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The Egyptian Pyramids—Connection to Rain and Nile Flood Anomalies

Konstantin Borisov

Independent Researcher, Avon, CT, USA
Email: kboris1890@gmail.com

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Abstract

This paper explores rain and Nile flood anomalies observed in Dynastic Egypt. It builds upon the meticulous analysis and documentation initially conducted by esteemed archaeologist Karl Butzer, whose findings constituted a foundational basis for subsequent research in this field. Barbara Bell further expanded upon Butzer's work through extensive research published in the 1970s. Additionally, James Allen and Malcolm Wiener have made contributions to the discussion of weather anomalies through their respective work. Drawing from the expertise and established facts derived from these studies, this paper puts forth a hypothesis to elucidate these weather and rain anomalies. It proposes that a combination of religious practices and pyramid function related to rainmaking played a significant role in influencing climatic conditions. The notion of the pyramids influencing weather takes its roots in the work of esteemed physicist Charles Wilson. To support the claims, the paper presents experimental results that provide empirical evidence. Finally, the paper concludes by presenting historical evidence that bolsters the proposed hypothesis, leveraging the facts about Egyptian civilization and its practices.

Keywords

Ancient Egypt, Heb-Sed, Naqada III, Old Kingdom, Pyramids, Maat Offerings, Rainfall, Nile Floods, Famine, Tempest Stela, Sphinx, Blue Lotus

1. Introduction

The Heb-Sed festival stands out as one of the most prominent and potentially the most ancient festival in ancient Egypt. This festival served as a demonstration of the king's vitality and potency, although certain aspects of its origin and specific details remain unclear. There is a belief that the festival tested the king's vital power and if unsuccessful, the king would be sacrificed and replaced by a more potent successor.

The Heb-Sed ceremonies have been the subject of extensive excavations conducted over the years, revealing valuable insights into this ancient Egyptian tradition (Uphill, 1965). It is widely acknowledged that these festivities occurred thirty years after the king's accession to the throne, although certain rulers deviated from this pattern and held them more frequently. Our current understanding of the Heb-Sed ceremonies however primarily stems from artifacts dating to the later period of Egyptian civilization, as in example of the temple in Bubastis, which emerged at least two thousand years after the probable inception of the festivities (Naville, 1892). Consequently, our knowledge may not precisely reflect the original process or purpose of the festival. Prominent Egyptologists, including Sir Flinders Petrie, have postulated that the initial motivation behind the Heb-Sed ceremonies possessed an agricultural context with the primary aim of invigorating rejuvenation in the fields of ancient Egypt (Petrie, 1925: p. 65). Although it is believed that King Namer was the first to introduce this festival, its origins potentially extend back to an even earlier period preceding the establishment of dynastic rule (Wilkinson, 1999: p. 212).

During excavations near the Khufu's pyramid causeway in Giza, Selim Hassan discovered a small stone fragment that appears to indicate a connection between the Heb-Sed festival and Khufu's pyramid (Hassan, 1960: p. 23). Unfortunately, due to the fragment's size and the fragmented text, the specific details could not be deciphered. Nevertheless, this finding holds significance as it suggests a link between Khufu's pyramid, Giza necropolis and the festival. It is intriguing to hypothesize on the nature of this connection. Could the ritual sacrifice of a feeble king still have been in practice at that point, leading to the death of King Khufu? Alternatively, could Khufu's substitute have been sacrificed? (Hassan, 1960: p. 24) Or perhaps, a ritualistic slaughtering of a bull took place. Further research, exploration, and analysis of additional archaeological evidence will be crucial in unraveling the mysteries surrounding the Heb-Sed festival and its connection to Khufu's pyramid. It is, however, safe to say that if King Khufu died at such event, his body would be destined for the Great Pyramid of Giza.

The details surrounding the burials and rituals of kings in the Old Kingdom of Egypt remain elusive, with limited concrete evidence to provide definitive answers. We can draw educated conclusions, however, and contemplate based on available information. A glimpse into burial customs before the Old Kingdom comes from a burial depicted in **Figure 1**, which dates to the Naqada III period, a few centuries prior to Khufu's time. In this image, a deceased individual is shown placed in a coffer along with jars containing provisions for the afterlife. While this provides a possible insight into burial practices of that earlier period, it does not guarantee that the same customs were followed in the Old Kingdom for king's burials.

Regarding the pyramids, which clearly have a funerary context, it is unclear whether they served as eternal tombs for kings or merely as temporary stops

Figure 1. Naqada III burial c. 3000 BCE, showing provisions added to the interior of the coffer along with the deceased individual.

before a more elaborate and appropriate burial for eternity would take place. The evidence is limited, and we are left to speculation. One perspective on this matter comes from Sir Wallis Budge, a prominent Egyptologist, who believed that looking at the customs of Western African tribes could help to gain insight into the burial rituals of the Old Kingdom (Budge, 1911). Budge argued that such isolated African tribes maintained their traditions with minimal external influence, potentially providing clues to how the Old Kingdom might have functioned in terms of religion and burials. Budge pointed out that certain Western African tribes employed a two-phase burial process, where the first phase served a specific objective or function, and it was followed by a more elaborate second phase at a later time for eternity. Budge and Petrie identified evidence suggestive of such practice in Naqada III burials as well, as seen through Petrie's excavation work (Budge, 1911: p. 171). Moreover, the discovery of two dates within the tomb of Queen Meresankh III further supports the notion of two phase burial process in the Old Kingdom (Reisner, 1927: p. 74). One date in her tomb corresponds to what the dynastic Egyptians referred to as the "resting Ka", while the other indicates the departure to the eternal tomb. The specific purpose of the "resting Ka" stage, however, within this complex burial process remains uncertain.

One approach to exploring the topic of "resting Ka" and its function is to formulate a well-grounded hypothesis. This can be accomplished drawing on the research work of Barbara Bell published in the American Journal of Archeology. Bell argued that a key responsibility of a reigning king in ancient Egypt included rainmaking (Bell, 1970, 1971, 1975).[1] According to this perspective, the king had a crucial role in ensuring the prosperity of the cultivated Egyptian lands by controlling rainfall through his purported magical abilities. It was believed that the

[1]A similar proposition was put forth by Gerald Wainwright in his book "The Sky Religion in Egypt; its antiquity & effects" (Wainwright, 1971).

king possessed the power to make the banks of the Nile valley and even the desert wadis green (Allen, 1988: p. 41). Extending this line of thinking, when the king died, he was believed to continue his caring role, though in a different capacity as a great god in the afterlife, where he would still oversee rain, crops, and Nile levels (Frankfort, 1978: p. 59). Meanwhile, his successor Horus, inheriting the role of his predecessor, fulfills his caregiving obligations upholding the principles of Maat, the fundamental principle of the world order (Teeter, 1997), where the integral part of Maat is offering rituals to the gods, which was believed to be essential in retaining the divine oversight and protection (Assmann, 2001: p. 5). It was believed that upholding Maat, a pharaoh could restore the Egyptian land to its primordial time (Teeter, 1997: p. 9), evoking the imagery of a land flourishing with abundant rainfall. Therefore, it seems conceivable that there exists a connection between "resting Ka", rainfall, and Maat.

The connection between the deceased king and rainfall receives additional support from the writings of Plutarch, a renowned philosopher from the first century. It is widely recognized that the deceased king is associated with the deity Osiris, who is not only the god of the dead, but also holds significance as an agricultural god. According to Plutarch, Osiris is linked to all germinating moisture (Plutarch, c.100, 1936: p. 81), which can be seen as a reference to rain. Furthermore, Osiris is associated with Nile floods and vegetation (Breasted, 1912: p. 23). The ancient Egyptians believed that only by performing the prescribed offering ceremonies correctly and at the right season could the Nile rise to the appropriate level to water the lands (Budge, 1910: p. 172). They also believed that cutting back on offering would result in famine throughout the land (Assmann, 2001: p. 64). Consequently, based on this association, one could interpret that there is indeed a link between the deceased king, offerings, and rainfall. Before scrutinizing this connection, it would be beneficial to examine certain elements of rain.

Rain Science

In 1895, Charles Wilson, a physicist, meteorologist, and Nobel Prize winner, made a groundbreaking discovery: he proved that rain could be artificially created. His research demonstrated that when air is subjected to an influx of electrically charged particles, condensation forms around these particles. If the accumulated water reaches a critical mass, it falls to the ground as rain. Fast forward to the twenty-first century, and we now have a plethora of academic institutions, funded research programs, conferences, and publications dedicated to advancing and perfecting this technology. Additionally, various businesses have emerged, offering rain enhancement products specifically designed for arid regions across the world.

One notable example is Meteo Systems Corporation, headquartered in Zurich. Over the past 15 years, this company has successfully provided rain enhancement services, resulting in 52 instances of rainfall in the Abu Dhabi desert. Meteo Systems achieves this by utilizing structures similar to tall towers, equipped with apexes that emit electrically charged particles. These particles are subsequently carried by the wind, covering a larger area and stimulating condensation, ultimately leading to rainfall.

One intriguing question remains unanswered: Can pyramids generate similar charged particles, leading to rainfall, constrained by well-established facts about the ancient Egyptian civilization? I will explore the details shortly, but first, let me summarize the hypothesis.

2. Hypothesis

1) A deceased king, along with jars containing provisions for the afterlife, is placed inside a coffer within a pyramid, drawing inspiration from the burial practices observed in the Naqada III, as depicted in **Figure 1**.

2) The jars contain beer, bread, grain, ox, and sweets, which are specifically listed in the Pyramid Texts as sustenance for the king (Allen, 2005: p. 326).

3) Once the king's body is laid to rest inside the coffer, it is hermetically sealed. Budge confirms that this sealing practice was indeed employed (Budge, 1925: p. 421).

4) The provisions within the jars undergo fermentation, where yeast converts the sugars present in food into carbon dioxide, water, or ethanol. This process can occur within a sealed coffer with no air intake, as long as the necessary conditions for yeast growth are provided. Some studies have found that fatty acids present in ox meat are essential for sustaining this growth (Tehlivets, 2006).

5) Due to the hermetic sealing, the carbon dioxide produced cannot escape, leading to the buildup of gas pressure inside the coffer. This pressure exerts mechanical stress on the coffer, which is made of Aswan granite containing at least 40% quartz. Quartz is known to possess piezoelectric properties, meaning that its crystal lattice generates electrically charged particles when deformed. The more significant the pressure on the quartz, the more charge is produced (Rosen, 1992: p. 36).

6) The produced negatively charged particles move through the moist limestone core of the pyramid towards the apex, where they accumulate and ultimately emit. The pyramid's shape is particularly conducive to the collection and emission of charged particles (Wilson, 2019: p. 410).

7) The emission of charged particles contributes to the formation of rain clouds, following the process introduced by Charles Wilson. It is worth noting that numerous cultures worldwide have traditionally associated quartz with rainmaking (Buchler, 2011: p. 34).

8) The rain clouds possess their own voltage potential. If the voltage potential from the cloud to the pyramid apex exceeds 3000 Volts per mm in the interface between the capstone and air, a corona discharge light will appear at the capstone, which in air has blue and purple signature.[2]

9) The reigning king upholds Maat, performing periodic offerings to the gods. These offerings include physical nourishment such as food, beer, bread, and

[2]For reference, a typical 5 mm quartz crystal inside a typical butane lighter creates about 15,000 Volts when a trigger knocks on the quartz crystal.

drinks (Teeter, 1997: p. 78).[3] I hypothesize that these items are periodically replaced inside tightly sealed coffer.

10) At one of the final steps, the king is removed from the coffer and the pyramid, dried in natron per process outlined by Herodotus, wrapped in clean strips of linen along with amulets, jewelry and buried in a mastaba or underground tomb more suitable for the eternal hereafter.[4]

With the aim of providing empirical support for several claims put forth in the hypothesis, a series of experiments was conducted. Specifically, the focus was on exploring the production of electrically charged particles resulting from the application of stress on granite with ferment. The following sections will present and discuss the experimental outcomes derived from these investigations.

3. Experimental Results

The experimental configuration was devised with the objective of preserving essential elements of Egyptian pyramid. In this regard, the Khafre's pyramid was employed as a point of reference for designing the setup. Khafre's pyramid has only one chamber that features a granite coffer embedded into the floor. Additionally, the pyramid consists of limestone blocks, stacked in a structure. The structure extends to a height of approximately 143.5 meters and has a base length measuring 213 meters (Lehner, 1997: p. 122). The key objective of the test to prove that granite material, stressed by ferment, hermetically sealed inside the container, produces electrically charged particles.

The experimental setup is shown in **Figure 2**. In this setup, a granite container is embedded into a masonry. A sensor made of copper foil is attached to the surface of the masonry. The purpose of the sensor is to detect and measure the charged particles generated inside the granite container. The output from the sensor is then connected to an acquisition system for data collection and analysis. The acquisition system employed in this setup utilizes an electrometer amplifier, specifically the Analog Devices ADA4530-1. This amplifier has a very large input impedance and allows for accurate measurement of the charged particles detected by the sensor. The acquired data is recorded using a USB oscilloscope, the PCSU1000, and a PC running PSG data logger software. To minimize electric noise interference, all electronic equipment used in the experiment is disconnected from switching power suppliers and powered by batteries. This precaution ensures that unwanted external electrical signals do not affect the measurements. In addition to the sensor and acquisition system, a pressure gauge is integrated into the experimental setup. The pressure gauge is connected to the interior of the granite container, enabling the measurement of pressure

[3]This belief is exemplified by the quote "That which you eat is Maat, your drinks are Maat, your bread is Maat, your beer is Maat" (Teeter, 1997: p. 78).

[4]Sir Wallis Budge held a belief that Dynastic Egyptians were pragmatic and had practical reasons be-hind their processes and rituals (Budge, 1911: p. 123). Building upon this perspective, it is plausible to contemplate that the original purpose of mummy wrappings could be to preserve and contain all body parts within a single piece of wrapping, ensuring the body's integrity during its journey from the pyramid to the eternal burial site.

changes inside during the test. Furthermore, a pressure relief valve is incorporated for safety purposes. This setup does not have limestone blocks stacked over the container. It can be reasonably inferred, however, that negative charged particles produced inside the container would collect at the apex of the stone structure through the Coulomb's law (Ling, 2021: p. 190).

The overall configuration of the acquisition system and experimental setup, including the granite container, masonry, sensor, electrometer amplifier, USB oscilloscope, PC, pressure gauge, and relief valve, is depicted in **Figure 3**.

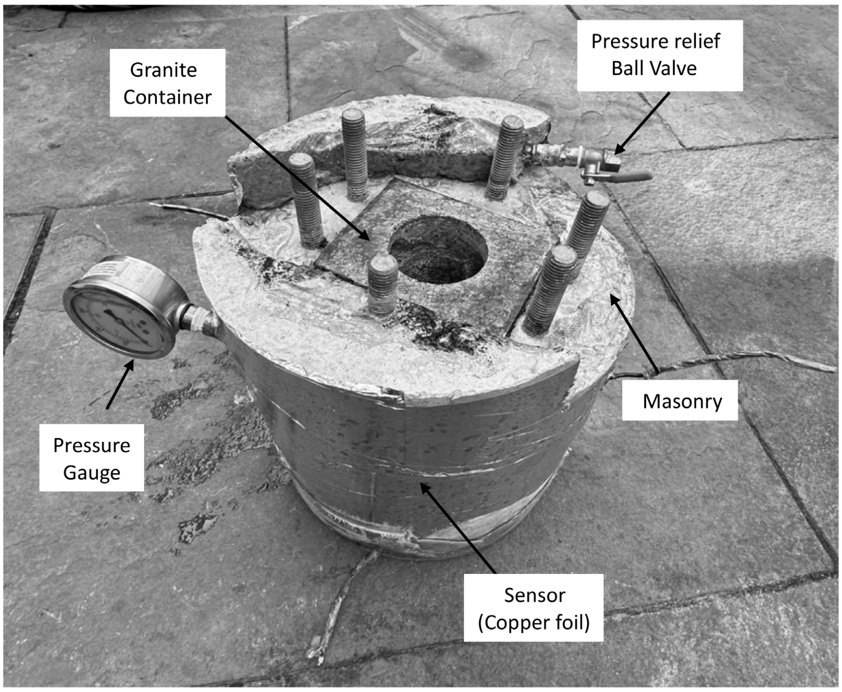

Figure 2. System under test. Granite container and instrumentation.

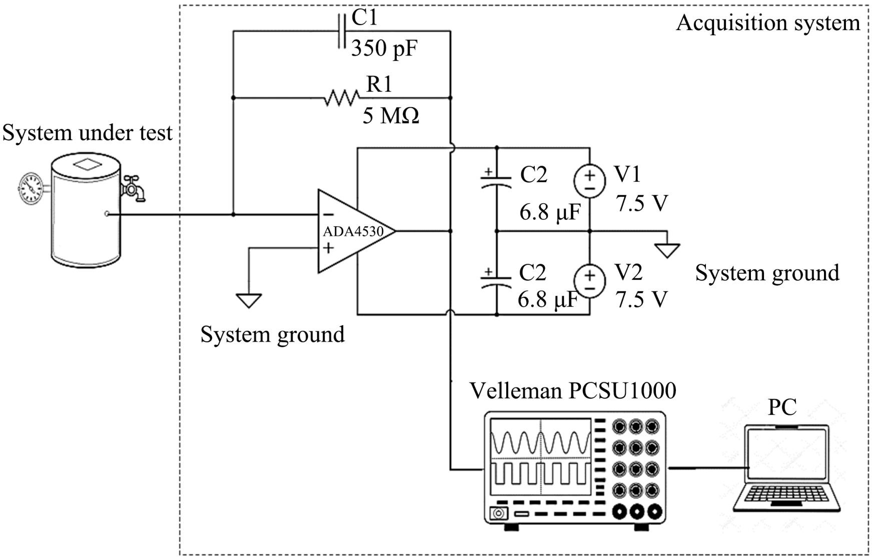

Figure 3. Acquisition system.

In the experiment, a solution was prepared by thoroughly mixing water, yeast, and sugar in specific quantities. The solution consisted of 0.7 liters of water, 2.66 ounces of yeast, and 6 ounces of sugar. This solution was then added to the granite container and hermetically sealed using a contraption installed in the masonry.

Figure 4 presents the experimental results obtained from this setup. As the yeast initiates the conversion of carbohydrates to carbon dioxide, the pressure within the container gradually increases over time. After 320 minutes, the pressure inside the container reaches 300 pounds per square inch (psi). The pressure relief valve is open at the 300 psi mark, releasing the excess pressure from the container. The surge in electrical charge associated with the opening of the pressure relief valve is captured and illustrated in Figure 5. The notes mentioned below elaborate on further observations, findings, and interpretations.

Notes:

1) In the initial 320 minutes of the experiment, the sensor did not capture any charge. However, this result should be interpreted cautiously. The sensitivity of the acquisition system may pose a limitation, as more charge may be dissipated through parasitic leakage paths in the setup than actually generated by the granite container. Previous research by Yoshida (Yoshida, 1997: p. 14885) supports the notion that charge carriers are generated by the granite during this phase. In the case of the actual pyramid, these charges have limited pathways, resulting in their accumulation at the pyramid's apex.

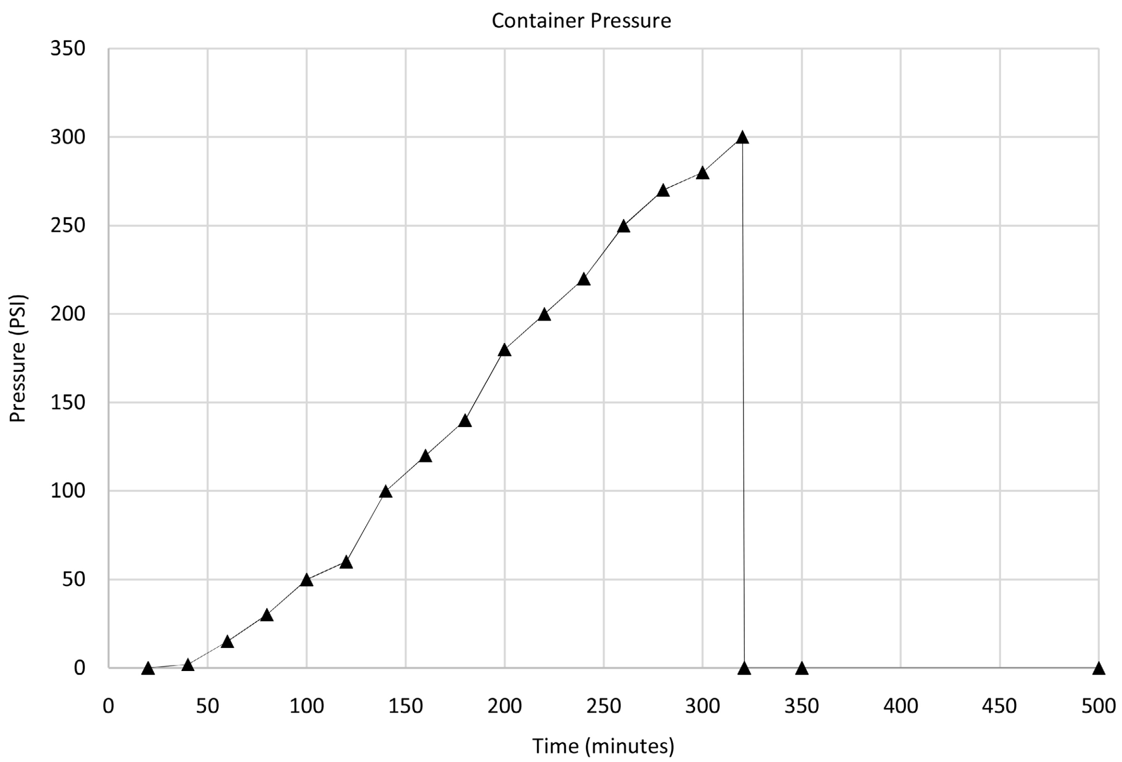

Figure 4. Granit container pressure measurement data.

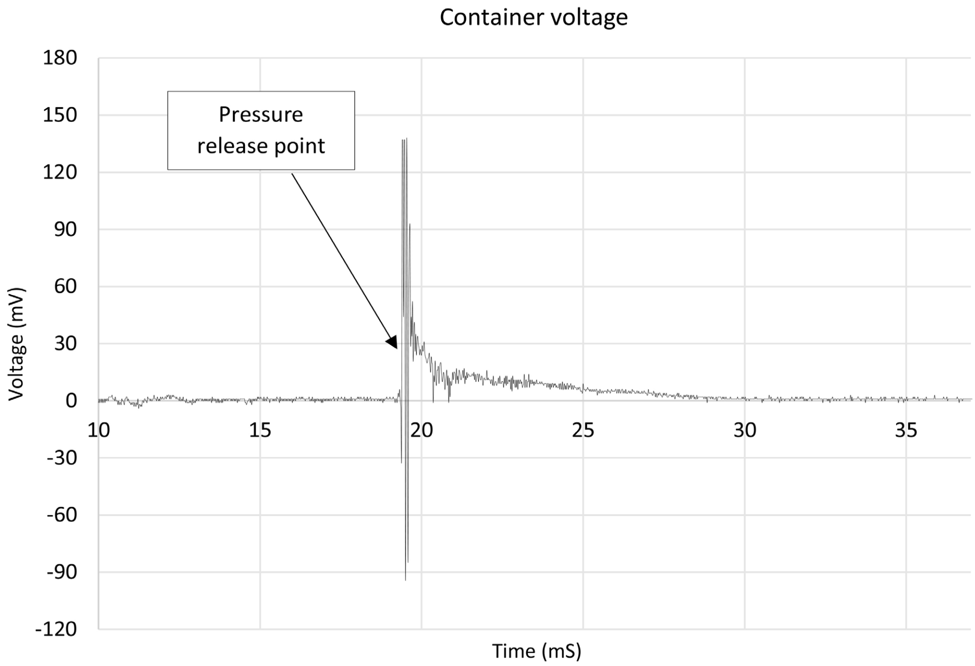

Figure 5. Granite container sensed voltage.

2) The granite material used in the experiment belongs to the category of rose granite. Although visually similar to Aswan granite, these two types of granite have different compositions of quartz crystals, distribution, orientation, and size. The properties of other components that make up the rest of the granite also differ. The presented results, however, are expected to be fundamentally similar regardless of the specific granite material used.

3) The experiment was conducted up to a pressure of 300 psi due to safety considerations and other factors. This pressure level is only about ten times higher than that of car tires. The effect of the experiment is anticipated to be more pronounced at higher pressures, as typical granite materials can withstand pressures at least 200 times greater pressure than what was employed in the test. Furthermore, enhancing the setup by implementing a socketing technique, similar to the design of the granite coffer in Khafre's pyramid, may further enhance the granite stress limit.

4) It is essential to note that the size of the granite container utilized in the experiment is small compared to a typical granite coffer found in Egyptian pyramids. The dimensions of the granite container in the test were 4" × 5" × 8", with a cavity volume of 0.7 liters, which is comparable to the volume of a large coffee mug. As a point of reference, the dimensions of Khafre's coffer are 41.9" × 38.12" × 103.6", with an inside volume of 1096.5 liters (Petrie, 1883: p. 107). Therefore, the scale of the test container should be considered when extrapolating the results to larger coffer size.

5) It is important to reiterate that the setup, from the sensor to the computer, is solely dedicated to data acquisition. No devices are included in the setup to actively add to the electrically charged particles. The purpose of the data acquisi-

tion setup is to capture, process, filter, display and assess the particles produced by stressed granite.

6) Although efforts were made in the test setup to minimize charge leakage, it is unfortunately unavoidable. Charge carriers can leak through air, wires, printed circuit board materials, or internal parasitic paths of the electrometer amplifiers. Due to this, it can be inferred that the amount of charge produced in the granite is likely higher than what was detected with the experimental setup.

7) The study of granite under stress and its production of electrical charges is not a novel field. Numerous publications have explored these properties of granite since at least the 1950s. Some relatively recent works examining this phenomenon can be found in the references provided by Yoshida (Yoshida, 1997).

8) In order to seal the ferment inside the container, a contraption including steel bolts was embedded in the masonry. It is important to note that such materials would not have been available during the Old Kingdom era of the pyramids. However, it can be hypothesized that limestone blocks stacked on top of the coffer lit, pressed against the ceiling, may have been used for a similar purpose. This would be in addition to cementing the lid to the coffer box. **Figure 6** provides a visual representation of how it was likely done in the Serapeum. Additionally, it is worth mentioning that limestone blocks have been found inside some of the pyramids in chambers, the purpose of which has not been fully explained (Hamilton, 2020: p. 31).

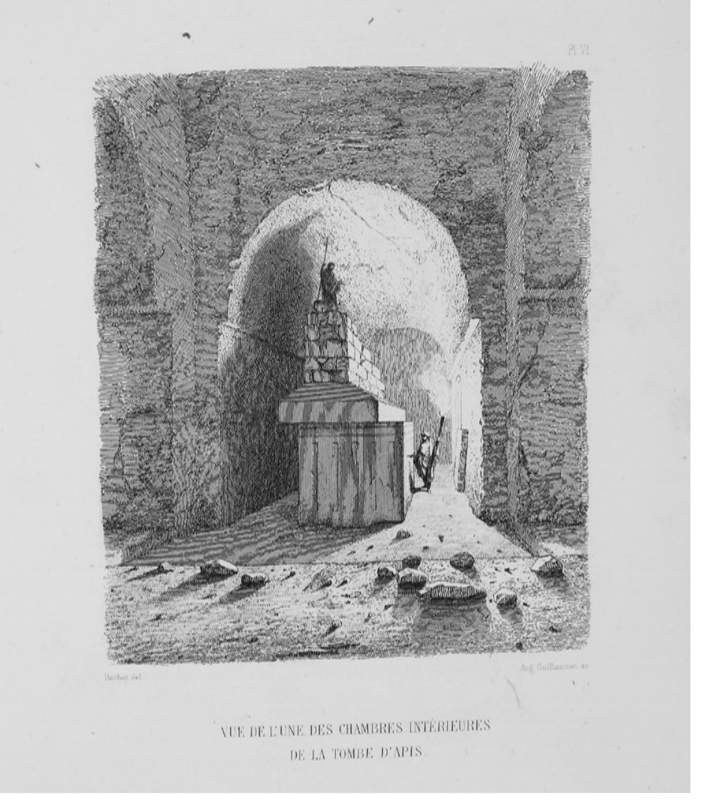

Figure 6. Serapeum of Saqqara, showing stone blocks piled on top of the lid of the granite coffer (Mariette, 1856: Pl. 6).

9) It is proposed that the emission of charge carriers from the apex, a process that occurs at ambient temperature, will result in the generation of rain clouds. Should this voltage potential from the apex to the cloud exceeds 3000 Volt per mm at the apex, a visible corona discharge light will be observed at the pyramid's apex.

10) Referring back to the experimental results presented in **Figure 5**, it is evident that there is a surge of charge carriers associated with container pressure relief. The reason for this surge is the significant stress change experienced by the quartz, relaxation and charge built as a result.

11) Upon further reflection, it is postulated that within the actual coffer found in the pyramid, there would come a point when the pressure built up inside the coffer surpasses the weight of the stone blocks stacked on top of the lead or cemented material, thereby propping up the lid, and releasing the pressure. This particular characteristic may be the key in the pyramid as the charge generation is the greatest at such event.

4. Evidence

Once the mechanism behind how the pyramids could potentially generate rainfall has been explored along with the experimental evidence, it becomes worthwhile to examine historical evidence supporting this proposition. By considering the historical evidence in conjunction with scientific exploration, experimental validation and cultural understanding, we can develop a well-rounded perspective, reinforcing the connection between the pyramids and rain.

4.1. Evidence 1—Famine Stela

The Famine Stela from the island of Sehel, recounts a seven-year drought during the reign of the third dynasty pharaoh Djoser (Budge, 1994: p. 60). Although the stela itself is a reproduction of an older text, the story line is what carries significance. According to the stela, the gods were angered by the Egyptians' lack of worship towards the Nile gods, leading them to unleash a prolonged period of aridity and insufficient Nile floods. To investigate this matter, Djoser sends Imhotep, who consults older records and discovers that floods are controlled by the god Khnum-Khufu, residing in Elephantine. As a response, Djoser reinstates offerings to the Nile gods, resulting in the drought ending, the Nile returning to its appropriate level, and bountiful agriculture and crops.

Two noteworthy points emerge from this evidence. Firstly, the story establishes a clear link between rainfall and offerings to the gods. It is hypothesized that Djoser likely made Maat offerings, which then allowed nature to respond accordingly. Secondly, the knowledge of the rainmaking practice seems to have been forgotten at Djoser's time. As Imhotep, himself, needed to align with older records to recover the knowledge. The question is then, when was this originally devised?

It is quite enticing to attribute this innovation to the era of the 1st Dynasty ruler, Den. This inclination arises due to several compelling factors. Firstly, the

Palermo stone, which records the lineage of kings, also includes measurements from a Nilometer (Bell, 1970: p. 571). These measurements reveal a significant anomaly during Den's reign, depicting higher Nile levels compared to the periods before and after his rule. Moreover, Den's Horus name, which is one of the earliest among the five names with a serekh façade, is bestowed upon the king posthumously (Petrie, 1888: p. 22). Notably, Gardiner suggests that Den's Horus name, "Udimu", can be translated as "water pourer" (Gardiner, 1961: p. 401). It is plausible to pressume that Den's recognized role in procuring rainfall and higher Nile levels left a lasting impression on his followers, leading them to confer upon him the appellation of "water pourer". This could indicate the recognition of his association with precipitation and his perceived ability to influence favorable weather conditions.

4.2. Evidence 2—Tempest Stela

The Tempest Stela, which recounts a devastating storm that occurred during the reign of Ahmose I, a pharaoh of the 18th Dynasty, has captured the attention of scholars and Egyptologists. This historical artifact describes an unprecedented calamity that ravaged Egypt, resulting in the destruction of temples, pyramids, and the loss of many lives. The stela, restored and translated in 1967, has since sparked various interpretations and scholarly discussions among experts in the field. Among the interpretations put forward by renowned scholars, Malcolm Wiener and James Allen propose that the storm described on the stela, although undoubtedly extraordinary, was a natural event (Wiener et al., 1998). On the other hand, Ritner, Foster, Moeller, Vandersleyen, Goedicke, and Davis, suggest that the calamity depicted on the stela might be attributed to the eruption of the Thera volcano, which is believed to have occurred around the same time as the events described (Ritner et al., 2014). Additionally, Ryholt and Manning offer an alternative perspective, suggesting that the inscription on the stela may be a metaphorical narrative inspired by the Hyksos invasion and the destructive force they brought (Manning, 1999: p. 196).

Each of the aforementioned proposals is not without its flaws, as pointed out by the authors cited above. For instance, Ritner argues that the magnitude of the storm described is too extraordinary to be attributed to a natural weather event (Ritner et al., 2014: p. 7). Additionally, Wiener suggests that the geographical distance between the Thera eruption and Egypt undermines the possibility of such a catastrophe being caused by the eruption alone (Wiener et al., 1998: p. 23). The misalignment between the dates of the Thera eruption and those inscribed on the stela, as noted by Wiener, weakens the direct connection hypothesized by Ritner (Wiener et al., 1998: p. 23). Moreover, the absence of the Hyksos name on the stela, which Ryholt attributes to the scribe's hesitation or feelings of humiliation, is regarded as a weak argument by Ritner and his colleagues (Ritner et al., 2014: p. 12). Importantly, it should be emphasized that the storm, as documented on the stela, affected the entirety of Egypt rather than just a localized area. Furthermore, as Ritner asserts, the prolonged duration of the storm could possibly extend to an unprecedented twenty nine days (Ritner et al., 2014: p. 7).

Based on a closer examination of the translation of the Tempest stela, an alternative interpretation emerges that expands upon the theories put forth by Allen and Wiener. Noteworthy elements within the inscription reveal a narrative structure and significant details that deserve attention. The stela begins in the customary manner, with a listing of the numerous titles and names of Pharaoh Ahmose I. However, it is the subsequent storyline that captures interest. First and foremost, the scribe intentionally includes a reference to the offerings made by Ahmose I to the gods. This inclusion suggests a direct correlation between these acts of devotion and the subsequent events. The scribe perceives a link, indicating that Ahmose I's offerings had a direct impact on the unfolding narrative. Without this connection, the mention of the offerings would have seemed superfluous, thus underscoring their relevance within the composition.

The narrative progresses to depict a sudden and devastating storm that befalls Egypt, prompting Ahmose I to question the cause of the gods' anger. The construction of this particular line on the stela seems to imply that Ahmose I had initially expected a favorable outcome, only to be confronted with an unforeseen and fierce divine response. It becomes apparent that the pharaoh may have inadvertently elicited a more severe phenomenon than he had bargained for. While he may have anticipated moderate rainfall, the gods responded with a cataclysmic tempest, resulting in the destruction of a considerable portion of the state.

Following this calamity, Ahmose I undertakes the arduous task of rebuilding temples and pyramids. He also likely reassesses the Maat offering, the rituals, and the underlying processes to prevent such a catastrophic storm from recurring in the future. The subsequent period, encompassing Ahmose I's reign and that of a few pharaohs who succeeded him witnesses the presence of substantial yet moderate rainfall, as well as the occurrence of proper flooding.

4.3. Evidence 3—Ramesses III and Harris Papyrus

Ramesses III, during his reign, made significant contributions to the Nile gods. However, it is noteworthy that all these contributions were directed exclusively towards the Heliopolitan and Memphis regions, while the capital city of Thebes received none (Breasted, 1906: p. 96). Smaller temples in different areas also did not receive any donations. This consistent pattern persisted throughout Ramesses III's thirty two year reign as evidenced by the surviving Harris Papyrus, now held by the British Museum. One possible explanation for this selective allocation of offerings may lie in pragmatism. In order to present offerings to the Nile gods, Ramesses III would have required the necessary infrastructure, such as pyramids and granite coffers. It is important to note that Upper Egypt, including Thebes, lacked large-scale pyramids, with only smaller symbolic ones like the pyramid of Ahmose I present. Hence, it may have appeared illogical to allocate resources to regions that did not possess the infrastructure required for grand offerings.

4.4. Evidence 4—Seventh's Dynasty Kings from Manetho's Account

The short reigns of the kings in the First Intermediate Period, particularly in the seventh dynasty, is an intriguing one. Manetho, an Egyptian priest from the third century BCE, allocated seventy days for seventy kings. Barbara Bell, in her research work, suggests that the short reigns may have been a result of the kings' inability to alleviate drought or bring about rainfall, which was then punished by sacrifice (Bell, 1971: p. 22). Although this scenario may seem uncommon, it is plausible in the context of dynastic Egypt, as the civilization occasionally resorted to extraordinary measures in times of trouble.

Expanding on Bell's line of reasoning, I suggest an alternative interpretation. Instead of the kings being sacrificed because they could not produce rain, they might have been sacrificed in an attempt to generate rainfall. It is noted that during the First Intermediate Period, Maat, the concept of right order and balance, was said to have been cast out or lost (James, 1960: p. 262). This implies that the rituals and processes related to offering to the Nile gods had been dismantled or forgotten, resulting in the loss of Maat. Manetho's account, if accurate, suggests that the dynastic Egyptians sought to restore Maat and revive the ancient practice of offering to the gods to regain their divine approval. One possible approach to reviving the lost knowledge, if indeed it was lost, could have been through trial and error. Each king might have been sacrificed, and a slightly different process employed each time to assess the outcome. However, it appears that this experimental approach did not yield the desired results, as the droughts and hardships of the First Intermediate Period persisted and somewhat beyond that until the 12th dynasty, specifically until the reign of Amenemhat I.

It is worth noting the irony that even the first sacrificed king may have been sufficient to bring about the desired outcome. Though, given the extremely short time span of one day, the likelihood of affecting rainfall would be unlikely. By examining Manetho's account and considering the absence of Maat during the first intermediate period, it is plausible to suggest that the sacrifices of the kings were an attempt to revive the ancient practice of offering to the gods and restore Maat. However, the effectiveness of these sacrificial rituals in alleviating drought and bringing rainfall appear to be futile.

4.5. Evidence 5—Amenhotep III's Sphinx Faience Statuette

The artifact held by the Metropolitan Museum of Art in New York, depicting Amenhotep III as a sphinx holding nu-jars, presents an interesting subject for analysis (**Figure 7**). Although limited information is available about this specific artifact, it is believed to be a smaller and likely copied version of a larger composition from the Amenhotep III's temple. The artifact is believed to be created around 1351 BCE.

Figure 7. Amenhotep III as a Sphinx, holding nu-jars. Metropolitan Museum of Art in New York.

One potential explanation for the composition is that it portrays Amenhotep III in the act of offering homage to the gods. However, sphinxes have a well-established historical connection with agriculture and safeguarding cultivated lands, from ancient times to the Roman era (Hassan, 1949: p. 128). Furthermore, sphinxes traditionally symbolized deities associated with death (Hassan, 1949: p. 148). Therefore, an alternative interpretation of this composition suggests that Amenhotep III is depicted as a revered "great god", already deceased. He is holding two jars in his hands filled with rainwater which he offers to Egypt to revitalize and rejuvenate the land. As previously discussed, a deceased king continues his caregiving role in a new capacity as a god. Consequently, this interpretation aligns with the themes of protecting cultivated lands and the association with a deceased ruler.

4.6. Evidence 6—Rain and Flood Anomalies

Karl Butzer, a leading geographer and archeologist observed a number of anomalies and irregularities for rain and Nile flood throughout the pharaonic Egypt which do not fit within a normal weather pattern (Butzer, 1958, 1984). Further Barbara Bell, adds more context in her analysis (Bell, 1971). I will cite a few excerpts from their work below, rearranged in a chronological order. A reader is encouraged to follow with the original works.

"*Throughout the southern Sahara the relatively moist conditions terminated in 2850 ± 100 BC… The Nile flood levels show a decline between the 1st and 2nd dynasties… which is a* thirty percent *reduction in discharge water… a seven year span of low Niles is alleged for the reign on Djoser culminating in Year 18, ca 2720 BC*".

Wet conditions were abruptly reestablished in East Africa ca. 1970 BC and the lake became 75 meters deeper which overflowed into the Nile System… the White Nile was 3 meters higher, with the discharge 10 times higher.

"*Sub-Saharan lake levels remained very low until 1950 ± 50 BC*"…

"*Multiple inscriptions dating to 1840-1770 BC, recoding floods 8 - 11 meters higher than at present… At least twice the basin water depth was present than at normal year… Comparable with catastrophic floods*".

"*Lake levels fell dramatically in East Africa ca. 1260 ± 50 BC. In Nubia, agriculture ceased almost entirely after the end of reign of Ramesses II* (*e.g., after 1212 BC*)… *where the floods were 1 m higher during Ramesses II*'*s time, dunes spread over the floodplain… In the Delta, discharge* [*water*] *declined so much that the Ramessid residence of Avaris was abandoned… Famine during 1210 BC*"…

But in 1176 BC, Ramesses III made offering to the Nile gods to seek good floods… in 1153 BC [*shortly after the Ramesses III death*] *the food supply failed.*

The excerpts provided indicate that there was considerable variation in the Nile floods and rainfall during ancient Egypt, ranging from severe droughts to exceptionally high floods. These fluctuations may appear to be linked to the practices of the pharaohs. Some kings demonstrated a strong religious devotion and chose to follow Maat, the established customs and offering rituals of their predecessors. As a result, their reigns were often accompanied by regular rainfall and proper flooding.

Some others, perhaps for various reasons, decided to deviate from these traditional practices. This departure from tradition seemingly led to undesirable consequences. One speculative example is the period following the assassination of Ramesses III, who was known for his religious piety. It is suggested that his immediate successor, possibly the vizier, may have disregarded the importance of upholding Maat and ensuring the necessary offerings and rituals. Consequently, this abandonment of religious tradition may have contributed to a lack of rainfall, droughts, and subsequent hardships for the people as we know from the records.

4.7. Evidence 7—Blue Lotus

In his book "*Tutankhamen, Amenism, Atenism and Egyptian Monotheism,*" Sir Wallis Budge discusses a ritual practiced in ancient Egypt where prisoners of war were reportedly sacrificed to invoke the spirit of the sun at the apex of an obelisk (Budge, 1923: p. 62). According to this belief, the sun god resided within the obelisk stone, at the apex, known as a benben. It was thought that by performing this ritual the priests could invoke sun god who would emerge from the benben stone, rising from the blue lotus.

Budge explains that during this procedure, priests would offer beer, bread, sweets, and an ox placed likely in a sealed granite coffer, along with the sacrificed prisoner. It is suggested that the combination of pressure, yeast, and granite in this arrangement could create corona discharge light as previously explained. Consequently, observers may have witnessed a light phenomenon at the peak of the obelisk similar to the light illustrated in **Figure 8**.

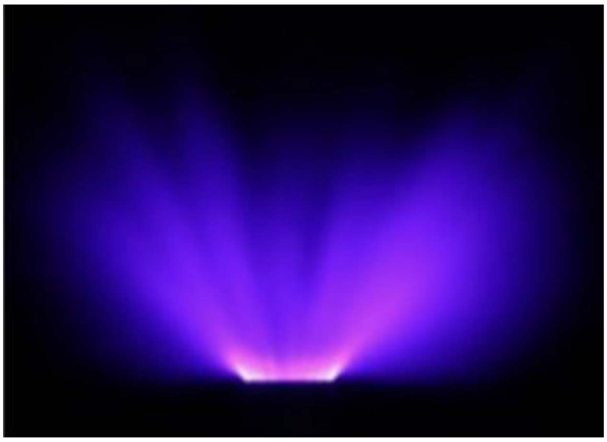

Figure 8. A light from corona discharge or ionization that appears when the electric field exceeds about 3000 Volts/mm in the air (Courtesy of Tao Shao, et al. 2011 "Runaway electrons and x-rays from a corona discharge in atmospheric pressure air" New Journal of Physics, Volume 13, Nov 2011).

The connection between this observed light and the concept of the blue lotus and sun god is speculative but understandable. It is likely that the ancient Egyptians, upon witnessing such light, may have associated it with the presence of sun god, rising from the blue lotus. The light is indeed reminiscent of the blue lotus.

4.8. Evidence 8—Joseph's Granaries and Hieroglyph O250

Following their visits to Egypt, the first European explorers brought back the notion that pyramids were used as granaries. However, it is clear that the pyramids were not constructed or equipped for grain storage. Nevertheless, an intriguing hieroglyph O250, which depicts a pyramid resting on a furrow sign, carries an agricultural association and seems to strengthen the connection between pyramids and granaries (Suignard, 2016: p. 185). These two instances, viewed independently, suggest the possibility of a grain-related function.

It is important to acknowledge that there may have been a misunderstanding of the term "granary" when European explorers introduced it. Rather than referring to a structure designed for grain storage, it could have been metaphorical, representing a structure that facilitated grain production. This aligns with the notion that pyramids were intended to enhance rainfall, promote precipitation, and improve overall vegetation growth. While this interpretation remains speculative, it complements the hypotheses previously outlined.

5. Conclusion

This study provides a thorough investigation of the well-documented Nile flood and rain anomalies, extensively discussed by esteemed experts Karl Butzer and Barbara Bell in their respective studies. The hypothesis introduced in this paper contributes novel insights into these anomalies by proposing that the interconnected factors of Egyptian pyramids, religious practices, and Maat were significant drivers behind such anomalies. The notion of pyramids influencing rainfall, Nile flood and weather in general finds its foundation in the groundbreaking research of Charles Wilson, who elucidated the ability of electrically charged particles to stimulate precipitation. The distinct features of Egyptian pyramids further strengthen the hypothesis, indicating that ancient Egyptians could have possessed an understanding of such rainmaking process in dynastic times, employing a combination of granite coffers, rich in quartz, and fermentation in their practices. Moreover, the compelling use of well-established historical evidence presented in this study serves to fortify assertions made regarding the impact of the dynastic Egyptians on weather patterns.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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