhangs, simple waterspouts, lion-shaped waterspouts ('lion-spouts'), and vertical downpipes, which all transport water to the ground in a way that minimises damage to the building and its decoration.

Overhangs were a feature of many Old Kingdom non-royal mastaba chapels. Cantilevered stone blocks were set above the portico in the façade, so that water on the roof

would not fall directly onto the decorated architrave and columns below (e.g. G2100-II: Der Manuelian 2009: 118; G2135a: Junker 1943: 89; G6010: Junker 1950: fig. 29). The cavetto cornice, a common architectural feature, would also have had a similar effect (Köpp-Junk 2021: 213). However, neither would fully protect against rainwater directly hitting the decorated surfaces of the portico.

Simple waterspouts were formed by a drainstone that was positioned so that it projected from the roof horizontally. The roofs of the valley temple of Khafre (Hölscher 1912: 47), and the sanctuaries of Amenhotep III at Luxor (Borchardt 1896: 130) and Wadi Hellal (Garnett 2017: 98) had simple spouts, although unfortunately their exact positioning on the temples and their current locations are unknown. There is one example of a simple waterspout from a non-royal funerary context, from the south side of the 5th Dynasty mastaba of Iymery at Giza (G 6020: L*D* I, 38; Petrie MSS 5.5.24d; Weeks 1994: 71, pl. 40). This spout directed water away from the mastaba, but later, Iymery's son Neferbauptah built his mastaba (G 6010) adjacent to Iymery's, and so the builders carefully lined up the waterspout with the new courtyard, as the portico roof is very close (clearest in L*D* I, pl. 21; see also PDM photo 1993.102.13). Since mastabas of this period incorporated many elements from royal mortuary complexes (Jánosi 1999: 34), the waterspout may have been inspired by nearby royal monuments. All of the preserved simple waterspouts are made of stone, but some were wood, to judge by the mention of 'sycamore waterspouts' for new temples in the Annals of Amenemhat II (M l. 15; P l. 2: Altenmüller 2015: 60).

Some simple waterspouts could be made of drainstones specifically carved for roofs. One surviving spout from the pyramid temple of Unas slopes downwards instead of the drainstone remaining horizontal (Cairo JE 35132: Labrousse *et al.* 1977: 45; see fig. 16); this design is apparently unique. A waterspout from the pyramid complex of Senwosret I at Lisht has a cavetto cornice carved next to it, as part of the same stone block (Di. Arnold 1992: 27, pl. 28e), while one waterspout from the mortuary temple of Thutmose II had a ~40º downward slope next to it instead of a cavetto cornice (Bruyère 1952: fig. 17).

Surviving simple waterspouts are outnumbered by examples of lion-spouts in religious contexts. In these, the lion is represented recumbent with its paws in front. Unlike the typically imagined Greek-style gargoyle (for which see Mertens-Horn 1988), the water came out from a channel between the two paws, and not from the mouth. The head was most often carved from a separate block to the paws and channel (Ventker 2012: 48). The representation of the lion was originally painted, as there is still some preserved colour on the lion-spout of

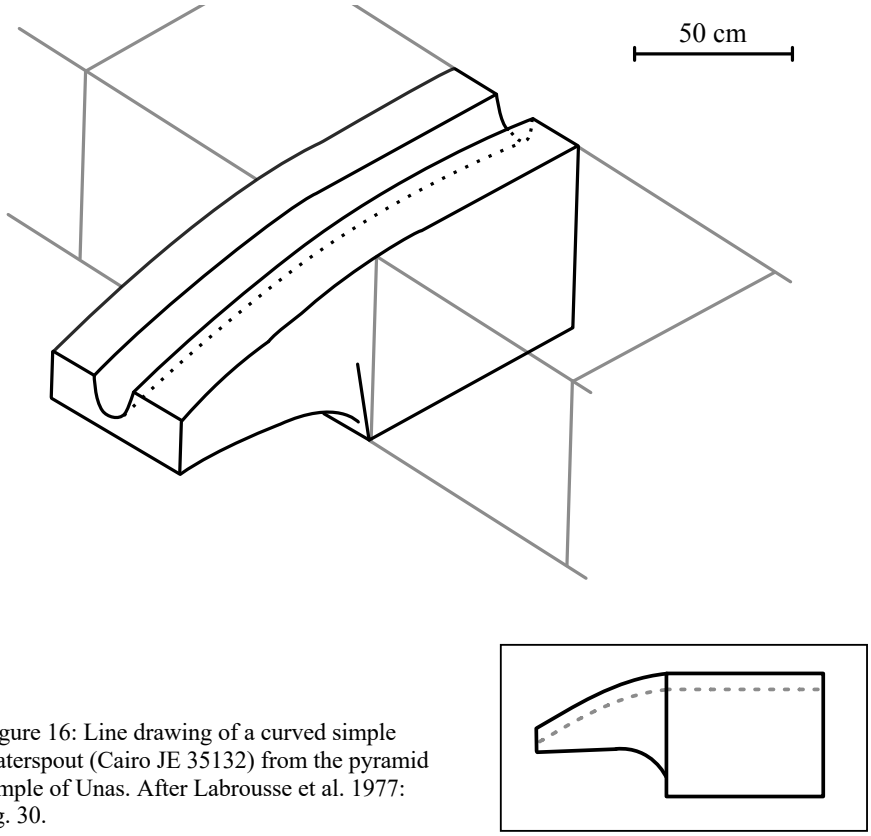


Figure 16: Line drawing of a curved simple waterspout (Cairo JE 35132) from the pyramid temple of Unas. After Labrousse et al. 1977: fig. 30.

the White Chapel (Ventker 2012: 49). The earliest evidence of lion-spouts is said to have come from the pyramid temple of Sahure (Borchardt 1910: 67, fig. 85), but the lack of any preserved channel in this example makes it uncertain. More complete examples survive from a few decades later, from the sun and pyramid temples of Niuserre (Borchardt 1905a: 55, fig. 49; Borchardt 1907: 18, fig. 44). From this time onwards, lion-spouts are attested on both divine and royal mortuary temples in all periods. Examples with a secure provenance include those from the pyramid temple of Senwosret I at Lisht (Di. Arnold 1988: 53, pl. 57), one from the White Chapel at Karnak (Chevrier 1929: 137; Lacau and Chevrier 1956: 6–10, pl. 3), the temple of Hatshepsut at Deir el-Bahari (Ventker 2012: 26), the temple of Ptah at Memphis (Petrie 1909: 9, pl. 23), the temple of Medinet Habu (Hölscher 1941: 46), and the temple of Ramesses III at Karnak (Chevrier 1933: 8). In some cases, the lion-spouts were re-used, as at the Graeco-Roman temple of Satet at Elephantine, where a Ramessid lion-spout from a dismantled temple was used as a decorative, non-functional feature in the terrace (visible in Jaritz 1980: pl. 3; Bommas 2000: 26, 124; Ventker 2012: 28). Others ended up as fill for other constructions (e.g. White Chapel lion-spout in the 3rd pylon of Karnak: Chevrier 1929: 137).

Many discussions of the usage of lions as waterspouts draw on the inscriptions on Graeco-Roman examples, which refer to the lion as repelling enemies of the god and protecting the temple against rainstorms (*ḥwyt* [§5.2.1], *snm* [§5.2.2]: de Wit 1951: 84–90; Thiers 2008; Ventker 2012: 263). These texts are not present on earlier waterspouts, but this apotropaic character was probably implicit in their form, as lions were already protector animals (e.g. von Lieven 2006: 50). Like every aspect of temples, lion-spouts were a symbolically charged component of the decorative program (Di. Arnold 1994: 38). Their ideological function derived from their physical function, to prevent damage to the material form of the temple. Of the known lion-spouts, only one was never used to remove rainwater, at the temple of Hatshepsut at Deir el-Bahari (briefly noted by Werbrouck 1949: 33). The lower and middle terraces originally had two lion-spouts each; the two on the middle terrace were functional, but the one on the lower terrace had no channel (and the assumed final one is lost: Ventker 2012: 27). The channel-less spout was added for its protective qualities. The channel-less spout is not necessarily evidence for waterspouts having become a fossilised tradition without any practical necessity, since this is a single example among many more fully functional ones, including at least two other fully functional ones in the same temple.

The reasons for choosing to use a lion-spout instead of a simple spout in a particular location are uncertain. Lion-spouts might have been reserved for more sacred spaces, as seems to be the case for the well-preserved Ptolemaic temples (Ventker 2012: 49), but there is only limited evidence for this earlier; all waterspouts within a single building project were apparently either simple spouts or lion-spouts, not a mix. The pyramid complex of Senwosret I is a slight exception: the pyramid temple had lion-spouts, but one of the temples of the satellite pyramids for members of the royal family (no. 3) had a plain waterspout (Di. Arnold 1988: 53, pl. 57, 1992: 27, pl. 28e). The use of lion-spouts is also seemingly not restricted to either mortuary or divine temples; when one compares the overall ratio of plain to sculpted waterspouts in mortuary versus divine temples (4:5 and 2:6 respectively), a divine complex was more likely to carry lion-spouts. Instead, practical considerations might have determined the choice—lion-spouts would have taken more time and resources to create than a simple waterspout.

There is one further type of roof drain, that is the rarely attested vertical drain. The best-preserved example is from the temple of Senwosret III at Abydos, which had a complex and well-documented drainage system (fig. 17; Wegner 2007: 96). Of particular relevance are

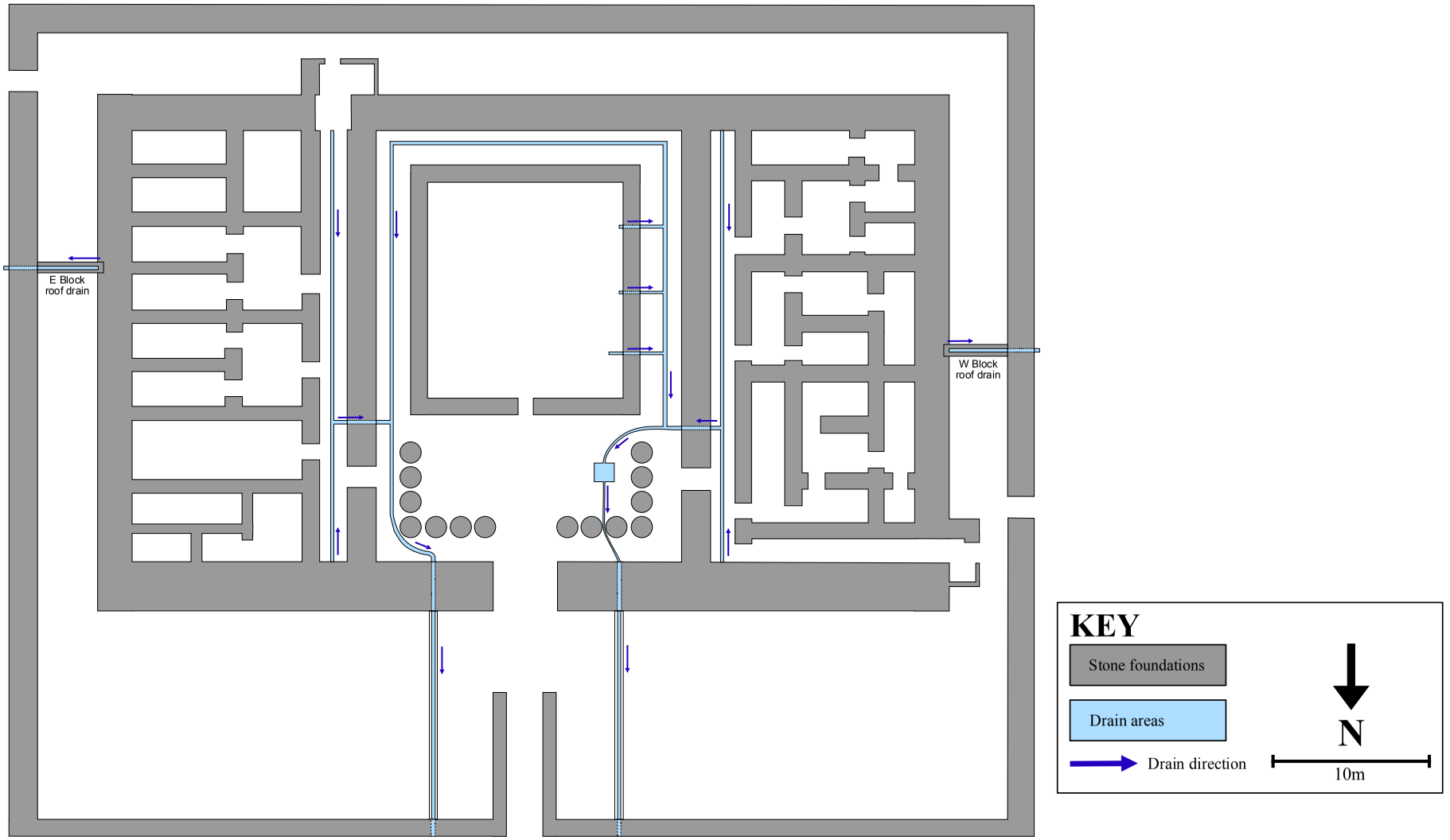


Figure 17: Schematic plan of Senwosret III's temple at Abydos. After Wegner 2007: fig. 20, 40, 46, 50.

two drains on the east and west sides of the temple building. The inlet is a drainstone that abruptly ends inside the stone foundations of the mudbrick temple wall; the other end leads first underneath the pavement and then under the enclosure wall (Randall-MacIver 1902: 58; Wegner 2007: 108–10, pl. 16d). This layout suggests that there were once vertical downpipes on or in the walls of the temple, removing water from the roof, though the wall itself does not survive (Wegner 2007: 110). At the temple of Ramesses II, Abydos, two hemi-cylindrical 'drip-channels' were carved into the western outer wall, with the sunk relief decoration carved in the channels, although shallower than the other decoration (Iskander and Goelet Jr. 2015: pl. 2.1.9). A possibly related feature might be found in the earlier sun temple of Niuserre, where there was reportedly a vertical drain within the wall near the start of the causeway, but this area is very damaged (von Bissing 1905: 23, fig. 12). How these varying systems interacted with the surface of the roof is unknown, as none of the monuments have walls preserved to their roof height.

4.2.2 *Engagement with wind*

While there is more extensive evidence for mitigation against rainwater, there is some evidence for mitigation and utilisation of wind in monumental cultic and funerary architecture.

4.2.2.1 *Mitigation*

Enclosure walls around cultic and funerary temples were primarily concerned with demarcating the sacred from the profane (e.g. Spence 2004a: 266), but these enclosure walls could also be protection against strong winds blowing sand into the cultic space. Occasionally those walls had their own protective barriers (compare §4.1.2.2). At Ramesses III's temple complex at Medinet Habu, where religious and military architecture are combined, a short stone-faced wall stood in front of the monumental mudbrick Great Girdle Wall (Hölscher 1939: pl. 41). This wall relates primarily to the overall fortified style of the temple complex (Hölscher 1951: 10), but it would also have the practical advantage of preventing the wind from undercutting the more friable massive enclosure walls, and preventing the build-up of windblown sand that would reduce defensive capabilities (compare with curtain wall of Balat's Old Kingdom fortress, Siegel 2020: 451; see also §4.1.2.2). However, whether this was a feature utilised in other temples that were not influenced by military architecture is uncertain, mainly because of the poor preservation and excavation of the outer perimeters of temples overall.

Another type of wall that might relate to wind mitigation are the screen walls between the pillars of a temple portico or pronaos. These screen (or intercolumnar) walls would act as a protective barrier between the sacred and profane, the inside and the outside (Wildung 1984: 690–92; Finnestad 1997: 190; Robins 1997: 214); in a practical but complementary manner, they would also have kept out wind-borne sand. Such screen walls possibly evolved from the Predynastic tent-shrines, where matting was hung between the tent poles (Kemp 1991: 152). The earliest known mud-brick example is in the pyramid temple of Menkaure at Giza, between the columns of the portico facing the open courtyard, although this screen wall was built by his successors, probably Shepseskaf (Reisner 1931: 26, 58, plan IV), and so was not part of the temple's original design. In the Ramessid temple of Zawiyet Umm el-Rakham, intercolumnar screen walls are present between the temple building proper and the courtyard in front, in conjunction with a raised floor level (Snape and Wilson 2007: 12, fig. 2.3; see also the now lost screen walls at the Ramesseum: Panckoucke 1821: 249). Screen walls are much better attested from the Late Period onwards, and are particularly prominent in Graeco-Roman temples (Finnestad 1997: 190). The similar 'parapet' walls that encircled raised shrines, such as those in the White Chapel of Senwosret I at Karnak (Wildung 1984: 691) and the 18th Dynasty temple at Medinet Habu (Hölscher 1939: 20), are less than a metre high, and thus lower than screen walls, but together with the raised nature of the shrines they would also have been effective against everyday sand. Privacy and security were the main functions of screen and parapet walls (see e.g. F. Arnold 2022: 157), but their ability to retard sand incursion is noteworthy and fits well with their ideological function.

Finally, in the South Temple of Senwosret III, a drain was found with retaining walls surrounding it to either prevent sand filling the channel or to ensure there was a clear drain access point for regular cleaning (Di. Arnold 2002: 91, plan 1). There are no other parallels for this in monumental architecture; the closest parallel would be the sand-blocking walls of houses at Amara West (§4.1.2.2).

4.2.2.2 *Utilisation*

Temples typically did not have wind-catchers, and the functional role of wind-catchers may have been played in part by windows. Slits in the wall and skylights on the roof that helped to light the interior would let in only a negligible amount of wind because of their size and orientation. Clerestory windows were mainly found in the larger spaces, such in the hypostyle hall of Karnak (Liarte Fernando *et al.* 2020: 563–64), where they had a north-south orientation ideal for the dominant north wind to filter through. Furthermore, they would allow

warm air from surrounding rooms to rise up and leave the building—the ceilings of those rooms or corridors were invariably lower than that of the spaces with clerestories, and so warm air could not re-enter other rooms (for the same process in houses, compare §4.1.2.1; Endruweit 1994: 68–70). Unlike wind-catchers, however, clerestory windows did not direct wind downwards, and any wind would not have dispersed incense smoke too quickly, possibly a key requirement in a religious space where the smell of burning intense was intrinsically linked to the divine (e.g. Frood 2013: 172). Effective cooling and ventilation of the interior might not have been a major priority in a context shaped by ritual meaning and significance, rather than habitation.

4.2.3 *Summary of monumental cultic and funerary architecture*

Archaeological evidence for rain mitigation is most extensive in monumental stone-built architecture due to high rates of preservation compared to mudbrick buildings. The same basic types of rain mitigation strategies were apparently used from the Old Kingdom onwards and did not change significantly; fillet stones and gutters first appeared in the Middle Kingdom, but this is possibly just due to preservation issues. However, the way in which these strategies were applied varied in concert with design aspects and practicalities specific to individual monuments; variations seem to reflect local differences rather than any chronological development. For example, the mortuary temples of Hatshepsut and Ramesses III both carry lion-spouts, but in the former these are aligned parallel to the temple axis, facing the visitor as they approached, while in the latter they emerge from all sides apart from the main entrance (compare fig. 8 and 11 in Ventker 2012); this is due to the radically different designs and locations for these two temples. In order to remove rainwater from a cultic complex, ground drains could follow underneath a walkway (as in the pyramid complex of Sahure: Borchardt 1910: pl. 16), or cut underneath an enclosure wall (as in the pyramid complex of Niuserre: Borchardt 1907: 97). Some drainage systems were designed to retain water up to a certain height in basins (as at the temple of Ezbet Rushdi: Czerny 2015: 114), while others were designed to immediate evacuate it (as in the pyramid complex of Senwosret I: Di. Arnold 1988: 84–86). Architectural mitigations against rain were not fossilised into a single form at the end of the Old Kingdom and variations continued to develop. There was variety in complexity, with both simple and intricate solutions attested in all periods. Drainstones, waterspouts, basins, and fillet stones were part of the Egyptian architectural repertoire when making practical decisions about monumental constructions, but elements were used or not as was appropriate for the specific circumstances. Elements of rain

mitigation that seem isolated today would probably have been part of larger mitigation systems, which have now been lost due to poor preservation and sometimes limited excavation.

In comparison, evidence for wind mitigation or utilisation is much less. This is in effect a reversal of the distribution that is found with domestic contexts. This may be an actual reflection of their priorities in different spaces, as there might have been, for example, less need to cool the temple space at night than domestic sleeping spaces, while the larger and taller spaces of the temple, in concert with the use of clerestories, might have made the air less susceptible to becoming stale. Temple architecture was shaped by ideological factors more extensively, and for example while intercolumnar screen walls might have played a role in hindering sand incursion, this is secondary to their other functions. Similarly, occasional examples of low walls outside the main enclosure wall of monumental buildings, probably had a primary ideological role of exclusion, but could also have prevented wind scouring. As will be discussed (§5.1.1), wind and air were influential concepts in Egyptian theology, but the effects of wind do not seem to have been a major concern in temple design and architecture.

4.3 Rock-Cut monuments

Monuments that were entirely carved into living rock with no significant built superstructure are treated separately here because they involved distinct mitigation techniques. The main concern for rock-cut monuments was the ingress of flash floods, particularly as many of these monuments are tombs that were meant to be eternally-lasting.

Many high-status tomb chapels avoided the problem of rainwater runoff by being cut into the cliff face facing the Nile, well above the valley floor, and sometimes with a small step at the threshold that would stop any water ingress, as at tomb 3 of Beni Hassan with its ~10cm step (Kanawati and Evans 2016: 22, pl. 81). In contrast, lower status burials were often made in more vulnerable wadi-beds, as with the North Tombs cemetery at Amarna (Stevens *et al.* 2018: 128). Additionally, sometimes elite tombs, most notably those in the Valley of the Kings, were excavated within a wadi course, although their position in relationship to the wadi floor at the time of construction is often hard to assess due to topographic changes influenced by natural and human sediment deposition (see Dorn 2019). The Valley tombs of the early 18th Dynasty had their entrances cut into the foot of rock fissures, directly beneath waterfalls (KV 20, 34, 35, 38, 43). This placement was apparently purposeful, as flood sediments effectively covered and hid the tomb entrance (Dorn 2016: 36;

Wilkinson 2016: 302); the secrecy around 18th Dynasty tombs is articulated in the autobiography of Ineni (TT 81: *Urk*. IV, 57.3–5). The initial corridors of these tombs had also been filled with stones, which would have protected the interior against this flow, effectively waterproofing them (Abitz 1974: 114; Weeks 2016: 104). However, later tombs generally had their entrances positioned on slightly elevated spurs, and/or the entrance faced downstream, preventing water ingress (Romer 1979: 2). In the 19th Dynasty, the entrances to the royal tombs became visible and monumental, and then these included overhangs above the doorway which threw water coming from the hills above away from the tomb (Roehrig 2016: 195), similar in function to the much earlier overhangs protecting the chapels of Old Kingdom mastabas (§4.2.1.2.3).

Another form of flood protection was erecting dam walls to divert water away from tomb entrances. Only a few sets of walls survive in the Theban necropolises: one in the cleft directly above the tomb of Thutmose III (KV 34: Dorn 2016: 35); one across a small wadi opposite the tomb of Aye (WV 23: Cross 2017: 55); and one upstream of the tomb of Merenptah (KV 8: Cross 2017: 55). These could have been temporary structures used for the duration of construction, and before a tomb was sealed, when there was inevitably a higher risk of water ingress. If so, it is probable that some such walls were removed after the burial, and so are undetectable now (as noted by Leblanc 1995: 203). There is also a Ramessid wall about 40m below the Grotto Cascade in the Valley of the Queens (Félix and Kurz 1970: 32–33). This wall had a slightly different context, and was probably ritualistic: the Grotto was associated with Hathor's aspect of rebirth, materialised through the flowing water, and its presence was probably why the Valley was originally chosen as a burial site (Leblanc 1989: 12; Demas and Agnew 2012a: 24). This wall, which essentially created a small dam, would have allowed the sacred water to be collected and used in ritual acts.

There is a further controversial feature for flood mitigation: the so-called 'well shafts' inside the tombs. In a number of royal tombs (KV 7, 8, 11, 17, 22, 34, 35, 43, 57), a vertical shaft was cut into Chamber E, from as shallow as half a metre to as deep as 8m from the floor level entering this chamber. In the 18th Dynasty tombs, the corridors before this shaft (and often the shaft itself) were left undecorated, and were filled with rubble at the time of burial (Abitz 1974: 45); however, in the 19th Dynasty, the corridors before the shaft were decorated. An early hypothesis was that these shafts were intended to catch floodwater and thus protect the tomb (Belzoni 1820: 231), but as Abitz (1974) notes, the most completely carved shafts had another room at the bottom, in the 18th Dynasty tombs of KV 22, 35, and 43 (and possibly 57), and these shafts had painted decoration (although the side chamber was

undecorated). Ramesses II's shaft had been inscribed with scenes from the 6th and 12th Hours of the *Amduat* (Hornung 1999 [1997]: 28). This suggests that the feature should be understood in religious rather than practical terms. In this reading, the shaft and its side-chamber could articulate Osirian beliefs, perhaps representing the cave of Sokar that is a focal point in the *Amduat* (Vandersleyen 1975: 152). However, this religious conceptualisation of the space does not exclude a secondary use for floodwater collection (Thomas 1978: 80). In fact, such aspects fit well with Egyptian mythology of the *Amduat*, as it would materialise the primordial waters associated with Osiris' rebirth (Vandersleyen 1975: 156; Rossi 2004: 140). Furthermore, at the time of a tomb's completion, a royal tomb had other, external, protections against flash flooding, which would stop the majority of water entering the tomb in a single event. If some water did enter, it would not be enough to damage the painted corridors before the shaft, which would then catch this water to ensure it did not reach the burial chamber in the lowest part of the tomb. A few New Kingdom tombs outside of the Valley of the Kings also have a well shaft—TT 358 (Queen Ahmose-Meryetamun: Aston 2015: 20), and AN-B in Dra Abu el-Naga (Carter 1916: pl. 20). While the New Kingdom well shafts are well known, there are Old Kingdom tombs with a similar feature. In the West Saqqara cemetery, many late 6th Dynasty burial shafts go further down than the actual burial chamber, creating a trap to hold damaging floodwaters (Kuraszkiewicz 2016: 31). This practice can perhaps be linked to the wet phase at the end of the Old Kingdom (see §2.1.4). Unlike in royal tombs, the shaft fill in these tombs was not watertight, which is clear from many trap-less tombs where the burial chamber is covered in mud (Kuraszkiewicz 2011: 533).

Overall, the Egyptians were remarkably successful in preventing direct floodwater ingress into a properly sealed royal tomb. Tutankhamun's intact tomb (KV 62) was adapted from a tomb dug straight into the valley floor where multiple streams merge, and would naturally have been at high risk, but the burial has no evidence of flash flood ingress, having been protected by layers of soil and debris that had accumulated on top of its entrance from repeated floods and winds (Cross 2008: 307; Dorn 2019: 98). Most direct flood damage arguably occurred after the royal tombs were reopened, their passages were unsealed, and the topography outside had changed (Dorn 2016: 33). While properly sealed tombs could still be damaged by water percolating through rock joints above tombs (Curtis 1979: 25), it is unlikely the Egyptians were aware of this risk, and their primary goal was mitigating direct floodwater ingress. Flood damage, however, is now a major threat to the Valley of the Kings' tombs (Weeks and Hetherington 2014: 41–47; Jones 2016: 545), and in other royal wadi

necropolises at the Valley of the Queens (Demas and Agnew 2012a: 13), Amarna (Zaid *et al.* 2013: 865), and Hierakonpolis (Friedman 2013: 3).

4.4 Conclusion

This chapter has analysed the types of weather mitigation or utilisation, drawing on a (non-comprehensive) range of examples. Overall, attestations span the length and breadth of ancient Egyptian territory, and for the majority of its history, although their distribution is uneven. These include a variety of archaeological sources, including houses, temples, towns, and tombs, as well as representational sources, such as soul-houses and tomb decoration. Based on this evidence, the following section provides some observations and conclusions on ancient Egyptian interaction with their weather.

Firstly, the diachronic perspective. Most architectural features related to rain mitigation can be traced back to the Old Kingdom. Some features are known only from the Middle Kingdom onwards (e.g. fillet stones), although these may well have been in use earlier and have not survived. It appears that the lion-shaped waterspout was first developed in the 5th Dynasty, as all surviving 4th Dynasty waterspouts are plain. However, plain waterspouts continued to be used occasionally, so this was not a straightforward evolution. Whether ground drains and waterspouts were first developed in the sacred or secular spheres is unclear—either sacred architecture could have made ever-lasting versions of what was used in domestic architecture, or domestic buildings could have imitated sacred architecture. Overall, rain drainage remained consistent, but not static; there were modifications and adjustments. Some historians have argued that the complex drainage systems of the Old Kingdom were the direct result of a wetter climate (see §3.1.4), and that the usage of drainage in later contexts represents fossilisation and not actual need. However, later simplification need not imply less necessity, just that methods had been streamlined, or that priorities had shifted, and there are examples of later complex systems that responded to a specific need. The hypothesis that rain drainage was less needed after the Old Kingdom is not supported by the presence of new innovations in drainage in later periods, such as carved gutters in the roof at Seti I's temples, and the double pools at Zawiyet Umm el-Rakham built by Ramesses II. Why would these be developed if drainage systems were no longer needed? Furthermore, later systems were still entirely functional and had not become simply 'dummy' objects or iconic representations. The Old Kingdom was most probably wetter, but rain still happened in later periods, and could well have been more destructive because there were less rain events overall.

Surviving evidence allows less analysis of how wind engagement changed over time. The earliest evidence of wind-catchers comes from the Middle Kingdom, and they do not appear to change in the New Kingdom, but the limited data makes this uncertain.

Geographically, many more drainage systems have been found in Upper and Middle Egypt than Lower Egypt, but this is at least partly due to preservation bias. Probably a large number in Lower Egypt have not survived or been documented, given the more regular and dependable rainfall there, and some of the most elaborate and unique drainage systems attested come from Lower Egypt. Even so, accurate regional distinctions in terms of rain mitigation are not easily discerned. One of the few conclusions is that Middle Egypt dominates in the Old and Middle Kingdoms, while Upper Egypt has a greater proportion of rain mitigation features in the New Kingdom. Weather mitigation was also part of the complex social system of status markers and decorum. The models of the high steward Meketre display his plain waterspouts as part of a house with a garden that was connected with wealth and status, and lion-spouts were only used in temples. However, other types of waterspouts might have been available to the lower classes as well, but there is no conclusive evidence. House orientation was part of architectural engagement with weather and this was also an embodiment of status. Town plans suggest that the elite had more freedom in decisions about house architecture. In some cases their houses were focal points around which other houses were built (e.g. Amarna: Kemp 2012: 163–68), or were simply the first houses constructed (as at Lahun: Moeller 2017: 184). They were able to orient their house to a favoured direction, often the north, while the non-elite Egyptians presumably had to make do with the space available to them, which sometimes meant opening their house towards unfavoured winds. Gardens within elite house complexes would also have protected against strong winds, sand, and high temperatures.

There are still some aspects of everyday life affected by weather that have not been discussed at length in this chapter. The wind was incredibly important for travelling the Nile; life would have been much different had there been no consistent northerly wind to push boats upstream (see Graham 2005). The Egyptians frequently orientated their furnaces to match local wind conditions, to let the prevailing winds strengthen the fire (e.g. at Wadi Dara: Castel *et al.* 1995: 17; Bir Nasb: Tallet *et al.* 2011: 81; Amarna: Jeffreys *et al.* 1995: 9; and Medinet Gurob: Hodgkinson 2012: 13). Wind was also crucial in the process of winnowing grain. Harvested and threshed grain would be thrown into the air with winnowing fans, and the lighter husk (or chaff) would be separated from the heavier kernel by the wind (Murray 2000: 525). This fundamental activity is well attested in tomb iconography from all



Figure 18: Winnowing in the tomb of Nakht (TT 52). Detail from painting by Norman de Garis Davies, MMA 15.5.19b. Creative Commons Zero, available at https://www.metmuseum.org/art/collection/search/548438. Rogers Fund, The Metropolitan Museum of Art, New York.

periods (e.g. the 6th Dynasty mastaba of Mehu, Saqqara: Altenmüller 1998a: pl. 22a; the 12th Dynasty tomb chapel of Senbi, Meir: Blackman 1914: pl. 4; and the 18th Dynasty tomb of Nakht [TT 52]: fig. 18); it is also evidenced in the tools that have survived (e.g. Berlin ÄM 12478). Not all interactions were positive: wind-blown sand could clog up irrigation canals (e.g. Misuriello 2013: 45) and bury buildings (e.g. Zivie-Coche 2002: 19), and this required frequent maintenance to prevent problems.

In such ways the Egyptian taskscape was filled with weather interactions in both actions of daily life and religious practice. Lion-spouts were a practical response to a real threat, but they had constructed religious and social significance as well. However, it is notable that despite their significance, lion-spouts are not depicted in images of temples. On the other hand, wind-catchers and plain waterspouts could be depicted on domestic buildings, perhaps because they represented the comfort of the homeowner, and thus contributed to the status the homeowner was projecting. The depiction of temple buildings, and what specific aspects could be shown, was probably more restricted due to issues of decorum. Therefore, lion-spouts were apparently not part of the allowable design repertoire for temple depictions.

Beyond the representational evidence, it is clear that engagement with weather pervaded many material aspects of life—at home, at work, within sacred spaces, and in death—for a broad spectrum of ancient Egyptians. While the specific types of engagement varied with

social class, wealth, and cultural decorum, everyone existed and moved through that weatherworld, even the gods and deceased.

5 Textual Evidence for Weather Engagement

Textual sources are a crucial part of how one can reconstruct the ancient Egyptian weatherworld, as language is an expression of individual and cultural perceptions as influenced by landscape and the meanings placed upon it. However, these sources overwhelmingly favour the elite perspective, a group of people who lived in relative comfort with greater control over their environment (e.g. Maitland 2021: 270). This chapter analyses the corpus of texts that use the weather to create narrative, enforce cultural norms, serve religious belief and royal ideology, explain complex ideas, or simply describe experienced events. Weather events are rarely the topic of a text, but are frequently used in imagery to metaphorically articulate the nature of things—such as emotion (*The Teaching of Ptahhotep*: §5.2.12.2), death (*Dialogue of a Man and his Ba*: §5.1.1.8, §5.1.3.2.1.4), *ma'at* (*The Eloquent Peasant*: §5.1.4.3), divinity (*The Shipwrecked Sailor*: §5.2.11.2) and the king (*Hymns to Senwosret III*: §5.1.7.2, §5.2.12.2) in Middle Egyptian poetry alone. Experience of weather was a fundamental part of how authors applied these words. Each word is explored individually, outlining their specific meanings and uses; this is done mostly diachronically, as, apart from a few exceptions, these words are not very common.

These words are grouped into two sections, those with the sail-determinative, and those with the rain-determinative. According to cognitive linguistic studies of Ancient Egyptian, the superordinate category of conceptual hierarchies is indicated by determinatives (or classifiers: e.g. Goldwasser 2002: 14; Lincke and Kammerzell 2012: 86). The determinative is a category, but also a visualisation of the attributes that are present in the words that use it (McDonald 2002: 32). The discussion on each word begins with its contexts of usage, orthography, and etymology, before piecing together its descriptive qualities and how those feed into figurative uses and conceptualisations of the weather feature described. Issues of polysemy are also considered. This chapter provides a lexicography of weather-related words; such subject-lexicographies (e.g. Gerhards 2021) are vital for expanding our understanding of Egyptian culture (see e.g. Warburton 2011: 312–13; Stauder-Porchet 2020: 903). It includes only words that typically use the sail- and rain-determinatives, and represent dynamic weather phenomena, and so excludes temperature and sunlight (see Eriksen *et al.* 2012: 391). However, because of the nature of Egyptian scripts, these words frequently involve other determinatives that are reflective of different aspects emphasised in each context (McDonald 2002: 32).

At the start of each section, two number counts are given: the total number of times the word is attested in the collected corpus; and the number of times the word is attested in distinct texts (for example, a word with five total attestations would only have four distinct attestations when two of the total were different witnesses for the same Book of the Dead spell).

Throughout this chapter, textual examples are transliterated and translated, but the weather words themselves are only given in their transliterated form in the translation, so that their meaning can be discussed without the constraints of a prescribed translation. Unless specified, all translations are my own.

5.1 The Sail-Determinative

 (Gardiner sign P5) is, as suggested by its form of a full sail, the determinative for all phenomena relating to air, including both atmospheric and human-produced air, including both nouns and verbs. The sail would have been the clearest image to represent the concept of air, since sailing was a crucial part of life on the Nile (e.g. Jones 1995: 1–3), and so the implications of a full sail would be immediately accessible to all. The image of the sail represents the thing it holds within, much as how the oil jar ( , Gardiner sign W1) was used to represent the oil it holds within it (for metonymic relationships in determinatives, see Goldwasser 2006: 24). The apparent iconic meaning of P5 as a determinative for ‘sail’-words is only attested in sources that date from well after the first attestations of P5 for ‘air’ (Lincke and Kammerzell 2012: 73).

Before being codified in script, images of similar sails are identifiable in Predynastic painted D-ware as individual elements (e.g. Yale 1937.159: Scott III 1986: no. 11). Visual art could depict smoke in images because it was more visible than wind, notably in temple reliefs of offerings, where sets of wavy lines extended upwards from the incense burners (e.g. at Medinet Habu: Epigraphic Survey 1934: pl. 173). An ostracon from the Georg Steindorff Egyptian Museum (Inv. 1894) shows a figure blowing air into an oven’s base, and wavy lines represent either her breath or smoke from the fire (Pomerantseva 2002: 985, fig. 2). However, this type of representation was never utilised in the hieroglyphic script for air.

Because of similarities in shape, the sail-determinative can be replaced by the papyrus bundle ( , Gardiner sign M13), papyrus plant (, M15), spindle (, Aa27), or a different mast (, P6), particularly in Ramessid texts.

In the case of the words *ṯzw* (§5.1.1) and *nfy* (§5.1.2), the sail is an ideogram; in some circumstances where no phonograms are given, it is impossible to determine whether *nfy* or *ṯzw* was meant. Following previous scholarship (e.g. Assmann 1983b: 188; Quack 1992: 79; Brovarski 2001: 117; Kubisch 2008: 208), I read the sail as *ṯzw* in such ambiguous cases, since that is the more common word.

Lexemes that use  as a classifier first appeared in the Old Kingdom, and remain in use throughout pharaonic Egypt. Several of these words survived in Coptic.

5.1.1 ṯzw

The basic meaning of  , *ṯzw* has previously been defined as 'wind', 'air', and 'breath' in major dictionaries (e.g. *Wb*. V, 350.12–352.29; Faulkner 2009 [1962]: 303; von Deines and Westendorf 1962: 964–65; Wilson 1997: 1157; Hannig 2003: 1442; Hannig 2006: 2718–23), and similarly in Coptic (Černý 1976: 198). 'Life-force' is also occasionally used by translators (e.g. Lucarelli 2006: 114). In their study on the root lexicon of Egyptian, Satzinger and Stefanović (2021: 448) placed *ṯzw* under the same lexical root as *ṯzw* 'boatman', and *ṯzwt* 'sail', indicating strong links with boat travel (§5.1.1.6).

The four translations of *ṯzw* have arguably shaped and limited our understanding of the term: *ṯzw* is a polysemous word in Egyptian, which does not map directly onto the English words 'wind', 'air', or 'breath'. So when translators choose a particular interpretation for a particular context, this strategy inevitably obscures the fact that *ṯzw* is not a one-to-one equivalent to any of these English words. This is, of course, true with many Egyptian words (see Nyord 2012: 142), and necessary for all translation (Warburton 2011: 304), but it is noteworthy here because Egyptian is rare in this specific co-lexification, compared to other languages. According to the CLICS^3 database of co-lexifications (Rzymski *et al.* 2019), the concepts of 'wind' and 'air' are often rolled into a single word throughout modern world languages, but combining either with 'breath' is much more unusual. Ancient Greek's πνεῦμα (*pneuma*) had this triplet of meanings, and additionally 'soul', but the concept of 'breath' was only identified as *pneuma* by 5th–4th century BCE philosophers and physicians later in that language's history, and eventually 'breath' and 'soul' would became the dominant concepts (Frixione 2013: 512–13). In Egyptian the various aspects were encompassed by *ṯzw* since the earliest surviving texts, and all were used throughout history.

Why does *ṯzw* encompass multiple meanings that could be considered disparate ideas to (for example) English-speakers? The basic concept behind *ṯzw* seems to be any type of moving air, which thus includes atmospheric movements (wind), air moving in and out of the

mortal or divine body (such as breath), and moving air from other sources (such as from incense, fire, fans). Egyptian texts play on these multiple meanings, such as in a New Kingdom funerary text, where parts of the body are identified with deities and the landscape:

> *iw fnd=k m ḫnmw* [*ṯ3w m*] *šrwt=k mi ṯ3w m pt*
>
> Your nose is provided with fragrance, and [the *ṯ3w* in] your nostrils is like the *ṯ3w* in the sky.
>
> (Book of the Dead spell 172, P. Nebseny, l. 14: Lapp 2004: pl. 98)

This spell shows the active conceptual link between atmospheric *ṯ3w* and bodily *ṯ3w*, and the reference to 'fragrance' calls to mind wafts of incense, which could be a type of *ṯ3w* (see §5.1.1.6). The following discussion considers all aspects of *ṯ3w*, and how they come together in a single word.

5.1.1.1 *Contexts*

ṯ3w is by far the best attested weather word of ancient Egypt; of the entire corpus, around half of the attestations are for *ṯ3w* (~2500). Excluding examples of the basic offering formula, about 850 of these are distinct attestations. The first securely dated attestation of *ṯ3w* comes from the latter half of the 5th Dynasty, in captions for boat scenes in non-royal mastabas (e.g. the mastaba of Kaipure: PM III.1^2, 455). This makes *ṯ3w* the oldest attested weather word in Egyptian. *ṯ3w* was used in the Pyramid Texts (e.g. spell 510: *Pyr*. 1140c), and afterwards features in all major works of mortuary literature for the rest of pharaonic history (e.g. Coffin Text spell 225: *CT* III, 244–45a; Book of the Dead spell 149: Lüscher 2010: 26d; Book of Gates, 5th gate: Hornung 1979a: 171; the 8th Hour of *Amduat*: Hornung 1992b: 603; *Book of Overthrowing Apep*, 30.3–4: Faulkner 1933: 76; *Book of Traversing Eternity*, 2: Smith 2009: 434–35). By the First Intermediate Period, *ṯ3w* was used in funerary wishes, and this became its most dominant function in the surviving texts. In the first copies of narrative and didactic literary texts in the mid-12th Dynasty, *ṯ3w* is present, and the term is also found in medical papyri and autobiographical narratives. *ṯ3w* appears in hymns of the Middle Kingdom, and is even more popular in this context later, during the New Kingdom. In fact, there was an explosion of *ṯ3w* into many textual genres during the New Kingdom, although this may be a reflection of the greater number of surviving sources from this period (Björkman 1964: 12). In any case, *ṯ3w* then appears in both literal and metaphorical contexts, throughout administrative documents, medical advice, funerary wishes, and poetry, as well as literary and monumental narratives. Arguably, *ṯ3w* developed several important functions in the religious and funerary spheres that lead to its high use rate.

5.1.1.2 Orthography

Initially, the full spelling of *ṯzw* includes the phonetic complements in front of the sail (i.e. ), as found in 5th Dynasty tomb captions, and then in the Pyramid Texts (e.g. those of Teti, see in spells 254 [*Pyr*. 291b], 258 [*Pyr*. 309b]). However, contemporaneous with this, an abbreviated orthography,  , became increasingly frequent, especially in non-royal texts; the sail even started to be used as a lone logogram without any phonetic complements, as in the mastaba of Ty (Steindorff 1913: pl. 80). In some copies of the Pyramid Texts, both spellings were used interchangeably (e.g. in those of Pepi I: compare PT spells 261 [*Pyr*. 324c] and 463 [*Pyr*. 877a]). After the Old Kingdom, when orthography became more standardised (Loprieno 1995: 20–21), there are only a few scattered instances of the spelling with  , as in Coffin Text spell 288 of P. Gardiner III (*CT* IV, 40c; though this papyrus may date from the late Old Kingdom, see Gestermann 2003: 206), Coffin Text spell 397 on a coffin from Saqqara (*CT* V, 92a [Sq1Sq/Sq2Sq]; for dating, see Willems 1988: 106), a dedication inscription of Thutmose III at Medinet Habu (l. 7: el-Adly 1981: 124), and a colossus of Ramesses II at Luxor (Statue D: K*RI* II, 186.11). The latter two are probably due to deliberate archaism, and the first two could be due to the scribe copying from earlier versions; Coffin Text spell 288 is a version of Pyramid Text spell 261 (see Faulkner 1973: 216). There is no semantic difference between the two types of orthography. From the Middle Kingdom onwards, plural strokes (and , more common in the New Kingdom) are added to *ṯzw*, and this probably either marks it as a collective noun or reinforces the *w*-phoneme; when it is occasionally pluralised, a further *w*-chick or plural strokes are added, as in Coffin Text spell 162 (*CT* II, 389b). Starting from the Middle Kingdom, the plural strokes of *ṯzw* are also visible in other words that use the sail-determinative, since scribes would include the inactive plural strokes, as though just adding the word *ṯzw* to the end of the descriptor (e.g. *mḥyt*, §5.1.3; see similar process with *niwt* and the city-determinative: Parkinson 2012: 36). *ṯzw* had become the determinative, indicating the centrality of *ṯzw* to the Egyptian conception of winds.

In Demotic, only the shortened spelling is used (Erichsen 1954: 669–70), and *ṯzw* survived into Coptic as ⲧⲏⲩ or ⲑⲏⲟⲩ (Černý 1976: 198; Vycichl 1983: 223).

5.1.1.3 *Creation*

According to post-Old Kingdom sources, the gods created *ṯzw*, like many aspects of the world. Generally, *ṯzw* was said to have been brought into existence by a number of creator

gods (e.g. Atum, Khnum, Ptah, Re), before the creation of heaven and earth, and often through the formation of Shu, the personification of air, light, and life (Bickel 1994: 130–36; Assmann 2006: 173). For instance, *The Teaching for King Merikare* (probably New Kingdom, see Bickel 1994: 219; Stauder 2013: 510), eulogises an un-named solar god in the act of creation:

ir.n=f pt tȝ n ib=sn … ir.n=f ṯȝw n ib ᶜnḫ fndw=sn

For their sake he created heaven and earth … he created the *ṯȝw* for (their) sake, so that their noses may live.

(*Merikare*, E 130–32: Quack 1992: 195–96)

A similar statement is found in Coffin Text spell 1130 (*CT* VII, 462d–63b), where the god is named as 'the one whose names are secret' (461c), probably Re (see *LGG* VII, 134). *ṯȝw* was conceived as a crucial element of the ordered world that the creator god fashioned after his own emergence, in order to benefit humankind (Hornung 1996 [1971]: 199; Bickel 1994: 83).

In some New Kingdom texts, *ṯȝw* is made by either the sky or its personification, Nut. In his funerary stela, Horemheb wishes for 'the *ṯȝw* that is created/birthed (*ms*) by the sky (*pt*)' (BM EA 551, l. 22: Martin 1989: pl. 21). This aspect of the sky providing *ṯȝw* for the deceased also appears in an 18th Dynasty hymn to Osiris:

mss pt ṯȝw r fnd=f r ḥtp{w} ib=f

It is in order to satisfy his (Osiris') heart that the sky gives birth to the *ṯȝw* for his nose.

(Louvre C 286, l. 4: Moret 1931: pl. 1)

The sky can provide *ṯȝw* for Osiris, or someone identified with him. The choice of the verb *msi* in these texts suggests a link with Nut, who perpetually gives birth to the sun. Nut, as a sycamore tree, was also one of the gods who can give *ṯȝw* to the deceased, as in Book of the Dead spell 59 (e.g. P. Nakhtamun: Munro 1997: pl. 17; for Nut as a life-giving goddess, see Billing 2002: 233). However, this was not the same as the creator gods bringing *ṯȝw* into existence at the beginning of creation; what comes from the womb was both already formed and reborn in the daily cycle (Billing 2002: 33–37; Wiebach-Koepke 2007: 26). So what the sky enacts was arguably not the creation, but the regeneration and then the manifestation of *ṯȝw*.

Once *ṯȝw* existed, where did the Egyptians conceptualise its point of departure? It could come from many locations: the horizon (e.g. P. Turin CGT 54050, l. 9: Pleyte and Rossi 1869: pl. 119; Berlin ÄM 2074, l. 10: Roeder 1913: 124), the *pt*-sky (see above; e.g. tomb of Nefersekheru [TT 296]: Feucht 1985: 44), and Nun (e.g. tomb of Amenhotep Huy [TT 40],

ceiling band C: Davies and Gardiner 1926: pl. 38). However, these are all from religious contexts, and most are specifically funerary. One early conception was that *ṯzw* emerged from underground, like the inundation (see van der Plas 1986: 178–79), as it is referenced in the name of a cavern in the Pyramid Texts:

> *ḏd-mdw in tpḥt=k tw nw <n> wsḫt wsir ppi pn int ṯzw sʒqḥ=s mḥwt wṯz ṯw m wsir ppi pn*
>
> Recitation. This your cavern—this broadhall of Osiris, O Pepi, that fetches the *ṯzw*—is the one which will strengthen the north wind and will bear you up as Osiris, O Pepi.
>
> (Spell 581: *Pyr*. 1551a–c [P])

However, by the New Kingdom this idea seems to have been superseded in favour of an origin in the horizon, which is often found in prayers to the sun god (as in P. Turin CT 54050, rt. 3.4: Roccati 2011: 24), or in funerary contexts, where the deceased expresses their desire to breathe that *ṯzw* (see below, §5.1.1.11), such as in Stela Avignon A1 (l. 9: Moret 1910: pl. 4). This horizonal origin for *ṯzw* remained the dominant conceptualisation throughout the rest of pharaonic history (Barta 1968: 237).

After creation, *ṯzw* could be set in motion by objects moving quickly through it (e.g. a throwstick: Coffin Text spell 62: *CT* I, 269h–i), or by wings. Isis' kite form was said to have 'created *ṯzw* with her wings' for the deceased Osiris (18th Dynasty stela Louvre C 286, l. 15), while a being of the *Amduat* 'lives by the *ṯzw* of his wings' (4th Hour, upper register: Hornung 1992b: 359). Funerary scenes show goddesses flapping their wings towards the deceased to give them *ṯzw* (Hornung 1996 [1971]: 199; see §5.1.1.11).

ṯzw was closely associated with the divine world. Seth is attested once as the 'lord of *ṯzw*' (*nb ṯzw*) in the Middle Kingdom (Coffin Text spell 630: *CT* VI, 252g; *LGG* III, 783), and in the New Kingdom onwards Amun(-Re) is attested as the 'lord of *ṯzw*' (see also the epithets *nb ṯzw n ꜥnḫ* and *nb ṯzw nḏm*: *LGG* III, 783–84). Other gods are frequently attested as controlling *ṯzw* in some manner. The 19th Dynasty official Kyky narrates his search for a patron deity in his tomb:

> *gm.n=f mwt m-ḫʒt nṯrw šzy rnnt m-ᶜ=sw ᶜḥᶜ(w) n ᶜnḫ ṯzw r-ḫt=s ḫprwt nb(t) ḥr wḏ=sw*
>
> He found Mut ahead of the (other) gods; Shay and Renenet are in her hand, the span of life and *ṯzw* are under her authority, everything that occurs is because of her control.
>
> (TT 409, text A, l. 5–6: K*RI* III, 336.8–9)

Control over *ṯzw* is most commonly expressed when the gods or the king gave *ṯzw* to the living or the deceased as a metaphoric proxy for 'life'. This is well known in funerary wishes from the Middle Kingdom onwards (see §5.1.1.11), but already in the 6th Dynasty there are examples of the gods giving *ṯzw*, though they are not explicitly asked for it, as in the mastaba of Mehu (scene 19.4: Altenmüller 1998a: 117). Some New Kingdom funerary wishes ask Atum (or rarely Osiris) that the supplicant may breathe (*sn*) 'the sweet *ṯzw* that is in your nose' (Book of the Dead spell 56: Lüscher 2019: 53a–b), which suggests that *ṯzw* could even be conceptualised specifically as the divine exhale. It is possible that this concept is only relevant in texts where the deceased desires to breathe divine *ṯzw* in order to live in the afterlife and which emphasise their intimate connection to the gods through the polysemy of *sn* 'to breathe/smell/kiss' (Price 2022: 79). However, there are some suggestions to the contrary. In the Coffin Texts, Shu, as the personification of *ṯzw* (e.g. Bickel 1994: 169; Hlouchová 2019: 243), is described on a cosmic scale at the moment of creation:

inm=i pw mḏdw ṯzww pr ḥr-sz=i m r n tm

The force of the *ṯzw*s which go forth after me (Shu) from the mouth of Atum are my skin.

(Coffin Text spell 80: *CT* II, 30c–d; translation after Smith 2002: 58)

Shu, the god who personifies the space between land and the heavens, invisible but omnipresent (Assmann 2006: 171), is here described as having skin (or 'aspect': Vernus 1979: 109; Bickel 1994: 81) made from the divine exhale of Atum. While Faulkner (1977: 83) takes this sentence differently as 'my pleasant colour is due to the *ṯzw*', both translations support the idea that the divine exhale was also atmospheric air and wind, as personified in Shu, and not merely a breath that transferred directly from the god's nose or mouth to the supplicant (see §5.1.1.9 for the distinction between the nose and mouth in breathing). This global aspect of the divine exhale is also seen in a 20th Dynasty hymn to Amun-Re-Horakhty:

ṯzw n fndw(=f) r r-ᶜ šnw ᶜrf n=f nz tz(w) r-ḏr

The *ṯzw* of (his) nose (reaches) to the end of the Encircler—the land(s) are entirely encircled for him.

(O. DeM 1038, rt. 8–9: Posener 1938: pl. 21)

The god's breath covers the entire land, reaching all his followers, a description that would equate divine breath with atmospheric air. As discussed by Assmann (2006: 168–73), the sun god gives *ṯzw* and light through Shu, and these form the fundamental elements of life.

When deceased individuals ritually identify themselves with the gods, they likewise gain control over *ṯzw*. Along with many other statements of his divinity, the deceased declares in the Coffin Texts:

iw mzᶜ=i ṯzww n nb itn

I guide the *ṯzws* for the lord of the sun disk.

(Spell 820: *CT* VII, 21l)

Later, this claim of controlling *ṯzw* is paralleled in spell 38A in the Book of the Dead, 'I give written commands to these winds (*wḏ=i sšw 4 ṯzw ipn*)' (Lüscher 2019: 20d–23a). The sun god, in all his forms, is particularly well attested for his control of *ṯzw*. For instance, in a self-identification passage of a Ramessid hymnic spell addressed to Horus (Beck 2019: 18), the sun god's authority is articulated as the following:

pt m ḫfᶜt=i tz m zmt(*=i*) *ddy*[*=i*] *ṯzw r mryw=i ink rᶜ m izbtt n pt*

The sky is in my fist, the earth in (my) grasp. It is according to what I desire that [I] give the *ṯzw*. I am Re in the east of heaven.

(P. Leiden I 347, rt. 8.1: Beck 2023: pl. 8a)

The solar gods' control over *ṯzw* has two rationalisations: firstly, as creator gods, they created the cosmos, including *ṯzw*, and so have a degree of ongoing association, which was shared with other creator gods (e.g. Ptah in P. Harris I, 44.5–6: Grandet 1994: 285; Khnum in the Dedication of Ramesses II, l. 41: K*RI* II, 326.13); and secondly, the solar barque is a ship that relies on wind for at least part of the journey (see *mzᶜw*, §5.1.4).

Not only did the gods have the ability to control *ṯzw*, they could manifest themselves as *ṯzw*. *ṯzw* was the *ba* of Shu in a wide range of sources: this is implied in Coffin Text spell 80 (*CT* II, 29h–30c); in the *Book of the Heavenly Cow* of Ramesses V (KV 9: Hornung 1982: 26); and in Late Period temple inscriptions at Hibis (Klotz 2006: 29). Other gods could take *ṯzw* as their form, as in a 19th Dynasty hymn to Amun from the Theban tomb of Tjay (TT 23), where the speaker says that 'you have taken your form (*ḫprw*) as *ṯzw* in order to give it to the nose' (l. 7: K*RI* VII, 224.3). Harmful deities could also manifest as *ṯzw* (e.g. P. Salt 825, 8.4: Derchain 1965: 140), though this was less commonly expressed.

From the New Kingdom onwards, *ṯzw* can also go before the gods, announcing their presence, as found in the 19th Dynasty stela of Neferabu:

iw=i ḥr ᶜš n tzy=i ḥmt gm(*=i*) *st iy.ti n=i m ṯzw nḏm*

I was calling my lady (Meretseger), and (I) found her coming to me as/in a sweet *ṯzw*.

(Turin no. 1593, l. 11–12: K*RI* III, 773.4–5)

In this use, the air is always ‘sweet’ (e.g. Berlin 20377, l. 12: K*RI* III, 654.11–12; Cairo CG 42121: *Urk*. IV, 1020.1), and it is possible that this link with sweetness developed from the distinctive smell of incense smoke burning in religious rituals. Incense itself could be conceived of as divine essence (Wise 2009: 69). One example of *ṯ3w* announcing the divine presence is in a famine prayer to Amun from the Late Egyptian miscellanies:

gm(*w*) *imn iw m ḥtp p3 ṯ3w nḏm r-ḫ3t=f*

May Amun be found returning in peace, with the sweet *ṯ3w* before him.

(P. Anastasi IV, rt. 10.3–4: *LEM* 45.9–10)

Such *ṯ3w* is only mentioned in situations where the god was in a benevolent mood, and was actively aiding the petitioner (Assmann 1994: 15; see also Berlin ÄM 2074, l. 10: *Urk*. IV, 1519.8).

In later periods, weather could be used as a divinatory tool by priests (von Lieven 2021: 183), and there is one earlier example before the Graeco-Roman Period of *ṯ3w* being read as an oracle, on the ‘Israel Stela’ of Merenptah:

nts in=s pḥwy n ḫftiw=s ḫr=w m n3 s3w n n3y=sn sb3w rḫyw r(*w*)*=sn nbw m nw r ṯ3w*

“It is she (Egypt) who shall bring an end to her foes”, so say they who gaze at their stars, those who know all their utterance(s), while looking at the *ṯ3w*.

(Cairo JE 31408, l. 13: K*RI* IV, 16.2–4)

In general, oracles were intermediaries to, or direct manifestations of, the gods, to enable divine legitimacy for decisions (e.g. Baines 1987: 88–89). A god could control or manifest as *ṯ3w*, so the actions of *ṯ3w* could represent divine will. It is unknown whether *ṯ3w* was used as a divinatory tool in earlier periods, but the inherently divine nature of *ṯ3w* suggests this possibility.

5.1.1.4 *ṯ3w and the sky*

At a cosmological level, *ṯ3w* was presented as existing in multiple spaces: between the land (*t3*) and the sky (*pt* or *ḥrt* typically), or within the sky. In the Book of the Dead, the deceased as Shu ‘drags the *ṯ3w* to the limits of the sky, to the limits of the earth’ (spell 55, P. Nu, l. 2: Lapp 1997: pl. 34), touching all of creation. Similarly, Akhenaten’s borders are said to extend south as far as the *ṯ3w* goes (an implied *mḥyt*, §5.1.3.2.1), and as far north as the Aten’s light illuminates, as in a hymn to the rising Aten from the tomb of Ahmose (l. 8: Davies 1908: 31, pl. 29; for *ṯ3w* and the cardinal winds, see §6.3). Here, the realm of *ma’at* that the king

maintains is filled with wind and sunlight. A 22nd Dynasty solar hymn locates *ṯ3w* more explicitly while praising the god:

ntk pt ntk t3 ntk ṯ3ww mw imywt=sn

You are the sky, you are the earth, you are the *ṯ3w*s and the water between them.

(P. Berlin P3056, 3.4–5: Möller 1905: pl. 29)

This later document may well have been copied from an earlier text, as its copyist claims (Knigge 2006: 179–80), and it articulates how *ṯ3w* was intrinsic to the Egyptian conceptualisation of their landscape, being a medium between the two boundaries of earth and sky that touched everything.

The ubiquity of *ṯ3w* is a core characteristic mobilised in the texts. Just as there is *ṯ3w* all around and will always be there, so too will the deceased be able to breathe in the afterlife:

[*srf imi r=k*] *pr m ms3dty stš ḥtm ṯ3ww nw pt ḥtm srf imi r=k*

[The warmth which is on your mouth is] that which issued from the nostrils of Seth, and the *ṯ3w*s of the sky will be destroyed if the warmth which is on your mouth is destroyed.

(Coffin Text spell 519: *CT* VI, 108i–l)

This spell ensures the protection of the deceased by identifying their breath with Seth's (Zandee 1960: 71; 1963: 145). The 'Installation of the Vizier' in the tomb of Rekhmire (TT 100) employs this concept of ubiquitous *ṯ3w* (and water) to express the idea that the vizier's actions should be just:

mk ir sr sḏm <m> wn-ḫr smi mw ṯ3w n irwt=f nbt mk ḫr n ḫm irywt=f is p[*w*]

Now, as for an official who judges <in> public, water and *ṯ3w* will make report of all that he does; look, there is no one who is ignorant of what he has done.

(l. 5–6: Davies 1943: pl. 116)

The implication is that *ṯ3w* and water are everywhere, and furthermore are mediums that can carry news of a person's wrongdoing.

However, while *ṯ3w* could be referred to as being 'below' *pt* (e.g. P. Berlin P3056, see above), *ṯ3w* was more often described as something that happens within *pt*, as in the tomb of Ankhtifi at el-Moalla, where the official describes his tomb's great entrance:

ir.n(*=i*) *ꜥ3 r q3w n pt h3wt pw ṯ3w iw* {*ꜥ3t*}<*ḫt*>*=f m pt iw=s gp.t*(*i*) *m sb3wt*

(I) made the door to the height of the sky: the ceiling (i.e. lintel) is *ṯ3w*. Its underside (lit. belly) is as the sky and it is covered with stars.

(Column 11, l. 2–3: Vandier 1950: pl. 20)

Ankhtifi describes his doorway as a reflection of the Egyptian cosmos, with the lintel above seemingly referencing the night sky, by describing the stars on its underside (this lintel does not survive). At this time, the word *hꜣwt* referred to a ceiling, but that word was probably also etymologically related to *hyt*, 'sky' (Spencer 1981: 158). The similar writings and probably similar pronunciations create wordplay within Ankhtifi's metaphor. A later presentation of *ṯꜣw* as within *pt* occurs in a passage from the *Amduat*:

ntsn irr ḫprt m pt m ṯꜣw m ḥtpw m ḏ^{c} m ḥ(wy)t

They are the ones who cause what happens in the sky, as *ṯꜣw*, as calmness, as a *ḏ^{c}*-storm, and as *ḥwyt*-rain.

(12th Hour, Middle Register, 7th Scene: Hornung 1994: 830–31)

This passage also clearly places *ṯꜣw* within the realm of weather, putting it alongside *ḏ^{c}* (§5.1.7) and *ḥwyt* (§5.2.7).

When in the construction *pt m ṯꜣw*, *ṯꜣw* was usually aligned with windy weather. In one of the Late Egyptian miscellanies, a priest purifying himself in the river pays no attention to weather conditions:

bn sw ḥr stnw {r} prt r šmw tꜣ pt m ṯꜣw ḥr mw

He does not distinguish Peret from Shemu, nor whether the sky is in *ṯꜣw* and water.

(P. Anastasi II, rt. 7.7: *LEM* 17.2–3)

Or in more idiomatic terms, 'whether the sky is windy or rainy' (see also the 21st Dynasty letter to the coffin of Ikhtay, O. Louvre 698, l. 20: Frandsen 1992: 41). One verse in a contemporaneous Ramessid love song reads 'the sky will descend (*hꜣi*) with a *ṯꜣw*' (P. Chester Beatty I, vs. 16.12: Mathieu 1996b: 33), which suggests that this sort of *ṯꜣw* was conceived as travelling downwards from *pt*, although some other texts state that *ṯꜣw* 'comes forth' (*pri*) from *pt* (e.g. tomb of Djehutymose [TT 32], axial hall bandeau: Kákosy *et al.* 2004: 287).

5.1.1.5 *Sound*

ṯꜣw could have associated sounds, in many cases presumably conveying the sound caused by the wind's movement, or the air being disturbed by a fast-moving object. The earliest reference to this aspect of *ṯꜣw* occurs in the Coffin Texts, in spells only known from Deir el-Bersha:

qmȝ.n=k ᶜmᶜȝt=k r=s(t) ḫȝ pw ḫr(.w) ḥr ḫrw ṯȝw=s

You cast your throwstick at them (waterfowl), and this means that a thousand have fallen at the sound of its *ṯȝw*.

(Spell 62: *CT* I, 269h–i)

Here, the 'sound' of *ṯȝw* is created by the hurled throwstick traversing the air. A Ramessid mythologising spell against scorpion stings also mentions an atmospheric *ṯȝw* producing sound, where the primeval world is described as having

ḫrw ṯȝw nn ṯȝw im=f ḫrw mw n mst ḥᶜpy

a sound of *ṯȝw*, (but) there is no *ṯȝw* in it; a sound of water, (but) the Nile flood has not yet been born.

(P. Chester Beatty VII, rt. 6.7–8: Gardiner 1935: pl. 35)

The juxtaposition with the Nile floodwaters implies that the environmental quality of *ṯȝw* was being evoked; both air and water were essential components of the living world that came into being when the sun rose for the first time (e.g. Lüscher 2022: 122g; see §5.1.1.3). Until then, only a sound like *ṯȝw* or water could be perceived in the primeval emptiness.

The almost human-like sound that wind can produce was also noted by the Egyptians. 'Lady of *ṯȝw*' was the name of a cavern in the 8th Hour of the *Amduat*, from which a noise emanates 'like the sound of an utterance, great in its rage (*mi ḫrw n ḥw ᶜȝ nšn=f*)' (Hornung 1992b: 603; Manassa 2008: 123). This sound was from the *ba*s calling out to Re, but the descriptive name of the cavern draws on the association between *ṯȝw* and speech. A more positive expression of the same idea of vocal noise is found in a hymn in Tjanefer's tomb:

[*... ḥᶜ*]*py m tpḥt=f šmᶜt n=f ṯȝw nbt*

[… Ha]py from his cave, to whom all *ṯȝw* sing.

(TT 158, west wall of court, south half, 2nd register, above offering table: Seele 1959: pl. 4)

In this broken context, it is unclear whether *ṯȝw* is 'singing' to or for Hapy, or to another entity, but the verse apparently draws on the concept of *ṯȝw* having an associated noise.

ṯȝw is also described as *qȝ* 'high, loud' in a 6th Dynasty tomb caption, where a sailor calls out the order to turn to starboard and comments:

iw ᶜȝ fȝt sk ṯȝw qȝ

Great is sailing while the *ṯȝw* is high!

(Tomb of Pepiankhu [Meir no. A2], room B, south wall, lower register: Kanawati and Evans 2014a: pl. 31b)

A parallel for this phrase occurs in the Coffin Text spell 1071 (*CT* VII, 334a), which is currently found only on six coffins from Deir el-Bersha; this spell refers to a divine entity named *qꜣ ṯꜣww*, 'High of *ṯꜣw*s' (*LGG* VII, 171), who the deceased must pass on their journey to the afterlife. Loudness was a core semantic sphere of *qꜣ* (e.g. the epithet *qꜣ ḫrw*, 'the one with the loud voice', *LGG* VII, 167; see also Parkinson 2012: 55), however, it could also carry a sense of general greatness and strength. So when *qꜣ* was attached to *ṯꜣw*, it probably referenced the loud sound made by a strong wind. This collocation is rare, although *qꜣ* is also found with *mḥyt* (§5.1.3.2.1.2) and *ḏꜥ* (§5.1.7.1) in contexts that describe strong winds.

5.1.1.6 *Strength*

ṯꜣw is also described as fast-moving and strong: in the Dream Stela of Thutmose IV, *ṯꜣw* was associated with the verb *ḫꜣḫ*, 'to be quick' (*Wb*. III, 232.18–233.15):

> *snmwt=f ḫꜣḫ=sy r ṯꜣw*
> his horses, they were faster than *ṯꜣw*.
> (l. 5–6: *Urk*. IV, 1541.13)

This line implies that *ṯꜣw* could be something to which the speed of other objects could be compared: the king's horses were so fast that they even overtake the wind. Wind strength and speed tend to be equivalents in human perception, because a fast wind is felt as a greater force against the body (for a discussion on wind force vs speed and the human body, see Watson 2019 [1984]: 210–18). Ideas of strength and speed converge in *The Satirical Letter of Hori*, where Hori proposes that Amenemope ride a chariot:

> *nḥb=tw n=k ssmwt šꜣrš mi sꜣbw* [*d*]š[*rw*] *msḏr=f iw=*{*f*}<*s*> *mi ḏꜥ n ṯꜣw ḫf*(*t*) *pry=f*
> Horses have been harnessed for you, swift as a jackal whose ears are [r]e[d],
> and are like a *ḏꜥ*-storm of *ṯꜣw* when it comes forth.
> (P. Anastasi I, 18.5: Fischer-Elfert 1983: 123)

The horses, as quick as angry jackals (for this metaphoric use of *ḏšr* 'to be red', see Köhler 2011: 88), are said to travel like this type of *ṯꜣw*. The connotations of a *ḏꜥ n ṯꜣw* are examined in a later section (§5.1.7.2); the passage continues to imply that Hori does not believe Amenemope could control these horses: they are galloping at such a rate, and with such power, that only an experienced individual could guide them, which Amenemope is not.

An indication of *ṯꜣw*'s tangible presence was in its ability to carry physical objects. Most of the preserved attestations of this aspect occur in metaphors (see below), though there is one literal example from the tomb of Sennefer (A) in a winnowing scene:

imi n=s sp-sn nfrw wr sp-sn nꜣ n ṯꜣw [*ḥ*]*ꜣ*(*.w*) *nꜣ n n*[*pr*]*i ip.w*

Give (it) to her (Renenutet)! It is very perfect! These *ṯꜣw*s have [des]cended and the g[rai]n is counted.

(TT 96, longitudinal hall, south wall: Angenot 2007: fig. 6; translation after Guglielmi 1973: 46)

Another aspect of Egyptian daily life impacted by the physical presence of *ṯꜣw* was sailing. An idiom for 'to sail' is *fꜣi ṯꜣw*, literally 'carrying the *ṯꜣw*' (*Wb*. I, 574.1), reflecting how the sail catches and fills with wind, then travels from point A to point B. An alternative reading would be 'raising the sail', interpreting the  as either a logogram for 'sail', or as a stand-in for *ḥtꜣw*, 'sail' (Jones 1988: 214 [30]). However, in none of the examples of this idiom is the sail-sign followed by the short vertical stroke that indicates the logographic status of a sign (Gardiner 1957: §25), and *ḥtꜣw* has no attestations for an orthography of just  apart from the supposed examples that follow *fꜣi* (see orthographies in Jones 1988: 182–83 [113]). On the other hand, *ṯꜣw*'s shortened orthography is well attested in other contexts. One example of this idiom is found in the 6th Dynasty mastaba of Seneb at Giza:

fꜣt ṯꜣw m ḥnti

Carrying the *ṯꜣw* in a hedgehog-boat.

(PM III.1^2, 101: Junker 1941: 64, fig. 14b)

From the grammar, it is clear that it is the sail (or by metonymic extension, the boat) that carries the wind, not that the wind carries the boat (Dévaud 1910: 96–97). This idiom is one of the oldest occurrences of *ṯꜣw* in texts, and the most continuously attested, though its contexts of use expanded over time. Besides being attested in Old Kingdom tomb captions, from the Middle Kingdom onwards it appears in funerary texts (e.g. Coffin Text spell 467: *CT* V, 369–79; Book of the Dead spell 99B, e.g. P. Nu, l. 28: Lapp 1997: pl. 63), poetic literature (e.g. *The Shipwrecked Sailor*, l. 34–35: Blackman 1932: 42), and hymns (e.g. *Hymns to Senwosret III*, rt. 3.17: Collier and Quirke 2004: 19; O. Cairo CG 25219, l. 6: K*RI* III, 562.1). *ṯꜣw* in sailing contexts could be both positive and negative. Captions on idealising boat scenes unanimously refer to a beneficial *ṯꜣw* that helps the sailors reach their destination, as in the mastaba of Seneb cited above. Later examples maintain this connotation, as in a Ramessid hymn to Amun, where the god is imagined as a ship's mast:

imn ḫt-ṯꜣw n ḫtwy 2 pꜣ tnw<b>y (*?*) *ṯꜣw nbt … fꜣty=f ṯꜣw iw<=f> mn ṯꜣw ḫnt=f st*

Amun, the mast of two trees, the one who withstands (?) every *ṯꜣw* … he (Amun) carries the *ṯꜣw*, (and) when he lacks *ṯꜣw*, he rows it.

(O. BM EA 29559, l. 3–5: Demarée 2002: pl. 86)

While the *ṯ3w* is beneficial for travelling, the mast is still said to stand against the force of *ṯ3w*. This theme occurs in magical and literary texts, where *ṯ3w* can be a fatal force that overwhelms boats, most apparent in *The Shipwrecked Sailor*:

f3t ṯ3w ir=f wḥmyt nwyt im=f nt mḥ 8 in ḫt ḥw n=i s(t) ᶜḥᶜ.n dpt mwt(.ti)

The carrying of *ṯ3w*, when it made a repetition, with a surge in it of 8 cubits. It was the mast that broke it for me. Then the boat died.

(*The Shipwrecked Sailor*, l. 34–39: Blackman 1932: 42)

There is no consensus on the translation for this problematic passage (for other interpretations, see e.g. Lichtheim 1973: 212; Simpson 2003 [1973]: 48; Quirke 2004: 72; Allen 2015: 17; Obsomer 2021: 37). The reading given here is based on the analysis of *f3i ṯ3w* discussed above. The high wind, driven by a *ḏᶜ*-storm (see §5.1.7), is too strong for the ship, and the resulting water surge swamps the boat, with only the mast protecting the protagonist. Therefore, a powerful *ṯ3w* could be both beneficial and detrimental for sailing.

In some very rare cases, *ṯ3w* is given agency, as in the later *Tale of Wenamun*:

iw p3 ṯ3w (ḫr) ḥw3(=i) r p3 t3 n irs

The *ṯ3w* thrust (me) to the land of Alashia (Cyprus).

(P. Moscow 120, rt. 2.74–75: *LES* 74–75; translation after Schipper 2005: 97)

Note the absence of the verb *f3i*: the boat and its crew are not in control of the situation. Instead, the *ṯ3w* forcefully pushes the ship, letting them outrun the pursuing Tjeker, and leading them to Cyprus (Schipper 2005: 275), where Wenamun finds a culture that is 'upside-down' to the Egyptian mindset (Winand 2011: 552). This *ṯ3w* may have been sent by Amun to aid his messenger (see §5.1.1.3).

Metaphors that describe *ṯ3w* moving physical objects besides sails are only found in New Kingdom sources, and particularly in Ramessid texts describing the pharaoh's effect on foreigners. In the Beth-Shan stela, Ramesses II was behind his enemies 'so that they were like bird feathers before a *ṯ3w* (*iw=w mi šwwt 3pdw r-ḫ3t ṯ3w*)' (l. 22: K*RI* II, 151.12); while in the description of the Siege of Dapur, Ramesses 'scattered them like chaff before a *ṯ3w* (*ḫnr=f sw mi dḥ3 r-ḫ3t p3 ṯ3w*)' (l. 7: K*RI* II, 173.11–12). These enemies are fleeing without any order, helpless, and going in random directions, like light objects blown by the wind. However, while this use for *ṯ3w* is often translated as 'wind' in English (e.g. Kitchen 1999: 29, 46), it could also refer to a puff of air from the mouth, which would be enough to scatter chaff, and further diminish the enemy's menace. More closely related to the wind-side of *ṯ3w* is a line from the Late Egyptian miscellanies that rebukes a misbehaving scribe:

[*m*] *dy*[*t*] *ḥɜty=k šmt ḥwɜwt mi ḏbɜww r-ḥɜt ṯɜw*

Do [not] let your heart go and whirl away like leaves before a *ṯɜw*.

(P. Sallier I, rt. 5.5–6: *LEM* 82.6–7)

This takes the physical metaphor of objects scattering aimlessly and applies it to a mental state of being. The scribe's heart is not physically scattered like leaves, but mentally scattered, reaching for 'miserable happiness' instead of doing his work. Caminos (1954: 313) plausibly interpreted this passage as a metaphor for feeble-mindedness.

ṯɜw also appears with metaphors in descriptions of landscape. A very fragmentary 20th Dynasty love song reads:

[...] *m ḥᶜt=i mi sy ḥr-ᶜwy ṯɜw* [...]

[…] in my body, like reeds in the hands of the *ṯɜw* […]

(O. Gardiner 339, rt. 5: Mathieu 1996b: 116, pl. 27)

This evokes reeds rippling in the breeze, but without more context, the precise meaning of this metaphor is uncertain. Landgráfová and Navratilova (2009: 147) suggest that it refers to the power of love over the body, conceptualised as a physical force, the wind.

ṯɜw could also move or carry less substantial things: odours, diseases, and flames. In a prayer to Amun against illness from the 18th Dynasty, the devotee claims that:

iw=k mi ḫt ḫr=sy m štɜ [*khɜb*] *ṯɜw* [...] *khɜb=f ib=s wsr*(*.w*) *n ᶜḫ*[*.n=s* ...]

You are like a fire, when it falls into the thicket and the *ṯɜw* […] it rages. Its centre is strong, [it] cannot be extinguished […]

(P. BM EA 10059, 18.3–4: Leitz 1999: 84, pl. 43)

Here, the *ṯɜw* adds to the sense of the fire's power by its raging. This presumably draws on the environmental observation that fire strength is partly determined by the movement of air. A few other attestations link fire and *ṯɜw*, although in different ways. For example, in Pyramid Text spell 261, the king enters the Akhet:

wnis pi nsr m-tp ṯɜw r ḏrw pt r ḏrw tɜ ḏr šwt ᶜ(*wy*) *ḥnbw m wnis*

This Unas is the flame at the top of the *ṯɜw*, to the limit of the sky, to the limit of the earth, since the sunbeams' arms had become empty of Unas.

(*Pyr*. 324c–d [W]; the first phrases also occur in Coffin Text spell 288: *CT* IV, 40c)

nsr, 'flame', probably alludes to the sun. However, these spells speak more about the relative positioning of *ṯɜw* in the atmosphere and the sun disk (see §5.1.1.4), than about *ṯɜw* being directly beneficial for the strength of a fire.

A Ramessid love song in P. Chester Beatty I (see §5.1.1.4) states:

hɜy tɜ pt m ṯɜw n nfy=f {*sw*} *int=st n=k ḫnmw=st sty bᶜḥy dit tḫw=tw nɜ nty <r>*{*iw*}*-ḫft-ḥr*

The sky shall descend in a *ṯɜw* of its *nf*-breath, and it (the sky) will bring to you her fragrance: an inundating aroma that causes those who are present to be intoxicated.

(P. Chester Beatty I, rt. 16.12–17.1: Mathieu 1996b: pl. 6–7; translation after Landgráfová and Navratilova 2009: 165–66)

The lyric describes how the *ṯɜw* descended from the sky and then carried the beloved's aroma. This indicates that *ṯɜw* could carry smells; in this case, the pleasant fragrance of the beloved. Another interpretation of this stanza is that the aroma is sent by Hathor to heighten the sexual experience, rather than being fragrance that is coming from the beloved (Mathieu 1996b: 49, n. 129). Both readings are plausible given the grammatical ambiguities, and the passage could be intentionally ambiguous to allow different layers of meaning (see Landgráfová and Navratilova 2009: 166).

ṯɜw could also carry the smell of incense, an aspect that is found many times in offering formulae from the First Intermediate Period onwards: 'to breathe the *ṯɜw* from/with (*m*) myrrh and incense' (Barta 1968: no. 126, to which add an earlier attestation from the Asyut tomb of Khety II [no. 4]: see Griffith 1889: pl. 17, l. 39), sometimes specifically the incense burnt at the altar of a particular god, as on the stela of May (TT 130, wall B: PM I.1^2, 244 (2); Scheil 1894a: 544–45). The association between *ṯɜw* and *snṯr* goes back to the Pyramid Texts:

ṯɜw=k snṯr mḥ(*y*)*t=k ḥti*

Your *ṯɜw* is incense; your north wind is smoke.

(Spell 463: *Pyr*. 877a)

This passage directly connects the deified king's *ṯɜw* with incense (*iɜdt* was also linked to incense in the divine sphere, see §5.2.3.3). To return to the idea of *ṯɜw* carrying incense, this would not only manifest olfactorily, but also visually, since any air movement impacts the swirling white incense smoke, appearing to move it around. While *ṯɜw* would eventually cause the incense smoke to become invisible, this was not necessarily a bad outcome, as it could indicate that the incense has transitioned to the divine world (see Price 2022: 229).

Finally, *ṯɜw* can also carry agents of disease. This is appropriate on an intuitive level, as disease and *ṯɜw* were both invisible forces (Megahed 2020: 128). In magico-medical texts, *ṯɜw n iɜdt-rnpt* or *nf n ṯɜw* are phrases used to indicate disease-carrying air, and instructions are given to avoid or repel it (e.g. Gnirs 2015: 126). In one Ramessid Calendar of Lucky and Unlucky Days, the date of I Peret 19 is a thrice *ᶜḫᶜ* ('uncertain') day, and it is said that:

iw ṯ3w m pt m hrw pn šbnw n sw i3dt-rnpwt mwt ʿš3t ḥbs.w m-ḫnw{n}=f i[*r*] *sw3{n}=f ḥr irt nb nn snb=f m ḫ3ywt imiw=f*

ṯ3w is in the sky on this day, a mixture of it and the annual pestilence, and the many dead enshrouded within it. I[f] it passes by anyone, he will not recover from the disease which is in him.

(P. Sallier IV, rt. 14.8–9: Leitz 1994: 212–13)

Once again, although *ṯ3w* is not in itself inherently negative, it could carry negative things, like the deadly *i3dt-rnpt*. In other texts about this contagion, the *ṯ3w* of demonic entities spread the disease (e.g. *ṯ3w n dḥrt ḫ3ytiw*: P. Edwin Smith, vs. 18.11–14: Allen 2005b: 106–7). This was apparently an aetiological explanation for an untreatable disease that spread easily (for a full discussion, see Megahed 2020).

5.1.1.7 *Time and Place*

ṯ3w is very rarely associated with a particular season, suggesting that *ṯ3w* was a year-round phenomenon, or at least was not strongly characteristic of any one part of the year. There are many implicit cases of *ṯ3w* occurring during the day (e.g. Berlin ÄM 2074, l. 10: *Urk.* IV, 1519.8), while cases of *ṯ3w* in the evening or night are explicit. In *The Doomed Prince*, the narrator says:

ḫr-ir m-ḫt hrw[*w*] *sw3*(*.w*) *ḥr nn wn.in p3 šri ḥr ḥms ḥr irt hrw nfr m p3y=f pr ḫr-ir m-ḫt nfryt ṯ3w grḥ wn.in p3 šr*[*iw ḥr*] *sḏr ḥr p3y=f ḥti*

Now, after some day[s] had elapsed from this, the boy set about making holiday in his house. Now, after the end of the *ṯ3w* of the night, the bo[y] then lay down upon his bed.

(P. BM EA 10060, vs. 7.13–15: *LES* 7.9–12, translation after Di Biase Dyson 2013: 378)

The *ṯ3w* of the night seems to be marking the passage of time. From a meteorological standpoint, prevailing northerly winds tend to lessen at night (e.g. Simon 1950: 259), so a possible interpretation would be these *ṯ3w* were the last winds before the night's stillness sets in. *grḥ* is the generic word for night, but could also refer specifically to the first five hours of night (Salmas 2013: 198). In the Coffin Texts, *ṯ3w* 'strengthens (*swsr*)' Ruty in the evening (spell 438: *CT* V, 291f), so perhaps *The Doomed Prince*'s *ṯ3w* was strengthening or refreshing the youth.

As with many other words for atmospheric phenomena, *ṯzw* was connected to various parts of the daily solar cycle (see above), including sunrise. In the Book of Two Ways, as Re rises into the sky, the speaker calls out in support:

ṯz ṯw rᶜ ṯz ṯw ir=k imi kȝry=f nsb=k ṯzww ᶜm=k bqsw bš=k hrw sn=k mȝᶜt

Raise yourself, Re, raise yourself, you who are in your shrine, that you may lick the *ṯzw*s, swallow the spines, spit out the day, and kiss (the goddess) Ma'at.

(Coffin Text spell 1029: *CT* VII, 253a–54c)

Licking is often a way to transfer magical power, as is swallowing, spitting, and kissing, due to their connection with saliva (Ritner 1993: 94). Another Coffin Text spell (1053: *CT* VII, 306a) mentions Khepri licking (*nsb*) the deceased, apparently as a type of solar blessing, enabling the deceased to continue on the solar journey. Robert K. Ritner (1993: 89) has also noted a connection between saliva and breathing. With this in mind, it seems that the sun god was imagined as licking *ṯzw* to revitalise it, imbuing *ṯzw* with his divine essence at the start of each day, renewing creation (see Hornung 1996 [1971]: 161). This might be based on the meteorological observation that winds are generally weaker at night, but as the sun rises and warms the land, the resulting steeper pressure gradients drive winds (see §3.2.1) that also bring fresher air; the air is revitalised for the new day by the sun.

The locations that were associated most frequently with *ṯzw* are the riverbank or open sea, as might be expected, since not only do the thermodynamics and geomorphology of such locations in Egypt contribute to greater wind frequency and strength, but also because they are where one of the most common interactions with wind take place, sailing. The most explicit example of this association is from the Late Period, in *The Teaching of Amenemope*:

šȝrš mdy(*t*) *m-ḏrty ḥḏ-ib r ṯzw ḥȝt*

Speech from the side of an offended person is swifter than the *ṯzw* of the river's mouth.

(P. BM EA 10474, rt. 12.1–2: Laisney 2007: 339, translation after Borghouts 1980: 73)

A reading of the signs as '*ṯzw* before the water (*ṯzw ḥȝt mw*)' is also possible (Griffith 1926: 208; Laisney 2007: 119), and the phrase can even be emended to **ṯzw ḥr mw,* '*ṯzw* over water' (Lichtheim 1976: 153) or '*ṯzw* and water' (Grumach 1972: 75), but all of these readings convey a similar idea, linking *ṯzw* and *mw*. This association is articulated in many other sources; one stanza of *The Words of Neferti* is devoted jointly to lack of water in the river and the lack of a homogenous *ṯzw* in the sky as symptomatic of a world gone wrong

(6a–e: Helck 1992: 26–27; see §5.1.1.5 for the relationship between *ṯ3w* and *mw* in cosmogony).

ṯ3w could also be present inside human-built structures. The nomarch Khnumhotep II, in his Middle Kingdom tomb at Beni Hassan (BH 3), evokes air entering a newly completed tomb chapel from the garden:

s3p.n=i š qd(.w) ḫwt ḫft<=f> dd ṯ3w n w{m}ḥ3 pn

I laid out a pool, and trees were erected in front of <it>, which gives *ṯ3w* to this columned hall.

(Autobiography, l. 206–8: Kanawati and Evans 2014b: 35, pl. 113)

This also draws on the connection between *ṯ3w* and water, and evokes a sense of the pleasant atmosphere in an elite garden, which informed funerary gardens (Bigelow 2000: 10), with a breeze coming off a pond, and shaded by trees (see §4.1.2.2; for a similar text concerning funerary gardens in general, see the tomb of Kereri at el-Hawawish: Kanawati 1986: 49).

5.1.1.8 *Temperature*

ṯ3w can also be described in terms of temperature. There are two main circumstances where *ṯ3w* is described as warm or hot, which is when it comes either from a fire, or the mouth/nose. The first of these is mainly found in Old Kingdom tomb scenes, in captions around metal being melted in crucibles:

šmšm ṯ3w ḥr sn=f

The *ṯ3w* becomes hot because of his breathing.

(Mastaba of Kaemrehu, Cairo CG 1534: Mogensen 1921: fig. 40; translation after Hampson 2022: 203)

Similar scenes are found in the mastaba of Niankhkhnum and Khnumhotep (Moussa and Altenmüller 1977: 86, pl. 24), and of Ptahshepses (Verner 1977: 54, pl. 27). In this reading, blowing into the crucible results in hot air emanating out (for a discussion of Old Kingdom metallurgy, see Davey 2012: 96). This is also hinted at in the later Middle Egyptian literary text *The Teaching of Khety*, where the potter is described as lamentable because:

ᶜq ṯ3w r fnd=f pr(.w) m t3w=f wḏ3

The *ṯ3w* enters his nose, having come forth from his furnace unhindered (?).

(9e: Helck 1970: 55)

The hot *ṯ3w* emanating from the furnace was an unpleasant experience. Book of the Dead spell 149 echoes the heat of *ṯ3w* coming off fire:

iw wn=s m ḫt iw ṯ3w=s ḥtm(.w) r fndw rw ir.n=f st r imiw-ḫt=f n-mrwt tm=sn ssnt ṯ3w

Its (Ikesi's) opening is fire, its *ṯ3w* is destruction for noses and mouths. He (God) made it against his following, so that they could not breathe the *ṯ3w*.

(Spell 149: Lüscher 2010: 136a–39a)

A hot *ṯ3w* could also come from the throat of the gods, often described in terms of a fiery blast, as in the Book of the Dead, where Re is one who travels and illuminates the land, and is:

dd ṯ3w m hh n r=f

the one who gives ṯ3w as/from the fiery heat of his mouth.

(Spell 17: Lapp 2006: 208c–9c; see LGG IV, 770)

Warm *ṯ3w* could thus be conceptualised as a god's exhale. The specific deity varied: these include Re (e.g. Coffin Text spell 1025: *CT* VII, 246i), Seth (e.g. PT *714.4–5: Allen 2013a: VI, 101), and Weret-Hekau (e.g. P. Boulaq 6, 4.1: Koenig 1981a: 43–44). Seth's warm exhale is mentioned in conjunction with the winds of the sky in Coffin Text spell 519 (*CT* VI, 108k; cited above), which also suggests that atmospheric *ṯ3w* could be warm. While exhaling hot *ṯ3w* was a divine trait, it seems possible that it arose from the combination of two observations: that the spontaneous human exhale is warm, and that the ambient air (and many winds) is warm in Egypt for much of the year (see §3).

A cool *ṯ3w* could be negative or positive, depending on the context: some offering formulae specifically ask for 'the sweet *ṯ3w* of the cool (*qbb*) north wind' (e.g. Middle Kingdom stela of Sekka, Cairo CG 20043, l. 2: Lange and Schäfer 1902: 53), which is an extended version of a more common request that describes *ṯ3w* as *nḏm* (*Wb*. II, 379.1) without further qualifiers. *ṯ3w nḏm* is generally interpreted as indicating a pleasant or refreshing breeze, though *nḏm* is also used to describe the sweet scent of incense and myrrh (*Wb*. II, 378.18–19), so the phrase could plausibly also relate to the smell, rather than temperature, of *ṯ3w*. This is supported by the texts that mention the gods coming as a *ṯ3w nḏm*, as one of the main ways a divine presence was recognised was smell (see §5.2.3.2; Price 2018: 144–45).

A winter *ṯ3w* that is too cold, on the other hand, is implicitly undesirable in the New Kingdom's *The Tale of Khonsuemhab and the Ghost*, as an *3ḫ*-spirit describes his pitiful existence in the afterlife:

nn šm n pȝ nty ḥȝyw m ṯȝw prt ḥqr nn [*kȝw…*]

There is no warmth for the one who is exposed in the *ṯȝw* of Peret, and who is hungry, there is no [food …].

(Column 2.2: von Beckerath 1992: 95.13–16)

As the narrative later explains (B 3.7), the spirit's tomb had fallen into disrepair, and *ṯȝw* is blowing through the subterranean chambers, a normally sacred sealed space. The spirit is cold and hungry, demonstrating the lack of an ongoing mortuary cult for this *akh*. This passage indicates that being outside, without shelter or protection, in a cold winter wind, an expected feature of Egyptian climate (see §3.2.1), which is also evoked elsewhere, such as in *Dialogue of a Man and his Ba* (l. 44–46: Faulkner 1956: 23), was a negative experience. *Khonsuemhab* uses this common experience to elicit empathy for the *akh*'s suffering.

5.1.1.9 *Breathing ṯȝw*

A noticeable theme in attestations of the word *ṯȝw* is breathing; all gods and people, alive or dead, require *ṯȝw* to breathe. Individuals were conceptualised as inhaling *ṯȝw* through the nose, and exhaling *ṯȝw* through the mouth, although this distinction was less prevalent among the gods. When the nose was blocked, breathing was impossible (e.g. *The Teaching of Ptahhotep*, verse 22: Žába 1956: 17). This nose/mouth distinction was only rarely inverted; Book of the Dead spell 149 is the only example I know of where the mouth inhales alongside the nose, though even here, only 7 of 22 copies mention the mouth (Lüscher 2010: 136b–37b). This preference could be due to the nose's ability to detect the odour of air when it inhales (Price 2022: 83). *ṯȝw* was also conceptualised as residing in the nose (e.g. Pyramid Texts spell 493: *Pyr*. 1061b). In a spell of the Leiden Magical Papyrus against headaches, the magic practitioner puts a mask on the patient, of which it is said:

4 im=f sbȝwt nw ʿnḫ irty im=f [*d*]*gȝ dgȝyw msḏrt im=f sḏm mdwt šrit im=f tpi ṯȝw r im=f wšb*[*t*] *n sšt*

Four (things) are in it, the gates of life. [E]yes are in it, which glimpse that which is to be glimpsed. Ears are in it, which hear words. Nostrils are in it, which inhales the *ṯȝw*. A mouth is in it, which answer[s] Seshat.

(P. Leiden I 348, Spell 3, rt. 2.6–8: Borghouts 1971: pl. 2)

These four 'gates of life' on the mask involve what are apparently the four components of the head and their perceived roles. The nose 'inhales' (*tpi*: *Wb.* V, 296.4) the *ṯȝw*, bringing something into the body, while the mouth was what could respond (*wšb*: *Wb*. I, 371.6–16) to the goddess of writing (see also similar phrasing on the canopic coffin of Tutankhamun,

JE 60688, speech of Geb, l. 4: Beinlich and Saleh 1989: 106). Air that was inhaled could often be of divine origin, as with Amun-Re 'giving *ṯ3w* to the blocked nose' (tomb of Djehutyemhab [TT 194], text 20.9: Seyfried 1995: 34–35), which implies inhalation, or in a funerary prayer to Osiris that asks 'that you may give … the sweet *ṯ3w* to my nose so that I may breathe it' (MMA 21.2.69, l. 7–14: Hayes 1953: fig. 227). Meanwhile, in the literary *Trial Between Head and Heart*, the head echoes the medical papyrus, though in this case the nostrils 'drag' (*iṯḥ*) the *ṯ3w* into the body, and the mouth 'opens in order to find its answer' (P. Turin CGT 58004, l. 4–5: Mathieu 2020: 109; Di Biase Dyson 2022b: 69, n. 106). Both this passage and the one from P. Leiden I 348 imply the exhalation of *ṯ3w* through speaking, an idea that is attested in many funerary addresses to the living, such as in the 12th Dynasty stela of Nebipusenwosret from Abydos:

> *ṯ3w n r 3ḫ n s3ḥ nn nw m wrdt ḫr=s*
> *ṯ3w* of the mouth is useful to the blessed one, and in which there is nothing wearisome.
> (BM EA 101, l. 7: Blackman 1935: pl. 1)

Nebipusenwosret is stating that simply speaking an offering formula for him costs the living nothing, just an exhale from speaking (e.g. Lichtheim 1997: 37, see in general Barta 1968: 280; for variants, see Vernus 1976: 143–45). This concept of *ṯ3w* being an incidental product of speaking is not limited to funerary texts; it is also mentioned in Middle Kingdom didactic literature in connection with teaching and the exchange of knowledge:

> *dd ṯ3w* [*ḫpr*] *ḥr sb3 m wḥ^{c}-ib*
> The one who gives the *ṯ3w* [that happens] during teaching is the one who has loosened the heart.
> (*Maxims of P. Ramesseum II*, rt. 3.3: Barns 1956: pl. 7)

Later in the same text, the *ṯ3w* of the mouth refers to the speaker's wisdom that will endure even after the perishing (*3q*: *Wb*. I, 21.11–20) of plants (vs. 2.5: Barns 1956: pl. 9). In these circumstances, *ṯ3w* is a metonym for the spoken word and the knowledge it contains.

One further difference between *ṯ3w* of the nose and *ṯ3w* of the mouth is that *nḏm*, 'sweet, pleasant', is not associated with *ṯ3w* coming from the mouth, regardless of whether it is from a god or a mortal. The *ṯ3w* that is present in the nose (e.g. Berlin ÄM 2298, left side, l. 6: Roeder 1913: 4) or is entering it (e.g. Cairo CG 20281, in front of Ptah: Lange and Schäfer 1902: 295–97) can be *nḏm*, presumably because the nose can detect this aspect through smell. This is further evidence that a *ṯ3w nḏm* refers to pleasant smelling air, as suggested above.

Occasionally in funerary texts, the throat (*ḥty* or *ḫḫ*) is said to receive *ṯzw*, although the main verb used is not *tpi*, but *srq*, 'to inhale' (*Wb*. IV, 201–203.10), with *ṯzw* as the subject that causes the throat to inhale:

ntk šw … ntk ṯzw srq ḥy

You are Shu … you are the *ṯzw* that causes the throat to inhale.

(Tomb of Tjanefer [TT 158], sun hymn, l. 3: Seele 1959: pl. 10).

Only in Coffin Text spell 1025 is *ṯzw* explicitly given to the lungs (*smz*: *Wb*. III, 445.15; *CT* VII, 246i–l). In medical descriptions of the human body, *ṯzw* enters the body through the nose and then makes its way to the heart (*ḥzty*: *Wb*. III, 26–27.19) and intestines via the 'vessels' (*mt*: *Wb*. II, 167.9–14), and then out to the other parts of the body (e.g. P. Ebers 855a, 99.12–13: Grapow 1958: 2.12–13; P. Berlin P3038, 15.5–6: Strouhal *et al.* 2021: 131). The close relationship between the heart and breathing is also seen in the *nfr*-sign ( , Gardiner sign F35), which depicts both the heart and windpipe (e.g. Borchardt 1905b: 80–81).

'Seizing' (*nḥm*: *Wb*. II, 295.13–296.8) the *ṯzw* from someone was akin to killing them (Nyord 2009a: 202). This phrase can be traced back to the Pyramid Texts, where the deceased saved himself from:

nḥmw ṯzw m fnḏ n tti pn siᶜw hrww tti pn nw ᶜnḫ

The one who would take the *ṯzw* out of this Teti's nose, who would end this Teti's days of life.

(Spell 254: *Pyr*. 290c–291b [T])

The Coffin Texts continue this idea, where 'the one who is deprived of *ṯzw* dies (*mwt itm ṯzw*)' (spell 630: *CT* VI, 251g–h). *The Eloquent Peasant* uses this collocation metaphorically, where taking a poor man's possessions is compared to seizing *ṯzw* (B1 264–65: Parkinson 2005: 34). Monumental military texts from the 19th Dynasty also refer to seizing the *ṯzw* of the king's enemies, as in this royal epithet from the Year 8 Sea Peoples campaign text of Ramesses III:

nḥm ṯzw r ḫzswt m {t}<h>h n ḥᶜw=f

The one who seizes the *ṯzw* from foreign lands by the fiery breath of his body.

(K*RI* V, 37.13–14)

Other examples specifically describing seizing *ṯzw* from the enemies' nostrils include Seti I's Karnak war reliefs (KIU 1019, l. 13: K*RI* I, 23.10), and the Siege of Dapur (l. 14: K*RI* II, 173.15).

5.1.1.10 *Divine and royal favour*

ṯ3w is life, and a lack of *ṯ3w* is death, as is expressed in the 3rd petition in the *The Eloquent Peasant*, where the protagonist addresses Rensi as the 'sun god', and reminds him of a proverb that connects acting in accordance with *ma'at* and living by virtue of breathing *ṯ3w*:

mr wȝḥ mi ḏd ṯ3w pw n fnd irt mȝᶜt

Wish to endure, like the saying, 'Doing *ma'at* is *ṯ3w* for the nose'.

(B1 177: Parkinson 1991: 28)

In other words, one should do *ma'at* so that one can inhale *ṯ3w*, and thus be able to 'endure' on the earth (for discussions of *ma'at* in *The Eloquent Peasant*, see Parkinson 2012: 151–52). It also might imply that if an individual acted in opposition to *ma'at*, against the gods' will, they would lose access to *ṯ3w* (see below).

ṯ3w was given by the gods or the king in response to correct action, and they could withhold it for improper action. In *The Tale of Sinuhe*, the king, who is presented in this scene as a 'god' (B 252–74), is implored by the royal children to treat Sinuhe graciously and not punish him:

imi ṯ3w <n> nty m itmw

Give *ṯ3w* <to> him who is in suffocation!

(B 275: Koch 1990: 78.4)

An earlier verse also references the king's link with *ṯ3w*, where Sinuhe tells the king that 'one lives on the *ṯ3w* of your giving' (B 236), while the *Teaching of Kaires* declares that when the king 'is calm, *ṯ3w* is breathed' (3.6: Posener 1976: 72–73). This aspect might be connected to the idiomatic use of *ṯ3w* in much later judicial texts, particularly the tomb robbery papyri: in these, after a suspect has been interrogated, and judged innocent, he 'was released. *ṯ3w* was given to him' (e.g. P. Mayer A, rt. 3.9: K*RI* VI, 809.5). *ṯ3w* is synonymous with freedom and life in this legal context, and is frequently translated as such (e.g. Peet 1930: 156; Kitchen 2012: 543). The relief felt by a released individual is poetically expressed in a hymn to Amun from the end of the Amarna period in the tomb of Pairy:

tw=k mi dpt […] *ḥqȝ <mi> pȝ ṯ3w n*[*=f*] *wn m* {*iḫ*}<*ḫnrt*>

You (Amun) are like the taste of […] ruler, <like> the *ṯ3w* for [him] who was in <bondage>.

(TT 139, left entrance jamb, l. 16–17: Gardiner 1928: pl. 5)

Receiving *ṯ3w* after legal action was an idiomatic phrase that incorporated the ideas of not being executed and thus losing *ṯ3w*; and of being released and having access to the *ṯ3w* once more, and perhaps even becoming part of the *ma'at*-led community again (Parant 1982: 271–

72). As such, *ṯ3w* was given not only directly by the king, but also indirectly through the official judges who represented the king and who upheld *ma'at* on his behalf (see Grandet 2013: 859). Also from the Ramessid Period, there is a relatively rare title 'royal messenger under the *ṯ3w* of life (*wpwty-nsw ḫr ṯ3w n ʿnḫ*)', which seems to have been held by high ranking officials who represented the pharaoh in judiciary assemblies (e.g. the vizier Nebamun: K*RI* I, 283.7), and thus again articulates *ṯ3w* in connection with the legal system (see Valloggia 1976: 263). The fact that there are few surviving Middle Kingdom judicial documents (e.g. Lippert 2020: 800) might explain why the only allusions to this legal usage before the New Kingdom come from literary texts such as *Sinuhe*. It is probable that the legal idiom was in use in the Middle Kingdom, and that *Sinuhe* alludes to this; alternatively the literary use of *ṯ3w* might predate its legal use.

ṯ3w could also be a metaphor for 'favour' from the king and gods. *ṯ3w* was given from high to low in the social hierarchy of the world, like *ḥsi* 'favour' (e.g. Fischer 1996: 67; Doxey 1998: 137). The Tombos Stela of Thutmose I acclaims the king as:

dd ṯ3w=f n šms sw

one who gives his *ṯ3w* to those who follow him.

(l. 15: *Urk*. IV, 86.5; translation after Goedicke 1996: 1766)

This implies that only those loyal to the king would benefit from the gift of his *ṯ3w*. *ṯ3w* associated with the god's favour is mentioned in a 19th Dynasty personal piety, where Neferabu narrates how he had angered Meretseger (the 'Scarp of the West'):

iw=i ḫr irt p3 zp n <t>h r dhnty … iw=i ḫms.k(*w*) *ḫr db*(*w*)*t mi t3 iwr iw=i ḫr ʿš n ṯ3w nn iw<=f> n=i {f}*

I performed an act of transgression against the Scarp … I sat on brick(s) like a pregnant woman, and called out for *ṯ3w*, but <it> would not come to me.

(Turin CGT 50058, l. 3–6: K*RI* III, 772.14–773.1)

This passage has two possible layers of meaning. More literally, Neferabu is in pain like a mother giving birth, gasping for breath, as a punishment sent by the gods (Frood 2007: 226). It can also be interpreted more allusively as Neferabu calling out for the god's favour (*ṯ3w*), and to be forgiven, but receiving nothing in response. This sense recurs in a line towards the end of the stela, where he says that Meretseger returned to him as a 'sweet *ṯ3w*' (l. 12: K*RI* III, 773.5), finally appeased (see also P. Anastasi IV, rt. 10.3–4: *LEM* 45.9).

This use of *ṯ3w* as a metaphor for divine favour carried over to the phrase *ṯ3w n ʿnḫ*, 'breath of life'. In the Middle Kingdom, *ṯ3w n ʿnḫ* is mainly attested in lists of objects given by the gods in response to offering formulae on stelae, statues, and tombs for its revivifying

properties (e.g. Cairo CG 20164, l. 2: Lange and Schäfer 1902: 195–96; see §5.1.1.11), though it is also rarely attested as referring to royal favour in the 12th Dynasty, such as in an epithet of the king recorded on an expedition stela at Wadi el-Hudi:

dd ṯ3w n ꜥnḫ n dw3 sw

the one who gives the *ṯ3w* of life to the one who adores him.

(WH no. 143, l. 6: Sadek 1980: 84, pl. 23)

However, the use of *ṯ3w n ꜥnḫ* in non-funerary texts became increasingly frequent during the New Kingdom. Two aspects can be observed: the gods giving *ṯ3w n ꜥnḫ* to royalty, and royalty giving it to commoners. Divinely-given *ṯ3w n ꜥnḫ* gained popularity in royal ideology during the Amarna period, possibly because it fitted well into other Atenist theology and imagery. Akhenaten equated himself with the god Shu, who was frequently described as being *ṯ3w* (see §5.1.1.3), and was also the carrier of the sun's rays (Assmann 1995 [1983]: 80). Nefertiti was likewise linked with Tefnut, another deity whose identity revolved around *ṯ3w* (Assmann 2006: 169–72). Therefore, *ṯ3w* was arguably integral to beliefs about the Aten, as it was in part the vehicle that allows the Aten's light to be seen. Scenes of this period show the Aten's rays holding *ankh*s, which extend down to the noses of the royal family to give them life (e.g. Hornung 1996 [1971]: 199; Finnestad 1999: 113). In the tomb of Ipy at Amarna (no. 10), the Short Hymn to the Aten claims that 'the sight of your (the Aten's) rays is the *ṯ3w* of life to their noses', probably in reference to such scenes (Davies 1906: pl. 31–33). The royal family is being provided with life, and by extension divine favour, through viewing the manifestation of the sun god.

Similarly, during the 18th Dynasty foreign enemies are represented as begging for peace and prosperity from the king by asking for *ṯ3w* or the '*ṯ3w* of life' in texts, rather than it being given to loyal Egyptians. They must act in accordance with *ma'at*—capitulating to Egypt—in order to receive the king's forgiveness and favour (e.g. Israeli 1998: 280). This theme is first attested in the Punt scenes at Hatshepsut's Theban mortuary temple (Naville 1898: pl. 84), and later examples include a granite stela of Amenhotep III from the temple of Karnak (*Urk*. IV, 1656.22), and then frequently in the Ramessid Period, with the Siege of Dapur (K*RI* II, 173), numerous campaign scenes at Ramesses III's Medinet Habu temple (K*RI* V, 9.8, 81.3, 106.14), and also in literary texts (e.g. *Praise of the Delta Residence*: *LEM* 13.2). There is a literal sense to this request that the enemies do not wish to be killed by being deprived of *ṯ3w* (see §5.1.1.9), but it can also be understood as a political wish for clemency and diplomatic peace couched in terms of Egyptian ideology (see Cifola 1991: 34; Davies 2018: 124–27).

In scenes from private tombs emissaries from foreign lands bring tribute to the pharaoh and ask for the *ṯ3w n ꜥnḫ*, as in the tribute scene of the Aegeans in the tomb of Rekhmire:

sb.tw rdt n=sn ṯ3w n ꜥnḫ m mryt wnn ḥr mw n ḥm=f r rdt mk st b3w=f

Seeking the *ṯ3w* of life to be given to them, in the desire to be loyal to his Majesty, in order to cause that his power protects them.

(TT 100: *Urk*. IV, 1099.1–3)

Here the king gives *ṯ3w n ꜥnḫ* in return for their gifts, making it appear to be a reciprocal relationship as required by *ma'at* (e.g. Assmann 2002: 130–31), even when it may be entirely one-sided in reality, with such foreigners being coerced into paying tribute (e.g. Hallmann 2006). In other cases, expressing the giving of *ṯ3w n ꜥnḫ* probably represents an exchange of gifts in the process of international diplomacy, avoiding any admission that other rulers were the pharaoh's equal (O'Connor 2003: 171; Wang 2020). In these contexts, *ṯ3w n ꜥnḫ* was used almost euphemistically in the depiction of political situations. In both the Amarna hymns and the other New Kingdom scenes of royal dominance, a being of greater divine power bestows, or in some cases withholds, the *ṯ3w n ꜥnḫ* upon those who praise him. It is a hierarchical arrangement in accordance with *ma'at*, and a legitimisation of divine and royal power.

A medical papyrus from the early New Kingdom shows a different use of *ṯ3w n ꜥnḫ*, where an opposite, *ṯ3w n mwt*, appears:

ꜥq ṯ3w n ꜥnḫ m msḏr imnty ꜥq ṯ3w n mwt m msḏr i3bty ky ḏd ꜥq=f m qꜥḥ imnty ꜥq ṯ3w n mwt qꜥḥ i3bty

ṯ3w of life enters the right ear, and *ṯ3w* of death enters the left ear. Another interpretation: it enters the right arm, and the *ṯ3w* of death enters the left arm.

(P. Ebers 854f, 100.3–5: Grapow 1958: 3.8–11)

In this medical text, *ṯ3w* was not related to the physical action of breathing (see §5.1.1.9), but instead to religious concepts. In case eight of P. Edwin Smith, the prognosis is dire if 'something has entered from outside', which according to the gloss, means 'the *ṯ3w* of an outside god or of death (*ṯ3w pw n nṯr n rwty mwt r-pw*)' (rt. 4.16: Smith 2002: 115; Allen 2005b: 78). Therefore, the *ṯ3w n mwt* could be seen as divine *dis*favour, and it enters through the left side, which often had sinister connotations (Müller 2012: 351). The passage in P. Ebers suggests that *ṯ3w n ꜥnḫ* and *ṯ3w n mwt* were not the same as the physical inhale or exhale in this context, since they entered through the ears; thus the expression need not be taken in an exclusively literal sense as a threat of violence in other contexts.

5.1.1.11 *Resurrection*

ṯzw was a requirement for birth and life, as it was what vivified (*sᶜnḫ*) a being in the womb or (divine) egg (Assmann 1995 [1983]: 83): in the Coffin Texts, the deceased wishes for the paths of Re to be opened for him on the day of

> *imt itmw pt n špt stḫ r ṯzw ḥr sᶜnḫ=f imi swḥt=f*
> choking and breathlessness of the sky, due to the anger of Seth towards the *ṯzw* because of it vivifying him who is in his egg.
> (Spell 464: *CT* V, 337b–d)

This theme of vivification via *ṯzw* is also found in the Great Hymn to the Aten, where the sun god is described as:

> *mnᶜt m ḫt dy ṯzw r sᶜnḫ irt=f nb*(*t*)
> a nurse in the womb who gives breath in order to cause to live all that he (the Aten) has created.
> (Tomb of Aye [Amarna no. 25], l. 6–7: Davies 1908: pl. 27)

The divine egg is found in many funerary spells that focus on the rebirth of the deceased, and *ṯzw* is found alongside it. In Coffin Text spell 223 (and its successor, Book of the Dead spell 56), the deceased is equated with the divine egg:

> *ink swḥt tw imit ngngn wrt … ᶜnḫ=i ᶜnḫ=s … ssn=i ṯzw ssn=s ṯzw*
> I am this egg which is in the Great Cackler … as I live, it will live … as I breathe the *ṯzw*, it will breathe the *ṯzw*.
> (Spell 223: *CT* III, 208e–10a)

This exemplifies the human and divine need for *ṯzw* in order to be (re)born.

Funerary rituals articulate a desire to breathe *ṯzw* once more, since breathlessness was considered to be a state of the dead (Zandee 1960: 72). When an individual moved from the realm of the living to that of the deceased through the process of mummification, the ability to breathe was restored through rituals in the Opening of the Mouth ceremony (Wise 2009: 75). In the Book of Gates, the mummies gain their transfigured body with the god's words:

> *ṯzw n=ṯn iwf=ṯn sʒq n=ṯn qsw=ṯn inq n=ṯn ᶜwt=ṯn dmḏ n=ṯn iwf=ṯn ṯzw nḏm r fndw=ṯn zfḫfḫ n stw=ṯn kft n ᶜft=ṯn*
> May your flesh rise up for you, may your bones assemble for you, may your limbs embrace for you, may your flesh be united for you! Sweet *ṯzw* for your noses, loosening for your mummy-bandages, uncovering for your headclothes!
> (6th Hour, Book of Gates: Hornung 1979a: 236–38)

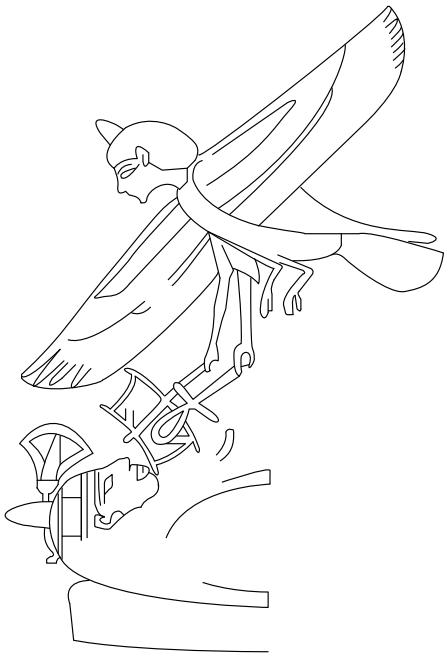


Figure 19: A *ba*-bird hovering above the deceased, from the tomb of Paser (TT 106), PM I.1[2], 223 [F (c)]. After Davies 1938: fig. 9.

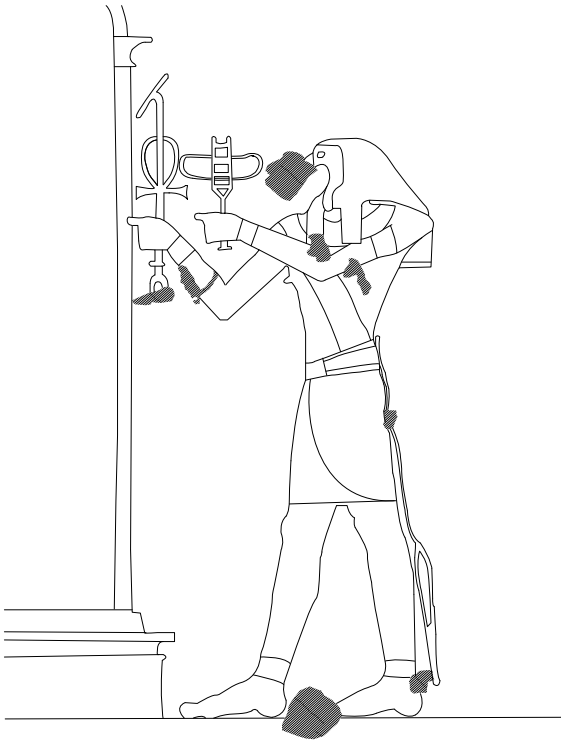


Figure 20: Thoth offering sail, *ankh*, and *was*-sceptre to Osiris, from the tomb of Nefersekheru (TT 296), PM I.1[2], 378 [5 (I.2)].

Similar ideas existed since the Pyramid Texts (e.g. spell 602: *Pyr*. 1674b; see also Coffin Text spell 934: *CT* VII, 134j), and in the New Kingdom, Anubis had the epithet 'the one who gives *ṯzw* to the one who lies in the coffin' (*LGG* IV: 769).

ṯzw nḏm, 'sweet air', is present in many offering lists for the deceased; the most common version is 'the sweet *ṯzw* of the north wind (*mḥyt*)', which was in use since the 12th Dynasty (e.g. Leiden AP 3: Simpson 1974: pl. 54, ANOC 36.2; for more examples, see Barta 1968: 237; see also §5.1.3.2.1.4). *ṯzw nḏm* first appeared in offering lists in the early Middle Kingdom, when offering formulae became more detailed and started to include wishes related to ongoing upkeep of the deceased in the afterlife, such as being able to drink water, enjoy free movement, and breathe the air (e.g. Barta 1968: 328). A New Kingdom variant of this formula, 'the sweet *nzw* of the north wind', is attested only four times: on the stelae of Nebamun (Avignon A1, l. 9: Foissy-Aufrère 1985: fig. 12) and of Nakhtmin (Berlin ÄM 2074, l. 10: *Urk*. IV, 1519.8), and in the tombs of Menkheper (TT 79: Guksch 1995: fig. 67) and Pehsukher (TT 88: *Urk*. IV, 1519.5). These represent the only pre-Ptolemaic attestations of the word *nzw* 'wind' (*Wb*. II, 200.5–6), which is not studied any further here because it apparently had the same meaning as *ṯzw*.

In the Middle Kingdom, *ṯ3w n ꜥnḫ* was a very common request in offering formulae and other funerary texts, which perhaps ultimately derived from an utterance in the Pyramid Texts: 'this NN will receive the *ṯ3w n ꜥnḫ* for himself' (spell 511: *Pyr*. 1158a). *ṯ3w n ꜥnḫ* was usually no longer requested in New Kingdom funerary wishes, with a few exceptions (e.g. tomb of Djehutyemhab [TT 194], text 17, l. 3: Seyfried 1995: 60), possibly because the phrase had become more closely aligned with royal ideology (see §5.1.1.10). However, occasional New Kingdom funerary vignettes represent the mummified body of the deceased on a bier, above which a *ba*-bird hovers holding both an *ankh* and a sail to the deceased's face, as in the tomb of Paser (TT 106: see fig. 19; Davies 1938: fig. 9). Similar imagery can be found in the tomb of Nefersekheru (TT 296), where Thoth offers an *ankh*, *was*-sceptre, and a sail to Osiris (see fig. 20; Feucht 1985: pl. 16). The juxtaposition of the sail and *ankh* in effect represents the deceased being given the 'breath of life', and this meaning is probably also implicit in vignettes where the sail alone is given (e.g. Hornung 1996 [1971]: 199).

After their transfiguration, the deceased desires to have 'power over water and *ṯ3w*', according to multiple spells in the Coffin Texts (e.g. spell 156: *CT* II, 311c; 355: *CT* V, 1a; 467: *CT* V, 379f; 535: *CT* VI, 132k) and the Book of the Dead (e.g. spell 59: Lüscher 2019: 93g; spell 68: Lapp 2011: 258a–b). In one case, this power was specifically over *ṯ3w n pt* (Coffin Text spell 83: *CT* II, 45–47). These spells are to ensure the deceased has access to, and control over, these two vital components of life in the afterlife (Hornung 1999 [1997]: 19), even without an active cult to speak the offering ritual.

5.1.1.12 *Summary*

ṯ3w is by far the best attested weather term in Egyptian texts, but commonality and assumed understanding has resulted in scholars underestimating the multiplicity of meanings and connection. Often, *ṯ3w* has either been translated as 'breath' or 'wind', separating these two interrelated aspects of *ṯ3w* that are distinct in many other languages. *ṯ3w* is more precisely understood as the ever-moving, divinely-made medium between heaven and earth, that could be gentle or strong, which was inhaled and exhaled by humans and gods alike, connecting all beings together. Combinations of these aspects were woven into metaphor, and specific features were highlighted in both religious and scientific spheres of knowledge. *ṯ3w* was a fundamental part of the Egyptian cosmos; Shu, the personification of *ṯ3w*, was one of the first gods formed by the sun god, before even the personifications of earth and sky came into being. The way in which the word *ṯ3w* connected wind, breath, air, and life exemplifies the

extent to which the Egyptians lived in a weatherworld, and also signals the extent to which they conceptualised and expressed it differently to modern cultures.

5.1.2 *nf*(*t*)

 *nf*, and the closely related *nft*, is often interpreted in dictionaries as a synonym for *ṯzw*, as it appears in similar contexts, and so it is translated as 'breath', 'air', or 'wind' (e.g. *Wb*. II, 250.16–18; Faulkner 2009 [1962]: 131; Wilson 1997: 513; van der Molen 2000: 221; Hannig 2006: 1271). However, despite similarities in conceptualisation, it does have a separate lexical etymology from *ṯzw* (Satzinger and Stefanović 2021: 201).

This section considers both *nf* and *nft* together. They were probably a single word that had phonological changes over time. The *t* ending of feminine nouns frequently disappeared in pronunciation, already by the Middle Kingdom, though it could be retained before suffix pronouns (Allen 2013b: 49). In occurrences where no suffix pronoun is attached, the majority (9 out of 11) use *nf*; conversely, where there is a suffix pronoun, most (5 out of 7) use *nft*, producing a discernible pattern of distribution that supports this hypothesis.

Apart from the feminine *t,* the orthographies do not vary extensively. A final -*y* was introduced in the New Kingdom, producing *nfy*. *nf* survived in Demotic (Erichsen 1954: 216), but not into Coptic; instead, the closely related verb *nfi* 'to blow' became ⲛⲓϥⲉ 'to blow (of wind)' (Černý 1976: 116; Vycichl 1983: 149).

In pharaonic Egypt, *nf* is much less frequently attested than *ṯzw*, first appearing in a First Intermediate Period graffito at Hatnub (no. 25, l. 12: Anthes 1928: 56–57), and thereafter predominantly in funerary contexts, including the Coffin Texts and hymns, although notably not in the Book of the Dead. There are 24 distinct attestations of *nf*, and 40 in total. Given the apparently synonymous nature of *nf* to *ṯzw*, one would expect that *nf* and *ṯzw* might be interchangeable in different copies of the Coffin Texts, but this is not the case; the two words were consistently used in different spells.

5.1.2.1 *Characteristics*

While *nf* often was synonymous with *ṯzw*, whether as a stylistic choice or a mistake, it was actually distinct from *ṯzw*, as is evident in sources that use both words in a genitive or conjunctive phrase, such as in this Sehel graffito: 'may your *ba* live in the *ṯzw* of/and the *nfw* (*bꜣ=k ꜥnḫ.ti m ṯzw nfw*)' (Sehel no. 423, l. 5: Gasse and Rondot 2007: 265); this probably

refers to the breath given during the performance of the offering ritual (see §5.1.1.9 and §5.1.1.11).

Evidence to define *nf* as a weather phenomenon is limited. One example in the Coffin Texts reads:

> *sw3ḏ=i bᶜnt imit sktt imit mᶜndt {m} nfw{t}=i pr(.w) m min m imntt i3btt m ḫt nt nwt*
>
> I make flourish the neck of the one who is in the night barque and who is in the day barque, my *nf*s have come forth today from the west and east from the belly of Nut.
>
> (Spell 80: *CT* II, 38b–c)

This spell is part of the series of 'Shu spells', where the deceased identifies themselves with both Shu and Atum, and describes the roles played by Shu in the creation and maintenance of the world (Willems 1996: 203; see §5.1.1.3). The passage implies that *nf* come from the west for the night barque, and the east for the day barque, which could suggest that *nf* contributed to the movement of the solar barques. The fact that they come forth from Nut implies a celestial nature.

However, *nf* was most frequently associated instead with breathing (particularly of the mouth), both of gods and mortals. Also in Coffin Text spell 80, *nf* is beneficial for the neck (*sw3ḏ=i bᶜnt*), and later Shu 'guides their *nfwt* into their (all living things) windpipe' (*CT* II, 43c; Nyord 2009a: 205). Coffin Text spell 81 continues with Shu stating that he 'gives *nfwt* to his (Atum's) nose' (*CT* II, 44f). Other utterances also refer to inhaling or exhaling *nf*, such as in spells 632 (*CT* VI, 255b), 992 (*CT* VII, 204e), and 1025 (*CT* VII, 246i). However, there are only two examples of *nf* being used in this manner in the New Kingdom. The first is from the tale of P. Chassinat III:

> *mi-pw* [*smt*] *ir=k p3 ḏd n=k wn* (*ḥr*) [*w*]*3wt ḥr nty h3.w nfw ḫ3ᶜ=k rn n niwt=k wᶜb ḫr ḥ3=w iwty fnd grḥ* [...] *n=f m nfi m r n nbyw{t}*.
>
> Mipou, [listen] to what the one who was (on) the [W]ays of Horus, where the *nfw* have descended, told you: 'you cast away the reputation of your city, being pure'. So they pitied him who had no nose. […] for him as a *nfi* from the mouth of the protectors.
>
> (P. Chassinat III, rt. x + 1.6–7: Barbotin 1999: 9)

The passage evokes the military Ways of Horus from the Delta to the Levant (e.g. Oren 1987: 69–70), as where the *nf*s descend, which could be a windswept plain (Barbotin 1999: 16). In the last line of this passage, the 'protectors' apparently exhaled *nf* for Mipou

from their mouths. Linking these two *nf*s is a sentence revealing that Mipou had had his nose cut off as punishment, the nose being particularly important in the conceptualisation of breathing (see §5.1.1.9; for the symbolism of nose mutilation, see Loktionov 2017: 279–82). This passage of P. Chassinat III thus alludes to *nf* as both atmospheric wind and human breath.

The second New Kingdom source is a narrative within a spell against snakes, where a god approaches his snake-bitten daughter:

nfy.n=f ṯzw=f r={s}st m ṯzw nw r=f ᶜnḫ=st ḥr-ᶜ(wy) ḫprw nfy r sḏt ᶜnḫ=st

He blew his *ṯzw*-breath towards her as the *ṯzw*-breath of his mouth, and at once she lived. When the *nfy* came to be fire, she lived.

(P. BM EA 9997, rt. 2.12–13: Leitz 1999: pl. 2)

The goddess is alive after this initial treatment of her father's *ṯzw* (see §5.1.1.9), but she is still suffering the effects of the snake bite, as the spell then details. The parallelism between the two sentences suggests that *nf* was related to *ṯzw*, and that both referred to breathing. Snake poison is often described as being a fire, or that it feels like fire to the victim (e.g. in the myth of Isis and Re, P. Turin 1993, rt. 2.5: Borghouts 1978: 52). The statement that *nf* became fire probably alludes to painful and laboured breathing. Alternatively, it references the hot air of an exhale, as with *ṯzw* (see §5.1.1.8), indicating a return to normal breathing. *nf* also appears in the context of other ailments. One utterance from P. Edwin Smith protects against disease-spreading demons:

i ḫtw ḫzytiw nn pḥ wi nfy r swꜣ swꜣw r nšny r ḥr=i

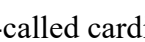
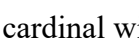
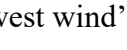
Retreat, *ḫzyti*-demons! The *nfy* shall not reach me until the *swꜣw*-demons have passed by the *nšn*-storm at my face.

(P. Edwin Smith, spell 2, vs. 1.13: Allen 2005b: 106)

This spell is titled 'another for barring *ṯzw* of the bitterness (*dḥrt*) of the night-demons', which again shows the entanglement between *ṯzw* and *nf*. The meaning seems to be that no disease-bearing *nfyw* would be able to touch the speaker until any demons, who 'rode' on *nfyw*, had left the area (see also spell 7 from the same papyrus: Allen 2005b: 109–11). This role of *nf* is comparable to that of *ṯzw* in similar contexts, as a wind that could carry agents of disease, or the breath of those malicious entities, though perhaps as a more specific type (Megahed 2020: 130–31; see §5.1.1.6). The earlier Lahun veterinary papyrus includes a treatment for 'the eyes of a bull (afflicted) with *nf*', which could also be related to the idea of disease-bearing winds (P. UCL 32036, l. 34: Collier and Quirke 2004: 55), if this *nf* is an attestation of the *nf*-wind.

In summary, it appears that *nf* had a weaker connection to the weatherworld than *ṯzw*, and it was more closely associated with to the concept of breathing, although it can be a wind helping the solar barque, or a disease-bearing wind. *nf* and *ṯzw* are not exact synonyms; the less well-attested *nf* may have been more specialised. Its restriction to religious texts, and to spells or narratives that incorporate mythic events, might also suggest a different linguistic register.

5.1.3 *Cardinal winds*

The so-called cardinal winds are  *mḥyt* 'north wind',  *rsw* 'south wind', *imnty* 'west wind', and  *iɜbty* 'east wind'. These mostly appear in each other's company, and share similar traits, with the exception of *mḥyt*, and so they are considered together here in one section. The etymological origin for each of these words is generally taken to be the cardinal directions from which the winds blow from, although general linguistic research suggests that most languages derive their cardinal words from concrete phenomena, including winds (Brown 1983: 125).

The best attested cardinal wind is *mḥyt*, the north wind (*Wb*. II, 125.6–9; Faulkner 2009 [1962]: 114; Lesko 2002 [1987]: I, 199; Hannig 2003: 552; Hannig 2006: 1115–16). It is in use from the Old Kingdom to the Roman Period, with numbers apparently exponentially growing, though probably due to preservation bias. *mḥyt* was frequently used in funerary contexts, often alongside *ṯzw*, but it can also be found in temple reliefs, and in literary and medical-magical texts. *mḥyt* is first attested in a caption to a ship scene in the 5th Dynasty mastaba of Tepiemankh II (Saqqara D11: PM III.2[2], 483), and subsequently in the 6th Dynasty copies of the Pyramid Texts. It then occurs in later mortuary literature, including the Coffin Texts, Book of the Dead, and Book of Gates. During the Middle Kingdom, *mḥyt* also appears in offering formulae and literary texts; its generic range further expanded in the New Kingdom with magical-medical texts, love songs, and hymns. In Coptic, *mḥyt* became ⲙϩⲏ 'breath' (Černý 1976: 99; Vycichl 1983: 130). There are 153 distinct attestations of *mḥyt*, and 295 in total, excluding examples of the common offering request (*ṯzw nḏm n mḥyt*, see §5.1.1.11 and §5.1.3.2.1.2); including this request brings the total number of attestations to 663.

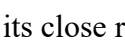
mḥyt's orthography is closely modelled on the related word *mḥt*, 'north' (*Wb*. II, 125.13–14; Satzinger and Stefanović 2021: 167). It seems likely that *mḥyt* can be understood as a feminine passive participle ('what is north'). The earliest attestations of the direction *mḥt*

come from Early Dynastic building notes, where it is spelt  or simply (Kahl 2004: 195). Likewise, the oldest orthographies of *mḥyt* in the Pyramid Texts can be broken down into 'north' and a sail-determinative:  (e.g. spell 340: *Pyr*. 554a–c [T]). Based on some more fully written examples (e.g.  in Pyramid Text spell 511: *Pyr*. 1158c [P]), the Old Kingdom reading should be *mḥwt*. *-wt* was largely replaced with *-yt* in the First Intermediate Period (e.g. autobiography of Khety II [Asyut no. 4], l. 16: Griffith 1889: pl. 13), following a well-known phonetic transformation (Schenkel 1962: §14). The phonetic complement started appearing in the First Intermediate Period, and orthographic borrowings from *ṯȝw* (and , the latter much more common in the New Kingdom, see §5.1.1.2) are found from the Middle Kingdom onwards. From this point the sail-determinative was occasionally omitted, particularly in formulaic contexts.

rsw is the opposite of *mḥyt*, the south wind (*Wb*. II, 453.11; Faulkner 2009 [1962]: 153; Lesko 2002 [1987]: I, 278; Hannig 2003: 734; Hannig 2006: 1526). It is not as commonly attested as *mḥyt*, and frequently appears only as a juxtaposition to *mḥyt*, although it can occur independently. Before the New Kingdom, *rsw* is apparently restricted to mortuary discourse, in the Pyramid Texts and the Coffin Texts, while in the New Kingdom it also appears in texts about the pharaoh, and exceptionally in one work journal that indicates that it was used in less formal contexts. In total, *rsw* has 83 attestations, of which 25 are from distinct texts.

rsw takes its orthography from the word for 'south'. In the Pyramid and Coffin Texts, *rsw* was written  , using Gardiner sign M24 (), a combination of and . In the New Kingdom, these signs separated so that *rsw* was written  , and was no longer the preferred choice regardless of script-type (hieroglyphs or hieratic). The adjective *rsy* 'south' did not undergo such an orthographic change; this might imply a comparative lack of familiarity with *rsw*, so that the scribes felt it necessary to provide a more phonetic reading in order to ensure understanding. The only other orthographic change was the sporadic use of plural strokes from the Middle Kingdom onwards, due to developments in *ṯȝw*'s orthography (see §5.1.1.2).

imnty has consistently been translated as 'west wind', on the basis of its close affinity with *imnt* 'west' (*Wb*. I, 86.23; Faulkner 2009 [1962]: 21; van der Molen 2000: 37; Hannig 2003: 144; Hannig 2006: 273). It is attested from the Old Kingdom to the Ptolemaic Period, but sparsely; there are only fifteen distinct attestations of *imnty*, and 60 attestations overall. While the majority of these are from funerary books, *imnty* also appears in a Middle Kingdom literary narrative, and in two hymns and a harper's song from the New Kingdom.

imnty takes its spelling from *imnt* ‘west’. Unlike *rsw*, *imnty*’s orthography evolves with that of its close relation. Initially, *imnty* was written  in the Old Kingdom, using Gardiner sign R13 () as the main semantic and phonetic unit, just as was the case with ‘west’ (Kahl 2004: 33–34). During the Middle Kingdom, the first character shifted to simply  (Gardiner sign R14), removing the falcon from the sign. The  became more common, occasionally doubled, and the  began to be written as well. In a few copies of the Coffin Texts (A1C: *CT* V, 5a; B3L and B2Bo: *CT* III, 290a) and the Book of the Dead (e.g. P. Ramose, spell 57: Lüscher 2019: 72b), the sail-determinative is joined or replaced by  (Gardiner sign N25), perhaps to emphasise the desert character of the *imnty* (see §5.1.3.2.3), or simply confusion with the *imnt* ‘west’ that frequently has the hills-determinative.

iȝbty is translated as ‘east wind’ because of its close relationship to *iȝbt*, ‘east’ (*Wb*. I, 31.5; Faulkner 2009 [1962]: 8; van der Molen 2000: 13; Hannig 2003: 32; Hannig 2006: 76; Satzinger and Stefanović 2021: 58). There are only ten distinct attestations, and 60 altogether, from the span of pharaonic history, which are all from funerary books apart from a single attestation in a First Intermediate Period autobiography.

The spelling of *iȝbty* changed little since the Old Kingdom. It is possible that a consistent use of and  before the became an orthographic feature in the Middle Kingdom, but Teti’s Pyramid Texts do include a , and those of Pepi II have a final . From the 18th Dynasty, the is added; hence, the conventional transliteration of *iȝbty*. Unlike *imnty*, *iȝbty* is not attested with the sign, even in texts that use it for *imnty*, suggesting a weaker association with the desert despite coming from the Eastern Desert.

5.1.3.1 *Common attributes*

5.1.3.1.1 Location

These four winds were all considered to come from the sky, but from different directions, as is expressed in Coffin Text spell 355:

r n sḫm ṯȝw 4

…

ir iw pt tn m mḥyt ḥms=i ḥr rsw=s

ir iw pt tn m rsw ḥms=i m mḥt=s

ir iw pt tn m imnt(y) ḥms=i m iȝbt=s

ir iw pt tn m iȝbt(y) ḥms=i m imnt=s

iṯḥ.n=i inm šrt=i wbȝ r bw mryt ḥms=i im

Spell for having power (over) the four winds:

…

If this sky comes in a north wind, I will sit to its (the sky's) south;

If this sky comes in a south wind, I will sit to its north;

If this sky comes in an east wind, I will sit to its west;

If this sky comes in a west wind, I will sit to its east.

I blew my nose, which is opened up at the place in which I want to sit.

(*CT* V, 1a–7b; compare Book of the Dead spell 57: Lüscher 2019: 66c–74c)

The *=s* attached to each of the winds is best interpreted as referring to the sky (*pt*) (Regulski 2020: 61; contra Faulkner 1973: 1). An alabaster drinking vessel of Tutankhamun (Cairo JE 62125) has an inscription that confirms this reading: 'may you sit (with) your face to the *mḥyt*' (Beinlich and Saleh 1989: 6). The deceased was not trying to avoid these winds, but rather wishes to face and enjoy them (see §5.1.3.1.2).

Collectively, the cardinal winds were known as the 'four winds (*ṯzw 4*)', which the creator made within the horizon (see Coffin Text spell 1130: *CT* VII, 462e), and they were eventually given physical manifestations in the images of Ptolemaic texts.

5.1.3.1.2 Breathing

As Coffin Text spell 355 implies, breathing the cardinal winds was a desirable outcome, and *mḥyt*, in particular, is a focus of breathing spells (§5.1.3.2.1.4). The other winds are wished to be breathed in the Ramessid tomb of Djehutymose:

mḥ(*y*)*t rsw ṯzw m pt imnt*{*t*}(*y*) *ṯzw n ꜥnḫ ṯzw nb pr m pt r fnd=k wnn-nfr*

mḥyt, *rsw*, the *ṯzw*-winds in the sky, *imnty*, the *ṯzw*-breath of life, every *ṯzw*-wind that comes forth from the sky to your nose, Wennefer.

(TT 32: Kákosy *et al.* 2004: 287)

With the exception of *iɜbty*, all the cardinal winds are named here. In another spell, they are all described as '*ṯzw* of life', which had funerary connotations (Coffin Text spell 162: *CT* II, 391a–98e; see §5.1.1.11). *rsw and imnty* are brought to Merenptah by Neith in order for him to breathe them (l. 9–10: K*RI* IV, 69.1). A harper's song from Tjanefer's tomb wishes that 'the *imnty* be exactly at your nose' (TT 158, l. 4: Seele 1959: pl. 12).

Because the Egyptians wanted to breathe these winds in the afterlife, there are also spells that describe the cardinals in anthropomorphic terms in order to use language of physical domination and control. For instance, in Coffin Text spell 228 (and its later version, Book of the Dead spell 70):

sn=i iȝbty ᶜȝt ḥr ḏȝȝ=s

ḫfᶜ=i m mḥyt ḥr ḥnskt=s

ȝm=i rsw ḥr gȝbt=f

nḏr=i imnt(*y*) *ḥr sskȝ=f*

I breathe by means of/kiss upon the great *iȝbty* by its hair braids;

I grasp the *mḥyt* by its braided lock;

I clasp the *rsw* by its hair;

I grip the *imnty* by its nape!

(*CT* III, 288a–90a)

By having control over all cardinal winds, the deceased symbolically has control over all winds.

5.1.3.1.3 Coming together, going apart

The pairs of *mḥyt*/*rsw* and *imnty/iȝbty* were often placed in opposition to each other, as either a way of describing a large ‘catchment’ area (physical or abstract), or directly confronting or balancing each other. For the former, an example from the Coffin Texts illustrates this for *mḥyt*/*rsw*:

di=i ir=k hȝbt ḥnᶜ rsw sin=k m-m mḥyt

I will cause that you make a journey with the *rsw*, and that you run with the *mḥyt*.

(Spell 62: *CT* I, 266c–e [B10C])

The deceased, as Horus, is performing the rituals necessary for Osiris to move freely once more, and be able to travel speedily across the length of the entire land. While Coffin Text spell 62 refers to winds going outward from a point, Book of the Dead spell 152 refers to winds coming inwards to a point, with the north and south winds carrying produce to fill the temple the deceased has created (e.g. P. Nu, l. 8–9: Lapp 1997: pl. 38; similarly in a hymn to Amun on P. Leiden I 350, rt. 1.12: Zandee 1947: pl. 1). Invoking these pairs created a metaphor for ‘everything’.

On the other hand, a concept of *mḥyt*/*rsw* and *imnty*/*iȝbty* meeting each other in confrontation is articulated in the Pyramid Texts:

iw.n NN ḫr=k nḫḥ ḥm=k n NN mi ḥmw iȝbt(*y*) *m-ḫt imnt*(*y*) *iwt=k m-ḫt NN mi iwt mḥ*(*y*)*t m-ḫt rsw*

NN has come to you, Old One. May you back away from NN like the *iꜣbty* backs away from the *imnty*; may you come after NN like the *mḥyt* comes after the *rsw*.

(Spell 340: *Pyr*. 554a–c)

These two sentences of diametrically opposed winds are used to indicate how the Old One (the sun god) should behave in front of Teti. Notably, the cardinal winds were envisioned as avoiding coming into conflict with each other. In the ideal system of the world, *mḥyt* and *rsw*, and *imnty* and *iꜣbty*, do not fight the other of their pair, but respectfully let the other blow, giving way to the strongest. In contrast to this, the turbulent confrontation of the north and south winds is evoked by *The Words of Neferti*:

iw rsw r ḫsf mḥyt nn pt m ṯꜣw wᶜ

rsw will oppose *mḥyt*, and the sky will not be as/in a single wind.

(*Neferti*, 6e: Helck 1992: 27 [Pet.])

This seems to imply a buffeting wind, when air flow from any one direction is not dominant. *Neferti* prophesies disastrous outlooks for Egypt in the form of inversions, where *ma'at* is abandoned, and the gods have forsaken the land, including the sun (Assmann 1983a: 358–59; Pouls Wegner 2021: 99). A sky filled with combating winds is part of this chaos. Conversely, this passage also suggests that wind unidirectionality was viewed as the proper order; a *mḥyt* or a *rsw* on their own were part of *ma'at*, but when both were in conflict, it was a sign of chaos. The north and south winds clashing might also be a metaphor for conflict between Upper and Lower Egypt (Lurson 2022: 214–16).

5.1.3.2 *Distinct attributes*

5.1.3.2.1 *mḥyt*

5.1.3.2.1.1 Direction

Since the First Intermediate Period, *mḥyt* was generally said to come from the sky. The First Intermediate Period autobiography of Khety II of Asyut contains the first reference to this (l. 15–16: Schenkel 1965b: 87), followed by an uncertain attestation from the Middle Kingdom (Coffin Text spell 1136: *CT* VII, 482b–c). *mḥyt* is mentioned coming from the sky or horizon more frequently in the New Kingdom; for instance, the funerary wishes in the 19th Dynasty tomb of Paser ask that:

ḫfḫfy pt m mḥ(*y*)*t r qr*(*r*)*t wnn=k im=s*

The sky blows with the *mḥyt* into the cave in which you (the deceased) are.

(TT 106: *TLA* [DZA 24.310.900], unpublished)

The *mḥyt* was associated with northerly locations, such as the Mediterranean (e.g. Coffin Text spell 162: *CT* II, 389c–90a) and the Delta (e.g. Penn. E9217, l. 17: *Urk*. IV, 519.17), and was frequently described as 'moving upstream (*ḫnty*)' (e.g. P. Turin 1993, vs. 4.11: Roccati 2011: 77). A *mḥyt* travelling south was such an integral part of the Egyptian world that during the New Kingdom it was worked into a metaphorical idiom for the natural inevitable course of things, as in the 20th Dynasty harper's song of Inherkhau:

nw ḫd mḥy(*t*) *ḫnty z nb r wnwt=f*

(As) the waters go downstream, and the *mḥyt* goes upstream (i.e. south), (so)

every man is for his hour.

(Tomb of Inherkhau [TT 359], l. 18: K*RI* VI, 192.2)

This harper's song states that it was natural and inevitable to die and enter the afterlife. There are two attestations of a *mḥyt* coming from or going to the west. The first is in the tomb of Amunmose (TT 373) from the reign of Ramesses II, where an image of a god with a Shu-feather on his head greets a Sokar (?) falcon (Seyfried 1990: 84–86), and between the two figures is the following:

mḥyt rsw pr m ḥrt imn[*tt*]

The *mḥyt* and the south wind that come forth from the western sky.

(Scene 41: Seyfried 1990: 84, fig. 97)

This use is probably due to the particular funerary significance of the western sky with its association to sunset and thus death. It is even possible that all four cardinal winds were meant to be written, as there is an empty column to the right of *mḥyt* and *rsw*; in which case, all of them could have been linked to the western sky due to the funerary context. Less than a century later, in *The Contendings of Horus and Seth*, Isis asks the *mḥyt* to tell Osiris the outcome of the legal proceedings at the start of the tale by travelling to the west:

mḥyt r [*imnt*]*t snḏm ib*{*=i*} *n wnn-nfr ᶜ-w-s*

'mḥyt, (go) to the [wes]t, please the heart of Wennefer, l.p.h.!'

(P. Chester Beatty I, rt. 1.6: LES 37.10–11)

Here, it seems that the author was using the *mḥyt* as a messenger to Osiris, who was closely associated with the west, because *mḥyt* had beneficial associations appropriate for a good messenger (see §5.1.3.2.1.2 and §5.1.3.2.1.4), despite the contradiction with *mḥyt*'s primary descriptor, 'northerly' (Gardiner 1931: 14). Another possibility is found in the symbolism of boat journeys: travelling from north to south up the Nile, pushed by a north wind, was equated to the solar barque sailing from east to west in the day (see Altenmüller 2004: 15; Abbas 2010: 42), which could explain how a *mḥyt* could travel to the west. Finally, in more

literal terms, this passage could be imagining a northeasterly wind that blows to the western half of the sky, just as Amunmose's *mḥyt* from the western sky could be a northwesterly wind.

5.1.3.2.1.2 Characteristics

As noted in a previous section (§5.1.1.6), wind speed is experientially identical to wind strength. The effects of *mḥyt* on sailing are not directly mentioned in Old Kingdom texts, despite the fact that Egyptians were taking advantage of *mḥyt* at this time, as indicated by scenes of sailing in mastabas (e.g. Irukaptah [PM III.2^2, 639]: McFarlane 2000: pl. 2), some of which have captions that mention *ṯzw* sent by Hathor (e.g. Mehu [PM III.2^2, 620]: Altenmüller 1998a: pl. 19b; Mereruka [PM III.2^2, 532]: Kanawati *et al.* 2011: II, pl. 67). However, from the First Intermediate Period, this aspect of *mḥyt* became more important, particularly in military narratives. In the autobiography of the nomarch Khety II, Asyut is recaptured by the Herakleopolitan forces through the aid of a *mḥyt*:

> [*pt*] *m swt nt mḥyt wꜣḏw hꜣy ḥr mw mni.n nn-nswt*
> [Heaven] was in a gust of the *mḥyt*, papyrus descended upon the water.
> Herakleopolis landed.
> (l. 15–16: Griffith 1889: pl. 13; El-Khadragy 2008: 223)

In this (now ruined) inscription (El-Khadragy 2008: 223), the fleet, coming from the north, is helped by the *mḥyt*. The allusion to papyrus bending over to touch the water could be interpreted as suggesting a particularly strong *mḥyt* that enabled the Herakleopolitans to reach Asyut quickly and surprise their rivals (Edel 1984: 183). In another later naval text, this time in a fragmentary campaign text of a New Kingdom ruler, probably Amenhotep III (O'Connor 1998: 268), from the temple of Bubastis, *mḥyt* is described as both 'great (*wr*)' and 'high (*qꜣ*)':

> [... *mḥ*]*yt qꜣ(t) wrt n prt ṯz-n-ḥw prt ṯz pn m ḥtp sqdw*[*t* ...]
> […] the great and high [*mḥ*]*yt* is for the coming forth of Tjesenhu—this bank comes forth in peace—a journe[y …]
> (Nubian campaign, l. x + 12: Urk. IV, 31.2–5)

qꜣ refers to strength and loudness in this context (see §5.1.1.6). This strong *mḥyt* is beneficial for the king's fleet in its approach to the unknown location of *ṯz-n-ḥw* (O'Connor 1998: 268). These strong winds in a favourable direction benefitted the specific aims of these two campaigners.

mḥyt does not have to be explicitly described as 'strong' to be mentioned in sailing texts. In the Opet festival, Amun-Re travels from Karnak to Luxor, and the perfect conditions are evoked:

> *nṯrw hrw-ib itrw ḥtp*(*.w*) *r wr sp-sn w{ȝ}ḏ tȝ pt mr*(*t*)*=s mḥy*(*t*) *ḥr mȝᶜ mw* [*r*] *ipt-rsyt*
>
> The gods are calm of heart, the river is greatly peaceful. The sky decrees what she desires: a *mḥyt* while (?) navigating the water [to] the Southern Opet.
>
> (Karnak complex, exterior west wall of Ramesses III's temple, inscription over barge of Amun, l. 9–11: K*RI* V, 187.8–9)

The river procession was the focal point of the festival, and it appears in many temple reliefs (Fukaya 2019: 22). A *mḥyt* provided ideal conditions for Opet, so that the barque could sail south from Karnak to Luxor.

The sound of a *mḥyt* is not mentioned in sources before the New Kingdom, but it then occurs in the metaphor of wind being like a voice (see §5.1.1.5 for this metaphor with *ṯȝw*). In the 19th Dynasty harper's song of Tjanefer (TT 158):

> *ᶜq*(*ȝ*) *n=k imnt*(*y*) *r fnd=k šmᶜ n=k mḥ*(*y*)*t*
>
> May the west wind be exactly at your nose for you, may the *mḥ*(*y*)*t* sing for you.
>
> (Harper's song, l. 4: Seele 1959: pl. 12, translation after Seyfried 1990: 98–99)

šmᶜ (*Wb*. IV, 478.11) is unusually determined with the sail, emphasising that it is the wind singing. This funerary lyric is alluding to the common request in the offering formulae for the 'sweet breeze of the *mḥyt*' (see below and see §5.1.3.2.1.4), but instead of simply evoking the arrival of the *mḥyt* to the deceased, this is implied through the pleasant sound of the moving wind.

nḏm, 'to be sweet, pleasant' (*Wb*. II, 379.1) had a close association with *mḥyt*, mostly through the funerary phrase 'the sweet air of the *mḥyt*'. In this phrase, known since the Middle Kingdom (§5.1.1.11), the *nḏm* does not directly modify *mḥyt*, but *ṯȝw*, implying that a *mḥyt* had the potential to be a pleasant, desired wind. In some instances, the pleasantness of the *mḥyt* was explicitly linked to coolness. One Middle Kingdom offering formula requests 'the sweet breeze of the cool (*qb*) *mḥyt*' for the *ka* of the deceased (Cairo CG 20043, l. 2: Lange and Schäfer 1902: 53), while a love song of the 19th Dynasty paints a pleasant image of a canal:

nḏm ᶜ{tt} im=f n šd ḏrt=kwi ḥr qbb=n n mḥyt st nfrt nt swtwt iw ḏrt=k ḥr ḏrt=i

Pleasant is the canal in it (a garden) of which your hand dug, because we are refreshed by the *mḥyt*, a perfect place to walk around, with your hand in my hand.

(P. Harris 500, rt. 7.8–9: Mathieu 1996b: pl. 13)

In both these examples, *mḥyt* is linked to *qb* 'to be cool' (*Wb*. V, 22.5–23.10), indicating that the *mḥyt* had the capacity to be pleasantly cooling (see §5.1.5 for *qbb* 'cool wind'). This coolness does not seem to tip into undesirable coldness, as the spirit in *The Tale of Khonsuemhab and the Ghost* complains of being cold, yet also desiring the *mḥyt* (3.1: von Beckerath 1992: 96). There are no textual examples of a warm *mḥyt*.

nḏm also appears in some instances of divine manifestation, as in this Ramessid spell for childbirth, where Hathor is summoned to the petitioner:

mi n=i ḥwt-ḥr{t} tzy=i ḥnwt m pzy=i imw [*nfr m*] *tzy wnwt nfr*(*t*) *m tzy m*[*ḥy*]*t nḏm*(*t*)

Come to me, Hathor, my mistress, into my [fine] tent, [at] this happy hour, as this sweet *m*[*ḥy*]*t*!

(P. Leiden I 348, Spell 33, vs. 12.11–11.1: Borghouts 1971: 30, pl. 14–15)

Hathor will come peacefully as/in a pleasant *mḥyt*, implying that she will favour the petitioner (Borghouts 1971: 165). The use of *nḏm* to describe *mḥyt* in such circumstances parallels similar phrases where the god arrives as a 'sweet *ṯzw*' (§5.1.1.3; see also Berlin ÄM 20377, l. 9: K*RI* III, 654.12), and perhaps also relates to the divine association with sweet-smelling incense (see §5.2.3.2).

5.1.3.2.1.3 *mḥyt* and the environment

mḥyt had a close relationship with other aspects of the natural world. Near the end of an 18th Dynasty hymn to Osiris, Horus acquires the kingship with reference to what he controls:

šnt.n iṯn ḫr sḫrw=f mḥ(*y*)*t itrw nwy ḫt-n-ᶜnḫw rnpt nbt*

What the sun disc encircled is under his plans: the *mḥyt*, the Nile, the flood, trees of life, and all fresh produce.

(Louvre C 286, l. 19–20: Moret 1931: pl. 3)

mḥyt begins a list of natural phenomena that each had associations with the return of fertility, and thus fittingly, Osiris. For *mḥyt* to be included indicates that it must also have shared these associations.

In particular, there seems to be some sort of relationship between *mḥyt* and the Nile flood. The early Greek philosopher, Thales of Miletus (6th–7th centuries BCE), attributed the flooding of the Nile to the north wind, arguing that the winds hitting the Mediterranean coast of Egypt would 'heighten the swelling of the Nile, the mouth of that river being obstructed by the force of the sea' (*Placita Philosophorum* 4.1). Leitz (1999: 86) suggests that Thales' concept was based on Egyptian thinking. He cites the following passage from a 19th Dynasty magical papyrus:

nn [*ḫn*]*t mḥyt bw ḫd.n ḥᶜpy*

The *mḥyt* will not [travel up]stream, so that the Nile flood cannot travel downstream.

(P. BM EA 10085, 1. 2–3: see Leitz 1999: 86, pl. 47)

The north wind staunching the escaping floodwaters was also recorded in a Roman Period hieroglyphic inscription in the temple of Dendera (*Dendara* III, 54.3–4; Sauneron 1960: 12–13). The flood (ideally) started to arrive approximately halfway through the season of Shemu (Krauss 2006: 370), and the north wind was the strongest in Shemu (see §3.2.1), so there was a possible phenomenological basis behind associating the flood and north wind. Furthermore, according to the Calendar of Lucky and Unlucky Days, I Akhet 4 (i.e. just after Shemu) is the day that Hathor and the *ḥntyw*-demons come forth and 'cause the body of the river to approach' (P. Cairo JE 86637, rt. 4.1–2: Leitz 1994: pl. 4). As Hathor is strongly associated with the *mḥyt*, this passage might evoke the *mḥyt* affecting the river (see Leitz 1994: 16–17). If this conceptualisation existed before the Graeco-Roman Period, then *mḥyt* would have had a key role in bringing fertility and plenty to Egypt. *mḥyt* is also more directly attested in relation to early Shemu, as in an 18th Dynasty visitor graffito at Asyut:

nfr ḥr n tȝy ḥnwt r it m ḥqȝwt <m>-sȝ sḏr.n tȝ mḥyt r šmw

The face of this mistress (the tomb) is more beautiful than barley in bushels, after the *mḥyt* has slept until Shemu.

(Asyut tomb N13.1, graffito TAS 4, l. 9–10: Verhoeven 2020: 189, pl. 133)

The use of *sḏr* with *mḥyt* is unparalleled, but the passage implies that a *mḥyt* was normally absent or light ('sleepy') until the end of the barley harvest (~February-May: Murray 2000: 520; Krauss 2006: 374), compared to the ideal circumstance of the *mḥyt* coming in Shemu, after the barley harvest was completed. Strong winds can reduce yield by pushing grain stems into a horizontal position and causing a permanent structural change that leads to lowered photosynthesis productivity (see Berry and Spink 2012; modern Egypt loses 7–19% of its yield annually to this 'lodging' process: Shah *et al.* 2019: 2), or by shattering grain ears

if at the wrong time of year (e.g. Farquhar *et al.* 2000: 496). The agricultural scenes in Paheri's 18th Dynasty tomb at Elkab also mention *mḥyt* in the harvest, presumably in Shemu:

hrw pn nfr pr m t3 t3 mḥyt pr.ti t3 pt ḥr irt n ib=n

This perfect day that emerges in the land: the *mḥyt* has come forth, the sky is acting according to our heart(s).

(West wall, over reapers: Naville et al. 1894: pl. 3)

This caption gives the speech of reapers harvesting the wheat fields. A shelter with water-jugs is depicted next to the workers, with a man fanning the jars to keep them cool. The *mḥyt* is portrayed as a welcome part of the harvest, cooling the workers. While not connected to the caption, the *mḥyt* would also benefit the workers winnowing the reaped grain (see §4.2.2.2), a scene depicted nearby.

In contrast, *mḥyt* was not linked to either Peret or Akhet in any text. This does not mean that *mḥyt* did not blow in these seasons, but that *mḥyt* was usually associated with Shemu, which is reflected in meteorological statistics (see §3.2.1).

5.1.3.2.1.4 *mḥyt* and the afterlife

Since *mḥyt* was perceived as a pleasant part of the (re)generative natural world, it was featured in many offering formulae to benefit the deceased. The fertility-inducing properties of *mḥyt* were clearly linked to funerary beliefs in the following Pyramid Texts spell:

šsp=k ḏ3t=k nt mḥ(y)t 3ḫw=k m-ḫt mḥ(y)t

You will receive your hands of the *mḥyt*, you will become verdant after the *mḥyt*.

(Spell 609: *Pyr*. 1703d–e)

This spell indicates that the regenerative aspect of *mḥyt* was already conceptualised in the late Old Kingdom. The 19th Dynasty tomb of Saroy further articulates why the deceased desired the *mḥyt*:

nḥb.tw n=k k3w m mḥyt

Life-essence will be provided for you through the *mḥyt*.

(TT 233, main text, l. 12: Ockinga 2019: 822)

mḥyt was thus not only a thing to be consumed in the afterlife alongside fresh produce to ensure longevity, it also had regenerative properties, either inherently or associatively (Price 2022: 82).

Breathing *mḥyt* was an important part of funerary beliefs. In the offering formula, *ṯ3w nḏm n mḥyt* can be among physical items that the deceased wishes to access in his afterlife,

along with bread and beer (e.g. Louvre C 50, left jamb: K*RI* I, 327.10). Breathing *ṯzw nḏm n mḥyt* was listed among other desired activities, such as 'coming forth as a living *ba*', and very commonly, 'drinking water at the *bzbzt* (eddy?)' (e.g. Louvre A 62, left side, l. 3: Barbotin 2024: no. 8; Louvre C 76, left jamb, l. 1: Pierret 1878: 13). In the *Tale of Khonsuemhab and the Ghost*, the priest describes the condition of the spirit with whom he is conversing, as existing unhappily

> *nn rnw nn mzz stzw n itn nn ḫnmy m*[*ḥy*]*t*
> without rejuvenating, without seeing the sun's rays, without breathing the *m*[*ḥy*]*t*.
> (Khonsuemhab, 3.1: von Beckerath 1992: 96)

In short, he is 'existing' without what an *akh* is normally provided with. *mḥyt* is present in a single copy of the Opening of the Mouth ritual, where the deceased's front, or possibly heart (*ḥzty*), faces towards the *mḥyt* (Tomb of Nebamun [TT 181], scene 1: Otto 1960: I, 210, II, 172), presumably in order to breathe it. Furthermore, statues, which were also activated through this ritual, were placed in temples to receive the *mḥyt*: a block statue of the same Saroy mentioned above found in the Karnak cachette has an inscription referring to the statue's location:

> *ḥtpt=k mn.ti r-ḫft-ḥr=k m ḥr*(*y*)*-ib pr*(*t*) *m-bzḥ mzᶜ-ḫrw=k ḫnt ḥsiyw nis.tw=k ḥr mzᶜt nst=k m ṯzw n mḥ*(*y*)*t*
> Your offerings are enduring in front of you in the midst of that which comes forth in the presence, your justification is at the head of the praised ones, you are summoned on account of (the goddess) Ma'at, and your seat (i.e. location) is in the breeze of the *mḥyt*.
> (Cairo CG 42167, right side, l. 1–2: K*RI* III, 496.4–5)

Not only did the statue receive the offerings that came forth from the divine offering tables, but it also was able to receive the *mḥyt* because of its position in the temple (on the interconnecting relationship between such statues and the temple, see Frood 2016).

mḥyt's role in commemorative and funerary discourse was not limited to a desire to breathe in the afterlife. Some texts seek control over *mḥyt* by having the deceased step into a divine role, or by holding the wind in their grasp. In the Pyramid Texts, the deified king gains control over *mḥyt*, which is literally in his grasp (e.g. spell 609: *Pyr*. 1703d), and similarly in the Coffin Texts *mḥyt* is grasped (spell 228: *CT* III, 288b–89a; see §5.1.3.1.2). In the Book of Two Ways, one spell describes this control through the act of eating: 'Re … may you swallow the *mḥyt*' (Coffin Text spell 1029: *CT* VII, 253c); consuming another entity is one

way of absorbing their power, as in the so-called 'Cannibal Hymn' (Pyramid Text spell 273+274: *Pyr*. 393a–414c; and Coffin Text spell 573: *CT* VI, 177–83; Ritner 1993: 104). In Coffin Text spell 228 (*CT* III, 288b–89a) and the later Book of the Dead spell 69+70 (e.g. P. Neferwebenef: Ratié 1968: pl. 8, l. 80), an anthropomorphised *mḥyt* is grasped by its *ḥnskyt* 'braided lock' (see §5.1.3.1.2). By controlling *mḥyt*, the deceased ensured an ongoing supply of *mḥyt* to breathe and strengthen themselves with.

There is one case where the normally positive *mḥyt* features as a negative force, in the 12th Dynasty *Dialogue of a Man and his Ba*, in its parable about a 'little man':

> *iw=f ȝtp=f šmw=f r-ḫnw dpt stȝs=f sqdwt ḥb=f tkn*(*.w*) *mȝ.n=f prt wḫt nt mḥyt rs*(*.w*) *m dpt rᶜ ḥr ᶜq pr*(*.w*) *ḥnᶜ ḥmt=f msw=f*
>
> He loads his harvest into a boat and drags a sailing—since his festival has approached, and he had seen the emergence of the darkness of a *mḥyt*. He watched in the boat while the sun was setting, and (then) came forth with his wife and children.
>
> (P. Berlin P3024, l. 69–73: Faulkner 1956: 24)

This is one of two narratives that the *ba* tells the man in order to convince him that death is undesirable (Parkinson 2002: 221). A farmer is transporting his harvest in a boat with his family, dragging against the *mḥyt*. He moors for the night and the family disembarks. Shortly after this excerpt, his wife and children are killed by crocodiles. In addition to the sail, *mḥyt* also has a water-determinative, possibly to indicate a storm with rain or how the wind picks up the water (Allen 2011: 70). The *wḫt*-darkness in this clause may be interpreted as the darkening of the sky before a storm, but a metaphorical reading is also possible, in which *wḫt* can refer to a menacing force (for *wḫt*, see Salmas 2013: 198–99). But why use *mḥyt*, which has such positive connotations, when there were other words for 'wind storm' that seem more applicable? It is exactly because of those connotations that *mḥyt* was chosen: the narrative concerns unexpected and ironic events and so the reversal of its usual characteristics suits the parable (Parkinson 2002: 218). *mḥyt* is also more closely associated with the afterlife than any of the many words meaning 'storm' (*ḏᶜ*, §5.1.7; *qri*, §5.2.12; *nšn*, §5.2.13, etc.), and death is the main theme of the whole poem. Instead of being a sweet breeze that sustains the dead, the *mḥyt* in the *Dialogue* is a dark force that poses a threat to your ship, and brings personal disaster. This attestation of *mḥyt* can thus be read as a conscious subversion of usual social associations. In contrast, sailing on a 'day of *ṯȝw*' is an agreeable experience in one of the man's lyrics (l. 133), a return to cultural norms.

5.1.3.2.1.5 Divine aspects

Divine epithets suggest an association between the concepts of *pt* and *mḥyt*. Two New Kingdom epithets of Hathor were 'lady of the sky (*nbt pt*)' (*LGG* IV, 49–50), and 'mistress of the *mḥt* (*ḥnwt mḥt*)' (*LGG* V, 184), and in at least one case, these were juxtaposed (tomb of Ramose [TT 55]: Davies 1941: pl. 23); a similarly close connection between these two epithets was also found with the goddess Taweret (Pushkin I.1a.4867a: K*RI* III, 754.1–2). Taweret is known to occasionally take on the iconography and attributes of Hathor, particularly in their cosmic roles (Loeben 2021: 76). Furthermore, Taweret (or one of the goddesses that were merged with her) was also associated with the 'Hippopotamus' constellation, which was in the northern hemisphere of the sky (Nemes 2020: 33).

Hathor was often the 'mistress of the north wind', either as *nbt mḥyt* or *ḥnwt mḥyt*, and has had this epithet since at least the Middle Kingdom (*LGG* IV, 66; V, 185): one example is on a Middle Kingdom ship finial (Athens NAM no. 1939: Goedicke 2000: 81, fig. 2). This association is also alluded to when Sinuhe's name is transformed to 'son of the north wind' when he returns to Egypt from the north (*The Tale of Sinuhe* B 276), rather than his original name 'son of the sycamore' which is itself a clear reference to Hathor as 'lady of the sycamore' (Parkinson 2002: 164–65). In Coffin Text spell 228 (*CT* III, 288b–89a), the *mḥyt* is grasped by its *ḥnskyt* 'braided lock' (see §5.1.3.1.2), a word often used to refer to Hathor's distinctive hairstyle, and it also appears in several of her epithets (*LGG* IV, 231; V, 197, 223–24), thus linking *mḥyt* again with Hathor.

The goddess Ma'at is also occasionally referred to as a *nbt mḥyt* or *ḥnwt mḥyt* by the late 18th Dynasty (e.g. BM EA 551, l. 21: *Urk*. IV, 2098.11–13), and she rarely appears with *mḥyt* in some other contexts. In a list of his good qualities, Rekhmire argues that he caused everyone to praise Ma'at, so that:

> *ḥtp=s m šrwt=sn mi* [*m*]*ḥyt ḫsr.n=s* [*dḥ*]*rt m ib m ḫt*
>
> she (Ma'at) shall rest in their nostrils like the [*m*]*ḥyt*, after she has dispelled
>
> the [sick]ness in the heart and body.
>
> (TT 100, autobiography, l. 19–20: Urk. IV, 1077.15–16; Davies 1943: pl. 11)

Ma'at, likened to *mḥyt*, is removing the influence of *dḥrt*, which can include both physical and psychological sickness (Engelmann and Hallof 1996: 113–14); in effect, causing the people to live. Ma'at is also said to be inhaled through the nose in Coffin Text spell 80 (*CT* II, 35c–d), where Nun tells weary Atum to 'breathe in your daughter Ma'at, put her at your nose so that your heart (*ib*) might live' (Kemboly 2010: 50–51). Rekhmire's autobiography

shows that having *mḥyt* in your nostril, by breathing it, must be highly positive, as it could be compared to the influence of Ma'at.

Amun and Hathor were both credited with manifesting as *mḥyt* in the New Kingdom. As with *ṯ3w* (§5.1.1.3), these gods took their form as *mḥyt* when coming to the aid of a petitioner. A Ramessid stela of Nebre dedicated to Amun on behalf of Nakhtamun is a good example of this:

> *gm.n=i nb nṯrw iw m mḥyt ṯ3w nḏm r-ḥ3t=f šd=f sḫ-qdwt n imn nḫt-imn*
> I found that the lord of the gods (Amun) came as the *mḥyt*, with the sweet *ṯ3w*
> before him, so that he might rescue the draughtsman of Amun, Nakhtamun.
> (Berlin ÄM 20377, l. 8–9: K*RI* III, 654.11–13)

In another New Kingdom medical spell, Hathor is summoned as a *mḥyt* to a woman in childbirth (P. Leiden I 348, vs. 12.11–11.1: Borghouts 1971: 30; see §5.1.3.2.1.4).
The divine ability to provide *mḥyt* is found in texts of all periods. From the 12th Dynasty onwards, gods were asked to give *mḥyt* (e.g. stela Cairo CG 20075, right vertical line: Simpson 1974: pl. 26, ANOC 17.1) or *ṯ3w nḏm n mḥyt* (e.g. reliefs of Ankhpuptah, Cairo CG 20253, l. C 2: Lange and Schäfer 1902: 272–73) in funerary offerings. While the gods mostly had complete control over *mḥyt*, Osiris Khentiumentiu typically received *mḥyt* from Atum in the New Kingdom (e.g. Book of the Dead spell 99: Lüscher 2009: 88; 183, e.g. TT 178: Hofmann 1995: pl. 38). Given the strong link between Osiris and the deceased, Osiris receiving *mḥyt* to breathe falls within the goal of reawakening the dead. However, in funerary offerings, Osiris himself was often evoked to give *mḥyt* to the deceased, so perhaps it was specifically Atum's *mḥyt* that Osiris required, and he could send his own *mḥyt* to others (e.g. Louvre C 50: K*RI* I, 327.10), or even send a *mḥyt* given to him by Atum (e.g. Cairo TR 7/11/24/1: Myśliwiec 1978: 147).

5.1.3.2.2 *rsw*

According to extant sources, *rsw* was able to 'come (*iw*)' (e.g. Coffin Text spell 355: *CT* V, 3a; Book of the Dead spell 57: Lüscher 2019: 70d), 'go forth (*pr*)' (e.g. tomb of Amunmose [TT 373]: Seyfried 1990: 84), or 'be a state of (*m*)' the sky (e.g. P. Leiden I 350, vs. 5.11: Janssen 1961: 49).

A south wind was not as useful as a north wind for Egyptian sailors. When travelling north on the Nile, the current of the river carried the boat while the sail was furled, as the more common north wind would work against the wishes of the crew, and the south wind was too unpredictable to rely upon (Graham 2005: 46; see §4.4.2.2). Furthermore, a south

wind would hamper a boat travelling south, as revealed in a ship's journal entry on III Peret 3, regnal year 52 of Ramesses II, concerning a trip from Piramesses to Heliopolis:

> *iw tȝ pt m rsw nḫty wḏ m ṯȝdy mnit r* (blank space) *iw nḫt pȝ ṯȝw*
> The sky was in a strong *rsw*. Departure from Tjady; mooring at (blank space)—the wind was strong.
> (P. Leiden I 350, vs. 5.11: Janssen 1961: 49, pl. 2)

Surrounding entries indicate that this journey took longer than expected, presumably because the sailors were towing their boat against the head wind. The last line of the journal entry was written in smaller characters, next to where the scribe should have written their mooring location, perhaps betraying the scribe's annoyance with the situation (Janssen 1961: 50). This text is apparently unique as a description of actual weather conditions in an administrative context.

The work journal cited above is also the only time a specific season was attributed to *rsw*. Due to the lack of a leap year in the Egyptian civil calendar, the months wandered, and every four years, a day was lost (e.g. Spalinger 1994: 304; Franci 2016: 142). According to the tables produced by von Beckerath (1997: 196–99), III Peret was roughly equivalent with December in the latter part of Ramesses II's reign. The wandering nature of the civil calendar has been of less relevance to previous cases where a weather phenomenon was linked to a specific day, because those were using the calendar in a generalised and idealised way, but this work journal is an administrative, day-to-day document that deals with the specific.

In December, the middle of winter, cold southerly winds are to be expected. Previous discussions of *rsw* have been based on Ptolemaic and Roman temple inscriptions about wind gods (e.g. de Wit 1957; Schreiber 1999), such as in the temple of Deir el-Medina, where the 'good wind of the south (*ṯȝw nfr n rst*)' is described as 'the dry one (*šhb*)' (*Wb*. IV, 529.9), and scholars have then linked *rsw* to the *khamsin* (e.g. Hannig 2003: 734; see §6.3). The meaning of *šhb* has been determined through a Coptic descendant, ϣωϩʙ 'to be scorched' (Crum 1939: 612b; see Černý 1976: 262). However, the south wind was not apparently characterised as *šhb* before the Ptolemaic Period, and so it cannot be assumed that a *rsw* was a *khamsin* earlier, on the basis of this attestation. Janssen (1961: 50) instead plausibly understood the journal's *rsw* as a cold and dry winter wind, as opposed to a *khamsin*. In a *khamsin*, even towing a boat against the wind would be inadvisable, due to the lack of visibility (see §3.2.1).

Later, Taharqa claims that Amun had 'prevented the *rsw* from reaping it (grain), so that I could reap the harvest for the granaries' (Copenhagen ÆIN 1712, l. 12: Ritner 2009: 544). The grain harvest took place between February and May (Krauss 2006: 374), so this damaging *rsw* was possible in this period, when the grain ears could be dislodged ('reaped') by wind (see §5.1.3.2.1.2 for discussion on how winds affect grain crops). The text compares the damaging *rsw* with rats, snakes, and locusts. These southerly winds could be a *khamsin* or an inactive RST event, judging by the time of year (see §3.2.2).

There is another example of a *rsw* being perceived negatively in the dedication inscription of Amenhotep III at Luxor:

ᶜḫm=k sw rsw hrw di=k šwt m st rᶜ

You (the temple) have stilled it, the *rsw*, it being content; you shall give shade instead of sunlight.

(Hypostyle hall, east wall, 2nd register, l. 2–3: Barguet 1952: 5)

Here, the *rsw* is calmed within the temple space (see §4.2.2). The *rsw* was the only directional wind mentioned in this dedication inscription, which might indicate that it was of particular concern for Theban temples (this text is also found at Medinet Habu), but it is possible that the text originated—at least in part—from the north, as it evokes many Delta divinities as protective entities (Barguet 1952: 2).

There is one attestation that suggests properties of fertility and rejuvenation for *rsw*:

rsw pw rsw m nḥs(*y*) *rst in mw srd ᶜnḫ ṯzw pw n ᶜnḫ rsw*

It is the *rsw*: the *rsw* is a Nubian and a southerner, which brings water, growth, and life. The *rsw* is the breath of life.

(Coffin Text spell 162: CT II, 397c–98c)

Of all the winds mentioned in this spell, *rsw* has the strongest association with fertility, as bringing water, growth, and life links *rsw* with the Nile inundation. This association may have been derived from the fact that the inundation also came from the south.

5.1.3.2.3 *imnty*

While an *imnty* could blow throughout Egypt, only one text provides a clear link to any particular region, in *The Tale of Sinuhe*, where the protagonist says:

ḏȝ.n=i m wsḫt nn ḥm=s [*m sw*]*t* (*?*) *n imnty*

I crossed in a barge with no rudder, [by means of a blow]ing (?) of the *imnty*.

(B 13–14: Koch 1990: 16)

The surrounding narrative implies that Sinuhe crossed the Nile near the quarries of the 'Red Mountain' (B 15), which is near the Moqattam hills, where the valley begins to flatten to the north (visible in Gomaà 1987: B II 3). The flatter topography of northern Egypt allows for more frequent westerly winds (see §3.3.1). Goedicke (1957: 78–79) had argued that since there is 'no regular west wind in Egypt', this *imnty* in *Sinuhe* could only be the *khamsin*. However, travelling Mediterranean depressions in winter can also bring west winds to the Cairo area that are not *khamsin*s (see §3.2.1), and the poem makes no mention of any of the *khamsin*'s other characteristics.

imnty is mentioned more frequently in funerary spells than *rsw* or *i3bty* (e.g. harper's song of Tjanefer, l. 4: Seele 1959: pl. 12; Merenptah's hymn of Neith, l. 10: K*RI* IV, 69.1), probably because of *imnt*'s connection to the west, the locality associated with the afterlife. In the Coffin Texts, *imnty* is described as a manifestation of Ha, the god of the Western Desert (spell 162: *CT* II, 395c), which would be appropriate for a wind that comes from the west (for Ha, see e.g. Fischer 1957; Wildung 1977: 923; Kemboly 2010: 112).

There has been some discussion on the positive or negative character of *imnty*. In the Coffin Texts, *imnty* is closely associated with the deity Iaau (spell 162: *CT* II, 395c), whom Frandsen (2000: 13–17) argues was an opposing entity to *ma'at*, part of *isfet*. In his view, *imnty* must therefore have been considered 'evil'. However, this argument has been countered by Kemboly (2010: 97–155), who observes that while Iaau was occasionally aggressive towards benevolent deities, many other typically positively-viewed deities can also be aggressive—such as Sekhmet and Seth. In Coffin Text spell 1130 (*CT* VII, 462d–e), the four cardinal winds were all created by the sun god as his 'four good deeds (*spw 4 nfrw*)', and thus their perfection, and their place in *ma'at*, is guaranteed (Hornung 1996 [1971]: 199). The fact that *imnty* itself was not used in an explicitly negative or chaotic sense in any of its attestations also suggests that it was not regarded as an agent of *isfet*.

5.1.3.2.4 *i3bty*

According to the Coffin Texts, *i3bty* could open the windows (*ptr*) for Re, which are described as features of the *pt*-sky in other texts (e.g. Pyramid Text spell 304: *Pyr*. 468a–b):

> *i3bt*(*y*) *pw wnt ptr snt i3bwt*(*y*) *irt w3t nfrt n r*^{c} *pr*(*t*)*=f im=s*
> It is the *i3bty* which opens the windows, which releases the *i3bty*s, and which makes a perfect path for Re, on which he may go forth.
> (Spell 162: *CT* II, 392b–93a)

This ‘going forth’ refers to the sunrise, and thus the east and the God’s Land (*tꜣ-nṯr*; see Cooper 2011). Although sunrise was normally associated with rebirth and renewal in Egyptian cosmology (e.g. Assmann 1995 [1983]: 44–45), no other texts explicitly mention such connotations for *iꜣbty*.

In Coffin Text spell 228 (*CT* III, 288a) and Book of the Dead spell 69+70 (e.g. P. Neferwebenef: Ratié 1968: pl. 8, l. 79–80), cited above (§5.1.3.1.2), the *iꜣbty* is ‘kissed upon’ or ‘breathed by means of’ (*sn ḥr*) its hair braids (*ḏꜣꜣ*). This phrase seems out of place with the rest of this wind-control spell which has winds being ‘grasped’. Since this is the first wind to be mentioned in this spell, this line may also be echoing the purpose of the whole: to breathe the four winds. Control was probably still the primary concern, as breathing something in was one method of gaining its power (e.g. Atum and the goddess Ma’at: Assmann 2006: 169). Another possibility is suggested by a parallel incident in the Ramessid *Tale of Two Brothers* (P. d’Orbiney, 10.8–12.1: *LES* 20.9–21.16), where a hairlock (*nbdt*) of Bata’s wife is snatched by the sea and then transfixes the pharaoh with its scent, leading her to become his wife. While the word for ‘hairlock’ is different (*ḏꜣꜣ* vs. *nbdt*), perhaps a similar conceptual path has been followed where taking hold of and smelling (women’s) hair results in ownership. It might even be relevant that the Valley of the Pine, where Bata’s wife resided, is located to the northeast of Egypt and shares many characteristics of the God’s Land where *iꜣbty* emerges (Pehal 2018: 174). The wife’s hair came from the east, and the pharaoh smelling it resulted in his control of her, which parallels well with *iꜣbty* in Coffin Text spell 228.

There is only one example of *iꜣbty* being used in a metaphor, in the autobiography of Iti-iby, a First Intermediate Period nomarch of Asyut, though the context is fragmentary and also partly obscured by a later inscription (Kahl 2007: 76). He protects his town against the southern nomes (El-Khadragy 2012: 32), and describes his own army:

> […] *pḏt nn gr n iri-n-ᶜḥꜣt* (*?*) *pḥ* […] *mi s*[*w*]*ḥ* (*?*) *n iꜣbt*(*y*) *mi* […]
>
> […] the bow, without falling silent before the opponent (?), attacking […]
>
> like a gust (?) of the *iꜣbty*, like […]
>
> (Asyut no. III, north wall, l. 22: Schenkel 1965b: 80)

Describing his own army, it is likely that this metaphor was positive, perhaps referring to its strength or persistence, in accordance with the previous clauses. For instance, the army could be pushing the enemy back like a gust of the east wind, perhaps towards the west.

5.1.3.3 *Summary*

Texts suggest that the most essential physical characteristic of *mḥyt* was its northerly origins, as its name articulates. The Egyptians conceptualised *mḥyt* as part of the natural world, alongside the Nile, the land, and the sky, and were aware of its seasonality. It was frequently described as cool or pleasant, and could be strong or soft, but like *ṯzw*, *mḥyt* was a force defined by movement, and almost always had positive connotations. The common funerary formula, *ṯzw nḏm n mḥyt*, indicates that *mḥyt* was desirable for the deceased, presumably transferred from its pleasantness for the living. From their positive lived experiences with the north wind (§3.2.1; §4.1.2.2), the ancient Egyptians linked *mḥyt* to concepts such as divine manifestation, fertility, rebirth in the afterlife, and *ma'at*. As with the other three directional winds, some of these themes reappear or are contradicted.

rsw is the south wind, the cardinal opposite of *mḥyt*, though less widely used in both concrete and conceptual contexts. The limited pharaonic evidence suggests that *rsw* could be a cold wind at times, although Graeco-Roman texts characterised it as the opposite. It was certainly annoying if a ship's crew wished to travel south, but *rsw* also has positive associations in mortuary literature, as a bringer of life and new growth, and as a breathable substance that the deceased wishes to control.

As the wind coming from the west, *imnty* was associated with the afterlife. *imnty* was not an agent of chaos through its link to Iaau, but rather part of the whole that was shaped by the creator god, and was more positive than negative.

iȝbty is the most enigmatic cardinal wind in Egyptian, due to its limited attestations. Its easterly origin, as indicated by etymology and context, probably led to an association with the sunrise. In funerary texts, *iȝbty* often has positive overtones, as a wind to be breathed, but the attestation from Iti-iby's tomb indicate that the uses of *iȝbty* were not limited to the funerary discourse.

mḥyt was by far the most common cardinal wind-word used, which perhaps reflects the physical reality of the Egyptian environment, where the north wind is the dominant wind. Conversely, *imnty* and *iȝbty* were used the least, probably because these winds are far less common, and had less direct impact on daily life, unlike the north and south winds that affected transportation (§4.4), industry (§4.4), and comfort (§4.1.2.1).

5.1.4 *mȝᶜw*

Unlike previous wind-words, the translation of  *mȝᶜw* has less consensus. The *Wörterbuch* chose '(richtigen) Wind', noting literal and figural uses (*Wb*. II, 23.15–24.5;

similar in *CDD m* [10.1]: 35); Faulkner (2009 [1962]: 102) translated as 'breeze'; Hannig (2006: 1013) has 'Wind (zum Segeln), günstiger Wind'; Erichsen's *Demotic Glossar* (1954: 150) suggested 'Wind'; while a Ptolemaic dictionary opts for 'wind, breeze' (Wilson 1997: 395). In addition, translators also describe this wind as being 'favourable' (e.g. Raven 2005: 45), 'fair' (e.g. Leitz 1999: 34), 'right' (e.g. Allen 2015: 251), or 'good' (e.g. Lichtheim 1997: 54), or as a 'sailing wind' ('Fahrtwind' or 'Segelwind': Assmann 1999 [1975]: 422). In some text commentaries, even the meaning for *mꜣᶜw* as a wind is removed, ignoring it altogether (e.g. Kitchen 1999: 159; Verhoeven 2016: 297). As demonstrated below, a simple translation of 'wind' for *mꜣᶜw* does not indicate the nuances of this word.

There are 50 distinct attestations, some of which have very similar phrasings, and 56 total attestations. *mꜣᶜw* first appears in the 12th Dynasty copies of *The Eloquent Peasant* (Parkinson 1991: 17), and there is only one further attestation before the start of the 18th Dynasty (stela of Horemkhauef, MMA 35.7.55: Kubisch 2008: 310). The vast majority of attestations come from the New Kingdom onwards. The two early attestations are part of narratives concerning mortal men; from the New Kingdom, the focus seems to have shifted to the divine sphere, with *mꜣᶜw* appearing in (solar) hymns, myths, harper's songs, and the funerary texts.

The phonetic signs of *mꜣᶜw* remained fairly constant, with only minimal noteworthy changes. Determinatives besides the sail are most varied in the Middle Kingdom; sometimes the sail-determinative is missing, though context clearly indicates the *mꜣᶜw*-wind. One unique spelling is in one version of *The Eloquent Peasant* (B1 86: see Parkinson 1991: 17), where  (Gardiner sign H2) was inserted before the sail, presumably because that sign is a phonographic determinative for *mꜣᶜ*. The Ramesseum copy of the poem uses (Gardiner sign Y1), in the context of someone acting in accordance with *ma'at* (R 14.4; see Parkinson 1991: 17), and the writing might be derived from the association of *mꜣᶜw* with *mꜣᶜ* 'to be just' (*Wb*. II, 12.1–14.19) or *mꜣᶜt* (*Wb*. II, 18.1–20.9; see Vogelsang 1913: 66; Parkinson 2012: 71). Another unique determinative,  (Gardiner sign P23), comes from the stela of Horemkhauef (MMA 35.7.55, l. 8: Kubisch 2008: 310), which links *mꜣᶜw* with boat travel. While a few 18th Dynasty examples have no determinative, the majority of New Kingdom attestations are written  (e.g. Abydos Decree of Seti I, l. 17: K*RI* I, 48.14). Plural strokes first appear in the Ramessid Period, without any consistent pattern; this might be due to confusion with *ṯzw* (see §5.1.1.2).

mꜣᶜw was probably etymologically derived from the root *mꜣᶜ* 'to be just', alongside *mꜣᶜt* 'truth' and *mꜣᶜ* 'to sail' (Satzinger and Stefanović 2021: 193–94). *mꜣᶜw* was clearly associated

with the concept of *ma'at* through word association (see §5.1.4.3), and was also occasionally grammatically confused with *mɜᶜt* (e.g. in the feminine ending of *nfr*: *ḏɜy=k pt m mɜᶜw nfrt*, from the tomb of Inherkhau [TT 359]: K*RI* VII, 350.5). Later orthographies from the Ptolemaic Period can even add the *ma'at* feather (Gardiner sign H6) to *mɜᶜw* (e.g. P. Bremner Rhind, 33.8: Faulkner 1933: 92). Di Biase Dyson (2017: 355) suggested an alternative etymology, with *mɜᶜw* as a deverbal *Nominalbildung* (see Osing 1976: 4) of the passive participle of *mɜᶜ* 'to sail', in a slight variation to the passive participle that is constructed as 'that with which is sailed'.

5.1.4.1 *Characteristics*

mɜᶜw can be identified as a wind by its orthography and contextual associations. In the two pre-New Kingdom attestations of *mɜᶜw*, the focus is on sailing by non-divine actors for the benefit of the gods. In Horemkhauef's Second Intermediate Period autobiography, he 'travelled downstream with a perfect *mɜᶜw*' from Hierakonpolis to Lisht to collect a sacred image of Horus of Nekhen (MMA 35.7.55, l. 8: Kubisch 2008: 310). Some later texts also have this connection: Senneferi's 18th Dynasty autobiography states that while acquiring wood for the temple flagpoles, he '[travelled on] the Great Green with a perfect *mɜᶜw*' (TT 99, l. 14: Strudwick 2016: 102).

Later, the sun god's barque is described sailing in *mɜᶜw*, and this is far more frequently attested, for instance:

inḏ ḥr=k rᶜ imi pt [...] ... *wnn=k m mɜᶜ*[*w*] *nfr* [...] *ḏɜ=k ḥrt m mɜᶜ-ḫrw*

Hail to you, Ra, the one who is in the sky […] … you are with a perfect *mɜᶜw*

[…] you cross the sky as a justified one.

(Stela of Raia, l. x + 3–7: Raven 2005: 45, pl. 76)

Many sources describe the gods traversing the sky (*pt* or *ḥrt*) with a *mɜᶜw* (see §5.1.4.2). Some texts link *mɜᶜw* with the sky-goddess Nut, as at the end of Book of the Dead spell 183 of the Ramessid P. Hunefer, in a passage that in other papyri is part of spell 182 (Simmance 2014: 24):

di.n=i ṯɜw n wnn-nfr mɜᶜw nfr n mḥyt mi prt=f m ḫt n(*t*) *mwt=f*

I gave Wennefer air, the perfect *mɜᶜw* of the north wind like him emerging

from his mother's womb.

(Spell 183, P. Hunefer: Budge 1899: pl. 3)

In this sentence, *mɜᶜw* is equated to *ṯɜw* and thus seen as part of *mḥyt* and present in the sky. However, *mɜᶜw* normally does not appear together with other wind-words. Its use here,

instead of a more generic term, is due to the spell's theme of Thoth making Osiris *mɜᶜ-ḫrw*, 'true of voice': there is wordplay between *mɜᶜw* and *mɜᶜ-ḫrw*, as well as conceptual resonance. This spell normally used *ṯɜw* (e.g. spell 182 in P. Muthotepti: Naville 1886: II, 447), but *mɜᶜw*'s appearance is a variant that provides an additional nuance. Regardless, good sailing, profane or sacred, was the major use context of *mɜᶜw*.

mɜᶜw was not closely associated with any particular direction; it can come from whichever direction made it a good sailing wind. It must come from the south in Horemkhauef's stela, from the northeast in Senneferi's autobiography, and in the solar journey it pushed the barque towards the west (e.g. P. Cairo JE 86637, rt. 6.12: Leitz 1994: 50, pl. 6). Characteristics that were inherent in other wind-words, like temperature and speed, are not present in *mɜᶜw*. Thus, *mɜᶜw* was a wind lacking specific physical features, but as a consequence was not limited by them, enabling it to be used extensively in various metaphorical and allegorical contexts (see below). Using *mɜᶜw* would be like modern English-speakers using 'zephyr' to describe a breeze (and not necessarily a westerly one, *OED* XX, 802); while technically correct, its use generally indicates that the speaker/writer is thinking poetically, evoking certain registers and associations.

5.1.4.2 *Divine voyages*

mɜᶜw was presented as an ideal sailing wind: in sailing contexts, *mɜᶜw*, in more than half the attestations, is described as *nfr* 'good, perfect, beautiful', indicating that the *mɜᶜw* was good for boat travel (e.g. P. BM EA 10042, rt. 3.3: Leitz 1999: 34). The frequent addition of *nfr* emphasises the desirable qualities of this wind. In some cases, *mɜᶜw* was juxtaposed with ease and peace, as in this text for travelling south to Abydos in the 18th Dynasty tomb of Neferhotep:

> *hɜ wsir NN m sb=t*(*w*) *nṯrw mḥwt m mɜᶜ šzp=tw nṯrw rsyw m ḥtpw sḏf=tw nṯrw iɜbtt qni=*(*t*)*w nṯrw imntt*
>
> Descend, Osiris NN, when the northern gods lead you with the *mɜᶜw*, the southern gods receive you in peace, the gods of the east supply you, and the gods of the west embrace you.
>
> (TT 50, Gallery, Wall H, middle register, l. 72–75: Hari 1985: pl. 31)

This is another instance in which *mɜᶜw* was linked with the north wind. Other sources which describe the solar journey characterise the wind similarly, such as 'Re travels in a *mɜᶜw*, having traversed the heavens in peace' (tomb of Ramesses IX [KV 6]: Darnell 2004: 313, pl. 34a). It is here an ideal wind for sailing, as it facilitates peace (*ḥtp*).

As a perfect wind, *mɜᶜw* was closely associated with the daily solar voyage. Many New Kingdom solar hymns (from tombs and temples) have variations on the motif 'the sun god traversed the sky with a good *mɜᶜw*', with references to both sunrise and sunset, as in a late 20th Dynasty hymn:

ḏɜ=k ḥrt m mɜᶜ-ḫrw mr/š nḫɜwy ḫpr(*.w*) *m ḥtpw iw=k m rᶜ m mɜᶜw hrw nb m msktt m mᶜnḏt*

You cross the sky in justification, the Lake of Two Knives has become peaceful, (for) you are Re with a *mɜᶜw*, every day, in the night barque and in the day-barque.

(Tomb of Imiseba [TT 65]: K*RI* VI, 553.12)

mɜᶜw was part of the eternal cycle of the sun god's triumph (his *mɜᶜ-ḫrw*) that was enacted by the hymns. In many of the hymns, *mɜᶜw* was invoked after the defeat of the sun's enemies, or during the crossing of a hazardous area, like 'the Lake of Knives' mentioned above (see Abbas 2010: 88), or 'the Lake of Fire' (O. Cairo CG 25206, l. 29, see Assmann 1999 [1975]: 422). The Nauri Decree mentions that the priests, while enacting the solar voyage on their sacred lake (see Junge 1978: 102–4; Assmann 1995 [1983]: 22), would 'direct a *mɜᶜw* for Khepri' (l. 17: K*RI* I, 48.14). By having these hymns in their tomb, the deceased desired to associate themselves with the mythic constellation; just as the sun god crossed the underworld regions with *mɜᶜw* supporting him, so too will the deceased (see Assmann 1969: 369–70; Assmann 1995 [1983]: 43).

Ultimately, *mɜᶜw*'s association with the safe travels of the sun god on the spatial plane was transferred to a temporal plane: sailing in *mɜᶜw* became connected with the concept of longevity in life, travelling safely over time (for this metaphor, see Vittmann 1999: 141–43). In the Cairo Calendar of Lucky and Unlucky Days, I Akhet 24 is a thrice *nfr* ('good') day, as:

sqdy ḥm n nṯr pn ḥr mɜᶜw nfr m ḥtp[*w r imnt*] *… ir ms nb m hrw pn <mwt=f> m imɜḫy m iɜwt*

The majesty of this god sails [to the west] in peac[e] with a perfect *mɜᶜw* …

As for anyone who is born on this day, <he shall die> as an *imɜḫy* in old age.

(P. Cairo JE 86637, rt. 6.12–7.1: Leitz 1994: 50, pl. 6)

mɜᶜw here is probably not a literal wind experienced by the Egyptians in this context (contra Leitz 1994: 51), as the passage seems to be evoking solar theology in which *mɜᶜw* was the guiding force of the sun god's barque. Instead, the ideal sailing of Re was applied to lifespan of individuals (see also tomb of Petosiris, PM IV, 173 [116]: Lefebvre 1924: I, 158).

5.1.4.3 *Ma'at and mɜᶜw*

The association with *ma'at* was deep. Since the earliest attestations of *mɜᶜw* in the Middle Kingdom, and lasting at least until the Late Period, being in a *mɜᶜw* was also a metaphor for acting in accordance with *ma'at*. *The Eloquent Peasant* eulogises on the responsibilities of officials as embodiments of *ma'at* (Parkinson 2002: 169), and in the first speech of the peasant, he advocates the benefits of living in accordance with *ma'at*:

> *ir hɜ=k r š n mɜᶜt sqd=k im=f m mɜᶜw nn kf ndbyt ḥtɜ=k nn ihm dpt=k*
> If you go down to the Lake of *Ma'at*, you will sail on it with a *mɜᶜw*, the bunt
> will not strip off your sail, nor will your boat delay.
> (*The Eloquent Peasant*, B1 85–89: Parkinson 1991: 17)

The official's future is imagined as him sailing successfully on the Lake of *Ma'at* as the teachings of *ma'at,* metaphorically conceptualised as good winds (*mɜᶜw*), guide him. To reinforce the idea that the official should be a just leader, the official is cast as Re, as the poetic toponym of 'Lake of *Ma'at*' brings up multiple associations with the sun god, as too does the use of *mɜᶜw* itself (for discussion, see Parkinson 2012: 70–71). This use of *mɜᶜw* also appeared in self-promoting statements in autobiographies, such as in the 18th Dynasty example of Baki:

> *n ir=i ḏwt r rmṯ ṯsswt nt nṯrw=sn ᶜḥᶜw=i m ᶜnḫ n mɜᶜw r pḥ imɜḫi m nfr*
> I did not do evil to people—a reprehensible thing of their gods; my lifespan
> was living in the *mɜᶜw*, in order to reach the state of *imɜḫ* in perfection.
> (Turin no. 156, l. 9–10: Varille 1954: pl. 1)

For Baki to achieve *imɜḫ* after death, he had to be in the *mɜᶜw* during life, that is living in accordance with *ma'at*. Just as a good wind guides the boat as it travels, the teachings of *ma'at* guided Egyptians as they travelled through life (see also Coulon 1999: 108).

The speech of the peasant can be compared with the harper's songs that speak of the benefits of being a follower of Amun, as in a song in Djehutymose's 19th Dynasty tomb:

> *di=f t*[*w*] *ḥr mɜᶜw nn qᶜḥt nḏm ib=tn*
> He places yo[u] in the *mɜᶜw* when there is no shore, and your heart is joyful.
> (TT 32, l. 7: Kákosy and Fábián 1995: fig. 1. See also lutist song of
> Neferhotep I, TT 50, l. 8: Hari 1985: pl. 4)

Amun will set the faithful recipient on the path of righteousness as represented by *mɜᶜw*. The abstract idea of following *ma'at* was metaphorically expressed by the image of a ship's journey, and the metaphor continues with a nautical idiom, where the lack of a shore, or

‘sides’, indicates being lost or in foreign waters, with no coast for easy guidance (for the importance of maintaining sight of the coast for ancient sailors, see Fabre 2004–2005).

An angry deity could deny the guiding presence of *mȝᶜw*. For example, the king (as a representative of the gods) could deny *mȝᶜw* to those who were not obedient:

> *nn ḥmy ḥr mȝᶜw n wny zpw=i*
> There is neither a steering oar nor *mȝᶜw* for those who neglect my matters.
> (Abu Simbel, Stela C 22, l. 26: K*RI* II, 320.11; translation after Di Biase Dyson 2017: 356)

In this case, *ṯȝw* could have been used—other New Kingdom texts mention Re emerging with *ṯȝw m ḫnt* ‘wind and rowing’ (e.g. Book of the Dead spell 149, P. Maiherperi: Lüscher 2010), or ships mooring by *ṯȝw ḥr wsrw* ‘wind and oars’ (e.g. Eulogy of Ramesses IV, O. Turin CGT 57001, rt. 7: Peden 1994: 103–4)—so it seems that *mȝᶜw* was specifically chosen to emphasis the king’s role in connection with *ma’at*. *mȝᶜw* is here parallel to *ḥmy*, which is specifically the steering oar (Jones 1988: 200); for *ḥmy* in connection with *ma’at*, see Parkinson 2012: 98), as opposed to a rowing oar, and so was a guiding force that ensured the ship did not go astray.

5.1.4.4 *Summary*

mȝᶜw is a very different type of wind-word compared to those already discussed. It was characterised as a ‘good’ wind, on multiple levels, and not by a particular direction, strength, or temperature. It was a good wind to sail on, a wind that guarantees safe passage, but in the majority of cases, *mȝᶜw* was linked to the upkeep of *ma’at* in all levels of society and solar theology. While *mȝᶜw* does appear in descriptions of human experience, it is unclear to what extent the word was used for a physical wind in day-to-day life, or whether *mȝᶜw* was only used in funerary contexts to link to the divine or in literary contexts to emphasise their moral character through poetic language.

5.1.5 *qbw*

qbw is a comparatively uncommon word, with only five attestations in the corpus of this thesis (and three of those are versions of the same text), although it did survive into Boharaic Coptic as ⲕⲃⲱⲟⲩ (Černý 1976: 53; Vycichl 1983: 72). It is translated as ‘cool wind/breeze’ (*Wb*. V, 24.19; Faulkner 2009 [1962]: 277; Wilson 1997: 1051; *CDD q* [04.1]: 22), based on its etymological root, *qbb* ‘to be cool’ (Satzinger and Stefanović 2021: 391–92). *qbw* first

appeared in the 18th Dynasty copy of *The Pleasures of Fishing and Fowling*, followed by a passage in the marriage stelae of Ramesses II, and then in the Late Egyptian miscellanies. Given the small number of attestations, it is worthwhile to mention the later examples of *qbw*: these comprise the Ptolemaic wind-god texts in Deir el-Medina's temple (du Bourguet 2002: 106, DEM112) and on some coffins (e.g. Vienna ÄS 4: Leitz 2011: 295), and in the Demotic *Instructions of Ankhsheshonq* (P. BM EA 10508, 20.14: Thissen 1984: 33).

All New Kingdom spellings of *qbw* have the signs  , , , and plural strokes. The versions on the marriage stelae also have a  sign, whilst the miscellanies text uses instead, and includes both and , as does *Fishing and Fowling*. All these combinations can be traced back to orthographies of the more common word, *qbb* 'to be cool' (*Wb*. V, 22.5–23.20), which shares the same lexical root.

5.1.5.1 *Characteristics*

qbw can be characterised as a cool wind by its etymology and because the Ramessid attestations all link *qbw* to Peret, the winter season. In the Marriage Stela, the king prays to Seth that:

> *wḏwt=k pw ḫpr*[*t nbt mi t*]*m=k irt ḥ*[*w*]*yt qbwy srq r spr n=i biȝt wḏ*(*t*)*=k n=i*
> [All that has ha]ppened is what you commanded, [in accordance with the fact that] you have [no]t made rain, *qbwy*, or snow, in order that the miracle that you allotted to me might arrive for me.
> (Marriage Stela, l. 30: K*RI* II, 249.11–14 [K])

The god has ensured that there is a mild winter without rain, snow, or *qbw*, so that 'days of Shemu happened in Peret' (l. 38: K*RI* II, 250.1–4). In the miscellanies, a 'be a scribe' composition denigrates the life of a soldier by contrasting his hard, sweaty work with a pleasant festival in Thebes such as a scribe would presumably attend:

> *mi*{*t*} *sḏd=i n=k pȝ sḫrw n wᶜw pȝ ᶜšȝ*{*t*} *ḏnn pȝ sw hrw n wḏ n wȝst r irt tȝ-ᶜbt m nȝw qbw n ȝbd 2 prt*
> Come, I shall recount to you the condition of the soldier, the much tormented one, on the day of commanding to Thebes to do the *tȝ-ᶜbt*-festival in the *qbw* of the second month of Peret.
> (P. Chester Beatty V, rt. 6.13–14: Gardiner 1935: pl. 25)

Later, the soldier is described as thirsty, but drinking 'does not overcome the heat and the sweat' (rt. 7.3); the *qbw* at the festival and the heat the soldiers endure are juxtaposed, suggesting that *qbw* was in contrast a welcome, refreshing wind, even in the coolest season.

qbw is also described as pleasant in Shemu. *The Pleasures of Fishing and Fowling* is fragmentary, but the following scene apparently took place during Shemu in the western Delta (Caminos 1956: 10):

ḥms=i r sšy (*?*) [*ḥr*]*=i n=i kȝp smn.n=i ḫȝrw=i iw=i n qbw rmw=i n šw*

I shall settle at the ford (?) and [make ready] for myself a screen after I have fastened my bait. I am for the *qbw* while my fishes are for the sunlight.

(P. Moskow o. Nr., B 2.6–7: Caminos 1956: pl. 2)

The fisherman has put up a screen to block out the sun's rays, either to protect himself or to attract fish to the shade, and waits, as a *qbw* blows. Given the bucolic tone of this fictional poem, *qbw* must be a pleasant event while fishing in Shemu. Furthermore, the setting in the Delta suggests that in this case, the *qbw* was a pleasant breeze coming off the waters of the Mediterranean.

The texts suggest that a *qbw* could be controlled by the gods, like other winds. In the Marriage Stela, Seth is named as the deity responsible for *qbw*, *ḫwyt*, and *srq* in the Syrian mountains. However, in the wind-god texts of the Ptolemaic Period, the deified north wind is identified as *qbw* (e.g. Temple of Deir el-Medina, DEM112.4: du Bourguet 2002: 106), suggesting that the *mḥyt* was a *qbw*; the *mḥyt* was characterised before the Ptolemaic Period as cool and refreshing (see §5.1.3.2.1.2), although *qbw* was not associated with any cardinal winds then.

qbw had in general positive connotations. The miscellanies present *qbw* as a pleasurable experience when compared to the heat soldiers endured on their expeditions, and associated it with the joy of festivals. *The Pleasures of Fishing and Fowling* also implies that *qbw* was desirable in the hot days of Shemu (B 2.6–7). The much later *Instructions of Ankhsheshonq* also confirms this opposition: 'a window with a large opening gives more hot air (*šhbw*) than *qbbw*' (P. BM EA 10508, 20.14: Glanville 1955: 47; for windows, see §4.1.2.1).

At the same time, *qbw* could have negative connotations. In the foreign context of the Marriage Stela, in northern, cold, and snowy mountains, the cool *qbw* was perceived as negative. Therefore, the perception (and use) of *qbw* was dependant on the specific context an individual found themselves in.

From the little evidence available, *qbw* was a cool, sometimes refreshing, sometimes bitter wind, depending on the physical context, that is attested for both Peret and Shemu. Despite its rarity, *qbw* had ongoing use from at least the 18th Dynasty to the Coptic period.

5.1.6 *sbyt*

sbyt is translated by the *Wörterbuch* as ‘Gegenwind’ (*Wb*. IV, 89.1), which German translators have consistently followed (Assmann 1999 [1975]: 64; Hornung 1991: 176; Leitz 1994: 17); English translators have rendered it variously as ‘rebellious blast’ (Gardiner 1905: 28), ‘contrary wind’ (Bakir 1956: 14), ‘counter wind’ (Hornung and Abt 2007: 337), ‘bad wind’ (von Bomhard 2008: 161), or ‘head wind’ (Satzinger and Stefanović 2021: 333). The earliest known attestation is from the tomb of Thutmose III (KV 34: Hornung 1994: 763), and the latest from the Roman Handbook for Sekhmet Priests (P. Florence PSI I 73 + P. Carlsberg 463, l. x + 10: Osing and Rosati 1998: 199). There are eight distinct attestations, and twelve altogether. *sbyt* appears in hymns, spells, and the *Amduat*, largely in divine contexts.

The most common orthography of *sbyt* is  , with a number of expected variations (additional , becomes). However, one variation provides evidence for *sbyt*’s etymology: the addition of the throwstick (, Gardiner sign T14) before the sail, which was probably derived from the writing of *sbi* ‘to rebel’ (*Wb*. IV, 87.8–13; although was often added as a ‘dummy’ determinative, see Spalinger 2008: 144), with which it shares a lexical root (Satzinger and Stefanović 2021: 333). This occurs twice, both in Ramessid hieratic papyri (P. Cairo JE 86637, vs. 4.4: Leitz 1994: pl. 34; P. Leiden I 350, rt. 3.19: Zandee 1947: pl. 3). While these examples could be read as either *sbyt* or *sbi ṯzw*, they are both included in this corpus.

5.1.6.1 *Characteristics*

The current translation of *sbyt* derives largely from its etymology, which suggests that it was a negative wind that ‘rebels’ against the proper order, just like an enemy rebels against the king (Zandee 1947: 59). However, the textual evidence is not so clear-cut.

sbyt was portrayed as an active force that moves itself—it can ‘come (*iy*)’ and ‘go (*šmi*)’ (e.g. P. Cairo JE 86637, vs. 4.4–5 and rt. 4.1–2: Leitz 1994: 16, 364), ‘go forth (*pri*)’ (e.g. 11th Hour of *Amduat*: Hornung 1994: 763), and ‘go back (*ḫn*)’ (e.g. P. Leiden I 350, rt. 3.19: Zandee 1947: pl. 3). It seems to have some chaotic unpredictability, for in the 11th Hour of *Amduat*, both the *sbyt* and the *sḫ3* are sent against Re’s enemies by four goddesses (Hornung 1994: 763). The *sḫ3* () is a weather word only attested in this text, and so is briefly discussed here. Its orthography suggests an origin from *sḫ3* ‘turmoil’ (*Wb*. IV, 206.2–6), and thus has been translated as ‘hurricane’ (e.g. Hornung and Abt 2007: 337). Since the

shȝ-wind appears to have been associated with *sbyt*, *sbyt* can also be understood as an anarchic wind.

sbyt was also associated with other wind-words. The most prominent was *ṯȝw*; the Cairo Calendar of Lucky and Unlucky Days implies that *sbyt* could be encompassed within *ṯȝw*, among other winds, when it advises that the reader should not 'go out in any *ṯȝw*' on the day of *sbyt* (P. Cairo JE 86637, II Shemu 20, vs. 4.5: Leitz 1994: 364, pl. 34). However, in a hymn to Amun from the Ramessid Period, *ṯȝw* and *sbyt* are distinct, perhaps contrary, entities:

> *ḥsi-mw imn rn=f ḥr nwn nn sḫm.n ḫnty dm.tw rn=f ṯȝw ḥr ḫsf sby*(*t*) *ḥr ᶜn sḏȝy-ḥr grḥ=f n sḫȝ.tw=f*
>
> Amun is a water charm, when his name is upon the Nun-flood. The crocodile will have no power when his name is pronounced; the *ṯȝw*-wind is opposing, the *sbyt* is retreating, and the 'cheerful of face'-phenomenon (?), it ceases because he is remembered.
>
> (P. Leiden I 350, rt. 3.18–20: Zandee 1947: pl. 3)

Amun here has power over many types of winds, represented by two winds that sit opposite each other, *ṯȝw* and *sbyt*, in some ways like the relationship between *mḥyt* and *rsw*. The third phenomenon,  *sḏȝy-ḥr*, is unknown, but it has been suggested that it refers to a storm or wind based on this context (Gardiner 1905: 29; Assmann 1999 [1975]: 64).

> Another comparison with other winds is found in a prayer of the late New Kingdom:
>
> *i mwt mwt<t> m ir iy r NN m nfy m sby<t> m šmy m dḥrt m wbd shhw pr m r n ᶜrᶜrt*
>
> Oh male and female dead! Do not come against NN as *nfy*-wind, as *sbyt*, as heat, as *dḥrt*-phenomenon, as flame, as heat coming from the mouth of the uraeus.
>
> (P. Turin CGT 54050, rt. 5.1–2: Roccati 2011: 26)

The following lines also list the fire that comes from the mouths of Bastet and Sekhmet. All these phenomena are heat-related (*dḥrt* has the fire-determinative Gardiner sign Q7), apart from *nfy* (though its strong link to breath might relate to heat, see §5.1.2.1), and this might suggest *sbyt* was a hot wind. Similarly, in the 11th Hour of *Amduat* (see above), it is the *sbyt* and *shȝ* coming from the goddesses' mouths that condemns the sun's enemies to the burning pits, as seen in the lower register vignettes, which Hornung likened to the 'breath of death' (Hornung 1991: 175–76). If this interpretation is accepted, then it provides another aspect of *sbyt* that was antithetical to the beneficial *ṯȝw*, which is the 'breath of life' (§5.1.1.9–11).

sbyt's association with heat is further articulated in the Cairo Calendar, where the *ḥntyw*-demons (and Hathor) travelled as *sbyt* on I Akhet 4 (rt. 4.1–2: Leitz 1994: 16, pl. 4). The *ḥntyw* have been identified as hot winds, possibly from the north or northeast (van der Plas 1986: 23; Leitz 1994: 95). Given the calendars were originally written in the area around modern Cairo (based on astronomic analysis, see Leitz 1994: 8), it is unlikely that a true north wind there would be hot, but a northeast one, going over the deserts of Canaan, could well be. In the ritual world of the calendars, *sbyt* appeared on II Shemu 20 (vs. 4.4–5) and I Akhet 4 (rt. 4.1–2), which are roughly equivalent to mid-April and mid-July, respectively (Leitz 1994: 486, 495). April is the peak month for *khamsin*s, which typically begin with a hot northeasterly wind (see §3.2.2), so *sbyt* might be related to this phenomenon; however, July is not in the *khamsin* season, so the Akhet occurrence probably represents a different sort of unfavourable wind.

5.1.6.2 *Divine*

sbyt often occurs in divine contexts: it is created, controlled, and used by divine entities. In the 11th Hour of *Amduat*, *sbyt* is created (*ḫpr*) 'in the gate (of the Netherworld) from the faces of these goddesses', referring to four seated figures in the upper register scenes, during the final preparations before sunrise (Hornung 1991: 175–6). *sbyt* is here a protector of Re. Likewise, Thutmose III requests aid from Amun-Re against the Syrians by saying:

> [*di=k*] *iw n=i wᶜ n sbiw n ṯzw* [*iw*] *3 mn*[*tiw*] *im=st*
> [May you cause] a *sbiw* of wind to come to me, [with] three Montu-[gods] in it.
> (P. Turin CGT 15374, rt. 2.6: Botti 1955: pl. 17)

Montu was a war-god, and so as the vessel that carries three Montus, *sbyt* is implied to be violent. A stela of Ramesses II might also associate *sbyt* with Montu, but the lacunae make this uncertain (BM EA 440, l. 2–3: K*RI* II, 337.6).

While those sources represent a *sbyt* as created by the gods, for the gods, a *sbyt* often had negative implications. Amun, in later sources called the 'lord of the *ṯzw*' (*LGG* III, 783), could stop a *sbyt* from blowing (P. Leiden I 350, rt. 3.19: Zandee 1947: pl. 3). In the calendars, the *ḥntyw*-demons and the unjustified deceased (*mwt*) could travel in/as (*m*) a *sbyt*, spreading misfortune and disease (Megahed 2020: 129), such as on II Shemu 20, a thrice *ᶜḥz* ('unfavourable') day:

i{w}<r> mwt ᶜšȝ iyt=sn m sbyt im=k p[r] m ṯȝw nb m hrw pn

As for many dead, they shall com[e] in/as *sbyt*. You shall not go out in any wind on this day!

(P. Cairo JE 86637, vs. 4.5: Leitz 1994: 364, pl. 34)

The prayer on P. Turin CGT 54050 cited above (§5.1.6.1) is another example of the hostile *mwt* coming in/as *sbyt* (for the *mwt*, see e.g. Szpakowska 2011: 67–68). The *sbyt* is portrayed as negative for people to be outside in. On I Akhet 4, the calendars have a specific warning against boat travel during *sbyt* (P. Cairo JE 86637, rt. 4.1–2: Leitz 1994: 16, pl. 4).

sbyt was a wind of opposites, both within itself and with other winds. It seems to be the opposite of *ṯȝw*, an unpredictable, hot, and aggressive wind that could be weaponised against others; it brings death instead of life. *sbyt* could be both a tool to protect the solar journey but also have negative connotations for humankind, depending on who was wielding it, and at whom it was directed. The gods could wield *sbyt* to destroy their enemies and preserve *ma'at*; so too could the hostile dead. Translations that limit the wind to being 'bad' or 'rebellious' are reductive. *sbyt* was more like an aggressive force that can be utilised by different divine entities for different outcomes.

5.1.7 *ḏᶜ*

 *ḏᶜ* was a long-lasting weather word in the Egyptian lexicon, first appearing in the Old Kingdom. It survived into Coptic as ϫⲟ (Černý 1976: 309), as well as the composite words ϫⲓⲛⲑⲏϒ = *ḏᶜw n ṯȝw* (1976: 199), and ϫⲓⲙϕⲉϩ = *ḏᶜ n pt* (1976: 315). It is generally translated as 'storm' or 'storm-wind' (e.g. *Wb*. V, 533.11–534.6; Faulkner 2009 [1962]: 320; Lesko 2002 [1987]: II, 264; van der Molen 2000: 822; Hannig 2003: 1494; Hannig 2006: 2825), though text editions have elaborated on this with 'tornado' (Cannuyer 2010: 285), 'gale' (Allen 2015: 15), or 'whirlwind' (Kitchen 1999: 29). Unlike many other wind-words, the etymology of *ḏᶜ* is obscure; Satzinger and Stefanović (2021: 476) placed *ḏᶜ* 'storm', *ḏᶜ* 'to be stormy', and *ḏᶜ* 'to lie desolate' under a root that they tentatively identified as *ḏᶜ* 'to be stormy'. In the corpus, there are 54 attestations, of which 39 are distinct, the majority of which come from the New Kingdom, particularly the reign of Ramesses III. Prior to the New Kingdom, *ḏᶜ* appears mostly in literary and funerary texts, with two isolated examples in a hymn and an autobiography. These genres were still represented in the New Kingdom, but a higher percentage of attestations related to royal ideology.

The earliest writing of *ḏˁ* is  , from the 5th Dynasty tomb of Kaemtjanet (Saqqara no. 84: Schott 1977: 449). The throwstick relates *ḏˁ* to the concept 'foreign', either marking the foreign-ness of the entity or possibly the word itself (Allon 2010: 14). From the Middle Kingdom onwards, the throwstick could be omitted. In the inscriptions of Medinet Habu, the *ḏ*-snake was often replaced with *ns* ( , Gardiner sign F20), due to their visual similarity in hieratic (compare Möller 1909b: no. 161, 250). The Ramessid copies of the *Amduat* are also corrupted for the same reason, but instead the *ḏ*-snake is replaced with the *f*-snake (e.g. 3rd Hour: Hornung 1987: 281). Finally, *ḏˁ* could have plural markers from the New Kingdom, though most examples of this are in hieratic.

5.1.7.1 *Characteristics*

ḏˁ was a phenomenon that was situated in the *pt*-sky, often listed next to other such phenomena, as given in the *Amduat*:

> *ntsn irr ḫprt m pt m ṯzw m ḥtpw m ḏˁ m ḥ*(*wy*)*t*
> They are the ones who cause what happens in the sky, like *ṯzw*-wind,
> calmness, *ḏˁ*, and *ḥwyt*-rain.
> (12th Hour, Middle Register, 7th Scene: Hornung 1994: 830–31)

Other examples of *ḏˁ* in the presence of other weather phenomena are found in *The Shipwrecked Sailor* (*nšn*, l. 30–31: Blackman 1932: 42), *The Eloquent Peasant* (*ḥtpw*, B1 275–76: Parkinson 1991: 34), the Tempest Stela (*ḥwyt*, *šnˁ*, front l. 6–7: Helck 2002 [1975]: 106), *Khufu's Court* (*ḥwyt*, 11.14: Blackman 1988: 15), and the triumph of Ramesses III (*skzp*, K*RI* V, 93.11). In the 3rd Hour of *Amduat*, *ḏˁ* is said to emerge from the earth underneath the unjustified dead (compare *ṯzw* in Pyramid Text spell 581: *Pyr*. 1551a–c).

The consequences of *ḏˁ* were largely felt by those on the land, the Nile, or the sea. A 5th Dynasty autobiographical text from the mastaba of Kaemtjenet has a long, though fragmentary, passage on the safe conduct of the king during a *ḏˁ*:

> *ny gm.n*(*=i*) *rmṯw nb šm=sn m wzwt n ḏˁ* [*... m*] *itrw m hrw pf n sšn qz r ḫt nb*
> [...]
> (I) could not find anyone travelling on the ways because of the *ḏˁ* [… in] the river, on that day of the *sšn*-storm, higher than anything […]
> (Saqqara tomb no. 84 [=D7], C. 3–5: Schott 1977: 449)

A *ḏˁ* changed water surface conditions: in a rhetorical stela of Ramesses II, the *ḏˁ* interacts with the water of the Great Green, creating a 'wave … like the mountains' (Abu Simbel

stelae C 20 + C 22, l. 21: K*RI* II, 319.16–20.2). The same text also articulates *ḏ*^{c}'s ability to fan flames higher (compare with *ṯzw*, §5.1.1.6):

> *bzw=f sḫm im=sn mitt nsrt mḥ.n=s m kzkzw ḏ*^{c} *ḥr sz=s mi wsrt dpw.n=s m tzw khz nty nb im=f ḫpr m ssf*
>
> His might takes control of them, just the likeness of a flame after it has seized onto *kzkz*-plants with a *ḏ*^{c} behind it, like a powerful (fire) after it had experienced the heat, a rage in which everything is reduced to ashes.
>
> (Abu Simbel stelae C 20 + C 22, l. 18–20: K*RI* II, 319.9–14)

Such strength was one of the defining characteristics of *ḏ*^{c}, which is elsewhere described as 'high (*qz*)' (*The Eloquent Peasant*, B1 276: Parkinson 1991: 34) or 'great (*wr*)' (P. Sallier IV, rt. 8.7: Leitz 1994: 130, pl. 62). The sudden gallop of horses was like a *ḏ*^{c} of air (*ḏ*^{c} *n ṯzw*) in *The Satirical Letter of Hori* (18.5: Fischer-Elfert 1983: 123, see §5.1.1.6), strong and fast but unpredictable and dangerous. Ramessid royal ideology in particular made use of this characteristic, as in a rhetorical text of Ramesses III:

> *di=i mz=sn ḥm=k mi pt skzpw.ṯ*(*i*) *iwr.ṯ*(*i*) *m ḏ*^{c} *tfy.n=s mnw ḥr mnwtt*
>
> I (Amun) shall cause them to see your majesty like the sky clouded and pregnant with *ḏ*^{c}, it having removed the trees from the roots.
>
> (Medinet Habu pylon, south triumph scene, l. 19: K*RI* V, 93.11)

This implies that a *ḏ*^{c} could be strong enough to uproot a tree. This passage also describes the experience of *ḏ*^{c} hitting: the sky is covered over, heavy with the promise of *ḏ*^{c}. Perhaps these are the signs that the sailors of *The Shipwrecked Sailor* were meant to watch for in order to 'predict a *ḏ*^{c} before it came' (l. 30–31: Blackman 1932: 42). Several other texts also associate darkness or obscurity with *ḏ*^{c}, the best known being the Tempest Stela of Ahmose:

> [^{c}*ḥ*^{c}*.n rd.n*] *nṯrw iwt pt m ḏ*^{c} *n ḥ*[*wyt kk*]*w m r-*^{c} *imnt pt šn*^{c}*.ti n wn*[*t zbw*]
>
> [Then] the gods [made] the sky come in a *ḏ*^{c} of ra[in and dark]ness in the western region, the sky being clouded with[out cessation].
>
> (Karnak Inv. K41, front l. 6–7 + back l. 8–9: Helck 2002 [1975]: 106, with reconstructions by Allen and Wiener 1998: fig. 1)

While here *kkw* is used for darkness, a passage in *The Dialogue of Ipuwer and the Lord to the Limit* employs *wḫt* (P. Leiden I 344, rt. 7.13: Enmarch 2005: 39). The Tempest Stela further defines the darkness as being *šn*^{c}*.ti*, a verbal form of *šn*^{c}, 'cloud' (see §5.2.7.1). Two later sources further build on the experience: a Third Intermediate Period magical papyrus has a spell that recalls how Horus went into the desert (*ḫzst*) while 'the sky was in *ḏ*^{c} and the earth was blinded' (P. Boulaq 6, 5.6: Koenig 1981a: pl. 5); while the Late Period naos of el-Arish

discusses the effects of a *ḏ*^{c} darkness, where 'people and gods could not see his second' (l. 7–8: Verhoeven 1991: 329; see §5.2.12.1). These descriptions might suggest a sandstorm—compare with this account by artist Myrtle Broome at Abydos in December 1929: 'Outside nothing is visible but driving sand, all the scenery is blotted out like in a sea mist' (Young 2021: 91; see also §3.2).

The sound of the *ḏ*^{c} is also mentioned; in the Ramessid texts, the pharaoh 'roars' (*khȝ*: *Wb*. V, 136.14) against his enemies as *ḏ*^{c}, while his war-cry is like 'Ba'al in the sky' (Second Libyan War of Ramesses III, Medinet Habu: K*RI* V, 58.10). Loud noise is also mentioned in the Tempest Stela, where it is '[…]er than the [voi]ce of the *rḫyt*-people, […] on the hills than the sound (*ḫrw*) of the cavern in Elephantine' (front l. 7–8, back l. 9–10: Helck 2002 [1975]: 106), though the crucial adjective is missing. These instances of loud noises might refer to thunder, particularly given that Seth/Ba'al's *ḫrw* (*m*) *pt* is well attested as thunder (§5.2.11.2), and the Tempest Stela passage speaks of how the *ḫrw* (voice/sound) of the people and the cavern are lesser to *ḏ*^{c} in some fashion. A different interpretation was offered by Vandersleyen (1967: 134), who argued that the loudness was the sound of the rain striking the ground; the wind itself however could be the source, since other types of winds have also been described as a human voice (see §5.1.1.5, §5.1.3.2.1.2). Regardless, it seems that a loud sound could be closely associated with *ḏ*^{c}.

Regarding the temperature of *ḏ*^{c}, *The Eloquent Peasant* implies it is cold when the peasant describes the good things the high steward could cause:

mi ḥtp pt r-sȝ ḏ{d}^{c} *qȝ sšmm=s ḥsw nb*

Like the sky becoming calm after a high *ḏ*^{c}, when it (the sky) warms all who were cold.

(B1 275–76: Parkinson 1991: 34)

The implication here is that the high *ḏ*^{c} is why people are cold, and they are warmed by the sunlight of a calm sky. The contrast between sunshine/warmth and *ḏ*^{c}/coolness might also be suggested in a passage of *Ipuwer*:

mtn iwty šwytt=f m nb šwyt nbw šwyt m wḫ{ȝ}<t> n(*t*) *ḏ*^{c}

See, he who had no shade is (now) an owner of shade, while all who had shade are (now) in the darkness of the *ḏ*^{c}.

(P. Leiden I 344, rt. 7.13: Enmarch 2005: 39)

Normally, having shade was an indicator of status, protecting the wealthy from the glare and heat of the sun while others worked, as seen in the 18th Dynasty tomb of Nakht (TT 52: Davies 1917: pl. 18). The shade provided shelter and coolness. In the second clause, those

who had such shade now have a different sort of shade, a threatening one, an inverse of what they had before (Enmarch 2009: 137). A shade is now overwhelming darkness, a coolness that was once welcomed now makes you shiver.

As for how *ḏ*^{c} impacted lived experience, the texts focus on people staying sheltered during a *ḏ*^{c}, and not going near any body of water. A hymn to Nun from the Ramessid Period says that:

> [*ir*] *ȝt nšny* [*pt m*] *ḏ*^{c} *nn* ^{c}*ḥ*[^{c}*=tw*] *m hȝw=k* {*d*}<*r*>*hn*[*.tw*]*=k m hrw* [*ḥtpw*]
> [As for] the moment of the *nšn*-storm, [the sky is in] *ḏ*^{c}, [one] will not sta[nd]
> in your (Nun's) vicinity. You may be waded through on [peaceful] days.
> (O. Turin CGT 57428, rt. 5–7: Fischer-Elfert 1997: 98)

The Calendar of Lucky and Unlucky Days is more direct; when *ḏ*^{c} strikes, one 'should not go on any boat on that day' (P. Sallier IV, rt. 8.7: Leitz 1994: 130). In *The Shipwrecked Sailor*, it was a *ḏ*^{c} that caused the ship to sink (l. 32–33: Blackman 1932: 42), and while the ship ferrying the king in Kaemtjenet's autobiography did not sink during the *ḏ*^{c} recalled, it was very much a dangerous endeavour, and no one besides Kaemtjenet would attempt it (l. 3–6: Schott 1977: 449). In these circumstances, *ḏ*^{c} was frequently associated with the raging *nšn* (see §5.2.12.1). The Tempest Stela continues to describe the destruction possible in an extremely ferocious *ḏ*^{c}, involving rain and subsequent flash flooding, and a lack of light (Karnak Inv. K41, front l. 8–10 + back l. 10–12: Helck 2002 [1975]: 106–7). In short, a *ḏ*^{c} could be so dangerous to Egyptians, that they probably did not venture outside unless necessary.

Two sources link *ḏ*^{c} with a specific time of year. In the ritual calendars, III Akhet 19 (late September) is said to be the day of the 'birth of the great *ḏ*^{c} of the sky' (P. Sallier IV, rt. 8.7: Leitz 1994: 130, 488). Early autumn is a meteorological unsettled period, with ARST-events, weaker khamsins, and duststorms possible (§3.2.2). In the fantastic *Tale of Khufu's Court*, the *ḏ*^{c} sent by the gods happens on I Peret 15, after Ruddjedet has given birth (9.15: Blackman 1988: 12), which would be around January, based on a late Second Intermediate Period composition date (see Stauder 2013: 508). However, as the latter example is miraculously created by the gods it cannot connect *ḏ*^{c} reliably with Peret.

It seems that a *ḏ*^{c} was a strong wind. In some circumstances (e.g. *The Eloquent Peasant*, B1 275–76; *Ipuwer,* rt. 7.13), *ḏ*^{c} could designate a sandstorm specifically fuelled by a cold wind, with associated (but not concurrent) rain. While dust- or sandstorms are more commonly hot, several historical sources describe the cold variety. Petrie's journal from his time at Hawara states:

> … as I slept in my tent there a gale sprang up, very cold & laden with sand … in the [following] afternoon the gale rose still more, & after sunset blew furiously, the whole air so full of sand that one could not see 50 yards. Luckily we have not yet had any hot winds to speak of; but this is the second cold sandstorm.
>
> (March 1889, Petrie MSS 1.8: 99–100)

This description matches many of the physical characteristics of *ḏʿ* discussed above: powerful, cold, obscuring, sandy; other accounts also mention rain afterwards.

5.1.7.2 *Conceptualisation*

ḏʿ was incorporated into Egyptian ideology in several ways. Until the 19th Dynasty, *ḏʿ* was universally a negative force that invoked danger and uncertainty. Gods are once attested creating a *ḏʿ* to obscure their activities (*Khufu's Court*, 11.14: Blackman 1988: 15), but typically when the gods (or by extension, the king) are mentioned alongside *ḏʿ*, they are working against *ḏʿ*. *The Hymns to Senwosret III* describes the king protecting the people:

> *isw ḏw p*[*w*] *mḏr ḏʿ r tr n nšnn pt*
>
> H[e] is the mountain that blocks the *ḏʿ* at the time of the sky's raging.
>
> (P. UCL 32157, 2.19: Collier and Quirke 2004: [pl. 2])

ḏʿ is here mapped to the domain of 'chaos', producing the metaphor of 'chaos is a *ḏʿ*', which the king protects against. Kaemtjenet's autobiography might even suggest that the crew of the sun barque would keep a *ḏʿ* away from Re in the solar cycle, since at the end of the river journey, the unnamed king praises Kaemtjenet because 'it was like the journey of Re on the great lake [of heaven]' despite the *ḏʿ* raging around them (C. 8: Schott 1977: 449). *The Teaching of Menena* apparently takes an almost direct quote from *The Shipwrecked Sailor* (l. 32–33: Blackman 1932: 42) and transforms it into a metaphor for insurmountable adversity by removing the original narrative context:

> *sr n=k pȝ ḏʿ bw iyt=f pȝy=i ṯȝw* [*ḥ*]*si* […] *m mni wȝḥ=i mdwt m tnw nb*{*t*} *m-bȝḥ=k ptri bw sḏm=k mtr=i r mtnw nb*
>
> The *ḏʿ* was foretold for you before it came, my [fe]eble *ṯȝw*-breath […] in mooring. I have set out words in every number before you. See, you have not heeded my teaching in any way.
>
> (O. Chicago OIC 12074 + O. IFAO Inv. 2188, rt. 1–2: K*RI* VI, 215.14–16)

Having not heeded Menena's words, the son cannot hope to survive the figurative *ḏ*^{c}, the troubles that are coming his way. The weather in *The Shipwrecked Sailor* also carried this implication, as the sailors could do nothing against the *ḏ*^{c}, which takes them by surprise.

The Ramessid Period saw a shift in the use of *ḏ*^{c}. It was still dangerous, but a *ḏ*^{c} was primarily conceptualised as the king's power, supporting royal ideology. The prologue text of Ramesses III's second Libyan war describes the king as:

> *ḏ*^{c} *kh m nḥȝ=f m-sȝ nȝ pḥ s*(*w*) *mȝȝ=sn* [*hm*]*hmwt=f mi b*^{c}*yr m ḥrt*
>
> A *ḏ*^{c} roaring in its violence, in pursuit of those who attack him; when they (the enemies) are seen, his [war]-cries are like Ba'al in the sky.
>
> (Second Libyan War, Medinet Habu, l. 21–22: K*RI* V, 58.10–11)

The power of *ḏ*^{c} was mapped to the might of the pharaoh, alongside that of bulls (l. 13: K*RI* V, 57.15) and lions (l. 21: K*RI* V, 58.9), in order to destroy Egypt's enemies (Redford 2018: 60). This motif recurs in the main text of the campaign:

> *r*^{c}*-ms-sw nwš m ȝ*^{c}*y=f sft m dmt* [*... pȝ*]*y=sn ḏfḏ ḥȝn* (*?*) *nn gmḥ* [*...*] *m*^{c}*tnw š*[*r*]*i*(*.w*) [*d*]*bit*(*.w*) *n-ḥr=sn pȝ tȝ m ḏ*^{c} *m-sȝ=sn ḥr tȝ p*^{c}(*t*)*=sn ḫ*^{c}*=w hw m ḏrt=w ib=sn ḫm.w smnw*
>
> Ramesses, the one who expels through his force and slaughters with the blade
> [… th]eir pupils afflicted (?), without being able to see […] the roads were
> bl[oc]ked and [st]opped up before them, while the land was a *ḏ*^{c} behind them,
> taking their people. Their weapons fell from their hands and their hearts knew
> no firmness.
>
> (Second Libyan War, l. 27–28: K*RI* V, 62.8–11)

The Libyans are trapped, with destruction all around, and are stricken with fear. Some manage to flee, if only temporarily (l. 30: K*RI* V, 62.14–63.2), but most die at the hand of the pharaoh in this moment. *ḏ*^{c} expresses the sheer devastation that his strength (and his army's) created: it is all-encompassing, dangerous to the unsheltered, and so powerful that weapons are useless. The reference here to eyes being unable to see might be connected to obscurity within a *ḏ*^{c} or sand-laden wind irritating the eyes. Both of these readings would suit a sandstorm.

If we return to the prologue of the war, there is a parallel in one Middle Kingdom version of *The Teaching of Ptahhotep* (P), about treating your wife properly:

> *im=k wḏ*^{c} (*?*) *s*(*y*) *rwyt sḫr s*(*y*) *r sḫm ȝrd s*(*y*) *ḏ*^{c}*=s pw irt=s mȝȝ=s swȝḥ=s pw m pr=k*

> You should not judge (?) her, remove her from power, or restrain her. Her eye is her *ḏ*^{c} when she sees. She is the one who will make her endure at your house.
>
> (Maxim 21, verse 331–35: Jéquier 1911: pl. 6 [P])

This is the only example of non-royalty being described partly or wholly as *ḏ*^{c}. The wife's gaze, instead of the pharaoh's might, is likened to a *ḏ*^{c} when she 'sees' something, presumably if she sees any of the mistreatment described in the previous sentence (for a detailed discussion, see Beatty 2005: 40; for a different reading, see Žába 1956: 88). This is very similar to the imagery of Ramesses-as-*ḏ*^{c} from the Libyan War prologue: when Ramesses and the wife see (*mɜɜ*) their problem, they are both characterised as *ḏ*^{c}, albeit in different ways. It seems unlikely that the Ramessid text was alluding to *Ptahhotep*, especially as by the New Kingdom another textual tradition of *Ptahhotep* had became dominant (Hagen 2012: 248), which has a different text (as seen on P. BM EA 10509, 6.2–3: *ḏ*^{c} *pw st iri=s mɜɜt=s swɜ*[*ḥ=s pw m pr*]*=k*; Caminos 1956: pl. 28). Nevertheless, this striking parallel provides us with further evidence for how *ḏ*^{c} could be deployed metaphorically, in contexts describing sudden and frightening outbursts of anger.

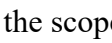
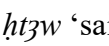
In medical texts, *ḏ*^{c} could also refer figuratively to gaseous substances of the human body. P. Ebers gives a remedy for someone who 'is with many *ḏ*^{c}s without knowing (how to stop) it' (case 139, 31.8–9: Grapow 1958: 250.16–17), while P. Carlsberg VIII suggests that if a woman 'makes *ḏ*^{c} from her rectum' in response to a test, she will give birth (vs. x + 6–2.1: Jiménez-Serrano *et al.* 2020: 177; see similar in P. Brugsch, case 194, rt. 22.7–8: Wreszinski 1909: pl. 22). This bodily *ḏ*^{c} has been interpreted as uncontrollable flatulence (e.g. Bardinet 1995: 269; Westendorf 1999: 570) or a build-up of stomach gases (e.g. Walker 1996: 232–33). The former is more plausible because of the gusty nature of the meteorological *ḏ*^{c} in other texts.

5.1.7.3 *Summary*

ḏ^{c} was a strong and powerful phenomenon, whose characteristics could include darkness from blocking out sunlight, loud noises (though the cause(s) of this are debatable), forceful winds, coldness, and rain. Darkness, noise, and strength seem to have been the core characteristics of *ḏ*^{c}, while coolness and rain were invoked far fewer times. These elements suggest that *ḏ*^{c} should be understood as a type of powerful wind that could, at least on occasion, be cold and sand-laden, and on rare occasions brought rain. The metaphorical use of *ḏ*^{c} took its cue from the dangerous aspect of the physical phenomena, but its meaning in

texts shifted from being a 'storm' the king would guard against prior to the Ramessid period, to being the king's 'storm' against his enemies, striking terror into their hearts.

5.1.8 *Final thoughts on the sail-determinative*

The sail-determinative marks words as belonging to the conceptual sphere of 'air', where the sail is a 'container for contents' metonym, and a smaller sphere of 'boat travel'. The latter falls outside the scope of this thesis, and only includes  *nf* 'sailor' (*Wb*. II, 251.1–2) and  *ḥtȝw* 'sail' (*Wb*. III, 182.16). Some nautical terms appear to fall into this category, but are actually compounds that end with *ṯȝw* ( *ḥȝ-ṯȝw* 'backstay',  *ḫt*-(*n*)-*ṯȝw* 'mast': Jones 1988: 174, 182). Overall, lexemes with the sail-determinative form the majority of the corpus for weather-related terminology from the Old to New Kingdoms, with 3021 attestations. These words increased in frequency over time, and are clustered in Upper Egypt. This distribution is to be expected, given issues of preservation and archaeological biases (see Björkman 1964: 12).

Ancient Egyptian contains multiple unique words for different types of wind. Broadly speaking, winds that were represented in the lexicon had directional-, temperature-, strength-, or value-based characteristics, and their names were drawn from that dominant characteristic. The two exceptions are *ṯȝw* and *ḏ*^{c}. Both of these have uncertain etymologies, and are among the first wind-words textually attested, from the 5th Dynasty. Both are also very complex in meaning and defy a singular translation.

Given the predominance of *ṯȝw* (~2500 attestations), the fact that it could stand in for other wind-words, its influence in the orthography of wind-words (§5.1.1.2), and its early admission into the lexicon, it is most likely that *ṯȝw* was the basic-level, or generic, term to which all other wind-related words were subordinate (for the criteria, see Goldwasser 2002: 32). A *nfy*, *mḥyt*, *rsw*, *imnty*, *iȝbty*, *mȝ*^{c}*w*, *qbb*, *sbyt*, and *ḏ*^{c} could all be reductively described as a type of *ṯȝw*, but the reverse was not true. For this reason, *ṯȝw* was the only wind whose creation at the beginning of the world is explicitly described in the texts (§5.1.1.3). All other winds were subordinate to *ṯȝw*, and so were implicitly created when *ṯȝw* is. The generic status of *ṯȝw* was thus reflected in Egyptian cosmogony.

5.2 The Rain-Determinative

 (Gardiner sign N4), a sky with vertical lines beneath it, has been interpreted as depicting rain, particularly as one writing variation replaces the vertical lines with zig-zags, the

Egyptian sign for ‘water’. Some academics have gone so far as to call it the ‘weather’ determinative (e.g. Allon 2007: 18), but this definition is not supported by the data, since the wind and rain groups are clearly distinguished in the Egyptian script. The rain-sign was used to determine words concerning clouds (*igp*, *ḥꜣty*, *ḫꜣty, sim*), dew (*iꜣdt*), rain (*ḥwyt*, *smn*), snow (*srq*), and storms (*nšn*, *ḫꜣpt*, *ḫꜣḫꜣty*, *šnit*/*šnᶜ*, *qri*); it could also determine some types of illnesses that were phonetically or morphologically associated, as with *ꜣgꜣp* (*Wb*. I, 22.9), *idw* (*Wb*. I, 152.13–15), and *ḥꜣty* (*Wb*. III, 35.13–14). Gardiner sign N4 was increasingly replaced with Gardiner sign S15 () over time, as the two signs share a similar appearance, or simply by the sky ( , Gardiner sign N1).

Unlike the sail-sign, the rain-sign never achieved iconographic status, and it was not used in visual art outside of hieroglyphic script. While the *pt*-sign was frequently used to indicate the sky in temple and tomb wall decoration (e.g. in the colonnade of the temple of Luxor, Epigraphic Survey 1998: pl. 160),  was not utilised as a frame, probably because any symbolic value did not outweigh the fact that the descending elements would interrupt the scene. Furthermore, the features that determines were not requested in standard funerary formulae, so unlike the sail-determinative, there was no reason for figures to be depicted holding it (see §5.1.1.11).

5.2.1 *ḥwyt*

This section covers the noun *ḥwyt* and the verb *ḥwi* from which it is derived, in the context of rain. *ḥwyt* has been translated as ‘rain’ or ‘rainwater’ (*Wb*. III, 49.1–4; Faulkner 2009 [1962]: 165; Meeks 1998: 188; van der Molen 2000: 317; Hannig 2003: 781; Hannig 2006: 1627), occasionally with a stormy connotation, while *ḥwi* is translated as ‘to rain’ (*Wb*. III, 48.23; Faulkner 2009 [1962]: 165; Lesko 2002 [1987]: I, 303). The same words are found in Demotic (*ḥw*(*y*): *CDD ḥ* [09.1]: 67, 73), and in Coptic, as ϩωογ (Černý 1976: 304). While *ḥwi* and *ḥwyt* are spread across a wide range of text types (e.g. hymns, medical treatises, letters, royal tales, literature, visitor inscriptions), they are noticeably absent from Middle and New Kingdom funerary literature, apart from once in the *Amduat* (12th Hour: Hornung and Abt 2007: 372). In total, there are 48 attestations for *ḥwyt*, 29 of which are distinct; *ḥwi* as ‘to rain’ appears 16 times.

ḥwyt is probably a participle of *ḥwi*. Both words are derived from the root *ḥwi* ‘to strike, beat’ (Roquet 1973: 158; Zivie 1984: 202), and are thus also related to *ḥwi* ‘to flow’ (*Wb*. III, 48.16–22), *ḥwy* ‘(inundation) flood’ (*Wb*. III, 48.24), and *ḥꜣy* ‘to overflow’ (*Wb*. III, 13.5–8;

Satzinger and Stefanović 2021: 275–76; although note alternative etymology excluding *ḥwi* ‘to strike’: Vycichl 1983: 318). The link between the concepts of ‘beating’ and ‘raining’ seems to be rain hitting the ground repeatedly (see Lopez 1972: 111–15; Roquet 1973: 158–59). Looking at the other words derived from the same root, many refer to circumstances where the ‘beating’ resulted in the dislodgement of part of what was being hit: *ḥwtt* ‘quarry’ (*Wb*. III, 6.6) and *ḥwi* ‘to collect (crops)’ (*Wb*. III, 47.4–6) fall into this category, and even the word *ḥwi* ‘to beat’ has a similar connotation in its earliest attestations, where it is used to describe flax being beaten in order to remove unwanted woody fibres (e.g. farming scene in the 5th Dynasty mastaba of Ty: Steindorff 1913: pl. 121; for linen production, see Vogelsang-Eastwood 2000: 271). In the case of *ḥwi* ‘to rain’, rain eroded the rock, and resulting wadi floods moved large amounts of material (see e.g. §3.3.3)

The original writing of *ḥwyt* was *ḥwt*, with the phonetic signs  ,  , and . Throughout history, was always present, and was rarely omitted. From the Middle Kingdom onwards, the *w*-chick was either replaced with or omitted entirely, and the double reed leaf was added, possibly due to phonetic changes (Schenkel 1962: §14; see §5.1.3), and this became the normal way to write the nominal *ḥwyt*.

While *ḥwyt* was originally determined with  , this becomes obsolete by the early Middle Kingdom, and was replaced instead with . Another Middle Kingdom addition is (Gardiner sign A25), which was almost always inserted between *ḥ* and *y*(*t*). This hieroglyph is relatively rare, and only occurs in words whose stem is *ḥwi* (Gardiner 1957: sign A25). Late Egyptian hieratic writings of *ḥwyt* give greater emphasis to this determinative, often tripling it by writing , as the last sign (Gardiner sign A24) has very similar connotations (and was often confused for), and the middle sign (Gardiner sign Z12) is simply an abbreviated hieratic form of / (for the evolution of , see Gardiner 1907).

Verbal *ḥwi* written with is unattested, but many examples have clearly celestial contexts (e.g. visitor inscription of O. Glasgow D.1925.88, l. 3: McDowell 1993: 29). Therefore, the orthographic omission of cannot be used as a criterion for fluvial meaning. Furthermore, a lone cannot be unproblematically read as *ḥwi*, as Davies (2001: 57) does in his publication of the Kurgus stelae of Thutmose I and III (l. 3), since the verb *ḥwi* has no attestations written with the rain-determinative.

5.2.1.1 *Characteristics*

As a verb, *ḥwi* was an action of the *pt* sky, as seen in the Ramessid dreambook, where if a man sees himself in a dream:

ḥr mȝ pt ḥw ḏw mḏwt iy.ti r=f

seeing the sky *ḥw*ing—bad, disputes have come against him.

(P. Chester Beatty III, rt. 9.8: Gardiner 1935: pl. 7)

The dreambook also indicates that the sky *ḥw*ing was a visible phenomenon, something that could be seen (*mȝȝ*). When used alongside *ḏ*^{c} in the Tempest Stela (front, l. 7: Helck 2002 [1975]: 106), *ḥwyt* is described as being dark (see §5.1.7.1), but as no other attestations of *ḥwyt* employ this imagery, this was perhaps a feature related to *ḏ*^{c}. The visible aspect of *ḥwyt* might primarily be the falling rain drops.

As a noun, *ḥwyt* was a relatively passive entity; there are very few examples of *ḥwyt* acting for itself; rather, it was created or moved by others. The visual experience of *ḥwyt* was mostly associated with water; unlike many of the other rain-determinative words studied here, *ḥwyt* appears to have intrinsically included rain. The liquidity of *ḥwyt* might be suggested by the well-attested visitor inscription formula (see McDowell 1993: 29–30; Navratilova 2015 [2007]: 254), as in this 18th Dynasty example:

ḥw pt m ^{c}*ntiw wȝḏ ḏf<ḏf>w=s m snṯr ḥr tp nt ḥwt-nṯr nt ḥr snfrw*

May the sky *ḥw* with fresh myrrh, may it drip with incense upon the roof of the temple of the Horus Sneferu.

(Graffito in mortuary temple of Sneferu, Meidum, l. 9–10: Petrie 1892: pl. 33)

The verb '*ḏfḏf* (to drip)' (*Wb*. V, 573.15) was not normally associated with rain, but rather teardrops and liquid aromatics. However, in some versions of this formula *ḏfḏf* is determined with 𓉐 (e.g. Cairo ostraca no. 430 + 432, l. 4: Hassan 2017: fig. 1–2), connecting the second clause with weather as well. While smell might have also linked *ḥwyt* and incense (compare with *iȝdt*, §5.2.3.1), this metaphoric mapping of incense onto rain was probably based on physical shape. When the sap of incense trees emerges, it creates small droplets of sap that are then harvested (Serpico and White 2000: 438–42); thus incense could look like raindrops, and specifically large, bulbous drops (Weber 2020: 115). By making this wish, the temple was once again provided with incense, a key aspect of a sacred space.

The flowing nature of *ḥwyt* appears in the tale of Isis and Re, as preserved in magico-medical papyri, when Re describes the effects of a snakebite:

pt ḥw ḥr ḥr=i m try n šmw

The sky *ḥw*s on my face at the time of Shemu!

(P. Turin CGT 54051, rt. x + 3.5: Roccati 2011: 70)

Shemu is mentioned here as a metaphor for the heat of his fever (which is 'hotter than fire', rt. x + 3.4), and the sky *ḥw*ing is the sweat running down his face. Elsewhere, *ḥwyt* could involve a large quantity of water, which could create flash floods, and in this situation, *ḥwyt* is paired with *snm* 'torrent' (§5.2.2.1), as in the Tombos stela of Thutmose I, where the Nubians are defeated, and 'their blood is like *snm*s of *ḥwyt*' (l. 8: *Urk*. IV, 84.9). The king has defeated so many Nubians that the quantity of blood he has spilt is likened to an actively flowing flash flood, the result of a *ḥwyt*.

5.2.1.2 *Effects*

The end results of *ḥwyt* were often the focus of texts. *ḥwyt* that fell on the ground could be collected and ingested, which was particularly valuable in the deserts. An expedition inscription in the reign of Montuhotep IV from Wadi Hammamat describes the result of a *ḥwyt* in the wadis, viewed as a miraculous event:

> *wḥm bi3t irt ḥw m33 ḫprw nw nṯr pn dit b3w=f n rḫyt irt ḫ3st m nwy bst* (*?*) *mw ḥr nḫ3 n inr gmt ḫmnt m ḥr-ib int*
>
> The repetition of a wonder: the making of *ḥw*, seeing the forms of this god,
> giving out his power to the *rekhyt*—making the hill country into pools.
> Welling up (?) of water on the rough surface of the stone. Finding a well in
> the middle of the wadi.
>
> (WH no. 191, l. 2–3: Couyat and Montet 1912: 97–98)

The appearance of water in the form of a pond (*nwy*) and well (*ḫmnt*) was seen as the result of the *ḥwyt* sent by an unnamed god, possibly Min (see Olette-Pelletier 2023: 775). The abbreviated spelling of *ḥw*(*yt*) in this passage has led to other scholars interpreting *ḥw* as 'divine action' (*Wb*. III, 44.7; see Lloyd 1975: 54–59), but given that multiple water features appear as a result, *ḥw*(*yt*) fits the context best (Shirun-Grumach 1993: 11). When traversing the desert, water supplies were critical, and any source of fresh water would be particularly welcomed (e.g. Köpp 2013: 20–21). The Qanais inscription of Seti I directly comments on this requirement, when the king exclaims upon surveying the desert 'how difficult is a road that has no water! What happens to the troop, then, to destroy the parching of their throats?' (K*RI* I, 66.2–3). Similar themes are found in the 26th Dynasty Tell Defanna stela (l. x + 8–15: Petrie 1888: pl. 42; see below), though this time well outside of Egypt, when *ḥwyt* occurs on the Mountain of Punt (probably in the northern Arabian Peninsula, see Cavasin 2019: 7–9) during an expedition to obtain frankincense. That *ḥwyt* is also described as a wonder (*bi3t*), because it provided fresh water where it was scarce.

One of Taharqa's stelae from Kawa has an evocative image, though perhaps influenced by Nubian perceptions:

is gr(*t*) *ḥw*(*y*)*t pt m tȝ-sty stḥn.n=s ḏww r-ḏr=sn*

Now, the *ḥwyt* of the sky was in Tasety, and it had made the hills glisten in their entirety.

(Ny Carlsberg Glyptothek *Æ*IN 1712 [Kawa V], l. 9: Jansen-Winkeln 2009: 136)

This is one of several wonders; another concerns an excellent inundation (l. 6–7: Gozzoli 2010: 194). It suggests that the water of *ḥwyt* could create a shimmering effect on the land, catching and reflecting the sunlight like glistening faience (for *sṯḥn*, see Corcoran 2016). The word for 'to glisten' in this passage is *sṯḥn* (*Wb*. IV, 359.14–360.9), and itself is written with a modified version of the rain-determinative:  . *sṯḥn* normally carries the faience-determinative,  (Gardiner sign S15), which typically was used for words related to shininess. Its similarity in shape to  also led to orthographic misunderstandings (see §5.2), however, examples like Taharqa's stela suggest that this orthography picked up on the already present association between rain and shininess, and as such resonated with the Egyptians (see also later at the Opet temple of Karnak, KIU 1780: de Wit 1957: fig. 2). Equally, the *ḥwyt* could be problematic for the Egyptians. Mudbrick, the most common building material, notoriously melts when exposed to water (Correas Amador 2013: 346). When Sarenput I of Elephantine restored the chapel of Heqaib, he erected a stela describing its prior condition:

ꜥ(*w*)[*t*]*=s nbt mḥ.t*(*i*) *m ḫmꜥw ḫpr ḥ*(*wy*)*t i*<*w*>*=s mḥ.t*(*i*) [...] *rn ꜥnḫ*(*.w*) *dbt wš.t*(*i*) *ꜥm.n tȝ swrt=s*

All its roo[ms] were filled with rubble, (and) when *ḥwyt* occurred, it became full [of mud? water?]. The name lived, but the bricks were destroyed, and the earth had swallowed its drinking place.

(Aswan no. 1373, l. 7–8: Franke 1994: pl. 1)

While this could be floodwaters, not rain, another example specifies the sky *ḥwi*ing. A late 20th Dynasty letter from Djehuty to Butehamun states:

ḫr m-di nȝw sḫȝw i.ḥw tȝ pt r=w m tȝ ꜥt n sḫȝ ḥr-šri pȝy=i <*it*> *iw=k in=w r-bnr iw=n gm=w r ḏd bwpwy ft*

Now as for the documents onto which the sky *ḥwi*ed in the house of the scribe Horisheri, my <(grand)father>, you brought them out, and we found that (they) had not become erased.

(P. BM EA 10326, rt. 2.20–21: Janssen 1991: pl. 37)

The documents had been left inside the house of Horisheri (possibly in the *ꜥt pȝ rdwy* 'room of the stairs' to judge by rt. 20.19–20; see Wente 1967: 40); this has been identified as house SO II at Deir el-Medina, abutting the western wall of the settlement (Bruyère 1939: 315, pl. 29). This location would have been susceptible to rain run-off coming down from the hills to the north and northwest (for wadi floods at Deir el-Medina, see e.g. Gobeil *et al.* 2023: 185, 189, 192, 194). Even without a strong flash flood, gradual water erosion can wear away mudbrick (contra Leblanc 1995: 202). Alternatively, the *ḥwyt* could have entered directly through a leak in the roof. The phrasing of *ḥwi tȝ pt* supports this, as it strongly links the *ḥwyt* and the sky in a way that might not be expected if it was water run-off (compare with *mw n pt*, §5.2.2.1). Regardless of how the rainwater gained access to the house, the two men found that their papyri and their contents had not been damaged by the water. Adding water and rubbing was done to erase ink when correcting mistakes or reusing papyrus (Skeat 1995: 80; e.g. P. Berlin P3024: Gardiner 1909: pl. 16–17); the concern of Djehuty that water might damage the contents is easily understood. They then moved the papyri to the (not yet identified) *mꜥḥꜥt*-chapel of Djehuty's great-grandfather (rt. 2.22), presumably to keep them safe in the event of future *ḥwyt* incidents.

Finally, a stela of Taharqa provides a parallel for the effects of *ḥwyt* on mudbrick structures:

> *gm.n=f ḥwt-nṯr tn qdwt m ḏbt pḥ.n qȝȝt iryw tp-ḥwt=s <ȝ>ᶜᶜ m ȝḫt r tr n rnpt snḏ n ḫpr ḥw*(*y*)*t*
>
> He found this temple, which was built with mudbricks, but a high mound thereof had reached its roof, which had been covered over with soil at the time of a fearful year due to the occurrence of *ḥwyt*.
>
> (Khartoum no. 2678 [Kawa IV], l. 10–11: Jansen-Winkeln 2009: 134)

While Macadam originally interpreted the covering with soil as a protective feature against *ḥwyt* ('at the time of year when one fears the occurrence of *ḥwyt*': Macadam 1949: 14–21), the following lines suggest that a *ḥwyt* had caused the mudbrick to melt and leave mounds of mud, which was 'not good in the hearts' (l. 15; see Ritner 2009: 539).

5.2.1.3 *Seasonality*

The Wadi Hammamat expedition inscription cited above was written on II Akhet 23, which when adjusted, is roughly January–February (von Beckerath 1997: 198). This wadi is on the western edge of the Red Sea mountains, an area more likely to receive rain directly or

indirectly than at the same latitude in the Nile Valley (see §3.3.2), due to the process of orographic uplift, which forces air carrying moisture from the Red Sea upwards to form clouds (Rothe *et al.* 2008: 3; Sidebotham *et al.* 2008: 22). This rain is most common in winter and autumn, often as part of an ARST event (see §3.2.2), which may well be what the inscription records.

In his Marriage Stela, Ramesses II was grateful that no *ḥwyt*, *srq* (§5.2.4), or *qbw* (§5.1.5) delayed the arrival of the Hittite princess, who would become his wife, Maathorneferure (Marriage Stela: K*RI* II, 249.4–15). These three phenomena were clearly a threat to people traversing the Levant from the Egyptian perspective. *ḥwyt*'s juxtaposition with 'snow' and 'cold wind' also implies that *ḥwyt* was cool, at least in this context. Furthermore, the text notes that these phenomena occur in Peret, which was October–January at this time (after von Beckerath 1994: 122). Thus, according to the Egyptians, *ḥwyt* could occur in the Levantine mountains during winter.

The Tell Defanna stela mentions that the *ḥwyt* occurred in IV Peret, adjusted to ~August–September (von Beckerath 1997: 197–99), when 'it was not its time in the cities of Lower Egypt' (l. x + 14: Petrie 1888: pl. 42; Cavasin 2019: 8–9). This implies an awareness of what time of year to expect *ḥwyt* in different regions, and modern records would agree that the winter rains of the Delta do not usually start in August (see §3.3.1).

5.2.1.4 *Divine aspects*

It is apparent from several texts that the gods had control over *ḥwyt*. An unnamed god (probably Min) in the Wadi Hammamat graffito created the miraculous *ḥwyt* (see §5.2.1.3). In *The Tales of King Khufu's Court*, the gods present at the birth of the three kings (Isis, Nephthys, Mesekhenet, Heqet, and Khnum) together created a *ḏ*^{c} *n ḥwyt* to allow them to return to the house in order to perform a wonder (11.14: Blackman 1988: 15). The same phrase appears in the Tempest Stela, though this time the gods are not specified, and the event is catastrophic (Karnak K41, back, l. 8: Helck 2002 [1975]: 106). In the *Amduat*, *ḥwyt* is also among the list of 'what happens in the sky' which were created by the entourage of Re (12th Hour, Middle Register: Hornung 1994: 831). In the Marriage Stela, Seth refrains from making *ḥwyt* (K*RI* II, 249.4–12). In the later Naos of the Decades, Shu is the one who 'brings the *ḥwyt* from the sky', alongside death and destruction (Decade 9: von Bomhard 2008: 127).

Depending on context, god-given *ḥwyt* could be a blessing or a curse. It was often associated with divine rage, as in the Tempest Stela, the Naos of the Decades, implicitly in the Marriage Stela, and the Metternich Stela (l. 55–56: Klasens 1952: 13). However, in

deserts or arid foreign lands, *ḥwyt* was often interpreted as a wonder sent by the gods (see Shirun-Grumach 1993: 23), as in the Wadi Hammamat inscription (§5.2.1.2), the Tell Defanna stela (§5.2.1.4), and Taharqa's *Kawa* V stela (§5.2.1.2).

Hapy was associated more with *ḥwyt* than other gods, since *ḥwi* could also refer to the flowing of Nile water, and this is where most of the attestations lie. However, in the Ramessid Great Hymn to the Nile rain might be the referent:

iṯw=f ḏww ḥr ḥwyt=f nn gmḥ.tw=f

He who seizes the mountains because of his *ḥwyt*, without him being seen.

(V.5–6: van der Plas 1986: II, 48–49)

This passage is slightly contentious. Van der Plas (1986: 101) strongly argues for *ḥwyt* as referencing the inundation, suggesting that the image describes the Nile lapping higher and higher against the hills in the south. However, elsewhere the hymn refers to Hapy in the sky: 'he who satisfies the *ḫȝst* far from water, for it is his dew (*iȝdt*, see §5.2.3) that descends from the sky' (I.7–8: van der Plas 1986: II, 14–15), and 'sky and earth are in his charge' (IV.7: van der Plas 1986: II, 40). Furthermore, this connection between Hapy and rain occurs in other texts, such as the Great Hymn to the Aten, where 'all distant foreign lands, you make them live, having placed Hapy in the sky that he may descend for them' (Sandman 1938: 95.5; Assmann 1999 [1975]: 220). Hapy's flow supplied both the Nile's inundation and the sky's rain (Zivie 1984: 204). Since the Great Hymn to the Nile notes that Hapy 'is not seen', the passage might refer to *ḥwyt* falling far away in time or place, so that the only evidence is water coming down the wadis, or the remnant pools and new greenery, an experience reflected in recent weather reports (§3.3.3).

A jotting on the verso of the Rhind Mathematical Papyrus can be interpreted as a literal account of actual weather events on the 3rd and 4th epagomenal days (~September: von Beckerath 1965: 211), but the dates suggest further mythological significance for this weather. The text reads:

mswt stḫ rdt.tw ḫrw=f in ḥm n nṯr pn

mswt ȝst irt pt ḥw(*y*)*t*

Birth of Seth: his voice has been given by the majesty of this god;

Birth of Isis: the heavens making *ḥwyt*.

(P. BM EA 10057, no. 87: Helck 2002 [1975]: 78)

The thunder (*ḫrw*) on the 3rd epagomenal day, the birthday of Seth, is symbolically appropriate, as Seth was the god most closely associated with this type of thunder (see §5.2.11.2). Likewise with Isis, although her connection to *ḥwyt* is less clear. She is among the

gods who produce a *ḏᶜ n ḥwyt* in *Khufu's Court* (11.14: Blackman 1988: 15), and she creates *ḥwyt* in the Metternich Stela, where she punishes a woman for refusing her (MMA 50.85, back, l. 55–56: Klasens 1952: 13). As a whole, the epagomenal days were perceived as a dangerous period when Sekhmet's agents threatened humankind (Spalinger 1995: 35). However, the Rhind note is not just a religious reference, as it is specifically dated to an unnamed king's Year 11 (possibly Khamudi, see Mourad 2021: 130), and includes notes concerning military activity. It might have recorded these mythologically appropriate occurrences of weather as a divine omen concerning the outcome of the campaign, or even be a metaphorical description of fighting with thunderous noise and raining arrows (Mourad 2021: 130). Some have even suggested that the passage is a metaphor for uncertainty, linking 'rare' weather events with the epagomenal days, when the normal rules are suspended (Ventker 2012: 12). The epagomenal days were also closely connected with the *iɜdt-rnpt* plague of Sekhmet, whose infectious arrows fell from the sky and have links with rain-words (Germond 1981: 286–97; Gnirs 2015: 130; see §5.2.3.3). The scribe recording the note in the Rhind papyrus drew on his knowledge of the symbolically charged epagomenal days and these significant weather events.

5.2.1.5 *Summary*

ḥwyt designates water droplets falling from the sky that could occur in combination with other phenomena, or by themselves. It could refer to gentle and desirable winter rains, or violent flooding rains. *ḥwyt* could have a large effect on the natural and built environment, damaging mudbrick structures, and also transforming the hill and desert regions. Texts express an understanding of the most likely times of year for *ḥwyt*, where it fell, and how it affected each landscape, including those which were not their own. *ḥwyt* had positive associations with inundation, incense, and the divine, but also had negative connotations with damage.

5.2.2 *snm*

There is as yet no generally agreed translation for *snm*. 'Rain flood' (*Wb*. IV, 165.11–12), '(rain)storm' (TLA no. 137440; Wilson 1997: 864), 'squalls' (Faulkner 2009 [1962]: 232), and 'water torrent' (Goedicke 2004: 17) are among proposed translations. Etymology is also uncertain, with *snm* 'mourning' (Wilson 1997: 864), or the hypothesised root *wnm* 'to eat' (TLA no. 137440, related lemmata), being proposed as *snm*'s antecedents; Satzinger and Stefanovic (2021: 351) do not suggest any possible relations. While 'mourning' may seem a

better fit for a word related to rain, linking mourners' teardrops to raindrops (for crying and mourning, see Volokhine 2008), 'eating' might be the better fit for *snm* given its contexts.

snm has only two attestations from the study period, both from the 18th Dynasty, and it becomes more common in the Ptolemaic Period (e.g. *Edfou* IV, 286.13). While Caminos (1956: pl. 8) suggested [*snm*] for a lacuna in *The Sporting King* (A2.4), only the Seth animal and sky are preserved, and other restorations are also possible (e.g. *nšn*). The texts in which *snm* occurs are high register, from royal and religious contexts.

In the New Kingdom, *snm* was written  , with the addition of the *mw*-water determinative () in the Tombos Stela (l. 8: *Urk*. IV, 84.8–9). In contrast, the Ptolemaic and Roman sources have a wide range of determinatives (e.g.  , Gardiner sign D3;  , Gardiner sign E28;  , Gardiner sign N36).

5.2.2.1 *Characteristics*

The first text with *snm* describes Thutmose I's victory over the Nubians in Year 2:

> *ȝ*(*i*)*s=sn ᶜbḥ=f inwt=sn ṯrw=sn mi snmw ḥwyt*
> Their viscera, it floods their wadis, and their red (i.e. 'blood') is like *snm*s of rain.
> (Tombos Stela, l. 8: *Urk*. IV, 84.8–9)

This passage suggests that *snm* and *ḥwyt* (§5.2.1) were related, with *ḥwyt* possibly being the event that creates a *snm*. In the Third Intermediate Period copies of the *Onomasticon of Amenope*, *snm* (or *srm* in some sources) is listed at the transition between types of precipitation and types of water bodies (Gardiner 1947: I, 6*, no. 21; see table 1), and this could also indicate *snm*'s position as an intermediary phenomenon, since onomastica organise words according to conceptual links (e.g. Assmann 2007: 28; Liszka 2010: 318). The metaphor in the Tombos Stela sits within a well-known corpus of enemy's blood being described as large quantities of water, such as 'their blood in their place was like water' (K*RI* V, 70.7). These metaphors emphasised the sheer quantity of fallen enemies, and thus the overwhelming power of the king (Matić 2017: 21; Takacs 2019: 306). *snm* might have been chosen here, instead of more common words for bodies of water, because of the setting in the Nubian desert, picking up the imagery of flash floods in the previous phrase. Aside from the large quantity of liquid, the metaphor has another layer: the blood might also be like a *snm* because of its colour. *ṯrw* is an oblique way of referring to blood, doing so via its property of redness, and the related word *ṯrw* describes a 'red, ochre-rich mineral' from the Elephantine region (*Wb*. V, 386.11; for discussion, see Harris 1961: 154–55; Schmidt

Gardiner no.	*Transliteration*	*Translation*
1	*pt*	Sky
2	*itn*	Sun
3	*iᶜḥ*	Moon
4	*sbȝ*	Star
5	*sȝḥ*	Orion
6	*msḫtyw*	Foreleg (constellation)
7	*iᶜn*	Ape (constellation)
8	*nḫt*	Strong One (constellation)
9	*rrt*	Sow (constellation)
10	***qri***	**Storm**
11	***ḫȝḫȝti***	**Cloud**
12	*sḥd-tȝ*	Dawn
13	*kkw*	Darkness
14	*šw*	Light
15	*ḫȝb*	Shade
16	*qȝḥȝ*	Sunlight
17	*sty-itn*	Rays of the sun
17a	***šnᶜ***	**Cloud**
18	***iȝdt***	**Dew**
19	*ȝwdt*	?
20	***srq***	**Snow**
21	***srmt***	***=snm?***
22	*nw*	Primaeval waters
23	*mtr*	Flood
24	*itrw*	River
25	*ym*	Sea

Table 1: The first 25 entries of the *Onomasticon of Amenope*, following numbering and translations of Gardiner 1947: I, 4*–7*. Weather terms discussed in this work are bolded.

2022: 406–7). The association between ochre and blood can also be seen in *The Destruction of Mankind*, where Re requests *dd*-ochre from Elephantine to mimic blood (verses 71–73: Hornung 1982: 39). Desert flash floods often take on a ruddy brown hue from the sediment

they pick up, including ochre-rich minerals, and this colour parallel might make *snm* a particularly relevant metaphor.

The Destruction of Mankind featured the leonine Solar Eye, who also appears in a different form in Hatshepsut's account justifying her decision to carve out a new chapel at Speos Artemidos:

> *pḫt wrt ḫnst inwt ḥrt-ib iȝbtt w*[*ḫȝ=s*] *wȝwt snm nn ibḥw ir*<*=s*> *ḫnp mw*
> Great Pakhet, who roams the wadis, resident in the eastern desert, she was
> s[eeking] the paths of *snm*, as there was no libation service related to (her)
> that fetched water.
> (Speos Artemidos, exterior architrave, l. 19–20: *Urk*. IV, 386.15–17; based on restorations by Allen 2002: 9, pl. 1)

Pakhet here was a local manifestation of the Solar Eye (Takács 2020: 47). As a whole, the chapel suggests this site was where the raging Eye returned to Egypt, needing to be pacified (Takacs 2019: 311; for the 'Distant Goddess' myth, see Pinch 1993: 191–94). Here, *snm* is again associated with wadis, this time in the Eastern Desert. The 'paths of *snm*' might even be describing the eroded channels that a *snm* travels down, which is why an etymology of 'to eat' is plausible for *snm*, as *snm* could be perceived as 'eating' the rock it travels over (see also *ḥwyt*, §5.2.1). The *snm* is of use to Pakhet as a source of water, which had not been provided to her by priests, and this is something that Hatshepsut rectifies (a common topos in royal texts, e.g. Ramesses II's Festal Calendar at Abydos: K*RI* II, 514.1–15.11). It is possible to imagine this natural libation as a waterfall grotto, the water falling from up high into a depression, like a priest pouring water onto an offering basin, similar to the western end of the Valley of the Queens, where there is the 'grotto cascade', which contains many graffiti (Félix and Kurz 1970). Some of these graffiti mention the *mw n pt* (no. 3012, 3013), while others contain pictorial or textual references to Hathor (Demas and Agnew 2012b: 20–24; Geisen 2020), the pacified form of the Solar Eye goddess. This grotto cascade was clearly a sacred site (e.g. Darnell 2023: 30).

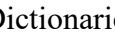
snm can be compared to *mw n/m pt*, which is not studied individually here because it does not carry either of the two weather-related determinatives. This phrase seems to have a very similar connotation to *snm*, describing meteorological water that is flowing over the ground and/or leaping downwards, particularly in the Theban wadis' graffiti (nos. 1736, 2868, 3012, and 3013; see Dorn and Müller 2006). The graffiti are all located close to ephemeral waterfalls (see Félix and Kurz 1970: plans 22, 85, and 125), and half of them describe the water descending (*hȝi*). No. 1736 seems to use *mw n pt* as a toponym, denoting a

specific waterfall that the scribe was visiting (Leblanc 1995: 203), and an ostracon found in the Valley of the Kings gives a measurement 'from the end of the *mw n pt* to the tomb of Isisnefert' (O. Cairo JE 72460, rt. 3: Dorn and Polis 2016: 134). Labelling waterfalls as *mw n pt* might be a localised practice in the Theban mountains, since when it occurs in other texts *mw n pt* clearly relates to rain that was beneficial for crops in foreign lands (e.g. the praise of P. BM EA 10249, 6.9: Gardiner 1932: 41.8), and similarly with a *ḥ^{c}py n pt* (Zandee 1963: 145; Jung 2007: 341). In Egypt, *mw n pt* (whether specific or general) was a special event, and probably one that carried positive connotations, possibly indicating the appearance of the divine, as suggested by the many graffiti inscriptions at waterfall sites.

snm can be distinguished from *mw n pt* semantically and practically. *mw n pt* seems to place more emphasis on the origin of the water, and how it descends from the sky, while *snm* places emphasis on the action it is performing on the ground. These aspects of *snm* come together in the Ptolemaic lion waterspouts of temples, where *snm* describes the water that the spout is throwing off (e.g. *Dendara* XII, 338.2–7; *Edfou* IV, 130.1–4; see Ventker 2012: 86, 154; Klotz 2014: 534). The use of *snm* in this context probably has three influences: firstly, the water came from rainfall; secondly, after rainwater initially hits the 'ground' of the temple roof, it falls again, creating an artificial waterfall; and thirdly, the waterspouts were carved as lions, which were associated with the deserts and gods like Sekhmet and Pakhet. A metaphor is created, where the water draining off temple roofs is equated to *snm* draining out of wadis. It is also perhaps relevant that an earlier name for a water spout is *sn-mw* ('one who lets water pass': Annals of Amenemhat II, M.15, Altenmüller 1998b: 153; see fig. 2), which has consonantal similarities to *snm*. The choice between using *snm* or *mw n pt* might have also been influenced by the relative writing/carving effort of each: *mw n pt* has fewer and more familiar signs than *snm*, and so was more likely to be chosen in the graffiti context.

While rarely attested, *snm* was probably a rain-fed 'torrent' that changed the landscape, picking up sediment as it travelled, including the concept of ephemeral waterfalls, either off cliffs or waterspouts. *snm* was associated with the lioness deities of the Solar Eye, whether as an indication of their return to Egypt, or as a natural libation to them. These goddesses were also often connected to violence and the desert, two aspects that are relevant to occurrences of *snm*.

5.2.3 *i3dt*

Dictionaries have defined  *i3dt* as 'dew', 'rain', 'downpour' and 'storm', with figurative meanings of 'influence' and 'fragrance' (*Wb*. I, 36.1–7; Faulkner 2009 [1962]: 9;

Lesko 2002 [1987]: I, 15; Wilson 1997: 129; van der Molen 2000: 16, 61; Hannig 2006: 81). It survived into Demotic (written *yᶜt3t*, *yt3t*, or *yᶜtyt*: *CDD y* [01.1]: 7), and was still used in Coptic (as ⲉⲓⲱⲧⲉ or ⲓⲱⲧ: Černý 1976: 49; Vycichl 1983: 68).

While *i3dt* has a separate etymological root from both *idt* 'fragrance' and *i3dw* 'plague' (Satzinger and Stefanović 2021: 59), the similarities between them led to ancient orthographic confusion, with *i3dt* used for *idt*/*i3dw* and vice versa, but also led to strong metaphoric connections between them, and these words might have completely fused in the New Kingdom (Schmidt 2022: 263).

In the Middle Kingdom, *i3dt* was frequently written with the phonogram  *i3d* (Gardiner sign D46a), which was taken from *idt* 'fragrance' (*Wb*. I, 152.9). Otherwise, *i3dt* was entirely written with uniliteral signs. The rain-determinative is present in all attestations except some figurative examples. There was a change in the New Kingdom:  was no longer used, and was completely replaced with uniliterals; the older spelling only returned in the Late Period. The water-determinative  is attested once in the Second Intermediate Period (P. Ebers case 19, 6.9: Grapow 1958: 207.14), but became more common in the New Kingdom. In the late New Kingdom, the determinative cluster  was introduced (e.g. P. BM EA 10720.6b, l. 2: Regulski and Beck 2024: 298). Most strikingly, in medical texts  represented the entire word, probably as a phonogram for *i3dt*, as some versions are followed by a *t* (). There are full writings of *i3dt* in the same formula within the same texts as this abbreviated spelling, and so it is probably *i3dt* and not another word.

In total, there are 176 attestations of *i3dt*, of which 48 are distinct passages. The earliest attestation of *i3dt* strictly as a weather phenomenon is from the late Middle Kingdom (e.g. in P. Ramesseum III, A 25: Barns 1956: pl. 11), though the figurative use appears in the 11th Dynasty (Cairo JE 45058, l. 8: Gardiner 1917: pl. 9). However, Middle Kingdom attestations are relatively rare, and it becomes much more common among New Kingdom attestations. *i3dt* is frequently found in medical treatises as part of a set phrase, rarely in fictional literature, and otherwise only in highly religious and royal contexts.

5.2.3.1 *Characteristics*

Aside from its determinative, *i3dt* can be recognised as a water-based weather phenomenon from the fact that it came from the *pt*-sky, as suggested by the Great Hymn to the Nile (I.8: van der Plas 1986: II, 15), and much more explicitly in the Third Intermediate Period *Voyage of the Libyan Goddess* (see below, B 3–5: Verhoeven and Derchain 1985: 12). In the

Onomasticon of Amenope, *i3dt* is listed at the start of the water section, immediately following words that describe the brightness/darkness of the atmosphere (Gardiner 1947: I, 5*, no. 18; see table 1). An indication of the nature of *i3dt* is found in the medical treatises, where a common instruction for the preparation of remedies is to *sḏr n i3dt*, 'spend the night for the *i3dt*', often translated 'leave overnight (exposed) to the *i3dt*' (three examples in P. Ramesseum III: Barns 1956; 56 in P. Ebers: Lalanne and Métra 2017; 14 in P. Hearst: Reisner 1905; five in P. Chester Beatty VI: Gardiner 1935; and 12 in P. Brugsch: Wreszinski 1909). This relatively frequent use of *i3dt* might suggest that it was a relatively common phenomenon, something that could be relied on happening regularly, unlike rain. It also happened overnight (for this in another context, see Book of the Dead spell 140 in the Late Period papyrus of Iahtesnakht, 66.11: Verhoeven 1993: 263, supplement 23). These factors suggest that *i3dt* can be understood as dew; early morning dews are very common in Egypt (see §3.2.1), and occur regularly enough to have been a practical ingredient in medical remedies.

It seems that the *i3dt* affected fields and marshlands at least, where proximity to the Nile leads to increased humidity levels. Near the end of *The Voyage of the Libyan Goddess*, the people in the Delta say:

mi n ir=n n=s sḏr (*m*) *sḫt iwḫ=n n=st m i3dt n pt*

Come, let us spend the night (in) the field for her, and we will become moistened by the *i3dt* of the sky for her.

(B 3–5: Verhoeven and Derchain 1985: 12)

This also confirms the watery nature of *i3dt*, that it can 'moisten' things. *i3dt* is also mentioned in the literary text *The Pleasures of Fishing and Fowling* in the context of marshes, though lacunae make interpretation difficult (C1, x + 8: Caminos 1956: pl. 4).

5.2.3.2 *Conceptualisations*

i3dt has a rich network of associations and conceptualisations, linking sky-given dew with bodily fluid, incense, and even divine influence over humankind. Firstly, *i3dt* is consistently characterised as 'of the gods', a liquid that comes from their bodies. This liquid is beneficial for the land, and is seen as a parallel to the inundation:

ss33 ḫ3s(*w*)*t r.w3w*(*t*) *r mw i3dt=f pw h3y*(*t*) *m pt*

One who satisfies the hill countr(ies) who are far from water; what descends from heaven is his *i3dt*.

(Great Hymn to the Nile, I.7–8: II, 14–15; van der Plas 1986: I, 70)

i3dt was, in turn, seen as fertilising and life-giving. Some later sources assert that the inundation itself was made fertile through the god's *i3dt* (e.g. the hymn of P. Berlin P3049, 5.6: Gülden 2001: pl. 5). The conceptual link between *i3dt* and the inundation might have derived from an increased probability of dew during the inundation due to the rise in local humidity (see §3.3.1). The birth-cycle of Hatshepsut suggests the beneficial natures of both the inundation and *i3dt*:

> *sh3 i3dt imi*[*t pt m rk=s … imi iwt n=s ḥ^{c}pw ^{c}3w*] *wrt m rk=s*
> Cause that the *i3dt* which is i[n the sky] descend [in her time! … Cause that] very [great floods come for her] in her time!
> (Temple of Hatshepsut, middle colonnade of second court, south half, lower register, l. 10: *Urk*. IV, 217.10–11; Brunner 1986: 14)

Graeco-Roman texts also explicitly describe *i3dt* as making plants grow (e.g. P. Insinger, 24.25: Kockelmann 2008: 62).

i3dt and *idt* 'fragrance' were frequently merged partly due to their orthographic similarities, and partly because they were semantically associated. Dew laying on the earth and plants in the early morning can produce a petrichor-like smell that could have been an agreeable odour in a world dominated by unpleasant ones (for discussions on sensory experience, see Price 2018). While petrichor is normally defined as an aerosol released when rain hits the ground (see Bear and Thomas 1966; Joung and Buie 2016: 6087), a similar mechanism is present for dew (Ott 2023: 198), and this, for simplicity, is here referred to as petrichor.

idt-nṯr 'fragrance of the god' was a term for incense, as well as *fdt-nṯr* 'sweat of the god' (e.g. P. Krakau IX-752, vs. 1: Luft 1977: pl. 1). *i3dt*, through its connection to *idt*, was also linked to incense, an association aided by some physical similarities between incense pellets and dew drops. Incense pellets have a characteristic drop-like shape (see §5.2.1.1), and the word for ritually spreading incense pellets is the same as that used for sprinkling water, *idi* (*Wb*. I, 152.5–6; Allen 1976: 15). Demidchik (1993: 147) has argued that the incense pellets were equated to divine sweat on account of their shared physical characteristics, specifically focusing on both being a source of fragrance that emerged when heated. This can be further extended to include *i3dt*, as suggested by a hymn to Amun, where *i3dt*'s smell is connected to incense resin:

> *snṯrw ḥr ḏf* [*ḏf …*] *^{c}ntiw ḫnm n i3dt=k i3bḫ*(*.w*) *m fnd=k*
> Incense-trees are drip[ping …] myrrh, the scent of your *i3dt* is joined in your nose.

(P. Leiden I 350, l. 1.6–7: Zandee 1947: pl. 1)

Amun's *i3dt*, exuded into the physical world as incense resin, is burned to release its fragrance in front of an image of the god who breathes it in, creating a cycle that emphasises Amun's connection to the world (for the idea of offering the god to himself, see Wise 2009: 70). Translations of *ḫnm n i3dt* (or similar: *sty n i3dt*) tend to take *i3dt* as a misspelling of *idt* 'fragrance' (e.g. Gardiner 1935: 101), but this is not necessary for understanding, and in fact obscures the close relationship between dew, sweat, incense, and the divine. The smell of incense is connected with the divine, with many forms of incense being burnt in temples during cultic rites in order to create a liminal space which bridged the gap between the living and the divine (e.g. Guglielimi and Buroh 1997: 126; Frood 2013: 172; Price 2018: 143). This suggests that incense smoke would have evoked the divine presence for ancient Egyptian participants (e.g. Wise 2009: 69). In the birth cycles of Hatshepsut and Amenhotep III, the queen recognises Amun by his scent, and after their union, 'the palace was flooded with the god's scent, all of his smells are from Punt' (*Urk*. IV, 220.5–6), with the Puntic smells being those of myrrh and frankincense (Hornung 1996 [1971]: 64; Matić 2018: 40).

i3dt itself features in the birth-cycle, shortly after the sexual meeting between Amun and Hatshepsut's mother:

ḫnm.n=k ḥmt=i m 3ḫw=k i(3)dt=k ḫt ꜥwt=i nbt

You have filled my majesty with your effectiveness, and your *i(3)dt* is throughout all my limbs.

(Scene IV D: *Urk*. IV, 221.3–4)

In this case, *i3dt* appears to be analogous to the fertilising powers of Amun, and the event imparts divine legitimacy to Hatshepsut's reign (see Brunner 1986). At the Speos Artemidos, the reigning Hatshepsut claims that 'I swallow (his) *i3dt*, I am as one flesh together with him' (*Urk*. IV, 385.2) as a way of expressing her right to rule. Matić (2018: 44) has argued that in the birth cycles, incense resin and (divine) semen are equated to each other because of their shared material physical properties, their colour and consistency, as well as the context. If so, *i3dt* also could represent divine semen in this context due to its previously established connections to incense and fertility. However, there are other attestations of divine *i3dt* being on or in a body that are not related to sexual activity, for instance in this Ramessid magical hymn spoken by Horus:

šfšft=i m-ḫt m ꜥwt=tn i3dt(=i) ḫn3.ti m ḥꜥwt=tn

Awe of me is throughout your limbs, (my) *i3dt* having settled in your bodies.

(P. Leiden I 347, rt. 12.4–5: Beck 2023: pl. 12a)

Such aspects give rise to the metaphorical interpretation of *i3dt* as 'influence' (see e.g. Gardiner 1935: 97). Often used in parallel with *šfšft* 'awe' (*Wb*. IV, 460.6–15) or *ḥryt* 'dread' (*Wb*. III, 147.14–148.12), *i3dt* could have a similar power affecting people from the inside, the feeling filling up the heart of the target until it spilt out (Hornung 1996 [1971]: 134; for the 'heart as a container' metaphor in relation to fear and awe, see Eicke 2021). This power extends to the king as well:

> *bdš ḫ3st nb*(*t*) *ḫpr*(*.t*) *m ḥtpw ḥry*(*t*) *ḥm=f* ᶜ[*q*]*.ti m im=sn i3d*(*t*)*=f sd.n=s ib=sn*
> Every foreign country is weak, becoming peaceful as dread of his majesty ent[er]ed into them. His *i3dt*, it has broken their hearts.
> (Karnak complex, war scenes of Seti I, KIU 1015, l. 29–32: K*RI* I, 19.1–2)

Some sources note that the god's *i3dt* was pervasive, spreading far and wide, as in the *Ritual for Amenhotep I* (P. Chester Beatty IX, rt. 13.4: Gardiner 1935: pl. 55). In the Middle Kingdom, there are also a few rare examples of a non-royal official claiming that they were 'great in *i3dt*' (Doxey 1998: 285), in contexts about their power in the community (e.g. 11th Dynasty autobiography of Antef, MMA 57.95, l. 7: Fischer 1960: fig. 1). While this 'influence' seems unconnected to meteorological *i3dt*, it could be reflective of the invasive quality of scent when inhaling, and *i3dt* was known for its fragrance (for these aspects of olfactory experience, see Hamilakis 2013: 77). Strong scents were intoxicating (*tḫw*) in Egyptian texts, overwhelming the recipient by entering their body and impacting their choices (e.g. P. Chester Beatty I, rt. 17.1: Mathieu 1996b: pl. 7; Price 2022: 110). Therefore, inhaling the scent of *i3dt* allowed divine influence into the body. In the 'poetical stela' of Thutmose III, Amun says:

> *di=i mȝ=sn ḥm=k mi sšd s*(*t*) *bs=f m sdt di=f i*(*ȝ*)*dt=f*
> I shall cause that they see your majesty as a shining star, throwing its fire as flame, when it gives its *i3dt*.
> (Cairo CG 34010 + JE 3425, l. 15: *Urk*. IV, 615.13–15. For the translation of *sšd*, see McDonald 2002: 442)

This passage articulates the connection between meteorological *i3dt* and power over others. Seti I (K*RI* I, 27.8) and Ramesses III (K*RI* V, 109.1) reiterate this passage in their own poetical stelae. This section of the stela describes the king in terms of powerful and awe-inspiring creatures: a bull (l. 16), crocodile (l. 17), lion (l. 19), and jackal (l. 21). It follows that this 'shining star' is also awesome, with its *i3dt*, which represents its power and influence. The choice of *i3dt* here might have been influenced by the fact that meteorological *i3dt* is laid at nighttime, when the stars are visible.

5.2.3.3 *i3dt in medical practices*

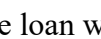
The divine influence of *i3dt* may also explain its usage in medicinal preparations. Since leaving a mixture outside overnight to be moistened by dew is not the simplest way of binding ingredients together, and the choice of ingredients and methods in Egyptian medical recipes are known to be highly symbolic (Pommerening 2017: 526), a different explanation for *i3dt*'s high use rate in medicine should be considered, probably *i3dt*'s conceptualisation as a divine bodily fluid and its role as an influencing essence. Other divine fluids were often evoked for healing purposes (such as spittle, Ritner 1993: 82), and for the deceased's transformation in the afterlife (Audouit 2020: 150). As *i3dt* was conceived as a physical manifestation of divine fluids, it falls into these roles as well. The smell of *i3dt* also evoked the gods' presence and thus when the bedewed mixture was collected, it would have been as if the gods had blessed it.

Another word associated with *i3dt* is *i3dw*, 'pestilence', which is mainly found in the phrase *i3dt-rnpt*, referring to the annual pestilences, a number of different illnesses grouped together because of their timing with the end of the year, and their perceived transmission methods (Győry 2010: 83). Invisible diseases were thought to be caused by the gods or their messengers, and most often by Sekhmet (Torras Benezet 2021: 119), spread by *ṯ3w* (§5.1.1.6), *nf* (§5.1.2.1), or *sbyt* (§5.1.6.2). As with *idt*, *i3dw* has an etymology separate from *i3dt*. However, the writings of the two words were consistently conflated, indicating a certain amount of conceptual bleeding. Medical texts suggest that disease was the physical manifestation of a divine entity's will, their influence, on the body (e.g. Lucarelli 2017: 58). This idea accords well with the previous discussion on *i3dt* as divine influence.

5.2.3.4 *Summary*

As a weather phenomenon, *i3dt* referred to dew that falls from the sky overnight, droplets that mainly form on plants and the earth close to the Nile or sea. The freshly laid *i3dt* interacted with the surface to release a kind of petrichor, a pleasant smell. *i3dt*'s physical properties had similarities with sweat and incense, and became deeply entangled with them, creating a complex conceptual web that was the source of multiple metaphors. *i3dt* was consistently a characteristic of the divine, not merely a meteorological phenomenon, and perhaps more so than any other weather word discussed here.

5.2.4 *srq*

An obscure loan word from Semitic,  *srq* has been universally translated as 'snow' (*Wb*. IV, 204.14; Lesko 2002 [1987]: II, 59), based on the root *tlg*, 'snow', from which it is derived (Hoch 1994: 264–65). It is first attested in the reign of Ramesses II, and only appears in two texts: the Marriage Stela (K*RI* II, 249.7–15), and the *Onomasticon of Amenope* (Gardiner 1947: I, 6*, no. 20; Regulski and Beck 2024: 298). While not a local word, *srq* illustrates how the Egyptians could incorporate phenomena into their conceptual map of weather.

Like many Semitic loan words, *srq* was written with group orthography (e.g. Schenkel 1986: 114; Quack, 2010, #185739@77–82), literally reading *s3-r-q3*. In order to cement its place in Egyptian, the rain-determinative was used in the earliest attested New Kingdom orthographies (for determinatives and loan words, see Goldwasser 2006: 28). Most of the *Onomasticon* copies use the determinative cluster  instead, maintaining the link to water. The Karnak version of the Marriage Stela used the faience-determinative, while the Abu Simbel version has an unidentified sign as *srq*'s determinative in one case (l. 37; fig. 21); Hoch (1994: 264) suggests a snowflake, but provides no argument for this. Instead, it might be a scribal mistake made during the transcription from the source document to the monumental stela (Kuentz 1925: 215).



Figure 21: 'Snowflake' determinative from Abu Simbel Marriage Stela, l.37. From Cerny *et al.* 1960: C17.7

5.2.4.1 *Characteristics*

srq is such a rare word because it describes a phenomenon that is exceptional in Egypt, and discordant with the ancient Egyptian homeworld (§2.2.3). Snow can fall in the Delta and the northernmost parts of Middle Egypt under highly unusual weather conditions that occur barely once in a century (see §3.2.1), the most recent being in December 2013 (Anon. 2013; other notable events, from tambora.org: winter 1423–24, winter 1494, 23rd February 1602). Snow falls on the hills of Sinai regularly (Sutton 1947: 218), but most ancient Egyptians would never have travelled to the Sinai. The phenomenon's rarity and foreignness meant that the Egyptians turned to their Semitic neighbours for an appropriate word. This is common practice when speakers come across a new concept, as borrowing a word from another language is easier than creating a new one (e.g. Hock and Joseph 2019: 240; ten Hacken and Panocová 2020: 7).

The foreign environment of Levantine Djahi was the setting for *srq* in the Marriage Stela: Ramesses II is concerned about the status of his emissaries as they travel to meet the king's wife-to-be, 'in these days of *ḥwyt* and *srq* which occur in Peret'. Seth refrains from sending those conditions, as well as any *qbw* (§5.1.5), for which the king thanks him (K*RI* II, 249.8–13). *srq* was thus an inconvenient (or threatening) problem for travellers in those foreign lands during winter. The Neo-Assyrian and Babylonian lexical equivalents to *srq* agree with this assessment, appearing in texts that describe their inability to travel through heavy snow (van Buylaere 2009: 298–303).

The words around *srq* in the Marriage Stela, *qbw* and *ḥwyt*, suggest that *srq* was associated with cooler weather conditions, and *srq* is listed alongside other terms for types of water coming from the sky in the *Onomasticon* (see table 1): *šnᶜ* (no. 17a: Gardiner 1947: I, 6*; §5.2.8), *iȝdt* (no. 18: Gardiner 1947: I, 6*; §5.2.3), *ȝwdt* (no. 19: Gardiner 1947: I, 6*; otherwise unattested), and *snm* (no. 21: Gardiner 1947: I, 6*; §5.2.2). Following this are several words that relate to water on earth (e.g. *mtr*, *itrw*, *ym*: Gardiner 1947: I, 7*, no. 23–25. Seth, already closely tied with unstable weather events and foreign lands (Zandee 1963; te Velde 1967: 128; Allon 2007: 20), is the potential creator of *srq* in the Marriage Stela. His association with *srq* is further suggested in one version of the *Onomasticon*, where *srq* receives a deity-form Seth-determinative (Gardiner sign C7: Cairo JE 67100, l. 5).

However, this *srq* of the Levantine might not have been equated to the exceptionally rare snow of Egypt. Within Egypt, snow would have been less threatening, either immediately melting, or resulting in a thin layer on the ground. No texts refer to *srq* falling in Egypt, so there is no way to know how they would have responded to this sort of snow. Snow in Egypt might not even have been termed *srq*.

Although a loan-word, *srq* gives us a better glimpse at the Egyptian conceptual system and weatherworld than indigenous words because the word went through a process of integration and transformation from its original Semitic form to fit into Egyptian knowledge of weather. The determinatives assigned to *srq* reflect how it was perceived and how it was related to other weather words, and its place in the Egyptian weatherworld. *srq* shows how the Egyptians perceived weather phenomena outside of Egypt.

5.2.5 *igp*

This section studies both the noun  *igp* and the verb  *gp*, as their meanings are related, and they have the same etymology. The noun has been translated as '(rain) clouds' (Faulkner 2009 [1962]: 32; Wilson 1997: 118; van der Molen 2000: 57), and in German as

‘Gewölk, Regenwolke, Gewitterwolke’ (*Wb*. I, 140.20; Hannig 2003: 227; Hannig 2006: 422). Its Demotic form is *gp*(*ꜣ*)*t* (*CDD g* [04.1]: 25), and it survived into Coptic as ϭⲏⲡⲉ/ϭⲏⲡⲓ (Černý 1976: 334; Bosson 2008: 12). The verb has two main translations, ‘to be cloudy, to be overcast’, and ‘to soar cloud-like’ (*Wb*. I, 141.1–2; Faulkner 2009 [1962]: 32; van der Molen 2000: 57; Hannig 2003: 227; Hannig 2006: 422).

Both words derive from the root *gp* ‘cloud’, and are also related to *gp* ‘to overflow’ (*Wb*. V, 166.1; Ward 1973: 229; Satzinger and Stefanović 2021: 417–18). The evidence suggests that *igp* is a nominal form derived from the perfective participle of *gp*, with a prothetic-*i* (Edel 1955: §450; Mathieu 1996a: 318). In the Old Kingdom, *gp* was commonly used for the verbal form, while *igp* appears only as the noun and was also less frequent. The writing with an *i* became increasingly common over time, but not exclusive; *gp* can still be found in Third Intermediate Period texts. After the Old Kingdom, the difference between *igp* and *gp* does not seem to be syntactic or semantic.

The *g* could also be written as either *k*/*q* or *p* out of phonetic and orthographic confusion, respectively, although the *k*/*q* version is only attested from the Late Period onwards (e.g. *Edfou* I.4, 551.7). A *t* before the determinatives can occasionally be found in the Middle Kingdom with the noun, which is perhaps a feminine version—*igpt* is classified as a separate word in some dictionaries (e.g. van der Molen 2000: 57; Hannig 2006: 423). From the New Kingdom, an  could be added, though its positioning was not consistent. New Kingdom copies of Book of the Dead spell 146 have a garbled writing of *igp*’s participle form (e.g.  , P. Yuya, l. 608: Munro 1994: pl. 63), and are only identifiable due to later parallel copies (e.g. P. Turin 1791: Lepsius 1842: pl. 62).

igp was almost always written with the rain-determinative since its earliest attestations, as is first found in the First Intermediate Period, but this could be substituted with the sky-determinative. One example from the Pyramid Texts has the divine-determinative () (Jéquier 1936: pl. 15; Allen 2005a: 283), presumably referring to a divine personification of *igp*. Another unique spelling on a hymnic ostracon (Cairo CG 25207, l. 6: Černý and Gardiner 1957: pl. 38.1) has *igp* written with an additional two determinatives,  (Gardiner sign N2) and ⊙ (Gardiner sign N5), but these are probably scribal errors, and the previous clause (l. 5) has *kkw* ‘darkness’ also written with these same signs.

igp is well attested across all periods, but within this study’s chronological frame it is restricted to funerary contexts and magic spells. In total, there are 47 nominal and 31 verbal attestations for *igp*, but 19 nominal and 12 verbal distinct attestations. Curiously, the New

Kingdom has fewer attestations than the Old or Middle Kingdoms, which is a reversal of the usual pattern. As the word is very common in the Ptolemaic temples, the low number of attestations in the New Kingdom cannot be seen as the beginning of a decline, but rather an anomaly.

5.2.5.1 *Characteristics*

igp was predominantly something that affects multiple aspects of the sky: various words for sky—*pt*, *ꜥḏtw*, *ḥrt*, and *biȝ*—are all attested in relation to *igp*. *pt* was by far the most common location, with it being in the state of *igp* (*pt m igp*), as in a hymn first recorded in the Coffin Texts (spell 607: *CT* VI, 220l; Kees 1922). The verb *igp* likewise affected the sky (e.g. in the autobiography of Ankhtifi, pillar 4, l. 9: see §5.1.1.4 for full treatment), although one New Kingdom hymn mentions that the 'earth was in *igp*s' (*tȝ m igpw*) (O. Cairo CG 25207, l. 5–6: see below); however, this is the only time that *igp* relates to the ground.

The defining characteristic of *igp* is that it covered the sky, as in the Cannibal Hymn, where the stars are hidden behind a *gp*ed sky at the moment of sunrise: *gp pt iḫy sbȝw* 'the sky is *gp*ed, the stars are darkened' (Pyramid Text spell 273: *Pyr*. 393a; also Coffin Text spell 573: *CT* VI, 177b). A Ptolemaic water clock has an inscription describing its purpose as 'to know the hours by means of Thoth, when the sky is *gp*ed' (Gautschy 2020: 176; compare with Ankhtifi's description of his door, pillar 11, l. 3: Vandier 1950: pl. 20). Celestial bodies were the standard method of time telling, and *igp* could prevent access to the sun, moon, or stars, so a water clock was necessary, particularly for temples whose rituals were ordained for a certain time (e.g. von Lieven and Schomberg 2020: 57–58). *igp* could be associated in this respect with darkness, as in this New Kingdom solar hymn:

> *irr šzp rwy kkwy iw wnw tȝ m igpw*
> The one who makes light, who dispels darkness, when the earth is in *igp*s.
> (O. Cairo CG 25207, l. 5–6: Daressy 1901: pl. 34)

These parallel phrases imply that *igp* created darkness as opposed to light. Meanwhile, beams of sunlight striking clouds and brightening them is evoked in the 19th Dynasty Magical Harris Papyrus:

> *dr=k šnꜥti sḥḏ.n=k igp{t} m rn=k pwy n dr šn{ȝ}ꜥti*
> May you (Shu) dispel the *šnꜥ*-cloud, after you have illuminated the *igp*, in this your name of 'Dispeller of the *šnꜥ*-cloud'!
> (P. BM EA 10042, Spell D, rt. 2.5–6: Leitz 1999: pl. 13)

The verb *sḥḏ* is an interesting choice here. *sḥḏ* was most often used for the illumination of the Two Lands by a solar deity (e.g. in Book of the Dead 17: Hornung 1979b: 69.216; Lapp 2006: 208d–9d), and was an action exerting a positive influence on its object. The verb was not used for the dispersal of any other atmospheric phenomena, so it might describe the shift from grey to white clouds. As a dark cloud mass (*šnᶜ*, see §5.2.8.1) dissipates, it becomes thinner in the atmosphere, allowing more light to refract through to the base of the cloud, making it lighter in colour, especially if there has been precipitation (for the science behind this, see e.g. Wood 2012: 2399). Furthermore, newly formed gaps in the cloud-cover would make the naturally brighter sides and tops visible. From a mythological perspective, it was the sun god (in this passage, Shu) who was causing these changes.

Besides covering the sky, *igp* was also a mobile phenomenon that both the deceased and gods utilised. Some of the earliest attestations of *igp* are its verbal form of 'to move cloud-like', for example, in the Pyramid Texts:

gp.n ppi pn ir pt m ᶜḫᶜw

This Pepi has *gp*ed to the sky as a heron.

(Spell 467: *Pyr*. 891b [P])

From this, it seems that the flight of at least certain birds (falcons are also attested: PT 682: *Pyr.* 2042c) was described with the verb *gp*, although it is not attested outside of the Pyramid Texts (compare with *šnᶜ*, §5.2.7.1). In these texts, *gp* is used to describe movement from the ground or lower sky upwards (Ward 1973: 229). However, this nuance of *gp* faded after the Old Kingdom, and occasionally the noun *igp* is described as having downward movement instead:

hȝ.n NN tn im=ṯ m ig[*p*] *pr.n=s im=ṯ m ḫrt-ib kȝw*

This NN has descended with you as/in an *ig*[*p*], and she has gone forth with you as one in the midst of the *ka*s.

(Coffin Text spell 718: *CT* VI, 346i–j [B3Bo])

Furthermore, there is an instance of an *igp* 'passing by' (*swȝ*) in a Middle Kingdom medical text (P. Ramesseum VIII, 12.7–8: Meyrat 2019: 49), which also suggests that the verb *gp* describes movement. The mobile nature of *igp* suggests an association with wind pushing clouds, but this was not made explicit in texts. One possible allusion to this aspect comes from the autobiography of Ankhtifi at Mo'alla:

iw [*s*]ᶜ*n*[*ḫ*].*n*(=*i*) *ḥfȝt ḥr-mr* […] *p*[*t*] <*m*> *igp tȝ m ṯȝ*[*w …*]

(I) caused Hefat, Hormer, […] to live, when the sk[y] was <in> *igp*, and the earth was in win[d …]

(Pillar 4, l. 7–9: Vandier 1950: 220)

Here, Ankhtifi discusses how he helped various towns during a period of hardship, and the description might be of a real event or a metaphor for distress. However, it suggests a possible association between *igp* and *ṯzw*, implying that these two phenomena could happen together. *igp* was also associated with *ḫzpt* (§5.2.9; e.g. Pyramid Text spell 311, *Pyr*. 500b), as well as *ḥzty* in later periods (§5.2.7; e.g. *Edfou* I.4, 551.5–6). In the temple of Philae, 'the *igp* that makes green the fields when she descends' is an epithet of Isis (*LGG* I, 571; Darnell 1995: 53), suggesting a fertile rain; there are no earlier indications of *igp* involving precipitation.

5.2.5.2 *Divine action*

igp's relationship to the gods was manifold: it could both benefit and hinder them. Its power to obscure could take on a much more positive aspect than *ḥzty* or *šnᶜ*/*šnit*, creating a safe place for Horus and Osiris in separate mythemes. Horus was hidden from Seth by *igp* and *sim* at the behest of Isis in a hymn that is often found within an offering ritual (Altenmüller 1967: 12–13; Barta 1973a: 91), first attested in Coffin Text spell 607 (*CT* VI, 219f–20x [L2Li]), and then (listed chronologically) twice in the southern offering hall of Hatshepsut (Naville 1901: pl. 112–13), in the 18th Dynasty tomb of Puimre (TT 39: Davies 1923: pl. 50), in the Late Period tomb of Ibi (TT 36: Scheil 1894b: pl. 8), and finally on a stone slab from Horbeit (Naville 1910: 191–92, pl. 2). These were collated by Hermann Kees (1922). However, the grammatical, orthographic, and contextual features of the hymn suggest that it might have been composed in the Old Kingdom (Kees 1922: 96; Altenmüller 1967: 18; Stupko-Lubczyńska 2016: 53). In the hymn, Isis speaks:

> *i.rḫ m-ᶜ n=n sḫm-ᶜnḫ int=f nn n ḥr ḥr rnpt tn int=f n=f pt m igp tz m sim rd qb*(*.w*) *ṯbwt ḫzp.ti* [*im*] *gm nbd sz nwt wzt r=f*
>
> Become acquainted with the 'Living Power' for us, so that he may bring this to Horus at (the time of) this year, that he may bring to him (Horus) the sky in *igp* and the land in *sim*, when the foot is cool and the sole is veiled, so that the destroyer, the son of Nut, [may not] find a way against him!
>
> (Temple of Hatshepsut, Deir el-Bahari, southern offering hall, l. 13–17: Naville 1901: pl. 112–13)

sim only appears in this one text, and so is discussed here. It has been translated as 'fog', 'mist', or even 'humidity' (van der Molen 2000: 452; 'Nebel': *Wb*. IV, 37.6; Hannig

2006: 2103), based on the context of this passage; while *sim* has a etymological root listed in Satzinger and Stefanovic (2021: 343), this has no related words that hint towards its meaning. In the hymn, Isis hopes that the 'Living Power' (unknown, see *LGG* VI, 529) will cause *igp* and *sim*, thus obscuring Horus from Seth. Other versions of this myth indicate that Horus was being hidden in the marshes of the Nile delta (e.g. Hornung 1996 [1971]: 144). The passage tells us that *sim* could happen on the land, in contrast to *igp* in the sky. Some commentators have taken the following clause as being metaphoric for *sḫm-ᶜnḫ*'s work being quiet and unseen (Kees 1922: 106), but it could also characterise the weather phenomena, since 'veiling' verbs are used elsewhere for clouds covering the sky (e.g. *ḥbs*; see also §5.2.5.1), and *qb* might describe the cool feeling experienced inside a low-lying cloud. As such, the translation of 'mist' or 'fog' for *sim* seems compelling. *sim* might be an archaic word, whose semantic function was absorbed by *igp*.

In the Book of the Dead, the 7th portal of the house of Osiris is called:

i{ȝ}g{g}<p>yt ḥbs(*t*) *bȝg iȝkbyt mr=s ḥȝp*(*t*) *ḫt*

igpt-one, veiler of the weary one (Osiris), mourner of the one whom she loves, who covers the body.

(Spell 145, P. Maiherperi, l. 500–1: Munro 1994: pl. 132; see also *LGG* I, 571)

While it is not an *igp* itself that is veiling Osiris, the name of the portal draws on the nuances of what an *igp* is. The deceased must know the name of the portal in order to access Osiris, who is otherwise cloaked from view by the gateways; this aspect of the 7th gate is expressed with *igp*. Almost all copies of this spell use the cloth- or speech-determinatives ( , ) for *igp*, emphasising concealment or silence.

Such a conceptualisation might also be at play in a number of funerary texts that mention a ferryman with the epithet 'lord of *igp*' who is also the 'keeper of the secret ferry' (Book of the Dead spell 99, e.g. P. Maiherperi: Munro 1994: pl. 123), or that mention the deceased knowing how to sail a boat through *igp*, as:

imy sqd=f m-ḫnw igpt ḥnᶜ šms rᶜ

a boatman when he navigates within the *igpt* together with the Follower of Re.

(Coffin Text spell 320: *CT* IV, 144n [B2L])

The sole copy of this spell, and the similar spell 317 (*CT* IV, 125f), use *m-ḫnw*, and not just *m*, as the preposition, so it is clear that the deceased were not travelling 'as' an *igp*, but 'within' it (see Werning 2012: 315–321). These scenes might thus represent a very similar

circumstance as the deceased travelling to Osiris, a protective barrier which the empowered deceased can permeate.

When the deceased travelled cloud-like to the sky in the Pyramid Texts (cited above), it is possible that the deceased was using these mythic constellations, taking the role of Horus or Osiris, in order to be concealed and protected in a vulnerable moment. Jacq (1986: 176) suggested that travelling as an *igp* helped protect the deceased against other, less amicable weather conditions, but without making these mythic parallels.

On the other hand, from the Old Kingdom onwards, *igp* was also a phenomenon that the gods repel, particularly those *igp* that block sunlight from reaching mankind. In these texts, *igp* was more strongly connected with other weather phenomena, as in Pyramid Text spell 311 (*Pyr*. 500b), where the deceased dispels the *igp* for Re, together with *šnit* and *ḫ3pt*. Many such attestations are in the context of social and cosmic chaos. In Ankhtifi's autobiography, 'the sky in *igp*, the land in wind' (Pillar 4, l. 9: Vandier 1950: 220) could describe weather events, which recall the sort of condition in which the sun's rays cannot reach the people, as in *The Words of Neferti* (5c: Helck 1992 [1970]: 21), which express metaphorically the loss of *ma'at* in Egypt (Ward 1973: 229). In the Third Intermediate Period *Chronicle of Osorkon*, the priests beg Osorkon to 'put an end to the *igp* in front of us' (l. A.31: Jansen-Winkeln 2007: II, 164), which had occurred due to the rebellion that had offended Amun. While these attestations could be framing *igp* as a force that acts against the sun god (like *ḫ3pt*, §5.2.8), it is possible that these *igp*s were also linked with the concealment of the gods as outlined above; since in these cases, the gods had forsaken the Egyptians, and withdrawn.

5.2.5.3 *Generic function*

The mention of *igp* in the Magical Harris Papyrus, cited above, also has implications for the hierarchical relationship between *igp* and other weather words. *šnᶜ* is another type of cloud (§5.2.7), which is treated differently, so one would not expect *igp* to be a feature of *šnᶜ*, unless *igp* is the generic term for 'cloud', and the word that could be applied to multiple other cloud types—just as *ṯzm* became a generic term for multiple types of dogs (Goldwasser 2002: 100; see also Lakoff 1987: 46). Over time, *igp* became an abstract word representative of a category, a prototype, compiling perceptual experiences common to all members of the category, and discarding any varying experiences (see Lupyan 2017: 392). A generic aspect of *igp* is also suggested by later examples, such as at Edfu: 'the solar disk shines, the *ḫ3pt*-storm has disappeared; the sky is clear, without *igp*' (*Edfou* I.3, 417.6b). The last two phrases

are essentially reframings of the first two phrases. The broad range of concepts connected with *igp* might also be evidence of generic status.

However, this is not to say that *igp* is always generic; for example, the oldest attestations of *igp* in the Pyramid Texts appear to be distinct from other clouds:

nfᶜ(=i) n=k šȝpt ḫsr(=i) n=k igp i.sḏ(=i) n=k šnit

(I) will blow away the *šȝpt*-storm for you (Re), (I) will drive away the *igp* for you, (I) will break up the *šnit*-clouds for you.

(Spell 311: *Pyr*. 500b [W])

It is plausible that when *igp* developed from the verb *gp* 'to soar cloud-like', it was not yet the prototypical member of its category, and it subsequently went from delimitating a specific phenomenon to becoming a generic term that could encompass several other phenomena, in addition to its original meaning (for this linguistic process, see Brown 1987: 183).

5.2.5.4 *gp n mw*

gp n mw is treated separately here because its function does not overlap with the broader uses of *igp*, despite being closely related etymologically. It appears in only two sources, *The Teaching for King Merikare* and the Victory Stela of Piye, both narrating a military attack on a town. The teacher of Merikare says:

iṯ.n=i s(y) mi gp n mw

I seized it (Thinis) like a *gp n mw*.

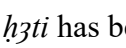
(E 73: Quack 1992: 179)

Piye's stela twice uses the same phrase to describe his soldiers' attacks against the cities of Oxyrhynchos (l. 27) and Memphis (l. 93–96: Jansen-Winkeln 2007: II, 41–45). *gp n mw* has often been translated as 'cloudburst' or 'thunderstorm' (e.g. Ward 1973: 229), but the assumption that it referred to water from an *igp* cloud, i.e. rain, is based purely on *gp*'s orthographic similarity to *igp*; yet in the two sources for *gp n mw*, *gp* carries only the water-determinative, which is very rarely seen in *igp* (only two instances, both in Book of the Dead spell 99B: Lüscher 2009: 25 [pC1, pMi1]). Instead of rain pelting down, *gp n mw* more likely denoted the result of rain, a violent flash flood, literally an 'overflow of water', whose water could swamp and destroy anything in its path, and so became a metaphor for soldiers overwhelming enemy forces.

5.2.5.5 *Summary*

igp has an especially complex history due in part to its verbal origin and subsequent nominal form, which are not always distinguishable in writing. Verbally, *igp*/*gp* could refer to the act of either moving like a cloud, or covering like a cloud. As a noun, *igp*/*gp* probably referred to a cloud that moves around and can (at least partially) cover the sky. These features are not unique to *igp* within the weather lexicon, probably because *igp* represented the generic cloud for the Egyptians, a word at the top of its category. However, one distinct feature of *igp* was the idea of *igp* as covering and concealing the gods for their own benefit, preserving what is hidden within. Furthermore, in some instances it could be a low-lying cloud or fog, possibly taking over the semantic function of the archaic word *sim*.

5.2.6 *ḥɜti*

 *ḥɜti* has been translated as 'clouds', or similar, by previous scholars (*Wb*. III, 35.8–12; Faulkner 2009 [1962]: 163; Wilson 1997: 619; van der Molen 2000: 311). It shares a common root with *ḥɜti* 'to encompass' (*Wb*. III, 35.15), and *ḥɜti* 'to be cloudy (of eyes)' (*Wb*. III, 35.4, 13–14; Satzinger and Stefanović 2021: 282–83). *ḥɜti* is attested in Old Kingdom funerary texts, and it gained frequency in New Kingdom texts, appearing in many solar hymns. In total, there are 37 attestations of *ḥɜti*, 12 of which are distinct.

The writing of *ḥɜti* shows a number of variations. The earliest writings in the Pyramid Texts (spell 570a: *Pyr*. 1449a [M]) used  instead of the biliteral  , which is first attested in the Coffin Texts (spell 1099: *CT* VII, 408b [B1L]). Over time there was a trend towards replacing *ti* () with *ṯ* (), first attested in the 19th Dynasty tomb of Tjanefer (TT 158: Seele 1959: pl. 13). Both of these orthographic changes are in line with general trends in Egyptian orthography (e.g. Allen 2013b: 54). The determinatives of *ḥɜti* were also productive. While the rain-determinative was fairly constant, additional determinatives are also attested, providing nuances relevant to the context, including:  (Pyramid Text spell 760: *Pyr*. 570a),  (Coffin Text spell 1099: *CT* VII, 393c–408b),  (P. Chester Beatty IV, rt. 9.3: Gardiner 1935: pl. 15), and (TT 373: Assmann 1983b: 359).

5.2.6.1 *Characteristics*

Despite taking the rain-determinative, *ḥɜti* did not have any apparent connection to precipitation. *ḥɜti* appeared in the sky (either *pt* or *biɜ*) and could cover it, blocking sight of celestial bodies. This aspect is first attested in the Pyramid Texts:

iᶜ.ti n NN m rn=k n rᶜ ḫsr=k ḥ3ti pt r dit sw ḥrw-3ḫty

Be ascended to NN in your name of Re, and repel the *ḥ3ti* of the sky until Horakhty gives himself.

(Spell 570a: *Pyr.* 1449a–b)

This event must take place shortly before dawn, as dispelling *ḥ3ti* is here a prerequisite for Horakhty to appear in the eastern horizon. *ḥ3ti* often forms a pair with *šnit*/*šnᶜ* in solar hymns, where both are repelled, as in the tomb of Tjanefer (TT 158, l. x + 9: Assmann 1983b: 211), in the tomb of Kheruef (TT 192, entrance vestibule north side, l. 2: Epigraphic Survey 1980: pl. 7), and the stela of Siamun (Cairo Wb. Nr. 243, l. 7: Bouriant 1886: 124–25). *šnit*/*šnᶜ* also had connotations of hiding the sun at liminal times (see §5.2.7).

Re was not the only celestial body that could dispel *ḥ3ti*. The moon gods also frequently dispelled *ḥ3ti* in the time before dawn (Sherbiny 2017: 421):

ḏḥwty … wb3 bi3 ḫsr ḥ3ti m ḏr=f

Thoth … who opens up the *bi3*-sky, who dispels the *ḥ3ti* from his limit.

(Coffin Text spell 1099: *CT* VII, 393a–c)

This phrase is repeated in Book of the Dead spell 130 (e.g. P. Nu, l. 14: Lapp 1997: pl. 49), and Roman temple reliefs also contains a very similar text (e.g. KIU 3947.1). In one particularly vivid version of this spell, Thoth dispels *ḥ3ṯ* ‘like Horus when he left his nest’ (P. Nakhtamun: Munro 1997: pl. 20), suggesting that the flap of the divine falcon’s wings dispersed *ḥ3ṯ*, perhaps from the moving *ṯ3w* produced (see §5.1.1.3). The vignette that accompanies Book of the Dead spell 135, which is another spell that dispelled *ḥ3ti*, shows gods and celestial bodies on a dark blue background, representing the cleared night sky (e.g. P. BM EA 9940: Milde 1991: 165). In later periods, *ḥ3ti* was also dispelled by the Eye of Horus (de Wit 1958: 80) and Neith (*Esna* III, 251; Troy 1997: 311). The phenomenological model for *ḥ3ti* may have thus been clouds covering the moon and then moonlight appearing to cut through them, or clouds hiding the rising or setting sun.

The main metaphorical use of *ḥ3ti* was in the description of eye ailments. The determinative of *ḥ3ti* in Coffin Text spell 1099 is, in most versions, an eye ( , Gardiner sign D5), which suggests a connection to vision, or the lack thereof. As mentioned above (§5.2.6), a type of eye affliction that obscures vision is also called *ḥ3ti*. There was a strong conceptual, as well as phonetic, link between these words, as suggested by the frequent swapping of determinatives. For example, in P. Ebers, the medical condition of the eye takes the rain-determinative (cases 339 and 385: Grapow 1958: 80.3, 76.1). This mixing was not simple

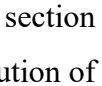
confusion between two similarly sounding words, as that would not explain the following hymn which praises Horakhty:

> *<pḥ>rt pw n irt nb <šsr> mɜ^{c} ḫpr ḥr-^{c} <m>sḏm<t> iwty snnw=f dr ḥɜ<t>y šnyt*
> He is a <rem>edy for all eyes, a true <utterance> which takes effect immediately, an <ey>e ointme<nt> that has no second, that repels *ḥɜty* and *šnyt*-clouds.
> (P. Chester Beatty IV, rt. 9.2–3: Gardiner 1935: pl. 16)

The hymn likens Horakhty's rays to a prescription for an eye ailment (Gardiner 1935: 33). The final clause merges the celestial and terrestrial, as both Horakhty and the prescription could remove *ḥɜti*. The metaphoric bridge between cloudiness of the sky and eye relates to the conceptualisation of the sun and moon as eyes (for which see Bickel 1994: 91–100; Darnell 1997a: 35). Clouds floating in front of the moon or sun changed their appearance, just as ocular clouds obscure the normal appearance of human eyes.

These descriptions and associations of *ḥɜti* suggest that it can be identified as a cloud that did not produce precipitation. In particular, the texts suggest that *ḥɜti* was a cloud of the night and the liminal times of sunrise and sunset, with a strong association with the moon and its gods (for moon gods and liminal times, see Goebs 2008: 69). While it was dispelled by the celestial deities, *ḥɜti* was not a malicious entity that actively seeks to do harm.

5.2.7 *šnit and šn^{c}*

This section discusses both  *šnit* and  *šn^{c}* together, as the latter is a linguistic evolution of the former, and there was no semantic difference between these two words. *šnit*/*šn^{c}* probably formed out of the root *šni* 'to dispute'; other words that came from this root include *šni* 'to knock down' (*Wb*. IV, 494.14), *šnn* 'illness' (*Wb*. IV, 515.3), *šni* 'to quarrel' (*Wb*. IV, 494.11–13), and *nšn* (§5.2.12; Satzinger and Stefanović 2021: 376). *šnit*/*šn^{c}* have received multiple definitions: 'storm', 'hail(storm)', and 'clouds' (*Wb*. IV, 502.15–503.4, 507.3–9; Faulkner 2009 [1962]: 268–69; Lesko 2002 [1987]: II, 128–29; Wilson 1997: 1017–18; van der Molen 2000: 625; Hannig 2003: 1309; Hannig 2006: 2472). *šn^{c}* was in use throughout the later phases of pharaonic history, and eventually became the Demotic word *šn* (Erichsen 1954: 512), although it did not survive into Coptic. Prior to the New Kingdom, *šnit*/*šn^{c}* appears to have been restricted to funerary literature. Afterwards, it spread to many types of text, including magical texts, hymns, autobiographies, royal tales, and literature. Altogether, there are 82 attestations of *šnit*/*šn^{c}*, 42 of which are distinct.

In the Old and Middle Kingdoms, *šnit* was largely written with the *š*-pond ( , Gardiner sign N37). There are also a few attestations with the *šn*-rope ( , Gardiner sign V7) at this time (e.g. in Pyramid Text spell 262: *Pyr*. 336b [T]; Coffin Text spells 427: *CT* V, 272c [P. Gard. II], and 467: *CT* V, 379a [B1C]), but from the end of the 18th Dynasty, only the *šn*-rope is attested for both *šnit* and *šnᶜ*, making this transition a potentially useful dating criterion. Hieratic texts often use the sign  (Gardiner sign V7b), as a ligature of and  . The *t* was sometimes dropped in the Middle Kingdom, probably reflective of the phonetic changes that would eventually result in *šnᶜ*. A transition from the feminine *šnit* to the masculine *šnᶜ* was underway in the New Kingdom, with equal occurrences of each, though there is one uncertain attestation of *šnᶜ* from the 13th Dynasty (Cairo CG 887, l. A.17: Kubisch 2008: 332). *šnit* is still attested in the Third Intermediate Period, but only in some transmitted spells of the Book of the Dead (e.g. spell 182 of P. Muthotepti: Naville 1886: II, 447).

As *šnᶜ*, the plow ( , Gardiner sign U13) was sometimes included as a phonetic complement (e.g. *The Words of Neferti*, 5d: Helck 1992 [1970]: 24 [Pet.]; P. Chester Beatty IX, rt. 13.13: Gardiner 1935: pl. 55), and this sign was occasionally written as a lion ( , Gardiner sign E23), because of the similarity of the two signs in hieratic (see Möller 1909a: no. 125, 468), for example: P. Chester Beatty IX (rt. 9.1: Gardiner 1935: pl. 54), P. BM EA 10042 (rt. 2.6: Leitz 1999: pl. 13), the Treaty of Ramesses II (l. 30: K*RI* II, 230.11), and P. Leiden I 343 (vs. 1.9: Beck 2018: pl. 42).

In most cases, *šnit*/*šnᶜ* used the rain-determinative, with the sky-determinative second commonest. There are two other attested determinatives that require some explanation: the Seth animal ( , Gardiner sign E21), and grain kernels ( , Gardiner sign M33). The Tempest Stela (front, l. 7: Helck 2002 [1975]: 106) probably includes the Seth animal to *šnᶜ* to emphasise aspects of celestial aggression and disturbance (McDonald 2002: 220). The kernels, on the other hand, are attested twice in the Old Kingdom (PT 311: *Pyr*. 500b [W]; PT 262: *Pyr*. 336b [T]), and are the basis for the traditional translation of *šnit* as 'hail', which derives from Maspero's publication of the Pyramid Texts of Teti (1884: 26), where he took *šnit* as 'grêlons' ('hailstones'). Hail is indeed possible in Egypt (see §3.2.2), but the actual content of the texts do not require or support such a translation for *šnit*/*šnᶜ* (see below). The three kernels could simply be a graphic variation on plural strokes (though see Allen 2017: 47). The kernels do not co-occur with the rain- or sky-determinatives in the only two examples, which might suggest confusion with another word, such as *it* 'grain' (*Wb*. I, 142.10–20). In another Pyramid Text spell of Teti (PT 373: *Pyr*. 657a), *it* is written  ,

exactly as at the end of *šnit*. In Unas' Pyramid Texts, spell 262 (*Pyr*. 336b) has *šnit* written with a rain-determinative whose downward strokes are small oval pellets, very similar to the kernels in spell 311 (*Pyr*. 500b), which suggest their use could be an abbreviation of the rain-determinative.

5.2.7.1 *Characteristics*

šnit/*šnᶜ* was a phenomenon of the *pt*-sky, but no seasonal or temporal associations were articulated. In Coffin Text spell 696 (*CT* VI, 330i), a *šnit* is traversed in the *wᶜrt n pt* (possibly the circumpolar region, see Krauss 1997: 127–30; Maravelia 2017: 373). One of the Book of the Dead's seven heavenly cows, the manifestations of Hathor, is known as the '*šnit* of the sky' (e.g. tomb of Nefertari [QV 66], spell 148: McCarthy 2011: 241, pl. 97). *šnit*/*šnᶜ* is said to be noticeable from the land, both from Egypt (compare below, the Tempest Stela) and from foreign lands, as in the 18th Dynasty autobiography of Senneferi (TT 99). This describes an expedition to the mountains of Lebanon to gather wood, possibly for temple flagpoles (Strudwick 2016: 101):

> […]=*i ḏw p*[*n*] *ḥr*(*y*)-*tp šnit iw*=*i ᶜq.kw r ḫnt*[*y*-*š*]
>
> I […] th[is] mountain, above the *šnit*, and I entered into the fore[st].
>
> (Wall 4, l. 7–8: Strudwick 2016: fig. 90)

This phrase might evoke the sight of mountains piercing through cloudbanks: for Egyptians living in the Nile Valley, this phenomenon would have been noteworthy. The passage also implies that *šnit* can be relatively low in the sky, below the peak of a 'mountain' (see further below). *šnit* is attested occurring above bodies of water in the afterlife: several Coffin Text spells refer to one occurring above the lake called 'Horns of the Lady of Purity', and these *šnit* could be lifted up by the deceased (spell 467: *CT* V, 379a) or the lake itself (466: *CT* V, 356xvi). Another spell mentions a *šnit* above the Waterway of Horus (904: *CT* VII, 110h).

Darkness was a key association of *šnit*/*šnᶜ*, particularly from the New Kingdom onwards. In the Middle Kingdom these words are linked with a *iḫḫw*-darkness/twilight (e.g. Coffin Text spell 400: *CT* V, 173a), but by the New Kingdom, *šnit*/*šnᶜ* has a stronger connection with *kkw*-darkness, as in this spell where Thoth speaks:

> *iw ḫsr.n*(=*i*) *kkw kfȝ.n*=*i šnᶜ*
>
> (I) have dispelled the darkness, and I have uncovered the *šnᶜ*.
>
> (Book of the Dead spell 183, P. Hunefer, l. 44: Budge 1899: pl. 3)

The Words of Neferti develops the theme of covering the sky to describe Egypt's state:

itn ḥbsw nn psd=f mȝȝ rḫyt nn ᶜnḫ=tw ḥ<b>s šnᶜ

The sun disk is covered; he will not shine so that the *rḫyt*-people can see. One cannot live when *šnᶜ* covers.

(5c–d: Helck 1992 [1970]: 21–22 [Pet.])

In the Israel Stela, Merenptah (as Shu) has the ability to uncover and clear (*kfi/kfȝ*: *Wb*. V, 119.4–9) the *šnᶜ* to 'allow Egypt to see the rays of the sun disk' (Cairo JE 31408, l. 2–3: K*RI* IV, 13.10). The fact that the verbal actions against *šnit*/*šnᶜ* could also be used in the removal of cloth from something (*kfi*), and that *šnit*/*šnᶜ* is described as 'covering' (*ḥbs*: *Wb*. III, 64.3–65.9) the sky, points to a metaphoric link between *šnit*/*šnᶜ* covering the sky or sun, and cloth covering the body (compare with *igp*, §5.2.5.1). By 'covering' the sky, *šnit*/*šnᶜ* had the effect of preventing people from seeing the sun god.

Only a few deities are attested as dispelling a *šnit*/*šnᶜ*, and they were all related to light. Solar gods were the most prominent in the New Kingdom, presumably because sunbeams can cut through cloud cover (e.g. P. Chester Beatty IV, rt. 9.3: Gardiner 1935: pl. 15; P. Chester Beatty IX, rt. 13.12: Gardiner 1935: pl. 56; tomb of Kheruef [TT 192], Hymn to the Setting Sun, l. 2: Epigraphic Survey 1980: pl. 7). Shu, the conveyor of that light, is also attested in this context (e.g. P. BM EA 10042, rt. 2.5: Leitz 1999: pl. 13; Cairo JE 31408, l. 2–3: K*RI* IV, 13.10). Sunset, in particular, is referenced in the dispelling of *šnit*/*šnᶜ*, which was an obstacle on the journey to the underworld (e.g. Cairo Wb. Nr. 243, l. 7: Bouriant 1886: 124; P. Chester Beatty IX, rt. 9.1: Gardiner 1935: pl. 53). Two non-solar deities also combat *šnit*/*šnᶜ*: in the Book of the Dead, the moon-god Thoth (spells 182 and 183: Hornung 1979b: 390.12, 398.120]), and the Lone Star (probably Venus: Krauss 1997: 109) in Coffin Text spell 398 (*CT* V, 140b). These deities were implicitly light emitters, and as such had the ability to be easily seen in breaks in cloud cover.

In later periods, tall objects were also said to touch or pierce through *šnit*/*šnᶜ*. Among the temple reliefs of Edfu, two passages claim that the flagpoles (*Edfou* VIII, 67.14) and obelisks (*Edfou* VII, 19.8) 'pierce (*tqs*) this *šnᶜ* of heaven'. Given that these inscriptions also mention the dimensions of the pylon and the materials used, this is more likely to describe their height than any other protective attribute. However, the flagpoles and obelisks of the divine temple could have also had the same effect as the gods mentioned above, clearing *šnᶜ*. Obelisks in particular often had a shiny gilded pyramidion, that would reflect and amplify the sun's rays (e.g. Quirke 2001: 134–38), so that one might imagine this light is what pierces the *šnit*/*šnᶜ* above, rather than the physical body of the obelisk. There is some evidence that the relationship between *šnit*/*šnᶜ* and divine monoliths existed before the Ptolemaic Period, found

in the autobiography of Senneferi cited above. He was searching for wood suitable for temple flagpoles when he came across a *šnit*; the trees seem to be above the clouds, though the broken context makes it difficult to be certain, and the divine association of the flagpoles may have added some resonance.

The concept of *šnit*/*šnᶜ* as a 'covering' may clarify two obscure isolated metaphorical passages. The first is from the Coffin Texts, where a pool is dug for the deceased:

iw mw imiw=f m qiswt irt ḥr m nšn iw sʒpwt=f m šni<t> iw <ʒ>ḥ{ʒ}wt=f m sfwt m ds

The waters in it are the tears of the Eye of Horus in rage; its lotus leaves are *šni<t>*; its <l>ands/fields are the slices from a knife.

(Spell 686: *CT* VI, 316j–l [B1Bo])

Faulkner (1977: 252) assumed that *šni<t>* was a mistake, as it appears to be meaningless. However, this passage is illustrating the pool's features metaphorically, and it might draw on the covering characteristic of *šnit*/*šnᶜ*, in order to describe how the lotus leaves cover the surface of the water, perhaps with the odd gap. The second metaphorical passage is a small fragment from *The Sporting King* that is missing its context: [*šni*]*t ʒpdw* 'a [*šni*]*t* of birds' (Fragment 2, l. 6: Caminos 1956: pl. 16). Caminos (1956: 39) translated as a 'shower of birds', and suggested that it was referring to a large number of birds falling down during a hunt, but there is no other evidence for *šnit* involving precipitation. Instead the phrase could describe birds covering the sky as they fly after being startled, like a *šnit*, behaviour that is a standard feature of 'fishing and fowling' scenes in many tombs (e.g. Merefnebef: Myśliwiec 2003: fig. 1; Puimre [TT 39]: Davies 1922: pl. 9).

While the description of birds as *šnit*/*šnᶜ* is only attested in the New Kingdom manuscript of *The Sporting King*, another role of *šnit*/*šnᶜ* fits within this conceptualisation. Since the Old Kingdom, *šnit*/*šnᶜ* was also said to raise the deceased up to the sky or be a vessel for other gods. The earliest attestation of this is in Unas' Pyramid Texts:

šd.n sw šniwt pt siᶜ=sn wnis n itn

The *šnit*s of the sky have taken him, that they might elevate Unas towards the sun disk.

(Spell 262: *Pyr*. 336b [W])

The same spell in the pyramid of Teti describes a contrary event, with 'he will repel (*ḫsb*) the *šnit* from them, and ascend to Re'. However, in the Middle Kingdom, *šnit*/*šnᶜ* could be *wṯs* 'raised up' (Coffin Text spell 468: *CT* V, 386j), and more pertinently in the New Kingdom, the heavenly cow named '*šnit* of the sky' also 'raises (*wṯs*) the gods' (Book of the Dead spell

148: Hornung 1979b: 299); this suggests that Unas' spell 262 was not simply an erroneous writing, and that the concept of *šnit*/*šnᶜ* moving up to the sky was a known theme. Rising up to the sky was also the action of startled birds, so there might be a connection here with the metaphorical realm of *šnit*/*šnᶜ*.

From the Old Kingdom, *šnit*/*šnᶜ* is also found in parallel with other cloud words—*igp* (§5.2.5), *ḥɜty* (§5.2.6), and *ḫɜpt* (§5.2.8). In these circumstances, both *šnit*/*šnᶜ* and the other clouds were repulsed (e.g. Pyramid Text spell 311: *Pyr*. 500b). The most frequent pairing was *šnit*/*šnᶜ* with *ḥɜty* (e.g. tomb of Kheruef [TT 192], Hymn to the Setting Sun, l. 2: Epigraphic Survey 1980: pl. 7). In the alliance treaty signed by Ramesses II with Hattušiliš III, both rulers swear on 'the sky, the earth, the sea, the wind, and the *šnᶜ*' (l. 30: K*RI* II, 230.11). The Akkadian version translates *šnᶜ* as *urpï*, 'cloud' (Edel 1997: 70–73; Black *et al.* 2000 [1999]: 426), which gives further credence to translating *šnit*/*šnᶜ* as a cloud.

Of the other weather words, *ḥwyt* and *ḏᶜ* appear with the rare verbal form of *šnᶜ* in the Tempest Stela, where the sky is '*šnᶜ*ed with[out cessation]' (Helck 2002 [1975]: 106; see further §5.1.7.1), in a vivid description of a storm that wreaked havoc on Egypt. As a verb, *šnit*/*šnᶜ* probably means 'to be clouded'; in this case, the sky was completely covered over by *šnᶜ*, as a feature of the *ḏᶜ*-storm alongside *ḥwyt*-rain and strong darkness in the western sky. This passage need not indicate that rain was inherent to *šnit*/*šnᶜ* events, but rather that they could co-occur—there can be clouds overhead with no rain.

The last two examples indicate that *šnit*/*šnᶜ* was, in many circumstances, perceived negatively and as dangerous. As with many weather words, it is the context that determined the response; in the Tempest Stela, the gods use a combination of phenomena to express their displeasure at Egypt, while in Pyramid Text spell 311 (*Pyr*. 500b), *šnit* was against the gods, and so must be repelled. The later *Book of Overthrowing Apep* expresses this vividly, as part of the instructions for a spell to protect Re:

<ir>.ḫr=k mitt nn ḫft psi{w} šnᶜ m iɜbtt nt pt

You shall <do> the likeness of this when the *šnᶜ* boils in the east of the sky.

(P. BM EA 10188, 23.13: Faulkner 1933: 47.4–5)

psi (*Wb*. I, 552.8–11) normally refers to the process of cooking, but in religious texts it can also be a metaphor for the complete annihilation of something, from which there was no escape (Verhoeven 1984: 108–9). The *šnᶜ* in the spell is a boiling-trap for the sun god. In addition, the use of *psi* might here indicate that heat was associated with *šnit*/*šnᶜ*.

5.2.7.2 *Summary*

Despite a significant change in orthography over time, *šnit* and *šnᶜ* were the same word, with the same connotations. Old and Middle Kingdom texts speak of dispelling *šnit*/*šnᶜ* or the action of it rising, while the 'covering' aspect of *šnit*/*šnᶜ* became a major characteristic in the New Kingdom. These aspects, as well as the parallels with other cloud words and the Akkadian translation, demonstrate that *šnit*/*šnᶜ* was a cloud. No evidence suggests that it could have been hail. It might have been a dark cloud, which could produce rain (or even hail), but not as a matter of course.

5.2.8 *ḫ3pt*

 *ḫ3pt* is generally translated as 'storm' (van der Molen 2000: 418), or 'Unwetter' (*Wb*. III, 362.8; Hannig 2003: 99; Hannig 2006: 1974) and 'orage' (Meeks 1981: 256). It does not appear to have a Coptic descendant, and the last attestation is from the early Roman Period (P. Bremner Rhind 23.9–15: Faulkner 1937: 168). While *ḫ3pt* resembles *ḫ3ty* (§5.2.9) and *ḫ3ḫ3ty* (§5.2.10), it was more probably derived from *ḫ3pi* 'to flow freely' (*Wb*. III, 362.7; Satzinger and Stefanović 2021: 318). This is why some commentators translate *ḫ3pt* as 'deluge' or 'downpour' (e.g. Allen 2005a: 59).

When it first appears in the Pyramid Texts of Unas, *ḫ3pt* was written as  *š3pt*, which is due to early interchangeability between *š* and *ḫ* graphemes, particularly in this copy of the funerary texts (e.g. Allen 2017: 26). The word is not attested anywhere else as *š3pt*, so in this chapter it is referred to as *ḫ3pt*. This was not the only orthographic development in *ḫ3pt*: while it was consistently determined with the rain-determinative in the Old and Middle Kingdoms, from the New Kingdom it was abbreviated to a simple sky sign. The phonetic complements ( , , and) were also dropped. In one source, *ḫ3pt* is given divine determinatives, personifying it as a god (P. Bremner Rhind, 23.9: Faulkner 1933: 47). Unlike many other 'storm' words, *ḫ3pt* is not attested with a Sethian determinative until the Ptolemaic Period, and in those cases *ḫ3pt* is an alias of Seth (e.g. *Dendara* X, 357.12). It is not a common word, appearing in only three distinct texts in the study period (with six total attestations), and a further five in later sources (excluding Seth's alias).

5.2.8.1 *Characteristics*

Textual sources provide little description of *ḫ3pt*. Pyramid Text spell 311 states that the king will 'remove (*nfᶜ*) the *š3pt*' for the sun god, and likewise with the *igp*- and *šnit*-clouds in



Figure 22: Detail of P. UCL 32110g, showing possible *šmsw*. Creative Commons BY-NC-SA 4.0, available at https://collections.ucl.ac.uk/Details/collect/40436

parallel clauses (*Pyr*. 500a–b; for this spell, see §5.2.5.3). *igp* (§5.2.5) and *šnit* (§5.2.7) are better attested words for types of clouds, and the parallelism of this passage indicates that *ḫ3pt* was probably also part of this semantic sphere. Some previous translations have instead interpreted the verb affecting *ḫ3pt* as *nfi* 'to blow away' (*Wb*. II, 250.11; e.g. Allen 2005a: 59), implying a wind parting the clouds, but that verb is otherwise unattested in the Pyramid Texts. The same imagery of removal is employed in a Ptolemaic liturgy, where the *ḫ3pt* is 'separated (*wḏ3*)' (P. Leiden T 31, l. 34: Pleyte 1881: pl. 163).

Re is the god addressed in PT spell 311, which suggests that *ḫ3pt* was an obstacle on the solar journey, a theme that is present in most attestations. In particular, there was a contrast between the *ḫ3pt* covering the sky, creating darkness, and then the sun disk shining brightly. This is perhaps first found in a fragmentary Middle Kingdom ritual text with a hymn to the sun god from Lahun:

> [...] *i*[*t*]*n w3 šmsw* (*?*) *r ḫ3pt n šs3* [...] *psd mi* [...] *i*[*t*]*n nty m pt*
>
> The su[n d]isk […], the follower (?) is far from the *ḫ3pt* because of the wise one […] shining like […] the sun [di]sk which is in the sky.
>
> (P. UCL 32110G, x + 2–3: Collier and Quirke 2004: 10)

I propose *šmsw* as the word following *wꜣ*, as it is a better fit for the hieratic than *ṯꜣw*, which was the transcription of the first edition (fig. 22; see Collier and Quirke 2004: 11), although the additional determinatives expected for *šmsw* are lacking. Lacunae make interpretation difficult, but it seems that the sun disk's presence and the absence of *ḫꜣpt* were associated. This association is also found in the Ptolemaic *Book of Overthrowing Apep*, which may have been composed in the late New Kingdom (Lustman 1999: 347):

> *iry.ḫr=k <mitt> nn ᶜšꜣw zp sn r ḫꜣpt r psd<t> itn nw rᶜ*
> You shall do the <likeness> of this very often against the *ḫꜣpt* until the sun disk of Re is shini<ng>.
> (P. BM EA 10188, 23.15: Faulkner 1933: 47.8–9)

This spell as a whole ascribes the *ḫꜣpt*, *ḏsrt*, *qri* (§5.2.11), and *ḫꜣty* (§5.2.9) that happen in the sky to Apep.

ḫꜣpt was a force to be avoided, if at all possible. Unlike some other storm words, *ḫꜣpt* is never attested under the control of the beneficent gods, only as a force which they must eliminate. It prevented the sun's journey, and stopped sunlight from reaching the earth, aspects that fit with Apep's mythological role. From its etymology of 'to flow', it is assumed that *ḫꜣpt* involved particularly heavy rain; however, as its context is always highly religious, it is probable that *ḫꜣpt* was conceived more as a mythological storm than an actually experienced storm for the living.

5.2.9 *ḫꜣti*

 *ḫꜣti*, unrelated to *ḫꜣpt* despite orthographic similarities, has been consistently translated as 'storm' (Wilson 1997: 762–63; van der Molen 2000: 417) or 'Unwetter' (*Wb*. III, 364.2; Hannig 2006: 1973). Its attestations are extremely limited, comprising four texts: Coffin Text spell 1112 (*CT* VII, 440e) on seven different Deir el-Bersha coffins, a funerary spell in two first millennium BCE tombs (Landgráfová *et al.* 2023: 148, 344), the *Book of Overthrowing Apep* (23.14: Faulkner 1933: 47.7), and the myth of Horus at the temple of Edfu (*Edfou* VI, 61.12–14).

According to Satzinger and Stefanović (2021: 317), *ḫꜣti* is derived from the root *ḫꜣ* 'to disturb', which it shares with *ḫꜣḫꜣti* (§5.2.10). Gardiner (1947: I, 5*, no. 11) argued that *ḫꜣḫꜣti* is the older word from which *ḫꜣti* derives, but this was before the publication of Buck's *Coffin Texts* VI, which contains an attestation of *ḫꜣti* that makes this significantly less certain. The key concepts of *ḫꜣti* were violence and disturbance. *ḫꜣti*'s connection with weather is revealed in its various determinatives. Three of the Coffin Text attestations have no

determinatives, but the rest have the pool- (B1Bo), sky- (B9C, B3L) or rain- (B1L) determinative. In the post-New Kingdom sources, the funerary spell uses the sky-determinative, the *Book of Overthrowing Apep* uses a Seth animal lying on top of the sky, and the Edfu texts uses 𓉐 (Gardiner sign S15).

5.2.9.1 *Characteristics*

The copies of Coffin Text spell 1112 are the sole reference point for *ḫ3ti* before the Third Intermediate Period:

> *wn tw ḫ3ti ḥ3t r^{c} wnḫ(.ti) sḏ3 ḥr nfr hrw nb ^{c}3 irrw wdn 3t ḫsr ḥ3t m hh=f*
> Open yourself, *ḫ3ti*! The cloudiness of (the eye of) Re has been undone, so that the perfect Horus may travel every day. Oh great of forms, weighty of attack, who repels the cloudiness with his blast!
> (*CT* VII, 440e–41c)

The phonetic pun between *ḥ3t* 'cloudiness (of eyes)' and *ḥ3ti* 'raincloud' (see §5.2.8.1) attested elsewhere is here developed, with a comparison of ocular 'cloudiness' to another, similar sounding, disruption of the sky, a *ḫ3ti* (Sherbiny 2017: 478). This metaphor of 'eye appearance is weather' is also found with other weather-words (see §5.1.2.1, 5.1.7.2, 5.2.6.1, 5.2.12.2). The direct juxtaposition of *ḫ3ti* with *ḥ3ti* suggests that a *ḫ3ti* involved a clouded sky. As a cloud-based phenomena, *ḫ3ti* was most likely an obstacle for the sun god that impeded travel and must be cleared. The spell commands the *ḫ3ti* to 'open up' (*wn*) so that Horus, who was often equated with Re in the Book of Two Ways (Jankuhn 1980: 13), can travel through the sky. The idea of undesirable *ḫ3ti* impacting the solar journey is also evoked in the later *Book of Overthrowing Apep*:

> *iry.ḫr=k mitt nn ^{c}šzw sp sn iw {d}<t>m rdit ḫpr ḫ3ti m pt*
> You shall do the likeness of this often, so that *ḫ3ti* is not allowed to happen in the sky.
> (P. BM EA 10188, 23.14: Faulkner 1933: 47.6–7)

In these spells, *ḫ3ti* was a negative force. The Ptolemaic Edfu text provides some more nuance on the experience of *ḫ3ti*:

> *sḏm=sn ḫrw hbq mzwt=k ḫrw sšd n w^{c}=k mi ḫ3ty ḥr i3btt n pt mi sh3r m-^{c} ḫrd*
> They hear the striking sound of your shaft and the whistling sound of your harpoon, like a *ḫ3ty* in the east of heaven, like a drum in the hand of a child.
> (Myth of Horus: *Edfou* VI, 61.12–14; translation after Kurth 2014: 106)

This compares the noise of Horus' harpoon to that of *ḫ3ti* and a drum as he fights in this episode against hippopotami, which are linked to Seth. *ḫ3ti* is either associated with a low-pitched thud (*hbq*) like a shaft striking its target (Wilson 1997: 603), or a high-pitched whistle (*sšd*) like a shaft speeding through the air (Wilson 1997: 936), depending on which clause *ḫ3ti* refers to (the shaft or the harpoon). It is possibly analogising a harpoon tip cutting through the air to a lightning bolt, but the subsequent comparison to drum beats would suggest a sound like thunder. However, whether this characterisation was valid before the Ptolemaic Period is unknown.

ḫ3ti is an enigmatic word that was associated with the interruption of the solar cycle, and probably represented some sort of cloud. Later sources might suggest that it may have had associated thunder or lightning.

5.2.10 *ḫ3ḫ3ti*

While  *ḫ3ḫ3ti* looks very similar to *ḫ3ti*, and shares a historic root in *ḫ3* (see §5.2.9), they are here considered separately because of their different contexts of use. *ḫ3ḫ3ti* has been translated as 'storm' (Faulkner 2009 [1962]: 201), 'Unwetter' (*Wb*. III, 363.8–9; Hannig 2006: 1975), and 'orage, tornade' (Meeks 1998: 228). There are seven attestations in total before the Third Intermediate Period, coming from magic and royal texts.

Consonantal reduplication could explain the relationship between *ḫ3ḫ3ti* and *ḫ3ti*. *ḫ3* 'to pound' could give rise to the theoretical continuous verb **ḫ3ḫ3* (for this process, see e.g. Gardiner 1957: §274; Allen 2013b: 95), which is a good candidate (Satzinger and Stefanović 2021: 317). Nominalisation of this verb's participle form could have resulted in *ḫ3ḫ3ti*, literally 'the one who disturbs'.

The first attestation of *ḫ3ḫ3ti* in the First Intermediate Period has the rain-determinative, but the Seth-determinative is most common for *ḫ3ḫ3ti*. The *ti* of *ḫ3ḫ3ti* was initially always written, but in the New Kingdom this phoneme started to be dropped, a process that also occurred with other *t*-ending words (e.g. *šnit*/*šnᶜ*, §5.2.7; see Loprieno 1995: 38). The 20th Dynasty version of the *Onomasticon* has  (Regulski and Beck 2024: 298), presumably confusing the *ḫ3*-fish () with the *bs*-fish (), which is followed by  in the common verb *bsi* (*Wb*. I, 474.5–18). A different writing of *ḫ3rḫ3r* is known from the Third Intermediate Period (*Onomasticon of Amenope* [H, L]: Gardiner 1947: I, 5*, no. 11), perhaps due to the actual pronunciation of *ꜣ* (see Allen 2013b: 39–42).

5.2.10.1 *Characteristics*

In all of its attestations, *ḫ3ḫ3ti* was an active participant, and in some cases it carries a divine-determinative, strong evidence of personification (McDonald 2002: 151). One of these cases, in the Leiden Magical Papyrus, seems to give a similar status to *ḫ3ḫ3ti* as to Seth and Ba'al:

> *p3 khb n stš r p3* [*ʿḥw*] *p3 ḥdnḏn bʿyr r=k p3 khb n p3 ḫ3ḫ3*[*ti*] *iw=*[*f ḥr*] *ib mw r t3 pt r=k k3 qn=f t3 pḥty*[*=f* ...]
>
> The rage of Seth is against A[khu]. The uproar of Ba'al is against you. The rage of *ḫ3ḫ3*[*ti*] when [he is] thirsting for water towards the sky is against you. He shall finish [his] strength […]
>
> (P. Leiden I 343, rt. 4.9–13 + vs. 7.5–6: Beck 2018: pl. 7)

A reading of *ḫ3ḫ3ti* is certain here because of the size of the lacuna, and the following determinatives (Beck 2018: 44). This passage could suggest that *ḫ3ḫ3ti* was a dark, foreboding cloud that had the potential for rain. This cloud 'thirsts' for the sky to give it water, implying it has not yet received that water, and thus it 'rages', perhaps in the form of thunder and lightning. Later references to water attacking the demon Samanu in the same spell suggest that the concept of a *ḫ3ḫ3ti* also included rain (rt. 4.13, 5.3–7). However, the presence of Akhu/Samanu and Ba'al could indicate that this conceptualisation originated from the Near East (Beck 2018: 16), but with the limited attestations of *ḫ3ḫ3ti*, this is unverifiable.

This papyrus is the only mention of *ḫ3ḫ3ti* in a medical-magical context, but the theme of *ḫ3ḫ3ti* acting against enemies is found elsewhere. As with other storm words, *ḫ3ḫ3ti* could be used by the king:

> *ḫ3ḫ3ti pw ḥr ḫ3swt ʿ3 hmhmt šdw qri r wrw r ḫf niwwt=sn ir*(*w*) *s*(*w*)*t=sn nbw m i3wt ḏsrwt*
>
> He is a *ḫ3ḫ3ti* upon foreign countries, great of war-cry, who raises a *qri*-storm against the chiefs, in order to destroy their cities, so that their places be made as red mounds.
>
> (Siege of Dapur, rhetorical text, l. 11–13: K*RI* II, 173.13–14)

The reference to the king's war-cry may suggest an association of thunder with *ḫ3ḫ3ti* (see also the Armant stela of Ramesses II, l. x + 1: K*RI* II, 713.7). Ramesses II has the quality of a *ḫ3ḫ3ti* in his fight against the Hittites, and he creates a *qri* (see §5.2.11.3). *ḫ3ḫ3ti* also immediately follows *qri* in the *Onomasticon of Amenope* (Gardiner 1947: I, 5*, no. 11), so these two weather words may be connected in some way. The 11th Dynasty steward named

Henu also claimed *ḫ3ḫ3ti*'s qualities, one of the only times that a non-royal is described as any type of storm:

> *ḫ3ḫ3ti sbdš ḥ3*(*w*)*-nbwt*
> A *ḫ3ḫ3ti* who makes weak the *ḥ3*(*w*)*-nbwt*
> (Wadi Hamammat no. 114, l. 9: Couyat and Montet 1912: 82, pl. 31; Doxey 1998: 359)

Henu was on an expedition to Punt on behalf of his king, and he might have taken the prerogative of likening himself to a *ḫ3ḫ3ti* because he was acting as a royal agent.

ḫ3ḫ3ti is a storm-word with associations to rain, thunder, and violence. The attestations are all in the context of violent action against foreigners. Henu's *ḫ3ḫ3ti* was against the Aegeans, and Ramesses II's was against the Hittites in the Siege of Dapur, while it could also be against demons like the Mesopotamian Samanu, who is equated with the Egyptian Akhu in the Leiden Magical Papyrus (see Fischer-Elfert 2011: 189–91; Beck 2018: 15–16). Furthermore, its association with *qri* from the New Kingdom onwards suggests that *ḫ3ḫ3ti* was an imagined divine tool against the enemies of *ma'at*, like *qri* (see §5.2.11.3).

5.2.11 *qri*

 *qri* is generally translated as 'storm', 'storm cloud', or 'bad weather' (e.g. *Wb*. V, 58.6–8; Faulkner 2009 [1962]: 280; van der Molen 2000: 655; Hannig 2003: 1338; Hannig 2006: 2527). Lesko (2002 [1987]: II, 156) goes further and offers 'thunderbolt, storm' for Late Egyptian. Demotic writes *qri* as *qll* (Erichsen 1954: 546), following the well-attested *r*/*l* transformation (see Allen 2013b: 39), and the Coptic descendant ⲕⲗⲟⲟⲗⲉ also shows this change (Crum 1939: 104; Černý 1976: 56; Bojowald 2020). The etymology of *qri* is not secure, but Hornung's suggestion (1973: 58) of it being related to a root *qrr* 'to cover, to hide' is most convincing, as *qri* could cover the sky and hide the sun from view (§5.2.11.1, full discussion in Bojowald 2020: 239).

In Old Egyptian, the second radical of *qri* was reduplicated, producing *qrr*. This continued until the New Kingdom, when the second *r* changed to *i*, probably reflecting an earlier phonetic change (for this process, see Schenkel 1965a: 115; Allen 2013b: 55), as writing normally took a while to catch up with the living language (e.g. Kammerzell 2005: 182). However, sporadic writings as *qri* are attested in the Old and Middle Kingdoms. In this section, I use *qri* when discussing the word generally.

qri is examined here under the 𓉔 determinative. A range of other determinatives are attested, including 𓌙, but the application of the sail-determinative is rare, being only found in two sources: Teti's Pyramid Text spell 254 (*Pyr*. 281a), and the Book of the Dead spell 174 of Neferwebenef (Ratié 1968: pl. 14, l. 508). Around 30% of pre-Third Intermediate Period attestations use 𓉔, and a further 20% use the *pt*-sign, which can be taken as a shorthand for 𓉔 (§5.2). In the Old Kingdom, *qri* could be determined with 𓉔, 𓌙, or 𓆑 (Gardiner sign Q7). The use of the Seth-animal first becomes apparent in the Coffin Texts (e.g. spell 622: *CT* VI, 237h [B3Bo]), as the earlier Old Kingdom attestations of *qri* are all from the Pyramid Texts, which often avoided using the Seth-animal (e.g. te Velde 1967: 6); the Seth-animal dominates attestations thereafter (50%). The striking man sign and its abbreviated form (𓀀, Gardiner sign A24; 𓇋, Gardiner sign D40) were also added in the Coffin Texts (e.g. spell 30: *CT* I, 82c [T1L]), which articulate the force of *qri* (see §5.2.11.1), as well as the sky-determinative (e.g. spell 622: *CT* VI, 237h [B3Bo]). In a few texts of the New Kingdom, the divine-determinative 𓇼 (Gardiner sign G7) is used to emphasise the divine origins of those *qri*s (e.g. P. Cairo JE 86637, rt. 27.5: Leitz 1994: pl. 27; see §5.2.11.3).

While attested from 5th Dynasty Old Egyptian to Coptic, *qri* noticeably clusters in religious and mortuary texts, with only a few exceptions. Of these, the use of *qri* in the stela of Djar (Cairo JE 41437, l. 5: Clère and Vandier 1948: 14) and *The Shipwrecked Sailor* (l. 57: Blackman 1932: 43.5–6) might be at least partly due to those texts consciously evoking mythological concepts (see §5.2.11.2–3). In total, there are 69 attestations of *qri*, 30 of which are distinct.

5.2.11.1 *Characteristics*

qri was a phenomenon of the *pt*-sky. The description of *qri* happening within the sky first appears in the Old Kingdom (Pyramid Text spell 254: *Pyr*. 281a), and the horizon as a location is first explicitly mentioned in the Middle Kingdom (e.g. Coffin Text spell 989: *CT* VII, 197b). For example, in the Book of the Dead:

> *ink stš šd ḫnnw qri m-ḫnw ꜣḫt nt pt*
>
> I am Seth, who expels disturbance and *qri* (or 'disturbance of *qri*') within the horizon of the sky.
>
> (Spell 39: Lapp 2017: 108c–11a)

There was some degree of visibility to *qri*, as it could be 'seen (*mꜣꜣ*)' (Book of the Dead spell 169, P. Neferwebenef: Ratié 1968: pl. 15, l. 565), 'observed (*dgꜣ*)' (Inventory Stela, l. 6: Hassan 1953: pl. 55), or 'foreseen (*sr*)' (Pyramid Text spell 669: *Pyr*. 1961a; Coffin Text

spell 682, *CT* VI, 308k). *The Teaching of Amenemope* (possibly of late New Kingdom composition, see Laisney 2007: 7) describes the fate of the evil-doer floundering in the river:

tȝ mḥw(t) hȝy.t skm=s wnwt=f dmi=sw r pȝ pḫpḫ pȝ qri{w} ḫy nȝw msḫw bin pȝ šmm tw=k mi iḫ

The north wind has descended to end his hour, it mingles with the *pḫpḫ*-storm. The *qri* is high, the crocodiles are evil, you heated man, how are you now?

(P. BM EA 10474, 4.14–17: Laisney 2007: 330)

The description of the *qri* as 'high (*ḫy*)' (*Wb*. III, 237.7–13) could refer to the height of the cloud mass, or its height above the ground. In other sources, *ḫy* refers to entities rising up, and in some cases 'mounting up to the sky' (e.g. liturgical texts of P. MMA 35.9.21, 12.1: Goyon 1999: 40, pl. 11), so the translation could instead be 'the *qri* is risen'. Others, however, have taken *ḫy* as indicating a loud noise (e.g. Laisney 2007: 62), which is also plausible, as the sound of *qri* is attested elsewhere (see below). The *qri* is here juxtaposed with the crocodile, an animal often used as bringers of justice in literary narratives (e.g. *The Tales of King Khufu's Court*, 3.14: Blackman 1988: 3; *The Doomed Prince*, P. Harris 500, vs. 8.11: Gardiner 1932: 8.15), and in other contexts, such as the Old Kingdom tomb inscription of Meni against desecrators (*Urk*. I, 226.13–15; see further Eyre 1976: 113). Such a juxtaposition suggests that the *qri* also threatened annihilation for the unrighteous.

Amenemope provides other indications of *qri*'s nature. Concurrent with *qri*, the north wind (§5.1.3.2.1) combines with another type of storm, a *pḫpḫ* (*Wb*. I, 544.5). This word only appears in *Amenemope*, its meaning assumed from having the same determinatives as *qri* in the next line (Allon 2007: 17; Laisney 2007: 61). Little is known about *pḫpḫ*, although its etymological root of *pḫȝ* connects it to the concept of tearing or splitting (Satzinger and Stefanović 2021: 150, ID 1001777). As *mḥyt* is present in this scene as well, it suggests that *qri* could involve wind; however, in no other texts is a wind-word associated with *qri*.
On the other hand, *qri* was associated with many storm-related words in other sources: *ḫnnw*, *šnᶜ* (§5.2.7), *ḫȝty* (§5.2.9), *ḫȝḫȝty* (§5.2.10), and *nšn* (§5.2.12). *nšn* is attested from the Middle Kingdom, *ḫȝḫȝty* and *ḫnnw* from the New Kingdom, while *ḫȝty* and *šnᶜ* only appear after the New Kingdom. Coffin Text spell 80 juxtaposes *qri* with *nšn*, both as aspects of Shu:

rḏw=i pw qrr n pt i(ȝ)dt=i pw nšn iḫḫw

The *qrr* of the sky is my efflux; the *nšn*-storm of twilight is my dew.

(*CT* II, 30e–f)

The parallel clauses imply that *qri* and *nšn* were two distinct but parallel phenomena. *rḏw* was a type of bodily fluid frequently linked with Osiris (e.g. Winkler 2006), and its use here might suggest a watery aspect to *qri*.

However, rain was probably not integral to the idea of *qri*, as its use of the rain-determinative is erratic. Furthermore, in the late New Kingdom *Onomasticon of Amenope* (see Regulski and Beck 2024: 296–300), *qri* and *ḫ3ḫ3ti* are listed separately from the precipitation words (see table 1): *qri* and *ḫ3ḫ3ti* are entry no. 10 and 11 respectively (following numbering in Gardiner 1947), just after constellations, and before words for sunrise, darkness, and light. Weather words relating to rain are listed from entry no. 17a, with *šnᶜ*, *i3dt*, *srq*, and *snm* being mentioned before terrestrial water is recorded from no. 23 onwards (Gardiner 1947: I, 6*).

The sound of a *qri* was sometimes compared to that of the human voice, as in a stela of Ramesses II from Armant:

hmhm=f qri ḫ3ḫ3(ti)
His war-cry is *qri* and *ḫ3ḫ3*(*ti*)-storm
(l. x + 1: K*RI* II, 713.7)

The king's characterisation apparently links *qri*, *ḫ3ḫ3ti*, and a loud shout, which is probably a metaphoric allusion to thunder. Normally, however, the sound produced by a *qri* is referred to as a *ḫrw qri*, and this phrase is considered next.

5.2.11.2 *Sunrise*

If time is mentioned, *qri* was stated to happen in the final moments of the solar god's nighttime voyage. For instance, in Pyramid Text spell 254, when the stars ('Climbing Star', 'Oxherd', 'Knife-Bearers') disappear at dawn (Allen 2005a: 63):

h3 snḏ sd3 mdsw tpyw qrr n pt wp.n=f t3 m rḫt.n=f hrw mr.n=f iwt im
Fear and trembling descends (upon) the Knife-Bearers before the *qrr* of the sky, for he has opened the earth through what he has learnt on the day on which he desired to come from (it).
(*Pyr*. 281a–b; see also the later version, Coffin Text spell 622: *CT* VI, 237h)

This locates *qri* in the eastern horizon (see also a Late Period spell in P. Brooklyn 47.218.138, l. x + 5.12: Goyon 2012). Sunrise was particularly associated with the *ḫrw qri*, the 'sound of the *qri*', that was heard as the sun god emerged from the horizon in Coffin Text spell 704:

sbḥ rᶜ m mw nw ḏsr=f sḏȝ r=sn ḫrw iȝ ᶜ(w)y=s nḫt nhmhm ḫȝswt iȝbtt ḥr ḫrw qrr sḫp{n}.n ḥrw=sn nbi

Re cries out from the water of his holy place. Those who are below tremble at them (?). Her strong arms are praised, and the eastern hills roar at the sound of the *qrr*. Their faces have brought the flaming one.

(*CT* VI, 335n–s [B2L])

The eastern hills respond to the *ḫrw qri* with a loud noise of their own, and the flaming one, an aspect of the sun, rises above the hills. Several other funerary spells also mention *ḫrw qri* at sunrise (e.g. Coffin Text spell 888: *CT* VII, 99t–w; Book of the Dead spell 39: Lapp 2017: 86b–87b), but it is unclear who or what is making this sound. It cannot be the eastern hills, as they react to the *ḫrw qri*. The agents of chaos could be the sources of the *ḫrw qri*: Apep and Rerek are both mentioned in spells that speak of *ḫrw qri*, and in solar mythology Apep is known as the lord of storms, albeit the *nšn*-storm (see §5.2.12.2), suggesting that their presence could in some way involve a *qri*. In the Pyramid Texts (spell 522: *Pyr*. 1229b), there is a snake deity named *qrr*, whose name appears to be closely related to *qri*, at least linguistically (Satzinger and Stefanović 2021: 400, ID 1001903). Yet Seth, who guarded the sun barque, also controlled *qri*, and he could both create it (Coffin Text spell 313: *CT* IV, 93j) and destroy it (Book of the Dead spell 39: Lapp 2017: 108d–9d). This suggests that the *qri* could have been summoned by the sun god's Entourage against the chaotic beings.

Elsewhere, the sound was related to battle amongst divine entities, as in the Book of the Dead:

ḫr sbn ᶜpp ḫfty n rᶜ i rwi ᶜd m iȝbt pt ḥr ḫrw/mdw qri nhmhm=s wn sbȝw ȝḫt tp-ᶜ rᶜ pri{t}=f g(ȝ)ḥ.w m nspw

Fall, stumble, Apep, enemy of Re! Oh, one who leaves the edge of the eastern part of the sky at the sound of *qri* when it (the sky) roars, open the gates of the horizon before Re, so that he comes forth, faint with wounds.

(Spell 39: Lapp 2017: 84–89)

The speaker (who is later equated to Seth) calls for Apep to be defeated, and orders an unnamed being to open the gates of the horizon when he hears the *ḫrw qri*, so that Re could emerge victorious, albeit weak (see Hornung 1979b: 108.20). The *ḫrw qri* is here perhaps a sign that the battle was over.

qri might actually be the source of the ground shaking before the appearance of the sun god, as evoked in the Cannibal Hymn (Pyramid Text spell 273: *Pyr*. 393b; Coffin Text spell 573: VI, 177c), and this association is expressed in a 19th Dynasty healing spell:

dm nbwty šsrw=f im=f nw<r>.n=f pt tȝ m qri

The Ombite shoots his arrows into it (the demon Wenti), when he has caused heaven and earth to shake with the *qri*.

(P. BM EA 10042, rt. 5.8: Leitz 1999: pl. 16)

Here, a *qri* explicitly initiated by the Ombite Seth, in his role of solar guardian, is causing movement in both heaven and earth. The link between *qri* and earthquakes might have been aural experience; earthquakes produce a low, constant rumbling, which is comparable to one type of rumbling thunder (see Roccati 1984: 352).

In the Coffin Texts, *ḫrw qri* was also used to announce other gods after they overcame some obstacle, for example when the deceased appears as a god-like *ȝḫ*:

pr sbḥ m r n wrw nbw rḫyt ḏsryt m r n nḥbtt ḥr ḫrw qrr n nṯrw imiw ȝḫt …

mȝȝ=sn NN pn sḏȝ=f m ḥtp ḥr wȝwt nfrwt nt imnt m irrw=f n ȝḫ nṯr

A cry comes forth from the mouth(s) of the great ones, lords of the people, and a shout from the mouth(s) of the sceptred-ones, because of the sound of *qrr* of the gods who are in the horizon … when they see this NN as he proceeds in peace on the perfect paths of the west in his shape of a divine *ȝḫ*.

(Coffin Text spell 30: *CT* I, 82a–87b)

This passage states that the *ḫrw qri* was made by the gods who are in the horizon; even though the utterance is not related to the solar cycle here, *ḫrw qri* was still associated with the horizon. Coffin Text spell 682 (*CT* VI, 308k) similarly states that the 'foretellers of the great *qri* go forth from within the inner horizon of the sky' at the time of a specific festival. These foretellers might actually be the *ḫrw* itself, the noise announcing an event before it could be seen. Another Coffin Text spell continues this theme of celebration at the enthronement of Horus, when:

pt m ḥ(ȝ)b tȝ m ḥ^{cc}wt psḏwt ib=sn nḏmw ḥr ḫrw qrr n nfȝy

The sky is in festival, the earth is in joy, and the Enneads, their heart(s) are sweet at the sound of the *qrr* of the Blower.

(Spell 313: *CT* IV, 93i–j [B5C])

The 'Blower (*nfȝy*)' is generally identified as Seth (e.g. Altenmüller 1987: 7), but the epithet has only been found here and then much later in Graeco-Roman reliefs of the Edfu temple, where it refers to a lion-headed guardian deity (*LGG* IV, 206; Goyon 1985: 75). Whoever the Blower is, the sound that came from his *qri* causes rejoicing. Royal coronation decrees used very similar phrasing (e.g. Coronation Decree of Horemheb, l. 20–21: Gardiner 1953: 15), although without any mention of *ḫrw qri*. Those royal rituals often evoked sunrise (e.g.

Frankfort 1948: 149), and Horus, who the king was identified with, also had solar connections (Barta 1973b: 156), so despite the ostensible separation from solar myth, spell 313 might still allude to sunrise.

Taken together, this evidence suggests that *ḫrw qri* could refer specifically to a sound heard at the moment of a god's transition to a position of greater power, whether that be the sun god reborn in the daily cycle, or Horus gaining the throne of his father after emerging victorious from a crucial battle. It is a sound that elicited celebration, but one that could strike awe into bystanders.

This is in contrast to *ḫrw m/n pt*, another word for thunder. Seth was undeniably the main creator of this sound (e.g. Coffin Text spell 1179: *CT* VII, 517c); elsewhere, he was given this ability by Atum to strike fear into their enemies (*The Contendings of Horus and Seth*, rt. 16.4: Gardiner 1931: pl. 16). *ḫrw m/n pt* was not associated with sunrise, and the one instance a time is mentioned in connection with it, it is sunset (P. Ebers 360, 58.7–8: Grapow 1958: 84.6). Compared with *ḫrw qri*, *ḫrw m/n pt* had a more narrowly focussed set of associations.

In texts, *ḫrw qri* was almost exclusively associated with divine contexts. One apparent exception to this is in *The Tale of the Shipwrecked Sailor*: after several days alone on an island following the shipwreck that had been caused by a *ḏ*^{c} (see §5.1.7.1), there is a sudden shift:

> *ʿḥ*^{c}*.n sḏm.n=i ḫrw qri ib.kw wʒw pw n wʒḏ-wr ḫtw ḥr gmgm tʒ ḥr mnmn kf.n=i ḥr=i gm.n=i ḥfʒw pw iw=f m iyt*
>
> Then I heard a *ḫrw qri*, and I thought it was a wave of the Great Green. The trees were cracking, the ground was shaking. I uncovered my face and I found that it was a snake who was coming.
>
> (l. 56–62: Blackman 1932: 43.5–8)

The Shipwrecked Sailor mobilises several divine and solar parallels: the snake's body is made of gold and lapis lazuli like a god's (Derchain-Urtel 1974: 87–88); the number of snakes on the island references the 75 forms of Re in the *Litany of Re* (Derchain-Urtel 1974: 84; for the *Litany*, see Piankoff 1964); the snake is the lord of Punt, which is part of the God's Land where the sun rises (Kurth 1987: 174); and the snake threatens the protagonist with burning, like the burning breath of the Solar Eye and uraeus (Zaki 2018: 79; e.g. Coffin Text spell 284: *CT* IV, 34h). The 'shaking' can be compared to the 'trembling (*nhmhm*)' that occurs at sunrise in Coffin Text spell 704 (*CT* VI, 335q; Jambon 2006: 71). The narrator portrays the snake as a manifestation of a god (Hornung 1996 [1971]: 130), and probably the creator sun

god (e.g. Baines 1990: 72). Thus, the *ḫrw qri* is another allusion suggesting that a (solar) deity is arriving.

5.2.11.3 *Battle and strife*

Gods who upheld *ma'at* could create or send a *qri*. Since the Old Kingdom, Seth had been called the *nb qri* (*LGG* III, 760), who used it to destroy the enemies of *ma'at* (e.g. the magical formulae of P. BM EA 10042, rt. 5.8: Leitz 1999: pl. 16; quoted above) but also to carry Atum (e.g. Pyramid Text spell 247: *Pyr*. 261a–b; Coffin Text spell 349: *CT* IV, 384c; Book of the Dead spell 174: Hornung 1979b: 363.18). By the 18th Dynasty, Hauron takes up the distinct epithet *ḥqꜣ qr* 'ruler of *qr*' (Cairo JE 72266: Hassan 1953: fig. 62; *LGG* V, 525). This epithet of Hauron may derive from his Canaanite background, rather than a local tradition (Zivie 1976: 313). However, the Calendars of Lucky and Unlucky Days make it clear that multiple gods had the ability to create *qri*:

> *ꜣbd 3 prt … hrw 25 im=k ir ḫwt nb*(*.w*) *m hrw pn n* {*t*}<*q*>*ri ꜥꜣ ir.n nṯrw ḏsrw iw*{*t*} *m hrw pn*
>
> III Peret … day 25: You should not do anything on this day of the great <*q*>*ri* which the gods of sanctuaries, who come on this day, made.
>
> (P. Cairo JE 86637, rt. 27.4–5: Leitz 1994: 297, pl. 27)

From this passage, *qri* was evidently dangerous for the average person even when it was not specifically targeted against them. The P. Sallier IV version states that this day is thrice *ꜥḥꜥ* ('uncertain'; rt. 20.10: Leitz 1994: 297). When *qri* was set against someone, they have been acting against the wishes of the gods, and this was their punishment, as is exemplified in the Siege of Dapur texts, where the divine Ramesses II sends a *qri* against his opponents (K*RI* II, 172.14), and also in *Amenemope* which features a *qri* against a morally poor individual (l. 4.16: Laisney 2007: 55). An 18th Dynasty Book of the Dead has an example linking this phenomenon to loyal conduct:

> *wbꜣ-ḥr=k m pr kkw wꜣḥ ḥr pgꜣ n mꜣ qri šms.n=k ḥqꜣ idbwy*
>
> May you be clear-sighted in the house of darkness (i.e. tomb), which endures on the open ground, while the *qri* cannot be seen, for you have followed the ruler of the Two Banks.
>
> (Spell 169, P. Neferwebenef, l. 564–65: Ratié 1968: pl. 15)

After behaving as he should, by following the 'ruler of the Two Banks' (who could be a number of gods, see *LGG* V, 499), the deceased will be clear-sighted, and yet not be able to see any *qri*, indicating that he and his tomb (see Assmann 2005 [2001]: 45) are not threatened

by one. This usage of *qri* as a divine punishment is mainly attested from the New Kingdom onwards. All gods, beneficial and dangerous, could create *qri*, and whether that was positive or negative depended on the affiliation of the person who experienced it.

The danger of *qri* for the non-divine and its solar associations are expressed together in the First Intermediate Period stela of Djari. This includes a warning against the Heracleopolitan king Khety, the rival of Djari's king, Intef II:

> *ṯkn wi ḫty ir*(=*i*) *qrw ḥr spȝt nḫt ḥqȝ=i ir.n*(=*i*) *tȝš=i r int ḥsy*
>
> Approach me, Khety, as (I) make *qr*s over the strong nome that I rule! It is at Wadi Hesy that (I) have made my border.
>
> (Cairo JE 41437, l. 5–6: Clère and Vandier 1948: 14)

It is uncertain whether the speaker here is Djari himself (so Morenz 1998: 9; Demidchik 2003: 36), or Intef II (so Lichtheim 1988: 41; Darnell 1997b: 108). My reading of *ir*(=*i*) as an imperfective, instead of a participle, with an unwritten first-person suffix pronoun (attested elsewhere on the stela) results in a new translation for this passage, in which the speaker threatens Khety with a *qri*. Most translations understand this passage as stating that Khety is creating the *qri*: 'Attack me, Khety, one who made *qr*s over the nome, one mighty of rule' (e.g. Schenkel 1965b: 100; Darnell 1997b: 102; Morenz 1998: 9). However, an epithet describing Khety as sending the *qri* would attribute a surprising amount of legitimacy for Khety's kingship, since it implies he had the divine power to make *qri*; in the texts of the Kamose stelae, the narrator withholds divine attributes from the rival ruler Apepi, suggesting that any presentation here of Khety with divine powers is unlikely (see Redford 1997: 13–15). Following this reading of Khety creating *qri*, some commenters have suggested that Khety here is imagined as Seth, the enemy of the rightful king, Horus (i.e. Intef II) (e.g. Darnell 1997b: 108). However, Seth is not presented elsewhere as sending a *qri* against Horus (in contrast to *nšn*, §5.2.12.2), and at this time Seth was more commonly represented as a solar protector, not yet consistently 'demonised' as in the latest periods of Egyptian history (e.g. Assmann 2002: 42–44). Another alternative suggested by Darnell (1997b: 105) is that Khety, as the apparent creator of *qri*, was being characterised as Apep, noting that battles against Apep often involved storm imagery. However, there are no examples of Apep creating *qri*; although he was frequently present in scenes that involve *qri* (e.g. Book of the Dead spell 39: Hornung 1979b: 109.15), he did not control it. Instead, I suggest that here the speaker is utilising phrases that evoke solar ideology, which is where most pre-New Kingdom attestations of *qri* are found, in order to identify himself with the sun god rightfully fighting against his foes (who include Apep). The mention of *qri* articulates his legitimate

power and ability to deny his foe new territory. This reading implies that Intef II, son of Re, is the speaker.

5.2.11.4 *Summary*

qri can thus be described as a phenomenon of the *pt*-sky that could involve loud noise, rain, and that appeared threatening. It had a strong association with Seth, but all the gods had some degree of control over *qri*. The most common usage of *qri* before the New Kingdom was to indicate the victory of the gods (most often the sun god), with a great noise; during the New Kingdom, another common motif was developed, in which *qri* was a punishment sent against those who did not follow *ma'at*, whether that be a local Egyptian or a foreigner. It was almost exclusively positioned in the eastern horizon, and this suggests that it took inspiration from storms over the Eastern Desert, where the mountains often cause storm events from orographic lifting of air (§3.3.2; see also §5.2.1.3). Arguably, *qri* probably became linked to sunrise because of its typical location, as happened with many 'eastern' things, and thereafter became a term with religious connotations. The religious importance of *qri* probably played a part in its long survival in the Egyptian texts.

5.2.12 *nšn*

This section covers both the nominal and verbal expressions of  *nšn*, which are typically translated as 'storm' or 'rage' and 'to be stormy' or 'to rage' (*Wb*. II, 340.11–341.22; Faulkner 2009 [1962]: 140; van der Molen 2000: 248; Hannig 2003: 662; Hannig 2006: 1349). While the use of *nšn* as rage continued into Demotic (*CDD n* [04:1]: 128), its meteorological use is not attested there, and both are absent from Coptic. Both the meteorological and emotional meanings of *nšn* were present and intertwined from the beginning of its use, and accordingly both are discussed here.

nšn is derived from the root *šni* 'to dispute' (see also §5.2.7) with the addition of the *n*-prefix, adding an aspect of reflexivity (Vernus 2009: 306–7; Stauder 2014: 214–17; Satzinger and Stefanović 2021: 376–77; for discussion on other interpretations of *n*-, see Štubňova Nigrelli 2023). This prefix converts any verb into an intransitive verb, so the verbal *nšn* should be attested before the nominal *nšn*. However, the noun is attested first in the Pyramid Texts, while the verb is first attested later in the Coffin Texts (Köhler 2016: 294); this is presumably due to accident of preservation.

 *sšn* (*Wb*. IV, 294.2) is a related word, attested in the autobiography of Kaemtjenet (C. 4: Schott 1977: 449), a Pyramid Text spell (519: *Pyr*. 1207d), and an obscure apotropaic (?) inscription from the pyramid of king Ibi (Jéquier 1935: pl. 3; Alvarez 2018: 37). Most scholars agree that *sšn* was an earlier form of *nšn* (e.g. Kaplony 1965: 163, n. 3; McDonald 2002: 58); however, both existed concurrently in the Old Kingdom, and Ibi's text uses both in parallel, perhaps suggesting that they had distinct meanings. More recently, Satzinger and Stefanović (2021: 357) put forth a separate etymology, with *sšn* derived from *sšn* 'to spin'. Regardless, *sšn* was absorbed into *nšn*, and with limited attestations, it is considered here.

nšn was always written with uniliterals, most commonly as  , but the first *n* could become *r*, particularly in later texts (e.g. the hymns of P. Turin CG 54031, vs. 20.II.10: Condon 1978: pl. 5). In one Middle Kingdom example, is used instead of  (CT spell 335, Lisht A1: *CT* IV, 238c; Allen 2021: pl. 25). An additional final  is first seen in Middle Kingdom literary manuscripts, but only becomes widespread in the early New Kingdom. At this point, plural strokes were also introduced. This is mainly a feature of hieratic and cursive texts, but in the late 20th Dynasty, the plural strokes also begin to appear in hieroglyphic texts.

The determinatives are much more varied. The rain- and Sethian-determinatives are the first attested (e.g. Pyramid Text spell 255: *Pyr*. 298b [W, T]), though only one or the other was used in any given inscription of the Old Kingdom. These two determinatives continued into the Ptolemaic Period. One significant form of the Seth-animal shows water arching over it ( , Gardiner sign E149), effectively incorporating the watery aspect of the word without using the rain-determinative (e.g. Pyramid Texts spell 255: *Pyr*. 298b [W]). An active 'violent' quality was added in the Pyramid Texts of Pepi I (spell 261: *Pyr*. 326d), with the introduction of the striking arm-determinative ( , Gardiner sign D40), and then in the Middle Kingdom with the striking man ( , Gardiner sign A24); together, these two determinatives appear in 57% of the attestations. The sky-determinative also first appeared in *nšn* during the Middle Kingdom. Altogether, the rain- and sky-determinatives appear in 36% of the attestations. Besides these more typical determinatives, *nšn* could have, more rarely (in chronological order): an eye ( , Gardiner sign D5: Coffin Text spell 82: *CT* II, 45f), a book roll ( , Y1: Coffin Text spell 1179: *CT* VII, 517c), a monkey ( , E35: Book of the Dead of Tjenena, spell 146, see McDonald 2002: 112), a man with hand to mouth (, A2: *Maxims of P. Ramesseum II*, vs. 2.5: Barns 1956: pl. 9), a falcon standard ( , G7: P. DeM 40, l. 5: Koenig 1981b: 30), a sparrow ( , G37: Great Hymn to the Nile III.1 [oGol]: van der Plas

1986: II, 26), and a wounded man ( , A14: Book of the Day, Ramesses VI: Piankoff 1954: pl. 191).

5.2.12.1 *Characteristics*

nšn is said to occur in the *biȝ*-, *ḥrt*-, and *pt*-sky. However, *biȝ* is mostly limited to the following phrase, which is repeated in multiple funerary sources, starting with the Book of Two Ways:

> *wbȝ biȝ ḫsf nšn*
>
> The one who splits the sky and drives away the *nšn*.
>
> (Coffin Text spell 1069: *CT* VII, 332h; see also spell 1179: *CT* VII, 517c, and Book of the Dead spell 144, P. Nu: Lapp 1997: pl. 75, l. 39)

nšn in *pt* or *ḥrt* was visible, such as in Coffin Text spell 631, where the sun god sees it:

> *ip.n nb wᶜ ḏt=f mȝȝ.n=f nšn m pt ḥrt*
>
> The sole lord has counted his body, for he has seen *nšn* in the upper sky.
>
> (*CT* VI, 253l–m)

nšn was also visible in P. Edwin Smith in an incantation against fever, where the speaker escapes from *nšn* by virtue of seeing it (no. 4, vs. 2.1: Allen 2005b: 108). *nšn* was occasionally associated with the nighttime (e.g. Coffin Text spell 353: *CT* IV, 396; Book of the Dead spell 60: Lüscher 2019: 99d) and with more general darkness (e.g. Coffin Text spell 80: *CT* II, 30e–f). The *nšn* created by Apep is a threat to the sun god at sunset:

> *ḏr-ntt biȝ m imnt sḏ.n=f nšn n ᶜȝpp*
>
> Since the Celestial One is in the west, having broken the *nšn* of Apep.
>
> (Spell 1099: *CT* VII, 401c–2a)

In later traditions, the *nšn* of Apep was broken upon Ruty, who guarded the horizon (e.g. Book of the Dead spell 130: Hornung 1979b: 252.60).

nšn could involve strong winds: *ḏᶜ* could be an aspect of *nšn*, as in *The Hymns to Senwosret III*, where the king is a mountain preventing harsh *ḏᶜ*-winds from affecting the people when the sky was in *nšn* (quoted in §5.1.7.2). Similarly, in the Naos of el-Arish erected by Nectanebo I:

> *ir h*[*rw 9*] *pn m nšn ḏᶜ*{*ty*} *pw nn mȝȝ ḥr n snnw=f in rmṯ nṯrw*
>
> As for these nine days in the *nšn*, it was a *ḏᶜ*-wind, without (being able) to see the face of his second by people or gods.
>
> (Ismailia 2248, C 7–8: Verhoeven 1991: 322, 329)

Further associations of *nšn* with *ḏ*^{c} can be found in the autobiography of Kaemtjenet (Schott 1977: 449), *The Shipwrecked Sailor* (l. 31–32: Blackman 1932: 42), and a New Kingdom hymn to Nun (?) (O. Turin CGT 57428, rt. 3–4: Fischer-Elfert 1997: 98. This description refers to a sandstorm restricting vision over many days (see also §5.1.7.1). Other types of winds could in contrast clear a *nšn*. In Coffin Text spell 1130 (*CT* VII, 468g–69c), the deity who 'destroys the *nšn*' is also the 'lord of winds (*ṯꜣw*), who foretells the north wind'.

Some sort of sound was associated with *nšn* since the Middle Kingdom, where a Coffin Text spell links Seth 'who created noise of the sky' with his action of driving away the *nšn* (spell 1069: *CT* VII, 332f). Another spell introduces the Entourage of the sun barque as 'the ones who silence (*sgr*) the *nšn*' (spell 1130: *CT* VII, 461e). More descriptively, in the *Amduat*:

iw sḏm=tw ḫrw ḫt m nwt tn m-ḫt ᶜpp nṯr pn ᶜꜣ ḥr=sn mi ḫrw hmhmt nt ḥrt m nšn=s

A noise of something is heard from this oval, when this great god has passed by them, like the sound of rumbling of the upper sky in its *nšn*.

(5th Hour, Lower Register: Hornung 1992b: 444–45)

This noise signalling the sun's rebirth in the middle of the night is being compared to the 'rumbling' sound of a *nšn* (Manassa 2008: 132). *hmhm* (and *nhmhm*) is elsewhere used for lions roaring, bulls bellowing, or the king's war-cry (*Wb*. II, 490.13–16), and it is the type of sound that fills a listener with dread, knowing that danger is nearby. This response of fearful respect may itself be part of *hmhm* (Spiegel 1957: 196; compare with *iꜣdt*, §5.2.3.2). The '*hmhmt* (call)' of a storm is probably thunder, heard well in advance of the storm as a low rumble, reminiscent of a roar. Alternatively, the comparison to roaring sounds might be evoking the sound of winds as a storm approaches, particularly of sandstorms; W. M. F. Petrie noted that the sound of a sandstorm's winds 'was astounding' (Cairo, 10 February 1881: Petrie MSS 1.1: 145).

The *nšn* was also said to occur in the ground. Such *nšn* has long been interpreted as an earthquake (e.g. Roccati 1984: 352; Gnirs 2015: 141), particularly in texts where Seth is involved, as in the Calendar of Lucky and Unlucky Days:

ḫrw=f m pt ḫrw=f m tꜣ m nšnyw ᶜꜣw{y}

His voice is in the sky and his voice is in the land as great *nšny*s.

(P. Sallier IV, rt. 18.9–19.1: Leitz 1994: 272, pl. 73)

If Seth's voice in the sky was thunder, the noise of storms, then his voice in the earth was rumbling, the noise of earthquakes. However, Seth's *ḫrw m tꜣ* is not otherwise attested

elsewhere alongside mentions of the ground shaking (see Jambon 2006). Together with the features of preventing sight and of noise, this could characterise *nšn* as a sandstorm, during which the ground is lifted by the wind, creating a phenomenon that consists of both sky and land, and one that makes a loud noise. A *nšn* makes it difficult to breathe, as with the sand and dust particles in a sandstorm:

> *pt ktkt.ti sꜣ*[*tw nš*]*n.w pt m shꜣ tꜣ m itm*
>
> The sky has quivered, the grou[nd] has [*nš*]*n*ed; the sky is in confusion, the earth is in breathlessness.
>
> (P. Leiden I 345, rt. 27.2: Beck 2018: pl. 37–38)

The inability to breathe was also a feature of *nšn*-rage as an emotion (e.g. *Loyalist Teaching of Kairsu*, §3: Posener 1976: 72–73; see §5.2.12.2).

Rain might also be a potential feature of *nšn*. While *ḥwyt*'s only attestation in association with *nšn* is uncertain because of a fragmentary context (*Maxims of P. Ramesseum II*, rt. 1.6: Barns 1956: pl. 7), a line from the Book of the Dead correlates *mw* and *nšn*:

> *bwt wsir NN nšnyw nn wbs mw r-gs=f*
>
> The *nšn* is the abomination of the Osiris NN, there shall be no heaping of water beside him.
>
> (Spell 130, P. Nu: Lapp 1997: pl. 49, l. 7–8; see also Coffin Text spell 1099: *CT* VII, 388b–c)

This 'heaping of water' has been read as a flash flood (e.g. Quirke 2013: 288), though it could also be waves of water produced by strong winds (as suggested for *The Shipwrecked Sailor* by Golénischeff 1912: 113). The following sentence relating to the Osiris myth found in multiple sources provides further information:

> *i ḥᶜpy wr n pt m rn=k pwy n ᶜd pt di=k sḫm=i m mw mi sḫmt ᶜwꜣt wsir grḥ pwy n nšny*
>
> Oh great Hapy of the sky, in this your name of 'Cleaver of the Sky', may you cause that I have power over water like Sekhmet, who robs Osiris on that night of *nšn*.
>
> (Book of the Dead spell 57: Lüscher 2019: 60f–64a)

Similar spells have Seth instead assailing Osiris, as in Coffin Text spells 358 (*CT* V, 10e) and 866 (*CT* VII, 72k), and Book of the Dead spell 60 (Lüscher 2019: 99c). The invocation of 'Hapy in the sky' is often used by itself to indicate rain (e.g. Great Hymn to the Aten of Ay, l. 10: Sandman 1938: 95.5–7). This, together with the desire to have 'power over water', suggest that rain could be expected in some *nšn* events.

nšn is found in some Middle Kingdom sources juxtaposed against other storm words, like *ḥɜty* (§5.2.6) and *qri* (§5.2.11). Coffin Text spell 631, immediately following the phrase cited above, where *nšn* is in the upper sky, states that 'he has foretold *ḥɜty* in the lower sky' (*CT* VI, 253n). Meanwhile, Shu's description of himself declares that 'the *qri* of the sky is my efflux, *nšn* and darkness are my dew' (Coffin Text spell 80: *CT* II, 30e–f; see §5.2.11.1). An earlier utterance from Pepi I's Pyramid Texts (PT *753; see Allen 2005a: 148) might also juxtapose *qri* and *nšn*, but identification of *qri* here is uncertain, as only the last two signs are preserved.

These characteristics can prove problematic for river transport, as is clear even in the earliest attestations. The 5th Dynasty autobiography of Kaemtjenet mentions that no sensible person was travelling on the Nile 'on that day of the exceedingly violent *sšn*' (l. C4: Schott 1977: fig. 5; see §5.1.7.1), due to the strong *ḏ*^{c}-wind. Slightly later, *The Shipwrecked Sailor* reports that the sailors could 'predict a *ḏ*^{c} before it came, a *nšn* before it happened' (l. 31–32: Blackman 1932: 42), implying the need to avoid sailing in an active *nšn*. A *nšn* was thus extremely dangerous to boats. While these examples of danger might be more connected to *ḏ*^{c} than *nšn*, solar mythemes often mention the warding off or destruction of *nšn* to protect the sun's barque (e.g. Coffin Text spell 1130: *CT* VII, 461e; Book of the Dead spell 144: Hornung 1979b: 280.75), and on the Great Abydos Stela of Ramesses IV, the king gives strength to Thoth so that he could sail in the great *nšn* (Cairo JE 48831, l. 29: K*RI* VI, 24.16–25.1). Sailing in a *nšn* is problematic not only for mortals, but also gods; once again this would match the dangers posed by sandstorms.

5.2.12.2 *Rage and storm*

Most metaphoric usage of *nšn* was centred around its meaning of 'rage', and how that related to 'storm'. In Ancient Egyptian, the semantic field of 'rage' represents a negative emotion that results in an inability to function according to social standards, and could be outright dangerous for others (Köhler 2011: 89; Köhler 2021: 95). Egyptian wisdom texts, and self-presentations, inform us that manifesting anger externally, by raging, was undesirable (e.g. Allon 2013: 110). Raging made individuals red, hot, strong, and incapable of productive spoken communication (Köhler 2011: 88–90). *nšn* specifically was a violent emotion, frequently attributed to wild and powerful animals, such as falcons (e.g. Memphite stela of Amenhotep II, l. 19: *Urk*. IV, 1306.3), bulls (e.g. rhetorical stela of Ramesses II, Cairo JE 66570, l. 8: K*RI* II, 311.11), and lions (e.g. reliefs of Ramesses II at Luxor: K*RI* II, 172.3). Its opposite was *ḥtp* 'peace' (e.g. *The Teaching of Ptahhotep*, Maxim 26, verse 395–97: Žába

1956: 47; *Loyalist Teaching of Kairsu*, §3.5–6: Posener 1976: 72–73). A study of Egyptian 'rage' lexemes has suggested that letting anger take over your body was a moral fault (Köhler 2021: 98). *nšn*-rage was the state of losing control of yourself as a result of anger, rather than the anger itself, as is suggested by the reflexive etymology of *nšn* (see above). One Nile hymn even has a state of *nšn* arising from joy, at the start of the inundation:

> *sbiȝt pry mkḫȝ n=f dnywt nšnw m-ḏbȝ nqmt*
> Laughter has come forth; lamentation was avoided because of him (Hapy),
> *nšn* instead of suffering.
> (O. DeM 1675, rt. 11: Fischer-Elfert 1986: 36)

Such a use of *nšn* is unique; it appears to be the loss of control from euphoria, with people shouting out in joy, and as such fits within the model of *nšn* as the resulting state from a loss of control, albeit on the opposite side of the emotional spectrum.

When mortals lost control from anger, society was damaged; when gods lost control, natural phenomena occurred. While not the only manifestation of such divine rage, the *nšn*-storm is one of the most frequently attested. All gods had the capacity to rage and manifest a *nšn*, but Seth and the Solar Eye goddesses (especially Sekhmet) had a stronger connection through their mythology and characteristics. Seth was aggressive, strong, loud, and associated with the colour red, which were all aspects of the conceptualisation of anger in ancient Egypt (Köhler 2016: 143–55). These characteristics also fit with a *nšn*-storm. Seth was frequently described as 'raging' (e.g. Second Libyan War prologue text, l. 8: K*RI* V, 57.9), or as 'in his *nšn*' (e.g. Coffin Text spell 607: *CT* VI, 220a; Konosso stela of Thutmose IV, l. 17: *Urk*. IV, 1547.6–8). Seth's attack on Osiris occurred 'on that day of great *nšn* (in) the Two Lands' (Coffin Text spell 358: *CT* V, 10e; many similar). This not only refers to a physical storm, but also to Seth's loss of control, and the responding rage of the Two Lands. Furthermore, Horus and Seth's later confrontation is described as 'in 603 [sic] *nšn*; there are 600 in the breadth of what is over this lake' (Coffin Text spell 1143: *CT* VII, 490d). In the Book of the Dead, these two gods are calmed by Thoth, and their *nšn*s are eliminated (spell 183: Hornung 1979b: 394.14; for Thoth's role as a pacifier, see Bleeker 1973: 157). Seth's close link with *nšn* is also clearly indicated by the presence of the animal form Seth-determinative in many orthographies, placing *nšn* within the Sethian category (McDonald 2002: 221; Allon 2007: 18). To summarise: Seth was generally aggressive, strong, loud, and associated with the colour red, which are all aspects of the conceptualisation of anger in ancient Egypt (Köhler 2016: 143–55). These characteristics also fit with a *nšn*-storm, and with a sandstorm.

Seth's *nšn* could however also be constructive, when directed at enemies of *maʿat*, and so New Kingdom kings compared themselves to Seth, such as Ramesses II in the Second Libyan War:

kȝ rnpi pḥty m sky mi stẖ ḫft nšny=f

Young bull, strong in battle like Seth when he *nšn*s.

(Prologue text, l. 7–8: K*RI* V, 57.8–9)

This is a feature of *nšn*: only gods and kings could rage constructively, without damaging *maʿat*, whereas mortals only rage negatively. The king's use of *nšn* against his enemies is first attested in a stela of Amenhotep II (*Urk*. IV, 1301.17–20). Prior to this, the king is said to protect against *nšn* (e.g. Tod inscription of Senwosret I, l. 24: Barbotin and Clère 1991: pl. 11; *Hymn to Senwosret III*, rt. 2.19: Collier and Quirke 2004: 18). If he does *nšn*, it was not a positive attribute: several texts talk of the need to calm the *nšn*ing pharaoh to return to normalcy, as in the *Teaching of Kaires (*§3.5–6: Posener 1976: 72) and the Coronation Decree of Horemheb (l. 7: Gardiner 1953: pl. 2).

The Solar Eye was another common source of *nšn*. Like Seth, the goddesses of the Eye were quick-tempered and powerful, associated with fire and heat because of their solar aspect and their merging with the uraeus (Köhler 2016: 147). When the returning Eye became angry at Re's actions, she was said to be 'in her *nšn*' (Book of the Dead spell 17: Hornung 1979b: 65.117; see also Coffin Text spell 335: *CT* IV, 242a), and Thoth was again the god who dealt with that *nšn* (Bleeker 1973: 120). Sekhmet in particular was so closely connected with *nšn* that she repeatedly replaced Seth in funerary texts which were ostensibly about the Seth-Osiris conflict (compare Book of the Dead spell 57 and 60 of P. Neferwebenef: Lüscher 2019: 62b, 99c).

Another type of eye associated with *nšn* was the Eye of Horus. In the Pyramid Texts, the flame of the Eye of Horus put *nšn* among those who do evil deeds (spell 255: *Pyr*. 298b). In comparison, in the Coffin Texts, the *nšn* mentioned with the Eye of Horus is always an injury to be cured:

ʿḥʿ.n ḥr ḥr kit ḥr qd n irt=f nšnt ḏd=f mk irt=i mi sqr pf tp ir.n stẖ r irt=i

Then Horus was exclaiming because of the condition of his eye that was *nšn*ing, saying: 'Look, my eye is like that first wound that Seth did to my eye'.

(Spell 157: *CT* II, 340b–41a; see also Coffin Text spell 82: *CT* II, 45f)

Some sources suggest that the Eye is weeping from the *nšn* (Coffin Text spell 686: *CT* VI, 316j). Other storm/cloud words could have been used, such as those more frequently linked

with eye disease or injury (e.g. *ḥꜣti*, §5.2.6), but *nšn*'s association with Seth and the dangers of raging apparently made it a meaningful choice.

Furthermore, some evidence suggests that weather remained core to the meaning of *nšn* even when it was an emotional state. Some texts about raging also have references to meteorological phenomena associated with *nšn*, for example in the Syrian scenes of Medinet Habu:

> *nṯr nfr wr šft pḥty nšnty m sk wr nḫwt ḥr ḫꜣswt nbw*(*t*) *h*[*mh*]*m*[*w*]*t=f mi stḫ m tꜣ pt*
>
> The good god, great of awe, the powerful one, the one who *nšn*s in battle,
> great of victories in all foreign countries; his wa[r c]rie[s] are like Seth in the sky.
>
> (Scene c: K*RI* V, 79.13–14)

Here, shortly after the description of the king *nšn*ing, his war cry is compared to Seth's voice, or thunder. The determinatives for *nšn*-rage often include the rain- or sky-determinative (e.g. in the autobiography of Usermontu: *Urk*. IV, 2080.16; Book of the Dead spell 78: Lüscher 2006: 104b–5b), thus maintaining a strong connection to weather (see McDonald 2002: 93).

The complementary nature of the meteorological and psychological aspects of *nšn* is exemplified in *The Shipwrecked Sailor*. The *nšn*-storm, which includes a *ḏ*^{c} (see §5.1.7.1), causes the protagonist to lose control over his life, and separates him from Egyptian society. These are the very same consequences that the wisdom texts warn of if you succumb to *nšn*-rage. The poem also advocates for speaking clearly to overcome challenging circumstances (Parkinson 2010: 122), something impossible in a *nšn*-rage. The *Sailor*'s evocation of the solar cycle (see §5.2.11.2) might suggest that the *nšn*-storm was created by solar enemies, who threatens the solar barque, just as the storm has negative implications for the *Sailor*'s boat. Therefore, there are at least three levels of meaning brought about by the polysemy of *nšn*: the physical event, the ethical implications, and the cosmic allusions.

5.2.12.3 *Temperature*

nšn-rage also has implications for the experience of a *nšn*-storm that are not explicit in texts. Factors such as the divine actors most closely associated with *nšn* and the conceptual metaphors of 'anger' (Köhler 2016: 269) suggest that a *nšn* could be characterised in terms of temperature. The Solar Eye goddesses produce heat, and their connection with the uraeus also incorporates the burning cobra spit. Sekhmet and Seth both have epithets that include 'redness' (*nbt-ins*: *LGG* IV, 19; *ḫꜣb-dšr*: *LGG* V, 626; *dšr*: *LGG* VII, 570), a colour which

was characteristic of fire and heat, as well as being associated with the desert (Griffiths 1972: 90). 'Anger' was metaphorically linked not only with 'meteorological disturbance', but with the domains of 'fire' and 'redness' (Köhler 2016: 269). These associations suggest the possibility that a *nšn*-storm was perceived as hot. A passage in one of the ritual calendars might support this, with the entry for III Shemu 14 (=16 May: Leitz 1994: 496):

> *im=k nsr{t} <ḫt?> m hrw pn m pr=k m ḫt {m} rkḥti m nbyw=s nb m hrw <pn> … <n> nšn{t} n irt twy n ḥr-wr.*
>
> You should not burn <anything?> on this day in your house, with the fire which burns in all its flame on <this> day … <of> *nšn* of that Eye of Horus the Elder.
>
> (P. Cairo JE 86637, vs. 6.1–3: Leitz 1994: 383, pl. 36)

This passage forbids the lighting of fire on what would typically be a hot day in Shemu, presumably because additional heat would not be ideal, and explaining the day's heat as the *nšn*-rage of a god (Leitz 1994: 383). One of the Coffin Text spells also equates *nšn* with fire:

> *ṯni sw ir=f ir*(*w*) *nšn wd ḫt* (*?*) *mk s*(*y*) *ʿḫm.t*(*i*)
>
> So where is he who made a *nšn* and started a fire (?)? Look, it is extinguished.
>
> (Spell 885: *CT* VII, 96l–m [S14C])

Medical texts also have a causal link between a 'burning fever (*nsrt*)' and *nšn* (P. Edwin Smith, vs. 2.1: Allen 2005b: 108). However, other mortuary spells speak of the fire 'that burns behind Re' in his barque, which causes fear in either the lord of *nšn* (Coffin Text spell 1033: *CT* VII, 263b) or the *nšn* itself (Book of the Dead spell 136b: Hornung 1979b: 263.3).

5.2.12.4 *Summary*

nšn was characterised by strong winds and a distinctive noise; it was highly visible yet restricts vision, was difficult to breathe in, and was dangerous. It was occasionally characterised by rain, heat, and possibly the colour red. Taken together, these characteristics suggest that *nšn* was probably a sandstorm. The gods could create them as the result of their anger, thus linking the meteorological *nšn* with its emotional counterpart of 'rage'. There was a consistent metaphorical association between the emotional state of losing control and the physical experience of a sandstorm, suggesting that the Egyptian conceptualisation of the state of 'rage' either inspired or was inspired by the name of meteorological *nšn*-storms; which came first is impossible to determine.

5.2.13 *Final thoughts on the rain-determinative*

The rain-determinative generally marks words as being associated with rain in some manner. Some early depictions of 𓈗 clearly show a *mw*-sign descending from a *pt*-sign (e.g. Pyramid Texts of Pepi I and Neith), although this writing quickly disappeared in favour of vertical lines. For some words, 𓈗 is a direct representation of the phenomena described, i.e. liquid descending from the sky (*ḥwyt*, *srq*), but 𓈗 could also be used for words that represent the end result of liquid descending from the sky, i.e. wadi floodwaters and dew (*snm*, *iȝdt*). Finally, 𓈗 could also be used for words that represent the container that holds the descending liquid, i.e. clouds (*igp*, *ḥȝty*, *šnᶜ*/*šnit*, *ḫȝpt*, *ḫȝty*, *ḫȝḫȝty*, *qri*, *nšn*), even with certain clouds that were not associated with rain. The inclusion of *nšn* in the 'rain' category, despite denoting a sandstorm, is startling to the American-European weatherworlds, which are based on climates where sandstorms are rare. In the Egyptian weatherworld, *nšn* could be placed in a category alongside rain and clouds because they were all visible phenomena that existed in, or came from, the space above Egypt that is bounded by the *pt*. Therefore, 'visible weather' might be the best description of the category that is expressed by 𓈗. The concept of 'rain' was that category's prototypical member, so a sky with water descending from it became the determinative that marked the category.

Etymologically, 𓈗-words share three main origins: flowing water (*ḫȝpt*), the act of covering (*igp*, *ḥȝty*, *qri*), or violence (*ḥwyt*, *snm*, *šnᶜ*/*šnit*, *ḫȝty*, *ḫȝḫȝty*, *nšn*). *iȝdt*'s etymology is uncertain. These origins are also reflected in the most frequent co-determinatives: water (𓈖, Gardiner sign N35a), cloth (𓋴, S28), the hitting man (𓀀, A24) or arm (𓂝, D40), and the Seth animal (𓃩/𓃫, E20/21). The latter suggests an untameable, unpredictable, and destructive power (McDonald 2002: 497). While most 𓈗-words are attested with the Sethian determinative at some point in their histories, *ḥwyt*, *iȝdt*, *igp*, and *ḥȝty* are not, indicating that these phenomena were not perceived in the same way as the others. The aversion to using a Sethian determinative with *ḥwyt* suggests that rain itself was not viewed as a destructive power leading to chaos, though it could play a role in those chaotic events (e.g. in a *nšn*). This contradicts much of what has been written about the nature of rain in ancient Egypt (e.g. van der Plas 1986: I, 186; Jung 2007: 340–41).

6 Always Take the Weather With You

6.1 Weather and Egyptology

This thesis started from an anthropological theory: that weather matters. Climate shapes how a society can survive; weather is the experience of daily life. For individuals, weather is more important to lived experience than overarching 'climate', an abstract idea that has barely any relation to individual experience and removes all variation. Chapter 1 explored how weather impacts individuals and cultures, influencing behaviours and beliefs, as investigated by anthropological research, in order to confront the biases that come from our own relationships with the weather. The influence of the weatherworld, the sum of all expectations around weather, is not deterministic to culture or history, but contributes to wider cultural markers and identity.

Research has previously focused on climate in ancient Egypt. While important for determining historical questions of environmental change, the movement of people (particularly in the Predynastic and earlier), potential resources, and flora and fauna at any given time, palaeoclimatology also smoothes out any discrepancies by its very nature, hiding any variations on a day-to-day basis that impacted the Egyptians. In essence, prioritising palaeoclimatological data can run the risk of erasing the Egyptian weatherworld, and obscuring aspects of their culture. Palaeoclimatology is a valuable tool, but it does not tell the full story with regards to daily experience.

Egypt may be arid climatically, but there is (and was) variation between north and south, valley and desert, and even variation from local geography that changes how the weather is experienced, not to mention any day-to-day differences in a single location. The common characterisation of Egypt as simply 'hot' is an outsider's perspective, a cultural stereotype, and not an emic perspective (as noted by Zivie 1984: 201–2). 'Hot' is in itself a subjective description. The Egyptians presumably would have had their own unspoken temperature scale of relative comfort, and most probably each region had variations on this—what was uncomfortably 'hot' for a Delta dweller would have been different than for a resident of southern Upper Egypt (for the subjectivity of thermal comfort, see Nikolopoulou *et al.* 2001; Nikolopoulou 2011: 1556–57; Zhao *et al.* 2021: 30). This hypothesised scale is impossible to recover today, but academics can at least be aware of the bias that stems from their own lived experience with weather. The impact of weather stretched beyond these averaged scientific trends, into aspects of architecture, literature, social life, ideology, religious beliefs, because it was an immediate and pervasive aspect of lived experience.

For any weather phenomenology of ancient Egypt to be valid, it requires grounding in what weather is possible in that environment. Some previous studies on weather terminology have either neglected to discuss the meteorological realities, or provided only simple overviews based on climatology (e.g. Jung 2007). Chapter 2 discussed the various synoptic features of Egyptian weather and climate, presenting the many types of weather events that can impact Egypt, and providing various post-Arab conquest anecdotes of personal experience of those events. These weather phenomena include static features like temperature and humidity, and dynamic events like wind, sandstorms (including the *khamsin*), and precipitation. Not all of these phenomena were necessarily part of the ancient local weatherworld, or lexicalised in their language, but they provide phenomenological affordances that can be used as a foundation for the interpretations of archaeological and linguistic data in the following chapters.

Archaeological sources also contextualise the written sources. The built environment can be equally as important as the natural environment for how we experience weather; the fact that the modern American-European experience with weather is so different to that of ancient Egypt is in part due to different architectural traditions, building materials, and social conventions around those buildings. For instance, a knowledge of the materials and layout of houses at Deir el-Medina can lead to a better understanding of the circumstances recorded in Djehutymose's letter to Butehamun (see §5.2.1.2). Studying the Theban rain graffiti within their physical contexts can make clear the sacred value of some waterfall sites and their grottos (§5.2.2.1). This aspect of the weather in natural environments might in turn have been consciously echoed in some temple contexts, where basins collected rainwater after it was guided by channels or falls from the roof, as at Ezbet Rushdi and Zawiyet Umm el-Rakham (§4.2.1.1).

Scholars have often overlooked the effects of weather on ancient life, even when the evidence is clear. Winlock (1955), in his publication of the Meketre models, described three models with waterspouts (see §4.1.1.3), which he acknowledged as being mitigation against rain. However, when discussing the granary model (MMA 20.3.11), he interpreted the lack of a roof in this model as an accurate representation of real granaries, stating that 'in practically rainless Egypt there was no need for roofing the granaries' (Winlock 1955: 25). Aside from this contradiction regarding rain, he also failed to acknowledge that wind would blow in sand and dust into an unroofed granary, particularly during sandstorms (Adams 2007: 5). Sandstorms are one of the most overlooked aspects of ancient Egyptian life. If mentioned within wider studies, they are briefly explained in mythological terms, as being part of the

domain of Seth, and no more (e.g. Gilli 2010: 55); nothing is said about possible ancient lived experience of sandstorms. In previous Egyptological literature, there are few mentions of sandstorms and how they must have affected daily life (exceptions include Gnirs 2015; Staring 2023: 28), and none of the major dictionaries have offered 'sandstorm' as a possible translation for any of the many Egyptian weather words. Jan Zandee's article 'Seth als Sturmgott' (1963) has no mention of sandstorms. However, sandstorms are frequently mentioned in the travelogues of the 19th to early 20th centuries (e.g. that of Walter Granger, 1907, published in: Morgan and Lucas 2002: 31), and in notes about excavation progress (e.g. Breasted 1908: 53–56) or site preservation (e.g. Habachi 1985: 141), though these experiences seems not to have informed the consideration of ancient experience in those publications. Recent avoidance might be a reaction to earlier orientalist attitudes, in which sandstorms were often an indicator of 'otherness' (for sandstorms and orientalist literature, see Haddad 2002: 110–11).

6.2 Lexicon

This lexical study of the ancient Egyptian weatherworld uses the  - and  -determinatives as the basis for an emic framework. The difference between  - and  -lexemes could be described as invisible versus visible: phenomena represented by  -words can only be seen through their interactions with the world, while phenomena represented by -words have physical form.

One conclusion of this study is that the Egyptians identified and lexicalised many types of weather, including manifestations that have no equivalent modern name, which is not apparent without a holistic view of the lexicon. The majority of the Egyptian weather words discussed here retain their previously established definitions, but with added nuance in their contexts, relationships, and connotations. However, a few words have received updated definitions.

As with any lexicographical study of an ancient culture, there are limitations to these conclusions. While I have attempted to locate as many attestations as possible, the corpus is not comprehensive, and some examples will have been unintentionally omitted. The corpus has two restrictions concerning its extent. Firstly, the corpus is chronologically limited to the period from the Old Kingdom to the end of the New Kingdom. Some words are only attested beyond the New Kingdom, but are very possibly older (e.g. *ȝiw* [Andreu and Cauville 1978: 10], *ꜥmt* [*Wb*. I, 187.5], *ḥnbb* [*Wb*. III, 133.14], *snb* [*Wb*. IV, 161.13], *šhb* [*Wb*. IV, 529.9], *gsm* [*Wb*. V, 206.12]). Although later texts are occasionally cited, the results cannot be

uncritically applied to Ptolemaic or Roman texts, as these were not a focus for the study, and it is possible that later foreign influence may have significantly changed Egyptian perceptions and expressions of weather. In addition, some words will not have been preserved in surviving texts because they were part of spoken vernacular or regional dialects, or were simply rarely used.

Secondly, this study has deliberately excluded words that do not fit within the framework of  or  , and represent less dynamic phenomena: sunlight (*ꜥnḏw* [*Wb*. I, 207.13], *wbn* [*Wb*. I, 294.7], *šw* [*Wb*. IV, 430.6–431.12], etc), temperature (*hh* [*Wb*. II, 502.5], *ḥs* [*Wb*. III, 166.3], *tȝ* [*Wb*. V, 229.2], etc), or humidity (*ḫm* [*Wb*. III, 277.12–13]). Similarly, the study has excluded verbs associated with weather activity, such as *wgp* (*Wb*. I, 377.7), *nfꜥ* (*Wb*. II, 252.4), *nhmhm* (*Wb*. II, 286.4), *ḥtp* (*Wb*. III, 190.2), *ḫsr* (*Wb*. III, 338.7), *skȝp* (*Wb*. IV, 316.19), and *kfi* (*Wb*. V, 119.9), among others.

The following sections briefly summarise the lexicographical results.

6.2.1 *Wind*

ṯȝw is defined as '(moving) air' (§5.1.1), including within it what English speakers may recognise as 'wind' and 'breath'. It acted as a medium, filling the space between the land and the sky and carrying small objects, sound, and smell when it moved; and it was a gift from the gods, which was inhaled and exhaled in order to live. Its connotative associations included life (§5.1.1.9), freedom (§5.1.1.10), ubiquity (§5.1.1.4), and speech (§5.1.1.9). *ṯȝw* was the only weather word that could also be represented in visual iconography, through the almost amuletic sail that was found in funerary representations, and post-New Kingdom temple scenes (§5.1.1.11).

nf(*t*) is also 'air' (§5.1.2) in a similar manner to *ṯȝw*, but with a greater emphasis on physiological 'breath', particularly divine breath. It often replaced *ṯȝw*, but equally must have had a distinct meaning, and was restricted to religious contexts.

sbyt is best understood as a counter wind to *ṯȝw* (§5.1.6), often being the breath of death to the breath of life. *sbyt* was associated with heat and disease. It could have negative connotations, but it also was used in service of the sun god, so a translation as a 'rebellious wind' is inaccurate, and a better definition is arguably 'chaotic wind', given that the gods made use of chaotic forces against their enemies.

The four cardinal winds were closely interconnected. *mḥyt* is the 'north wind' (§5.1.3.2.1). The predictable and pleasing nature of *mḥyt* led to it becoming the most important cardinal wind. Its associations included coolness, sweetness, relief in the season of

Shemu, southward travel, and revivification. *rsw* is the 'south wind' (§5.1.3.2.2), most often found alongside its opposite, *mḥyt*. While Graeco-Roman texts imply that *rsw* was a hot wind, Old to New Kingdom texts hint that it was more often cold. *imnty*, the 'west wind' (§5.1.3.2.3), has sometimes been identified with the modern *khamsin*, but no evidence supports this hypothesis; if anything, *imnty* could have had associations with fertility, which it shared with the other cardinal winds, and the afterlife. Its contrasting wind is the *iɜbty*, the 'east wind' (§5.1.3.2.4), which had associations to sunrise.

mɜᶜw can be defined as the 'ideal wind' (§5.1.4). For this wind, directionality was not a core quality, but rather came from whichever direction was best. It had strongly positive connotations, and was associated with ease, safety, sailing, the solar voyage, and *ma'at*.

qbw is the 'cool wind' (§5.1.5), used to emphasise the cold quality of a wind. A cold northerly wind could be denoted as both *qbw* or *mḥyt*, for instance, depending on the speaker's/writer's intention. It could have both positive or negative connotations depending on season and landscape.

ḏᶜ is a 'gusty wind' (§5.1.7), particularly a powerful one that picked up sand and dust; as such, it could be a component of a sandstorm. It could be associated with darkness, noisiness, cool temperatures, and danger.

6.2.2 *Rain*

Moving on to precipitation, *ḥwyt* is 'rain' (§5.2.1), with the term emphasising the repetitive vertical movement from the sky beating onto the ground. It was associated with the Nile flood, incense, deserts and foreign lands, and plague. *mw n pt* (§5.2.2.1) and *ḥᶜpy n pt* (§5.2.1.4) can also broadly be defined as 'rain', emphasising the celestial source of the water. *snm* is a term for the result of *ḥwyt*, a 'rainflood' cascading down the wadis (§5.2.2). From the limited attestations, it appears to have had associations with blood, deserts, lions, libations, and waterspouts. *gp n mw* (§5.2.5.4) is perhaps an exceedingly violent rainflood. All of these rain words could be used in contexts of divine manifestation, describing miracles in the dry desert or the return of a god to the Nile Valley.

While *iɜdt*'s common translation of 'dew' remains correct, the word had a complex web of associations, any one of which, or several, could be mobilised in a specific text (§5.2.3). The observed characteristics of *iɜdt* allowed for metaphoric connections with incense, sweat, and ultimately divine power. Furthermore, *iɜdt* was associated with night and early morning, fertility, and the Nile flood.

The rarely attested Semitic loanword *srq* is ‘snow’ (§5.2.4), and the only attestation for *srq* places it in mountains northeast of Egypt during Peret, and suggests that it was perceived as a cold, dangerous, and foreign entity.

igp is ‘cloud’ (§5.2.5), which could be used for a variety of cloud types. It had associations with movement, darkness, concealment, and protective boundaries. *igp* could accordingly carry both negative and positive connotations. *sim* is probably ‘fog’ (§5.2.5.2), and it was associated with coolness and concealment. *ḥꜣti* is ‘(obscuring) cloud’ or ‘cloudiness’ (§5.2.6), without any related rain. It was strongly associated with the liminal stages of the solar journey, and often connected to eye ailments due to a phonetic pun and the conceptualisation of the sun and moon disks as eyes. *šnit/šnᶜ* should not be translated as ‘hail’, as given in most dictionaries, but as a type of dark, sometimes rain-bearing, cloud that can veil the sky (§5.2.7). It was associated with upward movement and obscurity.

ḫꜣpt is probably a negative ‘stormcloud’ (§5.2.8), and etymology suggests that rain was involved. *ḫꜣty* was a type of negatively perceived cloud (§5.2.9). Later Ptolemaic sources, but none from earlier, mention thunder or lightning in connection with it as well. *ḫꜣḫꜣti* is ‘storm’, with emphasis on its destructive qualities (§5.2.10), and it was associated with the enfeebling of enemies.

qri is also ‘storm’ (§5.2.11), but its usage was connected less with the physical characteristics, and more with symbolic aspects. The *ḫrw qri* is a ‘(triumphant) thunder’ (§5.2.11.2), as opposed to the more generic *ḫrw n pt*, ‘thunder’. The connotative associations of *qri* included sunrise, victory, awesomeness, and quakes.

In most contexts, *nšn* is a ‘sandstorm’ (§5.2.12) whose strong winds carried sand, limiting visibility of not just the sun, as with other storms, but also of terrestrial surroundings. It can be noisy, and even feature rain. It had connotative associations of fire, uncontrolled rage, obscurity, loudness, quakes, and danger.

6.3 Weatherworlds

Having discussed the weather words definitions and connotations individually, several relationships between them can be suggested. At the broadest level, there are a few words that reached generic status, where phenomena labelled by terms under them could be described by the generic word as well, but not vice versa (i.e. all gales are winds, but not all winds are gales). The first is *ṯꜣw*, which could also be used for the four cardinal winds, *nf*, and *ḏᶜ*, though each of those words adds more specificity to the description. However, it is not simply that *ṯꜣw* was a broader category; rather, *ṯꜣw* was also the substance that made up

those other winds (see §5.1.8). Thus, there is 'the breath of the north wind', '*ṯ3w* of the north/south/east/west', '*ṯ3w* of her *nf*-breath', 'a perfect *ṯ3w* of *ma'at*' and 'a *ḏ*^{c}-gust of *ṯ3w*'. The other winds are different manifestations of *ṯ3w*. In mythology, one of the first gods, Shu, was the personification of *ṯ3w* between earth (Geb) and sky (Nut); other winds were not mentioned explicitly. This seems to confirm the core status of *ṯ3w*.

The cloud word *igp*, on the other hand, was used as a generic term, but it does not designate what all other clouds were made of, unlike *ṯ3w*. Other cloud words gave more specificity to the precise type of cloud. *šn*^{c}/*šnit*, *ḫ3pt*, and *sim* could be generically described as *igp*; *ḥ3ty* and *ḫ3ty* might also be part of this category, but there are no extant examples.

Besides hierarchical classification, there were also semantic word clusters. The cardinal winds were strongly connected to each other, particularly the pairs north-south and east-west. These frequently only appeared with each other, *mḥyt* being the one exception. This is probably because *mḥyt* had more distinctive positive connotations deriving from the Egyptian experience of the north wind (§5.1.3.2.1.2). However, none of these winds were inherently negative; for the most part, their defining characteristic was their directionality, not the quality of the air. As a group, the four winds made up all the winds of the sky, and this comprehensiveness made them desirable for the deceased.

Six words could be said to verbalise the concept of 'storm', and they each include multiple simultaneous or consecutive meteorological elements that disrupted everyday life, such as rain, strong winds, thunder, sharp temperature changes, dark clouds, flying sand, etc. These are, from most to least common, *nšn*, *ḏ*^{c}, *qri*, *ḫ3ḫ3ti*, *ḫ3pt*, and *ḫ3ti*. Apart from *ḏ*^{c}, these are all part of the rain-determinative grouping. *ḏ*^{c} is a powerful, strong wind, and as such was often a feature of these other storms, but it could be classed as an independent storm in itself if it picks up sand (i.e. a sandstorm). It did not carry the rain-determinative because *ḏ*^{c} was perceived as a primarily wind-based, invisible phenomenon, that could in some circumstances have  -like qualities; it was probably a 'fuzzy' category member between  and . It must be emphasised that the 'storm' category is demonstrably not emic, as far as we know, but one created to better facilitate understanding from a modern viewpoint and based on meteorological factors.

Three words describe rain and its outcomes specifically, without referring to any clouds or wind that might come with it: *ḫwyt*, *snm*, and *mw n pt*. Common to each of these forms is a focus on the ability of rainwater to carve and change the landscape. Rain was never as important to the Egyptians as it was in some other cultures because of its sporadic nature,

though they did conceptualise rain as a flood of the sky, giving it equal properties to the annual Nile flood: it caused growth and yet could also destroy.

A number of the words for wind have been construed as *khamsin* (see §3.2.1) in the past, when it suited the translator: *rsw* (e.g. Hannig 2003: 734), *imnty* (e.g. Goedicke 1957: 79), *sbyt* (e.g. Leitz 1994: 364), and *nšn* (e.g. Köhler 2016: 183). Identifying an event in the ancient record with such a well-documented modern phenomenon is tempting because it can improve our understanding of ancient experience, but the effect is arguably the opposite. A *khamsin* is actually a complex mix of individual weather processes that were bound together under one word by Arabic-speaking medieval Egyptians, derived from their cultural background. There is no evidence that the ancient Egyptians had an exactly equivalent word, and so this identification can disregard the unique aspects of the ancient weatherworld.

The ancient lexicon of weather words should not be untangled from the physical experience of meteorological phenomena, which was the tangible equivalent of their categorisation. When the ancient Egyptians were considering mitigation and utilisation strategies in response to their environment, they would have done so within the framework of their weather lexicon. Drains and waterspouts dealt with *ḥwyt* falling over towns (§4.1), temples, and funerary monuments (§4.2), and in the desert, walls were placed to direct *snm* flowing down wadis away from work sites (§4.3): these surviving instances show the pervasive impact rain had on architecture. In many houses, there is some evidence that wind-catchers were erected to catch the *mḥyt*, and more frequently it is clear that porticos were strategically planned to receive *mḥyt*. Windows were placed high on domestic walls to let some *ṯꜣw* circulate inside, while preventing sand incursion driven by those same winds (§4.1.2.1). When possible, it seems that malodorous workshops were situated to the south of towns, palaces, or temples, so *mḥyt* could blow the smells away (§4.1.2.2, 4.4). Boats made use of *mḥyt*, but *ḏꜥ* was a threat that people avoided sailing in. Water seeping into the ground after *ḥwyt* refreshed the wells that were crucial to desert expeditions, and the Egyptians were aware of this connection (§5.2.1.2). Texts show that *iꜣdt* was collected for medicinal mixtures (§5.2.3.3), although such use has no physical evidence. Many structures that may have once held evidence do not survive well in the archaeological record, significantly reducing the sample size, especially for domestic contexts. For example, it seems likely that many houses once had wooden or ceramic waterspouts, as well as wind-catchers, on their roofs, but physical evidence for these is limited (§4.1.1.3, 4.1.2.1). The weather strongly affected the architectural traditions and taskscapes of the ancient Egyptians.

Furthermore, these were not fossilised traditions, installed as homages to the past and forgotten about. If they stopped working as intended due to architectural or environmental change, the Egyptians modified them to fit the new situation. This is visible in the drainage systems of Ezbet Rushdi's 12th Dynasty temple and the *ka*-pyramid of Senwosret II (§4.2.1.1), as well as in the embankments added to Menkaure's valley temple to protect against flood or wind erosion (§4.2.1). When the landscape changed, houses in New Kingdom Amara West had stone blocks installed in front of entrances to prevent sand incursion (§4.2.2.1). The Egyptian response to weather was dynamic, and they continued to experiment with different solutions using their culture's architectural knowledge base.

Having surveyed what weather the Egyptians recognised and named, how they responded to weather, and how pervasive its influence was, the question of their preferred weather conditions remains. There was a preference for wind unidirectionality—where the wind blows from one direction, without rapidly changing to other directions. This latter sort of buffeting wind is negatively represented in some texts (e.g. *The Words of Neferti*, 6e: Helck 1992 [1970]: 27). The cool *mḥyt* was clearly favoured, judging by both its textual attestations and the architectural alignment of living spaces. If a house was designed in such a way to catch the north wind for its cooling properties, any other wind would be seen with annoyance, simply because it was not the north wind. Cloudless skies were preferable in terms of religious belief, since clouds would either block vision of, or be an obstacle for, the sun, while on the other hand a clear 'burning sky' would be unfavoured by labourers (as in *Dialogue of a Man and his Ba*, l. 88–90: Faulkner 1956: 24). Heavy rainstorms and sandstorms were unwelcome, though rain in the desert was desirable (Zivie 1984: 202). Medico-magical practitioners probably favoured the morning dew (§5.2.3.3), but whether this was a widespread reaction is unknown. Very few Egyptians would ever experience snow, so their preferences are unknown, though it presumably would not be part of their ideal weatherworld. Temperature is not under study in this research, but there is evidence to tentatively suggest that perceived temperature extremes were undesirable by themselves (e.g. *Dialogue of a Man and his Ba*, l. 45–47: Faulkner 1956: 23), and these could be mitigated or exacerbated by winds (e.g. *The Tale of Khonsuemhab and the Ghost*, 2.2: von Beckerath 1992: 95; P. Harris 500, rt. 7.8: Mathieu 1996b: 64).

Beyond the physical, these words represented concepts that were integral to the ancient Egyptian view of the cosmos. One of the first parts of creation was *ṯ3w*, and the god of this substance (Shu) was brought into being by the first act of the creator deity (e.g. Barta 1973b: 85–86; Hornung 1992a: 43). This made *ṯ3w* crucial to the compositional identity of

the world, the medium between the land and sky that delimitated mortal experience (Allen 1988: 3, 17–18), and a basic means of life (§5.1.1.3). Air, life, and light were embodied in the manifestation of Shu. After their initial creation, the winds were also reinvigorated every morning by the sun god when he 'licked the *ṯ3w*' (§5.1.1.7). This is a cosmogonic integration of the observation that the winds are generally weaker at nighttime, but start to become stronger at daybreak; they have been given fresh power by the morning sun.

While Shu was equated to life, his sister-wife Tefnut was equated to *ma'at* (Assmann 2006: 168), a fundamental principle of Egyptian ideology that also had connotations with multiple weather phenomena. Following the teachings of *ma'at* rewarded the Egyptians or foreigners with *ṯ3w* (§5.1.1.10) and *mḥyt* (§5.1.3.2.1.5), while *mȝᶜw* was given to those on journeys that contributed to the upkeep of *ma'at* (§5.1.4.3). Re also sailed on *mȝᶜw* while he fulfilled his role as the cosmic maintainer of *ma'at* (§5.1.4.2). Wrongdoers who act against *ma'at*, on the other hand, would be punished by the gods with *ḫ3ḫ3ti* (§5.2.10.1) and *qri* (§5.2.11.3). The goddess Ma'at was even given the epithet 'lady of the *mḥyt*' (§5.1.3.2.1.5). Therefore, there are theological resonances between some forms of weather and *ma'at*, which indicates that the ancient Egyptians interlinked their weatherworld with their cultural constructs.

ṯ3w was also vital to both the transformation in an *akh* and the continued presence of the deceased in the afterlife. As the breath of the gods, it had regenerative properties; *ṯ3w* was the breath of the sun god given to the deceased Osiris that led to his revival (§5.1.1.11). As such, *ṯ3w*, or its specific forms *ṯ3w nḏm n mḥyt* and *ṯ3w n ᶜnḫ*, was extensively invoked in funerary requests and spells, but was also implied in funerary objects. Many of the funerary soul-houses have wind-catchers on their roofs, devices that were designed to catch the north wind, and the prominence of a pillared portico furthers emphasises the acquisition of *ṯ3w* (§4.1.2.1; see Spence 2011). The exact function and ritual surrounding soul-houses is debated, but they clearly draw on the idea that *ṯ3w* was essential for the deceased. Another relevant object type is the Middle Kingdom *ankh*-stelae of Abydos, which feature a prominent central *ankh* with its top loop entirely cut through, creating a 'window'. The main examples are Vienna ÄS 109 (PM VIII, 803-033-011), Garstang E30 (Simpson 1974: no. 58.3), Cairo CG 20353 (PM V, 268), and Penn. E9952 (PM V, 69). The Liverpool example is decorated on both sides, suggesting it was set up to be visible on both sides (at least to the deceased). Therefore, these stelae are probably in part visual metaphors for *ṯ3w n ᶜnḫ*, in that any wind or breath that passes through the *ankh* loop would magically become the breath of life, in addition to being windows the deceased could look out of (for full discussion, see Hill 2010; Whelan 2016).

As with other aspects of nature, divine beings (including benign or malignant gods, 'demonic' beings, spirits, and kings) had power over the weather. Sometimes they created weather events for specific purposes (e.g. movement, concealment, punishment), and in other cases, those phenomena were side effects of their emotional state. While some divine beings were more likely to control the weather, it appears to have been a common manifestation of divine *sḫm*-power, and not exclusive to a single god. The weather phenomena were not deities in their own right: Seth may be the lord of *nšn*, but he himself was not *nšn*; Shu commonly manifested as *ṯ3w*, but other gods could also do so (for this concept, see Hornung 1996 [1971]: 68–80).

The solar cycle was a recurring theme in presentations of the Egyptian weatherworld. At sunrise, a *ḫrw qri* was heard (§5.2.11.2) as the gates of the sky were pushed open by *i3bty* (§5.1.3.2.4) so that Re could appear on the eastern horizon, and he revitalised the *ṯ3w*s (§5.1.1.7). The *m3ᶜw* guided him across the sky (§5.1.4.2), and he (or the entourage) dispel *igp*, *šnᶜ*, *ḫ3pt*, *ḫ3ty*, and *ḫ3ḫ3ti* as they travel. The Solar Eyes and Seth used their *nšn* to fight against enemies of Re (§5.2.12.2), although enemies could also wield *nšn* against Re. When the Eye of Re returned to Re, she did so in the form of a *snm* coming from the desert (§5.2.2.1). Weather phenomena played a prominent role in solar mythology because of their phenomenological experience. Clouds and storms blocked sunlight, but the sun seemed to then melt them away, as if the sun has beaten back his enemies, and additional related weather events (e.g. thunder, lightning, wind) were evidence of that battle. The solar barque's journey was modelled on the everyday experience of sailing south on the Nile (Altenmüller 2004: 15), using the wind.

Rain and dew were conceptualised as part of Hapy's flow since at least the Middle Kingdom. Like the inundation, rain had fertilising and revivifying properties; its importance was lesser not because of its materiality, but because of its frequency and unpredictability. When appearing in foreign lands, rain played the same role as the Nile (see e.g. Great Hymn to the Aten: Sandman 1938: 95.5). Rain-determinative words were also often conceptualised as bodily functions of the gods. *qri* is the *rḏw*-efflux of Shu (§5.2.11.1), and *nšn* or *šnit* is his *i3dt* (§5.2.12.1). *i3dt* was probably understood as divine sweat and fragrance (§5.2.3.2).

Many medical conditions were interpreted through the weather lens, with weather terminology explaining the cause, describing the symptoms, or offering a cure. Infectious diseases, particularly *i3dt-rnpt*, were spread by the *ṯ3w* of raging (*nšn*) demonic entities whom Sekhmet sent (§5.1.1.6; §5.2.12.2). Sweat running down a patient's face was described as *ḫw*ing (§5.2.1.1); ocular ailments were like *ḫ3ty*-clouds blocking the sun/moon (§5.2.6.1);

painful eyes were described as *nšn*ing (§5.2.12.2); excessive flatulence was like a *ḏ^{c}*-wind (§5.1.7.2); and there is even one example of a heart being darkened like a *igp* (P. Ebers 855t, l. 102.2: Grapow 1958: 5.9). *iʒdt* is collected as an ingredient in medicinal mixtures (§5.2.3.3). The *ṯʒw* of the medical practitioner could contribute to the patient's recovery (P. Ebers 855u, l. 102.4: Grapow 1958: 9.10), but if they do not survive, it is because the *ṯʒw* of death has entered them (§5.1.1.10). Furthermore, blood flowing from many victims of battle is compared to a *snm* (§5.2.2.1).

6.4 Patterns of Use

In general, weather words are rarest in administrative or everyday texts, the exceptions being records that mention an extraordinary event (especially waterfalls) or when work was impacted by weather. Legal documents feature *ṯʒw* only as a figurative expression (§5.1.1.10). Captions that reproduce speech in tomb scenes may also be included within this group of everyday texts, as they provide insights into how weather and everyday activities (sailing, metalwork, farming) interacted, albeit through the funerary lens of tomb iconography (see Hartwig 2004: 49–50). Even with these additions, weather words in administrative or everyday texts represent less than 50 attestations, and the bulk of these come from the legal use of *ṯʒw*. This is probably because when the weather was acting as expected, and not affecting daily practices in unexpected ways, there was no need to mention it in logbooks, letters, or legal documents. It seems counterintuitive that there are no references to storms or heavy winds in ship logbooks (apart from the *rsw* in P. Leiden I 350, see §5.1.3.2.2), but ship logbooks mainly record movement of the ship/workers, not the cause for delayed or faster movement, as with those of Merer (Tallet 2017) and Dhutmose (Demarée 2022). Excluding inundation-based problems, there are very few historical records of any natural disaster (e.g. locust swarms, plagues, earthquakes: Gnirs 2015: 143). Overall, attestations of weather are instead notably skewed towards higher register compositions, particularly those of religious character where specific secondary connotations could be drawn upon to produce deeper meanings that would support ideology, such as royal texts, wisdom literature, and funerary texts.

The textual record is insufficient to document variation in the use of weather words. Attestations with known provenances inevitably tend to cluster around the locality of the court, as the centre of cultural production. Thus, northern Middle Egypt has the greatest number of attestations during the Old Kingdom (>95%), when the capital was in Memphis, and this switches to Upper Egypt by the New Kingdom (>80%), when the capital was in

Thebes. The Middle Kingdom is slightly more balanced between Upper (>25%) and Middle Egypt (>75%), with high concentrations at Abydos—due to the increased investment in the cult of Osiris at this time—Thebes, and Middle Egyptian sites around Itjtawy and Deir el-Bersha. Thebes continued to have high numbers even after the capital moved to Pi-Ramesses in the 19th Dynasty. Even though this should mean Lower Egypt had more attestations in the Ramessid period, only six have been found (0.6%, compared to >80% for Upper Egypt). Poor preservation conditions in the Delta combined with the elite desire to build funerary and cult monuments in the better-established necropolises and cult centres (Thebes, Saqqara) explain this discrepancy. Altogether, this indicates that the use of weather terms was not isolated to one region, but evidence is insufficient to chart any regional differences in terminology or attitudes.

6.5 Final thoughts

Finally, a note on determinism. Climatic determinism is the attribution of all features of a culture as responses to climate and weather, and that there is only limited human agency affecting those responses. This is a dangerous line of thinking, as it not only flattens the wide diversity of human culture, but has also been used for political agendas to justify mistreatment and/or dehumanisation in the 16th to 20th centuries (see §2.6). Perhaps in response to this, archaeologists have often downplayed cultures' interactions with their weather, even though weather is, as a survey of the Egyptian evidence shows, a factor that shapes material culture, textual discourse, and ideology. Disregarding weather is the same as removing the Nile from our understanding of ancient Egypt—implausible and unrealistic. Including weather brings us closer to the goal of reconstructing ancient experience in all its forms.

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