

Scientific Life in Ancient Egyptian Civilization

"Historical and Analytical Study of Geometry, Astrology and Astronomy"

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Dedication

**Blessed is He who invented writing to help us in order to know language,
history, and civilization of ancient Egypt**

**To my family who suffered greatly from the overloaded with works,
however they were a great help to me in facing challenges, also they were of
immense support for resuming this work**

**To the souls of my Professors with whom I began to learn and study the
language, history, archaeology and civilization of ancient Egypt, or
Egyptology**

**To my friends, colleagues and students whose unconditional affection and
mutual respect**

To the admirers of Ancient Egyptian Civilization

**To the charming civilization and the Broad-Minded approach to
Egyptology; Ancient Egyptian Civilization**

I dedicate this book,

Acknowledgements

I'd like to thank my Professor Dr. (Nur el-Din, Abdel Haleem) and my Professor Dr. (Tobia, Adel Farid) - May Allah have mercy on them - for teaching me to read and search for several fields of Egyptology such as; Ancient Egyptian Linguistic Field, Scientific and Religious Fields in Ancient Civilization Approaches.

I remember a lot of reading and research sessions with them, through which I gained many insights and a lot of in-depth explanations of knowledge.

I wish to express my gratitude too to my family, friends and colleagues, where they not only encouraged me, but also they always supported, advised and helped me with infinite patience.

Basically the same, I wish to express my gratitude and thanks too tofor supporting and helping in order to this work emerges into the light.

Firstly and lastly, thanks and praise be to Allah, the Exalted, the Majestic is always supported and helped me to formulate this work.

Preface

The cosmic and scientific aspects were the core of the ancient Egyptian ideology and it should be noted that all the meteor phenomena were the nucleus of the Egyptian philosophy of life, death and resurrection. The Ideology of life, death and rebirth swept over the ancient Egyptian life-style and all various aspect of his life on earth and after his death, where this ideology was the main cause of what we have now from the ancient Egyptian culture and legacies. The Greek historian, Herodotus said "Egypt is the gift of the Nile". But mainly Egypt is the valley of the Nile, supplied by the inundation of the Nile yearly, which become filled with a fertile silt layer over Egypt' lands . Therefore, the Egyptians mentioned "*kmt*" on fertile land, in contrast to infertile desert "*dšrt*" and the Egyptian priest "Manetho" who collected the history of ancient Egypt based largely on evidence from the ancient documents and the historical lists of the kings' archives. In the same way the ancient Egyptians were not absolutely oblivious about their past. Therefore, based on historical facts and on documents, it seems as though that they recorded history for other purposes; that is clear by closely insight into their awareness and achievements that still obvious in memorial temples, funerary tombs and other archeological evidences. The invention of writing was a reflection of the life-style and the environment of the Egyptian culture as well as the cosmic aspects, which were the core of ancient Egyptian ideology, particularly the inundation cycle and the harvest cycle, the sun rise and sun set, all these cosmic phenomena were the nucleus of the Egyptian philosophy of life, death and resurrection. The ideology of life, death and rebirth engulfed the ancient Egyptian life-style and all various aspects of an individual's life on earth and after their death. This ideology was the main reason why now have what we do from the ancient Egyptian culture. Orthographic signs of Hieroglyphs were not just a form of an object, but a writing system to convey aspects of the sound and meaning of ancient Egyptian language, where each of these signs expressed a sound, some having one sound (Consonant

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signs), others have two sounds (Biliteral signs), or three sounds (Triliteral signs) and in some rare cases four sound were expressed. The difficulties that faced the group of ancient Egyptian pioneers who invented this writing system can only be imagined. There were so many signs of which carried a number of Phonetic values, which formed the syntax of the ancient Egyptian language. The basic principle of the Hieroglyphic orthographic system includes two major usages, where the first is ideograms which are signs used to convey both sound and meaning, the second is phonograms which are signs used to indicate the sounds of signs. The most common Hieroglyphic signs are those which represent a single vowel or Uniliteral signs. As a result, scholars and Scientists are highly significant in Ancient Egypt, where there are many ancient correspondences which advocate obtaining knowledge and science in ancient Egypt. The Houses of Science or as the ancient Egyptians called, Houses of Life "Prw-'nh" were established as Centers for science education. There are many titles that connected Gods with houses of life, which were used as centers of sciences, education and knowledge. Just like in Esna, El-Tod, and Edfu. Further evidence is found in text of the Sixth Dynasty that mentions the house of life in Al Hagarsah, located south of Sohag , also in Abydos, Al Barsha of EL-Minya, El Hiba, Lisht, Thebes, Heliopolis, Memphis and Bubastis and there were other Houses of documents throughout ancient Egypt. Late Egyptian and Greek sources praised the ancient Egyptian cultural centers as a source for knowledge and Sciences, which was a source of inspiration for the legislator "Solon", as well as "Thales of Miletus" who was a mathematician and astronomer, and for this reason he learned and practiced the Geometry of ancient Egypt, then taking this knowledge to the Greeks. As for "Pythagoras of Samos", he was a disciple of "Thales" who advised Pythagoras to complete his studies in ancient Egypt, and he then spent about twenty two years in Egypt studying astronomy and geometry. Included in this group of ancient Greeks who studied in Egypt were "Plato" and "Eudoxus". Evidence of the value of the Egyptian sciences are that the wisest of the Greeks; "Solon", "Thales", "Plato", "Eudoxus",

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"Pythagoras", in addition to "Lycurgus" also, came to Egypt and consorted with the priests. Based on the foregoing, it is clear that Egyptian civilization strived towards unity and had a bias for the sake of identity, instead of conflicts. So, ancient Egyptians have a pursuit of knowledge, the contributions of ancient Egyptians still as witness in different fields of knowledge such as the areas of astronomy, mathematics, land surveying, geometry and medicine that were continued to notify contemporary thought. The ancient Egyptians excelled in many sciences such as Geometry, Surveying, Astronomy and Mathematics and they believed that there are some links between Mathematics and other sciences such as Astronomy, Geology, Topography and Surveying, so they tried carefully to be aware of these sciences in order to use this knowledge in the best way possible. Moreover, the ancient Egyptians had created and developed effective methods for land surveying, leveling, mensuration, and hired the mathematicians to deal with the methods of mensuration, which is a branch of mathematics is concerned with the measurement of areas and volumes of various geometric figures. In the broadest sense, mensuration is all about the process and approach of measurement that addresses the development of formulas to measure their areas and volumes. Mensuration is based on the use of algebraic equations and geometric calculations to provide factual measurement information regarding the width, depth and volume of a given object or group of objects. Whilst the measurement results gained via the use of mensuration are estimates rather than actual physical measurements, the mathematical calculations are usually considered more accurate. Most of the existing evidence comes from the paintings on the tomb walls or fragments of papyrus, all of these evidenced that ancient Egyptian surveyors created and used the best methodology for surveying. In Egypt, Pythagoras studied with the people known as the "rope-stretchers". The rope stretchers were the surveyors of land and buildings. These people were the engineers who built the pyramids. Noteworthy, in relation to determining the intersection point of two lines by extending them indefinitely - a method that can be compared to the sighting of points and the

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measurement of geometric forms using a dioptra, an ancient surveying instrument that Euclid mentioned in his works on astronomy. The methodology of sloping span length measuring in ancient Egypt was based on the calculation of mathematics that is mentioned in linguistic sources, scenes of tombs, temples and stelae. The technique and methodology of land surveying and geometry were an accurate proof for determining the direction ancillary indication of points, degrees and the distances for the building, these skills were used for locating bases of the pyramids which characterized by geometric shape formed of ribbed base. Thus, it was noticed that there is a precious ratio in connection with measurement methods which be reflected in many constructions belonging to ancient Egyptians. Traditionally, arithmetic and geometric issues are assigned to the Greek Pythagoras; however, there are harbingers of mathematics and geometry prevailed in ancient Egypt. Noteworthy, the major side of discussions concerning the roots of science included only the contributions of the Greeks and Romans without being focus deeply to the scientific contributions of ancient Egyptians. Although, the greatest part of scientific discoveries came to light after thousands of years of ancient Egyptians achievements. There is no doubt that few people know that a lot of current high-level hypotheses in mathematics were formed and developed depending on ancient Egyptian Mathematics sources that included the harbingers of counting, numeration, division, fractions and geometric shapes in order to compute extent of space and size of forms. The primary sources of Egyptian mathematics are the Rhind which called also A'hmes Papyrus, the Moscow Papyrus, the Berlin Papyrus and the Reisner Papyrus, all of them included problems together with calculations and solutions to fractions, equations and sizes. It is already clear that Mathematics during ancient and present times is the science of structure, system, arrangement and relation that has evolved from primary practices of numeration, measuring, and describing the forms of objects and issues. Multiplication and divisions were carried out by ancient mathematicians to facilitate the numbers so that only two or ten had to be multiplied. These were the

length measures used for the desired outcomes of surveying. There are some differences which have caused confusion when we want to measure the length of cubit accurately and there are variations in opinions of scientists such as those mentioned by "Gardiner, Carter & Gardiner, Noblecourt, Budge, Shaffer, Naguib and Encyclopaedia Britannica/ Merriam-Webster". It should certainly be considered that there were also variations of what was stated in the sources of the ancient Egyptians. Thus, the variations may have originated in Egypt close to 5,000 years ago. In ancient Egypt, there were seven palms in a cubit; in addition to the Seked was seven times the cotangent. The Egyptian Seked/Seqed is the ratio of the run to the rise of a slope of the cotangent. The Rhind Papyrus - an ancient Egyptian source or document mentioned the Seked, which is the base of many problems or issues such as; 56, 57, 58, 59 ,59 b and 60. In present-day trigonometry, the cotangent requires the same units for both the horizontal run and vertical rise; however, the papyrus uses palms for the run and cubits for the rise, resulting in different yet characteristic mathematical numbers. Ancient Egyptians constructed their temples and tombs in a precise orientation to specific astronomical points, as seen in the designs of the Old Kingdom pyramids and related temples. This precise orientation is seen in many religious and funerary buildings across the sequential historical epochs of ancient Egypt. This work introduces what can be called "astronomical design improvements" created by ancient Egyptians in order to better secure the precise orientation of religious and funerary monuments. Moreover, this precise orientation requires observatories to be built and used for the orientation and monitoring of celestial objects in order to determine geographical directions. Therefore, this work discusses the Probability or Possibility hypothesis of Evidences of the existence of Astronomical Observatories in ancient Egypt, the Probability hypothesis leads to suppose the statistical evidences of this work. Due to the ancient Egyptian civilization a number of discoveries in astronomy and mathematics caused features of a semi-balanced calendar almost 4200 B.C. Many of these are bases on which still prevalent until

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current time. The ancient Egyptians appointed the orbit movement of the sun, constellation of hemispheres and the cycles of the moon. Therefore, they divided the year into 12 divisions and created a yearlong calendar framework including 365¼ day. The Nile inundation was an important reason for looking toward the sky in order to monitor and control knowledge about the stars. Therefore, the process of star monitoring has since ancient times been a major function assumed by senior figures in the state. Specifically, the Minister or the High priest had the important title "greatest of the observers". Ancient Egyptians insisted on precise orientation of temples and tombs to a specific astronomical point or geographic locality and in relation to the four cardinal directions. The design improvements of temples and tombs confirmed the importance of this belief, where the researcher believes this can be called "Astronomical improvements of design". Moreover, when ancient Egyptians initiated the building of a temple, it was necessary to accurately identify the northern and southern axes by monitoring the Polar stars located in the northern hemisphere, and likewise the Non-polar stars located in the southern hemisphere. It is clear that there must have been observatories to monitor these zones and directions accurately. It can be said that the monitoring process and looking upward to the world of the sky started through the observation of simple harbingers in order to note an expectation of some astronomical phenomena and predict the movement of the stars in the sky, and there is a belief that the first Astronomical Observatory to monitor stars is situated in Nabta Playa. Furthermore, it is noted that the directions of the Khufu pyramid had been identified in a way that makes the northern side centered and oriented towards the city of Ausim/Letopolis. Similarly, the pyramids of the Kings" Menkaure, Shepseskaf, Sahure, Userkaf, Neferirkare" have been identified as also pointing towards that city. Accordingly, it is believed that there was a guard tower in Letopolis which was used as a celestial Observatory. Likewise, in order to identify and orient the directions of pyramids to a specific point, there must be an astronomical observatory in the Panorama area located to the south of the Menkaure pyramid or

in the surroundings of the Giza plateau. There must also have been an observatory in the city of Heliopolis, which is considered one of the most important cultural centers in Egypt both for astronomy and engineering. Therefore, it probably possessed an important role in monitoring and studying stars, so it would have been necessary to possess an astronomical observatory for observing and monitoring stars. Similarly, *Dḥwty* Hill area is known as one of the most important archaeological sites not only from an archaeological perspective, but also in the astronomical and celestial spheres. Therefore, it is believed that *Dḥwty* Hill Observatory was one of the most important astronomical observatories in Thebes, and probably the best place to observe and monitor winter and summer solstices as well as moon phases and star paths. Religion remains a main element in ancient Egypt life, everyday and its close association to the afterlife/life after death. Consequently, the ancient Egyptians were interested in many branches of science related to primarily the ancient Egyptian beliefs. Astronomy was one of those promoted branches of sciences; it was related to faiths, especially the solar dogma. Besides this was a link between astronomy and the ancient Egyptian religious aspects. Furthermore, the ancient Egyptian daily life aspects included the observation of the star *Spdt*/Sirius/Sothis appearance and disappearance in the sky that related to the Nile flood, a reason for the development of astronomy in Ancient Egypt. The process of stars observing was a profound impact on the later knowledge of celestial objects called with names related with astral dogma. When observing and learning about certain stars, it was noticeably divided into individual or singular and gather or set of moving within the stellar constellation. Thus, use the term astral entity, which is equivalent to the term constellation, the unity of a group of stars combined by common traits in their structure. Astral entities monitored by the ancient Egyptians, who knew that the sky was divided into northern and southern hemispheres separated by a winding channel called *Mr-n-h3*, each section contains astral entities which has unique cosmic qualities that distinguish them from other stars. The ancient Egyptians believed that the astral

shapes were mainly entities located in the northern hemisphere, some of them are Polar and others are Non-polar according to the scope of the proximity and distance from the center of the northern section. Examples of these astral entities exist in the northern hemisphere; a set of immortal stars *Thmw-sk*, while the ancient Egyptians considered that the constellation located in the southern hemisphere was a set of non-polar stars including a group of moving stars called *Thmw-wrd*. According to the ancient Egyptians' point of view the cosmic phenomena were linked to his religious beliefs; these two constellations were a major part of the ancient Egyptians' religious beliefs, where the ancient Egyptians tried carefully to identify the secrets of surrounding universe and the beginnings of creation, as well as the nature of heaven and the celestial bodies that move in it through his daily observations of what surrounds him from natural and cosmic phenomena. The sky was the place of stars and planets, where the observer watched boundless heavens including bright spots of variable brightness known as stars. The renowned stars appear on the horizon after sunset then the less illustrious appear with darkness; moving from the east to the west, as is the moon at night and the sun by day, where during the day stars are not shown because the sunlight prevents its vision. The stars are shining objects that the ancient Egyptians saw in the sky at night, and believed that these stars are descend from a sky dome at night and during the day they are hang from it by chains or ropes. That was inscribed by the term that includes a determinative of the night. Noticeably, the end of the chain was free and through which the stars could appear during the day and disappear in the sky (*Nwt*), while being lowered at night and brighten the darkness of night, where the ancient Egyptians believed that the sky was divided into northern and southern hemispheres separated by a winding channel called *Mr-n-h3*, each section contained an astral entity which has unique cosmic qualities that distinguish them from the other stars and these astral entities are located in the northern hemisphere, some of them are polar while others are non-polar and in accordance to the proximity and distance from the center of the northern hemisphere. Examples of

these astral entities in the northern sky are a group of immortal stars known as *Thmw-sk*, while the constellation located in the southern hemisphere is a set of non-polar stars that include of a group of stars called *Thmw -wrd*. Each Mythological concepts often are representative of entities that created the sacred world, so all of mythology has a basis in the creation myths of each culture, representing by the duality of good and evil or order and disorder, which reflected in each legend. Religion remains a main element in ancient Egypt life, everyday and its close association to the afterlife/life after death. Consequently, the ancient Egyptians were interested in many branches of science related to primarily the ancient Egyptian beliefs. Astronomy was one of those promoted branches of sciences; it was related to faiths, especially the solar dogma and there was a link between astronomy and the ancient Egyptian religious aspects. Furthermore, the ancient Egyptians tried carefully to identify the secrets of his surrounding universe and the beginnings of creation, as well as the nature of heaven and the celestial bodies that move in it through his daily observations of what surrounds him from natural and cosmic phenomena. The process of stars observing was a profound impact on the later knowledge of celestial objects called with names related with astral dogma and when observing and learning about certain stars, it was noticeably divided into individual or singular and gather or set of moving within the stellar constellation. The sky was the place of stars and planets, where the observer watched boundless heavens including bright spots of variable brightness known as stars, where the renowned stars appear on the horizon after sunset then the less illustrious appear with darkness; moving from the east to the west, as is the moon at night and the sun by day and during the day stars are not shown because the sunlight prevents its vision. By studying astral entities *Thmw-sk* and *Thmw-wrd* and their role in ancient Egyptian astronomical circles clarified the importance of these two entities similar to the other constellation *Mshtyw* and *S3h*, these astral entities monitored by the ancient Egyptians, who knew that the sky was divided into northern and southern hemispheres separated by a winding channel called *Mr-n-h3*, each section contains

astral entities which has unique cosmic qualities that distinguish them from other stars, where the ancient Egyptians believed that the astral shapes were mainly entities located in the northern hemisphere, some of them are Polar and others are Non-polar according to the scope of the proximity and distance from the center of the northern section. According to the ancient Egyptians' point of view the cosmic phenomena were linked to his religious beliefs; these two constellations were a major part of the ancient Egyptians' religious beliefs, where the symbolism leads to understand the mythology and help to analyze various legends' aspects, so symbolism reflects the ancient humanity's experiences and the origin of cosmic system. To sum up, the symbolism of differentiation between the two groups of the northern and southern stars was the same purpose of differentiation between the two warring brothers; the first brother is the God Wsir accompanies the southern stars called *Thmw-wrd*, which are the set of Ursa Minor *S3hw*, whilst the second brother is the God *Swth* accompany the northern stars called *Thmw-sk*, which are the set of Ursa Major *Mshtyw*, so the differentiation between those two groups of constellations achieves the ancient Egyptian' belief of two cosmic forces, which organizes the universe's system through the relation between night/ *Thmw-sk*/Ursa Major *Mshtyw*/the God *Swth* and day/ *Thmw-wrd* / Ursa Minor *S3hw*/the God *Wsir*, so the day/order/ *M3t* cannot exist without the night/disorder/*Isft* and vice versa; each totally depends on the other and there cannot be light/order/*M3t* without dark/disorder/ *Isft*, and cannot be order/*M3t* without disorder/ *Isft*. The balance between those two sets is not a fixed state but a constant flux achieved by the dynamic movement of the two forces of cosmos; disorder, and order. Day consumes night; summer consumes winter. If the two sets become out of balance, then disharmony can occur and if one becomes very weak, it cannot support the other; or, if one becomes excessive, it may over-consume the other. Likewise, the control the flood arrival every year, this force was a source of risk, which could threaten the course of cosmos. The ancient Egyptians priests/astronomers who studied the skies for signs that connected the *Dw3t*/Duat (Land of the afterlife) above to the two lands

below noticed a connection between the star of Isis, Sirius, and the rising of the Nile Flood, where they principally observed helical culmination, which known as the point of rising just before dawn. The Five Epagomenal days, "days out of time," were placed between the 30th of the last month and the first day of the New Year to bring the total to 365. Although the rising of Sirius/Sothis originally marked the New Year (Thoth 1), the missing quarter day in the civil calendar caused a "Wandering year" as the rising of Sirius cycled through the days of the year; it returned to Thoth 1 every 1461 of the civil years/the Sothic cycle. The Epagomenal days are the transition duration between the end of the year and the beginning of the new one, it may be as a period of confusion and disorder, so the ancient Egyptian was afraid of occur disasters during those days, and the papyrus "Salt 825" reported on its beginning "Rite to keep life in Egypt", which means to prevent Disorder/ *Isft* and approval Order/*M3ct*. It was necessary to be done in order to keep the continuation of the life and order in the cosmos without cosmic disasters and disorder, where the ancient Egyptians exerted a big effort to preserve the cosmic order, which created by the creator god since the beginning of the cosmos creation, the so-called *Sp-tpy*.

The framework of this book is composed of three chapters;

The first one provides "Manifestations of Geometry and Mathematics in Ancient Egypt".

The second chapter includes "Manifestations of Astrological Life in Ancient Egypt".

The third chapter provides "Manifestations of Astronomical Life in Ancient Egypt".

All of these three chapters divided to several sections and topics which serve the scientific methodologies in ancient Egyptian civilization which was absolutely precious.

List of abbreviations

List of abbreviations

<u>A</u>	
ÄA	<i>Ägyptologische Abhandlungen, Wiesbaden.</i>
ÄAT	<i>Ägypten und Altes Testament: Studien zu Geschichte, Kultur und Religion Ägyptens und des Alten Testaments, Münster & Wiesbaden.</i>
AAWLM	<i>Abhandlungen der Akademie der Wissenschaften und der Literature in Mainz, Wiesbaden.</i>
ABD EL-RAZIK. JEA 61	<i>ABD El-RAZIK, M., The Dedicatory and Building Texts of Ramesses II in Louxor Temple II, interpretation, JEA, 61, 1975, pp. 125-13</i>
ABYDOS/ ABYD.	<i>Mariette, A., Abydos, 2 Vols., Paris, 1869-1880.</i>
ADMONATIONS / ADMON	<i>Gardiner, A. H., The admonitions of an Egyptian Sage, Pap. Berlin 344 recto, Leipzig, 1909.</i>
AC OR	<i>Acta Orientalia, Leiden, ab. Bd. 21: Kopenhagen.</i>
ADAIK	<i>Abhandlungen des Deutschen Archäologischen Instituts zu Kairo, Glückstadt & Hamburg.</i>
AE	<i>Ancient Egypt, London & New York.</i>
ÄF	<i>Ägyptologische Forschungen, Glückstadt, Hamburg & New York.</i>
AFO	<i>Archiv für Orientforschung, Berlin.</i>
ALDRED, JEA 56	<i>Aldred, C., The foreign Gifts offered to Pharaoh, JEA 56, 1970, pp. 105-116.</i>
ALEX.	<i>Meeks, D., Année Lexicographique, 3 Vols., Paris, 1989.</i>
ALLEN, B. D.	<i>Allen, T. G., The book of the Dead or going forth by Day, Ideas of the Ancient Egyptians concerning the hereafter as Expressed in their own terms, Chicago, 1974.</i>

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AMARNA	<i>Davies, N. de. G., The Rock Tombs of El Amarna, in Archaeological Survey of Egypt, 6 vols. London, 1903-1908.</i>
AME	<i>Allen, J. P., Middle Egyptian, An introduction to the language and culture of Hieroglyphs, Cambridge, 2000.</i>
AMENEMHET	<i>Davies, N. de. G., & Gardiner, A. H., The Tomb of Amenemhet, London, 1915.</i>
AMENEMOPE	<i>Lange, H. O., Das Weisheitsbuch des Amenemope, Pap. British. Mus. 10, 474, Kopenhagen, 1925.</i>
AMONHYMN	<i>Gardiner, A. H., Hymns to Amon from A Leiden Papyrus, Pap. Leiden. 350, ZÄS 42, 1905, pp. 12-42.</i>
AN I	<i>Gardiner, A. H., Egyptian hieratic texts, Anastasi I and Koller, Leipzig, 1911.</i>
ANTIQUITY	<i>Antiquity A quarterly Review of Archaeology, U.K & Cambridge.</i>
APOPH	<i>Budge, W., Egyptian Hieratic Papyri in the British. Museum, London, 1910. (P. Brit. Mus. 10188, Apophis) (Hierogl. Trans. In Faulkner, R. O., the Papyrus Bremner-Rhind, British Museum No. 10188, Bibliotheca Aegyptiaca III, Bruxelles, 1933, pp. 42ff).</i>
ASAE	<i>Annals du Service des Antiquités de L'Égypte, Le Caire.</i>
ASSIOUT	<i>Chassinat, E., & Palanque, Ch., Une Campagne de Fouilles dans la nécropole d'Assiout, MIFAO 24, Le Caire, 1911.</i>
ASSMAN, MUTIRDIS	<i>Assman, J., Das Grab der Mutyirdis, Mainz, 1977.</i>
ASSMANN, RDE 30	<i>Assmann, J., Eine Traumoffenbarung der Göttin Hathor, RdE 30, 1978, pp. 22-50.</i>

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AUC	<i>American University in Cairo, Cairo.</i>
AV	<i>Archäologische Veröffentlichungen des Deutschen Archäologischen Instituts Abteilung, Kairo.</i>
<u>B</u>	
BACE	<i>Bulletin of the Australian Center for Egyptology, Sydney.</i>
BAE	<i>Bibliotheca Aegyptiaca, Brüssel.</i>
BAKIR, JEA 60	<i>Bakir, A. M., A further Re-Appraisal of the Terms: <i>nḥḥ</i> and <i>ḏt</i>, JEA 60, 1974, pp. 252-254.</i>
BAR	<i>Breasted, J.H., Ancient Records of Egypt, 5 Vols. Chicago, 1st Edition, 1906-7; 3rd Ed. 1927.</i>
BAUER A	<i>Vogelsang, F., Kommentar zu den Klagen des Bauern, In: Sehte, K., Untersuchungen Zur Geschichte und Altertums Kunde Ägyptens, Vol. VI, Leipzig, 1913.</i>
BEATTY	<i>Gardiner, A.H., The Chester Beatty Papyri No. 1, London, 1931, section (a) Taf. 16; section (B) Taf. 9-17; Section (c) Taf. 22-26; section (G.) Taf. 29-30.</i>
BENI-HASSAN / BH.	<i>NewBerry, P. E., Beni Hasan, in Archaeological Survey of Egypt, vol. I, London, 1893.</i>
BERSHEH / BERSH.	<i>NewBerry, P. E., El Berscheh, in Archaeological Survey of Egypt, 2 Vols., London, 1893-1894.</i>
BIFAO	<i>Bulletin de L'Institute Français d'Archéologie Orientale, Le Caire.</i>
BISEL	<i>Bakir, A. M., An introduction to the study of the Egyptian Language, A semitic Approach, Cairo, 1978.</i>
BISSING, ZÄS 41	<i>Bissing, F., Zur Lesung Von , ZÄS 41, 1904, pp.147.ff.</i>
BLACKMAN JEA II	<i>Blackman, A., Papyrus Lansing, Translation with Notes,</i>

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	<i>JEA 2, 1925, pp. 284-298.</i>
BLACKMAN, BIFAO 30	<i>Blackman, A., A new translation of the inscription of Herwerre-c at Serâbît el-khadim, BIFAO, 30, 1931, pp. 97-101, Taf. I.</i>
BMMA	<i>Bulletin of the Metropolitan Museum of Art, New York.</i>
BNLEG	<i>Bakir, A. M., Notes on late Egyptian Grammar, England, 1983.</i>
BORCHARDT, ZÄS 38	<i>Borchardt, L., Vorläufiger Bericht über die Ausgrabungen bei Abusir im Winter 1899-1900, (1900-1901), ZÄS 38, 1900, pp. 94-103.</i>
BORCHARDT, ZÄS 48	<i>Borchardt, L., Altägyptische Sonnenuhren, ZÄS 48, 1911, pp. 9-17, Taf. I-II.</i>
BORGHOUTS, MAG. TEXTS	<i>Borghouts, J. F., Ancient Egyptian Magical Texts, Leiden, 1978.</i>
BRUGSCH, FESTKAL.	<i>Brusch, H., Drei festkalender des Temples von Apollinopolis Magna in Ober – Ägypten, Leipzig, 1877.</i>
<u>C</u>	
CAMINOS, A TALE OF WOE	<i>Camino, R. A., A Tale of woe From a Hieratic Papyrus in the A.S. Pushkin museum of fine Arts in Moscow, Oxford, 1977.</i>
CAMINOS, JEA 49	<i>Camino, R., Papyrus Berlin 10463, JEA 49, 1963, pp. 29-37.</i>
CAPART, JEA 22	<i>Capart, J., New Light on the Ramesside Tomb-Robberies, JEA 22, 1936, pp. 169-193, Taf. I – VII.</i>
CB4	<i>Gardiner, A. H., Hieratic Papyri in the British Museum, Third Series, 2 Vols, London, 1935.</i>
CBI	<i>Gardiner, A. H., The Chester Beatty Papyrus No. 1, the</i>

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	<i>Library of A. Chester Beatty, London, 1931.</i>
CDE	<i>Chronique d’Egypte, Bulletin périodique de la Fondation égyptologique Reine Alisabeth, Bruxelles.</i>
ČERNY, ASAE 43	<i>Černy, J., The Origin of the Name of the Month Typi, ASAE 43, 1943, pp. 173-181.</i>
ČERNY, WORKMEN	<i>Černy, J., A Community of Workmen at Thebes in the Ramesside Period, Cairo, 1973.</i>
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