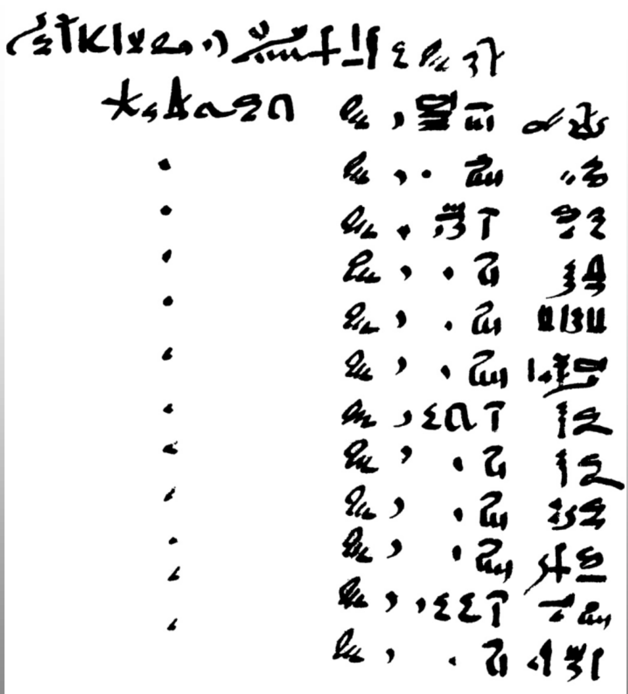
The Reconstructed Chronology of the Egyptian Kings

M. Christine Tetley

Volume One



The Ebers Calendar is probably the most valuable chronological tool from Egypt that we are ever likely to possess. M. Christine Tetley

ISBN 978-0-473-29338-3

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The Reconstructed Chronology of the Egyptian Kings – Volume One
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Publisher: Barry W. Tetley
Address: 14 Workman Way, Onerahi, Whangarei, New Zealand 0110
Publication Date: July 2014

ISBN: 978-0-473-29338-3

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Author’s Preface

A military confrontation in the Middle East occurred about 3000 years ago in the 5th year of Judah’s King Rehoboam and the 20th year of Egypt’s King Shoshenq I. Though the campaign was recorded in the annals of both nations, agreement on the actual year—which could anchor the chronologies of each—has not been established, despite much effort over the last century.

Edwin Thiele, a Seventh Day Adventist teacher, authored The Mysterious Numbers of the Hebrew Kings, which—in the absence of a credible alternative—for the last 50 years has been a standard reference for dating reigns in the 1st and 2nd Books of Kings in the Old Testament. But Thiele based his theories only on the Hebrew Masoretic Text which only goes back to about 1000 CE. He dismissed the variant numbers recorded in the Septuagint, the Greek translation of the Hebrew Text, as it stood about 1200 years earlier, around 200 BCE. The Septuagint was widely accepted at the time of Jesus Christ, was quoted in the New Testament, and was used to spread Christianity through the early centuries of the Common Era (CE).

Thiele explained the “mysterious” numbers by invoking separate calendars for Judah and Israel, and many co-regencies; which find no mention in the records. He supported his theory by a continuous list of Assyrian Kings which remains unproven.

My Reconstructed Chronology of the Divided Kingdom published in 2005 considered all the biblical texts, and established that Rehoboam’s 5th year was 977 BCE, 52 years earlier than Thiele’s proposed date. But the date for Judah was only half of the equation in the Rehoboam and Shoshenq I engagement. How did it fit with Egyptian chronology?

During the last century the tempo and temperature in meetings and writings between Egyptologists, scientists, and archaeologists has risen dramatically—all intent on establishing the dates for Egyptian events. They have dealt with Ramesses II, the Eruption of Thera on Santorini, which produced pumice used in some Egyptian monuments, and many other themes. Inscriptions and evidence continues to emerge from the sands of Egypt.

The Reconstructed Chronology of the Divided Kingdom established the Egyptian chronology in part, confirming that Shoshenq I’s 20th year was 977 BCE. Now I present the full chronology for the Egyptian Dynasties 1-25 anchored by the heliacal risings of Sirius (Sothis) and lunar phases, which modern reconstructions can identify precisely. A new understanding of Egyptian calendars is a critical feature of the reconstruction.

With the completion of this reconstructed chronology of the Egyptian kings, the date of Rehoboam’s encounter with Shoshenq I is established by independent chronologies of Israel/Judah (in The Reconstructed Chronology of the Divided Kingdom), and of Egypt (herein). The date of 977 BCE in the total dynastic framework of Egyptian chronology finally makes sense of all the evidence from inscriptions, archaeological effort, and scientific research.

I wish to acknowledge the invaluable contribution of Dr. Lee W. Casperson in accomplishing this project. In two JNES articles in the 1980s he employed astronomical data to evaluate proposed dates for Thutmose III and Ramesses II—“The Lunar Dates of

Thutmose III," (J Near E Stud, Vol. 45, No. 2: 139-150) and "The Lunar Date of Ramesses II," (J Near E Stud, Vol. 47, No. 3: 181-184). The use of this data offered a means for testing the feasibility of dates proposed from inscriptions and other sources. Over the many years of this research, Dr Casperson has provided me (upon request) with numerous sets of tables for specified periods. For this collaboration, and the corroboration that his data has supplied, I am truly grateful.

M. Christine Tetley, Th.D,
Whangarei, New Zealand,
3 July 2013.

Editor’s Note

Dr Christine Tetley died on 19 July 2013. She was the first female graduate of New Zealand’s Laidlaw College to be awarded a Doctorate in Theology. It was awarded by the Australian College of Theology, again the first awarded to a woman by thesis (others had been *honoris causa*). Her thesis was published in 2005 by Eisenbrauns entitled *The Reconstructed Chronology of the Divided Kingdom*. She completed this present work two weeks before her death. Her husband, Rev. Barry Tetley (M.Div. Hons.) has been in Christian ministry for 45 years, including 12 years as a lecturer at NZ's Laidlaw College. He was responsible for the final editing of the text.

The central chronological thesis of this presentation is established by the concordance of inscriptional and astronomical evidence available to Dr Tetley at the time of compilation. It radically differs from most chronological estimates in current Egyptological publications.

It establishes the early use of a civil Calendar in Upper Egypt with Wep Renpet as the first month, with a changing four-year link to with the annual heliacal rising of Sothis, referred to in inscriptions. A great number of events reported in historical materials link to new or full moon events, that are pin-pointed by secure astronomical evidence. This evidence establishes the date of Neferefre's reign as the earliest secure date in Egyptian history. From this date, together with analysis of the Turin Canon, the reconstructed Royal Annals, and other ancient king-lists, Dr Tetley establishes new dates for the first five dynasties. Later dynastic records contain numerous sothic or lunar references, which enable the reconstruction of a chronology that conforms to astronomical evidence. Such evidence is not susceptible to the vagaries of guess-work and estimation from a flawed starting date, as is currently relied upon in much of the present information available to the public.

Dr Tetley's methodology must be examined on its merits. The study of Ancient Egypt is ongoing, and Dr Tetley hoped that her contribution to its chronology would provide answers with a confidence that has so far eluded the Egyptology community.

New information can fill “knowledge gaps” and further refine her endeavour. The editor invites readers who recognize such gaps, or errors in the compiled material, to communicate directly with him. Any material of chronological significance that could improve and refine the Reconstructed Chronology of the Egyptian Kings would be exactly within the intentions of Dr Tetley, and would be considered for inclusion and recognition within the existing narrative.

Finally, I wish to thank Ruth Blaikie for her superb skills in copy editing this project for publication.

Barry Tetley - editor@egyptchronology.com

Tables

(Note: the explanation of Casperson's new moon tables is on page xv.)

The first number of the Table indicates the chapter it appears in.

Note on Casperson Tables.

Explanation of tables supplied by Dr. Lee Casperson occur in the context of the book, especially in chapter 4 (pp. 66-67), chapter 5 (pp. 81-82) and chapter 10 (p. 168). As can be seen in the above list, there are over 130 tables related to new moons or full moons. Many feasts and significant events referred to in inscriptions occurred in relation to lunar events.

Casperson's tables derive from astronomical calculation and are helpful in the first 11 columns for showing the comparative dates of the months of the Egyptian calendar and the Gregorian and Julian calendars. But most of the tables are employed for identifying the dates of new moons. The tables are based on the time of conjunction, shown in the 0 column, "the time of occurrence of the astronomical new moon, the instant of conjunction at which the ecliptic longitudes of Sun and Moon are equal" as Casperson says. This is the moment and day when the moon is invisible because it is directly between the sun and the earth. For the ancients the day of *in*visibility was the day of the new moon. In Casperson's tables, usually the day of the new moon occurs on the day of conjunction. But occasionally, the new moon—the day of its *in*visibility—occurred a day *before* actual conjunction. This is shown in the tables if the number in the –1 column is less than 100.

In the table below, in the −1 column all the values are over 100 so that the moon could still be seen on the day before conjunction, except for the first and second months of the Julian year −1936. The *actual* new moon date in those months recorded in Egyptian historical inscriptions—when the moon was invisible—was the day before conjunction, that is, January 19 and February 19 (using Julian month names).

Table 4.5: Amenemhet III, 30th and 31st years (new moon listing from −1937 to −1936)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1937	**9**	**12**	−1937	8	26	844	9	26	1	16:53	5:34	297	5:35	173	5:36	**53**
−1937	**10**	**12**	−1937	9	25	844	**10**	**26**	3	5:06	6:01	224	6:02	106	6:03	**−8**
−1937	**11**	**10**	−1937	10	24	844	**11**	**25**	4	19:39	6:27	284	6:28	163	6:29	**51**
−1937	**12**	**10**	−1937	11	23	844	**12**	**25**	6	12:27	6:49	227	6:49	108	6:50	**9**
−1936	**1**	**9**	−1937	12	23	845	**1**	**20**	1	6:49	6:57	169	6:57	**69**	6:57	−9
−1936	**2**	**8**	−1936	1	22	845	**2**	**20**	3	1:14	6:48	130	6:47	**53**	6:46	−8
−1936	**3**	**8**	−1936	2	20	845	**3**	**19**	4	18:05	6:27	221	6:26	113	6:25	**49**
−1936	**4**	**7**	−1936	3	21	845	**4**	**19**	6	8:23	6:01	188	6:00	100	5:59	**40**
−1936	**5**	**6**	−1936	4	19	845	**5**	**18**	7	20:08	5:37	302	5:36	155	5:35	**76**
−1936	**6**	**5**	−1936	5	19	845	**6**	**18**	2	5:59	5:15	224	5:14	113	5:14	**27**
−1936	**7**	**4**	−1936	6	17	845	**7**	**17**	3	14:49	5:03	300	5:03	158	5:03	**51**
−1936	**8**	**2**	−1936	7	16	845	**8**	**16**	4	23:26	5:07	359	5:07	211	5:08	**87**
−1936	**9**	**1**	−1936	8	15	845	**9**	**16**	6	8:25	5:25	264	5:26	135	5:27	**10**
−1936	**9**	**30**	−1936	9	13	845	**10**	**15**	7	18:17	5:50	316	5:51	187	5:52	**60**

DoW = day of week; ToD = time of day.

These tables enable us to actually *know* the new moon dates reported in Egyptian history; allowing us to rule out guesswork about Egyptian chronology. The multiple network of anchor dates reported in this chronology give compelling corroboration to its accuracy.

Figures

The first number of the Figure indicates the chapter it appears in.

General Abbreviations

AbKL	Abydos King List
ACACIA	Arid Climate, Adaptation and Cultural Innovation in Africa
AEC	Assyrian Eponym Canon
AEC	Ancient Egyption Chronology (2006)
B.C.E.	Before the Common Era (= B.C.)
BM	British Museum
C.E.	Common Era (= A.D.)
C1-6	Cairo fragments of the Royal Annals 1 - 6
DB	Deir el-Bahari Temple
EA	Egyptian Archaeology
FIP	First Intermediate Period
Greg.	Gregorian Calendar
HP	High Priest
HPA	High Priest of Amun
Jul.	Julian Calendar
KR	The *Kaige* Recension
KKL	Karnak King List
KPA	Karnak Priestly Annals
L	Lucian/Lucianic
LXX	Septuagint
MT	Masoretic Text
NK	New Kingdom
NLT	Nile Level Text
NT	New Testament
OG	Old Greek
OG/L	The Old Greek and Lucianic textual source
OK	Old Kingdom
OT	Old Testament
PS	Palermo Stone
SCIEM	Synchronisation of Civilisations in the Eastern Mediterranean in the Second
SIP	Second Intermediate Period
SaqTab	Saqqara Tablet
TC	Turin Canon
TIP	Third Intermediate Period

Bibliographic Abbreviations

Ä und L	Ägypten und Levante, a Journal published in Austria by Verlag der Oesterreichischen Akademie der Wissenschaften.
ÄA	Ägyptologische Abhandlungen, a German Journal published in Wiesbaden by Harrassowitz since 1960.
ABD	Anchor Bible Dictionary, 6 Volumes published in 1992 by Bantam Doubleday Dell Publishing Group, Inc. USA.
ACE	Australian Centre for Egyptology, Department of Ancient History, Macquarie University NSW 2109, Australia.
AEC (2006)	Ancient Egyptian Chronology (eds. Erik Hornung, Rolf Krauss, and David A. Warburton) Handbook of Oriental Studies 83; Leiden and Boston: Brill, 2006.
AFAA	Association Francaise d'Action Artistique
AJSL	American Journal of Semitic Languages and Literatures was a journal of Semitic and Hebrew philology, published by the University of Chicago from 1895 as a sucessor of *Hebraica,* until 1941 when it was succedded by the Journal of Near Eastern Studies (JNES).
ANET	Ancient Near Eastern Texts (ed. J. B. Pritchard) Princeton: Princeton University Press, 1969.
ARAB	D. D. Luckenbill, Ancient Records of Assyria and Babylonia, 2 vols; repr. New York: Greenwood, 1968 (orig. Chicago, University of Chicago Press 1926-1927).
ASAÉ	Annales de Service des Antiquités de l'Égypte, is published for Supreme Council of Antiquities in Egypt by the American University in Cairo Press.
BAR	Bibilical Archaeological Review, Magazine of the Biblical Archaeological Society, Washington, DC, USA.
BASOR	Bulletin of the American Schools of Oriental Research, USA.
BdÉ	Bibliothèque d'Étude, publications of the Institut Français d'Archéologie Orientale (IFAO), Cairo, Egypt.
BES	Bulletin of the Egyptological Seminar published by Scholars Press of the University of Michigan.
BIFAO	Le Bulletin de l'Institut Français d'Archēologie Orientale
BiOr	Bibliotheca Orientalis, Journal for the Netherlands Institute for the Near East (NINO), Leiden University, The Netherlands.
BibOr	Biblica et orientalia published by the Pontifical Gregorian University, Rome, Italy.
BSÉG	Bulletin de la Société d'Égyptologie, Genèva, Switzerland.
BSFE	Bulletin de la Société Française d'Egyptologie, Paris, France.
CAH	Cambridge Ancient History, published in 14 volumes by the Cambridge University Press, Cambridge, UK.
CdÉ	Chronique d'Égypte, published since 1925 by the Association Egyptological Queen Elizabeth sponsored by the Ministry of Education Foundation and the University of Belgium.

CFEETK	Centre Franco-Égyptien d'Étude des Temples de Karnak
CG	Catalogue General du Musee du Caire (series, Cairo Museum)
CRAIBL	Comptes rendus de l'Académie des inscriptions et belles lettres.
CRIPEL	Cahier de recherches de l'Institut de papyrologie et d'égyptologie de Lille
DE	Discussions in Egyptology
EA	Egyptian Archaeology
EU	Egyptologische Uitgaven
GM	Göttinger Miszellan
HÄB	Hildesheimer Ägyptologische Beiträge
HAIJ	J. M. Miller and J. H. Hayes, A History of Ancient Israel and Judah (Philadelphia PA: and Westminster/London: SCM., 1986)
HPBM	Hieratic Papyri in the British Museum
IFAO	Institut français d'archéologie orientale.
JAMA	Journal of the American Medical Association
JARCE	Journal of the American Research Centre in Egypt
JAOS	Journal of the American Oriental Society
JBL	Journal of Biblical Literature
JCS	Journal of Cuneiform Studies
JEA	Journal of Egyptian Archaeology
JEH	Journal of Ecclesiastical History
JEOL	Jaarbericht Ex Oriente Lux
JHA	Journal for the History of Astronomy
JNES	Journal of Near Eastern Studies
JSSEA	Journal for the Society of Study of Egyptian Antiquities, Toronto, Canada
JTS	Journal of Theological Studies
Kêmi	Revue De Philologie Et D Archéologie Égyptienne Et Coptes
KMT	Kmt: A Modern Journal of Ancient Egypt
KRI	K. A. Kitchen, Ramesside Inscriptions: Historical and Biographical (Oxford, 1969)
LÄ	Lexikon tier Ägyptologie
Manetho	Manetho (trans. W. G. Waddell; Loeb Classical Library 350; London: William Heinemann Ltd. and Cambridge, MA: Harvard University Press, 1940
MAA	Mediterranean Archaeology and Archaeometry
MDAIK	Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo
MNHK^{1}	E. R. Thiele, The Mysterious Numbers of the Hebrew Kings: A Reconstruction of the Chronology of the Kingdoms of Israel and Judah (1st ed.; Chicage: University of Chicago Press, 1951)
MNHK^{2}	E. R. Thiele, The Mysterious Numbers of the Hebrew Kings:A Reconstruction of the Chronology of the Kingdoms of Israel and Judah (2nd ed.; Grand Rapids: Eerdmans/Exeter: Paternoster, 1965)
MNHK^{3}	E. R. Thiele, The Mysterious Numbers of the Hebrew Kings (3rd ed.; Grand Rapids: Zondervan, 1983)
NARCE	Newsletter of the American Research Center in Egypt
NINO	Nederlands Instituut voor het Nabije Oosten
OIC	Oriental Institute Communications (Archeological communications of the University of Chicago)
PÄ	Probleme der Ägyptologie (Leiden)

RAD	Ramesside Administrative Documents (ed. A. H. Gardiner; Griffith Institute, Ashmolean Museum, 1948)
RCDK	M. C. Tetley, The Reconstructed Chronology of the Divided Kingdom (Winona Lake, IN: Eisenbrauns, 2005) originally a Th.D. diss., Australian College of Theology, 1999.
Rd'É	Revue d'Égyptologie published by the Société Française d'Égyptologie.
SAK	Studien zur Altägyptischen Kultur, published in Hamburg by Helmut Buske Verlag since 1974.
SAOC	Studies in Ancient Oriental Civilization, publications of the Oriental Institute of the University of Chicago, IL.
SCIEM	The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium B.C.
SCIEM II (2000)	Proceedings of SCIEM Symposia at Schloβ Haindorf 15-17 November 1996, and at Austrian Academy, Vienna, 11-12 May 1998, (ed. Manfred Bietak; Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2000).
SCIEM II (2003)	Proceedings of the SCIEM EuroConference at Haindorf, 2–7 May 2001 (ed. Manfred Bietak; Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2003).
SCIEM II (2007)	Proceedings of the SCIEM 2nd EuroConference Vienna, 28 May–1 June 2003 (eds. Manfred Bietak and Ernst Czerny; Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2007).
SOAS	School of Oriental and African Studies
SSEA	Society of the Study of Egyptian Antiquities (Toronto)
TIP	K. A. Kitchen, The Third Intermediate Period in Egypt (1100-650 BC), (Warminster, England: Aris & Phillips, 1972, 1986, 1996).
Urk	Urkunden des ägyptischen Altertums
VA	Varia Aegyptiaca
ZÄS	Zeitshrift für ägyptische Sprache und Altertumskunde

Synopsis

The reader might expect a chart of key dates presented in this book, as a means of comparison with his or her presuppositions. But the author's methodology must be well understood, before considering precise dates. The Egyptian calendar(s) must be established in the first part of the book, to secure the date and year of Neferefre's w3gy feast, pivotal for dates before and after. The following synopsis is compiled by the editor to assist the reader's journey through the book, and to introduce the chapters where specific Dynastic tables are to be found after full consideration of the evidence and anchor points that determine the dates and length of each king's reign.

The introductory chapter, "Problems with the Historical Chronology of Ancient Egypt", describes the ongoing yet unresolved chronological controversies within the Egyptological community throughout the 20th century to the present. This includes the dating of the Eruption of Thera which produced material for construction for a limited period in Egypt. The chapter describes the views of Egyptologists who have formed opinions on the chronology of ancient Egypt based on the comparatively incomplete inscriptional evidence, and scientists who rely on carbon-dating and other methodologies; a perceived difference of approx. 150 years. The selective reliance by Egyptologists who seek to establish the chronology of ancient Egypt on uncertain evidence and methodologies, and a rejection of alternative sources such as scientific analysis, astronomical observation, and inscriptions not fitting their presuppositions (like the Ebers Calendar), portrays a research discipline in considerable conflict.

Chapter Two reprises the author's findings in her *Reconstructed Chronology of the Divided Kingdom* (Eisenbrauns, 2005). She challenges Egyptologists for generally accepting the dating methodologies of Edwin Thiele for the Israel/Judah chronology, linked to a dubious Assyrian Eponym Canon, upon which they generally rely as an accepted date for Egyptian chronological calculations. Based on her comprehensive critical analysis of *all* Israel/Judean textual sources she reconstructs a cogent and coherent presentation of the deliberately interlinked chronologies of Judah and Israel in the canonical Books of Kings. She establishes that a crucial encounter between Rehoboam of Judah and Shoshenq I of Egypt occurred in 977 BCE, not 925 as commonly assumed. This is the primary synchronism for establishing the chronologies of ancient Assyria, Israel/Judah, and Egypt.

In Chapters Three to Seven, Dr Tetley explains the importance to ancient Egyptians of the annual rising of the star Sothis and other means of marking the passage of time. She surveys the various calendrical images and devices known to Egyptologists. Then she examines in laborious detail one of the primary chronological puzzles among Egyptologists over the last century, which is the search to explain why various inscriptions and calendar references report some feasts apparently held out of their eponymous months in the Greco-Roman calendar. In particular she highlights the information supplied by Sir Alan Gardiner in 1906 suggesting two civil calendars, and Dr Richard Parker's advocacy in 1950 of lunar calendars, and their subsequent irate interchanges in 1955 and 1957. She discusses the more recent workings of Winfried Barta, Jürgen von Beckerath, Marshall Clagett, Leo Depuydt, Wolfgang Helck, Heidi Jauhiainen, Rolf Krauss, Christian Leitz, Ulrich Luft, John Nolan, and Anthony Spalinger, meticulously examining the calendrical materials. From this extended narrative, describing an array of detail, contention and uncertainty, is highlighted a range of observations upon which a constructive analysis can be eventually postulated. Tetley repeatedly contends that no responsible chronology of Ancient Egypt can be ventured without a satisfactory understanding of Egypt's calendar or calendars, by which chronological information on inscriptions, letters and elsewhere must be interpreted. This section of the book is critical for engaging with the real situation in the twin Kingdoms of Upper Egypt and Lower Egypt, and the calendrical solution that explains feasts "apparently" held out of their eponymous months.

In chapter Eight and Nine evidence is examined that supports the existence of a Calendar commencing with the month of Wep Renpet (*wp rnpt*). The evidence adduced related not only to the first month of the year, but by implication other months and feasts that conform to such a calendar. Chapter eight concludes with an extensive list of evidence from many sources that validate the existence of such a calendar. Chapter nine discusses in detail the famous Ebers Calendar.

In Chapter Ten, Tetley finally offers her explanation to resolve previously described impasse. She validates the Ebers Calendar as the key document for establishing the calendrical system and a chronological fixed point for Upper Egypt by its reference to the heliacal rising of Sothis on III *šmw 9* at Thebes (Upper Egypt) in the ninth year of the reign of King Amenhotep I. She then explores the documentary evidence for the Era of Menophres, and establishes how the calendar of Lower Egypt eventually supplanted the calendar for Upper Egypt, a transition recognized as the Era of Memphis (Lower Egypt). Throughout this and previous chapters Tetley's proposals are corroborated and validated by astronomical tables supplied by Prof. Lee Casperson, and occasionally the calculations of Dr. Fred Espenek (NASA's Goddard Space Flight Center) for new moon phases. Readers will not appreciate and substantiate the remainder of this work without understanding the importance of the Sothic cycle in the formation of the Egyptian calendar, as well as the Casperson tables.

Chapters 11 to 13 engage in a case study of Sesostris III and Amenhotep III and are pivotal to the validity of the entire work. Firstly, Sesostris III's seventh year is linked in diaries found at Illahun to a heliacal rising of Sothis recorded at Illahun. By analyzing the seventh year date based on the Sothic cycle explicated in Chapter 10, the year can be identified as 1980 BCE, confirmed by multiple corroboration through astronomical analysis by Casperson. Also found at Illahun are papyrii (pBerlin 10282 and 10130) describing festivals dated specifically to new moons in Sesostris III's sixth and eight years. Casperson's tables can again be applied to the new moon dates in 1981 BCE and 1979 BCE respectively. They provide exact agreement. Of these three adjacent years, Tetley says, "that the Sothic date and the lunar dates support each other is a compelling argument for their reliability." Chapter 12 examines the various feast dates occurring in the Illahun papyri. Tetley concludes, "The inscriptional data in the Illahun materials offer numerous dates that can be checked and corroborated by lunar phases. The confirmation of multiple and connected chronological evidence shown in the detail of this chapter affords a high level of confidence in the accuracy for the dates of the reigns of Sesostris III and Amenemhet III and provides a secure anchor for dating the rest of the 12th Dynasty, which we come to later." Chapter 13 involves the discussion of fixed and movable *w3gy* feasts also from Illahun records, that is of more than academic interest. Tetley concludes the chapter by saying, “The date of a movable *w3gy* feast in the reign of Neferefre (Raneferef) secures a date in the Fifth Dynasty. This results in exciting implications for Egyptian chronology.”

In **Chapter 14,** “Securing Neferefre’s *W3gy* Feast Date”, the previous painstaking study of feast dates pays off, permitting the interpretation of inscriptions discovered as recently as 1982 relating to the brief reign of the Fifth Dynasty King Neferefre (aka Raneferef). Based on the previous analysis of movable *w3gy* feasts in chapter 13. The date of the feast is located within the 25 year range to which it applied. Alternative ranges are shown to be inadmissible, confirming the date of 2750 BCE as the earliest secure date of Egyptian chronology. This landmark discovery will be later corroborated by nine lunar dates relating to five subsequent kings in the Fifth, Sixth, and Eighth Dynasties.

Chapter 15 introduces the fragmentary data that comprise early Egyptian chronological constructions including the Royal Annals, South Saqqara Stone, Turin Canon, Abydos King-list, Saqqara Tablet, Karnak King-list, Papyrus Westcar, and Manetho. While providing important historical material, the deficiencies and discrepancies between these sources are also noted. Tetley then describes her approach to the reconstruction of the Egyptian dynasties. She will proceed forwards from Neferefre’s Fifth Dynasty anchor date of 2750 BCE to the Eighth Dynasty, examining inscriptional and astronomical evidence along the way. Then she will return to the Royal Annals and its prior record of Dynasties One to Five.

Chapters 16 and 17 recast the latter part of Dynasty Five, then Six and Eight (Manetho’s Seventh Dynasty is apparently a garbled list of localized reigns that seem unconnected with kings appearing in other chronological materials). These chapters exhibit Tetley’s approach, drawing on all the available (though incomplete) evidence in the materials mentioned in Chapter 15. She reports and interacts with the chronological information from fragments reported in all the latest published scholarship, confirming and occasionally contesting proposed conclusions. And, importantly for this period, she interprets inscriptional information contained on fragments in the light of the fixed and uncontested astronomical computations of lunar risings etc, of which there are nine relating to the reigns of five kings. She treats with due caution every item of information, including the occasional summaries of periods in the Turin Canon. Also important to resolve are claims for annual or biennial numbering of regnal years, and the discrepancies between the lists of kings in the Turin Canon etc. and Manetho.

Chapter 18 introduces the Royal Annals. The Cairo 1 fragment is displayed. Toby Wilkinson’s book in 2000 is acknowledged and appreciated though it doesn’t offer a chronological reconstruction. Tetley’s earlier chapters have supplied a provisional dating range, by which the possible edges of the Annals may be constrained. This brief chapter introduces the three-stage discussion that follows; the essential description and history of the Annals, which also includes charts displaying Tetley’s own reconstruction—preliminary to the detailed arguments offered to substantiate later conclusions and proposals.

Chapter 19. The fragmented chronological information about each successive king—Menes to Neferkare—in TC, AbKL, and SSS, is first reported. Inscriptional evidence known to Egyptologists is disclosed including the various uncertainties that exist. Then the discussion turns to the evidence of the Annals. Tetley fully discloses her methods of reconstruction. Some lengths—of—reign, changes of reign, *Heb Sed* festivals, and other chronological indicators are represented on the Palermo Stone (PS) and the Cairo 1 (C1) fragment. Cairo 5 (C5) also has a key place in the reconstruction. But the gaps in the Annals hold the greatest intrigue, and Tetley carefully explains every "gap" and consequently every length—of—reign with simplicity, associated extracts from her reconstruction, and where necessary the uncertainty of scholars about particular reigns. As with the other chronological sources, in a few cases the lengths—of—reign of some kings in the period of the Annals must be estimated from other inscriptional evidence (such as the Turin Canon), or as suggested by the overall structure of the Annals. The Annals was a two-sided stone record with a clear and discrete structure, size, format of registers, and compartments representing each individual year, many which are explicitly allocated to kings identified on the Annals. **Chapter 20** completes the discussion of the recto side of the Annals, and Chapter 21 addresses the issues of the verso side. Alternative views are considered. However, the combination of archaeological findings to date, the Turin Canon and companion King-Lists, and the structure of the Royal Annals with the detail of surviving fragments offering evidence of its original form, permits a chronological reconstruction of the first four and a half dynasties that display agreement between the summaries of the Turin Canon and the reconstructed registers of the Royal Annals. Given the paucity of archaeological information about each king, the missing material of the TC, and the few fragments of the Royal Annals, this is a most remarkable contribution to the discussion for dating the earliest dynasties of Egypt.

Chapter 22 surveys Dynasties Nine to Eleven, a period when, except for a Sothic date in the reign of Mentuhotep II, extant records do not permit many of the kings reported to be accorded precise dates or lengths of reign. The Sothic date derives from a star clock on a coffin and via a Casperson Table, corroborated by the HELIAC Program, Mentuhotep II's first regnal year is located as 2186 BCE Eleventh Dynasty dates can be confirmed, beginning in 2259 BCE. Earlier, the ending date for the Eighth Dynasty was determined at 2434, but the 18 kings named in the Turin Canon for the Ninth and Tenth Dynasities can not be more closely dated other than to say that collectively they reigned for 175 years.

Chapter 23 establishes the 12th Dynasty, drawing again on the Sothic and lunar dates ascertained in chapters 11-13. Dealing solely with chronological matters the author says, "Chapter 11 … determined that Sesostris III's sixth, seventh, and eighth years are dated to 1981, 1980, and 1979 BCE respectively, which provide an anchor for the 12th Dynasty. The length of Sesostris III's reign is discussed below but I first look at his accession in the year 1986 and the question of a co-regency with Sesostris II." Accession dates, lengths of reign, evidence for co-regencies, and specific dates for each reign and for the whole of the dynasty, is the grist of a chapter, which may be more difficult to beginners because the names of Amenemhet (I, II, III, IV), and Sesostris (I, II, III) are repeated and interlinked.

Chapter 24. As a delightful diversion, Hekanakhte's parcel of previously unopened letters, discovered in the 20th century, contain domestic and agricultural arrangements between a land-owner and his workers in southern Egypt, with seven calendar references including two regnal years. The previous chapters relating to calendars of Upper and Lower Egypt, the Sothic rising in the seventh year of Sesostris III (chapters 11-13), and the other kings of the 12th Dynasty in chapter 23, enable Tetley to definitively date the letters, and the seasonal arrangements made by Hekanakhte. And importantly for chronological interests, the Hekanakhte Letters provide further attestation of the use of an Upper Egyptian calendar in the 12th Dynasty in Upper Egypt in the same manner that the Ebers Calendar attests to its use in the 18th Dynasty.

Chapter 25 reports of Dynasties 13 to 17, about which little can be chronologically affirmed due to the absence of records. This does not impede the chronology because dates relating to the prior 12th Dynasty and the 18th and following Dynasties are securely anchored as detailed in the relevant chapters. Meanwhile, the author states, “The 13th-17th Dynasties await further clarification.”

Chapter 26 introduces the contested dates for the 18th Dynasty. She recapitulates the process by which most Egyptian scholars begin to compute their dates, and reports the 20th century and more recent years of debate. She notes the aversion of Egyptologists to consider the Sothic cycle and the Ebers Calendar, the assistance of astronomical data, and an absent awareness of distinct calendars for Upper and Lower Egypt; all are at the heart of the coverage in previous chapters.

Chapter 27 reinstates the correct dates for the 18th Dynasty covering the first five rulers. These include Amenhotep I, whose dates are anchored by the Ebers Calendar when rightly understood. Tetley determines each ruler’s death and the accession of his successor to the day, drawing from dates on inscriptions that are matched with astronomical observations. A notable feature within this period is the discussion of Thera’s eruption and the 150 years disparity between the dates of scientists (who advocate an earlier date) and the conventional dates cited by many in the Egyptology community.

Chapter 28-30 continue to establish the dates of the kings of the 18th Dynasty. A heliacal rising in Thutmose II’s 33rd year is one anchor point, and four other lunar references attested from various sources during the reigns of Thutmose and Amenhotep II corroborate the proposed dates of their reigns. Chapter 29 considers the regnal dates and lengths of reign between Thutmose IV and Tutankhamun. The author says, “The virtual absence of anchor points places more reliance on inscriptional and circumstantial evidence, which has considerable complexity.” It concludes with a discourse on Akhenaten’s successor. Chapter 30 covers the reigns of Ay and Horemheb which includes the end of the Sothic cycle in 1414 BCE. as viewed from Thebes in Upper Egypt, leading to the adoption of a new Sothic cycle as viewed from Memphis in Lower Egypt in 1314 BCE that would govern the future calendar of all Egypt.

Chapter 31 redates the 19th Dynasty centered in the reign of Ramesses II. Tetley’s most controversial claim challenges the conventional pivot of Egyptian chronology by determining the precise date of the famous new moon reported in a ship’s log in Ramesses II’s 52nd year. Other lunar and heliacal rising dates during the reign of Ramesses II and other 19th Dynasty kings add further unequivocal support for her key dating claim.

Chapter 32 addresses the discrepancies between Manetho’s chronology (in general accord with Josephus and Theophilus) and that which has been previously covered. Tetley demonstrates that the total number of years from Manetho’s 18th and 19th Dynasties cover the same number of years as the 18th, 19th, *and 20th* Dynasties known from contemporary sources and that Manetho’s 19th Dynasty in Lower Egypt runs mostly concurrently with the Theban-based 20th Dynasty in Upper Egypt. However the listing of kings and lengths of reign between the reigns of Ahmose and Ramesses II are incompatible until Ramesses moves his capital to the Delta and builds Pi-Ramesses. Ramesses is the king of Israel's slavery. He is followed by an almost 40 year reign of Amenophis, and then an unidentified pharaoh who reigned for one year and four months. The events mesh with the narrative of Moses in *Exodus*, his exile during the reign of Amenophis, and the death shortly after accession of a new pharaoh. Tetley then documents the wider framework of interlocking synchronisms between Israel and Egypt which support from both the chronology of Israel/Judah and of Egypt the claim that Rehoboam's fifth year coincides with Shoshenq I's 20 year. It remains for the following chapters to validate that claim by its treatment of the Egyptian Dynasties 20 to 25.

Chapter 33 Tetley sets out to "discuss the evidence that identifies the lunar anchor points within the regnal years of the associated kings of the 20th Dynasty, the dates and lengths of their reigns; proceeding from the anchor points of the 19th Dynasty established in chapter 31 and the conclusion of Twosre's reign in 1297 BCE." This period is "significantly informed by the chronological information attributed to *Manetho* in its several versions. In the case of the 20th Dynasty, the larger 'totals' in the *Manetho* versions offer greater consistency with other evidence than dates currently being presented by some Egyptologists. Ancient historians were much closer to the events and inscriptional evidence than people of our times, and their writings were intentionally preserved." *The Book of Sothis* also assists in providing several key dates, which are helpfully tabled throughout each chapter.

Chapter 34 revises again the much debated 21st Dynasty of Tanite Kings. The use of lunar dates referred to on inscriptions and Karnak Priestly Annals assist the (tentative) determination of kings' dates, although working with the incumbencies of both kings and high priests can be taxing on the new reader, especially when some dates in the records are uncertain. Nevertheless, Tetley produces a table of kings that approximates those delivered by other scholars, though the absolute dates differ in keeping with her overall chronology which also determines the astronomical period in which lunar events occur and supportive evidence adduced.

Chapter 35 looks at other attempts to reconstruct the chronology of Dynasties 22 to 25 and shows the surprising breadth of disagreement and improvisation among Egyptologists arising from not having a secure chronological framework and dismissing the usefulness of anchor points from the astronomical evidence of that period. But the chapter also serves to high-light recently found evidence, and the work or opinions of Kitchen, Leahy, Aston and Taylor, Rohl and Dodson, Jansen-Wilkeln, von Beckerath, Muhs, Frame and Redford, Broekman, Jaquet-Gordon, Payraudeau, Kaper and Demarée, Perdu, Kahn, etc. Again, it can be hard reading in a very complex and contested area, but it serves the author by preparing some of the ground in the final chapters to come.

Chapters 36 & 37. The most significant contribution here is the recognition that Manetho gives a framework of the 22nd Dynasty in two divisions (which include several unnamed kings now identified in recent years). Chapter 36 frames the reconstruction at length, and Chapter 37 finishes it. Against recent and ever-changing theories forced by the compressed chronologies advocated by Kitchen, Aston and others, the identity, length of reign and actual dates are steadily pursued. Inscriptional evidence here includes the inductions of High Priests and Apis bulls, with the given dates of induction confirmed by astronomical data of new and full moons, as well as the fixed synchronisms between various rulers within and without Egypt.

Chapters 38 & 39 examine and establish the dates of the 23rd, 24th, and 25th Dynasties using the customary methodology of the author. She says “The chronology of Dynasties 22-25 supplies the years from Shoshenq I in 998/997 BCE to the end of the reign of Taharqa in 664 BCE which is the secure starting point for ancient Egyptian history. Every year is accounted for in this time period. It cannot be truncated to begin ca. 945 BCE.” She then concludes by showing how this Egyptian Chronology synchronizes with her previous book, *The Reconstructed Chronology of the Divided Kingdom* (Israel and Judah), and again advocates that the Assyrian Eponym Canon be reviewed to conform to the dates established in her work on Israel and Judah and now by the Egyptian chronology that has been conclusively established upon the inscriptional and astronomical evidence.

Chapter 1

Introduction to Problems with the Historical Chronology of Ancient Egypt

Commenting on the conclusion reached by the SCIEM 2000 Workshop held in Vienna from 30 June to 1 July 2005, Malcolm H. Wiener stated, *"Most participants felt that the resolution of the apparent chronological conflict between the radiocarbon measurements at Dab^{c}a on the one hand, and the evidence from astronomy, archaeology, and texts on the other, must await future developments.*[1]

Ancient Egyptian Chronology Not Yet Established

Vast amounts of literature have been devoted to ancient Egyptian history including the pursuit of its chronology. With all the resources available, it is remarkable that neither the relative nor the absolute chronology of ancient Egypt has yet been established. Egyptologists who adhere to the commonly assumed chronology derived from written records are fairly confident that their dates of ca. 1540–1530 BCE for the beginning of the 18th Dynasty are accurate. However, these dates are challenged by scientists who rely on recent radiocarbon and other science-based tests, who propose a date in the mid to late 17th century BCE, a disparity of 100–150 years. More specifically, they place the eruption of the Thera volcano on the island of Santorini in the Aegean Sea sometime earlier than the common date for the Thutmoside period early in the 18th Dynasty. Scientists cannot explain how their dates can be so much higher than those derived from written records, and historical chronologists cannot see how one and a half centuries can be added to the chronology based on the kings' regnal years.

"Future Developments" to Resolve the Impasse

"Future developments" presented in this book offer a solution to the impasse between scientists and Egyptologists. It does so by considering the latest inscriptional evidence from the continuing archaeological enterprise to uncover Egypt's heritage. And it does so by the use of astronomical data, especially Sothic and lunar evidence found in Egyptian records.

This book also engages with Egyptian chronological issues in the context of bringing the Egyptian chronology into agreement with the dates proposed in my companion book for the original Hebrew chronology, *The Reconstructed Chronology of the Divided Kingdom.*[2] In particular, that volume demonstrates that the 5th year of Rehoboam synchronized with the 20th year of Shoshenq I (biblical Shishak) occurred in the year 977 BCE and not in 925 as it is commonly dated.

In this book, Egyptian dates, both preceding and succeeding 977, are established by Sothic heliacal risings and are confirmed by numerous lunar dates from the 5th to

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[1] M.H. Wiener, "Egypt and Time," SCIEM 2000 Workshop, *Ä und L* 16 (2006) 336.

[2] M.C. Tetley, *The Reconstructed Chronology of the Divided Kingdom* (Winona Lake, IN: Eisenbrauns, 2005) originally a Th.D. diss., Australian College of Theology, 1999.

25th Dynasties from computerized tables provided by Lee W. Casperson.[3] These dates concur in large part with the dates of science-based research for the early 18th Dynasty.

Aided by the correct dates for the kings of Israel and Judah, correlated to the Egyptian chronology, science-based dates and historical chronology can be reconciled, as the SCIEM conference wished. Early Egyptian calendars played a crucial role in dating the kings.

I begin with the basics of Egyptian chronology.

Introductory Outline

The periods of ancient Egypt as recognized by Egyptologists need to be noted. Then follows an introduction to the resources available to Egyptologists for constructing an absolute chronology. A relative chronology refers to the time-span between kings, whereas an absolute chronology refers to the dates applied to kings. I explain how Egyptologists have derived dates, and how the results are now applied to the chronology cited in the more recent literature since the mid-1980s. A brief summary of science-based tests follows (Table 1.1).

Recognized Periods of Egyptian History

Table 1.1: Designated periods of ancient Egypt

Archaic Period	1st and 2nd Dynasties
Old Kingdom	3rd–8th Dynasties
First Intermediate Period (FIP)	9th and 10th Dynasties
Middle Kingdom	11th and 12th Dynasties
Second Intermediate Period (SIP)	13th–17th Dynasties
New Kingdom	18th–20th Dynasties
Third Intermediate Period (TIP)	21st–25th Dynasties[4]
Late Period	26th–31st Dynasties
Ptolemaic Period (Greek)	from 332 to 30 BCE
Roman	from 30 BCE to 395 CE

Resources Available for Reconstructing the Chronology of Ancient Egypt

1. Inscriptions from monuments, stelae, or papyri mentioning specific years of a king's reign are of prime importance in constructing a chronology, especially if they give the regnal year in which the king died. Unfortunately, the final year of a king's reign is often not recorded. Synchronisms between one king and another of a co-existing dynasty, such as between the 22nd and 23rd Dynasties, help to establish the relative chronology.

2. Manetho, a 3rd century BCE priest and historian, copied the regnal years of kings and the total years for dynasties from ancient dynastic king-lists and recorded them in his largest work, *Aegyptiaca*, in which he recounted Egypt's history. Though he was an Egyptian, Manetho wrote in fluent Greek and it is thought he derived his primary resources from a temple library in the Delta region. Manetho composed a chronological list of dynasties from groups of rulers having a common ancestor or origin. These lists survive now only through copyists: Africanus, 3rd century CE; Eusebius, 4th century CE (in Greek and an Armenian translation); Flavius Josephus, the Jewish historian in the 1st century CE has excerpts in his book, *Contra Apionem*. *The Book of Sothis* derives from

[3] See Preface iii.

[4] Some scholars end the TIP with the 24th Dynasty.

Manetho also but in a very corrupt form.[5] Most lists have suffered in transmission with some kings attributed regnal years that conflict with other sources, or with kings' names and regnal years missing altogether. Nevertheless, combined with other information, some original data can still be isolated and they confirm various kings' regnal years or the length of a dynasty. Manetho's numbering of the dynastic divisions is still universally used.

3. The Royal Annals, which today consist of only two large fragments, namely the Palermo Stone and Cairo 1, and five smaller pieces, once gave the names and regnal years of the kings of Dynasties 1–5. The Turin Canon complements this record with its list of names and years covering the 1st to the 12th Dynasties, after which the canon consists of mostly unidentifiable kings down to the Second Intermediate Period (SIP) with most regnal years damaged or lost. Other king-lists, such as the Abydos King-list and the South Saqqara Stone also aid in establishing the names and regnal years of the kings.

4. Records of new moon dates in the Egyptian calendar can be used to provide Julian dates (the calendar used for ancient Egypt). Computer programs can convert Egyptian dates to Julian dates (and Gregorian dates—the calendar we use now) going back over many centuries BCE. Some occasions, such as the "Stretching-of-the-Cord" ceremony—the foundation act in building a temple—were held on new moon days; that is, the first day of the lunar month. The Egyptians also held specific festivals on a day associated with the beginning of the lunar month, such as the appearance of the god Amun at a feast or the induction of priests, dated to the Egyptian calendar. The installation of Apis bulls at Memphis were held within days of a full moon dated to a specific king's regnal year and some of these have been recorded for the Third Intermediate Period (TIP). Lunar dates recur in a 25-year cycle, but a specific lunar date will only repeat itself in the next 25-year period in 70% of cases. It may fall a day earlier or later.[6] Therefore, it is important to be sure in which 25-year period a lunar date fell, because the same date could fall in another cycle period and incorrectly be assumed to be the right date.

5. Egyptians used the Sothic cycle to record events or the passing of time. They reckoned the beginning of the solar year by the heliacal rising of the star Sirius (Sothis in Greek); that is, its reappearance in the early morning light after about 70 days of invisibility due to the star's close proximity to the sun. This annual appearance came shortly before the inundation of the Nile River upon which the Egyptians depended for the irrigation of their crops and their livelihood. The Sothic year was 365¼ days long. The Egyptian calendar was reckoned as 365 days long, being a quarter of a day short every year, because it did not include an extra day every fourth year as we now do using our Gregorian calendar. This meant that New Year's day fell one day ahead of the rising of Sothis every four years, so that after four years the Sothic rising fell on the second day of the first month of the year instead. It took nearly 1460 years to get back to the position where the rising of Sothis coincided again with the first day of the Egyptian calendar. This period of time is referred to as the Sothic cycle.

The rising of Sothis is not seen on the same day throughout Egypt but is seen first in the south and approximately a day later for every degree going north. This meant that the date will be seen earlier at Thebes than at Memphis because of the approximately four degrees of latitude difference between the cities. A small number of Sothic risings

[5] These are found in *Manetho* (trans. W.G. Waddell; Loeb Classical Library 350; London: William Heinemann Ltd, and Cambridge, MA: Harvard University Press, 1940). Hereafter *Manetho*.

[6] R. Krauss, "Arguments in Favor of a Low Chronology for the Middle and New Kingdom in Egypt," *SCIEM II* (2003) 175, 190.

have been recorded associated with the date and regnal year of a king, which may be used to date the king's reign. However, the Sothic date has to be reckoned from the place where the observation was made. This is not always stated. And it also depends on being dated to the calendar used by the ancient observer(s). Computer programs can now give the dates for the heliacal rising of Sothis at any location in Egypt going back many millennia. In dynastic times, the heliacal rising of Sothis fell near the middle of July in the Julian calendar, the date slowly moving later in the year over the centuries. Since each Sothic date occurs only once on four consecutive years in a Sothic cycle, a *lunar* date that is in close proximity to those four years in a king's reign may indicate that a correct date has been established.

6. Calendar depictions constitute a very important resource for clarifying the calendars(s) used by the early Egyptians. One famous example is that of the Ebers papyrus calendar dating to the reign of Amenhotep I of the early 18th Dynasty. It contains a date in his ninth year for the heliacal rising of Sothis. The calendar appears to contain corresponding dates between two columns of 12 months each, one belonging to the Egyptian's so-called civil calendar and the other calendar of uncertain origin. This latter calendar *starts* with the name of a month that in all later calendar depictions is the *last* month of the year. Calendar depictions are found on the ceilings of tombs, on water clocks, and on papyri from the 18th Dynasty down to the Late Period. The identification of the calendars on the Ebers papyrus is an important aid in establishing Egyptian chronology.

7. The enigmatic "Era of Menophres" (Μενόφρεως in Greek), associated with a Sothic cycle, can help confirm the chronology once Menophres has been identified with Memphis.

8. A 30-year festival known as the *heb sed* was celebrated by some kings and indicates that a king reigned at least 30 years. It may be repeated every 3 or 4 years thereafter. This information may extend a king's reign beyond only lower years known for his reign.

9. Genealogies covering numbers of generations may provide approximate time spans for a sequence of kings. Since the period between one generation and the next varies greatly, genealogies can give only a rough estimate of time.

10. A king-list known as the Assyrian Eponym Canon (AEC) mentions a solar eclipse that is reliably dated to the year 763 BCE. Egyptian synchronisms with Assyrian or Babylonian rulers, or kings of Israel and Judah, can be validated *after* this date. But there is no proof that the years *before* 763 constitute a continuous list. Therefore, the years before 763 BCE need to be examined.

11. Scientific studies, such as carbon-14 dating, tree-ring counting (dendrochronology), and ice-core testing, can supply approximate dates to a given time period.

These are some of the available resources on which a relative and absolute chronology of ancient Egypt may be reconstructed. Others will arise as we proceed.

How do Egyptologists Reconstruct the Chronology of Ancient Egypt?

A starting date for the Egyptian chronology has to come from a king of Egypt who can be dated by the Julian calendar. The earliest certain (but late) date comes at the end of the 25th Dynasty when Taharqa acceded the throne in 690 and after a 26-year reign died in 664 BCE. He was succeeded by Psammetichus I who became the first king of the 26th Dynasty.

From this date, Egyptologists proceed backwards using *"known"* regnal years of the kings of Egypt. This system gives a *minimal* chronology. Since the *final* regnal years of most kings are not stated, additional years beyond their highest *attested* years need to be considered. In an effort to tie the minimal chronology to an external date, Egyptologists look for a synchronism with a neighboring nation. They utilize one at the beginning of the 22nd Dynasty noting that the invasion of Shoshenq I (the biblical Shishak) of Israel and Judah is dated to the fifth year of Rehoboam of Judah (1 Kgs 14:25-26; 2 Chr 12:2-5). This equates in the Egyptian chronology with Shoshenq I's 20th year because his victory stelae describing the campaign dates it to his 21st year.

Egyptologists then look to the chronology of Judah and Israel to find when this invasion took place. They find that in 1944 Edwin R. Thiele, a scholar of St Andrews Seventh Day Adventist Seminary of Berrien Springs, MI, USA, placed Rehoboam's fifth year in 925 BCE with the commencement of the divided kingdom in 931. Where did Thiele get this date from? He looked to records from Assyria, and specifically the AEC, and derived his dates from it.

This Assyrian canon is compiled from fragments of eponym lists found on tablets in the ruins of three sites, Nineveh, Assur, and Sultantepe that were copied in the seventh century BCE from earlier records. The pieces appear to overlap and are now made into one long list that seems to be continuous apart from one section where an eponym appears in one list but not in others. This canon is a list of Assyrian kings and their officials with each year being named after the king or one of his subordinates, and called an eponym year (*limmu* in Assyrian).

If, for example, a king reigned 10 years, he would have 10 eponyms attributed to his reign. For the greater part, the reconstructed canon has three columns. In the first column is the name of the king or his official, usually in descending order of importance. In the second column is the official's title or position, such as commander or governor of the place under his jurisdiction. In the third column is a brief comment, referring to a significant event for that year, often where the king went on campaign.

Significant for chronology is the note against the eponym of a certain Bur-Saggile "of Guzanna" about a "revolt in the citadel: in Siwan the sun had an eclipse."[7] Scientists are able to date this eclipse to the 15/16 June in 763 BCE. Proceeding upward and downward from this date the surviving eponyms have been attributed to the years from 910 to 649 BCE. Another list, the Babylonian king-list, begins in 747 BCE and together with the AEC and other records the chronology of Assyria is securely linked to the Babylonian king-list from 747 *forward*.

Alan Millard, who republished the AEC in 1994, refers to another list called the Assyrian King-list. He states, "There the length of each reign is stated and the figures agree with the years allotted by the Eponym Lists as described above in every case. Although the King-lists and the Eponym Lists may be generically related, that still serves to confirm the figures as handed down from one generation of scribes to another, and so indicates the reliability of these sources for the Neo-Assyrian period, when correctly understood."[8]

Judging from this statement, the accuracy of the AEC relies on lists that are "generically related" so there is no guarantee that they are independent attestations of the completeness of the AEC. One may be a copy of the other, or both come from a deficient *Vorlage*. It appears that Millard's statement above is the only support for the accuracy of the AEC before the date of 763 BCE. This is disconcerting to say the least, because the *entire Near Eastern chronology relies on the accuracy of the AEC* for the years 910–612. On the *presumed* accuracy of the AEC, most historical chronologists (myself excepted) derive their dates for the ancient Near East including Assyria, Israel/Judah, and Egypt.

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[7] A. Millard, *The Eponyms of the Assyrian Empire 910-612 BC* (State Archives of Assyria Studies Vol. 2; Helsinki: Neo-Assyrian Text Corpus Project, 1994) 41, 58.

[8] Millard, *Eponyms of the Assyrian Empire*, 13.

Thus Egypt gets its dates from the Hebrew chronology of Israel and Judah, and the Hebrew chronological construction gets its dates from the AEC.

In order to give a date to the kings of Judah and Israel, Thiele had to find a starting date or a synchronism between a king of Assyria and a king of Israel or Judah. The first synchronism between Assyria and Israel in the divided kingdom period is provided by the battle of Qarqar fought between the Assyrians and a coalition of Levantine kings, including Ahab of Israel. This event is dated in Assyrian records to the sixth year of Shalmaneser III of Assyria.[9]

Assyrian records, of course, do not give Julian dates, but it was *assigned* the date of 853 BCE on the *assumption* that the AEC contained all the eponyms from 910 to 612 BCE. However, by adding up the reign lengths given for the kings of Israel and Judah as recorded in the English translation of the Hebrew text, Thiele realized that the regnal year numbers given for the kings of Israel for the period of the divided kingdom, from the accession of Rehoboam of Judah and Jeroboam I of Israel until the fall of Samaria in the reigns of Hoshea of Israel and Hezekiah of Judah, were about 23 years higher for Israel than for the concurrent period of Assyrian history, and for the kings of Judah *46 years higher*, based on the dates allocated to the AEC.[10]

Thiele had a choice: either recognize that the AEC was deficient and try to reconstruct a chronology for the kings of Israel and Judah from the figures given in the Hebrew/English taking into account variants in the Greek texts, or compress the Hebrew/English data for the kings of Israel and Judah to bring them into line with the years assigned to the AEC.

He chose the latter option, even though the kings of Judah and Israel had a dual system of cross-referenced reigns, whereas the AEC was composed of one linear record of Assyrian kings whose chronology had never been corroborated in the period prior to the solar eclipse of 763 BCE. Thiele decided that the numbers were “mysterious” and proceeded on the basis that the numbers could be harmonized if certain *dating systems* were applied.

Having made this decision, Thiele overlapped the reigns of the kings of Israel and Judah by about 50 years overall to make the reigns fit the years indicated by the AEC. Thus, he dated Ahab’s 22nd and last year to 853 BCE, which was presumed to be the sixth year of Shalmaneser III, and by means of his dating systems arrived at the date of 931 for the commencement of the divided kingdom and Rehoboam’s fifth year in 925.

The excess years for the kings of Judah and Israel were explained away by the use of various dating systems. Two such systems used were antedating and postdating (also called non-accession and accession year dating). In antedating, a king’s first year is the year he comes to the throne and his first full year is his second year; in postdating, the king’s reign is dated from the beginning of the year after his accession. These dating systems give flexibility to the length of a king’s reign. Judah’s kings supposedly used postdating for the first four kings, Rehoboam to Jehoshaphat, then switched to antedating for Jehoram, Ahaziah, Queen Athaliah, and Joash, and then switched back to postdating for the remaining kings. Israel used antedating from Jeroboam I to Jehoahaz and then switched to postdating from Jehoash to Hoshea.[11]

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[9] Collated from Bull Inscription (*ARAB* 1: §§646-47; *ANET*, 279); Black Obelisk (*ARAB* 1: §563; *ANET*, 279), and Monolith Inscription (*ARAB* 1: §§610-11; *ANET*, 278-79; *HAIJ*, 258-59; J.K. Kuan, *Neo-Assyrian Historical Inscriptions and Syria-Palestine* [Jian Dao Dissertation Series 1; Hong Kong: Alliance Bible Seminary, 1995] 27-31).

[10] E.R. Thiele, *The Mysterious Numbers of the Hebrew Kings* (3rd ed., Grand Rapids, MI: Zondervan, 1983) 37.

[11] Ibid., 59-60; 215-16.

Thiele also started the calendar years six months apart in the two kingdoms; Israel starting in the month of Nisan and Judah in Tishri.[12] He also states that Judah used its (Tishri-commencing) system for recording its years and those of Israel, while Israel used its (Nisan-commencing) system for recording its years and those of Judah.[13]

However, Thiele's main resort to bring the Hebrew chronology into line with the Assyrian chronology dated to the AEC was by introducing co-regencies or overlapping reigns into both kingdoms, some of considerable length. For example, Azariah of Judah was allotted 24 co-regent years with his father Amaziah out of a total of 52.[14] Thiele also proposed that at times there were two kings ruling contemporaneously in both kingdoms; that is, four kings altogether. For instance, while Amaziah and Azariah had a 24-year co-regency in Judah, Jehoash and Jeroboam II had a 12-year co-regency in Israel.[15]

The Books of 1 and 2 Kings are silent about these dating methods. The dating method that *is* stated is that a king began to reign *in a certain year of the king of the other kingdom* and that he reigned so many years. When that king died his son or successor began to reign. For example, 1 Kgs 15:1-2 states, "In the 18th year of King Jeroboam the son of Nebat, Abijam began to reign over Judah. He reigned three (Greek variant six) years in Jerusalem." Verse 8: "And Abijam slept with his fathers, and they buried him in the city of David and Asa his son reigned in his stead." This is the only dating system given in the Books of 1 and 2 Kings. The terms postdating or antedating are never used, co-regencies are never stated,[16] nor does it state that Israel and Judah started their calendar years six months apart. Therefore, Thiele's dating systems are not exhibited in the Books of Kings.

Naturally enough, Egyptologists assume that the scholars concerned with the chronology of Israel and Judah have established the correct dates for the Hebrew kings and that they can confidently use Rehoboam's fifth year in 925 BCE as the date for Shoshenq I's 20th year. It seems that they have not investigated the textual evidence for themselves so they do not realize that Thiele's dates are based on many assumptions and not on the actual dating method indicated in the statements of accession given with the regnal years cited.

The following discussion shows that Egyptologists have accepted Thiele's dates for Rehoboam's fifth year, and that they rely on synchronisms with Assyria dated to the AEC while at the same time limiting their use of lunar and astronomical data.

Recent Publications on Egyptian Chronology

One of the most comprehensive monographs written on Egyptian history is Kenneth A. Kitchen's *The Third Intermediate Period in Egypt (1100–650 BC)*.[17] First published in 1972, it was updated with new information and republished with a supplement in 1986. A third edition was published in 1996 with an added preface. The preface was mainly a response to new material that had come to light in the intervening 10 years, and Kitchen's rejoinder to those scholars with whom he had differing points of view.

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[12] Ibid., 51-54.

[13] Ibid., 49-50.

[14] Ibid., 63, 119, 219.

[15] Ibid., 113, 118, 219.

[16] Some scholars point out that a co-regency is inferred because Jotham governed the people after his father Azariah had contracted leprosy (2 Kgs 15:5). Jotham was not king at this time, and the years for his reign do not include a co-regency with his father. See ch. 2, p. 30ff.

[17] K.A. Kitchen, *The Third Intermediate Period in Egypt (1100-650 BC)*, (Warminster, UK: Aris and Phillips, 1973, 1986, 1996).

Kitchen has written other books and numerous articles on Egyptian history and chronology, but it is *TIP* that is his monumental work. It is in recognition of this work and his phenomenal knowledge that brings his writings to the forefront in scholarly discussions on the relative and absolute chronology of Egypt.

In *TIP*, Kitchen restates the dating systems used by Thiele. He writes: "(i) that Judah initially used the accession-year custom of counting regnal years, (ii) that Israel initially used the non-accession mode of counting regnal years, (iii) that, in synchronisms, each kingdom reckoned the years of its neighbor in terms of its *own* method, not that of its neighbor, and (iv) that Judah used an autumn New Year (Tishri) and Israel a spring New Year (Nisan)."[18]

In the year after the second edition of *TIP* appeared, an international colloquium on absolute chronology was held at the University of Gothenburg in Sweden, on 20–22 August 1987.[19] Its title "High, Middle or Low?" indicated that the main discussion centered on whether Egypt should be given high or low dates—the higher dates giving a longer chronology than the lower dates.

The opinions expressed were influential in changing dates for ancient Egypt. Indications for a lower chronology had been previously suggested by John A. Brinkman in 1970 after he noted that the dates for the kings of Assyria/Babylon in the last four centuries of the second millennium could be reduced by 9–18 years. However, these dates are based on the AEC. He writes, "This Assyrian chronology is founded ultimately on the evidence of the Assyrian King-list and, for the period after 910 BCE, on the eponym lists as well. Beginning with the fixed date of 763 BCE for the famed eclipse in the eponymy of Bur-sagale, one then reckons by means of these lists to obtain dates for all the reigns of the Assyrian kings back to Enlil-naṣir II (1432–1427)."[20] However, since these dates come before 763 BCE, they have no corroboration and therefore any lowering of dates has no validation.

Morris Bierbrier sought to date the reign of Ramesses II taking as his starting point the date of the (supposed) biblical evidence that Shoshenq I became the first king of Dynasty 22 in 945–940 BCE.[21] Again, this reflects Thiele's dates. On astronomical grounds (the new moon in Ramesses II's 52nd year), Bierbrier noted that 1304, 1290, or 1279 were possible. The latter date, however, was only possible if synchronisms with Assyrian, Babylonian, and Hittite sources could be lowered. Thus it seemed that Brinkman's lowering of the Mesopotamian chronology allowed the date of 1279 for Ramesses II's accession. Based on generation counts, Bierbrier concluded that either 1290 or 1279 could be the accession date of Ramesses II.[22]

Rolf Krauss suggested in 1978 that Elephantine and not Thebes or Memphis could be the observation site of the going up of Sothis in the ninth year of Amenhotep I as noted on the Ebers calendar,[23] which would lower the accession date of Ramesses II.

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18 Kitchen, *TIP*, 74-75 §59 nn. 363-64 (emphasis his) citing *MNHK*[1] 20-23; *MNHK*[2] 23-26.

19 *High, Middle or Low? Acts of an International Colloquium on Absolute Chronology Held at the University of Gothenburg 20th–22nd August 1987* (ed. P. Åström; Gothenburg: Paul Åström's Förlag, Part 1 and 2, 1987; Part 3, 1989).

20 J.H. Brinkman, "Notes on Mesopotamian History in the Thirteenth Century BCE." *BiOr* 27 (1970) 305-6 and n. 52.

21 M.L. Bierbrier, *The Late New Kingdom in Egypt (c. 1300–664 BC) A Genealogical and Chronological Investigation* (Warminster, UK: Aris and Phillips, 1975) 111.

22 Ibid., 109-13.

23 R. Krauss, *Das Ende der Amarnazeit* (HÄB 7; Hildesheim: Gerstenberg, 1978) 189-91. See also, idem, "Sothis, Elephantine and die altägyptische Chronologie," *GM* 50 (1981) 71-72; idem, *Sothis und Monddaten. Studien zur astronomischen und technischen Chronologie Altägyptens* (HÄB 20; Hildesheim: Gerstenberg, 1985) 109-10; idem, "Egyptian Sirius/Sothic Dates and the Question of the Sirius based

It seemed to Krauss that Bierbrier's lowering of Ramesses II's accession from 1304 to 1290 or 1279, lowering also the accession date of Thutmose III to 1479, 200 years before, was justifiable on astronomical grounds. He supported Bierbrier's claim that the observation point of the rising of Sothis was Elephantine.[24] Based on his own astronomical calculations of the new moon in Ramesses II's 52nd year, Krauss concluded at Gothenburg that Ramesses' accession fell in 1290, 1279, or 1276.[25]

Most of the scholars at the Gothenburg colloquium favored the lower dates for the chronology even though some objected that because the Ebers papyrus was found at Thebes where Amenhotep resided, it was not likely that the observation point for the Sothic date was Elephantine.[26]

Wolfgang Helck thought that the Ebers Sothic date was meaningless[27] and stated that, "We are not allowed to use this date for chronological calculations."[28] The noted archaeologist, Manfred Bietak, also at the colloquium, thought that a consensus of opinion was forming for the dates of the New Kingdom and that the regnal dates and genealogical data provided a secure framework. Therefore, it was no longer necessary to depend on the Ebers Sothic date "and [it] should not be used any more."[29]

Kitchen contributed two papers to the colloquium outlining the chronology of ancient Egypt. He reiterated his position: "The 21 year reign of the founder of the 22nd Dynasty, Shoshenq I, can be set at ca. 945–924 BCE, thanks (i) to his synchronism with the detailed chronology of Judah and Israel, itself linked closely to a firm Assyrian chronology (details, Kitchen, 1986, 72–76, 544, with references), and (ii) to the series of known regnal years of his successors, which fill up the interval 924–716/712 BCE almost completely…"[30] In addition, he accepted the "low" date giving Ramesses II's accession in 1279 though he warned that a consensus was no guarantee of truth.[31]

Erik Hornung proposed that the previously held dates should be abandoned in favor of lower ones. He stated, "Egyptology has relied too much for a long time on so called absolutely fixed astronomical data."[32] Furthermore, "We have not to rely on kinglists like Manetho or the Turin Canon and we have not to rely on astronomical computation for the famous Ebers' datum or for lunar dates of the New Kingdom."[33] Also he writes, "I think it is now very clear that Ramesses II cannot have started his reign before 1279 and Thutmosis III before 1479." Further on; "So I think our chronology of the New Kingdom is fairly well established without all the problems connected with astronomical data."[34]

Lunar Calendar," *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006) 441. Hereafter *AEC* (2006).

24 Idem, *Sothis und Monddaten*, 65-66.

25 Idem, "Note on Modern Computational Errors in Astronomical Dating," *High, Middle or Low?* Part 3, 162.

26 E. Hornung, "E. Hornung's paper," *High, Middle or Low?* Part 3, 35.

27 "Discussion following W. Helck's paper," *High, Middle or Low?* Part 3, 44.

28 W. Helck, "W. Helck's paper," *High, Middle or Low?* Part 3, 41.

29 M. Bietak, "The Middle Bronze Age of the Levant – A New Approach to Relative and Absolute Chronology," *High, Middle or Low?* Part 3, 91.

30 K.A. Kitchen, "The Basics of Egyptian Chronology in Relation to the Bronze Age," *High, Middle or Low?* Part 1, 38.

31 Idem, "Supplementary Notes on 'The Basics of Egyptian Chronology'," *High, Middle or Low?* Part 3, 158.

32 Hornung, "E. Hornung's paper," *High, Middle or Low?* Part 3, 34.

33 Ibid., 34.

34 Ibid., 35.

At the close of the conference a vote was taken, and the "low" chronology was adopted. Hornung later wrote, "It is absolutely clear for Egypt that for the NK, this is the only chronology with which we can live. There [at Gothenburg], I endeavoured to avoid the astronomical problems when discussing the chronology of the NK." [35]

As a follow-on from the Gothenburg colloquium, a further conference was held in 1990 at Schloss Haindorf among scholars who again debated the Ebers calendar and its Sothic date and the chronology of the NK. The papers were published in 1992.[36] Aspects of these papers are discussed later.

The above conferences were succeeded by several symposiums on the chronology and related topics of the Eastern Mediterranean under the title *The Synchronization of Civilizations in the Eastern Mediterranean in the Second Millennium BCE*, (known as SCIEM). The first was held in Schloss Haindorf in November 1996, and another at the Austrian Academy, Vienna in May 1998.[37] These were followed by others in May 2001,[38] June 2003,[39] and June 2005.[40] Many of the papers majored on science-based subjects concerning the dating of ancient Egypt and surrounding nations. We consider these below. Kitchen contributed a paper on historical chronology in the first[41] and third SCIEM conferences.[42]

In these, Kitchen emphasized the independence of his construction from dynastic lists and astrochronology, while utilizing Near-Eastern synchronisms. For example, in the 1996 SCIEM conference (papers published in 2000), Kitchen wrote,

> His [Manetho's] work ceased to be the basis of Egyptian chronology many decades ago. From original contemporary sources, we may construct a basic Egyptian chronology dependent on no other source. The king-lists (including Manetho) contribute their mite to establishing some royal sequences and regnal years, but no longer dominate. Egyptian dates can sometimes then be refined in detail by use of synchronisms with other ancient Near-Eastern states, especially Mesopotamia from ca. 1400 BCE onwards, and occasionally (only occasionally) by use of a tiny handful of astronomical data (one definite Sothic date in the 12th Dynasty; lunar dates with this; and one lunar date each in the 18th and 19th Dynasties). Egyptian chronology overall is not based on these meagre astronomical data – these merely help to limit the options in fine detail.[43]

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35 Idem, "Introduction," *AEC* (2006) 8.

36 Published in *Ä und L* 3 (1992). Those most applicable are: J. von Beckerath, "Das Kalendarium des papyrus Ebers and die Chronologies des ägyptischen Neuen Reiches. Gegenwärtiger Stand der Frage," 23-27; W. Helck, "Zur Chronologiediskussion über das Neuen Reich," 63-68; R. Krauss, "Das Kalendarium des papyrus Ebers und seine chronologische Verwertbarkeit," 75-96; C. Leitz, "Bemerkungen zur astronomischen Chronologie," 97-102; U. Luft, "Remarks of a Philologist on Egyptian Chronology," 109-14.

37 Proceedings of both symposiums were published in *The Synchronization of Civilizations in the Eastern Mediterranean in the Second Millennium BCE: Proceedings of an International Symposium at Schloß Haindorf, 15-17 November 1996 and at the Austrian Academy, Vienna, 11-12 May 1998*, (ed. M. Bietak; Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2000).

38 *The Synchronization of Civilizations in the Eastern Mediterranean in the Second Millennium BCE II: Proceedings of the SCIEM 2000 EuroConference Haindorf, 2–7 May 2001* (ed. M. Bietak; Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2003).

39 *The Synchronization of Civilizations in the Eastern Mediterranean in the Second Millennium BCE III: Proceedings of the SCIEM 2000 –2nd EuroConference Vienna, 28 May–1 June 2003* (eds. M. Bietak and E. Czerny; Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 2007).

40 *SCIEM 2000 Workshop on Precision and Accuracy of the Egyptian Historical Chronology, Vienna, 30 June–2 July 2005.* Proceedings published in *Ä und L* 16 (2006).

41 K.A. Kitchen, "Regnal and Genealogical Data of Ancient Egypt (Absolute Chronology I): The Historical Chronology of Ancient Egypt, a Current Assessment," *SCIEM II* (2000) 39-52.

42 Idem, "Egyptian and Related Chronologies – Look, no Sciences, no Pots!" *SCIEM II* (2007) 163-71.

43 Idem, "Regnal and Genealogical Data," 39.

There are far more astronomical data than Kitchen allows for, which can been seen by the lunar tables in this book. Concerning the Sothic-rising date of the Ebers papyrus, Kitchen says in the same paper, “Most opinion now disallows this document as real evidence of the record of a specific rising of Sothis.”[44]

Following these assertions, Kitchen assigns 125 years to the 21st Dynasty, which is not far from the 130 years that Manetho’s list gives.[45] Then he writes, “The Ramesside 20th Dynasty (and the New Kingdom) ended beyond any serious doubt, in or about 1070 BCE. *None* of the above relies on Manetho by himself, or on astronomy, or on foreign synchronisms except to confirm positions *already* arrived at by dead-reckoning; the overall dates are limited biologically by genealogical data.”[46]

It should be understood that dead-reckoning provides the most *minimal* chronology possible, since it gives only the highest *known* regnal year for each king, not necessarily the final year. No-one can tell how many *unknown* years might have been reigned by various kings unless further information is available; therefore, dead-reckoning is only useful to give a base-line number of years. Appeal to the length of a period by generations known to have lived during the time is highly subjective depending on how short or long one wishes to assign to a generation, and is therefore of limited value—as Kitchen himself expounded in a paper written for the SCIEM 2005 conference.[47]

One of the reasons why astronomy was not helpful in securing chronological dates is explained by Krauss at the SCIEM conference held in 2001 (papers published in 2003). He writes:

> Egyptologists have traditionally calculated the Illahun Sothic date first and then related the lunar dates to it. But because of uncertainties surrounding the interpretation of Sothic dates in general, a better approach establishes a possible time span on the basis of minimal chronology and seeks to correlate the lunar dates to it.[48]

Illahun Sothic Date

The Illahun Sothic date referred to dates to the seventh year of Sesostris III of the 12th Dynasty. Difficulties in obtaining a date for this has led Krauss to abandon Sothic dating in general and concentrate on dead-reckoning and then applying lunar dates to fix the reign within a period of 25 years. This implies that he does not look higher than the minimal chronology allows. Since Sothic dates and lunar dates that fall in a closely defined period in the Egyptian calendar (as they do for Sesostris III of the 12th Dynasty and Thutmose III of the 18th Dynasty) they must also fall in the same respective time frame in the Julian calendar.

The *lack* of a given Sothic date to act as a control for a given *lunar* date means that there can be no assurance that the correct Julian calendar years have been established for the lunar date. At the same conference in 2001, Ulrich Luft contributed a paper entitled “Priorities in Absolute Chronology.” He states:

> The aim of the research at SCIEM 2000 is to get data for the chronology of the 2nd millennium BCE that are fixed to a defined year and leave no possibility for shifting some years backwards or forwards in the frame of the Julian calendar.[49]

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[44] Ibid., 44. Kitchen refers to J. von Beckerath, “Das kalendarium des Papyrus Ebers und die Chronologie des ägyptischen Neuen reiches. Gegenwärtiger Stand der Frage,” *Ä und L* 3, (1992) 23-27.

[45] Ibid., 41.

[46] Ibid. Kitchen’s emphases.

[47] Idem, “The Strengths and Weaknesses of Egyptian Chronology – A Reconsideration,” *Ä und L* 16 (2006) 299.

[48] Krauss, “Arguments in Favor,” 197.

[49] U. Luft, “Priorities in Absolute Chronology,” *SCIEM II* (2003) 199.

The aim was not realized because there was no resolution about how the calendar of the Ebers papyrus with its Sothic date for Amenhotep I's ninth year should be understood, though Luft proposed that the Ebers calendar was "evidence for the failure to establish the regnal year." Nor was it determined what calendars Egyptians used.[50]

For the SCIEM II conference held in 2003, Kitchen writes:

> During last century highly ingenious "scientific" procedures have been developed to try to overcome the problem of fixing absolute dates, especially when explicit written records are lacking, including use of astronomy, radio-carbon, tree-rings, ice-cores and so on. However, each of these is subject to various flaws that prevent attainment of absolutely reliable results so far.[51]

Kitchen continues to date by dead-reckoning and Near East synchronisms. Krauss's SCIEM II paper published in 2007 brings together various lunar dates from Dynasties 18 to 25. However, he prejudices the outcome of using them for a chronology by again establishing lunar dates "without reference to traditional Sirius dates."[52]

In a SCIEM "Egypt & Time Workshop" held in 2005, Kitchen presented a paper in absentia, discussing the strengths and weaknesses of Egyptian chronology. He proposed two options for the 22nd and 23rd Dynasties to take into account new findings that lengthened the dynasties by a number of years.[53] Malcolm Wiener presented a paper on the reliability of the Egyptian historical chronology and scientific studies, and stated:

> Kitchen's paper … addressed many contentious chronological issues within the T.I.P. and presented his current position with respect to the whole of Egyptian historical chronology, relying largely on texts and 'dead reckoning', of reigns. The dates proposed have received widespread general acceptance.[54]

At the same workshop, Gerard Broekman also presented a paper in absentia,[55] outlining an ongoing contention between Kitchen and David Aston on the place of Takeloth II, either in the 22nd Dynasty where Manetho places him as argued by Kitchen, or in a hypothetical 23rd *Theban* Dynasty, which Aston had proposed in 1989.[56] Kitchen had hotly defended his position in *TIP* in 1996.[57] The initial date for the 22nd Dynasty still remains at 945 in both chronologies.[58]

A recent comprehensive discussion on the historical chronology of ancient Egypt is found in *Ancient Egyptian Chronology* edited by Erik Hornung, Rolf Krauss, and David A. Warburton, published in 2006.[59] It majors on relative and absolute chronology compiled from the contributions of many experts in their fields, including chapters on lunar dates and the heliacal rising of Sothis.

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50 Ibid., 203.

51 Kitchen, "Egyptian and Related Chronologies," 163.

52 R. Krauss, "An Egyptian Chronology for Dynasties XIII to XXV," *SCIEM II* (2007) 173.

53 Kitchen, "Strengths and Weaknesses," 293-308.

54 Wiener, "Egypt and Time," 325.

55 G.P.F. Broekman, "Once Again the Reign of Takeloth II; Another View on the Chronology of the Mid 22nd Dynasty," *Ä und L* 16 (2006) 245-56.

56 D.A. Aston, "Takeloth II – A King of the 'Theban Twenty-Third Dynasty'?" *JEA* 75 (1989) 139-53.

57 Kitchen, *TIP*, xxiii-xxiv.

58 Broekman, "Once Again the Reign of Takeloth II," table 1, p. 246.

59 *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D. A. Warburton; Leiden and Boston: Brill, 2006). This volume is part of a series entitled Handbook of Oriental Studies 83; Section One: The Near and Middle East.

Erik Hornung, nearly 20 years after the conference on "High, Middle, or Low?", wrote in 2006:

> Already at Gothenburg, there was general agreement about the dates for beginnings of the New Kingdom. Helk, Kitchen and Hornung/Krauss all worked with the very narrow range of 1540 to 1530 for the start of the reign of Ahmose, and after some debate, there is now general acceptance for the reign of Ramesses II at 1279–1213 BCE. Although we must be wary of confusing consensus with actual fact, for the New Kingdom we now have such a fine mesh of relative dates which are themselves woven into NE dates that major adjustments can probably be excluded. While there is room for minor cosmetic corrections, we are relatively confident about the framework.[60]

Referring to the TIP (Dynasties 21–24), which followed the New Kingdom, Karl Jansen-Winkeln noted in this same book:

> We lack a continuous series … of dates for any given sovereign, and thus by no means can we confidently suggest that the highest known date for any reign reflects its actual length. Given this paucity of dates, the chronology of this era is imprecise and uncertain in many respects.[61]

He concluded his chapter on the TIP by asserting:

> The date of the campaign of Shoshenq I, presumably towards the end of his reign, can be placed with the aid of Near Eastern chronology in 925/926. Between these two [the date of 690 at the end] there is not one single firm date, but the sequence of kings and the highest known dates for these kings does not leave significant gaps. The general framework of this age is certain.[62]

A significant publication in 2009 covering the same 21st to 24th Dynasties, designated the Libyan Period (that is, the TIP), was compiled from contributors at a special conference at Leiden, in the Netherlands, held in 2007.[63] Papers from this conference are wide-ranging but focus mainly on historical developments—the chief of these being the chronological issues.[64] Kitchen contributed a comprehensive paper detailing the state of the debate on Egyptian chronology, which had become quite heated in some areas of scholarly disagreement.[65] One of the most controversial topics continues to be whether Takeloth II was a king of the 22nd Dynasty or a hitherto unknown 23rd Theban Dynasty. (Kitchen favored the first view; Aston, Broekman, and Jansen-Winkeln favored the second view.)[66] This debate is ongoing. Nevertheless, the chronology still retains Shoshenq I's accession in 945.[67]

Certain conclusions may be drawn from the above comments. Foremost is the observation that historical chronology is based on "dead-reckoning" of regnal years and synchronisms with the ancient Near East. The latter derive from the dates assigned to the AEC. On this framework, Shoshenq I's accession and the beginning of the 22nd Dynasty

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60 E. Hornung, "Introduction," *AEC* (2006) 13.

61 K. Jansen-Winkeln, "The Chronology of the Third Intermediate Period: Dyns. 22-24," *AEC* (2006) 235.

62 Ibid., 264.

63 *The Libyan Period in Egypt: Historical and Cultural Studies into the 21st-24th Dynasties: Proceedings of a Conference at Leiden University, 25-27 October 2007* (eds. G.P.F. Broekman, R.J. Demarée, and O.E. Kaper; Leiden: NINO, 2009).

64 "Introduction," *Libyan Period*, vii.

65 Kitchen, "The Third Intermediate Period in Egypt: An Overview of Fact and Fiction," *Libyan Period*, 161-202.

66 "Introduction," *Libyan Period*, viii-ix; Kitchen, "Third Intermediate Period," 161-202. These topics will be discussed later in context.

67 Kitchen, "The Third Intermediate Period," 202.

are dated to 945 BCE and lunar dates are used to define the accession of Ramesses II in 1279, and Thutmose III in 1479. The Sothic rising date on the Ebers calendar for Amenhotep I's ninth year is not factored into these dates.

Scientists' Views on Egyptian Chronology

Having touched on the historical chronology, I turn now to what scientists are saying about their dates for the Egyptian chronology. A publication of 2004 entitled *Tools for Constructing Chronologies* is also devoted to eliciting the chronology of the ancient Near East. Chapter 4 summarizes results of the SCIEM 2000 Project.[68] Cichoki et al. state:

> Unfortunately, this new, very early date (17th century BCE) seemed to make the sequences drift apart. It appears to be quite impossible to squeeze an additional 150 years out of the traditional sequence of time based on the regencies of Egyptian kings. Scholars who were used to chronological discrepancies of 20 to 30 years suddenly saw themselves confronted with a completely new, utterly irritating situation.[69]

According to Bietak and Höflmayer in their introduction to the SCIEM conference held in 2003 (proceedings published in 2007) the latest scientific studies indicate that the beginning of the 18th Dynasty should be raised by about 100–150 years to the middle-to-second-half of the 17th century BCE (1650–1600) above the dates currently being advocated for it on the basis of historical chronology, ca. 1500 BCE.[70] Thus there is a real conflict between the dates given to historical chronology and radiocarbon dating. They write,

> It would not make sense to try to remedy this situation by unilaterally raising the Aegean chronology by 100 to 150 years, claiming that a new proportion of the relationship between Egypt and the Aegean has been found. The previous generation of scholars who have established the historical chronology by comparative methods of prehistoric archaeology were certainly no fools and have done their best to establish a timeframe based on exports and imports, with all the difficulties such as time lags and heirloom effects involved.[71]

The conclusion of Bietak and Höflmayer is that "either the radiocarbon chronology or the historic chronology is wrong, or both have a defect."[72]

Thera Eruption

The Thera eruption is central to the dating of the early 18th Dynasty. Manfred Bietak stated at the May 2001 SCIEM II conference, "Theran pumice suddenly appears in large quantities at the 18th Dynasty levels from stratum C/2 onwards to be dated to the Tuthmoside period. At the Hyksos and early 18th Dynasty levels pumice is very rare and does not originate from Thera."[73] Malcolm Wiener at the 2003 conference noted that Theran pumice was found in large quantities in the workshops of Thutmose III or his

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[68] Otto Cichoki, Max Bichler, Gertrude Firneis, Walter Kutschera, Wolfgang Müller, and Peter Stadler, "The Synchronization of Civilizations in the Eastern Mediterranean in the Second Millennium BC: Natural Science Dating Attempts," *Tools for Constructing Chronologies: Crossing Disciplinary Boundaries* (eds. C.E. Buck and A.R. Millard; London: Springer, 2004) 83-110.

[69] Cichoki et al., "Synchronization of Civilizations," 84.

[70] Bietak and Höflmayer, "Introduction: High and Low Chronology," *SCIEM II* (2007) 16; see also Wiener, "Egypt and Time," 331.

[71] Ibid., 16.

[72] Ibid., 19.

[73] M. Bietak, "Science versus Archaeology: Problems and Consequences of High Aegean Chronology," *SCIEM II* (2003) 28.

successor Amenhotep II and were abandoned "in any event after ca. 1450 BCE."[74] He notes though, that in "Workshop N in area H/I, the pumice may appear as early as the reign of Tuthmosis I, around 1500 BCE." The latest date for the eruption, being for him ca. 1525 would separate the abandonment of the workshops by two to three generations, and if the eruption was ca. 1600 it would mean five to six generations.[75] Thus it seems impossible for Wiener to date the Thera eruption to the 17th century.

Bietak concluded, "All the evidence strongly suggests that this event [the eruption of Thera] happened sometime in the early 18th Dynasty most probably before the reign of Tuthmosis III."[76] But he also states: "The network of Egyptian chronology and its synchronism with Near Eastern, particularly Assyrian chronology makes this, at least for the time being, somewhat difficult to accept."[77]

Radiocarbon-dating of Seeds

Wiener also commented on a challenge to the standard chronology in noting that radiocarbon dates of seeds collected at Tell el-Dab^c^a in the C/2 stratum for the post-Hatshepsut Thutmose III period "gave central dates of 1620, and earlier, far too early on textual, archaeological and astronomical grounds."[78] Also, he writes, that the dates for the New Kingdom "cannot move very much from those stated above … because of the correlations with the chronology of the ancient Near East fixed via the correspondence of Amenophis III and Akhenaten with Near Eastern rulers whose dates are known to within about a decade."[79]

Consequently, Wiener concludes that the ca. 1620 date for the post Hapshepsut Thutmoside levels cannot be correct, and proceeds to discuss possible reasons why the radiocarbon dating might have been affected to give high dates. He does not come to any definitive conclusion.[80] He awaits "future developments".[81]

Ice-core Samples and Dendrochronology

Another line of scientific research concerned ice-core samples taken from Greenland containing rough-textured volcanic glass particles (pumice), such as that found in the workshops of Thutmose III and Amenhotep II. The samples yielded the date of ca. 1645 ± 4 BCE based on the counting of the laminations (done repeatedly) and their chemical analysis.[82] Some scholars declared that the glass particles came from the Thera eruption;[83] others argued that the chemical composition of the ice particles was so close to those obtained from the Aniakchak eruption in the Aleutian Chain near Alaska that they were more likely to come from that area.[84] Because the origin of the pumice

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[74] M.H. Wiener, "Times Change: The Current State of the Debate in Old World Chronology," *SCIEM II* (2007) 40, citing M. Bietak, "Towards a Chronology of Bichrome Ware? Some Material from ^c^Ezbet Helmi and," *The Chronology of Base-ring Ware and Bichrome Wheelmade Ware* (ed. P. Åström; Stockholm: The Royal Academy of Letters, History and Antiquities, 2001) 175-201.

[75] Ibid., 40.

[76] Bietak, "Science versus Archaeology," 30.

[77] Ibid., 30.

[78] Wiener, "Egypt and Time," 326.

[79] Ibid., 326, 331; similarly idem, "Times Change," 26.

[80] Ibid., 331-36.

[81] Ibid., 336.

[82] Idem, "Times Change," 27.

[83] C.U. Hammer, G. Kurat, P. Hoppe, W. Grum, and H. Clausen, "Thera Eruption Date 1645 BC Confirmed by New Ice Core Data?" *SCIEM II* (2003) 87-94.

[84] Wiener, "Times Change," 27 citing N.J.G. Pearce, et al., "Identification of Aniakchak (Alaska) Tephra in Greenland Ice Core Challenges the 1645 BC Date for Minoan Eruption of Santorini," *Geochemistry,*

particles in the ice-cores has been contested, they have not yet been able to confirm the years of the Thera eruption nor the 18th Dynasty.

Another area of investigation concerns dendrochronology or the dating of tree rings. Concerning a 1503-year tree-ring sequence involving trees from Gordion, the capital of Phyrgia, Sturt Manning commented that:

> A remarkable growth anomaly occurs over a few years in this Aegean dendrochronology starting in ring 854 (in 61 constituent trees as of early 2004). It has been suggested that this anomaly could be consistent with the impact of a massive low-mid latitude northern hemisphere volcanic eruption, and in particular Thera (Santorini). However, there is at present absolutely no positive evidence that connects the two events.[85]

Tree ring 854 is dated ca. 1653–1650 in a sequence based on "many high-precision radiocarbon dates on specific decadal blocks of wood."[86] Manning asserts, "This dendrochronology is a fact and its dating is very near absolute."[87] He recognizes the possibility that there could be "a temporal overlap with the large volcanic signal in the Dye 3/GRIP ice-core ca. 1645 BCE – however this is not certain … and, moreover, this volcanic signal seems not to be related to Thera on current evidence."[88]

Wiener makes the following statement concerning pottery evidence for the eruption of Thera: "The earliest certain appearance of W[hite] S[lip] I pottery in Egypt and the Near East comes in the Tuthmoside era, not long before ca. 1500 BCE with the possible exception of WS I sherds found at Tell el^c^Ajjul whose context, while uncertain, makes them potential candidates for an earlier arrival."[89] Bietak notes that at Thera, the white slip I (WS I) ware comes from a pre-eruption layer, and a WS I bowl in Egypt from Tell el-Dab^c^a is not seen there before the 18th Dynasty.[90] He dates WS I's earliest appearance with the reign of Thutmose I onwards.[91] In an effort to make the pottery dates meet conventional chronology, Wiener poses four extenuating circumstances then concludes, "The date of the eruption would still move no earlier than 1550 BCE."[92] He concludes, "A delay of 100 or more years between the time a WS I bowl reaches Thera and the time the ware reaches the Near East and Egypt appears unlikely."[93]

Problems Remain

The above discussion illustrates problems with the dating of the beginning of the 18th Dynasty. Radiocarbon dates give a high chronology in the 17th century, and historical chronology based on dead-reckoning of known regnal years, results in a low chronology. While the scientists are re-examining their scientific results, others still cling to the dates derived for the historical chronology based on Thiele's dates for

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Geophysics, Geosystems 5:3, (2004); Pearce, et al., "Reinterpretation of Greenland Ice-Core Data Recognises the Presence of the Late Holocene Aniakchak Tephra (Alaska), not the Minoan Tephra (Santorini), at 1645 BC," *SCIEM II* (2007) 139-47.

[85] S.W. Manning, "Clarifying the 'High' v. 'Low' Aegean/Cypriot Chronology for the Mid Second Millennium BC: Assessing the Evidence, Interpretative Frameworks, and Current State of the Debate," *SCIEM II* (2007) 103.

[86] Ibid., 103.

[87] Ibid.

[88] Ibid., 103-4; See also S. W. Manning, B. Kromer, P. I. Kuniholm, M. W. Newton, "Anatolian Tree Rings and a New Chronology for the East Mediterranean Bronze-Iron Ages," *Science* 294, Issue 5551 (2001) 2532-35; Wiener, "Times Change," 28-29.

[89] Wiener, "Times Change," 39. Tell el^c^Ajjul is in Canaan.

[90] Bietak, "Science versus Archaeology," 23-25.

[91] Ibid., 23-25 and see discussion to p. 28.

[92] Wiener, "Times Change," 39.

[93] Ibid., 39-40.

Rehoboam's fifth year in 925 BCE. They cite the lower dates as being compatible with the ancient Near East while not being able to close the gap between them and the science-based dates. The fallacies of Thiele's chronology have already been suggested and will be demonstrated further in the next chapter. Results from the Gothenburg colloquium demonstrated that Egyptologists were disinclined to use resources that were unhelpful in confirming their dates, such as Manetho's dynastic lists, Sothic dates (especially that of the Ebers calendar), and only applied lunar dates to fit their already dead-reckoned dates.

What is needed is a new historical chronology, one that takes into account all the available resources including the results of science-based studies. An historical chronology that accommodates the raising of the 18th Dynasty by 100–150 years is presented in these chapters.

For example, in my chronology, Thutmose I began to reign in 1630 BCE, which would place the Theran eruption before the Thutmosides at about the same time as the date attributed to the ice-core samples from Greenland of about 1645 ± 4 years. (That does not prove the ice shards came from Thera).

Regarding the carbon dating of seeds, the central date of 1620 for post-Hatshepsut and Thutmose III is a little too early compared with my dates for Hatshepsut beginning to reign in 1604 (as Thutmose III's guardian, and regent) and Thutmose III's accession in 1590. But the *earlier* dates for the seeds would accord with the reigns of Thutmose I (my dates 1630–1622) or Thutmose II (my dates 1622–1604), *or even before*, and would be consistent with the Theran pumice and Greenland ice-core dates.

Furthermore, the appearance of the WS I pottery comes at the appropriate time, after the accession of Thutmose I being an update of between 100 and 150 years from the commonly assumed chronology.

Sturt Manning gives a pertinent comment with respect to the chronology of the middle second millennium and the date of the Thera eruption—an observation that is applicable to all areas of research. He writes:

> Various authors begin any study with a largely pre-determined position. They believe some set of views or set of data are effectively right or paramount and everything else is then analysed accordingly – thus alternative evidence receives intense critical comment and or dismissal (even is ignored), while confirmatory evidence or scholarship is simply stated and or praised with little critical consideration or self-reflection…. The outcome of such pre-conceived positions and assumptions, the resultant selective filtering of information, and the not unimportant role of the academic ego, is that only small and incremental changes and revisions are made to the "right" basic position. Radical revision is avoided where possible, and the approximate status quo is maintained almost on principle.[94]

A new chronology for ancient Egypt cannot be proposed by merely making a few slight changes here and there. It starts by dispensing with Thiele's dates and dating methods for Israel and Judah and Rehoboam's fifth year in 925. A "new" but old chronology for Israel and Judah comes from analyzing the textual history and chronological data found in the early Greek recensions of the Books of 1 and 2 Kings complemented by comparison with the late Hebrew Masoretic Text. When the relative chronology is established, Julian calendar dates can be applied to give the dates of the absolute chronology. A new starting date for the divided kingdom and Rehoboam's fifth year emerges—a date 52 years earlier than currently assumed. This goes a long way in closing the gap between the science-based dates and those of current Egyptian historical chronology. Then other chapters will show how the gap is closed even further. Finally, a

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[94] Manning, "Clarifying the 'High' v. 'Low'," 101-2.

reconstruction of Dynasties 1–25, validated by modern astronomical analysis of numerous references in the archaeological record, will provide a full and credible chronology of the kings of Egypt.

Finally, a warning is apposite. Egyptology is a gigantic field of research. The study of its chronology is huge in itself, so there exists the tendency to specialize on the chronology of particular periods or artifacts. But turning to selected chapters of interest without following the consecutive argument herein will leave the researcher exposed. The argument is consecutive, and the omission of any chapter may lead the reader to miss vital information.

Failure to grasp how the astronomical tables work will vitiate a large portion of vital evidence. Dismissing the 20th century wrangle over "feasts held out their eponymous months" will ensure that the evidence for the eventual solution in chapter 10 is utterly missed. The three chapters about Sesostris III and Illahun are pivotal to establish the key earliest fixed date in Egyptian chronology in Chapter 14, of Neferefre in 1750 BCE.

The dates of dynasties before and after 1750 BCE, while contentious in the current Egyptological community, can only be responsibly challenged if the anchor links in the chain of evidence presented are conclusively disproven. Isolated disagreements from prior presuppositions will carry little weight unless this author's methodology, supported by astronomical evidence and its consecutive application herein, are conclusively disproven. Ultimately that chain of evidence leads to 977 BCE as the meeting point between Shoshenq I in his 20th year and Rehoboam of Judah in his 5th year.

Picking up this work will involve the reader in an adventure of discovery, even if every step will require careful consideration to assure validation and dependability along the way. That does not mean this author has all the answers. By no means. But where assumptions must be made and uncertainties admitted, they too are openly stated, given due consideration, and the passage to the next anchor point undertaken with extra caution.

Volume One

Chapter 2

Fixing the Chronology for Israel, Judah, and Egypt

While Egyptologists may not have undertaken a study of the Hebrew chronology, I hope the reader's perusal of the following discussion will prompt doubt that Edwin Thiele produced a credible chronology for the kings of Israel and Judah. This chapter challenges the common assumption that the synchronism of Rehoboam's 5th year with Shoshenq I's 20th year is properly fixed at 925 BCE. No chronology of Egypt based upon that date is supportable, nor can it find agreement with the scientific, astronomical, inscriptional, and other archaeological evidence. My earlier book, *The Reconstructed Chronology of the Divided Kingdom*, showed that it was also inconsistent with the textual reconstruction of biblical evidence. The critical date by which the chronologies of Israel/Judah and Egypt should be fixed is 977 BCE.

This chapter recapitulates the content of *The Reconstructed Chronology of the Divided Kingdom* which establishes within the chronology of Judah and Israel that Rehoboam's fifth year was 977 BCE. It involves working with Old Testament textual origins, and the complexity of the chronology and synchronisms of the Books of 1 and 2 Kings, which were designed around a structure of kingly reigns in Judah and Israel intending originally to display their synchronicity. The subsequent discrepancies arising from copyist errors through many generations, and differences in chronological details between early and later copies or translations of the original records, leads to a highly complex analysis that is thoroughly worth the effort, and arrives at 977 BCE as the date for Rehoboam's fifth year. The detail of that venture is documented in this chapter, and will be rewarding to those who pursue it, though it occurs in brief summary form.

For other readers, the complexity of this pursuit may not be of interest, especially because this book is about the chronology of the Egyptian kings. It establishes the chronology of the Egyptian kings on completely different grounds than biblical records, though the encounter between Shoshenq I of Egypt in his 20th year and Rehoboam of Judah in his 5th year has traditionally been a confirmatory link for connecting Egyptian chronology with the history of the Ancient Near East.

Yet it is not a link upon which reconstructing the chronology of the Egyptian kings relies, so that those who choose not to engage in the intricacies of the historical chronology of Israel and Judah can pass over this chapter at will.

Another Chronology for Israel and Judah

A doctoral thesis written in 1964 by James Donald Shenkel, entitled *Chronology and Recensional Development in the Greek Text of Kings* published in 1968 under the same title,[1] urged that a new chronology for Israel and Judah be sought in the early Greek manuscripts that pre-date the earliest extant Hebrew manuscripts of the biblical Books of 1 and 2 Kings.

[1] J.D. Shenkel, *Chronology and Recensional Development in the Greek Text of Kings* (Harvard Semitic Monographs Vol. 1; Cambridge, MA: Harvard University Press, 1968).

Shenkel wrote, “In the history of biblical scholarship innumerable attempts have been made to comprehend the chronological data in the Books of Kings and to reconstruct a coherent chronology. But only those studies that have given serious attention to the data of the Greek texts can pretend to be adequate.” [2] And further on, “It is hoped that a better understanding of the recensional development of the Greek text will provide a new perspective for conducting research into the chronology of the Books of Kings.”[3]

Thackeray’s Advocacy of the Greek Text

Shenkel built on previous observations of other scholars, and in particular those of the noted biblical scholar H. St. J. Thackeray, who, in 1907, called scholars’ attention to textual evidence showing different divisions in the Greek text of 1 and 2 Samuel and the Books of 1 and 2 Kings (known in the Greek as 1–4 Reigns) from those shown in the Hebrew text.[4] These divisions showed early and late Greek texts. In Thackeray’s opinion, the early text went back to the second century BCE, while the later text was not earlier than 100 CE.[5] “Early” and “late” refer not to particular texts, but large families of textual witnesses with particular characteristics. The “early” period includes the LXX and Lucianic (L) texts, and “late” period includes the *Kaige* recension (KR) some three centuries later.

In 1920, Thackeray discussed the divisions in the Books of Reigns again and illustrated how the uniform translation of various words indicated either early or late text—consistent with the divisions.[6] Thackeray was one of three editors who compiled *The Old Testament in Greek*, including the Books of 1 and 2 Kings.[7] The text used was the oldest and most complete Greek text of the Old and New Testaments—the Codex Vaticanus—dating to the 4th century CE. Beneath its text is an extensive apparatus giving all the variants from the different Greek manuscripts available.

Significant among these are the chronological data found in a family of manuscripts known as Lucianic (L), which mostly exhibit the same numbers as those of the early Greek text, but when they differ, the variants are supplied in the apparatus.[8] They are known under the sigla b′ + *b* = b, o, e_2, and c_2 and date from the 10th to 14th centuries CE.

Shenkel’s analysis of the Greek texts’ recensional history and data led him to state: “The aim of the present enquiry is not to reconstruct a harmonious biblical chronology … but to demonstrate the relationship of divergent chronological data to different stages in the development of the textual tradition.”[9]

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[2] Ibid., 3-4.

[3] Ibid., 4.

[4] H. St. J. Thackeray, “The Greek Translators of the Four Books of Kings,” *JTS* 8 (1907) 262-78.

[5] Ibid., 277.

[6] Idem, *The Septuagint and Jewish Worship: A Study in Origins* (The Schweich Lectures; London: The British Academy of the Oxford University Press, 1920) 16-28. See also Shenkel, *Recensional Development*, 19 and n. 30.

[7] The Old Testament in Greek According to the Text of Codex Vaticanus, Supplemented from other Uncial Manuscripts, with a Critical Apparatus Containing the Variants of the Chief Ancient Authorities for the Text of the Septuagint. Vol. 2: The Later Historical Books; Part 2: I and II Kings (eds. A.E. Brooke, N. McLean, and H. St. J. Thackeray; Cambridge: Cambridge University Press, 1930).

[8] The Lucianic manuscripts are named after their purported redactor, Lucian of Antioch who lived ca. 240-311/12 CE. However, Josephus (writing at the end of the 1st Century CE), used a “Lucianic” text from the 1st century BCE in his history of the Jews, *Antiquities*, so the “Lucianic” text actually pre-dates Lucian, and may refer to Lucian’s source texts. Lucianic textual sources are indicated by L.

[9] Shenkel, Chronology and Recensional Development, 26.

Variant Text Types: Early and Later Greek Texts

The early Greek Text is commonly known as the Septuagint (LXX) due to the tradition that it was a translation of the Hebrew texts of the day by 70 (or 72) scholars in Alexandria in the second century BCE. Stanley Porter explains its origin.

> Almost assuredly the translation of the Hebrew Bible into Greek was occasioned by the fact that the vast majority of Jews—certainly those outside Palestine, and especially in Egypt where there was a significant number of Jews—did not have linguistic access to their Scriptures in Hebrew and required a Greek version."[10]

The Septuagint was "the Bible" of the early Christians, quoted in the New Testament, and the Scriptures used during the expansion of Christianity around the Mediterranean world of both Jews and Gentiles. As Julio Trebolle Barrera says, after surveying the multiplicity of Greek texts in the first century CE, "The fact that the Christians made the LXX translation their own, and had used it in disputes with the Jews led to an increasing rejection of that version by the Jews, who ended by replacing it with new translations, more faithful to the rabbinic Hebrew."[11] The KR was produced by the Pharisees in the first century, so named after the translational feature of the Greek word *kaige* (also, moreover) used for the Hebrew particle *gam*.

> The various communities of the Jewish diaspora knew the Greek Bible in collections which certainly differed greatly from each other. The number of books in a collection could be greater or smaller and the text of each book could be the original of a version or a revised form agreeing with the most up-to-date Hebrew text. The Christian communities accepted this pluralism of books and texts of the Greek version. They even contributed to making the Greek text increasingly different, so that it needed Origen to try to introduce some logic into the transmission of the Greek text of the Bible.[12]

Clearly, the Masoretic Text (MT) should not be assumed as the prevailing text during first century times, though this text, preserved by the Masorites, is commonly translated into our English versions.[13] The variety of texts is confirmed by the Dead Sea Scrolls. Trebolle Barrera says,

> The most important information provided by the biblical manuscripts from Qumran is that, undoubtedly, the fact that in some books of the LXX version reflects a different Hebrew text from the one known in later masoretic tradition."[14]

In line with Thackeray's analysis of the divisions in the Books of Kings it is important to note that the fourth century CE Codex Vaticanus—thought to be the oldest and most complete copy of the Greek Bible in existence—does not represent the same text type throughout 1 and 2 Kings. It appears that the Codex had been copied from various scrolls. One scroll began at 1 Kgs 2:12 and finished at the end of what is now chapter 20:43, but 21:43 in the MT.[15] The section representing this scroll contains the chronological data of the *early* Greek text (OG/LXX). A new scroll apparently started with Chapter 22 and exhibits a *later* Greek text of KR, which continues through to the

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[10] S. Porter, "Septuagint/Greek Old Testament," *Dictionary of New Testament Background* (eds. C.A. Evans and S.E. Porter; Leicester, Eng. and Downers Grove, IL: InterVarsity Press, 2000) 1099-1105 citing M. Müller, *The First Bible of the Church: A Plea for the Septuagint* (JSOT Supplement 206; Sheffield: Sheffield Academic Press, 1996) 38-39.

[11] J. Trebolle Barrera, *The Jewish Bible and the Christian Bible* (trans. W.G.E. Watson; Leiden: Brill, 1998), 312.

[12] Ibid., 302.

[13] Earlier manuscripts were destroyed after they had been copied.

[14] Ibid., 320 (Trebolle Barrera's emphasis).

[15] In the Greek text chapter 21 precedes chapter 20, but in the Hebrew text chapter 21 follows chapter 20.

end of 2 Kings.[16] As a result Codex Vaticanus contains two text types with their different chronological data, which is significant for understanding the chronology of the kings and the order in which their reigns were recorded.

The L text is present throughout 1 and 2 Kings but some of their chronological data, also found in the old Greek (OG), have been made to conform to that of the *kaige*/MT version, especially in 2 Kings. These late alterations are attributed to Origen's recension known as the Hexapla (a six-columned work) completed in 245 CE.[17] A few of the revised numbers were entered into the Codex Vaticanus, and replaced original data during the copying in the 4th century CE, and were later also entered into the L texts.

The disparity between the chronological data within the MT, let alone between the OG/L and KR/MT appears to be so inexplicable that it has been said that there is no problem more complicated in the Old Testament than that of its chronology.[18]

Construction of the Original Books of Kings

Originally 1 and 2 Kings was compiled as a historical narrative of the post-Davidic reign of Solomon and the subsequent twin kingdoms of Judah and Israel. The significant movements of spiritual history are woven into a record of the kings who assumed the throne, their lengths of reign, and details of their death—in a manner that is cross-referenced between the twin kingdoms by an intentional system of synchronisms. The accession synchronisms imply that they were originally cogent and coherent, and historically consecutive. Within the historical and prosaic nature of the narrative it seems untenable that the numbers in the text were intended to be mysterious and confusing.

A king's *regnal* years commence at the death of the king's predecessor and are all complete years except for the last year, which is a partial year. Following the textual form, the regnal years are given as rounded numbers. The final year is counted as a full year if the king reigned a substantial part (say at least six months), but if a lesser portion, it is not counted. The length of the final year has to be determined by the synchronisms. If the length is too long or too short, a later synchronism will fall out of alignment. Synchronisms provide a check on accuracy.

Variant Numbers

Nevertheless, in the passage of time and the process of repeated copying, the accuracy of numbers was affected to the extent that subsequent copies or versions contained numbers that are clearly discrepant. This is not unique to 1 and 2 Kings. Writing about a record of names and numbers in Ezra 2:2b-35, Derek Kidner observes,

> A comparison of this list with Nehemiah's copy of it (Ne. 7:7bff.) reveals a startling contrast between the transmission of names and that of numbers—for the names in the two lists show only the slightest variations whereas half the numbers disagree, and do so apparently at random. The fact that two kinds of material in the one document have fared so differently lends the weight of virtually a controlled experiment to the many other indications in the Old Testament that numbers were the bane of copyists. Here the changes have all the marks of accident. Now one list and then the other will give the larger figure ..."[19]

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[16] A recension refers to a revision of the text being copied, not to a new translation. In the example of the *kaige* recension it was revised toward conformity with a proto-Masoretic text type (Shenkel, *Chronology and Recensional Development*, 20).

[17] Trebolle Barrera, *The Jewish Bible*, 311-12.

[18] T.R. Hobbs, *2 Kings* (Word Biblical Commentary 13; Waco, TX: Word, 1985) xxxix.

[19] D. Kidner, *Ezra and Nehemiah* (Tyndale OT Commentaries; Leicester and Downers Grove IL: IVP 1979) 38.

Whether Bible scholars advocate the inspiration and authority of the original Scriptures or not, they commonly agree that the human role in the transmission process can display accidental errors typical of copyists before photocopying enabled direct replication.

Reason for Changes in Numbers

The simplest explanation for the change in chronological data from the OG/L texts to the MT lies in the probability that in an early Hebrew script similar-looking letters (representing numbers) were mistaken during copying. This appears to have occurred in a pre-Masoretic text. The miscopied numbers entered the *kaige* text in the first century CE, and are now seen in the MT, but the OG/L texts of the second century BCE appear to retain a less affected record.

Though no original copies exist, it appears that the numbers of the kings' regnal years and their accession synchronisms were written in the Hebrew script as *letters* of the Hebrew alphabet using their numerical value. Thus the first letter א (*aleph*) was 1, the second ב (*beth*) was 2, and so on up to 10 (י *yod*), then 10s with the digits for 11–19. The 11th letter כ (*kaph*) is 20 and the 12th letter ל (*lamed*) is 30, and so on.

The Hebrew script altered over the centuries. It is not possible to determine the exact shape of the letters that may have been mistaken for each other.[20] Letters representing numbers that have caused most problems in the text of the Divided Kingdom are the numbers 3 and 6; 4 and 7; and 10 and 20. These numbers (letters) are basically responsible for the divergent data seen in the Books of 1 and 2 Kings. Initial changes have brought secondary data into the *kaige* and Hebrew texts, and some were introduced into the OG/L texts—before the writing of the Codex Vaticanus—to bring the Greek texts into conformity with the Hebrew.

The transmission history shows that copyists were alert to discrepant numbers (which they sometimes tried to fix), and at some point of time the writing of numbers was changed from alphabetic character values to transcription as words.

The Structure of Synchronisms

The synchronisms in 1 and 2 Kings use a stylized form, which is comprehensively explained in my book.[21] Differences in the patterns of opening formulae betray differing textual origins. They typically report an accession statement, a duration statement, and an assessment statement. The accession statement would include a synchronism with the reigning monarch of the twin kingdom. Variation to this pattern usually indicates secondary intrusion. As I demonstrate in *The Reconstructed Chronology of the Divided Kingdom*, the intrusion of supplementary notations into the opening or closing formulae of a king's reign indicates textual disruption.

Variant Information

The intrusion of variance is readily seen where a king has two different accession synchronisms. Several examples may be noted.

1. Jehoshaphat. 1 Kgs 22:41-42 records that Jehoshaphat began to reign in the 4th year of Ahab, whereas in 16:28a Jehoshaphat began to reign in the 11th year of Omri.

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[20] M.C. Tetley, *The Reconstructed Chronology of the Divided Kingdom* (Winona Lake, IN: Eisenbrauns, 2005) 93-94 and nn. 1 and 3, 133-36, and M. Lidzbarski's table of alphabets on p. 137. These are taken from E. Kautzsch (ed.), *Gesenius' Hebrew Grammar* (2nd ed.; trans. A.E. Cowley; Oxford: Clarendon, 1910, facing p. xvi).

[21] Ibid., See especially chapter 5, pp. 64-90; Shenkel, *Chronology and Recensional Development*, 43-54.

2. Joram and Jehoram. The MT reflected in English Bibles says in 2 Kgs 1:17b Joram (of Israel) became king in the second year of Jehoram (of Judah), yet in 2 Kgs 8:16 Jehoram (of Judah) became king in the fifth year of Joram (of Israel).

3. Hoshea is said to have become king in the 20th year of Jotham at 2 Kgs 15:30b, and in the 12th year of Ahaz at 17:1.

It is evident that each example involves discrepancies, which require consideration of the textual transmission and explanation.

The Early Divided Kingdom begins with Rehoboam of Judah in the south, and Jeroboam of Israel in the north, and continues for nearly 100 years until Jehu kills Ahaziah (king of Judah) and Joram (king of Israel) on the same day (2 Kgs 9:14-28).

Tables 2.1 and 2.2 are copied from my book *The Reconstructed Chronology of the Divided Kingdom* to show how the OG/L data compares with the MT data in the Early Divided Kingdom period found in 1 Kgs 14:20–21:29, and how the Lucian text (where extant) compares with the kaige/MT in 1 Kgs 22:41–2 Kgs 9:29. Problems and solutions are briefly explained.

The subsequent period following the simultaneous decease of Ahaziah and Joram is known as the Late Divided Kingdom, and continues down to the fall of Samaria. Tables of that period, 2.3 and 2.4, will also be presented with brief explanations. (Abbreviations not defined in the tables in this chapter can be found in the list of General Abbreviations.)

Table 2.1 collates the variants found in the Greek and Hebrew texts in the Books of 1 and 2 Kings of the Early Divided Kingdom according to the textual witnesses and supplies the critical data that must be considered in reconstructing the chronology. Failure to recognize the information in this table, and subject it to responsible text-critical analysis, is a primary reason for the erroneous chronology constructed by Edwin Thiele. Table 2.3 supplies the equivalent data for the later period.

Table 2.1: Variant chronological data of the Greek and Hebrew texts in the Books of 1 and 2 Kings (Kgs) of the Early Divided Kingdom according to textual witnesses

Reference	King	Text	Regnal years	Accession synchronism
1 Kgs 14:20	Jeroboam of Is.	MT	22	None
1 Kgs 15:8-9		OG/L	24	None
1 Kgs 14:21	Rehoboam of J.	MT & OG/L	17	None
1 Kgs 15:1-2	Abijam of J.	MT	3	18th Jeroboam
		OG/L	6	
1 K. 15:9-10	Asa of J.	MT	41	20th Jeroboam
		OG/L	41	24th Jeroboam
1 Kgs 15:25	Nadab of Is.	MT & OG/L	2	2nd Asa
1 Kgs 15:33	Baasha of Is.	MT & OG/L	24	3rd Asa
1 Kgs 16:8	Elah of Is.	MT	2	26th Asa
1 Kgs 16: 6, 8		OG/L	2	20th Asa
1 Kgs 16:10, 15	Zimri of Is.	MT	7 days	27th Asa
1 Kgs 16:15		OG	7 days	None
		L (be$_2$ only)	7 days	22nd Asa
1 Kgs 16:16	Omri of Is.	MT implies same as Zimri “that day”		27th Asa
		OG		None
		L implies same as Zimri “that day”		22nd Asa
1 Kgs 16:23	Omri of Is.	MT & OG/L	12 yrs: 6 at Tirzah	31st Asa
1 Kgs 16:28a	absent	MT	Absent	Absent
	Jehoshaphat of J.	OG/L	25	11th Omri
1 Kgs 16:29	Ahab of Is.	MT	22	38th Asa
		OG/L	22	2nd Jehoshaphat
The OG section of 1 Kings finishes and the *kaige* recension begins at Chapter 22				
1 Kgs 22:41–42	Jehoshaphat of J.	kaige/MT	25	4th Ahab
		L	Absent	Absent
1 Kgs 22:52	Ahaziah of Is.	kaige/MT	2	17th Jehoshaphat
		L	2	24th Jehoshaphat
2 Kgs 1:17	Joram of Is.	MT	Absent	2nd Jehoram
The previous synchronism indicates that Jehoram of Judah began to reign in the 2nd year of Ahaziah of Israel, but this is missing in all texts				
2 Kgs 1:18a	Absent	MT	Absent	Absent
	Joram of Is.	kaige	12	18th Jehoshaphat
		L	12	Absent
2 Kgs 3:1	Joram of Is.	kaige MT	12	18th Jehoshaphat
2 Kgs 8:16–17	Jehoram of J.	MT	8	5th Joram
		kaige	40	5th Joram
		L (oe$_2$)	10	5th Joram
		L (b)	8	5th Joram
2 Kgs 8:25–26	Ahaziah of J.	kaige/MT	1	12th Joram
		L (e$_2$)	1	11th Joram
		L (b)	Absent	11th Joram
		L (o)	Absent	10th Joram
2 Kgs 9:29	Ahaziah of J.	kaige/MT	Absent	11th Joram
		L (be$_2$)	1	11th Joram
		L (o)	Absent	11th Joram

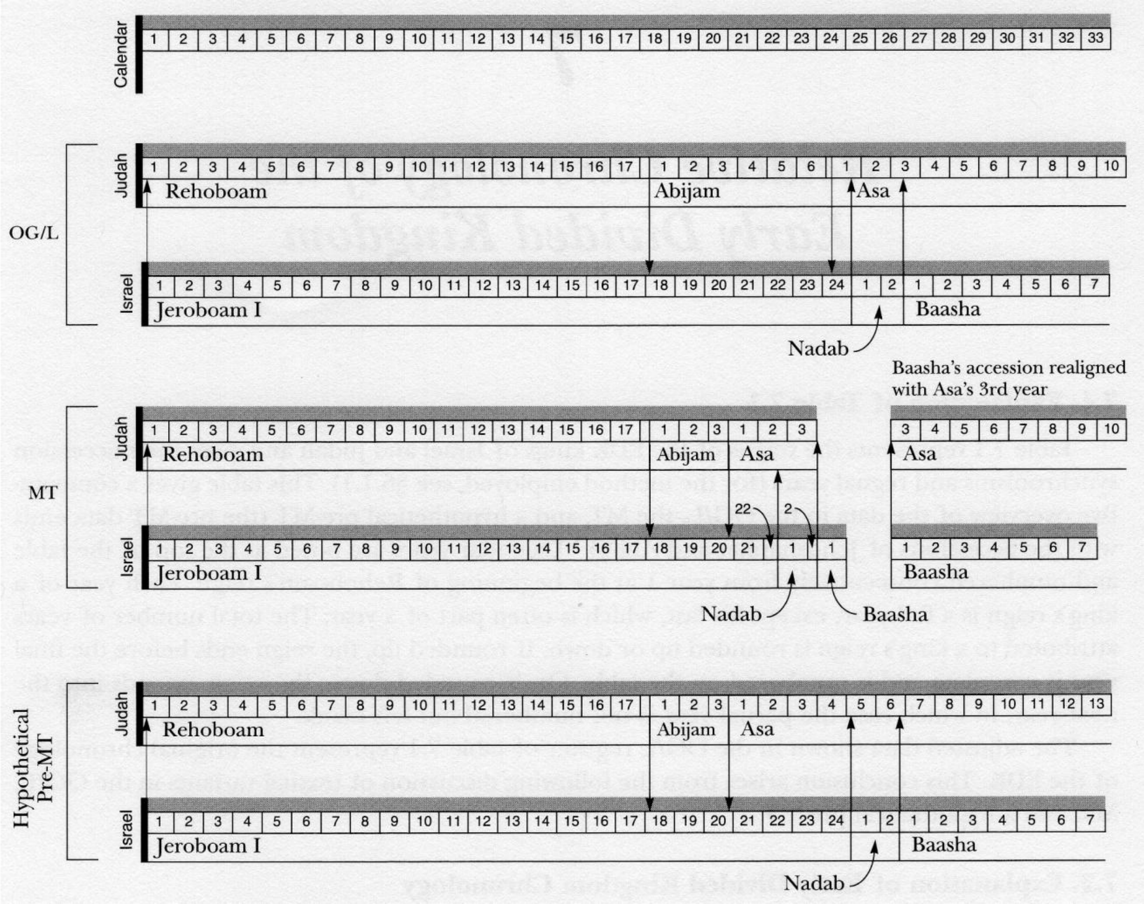
Is. = Israel; J. = Judah.

This excursus on the historical development of the text of 1 and 2 Kings is made necessary to give some indication of the complex background that must be taken into account when constructing the chronology. The variant numbers in the old text (OG/L) and the “new” text in the Greek KR and Hebrew MT can be explained by recognizing the different text types.

Explaining Textual Variances

What has been seen as an intractable problem to scholars wrestling only with the numbers of the Hebrew text, can, with the help of the much earlier OG/L texts, be made explicable and logical. *The Reconstructed Chronology of the Divided Kingdom* addresses these issues systematically, to establish both a relative and absolute chronology. Space

Table 2.2 Early Divided Kingdom chronology



here precludes an explanation of all the intricacies of textual variants, but I briefly attempt to show how many variants arose in the OG/L and *kaige*/MT. The table of variants above (Table 2.1) should be referred to, as well as the table below. (Table 2.2 continues across three pages which should be read continuously side by side). Table 2.2 demonstrates the synchronisms and length of reigns of each of the kings in their variant textual traditions.

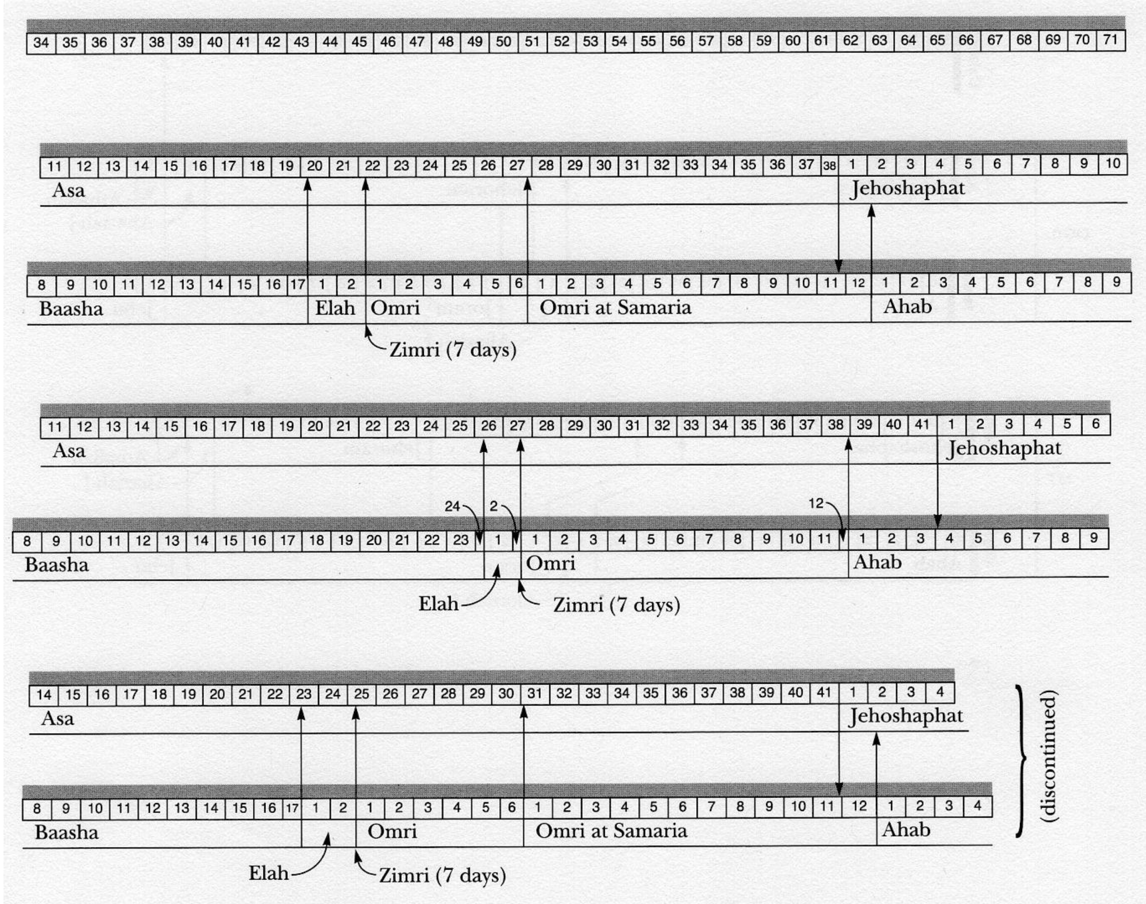
Tables 2.2 and 2.4 display a Calendar line (top) for the formation of a relative chronology, lines of the twin kingdoms in the OG/L and MT texts, respectively, plus a line for a hypothetical pre-MT text, which scholars acknowledge and the evidence shows existed at some stage of the transmission process of the MT. The vertical arrows indicate the synchronisms expressed in the texts.

Primary Key to Understanding the Early Divided Kingdom Chronology

The key to understanding the chronology of the Early Divided Kingdom is by paying attention to the results of differing reign lengths given to Abijam (son of Rehoboam of Judah) and his successor, Asa. In the OG/L texts Abijam is given six years (1 Kgs 15:1-2; years 18–24) but in the extant MT he is given only *three* years. Then, in order to correct the discrepancy in the lengths of their reigns, a pre-Masoretic text added three years—not to Abijam's reign where it belonged—but to Asa's reign, increasing it from 38 years to 41 years (1 Kgs 15:10).

This adjustment must have occurred in a pre-MT text that still retained the original six years for Abijam, which assimilated the 41 years for Asa when it would otherwise have been 38. Asa's reign is now three years longer than it should have been. The OG/L demonstrate that Asa once had 38 years because his reign ends and Jehoshaphat's begins in the 11th year of Omri (1 Kgs 16:28a OG/L), requiring only

Table 2.2 Early Divided Kingdom chronology (cont.)



38 years.[22] The significance of these adjustments is that the kings of Judah in the MT are three years in advance of their correct position, demonstrated by Jehoshaphat's accession—which is now three years further ahead in the MT than in the OG/L. This anomaly must have been noticed by a redactor (copyist) at some stage, but instead of returning Asa's reign back to 38 years, he changed the *synchronism* so that Jehoshaphat began to reign in the fourth year of Ahab (1 Kgs 22:41). In the MT, a new synchronism was also formed for Ahab who then became king in the 38th year of Asa (1 Kgs 16:29). This led to a drastic rearrangement of the text.

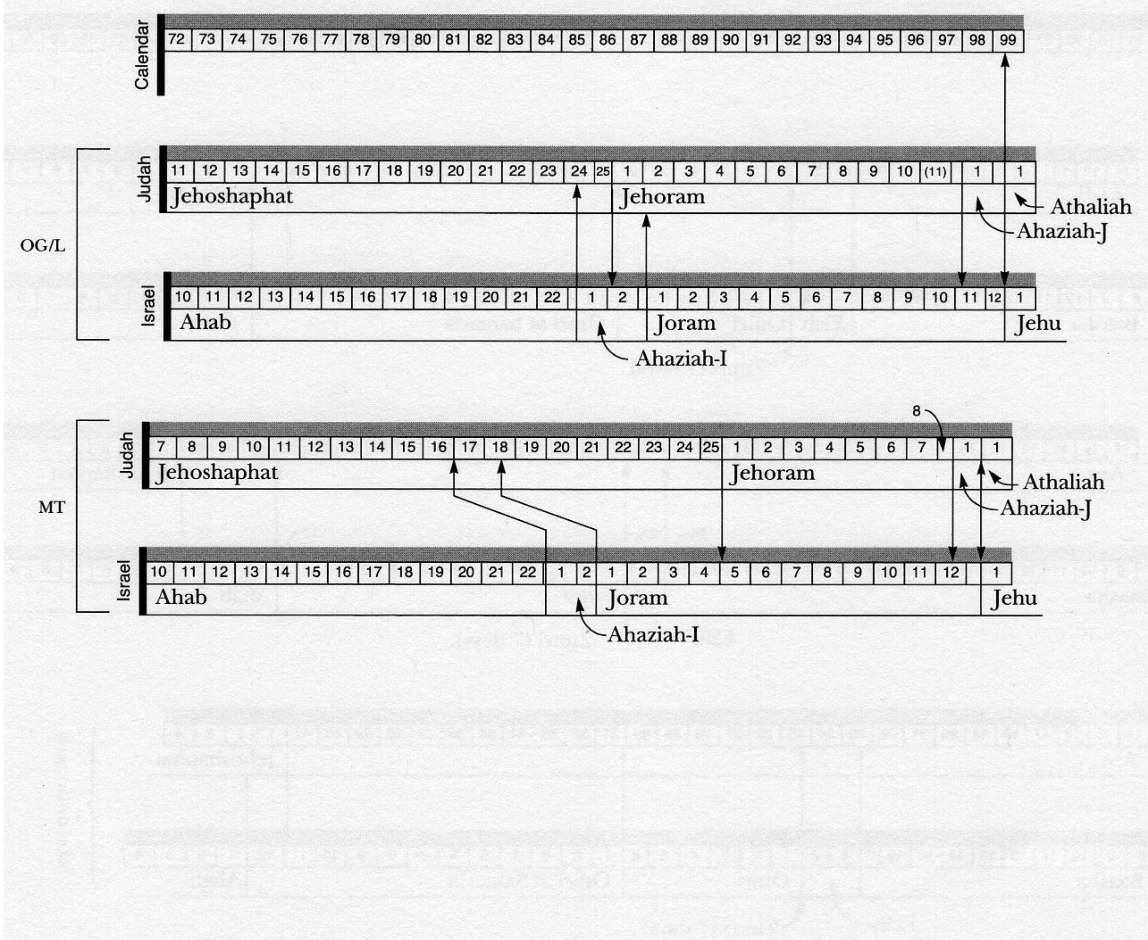
Variant Arrangements of the Text

Instead of Ahab's reign coming after Jehoshaphat's as in OG/L, Ahab now starts his reign in Israel ahead of Jehoshaphat in Judah. (See Table 2.2, calendar year 62, MT row). The rearrangement in the numbering and positioning of Jehoshaphat and Ahab had serious repercussions for the remaining chronology of the Early Divided Kingdom.

By adopting the accession of Ahab before Jehoshaphat, and following the structural design that reigns are recorded from a king's accession in a strict historical sequence, the redactor had to remove the narrative of Jehoshaphat's reign at 1 Kgs 16:28a-h where it appears in OG/L, so that the narrative of Ahab's reign would appear *before* Jehoshaphat's narrative. In the MT, Ahab's reign runs from the accession synchronism in 1 Kgs 16:29 to Ahab's death in 1 Kgs 22:40. Then it is immediately followed by Jehoshaphat's accession synchronism and reign narrative in 1 Kgs 22:41-50.

[22] The 38 years is not found in texts because it has been replaced by the 41 years at 1 Kgs 15:9-10. In the OG/L this can be explained by a later change to conform to the MT.

Table 2.2 Early Divided Kingdom chronology (cont.)



On the other hand, the OG/L texts have Jehoshaphat's accession ("in the 11th year of Omri") at 1 Kgs 16:28a, where the 10 verse narrative of his reign is designated a-h.[23]

Codex Vaticanus has Jehoshaphat's Reign Twice!

The Codex Vaticanus followed the OG/L up to the end of 1 Kgs 21, then at 1 Kgs 22 followed the KR scroll with its MT synchronisms and sequence of reigns. As a result, Codex Vaticanus *has the narrative of Jehoshaphat's reign at two places*: 1 Kgs 16:28a-h, and at 1 Kgs 22:41-50,[24] thereby confirming the repositioning of Jehoshaphat's reign in conformity with the MT order.

[23] Because the L texts have Jehoshaphat in his appropriate place at 1 Kgs 16:28 a-h, their texts proceed from 22:40 to v. 51 and do not have a second intervening narrative about Jehoshaphat. 1 Kgs 22:52 in *kaige*/MT appears as v. 51 in English translations.

[24] Thiele argued that the MT was the earlier text because the Greek had only *one* verse at 1 Kgs 16:28, whereas the account of Jehoshaphat at 1 Kings 22:41-50 occupied 10 verses. He wrote, "If the Greek had been in existence before the Hebrew, the account of Jehoshaphat would have been at 1 Kings 16:29-38, and it would then have been followed by the account of Ahab. There would have been no second account of Jehoshaphat after the account of Ahab at I Kings 22:41" (*MNHK*[3], 90-91. See pp. 88-94 for the entire section). Thiele did not understand the recensional development of the Greek texts or the fact that 1 Kings chapter 22 was a later text than the OG of 16:28. Apparently he had not seen for himself the Codex Vaticanus or even its translation, and did not know that the Greek has a *longer* text at 16:28a-h than at 22:41-51. Concerning vv. 41-51 Shenkel writes: "These verses of the regnal formula have all the characteristics of the KR and evidently are a reworking of the earlier regnal formula at $16{:}28^{a\text{-}h}$ with a view to bringing the latter into conformity with the proto-Masoretic text" (*Chronology and Recensional*

The OG, which is now lost, would not have had Jehoshaphat's narrative after Ahab's in 1 Kgs 22: 41-50, because it is inconsistent with the structure of 1 and 2 Kings, which has accession synchronisms (and associated reign narratives) in strict historical sequence. Confirmation of the earlier OG order is seen by the absence of the Jehoshaphat accession and narrative at this point in the L texts.

Variant Methods of Resolution

One approach to resolving these problems is to arbitrarily nominate a single textual tradition as inerrant, and dispense with other sources that witness to the original Hebrew Scriptures. Thiele's adherence to the late MT forced him to compose theories of multiple calendar systems and co-regencies not mentioned in the text. These seem to belie the intention of the original editors to provide a cogent and coherent historical narrative. Thiele was motivated to uphold the reliability and authority of the biblical text. But this is not aided by preferring one textual tradition over the Greek translations (in various versions) of much earlier Hebrew texts, especially those extensively used in the New Testament era, nor by under-estimating that the transmission processes of documentary material through many hands can multiply copyist errors, especially with numbers.

Reviewing *all* available evidence is the most likely way of recovering the original, and explaining how variants may have appeared.[25] While the evidence now shows discrepancies of various kinds, a reconstruction of the transmission process can make the original explicable. *The Reconstructed Chronology of the Divided Kingdom* shows that the variant numbers may be *robustly explicable* without any of Thiele's resort to unattested dating methods and co-regencies. The reasons for textual variation are demonstrated when the years of the kings' reigns of Israel and Judah are put side by side, with the OG/L texts displaying the early data, and the KR and the MT exhibiting the later data.

Rehoboam's Fifth Year Derives from the Entirety of the Divided Kingdom

Having briefly addressed my approach to fixing the chronology for Israel and Judah in coverage of 1 Kings, I proceed to the remainder of the Early Divided Kingdom in 2 Kings. The synchronism of Rehoboam's 5th year with Shishak's 20th year occurs in the first years of the Early Divided Kingdom, but the chronology of Israel and Judah through to the Fall of Samaria needs completion to establish an absolute chronology, and to locate Rehoboam's fifth year encounter with Shishak in 977 BCE.

MT Repercussions for Jehoram of Judah, and Joram and Ahaziah of Israel

Further consequences of disordered numbering of the reigns of Abijam and Asa, and the subsequent secondary synchronisms for Ahab and Jehoshaphat, are seen in the reigns of Jehoram of Judah, and Joram and Ahaziah of Israel. Another transposition occurs in the text of the *kaige*/MT, but not in the original text now represented by a few verses of the L text and, somewhat surprisingly, in the MT itself at 2 Kgs 1:17b. The MT has retained a crucial piece of information that Joram of Israel became king *in the second year of Jehoram of Judah*.

This is in obvious conflict with a "secondary" synchronism that *Joram became king in the 18th year of Jehoshaphat* (2 Kgs 3:1). The loss of the OG text, and much of

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Development, 43). So Thiele's own argument turns on its head because the longer Greek text *is* found at 1 Kings 16:28 a-h and it *is* followed by the account of Ahab!

[25] Porter commends Lagarde "who pioneered Septuagintal research into manuscript types and claimed that all the texts were mixed and that an attempt to arrive at the original text necessarily must involve an eclectic process of comparing and weighing evidence," ("Septuagint/Greek OT," 1104), a principle that Thiele did not adequately pursue.

the L text made to conform to the pre-MT, makes for a very complex situation with regard to the positioning of Joram and Jehoram's reigns. The textual material is demonstrated here in the list of variants (in Table 2.1) and by the several chronological formulations for the Early Divided Kingdom based upon those variants displayed in Table 2.2. For a comprehensive discussion see my book, *The Reconstructed Chronology of the Divided Kingdom*.

Reigns of Jehoram and Joram Shifted, with Elements of Both Constructions

As a brief summary, the situation is akin to that of the Jehoshaphat/Ahab transposition. In the OG order, Jehoram of Judah succeeds Jehoshaphat in the second year of Ahaziah of Israel. This synchronism is anomalously *not found in any text*, an omission clearly showing textual interference. But the synchronism is implied in the text that remains in the MT at 2 Kgs 1:17 (and L at 1:18), which states instead that *Joram of Israel* began to reign in the second year of Jehoram of Judah. So *Jehoram must have begun to reign a year before Joram.* Sequentially, Jehoram's accession and reign should have been reported before that of Joram.

The reason for these anomalies is that the MT order has placed Joram of Israel's accession (calendar year 82) before Jehoram of Judah (calendar year 90). The synchronism for Jehoram of Judah's accession, which would have been at 1:17 or 18, was excised because it did not conform to the MT order. Into its place was inserted the accession of Joram of Israel in the second year of Jehoram of Judah. Joram's synchronism belongs to the OG order and should have appeared at 2 Kgs 3:1 after the narrative of Jehoram of Judah. But in the MT the synchronism is inserted incorrectly at 1:17-18 as can be seen by its *intrusion* into the closing regnal formula of Ahaziah. Perhaps this was a copyist's effort not to lose the synchronism altogether.

The MT order required a new accession synchronism for Israel's Joram before Jehoram's accession. Two problems are associated with these synchronisms. Firstly, the extension of Asa's reign from 38 years to 41 years means that his successor, Jehoshaphat, started his reign three years after the true position. Secondly, in the MT, Ahaziah of Israel began to reign in the 17th year of Jehoshaphat (1 Kgs 22:51) but in the L texts (boc$_2$e$_2$) he began to reign in the *24th* year of Jehoshaphat (see calendar year 85). The OG/L arrangement is obviously correct. The result of the MT synchronizing Ahaziah of Israel's accession with the 17th year of Jehoshaphat led the MT redactor to synchronize Joram of Israel's accession in the 18th year of Jehoshaphat. Due to these adjusted synchronisms, the MT has a secondary synchronism for Joram's accession in the 18th year of Jehoshaphat at 2 Kgs 3.1. The correct synchronism of Joram becoming king in the second year of Jehoram was removed from 3:1 and placed at 1:17-18 where it does not belong, and the secondary synchronism for Joram's accession in the 18th year of Jehoshaphat is inserted in the MT at 3:1.

Early Divided Kingdom Ends With Simultaneous Deaths of Jehoram and Ahaziah

Jehoram's reign is three years advanced out of its correct (OG/L) position. A consequence of this is that Jehoram's reign was synchronized with the fifth year of Joram (2 Kgs 8:16) with a reign of eight years. In the L manuscripts oe$_2$ Jehoram is given 10 years, but this is one year short of the required number as can be seen in calendar years 95–98. The 11 years that would have been original in the OG text had to be reduced to eight years in the MT so that Jehoram's successor, Ahaziah of Judah, who reigned about one year (2 Kgs 8:26), was killed on the same day as Joram by Jehu, a challenger from Israel (2 Kgs 9:24, 27). The incorrect addition of three years to Asa's reign, causing his successor kings of Judah to be three years in advance of their true chronological position, has finally come to an end because the years allocated to Jehoram could not show that he *was still alive three years after his death!*

The difference between the OG/L and *kaige*/MT has led to variant synchronisms and transpositions of reigns. One further area of the Early Divided Kingdom not discussed above concerns that of Baasha, Elah, and Omri who were contemporaries of Asa.

Baasha of Israel

In the MT, Baasha is credited with 24 years—seven more than the OG/L 17 years. This caused changes in the synchronisms in the MT. In the MT, Baasha's accession falls in the third year of Asa (1 Kgs 15:33), calendar years 23–26, but it is not appropriate because it omits three of Abijam's six years.

The problem with Baasha's reign is that the OG/L texts give him 17 years, indicated by the synchronism that Elah began to reign in Asa's 20th year (1 Kgs 16:6, 8 OG/L) whereas the MT gives Baasha 24 years (1 Kgs 15:33). The correct number of years for Baasha is the OG/L's 17 years. Elah's successor, Zimri, followed him two years later, reigning only seven days. Both accessions occur in the 22nd year of Asa (1 Kgs 16:15-16: L text be_2 only). After six years at Tirzah, Omri moved to Samaria in the 27th year of Asa. This datum should have appeared at 16:23 but it has been replaced by the 31st of Asa, so that OG/L do not have this datum. As the OG/L texts show, Omri actually reigned 18 years altogether.

In the MT, the seven-year extension to Baasha's reign—giving him 24 years—means that seven years must be eliminated from the MT arrangement. Elah's accession is given for the 26th year of Asa (16:8). By eliminating almost one year of two years for Elah's reign, Omri's accession is given for the 27th year of Asa (16:15). Instead of this being Omri's accession at Tirzah, as it is in the OG/L texts, it is Omri's accession *at Samaria*. By omitting a year from Elah's reign and six years of Omri's reign at Tirzah, the seven years difference between the 17-year reign of Baasha in OG/L and the 24th year of Baasha in MT is eliminated.

The point here is that the numbers for Baasha's regnal years, 17 versus 24, are the cause of differences in the positions of the synchronisms for the reigns of Elah, Zimri, and Omri in the MT in 1 Kgs 16. As noted above, these numbers have also been confused concerning the accession of Ahaziah of Israel. He began to reign in the 17th year of Jehoshaphat according to the MT, but in the 24th year according to the L texts (1 Kgs 22:51). It seems apparent that these numbers were written alike and became confused over the process of copying from one Hebrew text to another. The OG/L texts escaped this revision.

The Importance of Israel/Judah Divided Kingdom Dates and Lengths of Reign

The importance of establishing the length of the divided kingdom is to accurately date Rehoboam's fifth year. Correctly reconstructed, the Early Divided Kingdom account begins with the public division (1 Kgs 12) between King Rehoboam and Jeroboam—dividing Solomon's kingdom between them—and ends on the same day with the deaths of Judah's King Ahaziah and Israel's King Joram, at Jehu's hand (2 Kgs 9:23-28). According to the calendar line, it comprises 98½ years. We now continue with the Late Divided Kingdom period, to establish its length and to date the fall of Samaria. Counting from this point back to the beginning of the divided kingdom enables Rehoboam's fifth year to be established.

Late Divided Kingdom Chronology

The period covered by the Late Divided Kingdom has been discussed at length in my book, *The Reconstructed Chronology of the Divided Kingdom*.[26] There are only a few differences in the data of the *kaige*/MT and L (OG not being extant). Table 2.3 gives the actual data, and amended data, and is provided below. There are three main difficulties. I comment on these briefly.

Table 2.3: Chronological data of the Late Divided Kingdom according to textual witnesses (*kaige*/MT/L)

Reference	King	Regnal years	Accession synchronism	Amended data
2 Kgs 10:36	Jehu of Is.	28	None	
2 Kgs 11:4	Q. Athaliah	7	None	
2 Kgs 12:1/2	Joash of J.	40	7th Jehu	
2 Kgs 13:1	Jehoahaz of Is.	17	23rd Joash of J.	
2 Kgs 13:10	Joash of Is.	16	37th Joash of J.	
2 Kgs 14:1–2	Amaziah of J.	29	2nd Joash of Is.	
2 Kgs 14:23	Jeroboam II	41	15th Amaziah	
2 Kgs 15:1–2 *Antiq*. 9.205, 215	Azariah of J.	52 52	27th Jeroboam II 14th Jeroboam II	14th Jeroboam II
2 Kgs 15:8	Zechariah of Is.	6 m	38th Azariah	28th Azariah
2 Kgs 15:13	Shallum of Is.	1 m	39th Azariah	29th Azariah
2 Kgs 15:17	Menahem of Is.	10	39th Azariah	11 yrs; 29th Azariah
2 Kgs 15:23	Pekahiah of Is.	2 yrs MT 10 yrs L	50th Azariah 50th Azariah	12 yrs; 40th Azariah
2 Kgs 15:27	Pekah of Is.	20	52nd Azariah	29 yrs
2 Kgs 15:32–33	Jotham of J.	16	2nd Pekah	
2 Kgs 16:1–2	Ahaz of J.	16	17th Pekah	
2 Kgs 17:1 2 Kgs 15:30	Hoshea of Is. Hoshea of Is.	9 absent	12th Ahaz 20th Jotham	13th Ahaz
2 Kgs 18:1–2	Hezekiah	6 (of 29) at fall of Samaria	9th Hoshea at fall of Samaria	

Is. = Israel; J. = Judah.

Table 2.4 (on pages 34 and 35) again supplies the calendar years for the regnal years of the kings of Israel and Judah as reconstructed from the chronological data of the late divided kingdom. Note that this table does not have separate rows for the OG/L and MT because the OG is not extant and the L text has mostly been assimilated to the MT. Differences are pointed out and discussed in context.

Azariah's Accession and Following Synchronisms

The first textual problem appears at 2 Kgs 15:1-2, which begins with Azariah of Judah's accession in the 27th year of Jeroboam II (MT/*kaige*/L). With Jeroboam's II's accession located in Amaziah's 15th year (14:23) and Amaziah spanning a 29-year reign (14:2), the synchronism of his successor would be expected in Jeroboam II's 14th or 15th year. But the MT places Azariah's accession in Jeroboam II's 27th year (15:1), plainly in conflict with the previous synchronism.

It can be seen, however, that the 29th and last year of Amaziah's reign falls in the *14th year* of Jeroboam, when Azariah would have succeeded him. The 14th year of Jeroboam is cited in the *Antiquities of the Jews* written by Flavius Josephus, the Jewish historian of the First Century CE, and agrees with the other data.[27] This is the third instance we have noted where numbers with 10 + 4, and 20 + 7, have been confused and incorrectly transcribed—presumably because the letters used as numbers looked

[26] Tetley, *Divided Kingdom*.

[27] Josephus, *Antiquities*, (tr. H. St. John Thackeray; Loeb Classical Library: Harvard University Press) 9.216, 227.

somewhat alike, and were incorrectly transcribed, perhaps due to poor handwriting or damaged text.[28]

The correct synchronism is that Azariah began to reign in Jeroboam II's 14th year, and Jeroboam II reigned 41 years (14:23), which was presumably the synchronism of the OG/L texts to make the adjacent synchronisms coherent. However, this synchronism cannot accommodate the following synchronisms *in the MT* because they have become advanced by 10 years in order to accommodate the incorrect synchronism of Azariah's accession in Jeroboam's 27th year.

Table 2.4 demonstrates the chronology adduced from the variants to be the original numbers. The table shows at calendar years 201–227 that Zechariah would have assumed the throne for six months in the 28th year of Azariah, not the 38th as now stated in 1 Kgs 15:8. Shallum, who reigned just one month, and his successor, Menahem, would both have acceded the throne in the 29th year of Azariah not the 39th (2 Kgs 15:8, 13, 15).

Menahem is attributed 10 years, and his son Pekahiah is attributed 2 years (2 Kgs 15:23) beginning in the 50th year of Azariah, while his successor, Pekah, became king of Israel in the 52nd year of Ahaziah of Judah (2 Kgs 15:27). But while the MT allocates Pekahiah two years (2 Kgs 15:23) the L texts give Pekahiah 10 years and later minor texts give him 12 years.[29] Clearly confused, the highest attested years for Pekahiah are 12 years (see calendar years 213–226 in Table 2.4), with the numbers 10 and 2 being derivative. This suggests that 12 is original, and prior to that Menahem would have reigned 11 or 12 years (not 10 as given at 15:17) as there are 23–24 years between Menahem's accession in the 29th of Azariah, and Pekah's accession in Azariah's 52nd year.

To reconcile the data, it is proposed that Menahem began to reign in the 29th year of Azariah, and Pekahiah began to reign in the 40th, not 50th of Azariah (15:23).[30] By attributing Azariah's accession in the 14th year of Jeroboam II, updating the accessions of Zechariah, Shallum, Menahem, and Pekahiah by 10 years (attributing Menahem 11 or 12 years and Pekahiah 12 years), the reigns fit comfortably into Azariah's 52 years. I address Pekah's reign below.

Hoshea has Two Accession Synchronisms

Pekah's accession in the 52nd and last year of Azariah appears to be an original synchronism agreeing with Jotham's accession in Pekah's second year (see calendar years 225–227 in Table 2.4). It also agrees with Jotham reigning 16 years with Ahaz's accession in the 17th year of Pekah (2 Kgs 16:1-2). But the problem remains that Hoshea, Pekah's successor, has *two different* accession synchronisms; one in the 20th year of Jotham at 2 Kgs 15:30b, and another for the 12th of Ahaz at 17:1. The first comes about because if Jotham *had* reigned 20 years as at 15:30b, not 16, Hoshea's first year could have begun in Jotham's 20th.

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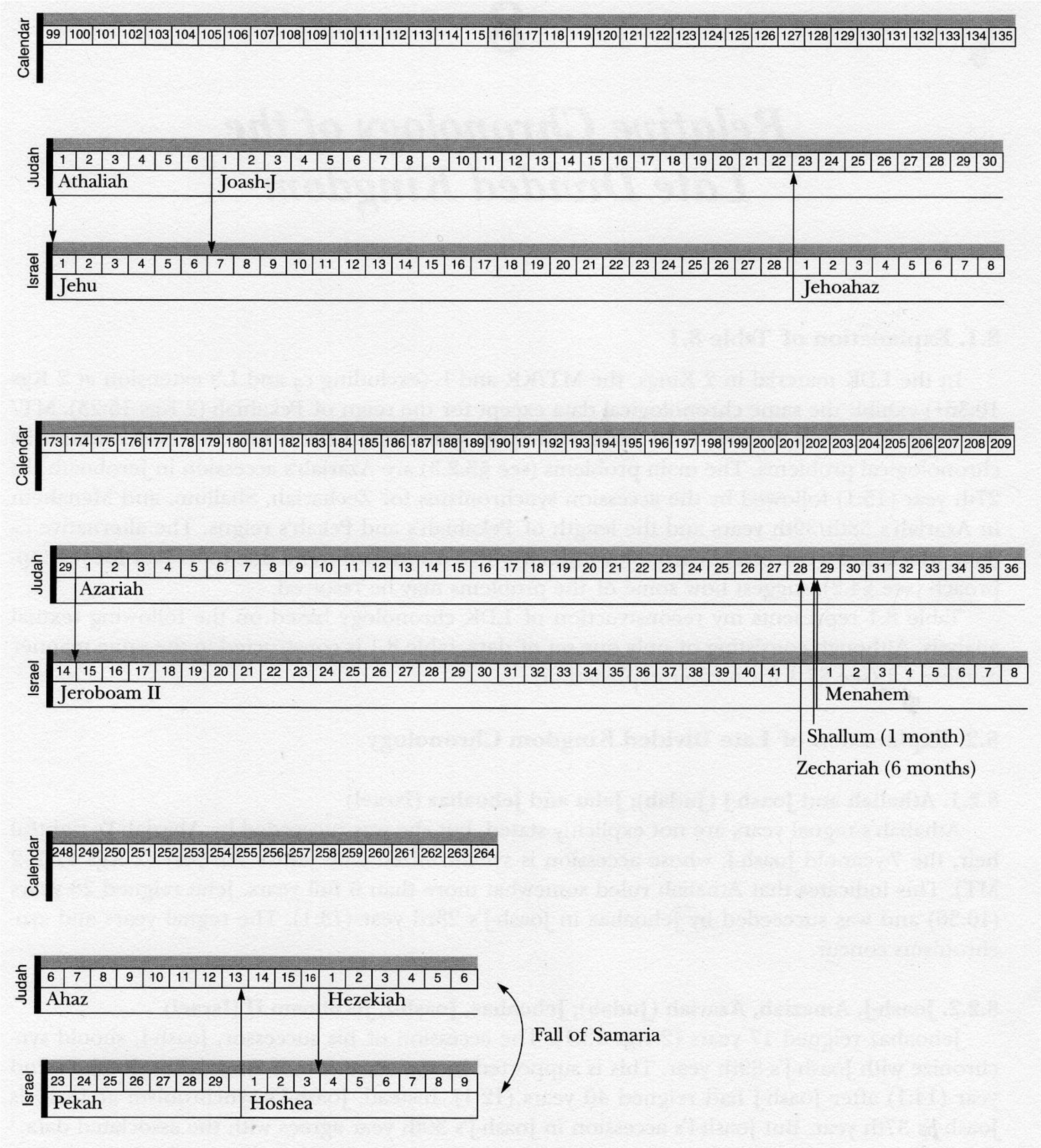
[28] The simple explanation of numbers that look alike as letters of the Hebrew alphabet to explain the incorrect accession of Azariah in Jeroboam II's 27th year, shows how mistaken is Thiele's explanation that Amaziah and Azariah had a 24-year co-regency beginning in the fifth year of Amaziah. Since Azariah was 16 when he became king on the death of his father, Amaziah (14:21), he could not have been king eight years before he was born! Thiele gets around this by moving v. 21 to v. 14, apparently to make it look like Azariah was 16 at the beginning of the supposed co-regency when Amaziah was captured by Joash king of Israel, not at the time of Amaziah's death. See Thiele, *Mysterious Numbers*[3], 107-19, 199.

[29] As stated by Shenkel: Nc2defmnp*qstwz in *Chronology and Recensional Development*, 26.

[30] For further explanation see Tetley, *Divided Kingdom*, 148-51.

Table 2.4: Late Divided Kingdom chronology reconstructed from MT/KR, L and c_2 data



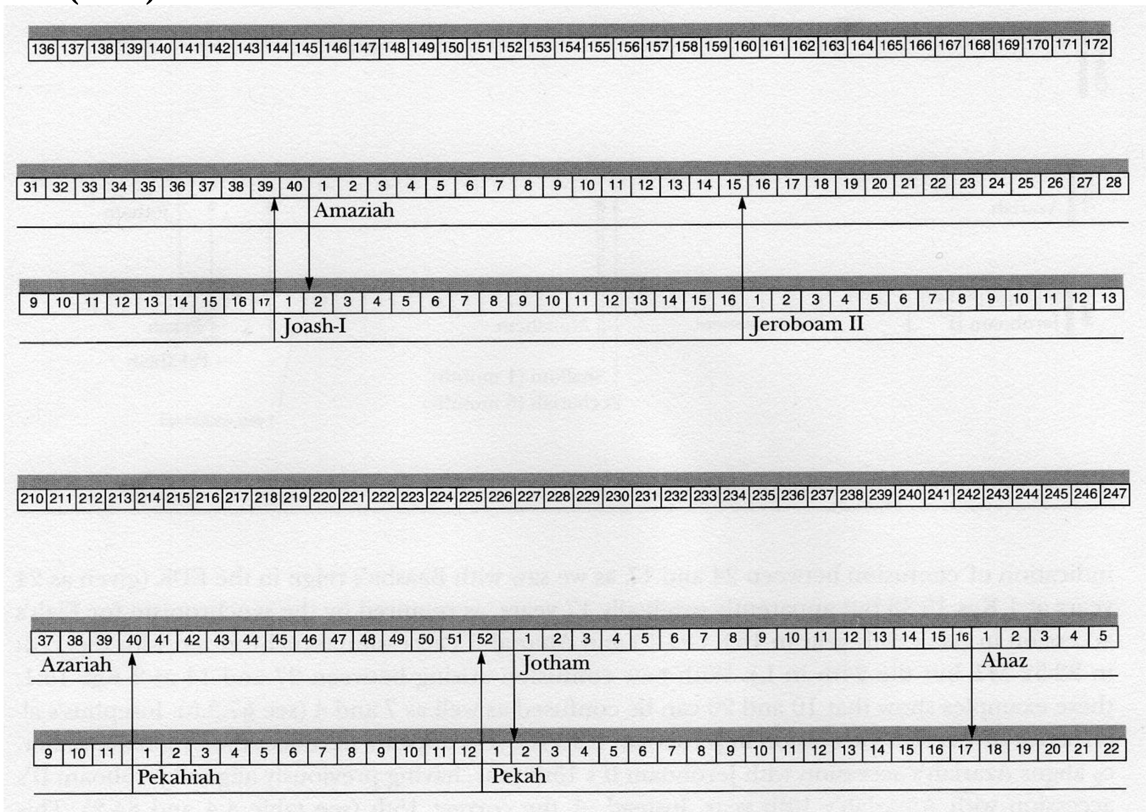
Please read Table 2.4 as a continuous table across pages 34 and 35 (note the calendar years).

Hoshea's second accession synchronism is based on Pekah having reigned 29 years not the 20 years given him at 2 Kgs 15:27 omitting nine years. By reinstating 29–30 years for Pekah, Ahaz's successor, Hezekiah, comes to the throne in the third year of Hoshea (18:1). The siege of Samaria by Shalmaneser [V] of Assyria started in the fourth year of Hezekiah—the seventh year of Hoshea (18:9), and after three years Samaria fell in Hezekiah's sixth year (18:10). Hezekiah reigned 29 years in Jerusalem (18:1).

Hoshea, Hezekiah, and History

Working backwards from Hezekiah's accession in the third year of Hoshea confirms that Pekah reigned 29–30 years (see calendar years 254–258). The 29 years is preferred, implying that a letter-number for nine has fallen from the text. In this textual problem we see that the omission of nine years from the reign of Pekah has led to an incorrect accession synchronism for Hoshea in the 20th year of Jotham.

Table 2.4: Late Divided Kingdom chronology reconstructed from MT/KR, L and c_2 data (cont.)



Jotham reigned only 16 years (2 Kgs 15:33) followed by Ahaz also with 16 years (16:2). These 32 years run contemporaneously from Jotham's accession in the second of Pekah (15:32) to Hezekiah's accession in the third of Hoshea (18:1), taking in the 29–30 years of Pekah followed by the three years of Hoshea before the king of Assyria laid siege to Samaria.

From these synchronisms we can now find the important date for the fall of Samaria from which to establish the years back to the beginning of the divided kingdom, thus Rehoboam's accession year, and then his fifth regnal year.

The Date of the Fall of Samaria

The Fall of Samaria has to be dated by the regnal years of Shalmaneser V and Sargon II, his successor. It was Shalmaneser V of Assyria who imprisoned his vassal, King Hoshea, because Hoshea had appealed to King So of Egypt for help against Shalmaneser (2 Kgs 17:4). Shalmaneser V reigned from 727 to 722 BCE. Since the Assyrians used post-dating, Shalmaneser V's first regnal year was counted from 726 BCE. He reigned five years. Shalmaneser's successor was Sargon II who became king in 722 with his post-dated first regnal year in 721. It was he, and not Shalmaneser V, who laid siege to Samaria and took it in the ninth year of Hoshea (2 Kgs 17:5-8; 18:10)[31] attested by the Khorsabad Annals for his first three years, 721–719.[32] The regnal years of Shalmaneser V and Sargon II are confirmed by the Assyrian Eponym Canon for the

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[31] Although Shalmaneser is named at 18:9, this is thought to be an appropriation by a copyist who understood that the king who imprisoned Hoshea was the same king as the one who invaded Israel and Samaria, but this king is not named at 17:5.

[32] A. Millard, *The Eponyms of the Assyrian Empire 910-612 BC* (State Archives of Assyria Studies Vol. 2; Helsinki: Neo-Assyrian Text Corpus Project, 1994) 59.

years 728–718.[33] The siege began in 721 BCE; Hezekiah's fourth and Hoshea's seventh years. Their sixth and ninth year, respectively, is 719. The fall of Samaria probably occurred at the beginning of 718 BCE, still 719 in the Assyrian calendar (being three months behind the Julian calendar).[34]

The Years of the Divided Kingdom of Judah and Israel

According to Table 2.4, the fall of Samaria occurred in the calendar year (relative chronology) 263. Thus, 263 years prior to 718 BCE supplies the date of 981 BCE for the commencement of the divided kingdom. Rehoboam's fifth year fell in 977, synchronized with the date for Shoshenq I's 20th year—relevant to clarifying Egyptian chronology. The Early Divided Kingdom encompassed 98½ years, from 981 to 883, and the Late Divided Kingdom 164½ years from 883 to 718 BCE.

Between the beginning and end dates of the Divided Kingdom, chapter 9 in *The Reconstructed Chronology of the Divided Kingdom* also identifies other synchronisms of the period (Table 2.5).

Table 2.5 Significant dates in Ancient Near Eastern history addressed in *The Reconstructed Chronology of the Divided Kingdom*

BCE	
977	Rehoboam's 5th year; Shishak (Shoshenq I) of Egypt campaigns against Judah
897	Ahab's last year and Shalmaneser III's 6th year; battle of Qarqar
885	Shalmaneser III's 18th year and Joram's 10th year; *Iaúa* (Joram) pays tribute to Shalmaneser III
827	Adad-nirari III's 5th year; Joash of Israel pays tribute to Adad-nirari III
773	Shalmaneser IV's 9th year; Menahem pays tribute to Shalmaneser IV
719/718	Fall of Samaria in Hezekiah's 6th year, Hoshea's 9th year, and Sargon II's 3rd year

Reason for Discussing the Judah and Israel Chronology

Discussion of the Hebrew chronology is fundamental to demonstrating that the divided kingdom was some 50 years longer than scholars usually reckon, shifting from the commonly assumed—though incorrect—beginning date of 931 to the more recently corrected date of 981 BCE. A reconstruction of Egyptian chronology must apply the corrected dates for the beginning of the divided kingdom in order to confirm Shoshenq I's 20th year, now proposed as 977 BCE. This date is corroborated by numerous lunar tables provided throughout this work.

This discourse on the chronology of the divided kingdom of Israel and Judah has established that the answer to the divergent chronological data does not lie in unattested dating methods and co-regencies, but in understanding the recensional development of the Greek text of 1 and 2 Kings, and the explanation of variant phenomena. The OG/L and the *kaige*/MT data all derive from what was once a single coherent record of the kings' regnal years and accession synchronisms given in a cross-referencing framework with each king's reign recorded in a strictly chronological sequence. Not until the correct Hebrew chronology is accepted, based on the latest and best research into the *original* data in the Books of 1 and 2 Kings and the years gained from that, will the chronology of Egypt from the 22nd Dynasty down to the 25th conform to the historical situation.

In chapter 1 we noted that there were 100–150 years' discrepancy at the start of the 18th Dynasty between the historical chronologists and the science-based dates. This

[33] H. Tadmor, "The Campaigns of Sargon II of Assur: A Chronological-Historical Study," *JCS* 12 (1958) 94-97.

[34] Tetley, *Divided Kingdom*, 157-64, 186 tab. 9.9; idem, "The Date of Samaria's Fall as a Reason for Rejecting the Hypothesis of Two Conquests," *CBQ* 64 (2002) 59-77. Thiele's date of 723/22 for the fall of Samaria is incorrect (*Mysterious Numbers*[3], 163), and his assertion that "the northern kingdom had come to its end some years before Hezekiah first came to the throne" (201) falsifies the text.

situation still requires further adjustment to the accepted chronology because the incorrect starting date for Shoshenq I is *not the only reason* why the conventional historical chronologies do not agree with the science-based dates derived for the beginning of the 18th Dynasty.

For more than 100 years there has been an ongoing debate about what calendars the ancient Egyptians used (Gardiner, Parker, Spalinger, Depuydt), yet in current literature *on chronology*, the debate scarcely rates a mention. Kings' reigns and key events are dated by calendars. How can Egyptian chronology be established if it is not known what calendar(s) the Egyptians were using to date kings, and lunar and Sothic appearances? Were they all being dated by the same calendar or were there different calendars? This subject occupies the following chapters. Knowing what calendars the ancient Egyptians used is crucial for resolving the chronology of Egypt.

Chapter 3

Investigating Ancient Egyptian Calendars

Much has been written about the calendars that the ancient Egyptians used, and none as perplexing as the calendar on the Ebers papyrus mentioned in chapter 1 and again here. Because scholars could not understand how to interpret its columns and its Sothic date in the ninth year of Amenhotep I it was virtually "disallowed" at the Gothenburg Colloquium in 1987 as a tool to aid chronology.

The Ebers calendar is a critical piece of evidence for the dating of the early 18th Dynasty. It must be correctly understood and not disallowed, as Kitchen suggested was the position of "most opinion" in the late 1990s.

Interest surrounds the dating of Amenhotep I because his reign preceded that of Thutmose I followed by Thutmose II, Hatshepsut, and Thutmose III; a range of reigns in which scientists have dated the eruption of the volcano Thera in the mid-to-late-17th century BCE updating the early 18th Dynasty by some 100–150 years.

Discussing other calendars used by the Egyptians may reveal how they understood the Ebers calendar. But before discussing the Ebers calendar, it is necessary to understand some fundamental matters, such as the solar or agricultural year based on the Nile phases, the Sothic year and Sothic cycle, the civil calendar, and dating by the use of lunar phases.

Seasonal or Agricultural Calendar

For the ancient Egyptians, the agricultural year began with the flooding of the Nile when heavy summer rains and melting snow brought silt-laden water down from East Africa and the Ethiopian highlands.[1] The inundation provided them with rich, friable soil, essential for the planting and growing of crops. When the Nile overflowed its banks, this first season of the year was known as *akhet* (*3ḫt*) or "inundation" lasting approximately four months—I *3ḫt,* II *3ḫt,* III *3ḫt,* IV *3ḫt*—from June to September in our Gregorian calendar; somewhat later in the Julian calendar—the calendar used to date ancient Egypt. When the waters had receded and land emerged, crops were planted and this season was known as *peret* (*prt*) "emergence", approximately October to January—I *prt,* II *prt,* III *prt,* IV *prt*—the Egyptian winter. In the third season, *shomu* (*šmw*), "harvest", crops were gathered, lasting from about February to May—I *šmw,* II *šmw,* III *šmw,* IV *šmw*—the Egyptian summer.[2]

These phases gave their names to the three seasons, which approximately, but not exactly, corresponded in length to the solar year: the time it takes the Earth to orbit around the Sun from one starting point until its return to that same point.

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[1] W.M. O'Neil, *Time and the Calendars* (Sydney: Sydney University Press, 1975) 70.

[2] See H.E. Winlock, "The Origin of the Ancient Egyptian Calendar," *Proceedings of the American Philosophical Society* 83 (New York: Metropolitan Museum of Art, 1940) 452; A.J. Spalinger, "Calendrical Evidence and Hekanakhte," *ZÄS* 123 (1996) 90 and sources cited in n. 26; R. Krauss, "Dates Relating to Seasonal Phenomena and Miscellaneous Astronomical Dates," *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006) 369.

Civil Calendar

The so-called civil calendar was based on the three seasons of the Nile, each of four months of 30 days, plus five epagomenal (extra) days added to give it 365 days. It is not clear when the five days were added as there are indications that the Egyptians may once have had a year of 360 days.[3] In computing the Egyptian calendar, as we will see in Casperson's tables throughout these chapters, the five epagomenal days appear as days 1–5 in month 13.

It will help newcomers to Egyptology to make themselves a simple chart like the one below (Table 3.1) to compare the months as reckoned by the Julian calendar,[4] as used in Egyptian studies with the 12 months plus 5 days of the Egyptian civil calendar.

Table 3.1: Chart of Julian calendar months plus five days of the Egyptian civil calendar

Month		Season\month	Days	
1	I	Akhet = *3ḫt*	1–30	
2	II	Akhet = *3ḫt*	1–30	
3	III	Akhet = *3ḫt*	1–30	
4	IV	Akhet = *3ḫt*	1–30	
5	I	Peret = *prt*	1–30	
6	II	Peret = *prt*	1–30	
7	III	Peret = *prt*	1–30	
8	IV	Peret = *prt*	1–30	
9	I	Shomu = *šmw*	1–30	
10	II	Shomu = *šmw*	1–30	
11	III	Shomu = *šmw*	1–30	
12	IV	Shomu = *šmw*	1–30	
13			1–5	Epagomenal days

The Solar Year

In fact, the solar year consists of about 365.25 days. The inconsistency of the Egyptian civil calendar described above led, in due course, to the adoption of the Julian calendar, and ultimately to the Gregorian calendar used today.

While the solar year governs the seasonal agricultural cycle, the timing of the inundation or flooding of the Nile could vary by several months from one year to the next,[5] and was no reliable indicator of the beginning of the solar year. The civil calendar would stand alone as an independent record of the passing of time. Yet a civil calendar composed of 365 days instead of 365.25 days would also fall behind the realities of time dictated by our solar system. The Egyptians had a better indicator of the passage of long periods of time than their civil calendars (of 365 days) or the variable arrival of the inundation.

The helical rising of the star Sothis provided an assured signal every year of the beginning of the new solar year. It kept to the strict solar timetable of 365.25 days, but its appearance was recorded on a calendar composed of only 365 days. As a result, the heliacal rising of Sothis would appear on the same day for four years then on the next day of the civil calendar for the next four years, and so on. It would take approximately 1460 years for the Sothic cycle to once again be synchronized with the civil calendar. This is explained further shortly, but first a significant complication needs to be

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[3] See A.J. Spalinger, "Some Remarks on the Epagomenal Days in Ancient Egypt," *JNES* 54 (1995) 33-34. See also idem, "Month Representations," *Cd'É* 70 (1995) 113 n. 14, 114. The temple day was described as 1/360th part of the year on a tomb at Asyûṭ (A.H. Gardiner, "The Problem of the Month-Names," *Rd'É* 10 [1955] 20, 24) where tombs from the 9th, 10th, and 12th Dynasties were found.

[4] The later Gregorian Calendar used today adjusted for the time needed every 400 years to accommodate minor differences not dealt with by the quadrennial leap year.

[5] The beginning of inundation could vary from 335 to 415 days, according to Winlock, "Origin," 452.

mentioned, because the failure to recognize it has led to the disarray that exists throughout Egyptian chronology.

Seasonal Dates Differed in Upper and Lower Egypt

The inundation of the Nile took place earlier at Egypt's southern border near the first cataract at Elephantine (modern Aswan) where the lowest water occurred about the end of May. Rising slowly at first, the flood reached its height about the beginning of September in Upper Egypt and arrived at the Delta some time later.[6] Krauss writes:

> There are 34 maximum [flood] dates for Aswan on record, the earliest is August 18, the latest October 1, yielding maximum dates for Luxor between August 21/22 and October 4/5. Based on a comparison of the dates at Aswan and Roda [old Cairo], it follows that the maximum gauge occurred between 4 days (1882) and 63 days (1894) at Roda later than at Aswan.[7]

The difference in the arrival time of the Nile flood at the southern border of Egypt, and its arrival in the Delta, would have delayed the agricultural seasons accordingly. This has significance for our later discussion.

The Rising of Sirius was a Better Sign of the New Solar Year

A more exact marker of the new solar year was the annual reappearance of Sirius, the brightest star in the eastern sky just before sunrise, signalling the solar induced climatic seasons of the agricultural year.

Sirius, the Dogstar in the constellation of Canis Major, was known to Egyptians as *Spdt* after their goddess Sopdet, and as Sothis by the Greeks. As the Earth orbited around the Sun, Sirius could be observed for all but the 70 days of the year when it was obliterated from view by the Sun's light. Its reappearance came predictably every 365¼ days, known as its heliacal rising. It was a reliable indicator of the beginning of the solar year, and that the anticipated inundation beginning the agricultural cycle was near.

The striking reappearance of Sothis after 70 days was an expected event because the ancient Egyptians scrupulously observed the stars that were seen above the horizon throughout the year. Sirius was preceded by the constellation of Orion. R.A. Wells writes: "The red giant at the left shoulder of the figure of Orion, Betelgeuse (α Ori), and the slightly fainter, bluer star in the right leg, Rigel (β Ori), rise close together in time. When they are high enough in the sky so that Sirius can just be seen rising, the 3 stars together form a very distinctive triangle pointing downwards."[8] Together with other attendant stars the rising of Sirius was eagerly awaited and celebrated by the ancient Egyptians.

The "Going up of Sothis"

This "going up of Sothis" could be seen by the naked eye in Egypt's cloudless summer sky, but its observation depended on the arc of vision (*arcus visionis*). That is:

> The angle between Sirius and the sun when the star is first observed. The point of observation is not on the horizon, where observation is impossible. Modern calculations show that this angle is 7.5 degrees, with Sirius two degrees above the horizon, the sun

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[6] Winlock states that it arrived about a month later, ("Origin," 452), while Spalinger cites 10 days ("Calendrical Evidence," 90). V. Hankey says, "It took 12 days for the first sign of the Nile flood, which was observed in the cataract at Elephantine to reach Memphis" (quoted in *High, Middle or Low? Acts of an International Colloquium on Absolute Chronology Held at the University of Gothenburg 20th–22nd August 1987* [ed. P. Åström; Gothenburg: Paul Åström's Förlag, 1989] Pt. 3, 45).

[7] Krauss, "Dates Relating to Seasonal Phenomena," 371.

[8] R.A. Wells, "Re and the Calendars," *Revolutions in Time: Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 11.

> 5.5 degrees below it. Variations in this angle will affect the time of observation, hence the chronological conclusions drawn from the assumption that an ancient heliacal rising was made with one of 7.5 degrees.[9]

> Rita Gautschy writes:
> A realistic value for a successful first sighting of Sirius after its period of invisibility is an apparent altitude of 2° to 3° above the horizon, whereas the effect of refraction should be taken into account. In the following I will always denote that angle between Sun and star as arc of vision for which the star has an apparent height of 2° to 3° and the Sun 6° (7°, 8°, 9°, respectively) below the horizon. This is in contradiction to the classical definition of the arcus visionis, but reflects the true constraints in the sky.[10]

Gautschy notes three main uncertainties in calculating the heliacal risings of Sothis: the Sun's proper motion since Sirius is close to it; the arc of vision is not constant; and the rotation of the Earth decreases over time.[11]

Sothic Year

The Sothic year, understood as the time from one heliacal rising to the next, coincided with the length of the Earth's annual orbit around the Sun of 365.25 days. The "going up" of Sothis was first seen in Egypt at its southern border and was observed a day later for every degree of latitude going north. It stayed on the same day in the civil calendar usually for four consecutive years, occasionally for only three years or even five,[12] before moving on to the next day. In dynastic times the passage of Sothis through the year was recorded using the so-called civil calendar, but being a schematic calendar this was a later invention that we now need to discuss.

This schematic or civil calendar was a quarter of a day shorter than the solar year on which it was based, and, since days are always 24 hours in duration, the extra six hours were not represented in a year. The civil calendar was timed to begin with the heliacal rising of Sothis, which marked the first day of the new year on I *3ḫt* 1.

However, without a leap-year day to correct the ¼ day deficiency, the civil year moved forward of the solar year. Over four years the civil calendar moved forward of the rising of Sothis by one day, and on the fifth to eighth years by two days. Instead of being seen on I *3ḫt* 1 in the civil calendar, it was seen on I *3ḫt* 2. After 120 years the inundation no longer took place (ideally) in the month of I *3ḫt* but began to fall in II *3ḫt*, and after another 120 years in III *3ḫt*, and so on. After approximately 730 years the civil months were displaced by six months from their original positions so that the rising of Sothis and the inundation fell in the middle of the civil year in the months of II-III *prt* of the civil calendar. Sothis took a little less than 1460 years to move through each day of the civil calendar in dynastic times becoming marginally shorter over succeeding centuries.[13]

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[9] W.A. Ward, "The Present Status of Egyptian Chronology," *BASOR* 288 (1992) 58.

[10] R. Gautschy, "The Star Sirius in Ancient Egypt and Babylonia," at http://www.gautschy.ch/~rita/archast/sirius/siriuseng.htm

[11] Ibid.

[12] Ibid.

[13] A Sothic year was a minute longer than a Julian year, and when the difference added up to six hours, Sothis stayed on the same date only three years before moving on to the next day (R. Krauss, "Egyptian Sirius/Sothic Dates, and the Question of the Sothis-Based Lunar Calendar," *AEC* (2006) 441; M.F. Ingham, "The Length of the Sothic Cycle," *JEA* 55 (1969) 36-40.

When the rising of Sothis again coincided with I *3ḫt* 1 the Sothic cycle recommenced. The four years on which the heliacal rising appears on the same date is known as a quadrennium or a tetraeteris.

Date of the Rising of Sothis Differs at Different Latitudes

However, the heliacal rising of Sothis is not seen on exactly the same day throughout Egypt in any given year. It is seen first in the south near Elephantine with a latitude of 24.06°. For every degree moving north, the sighting is one day later, so that at Thebes with a latitude of 25.7° it is about two days later, and at Memphis with a latitude of 29.9° it is seen about six days later than at Elephantine. Wells explains the difference that latitude makes.

> Because the inclination of the ecliptic is greater relative to the level horizon at lower altitudes, the farther south the observation site, the earlier Sirius will be seen to emerge from solar occultation with a large enough elongation. In a given year, such a heliacal rising of Sirius would occur about four days earlier at Thebes, and about six days earlier at Elephantine, than at Memphis. Moreover, before sunrise the angular depression of the sun below the horizon (assumed to be level and free of clouds) at the moment of first stellar sighting is greater at latitudes nearer the equator than at higher latitudes.[14]

For example, Amenhotep I had a Sothic heliacal rising dated to III *šmw* 9 (the 9th day of the 11th month) in his ninth regnal year. This is the Ebers calendar date that we look at below. If this heliacal rising was observed at Thebes, because of the effects described by Wells, it would not be seen until about four days later at Memphis, when the date will be III *šmw* 13, because the Sothis rising stays on the same day for four years. The four days difference between Thebes and Memphis means that the passage of Sothis through the civil calendar will take about 16 years to move from III *šmw* 9 to III *šmw* 13. If the Sothic rising is seen at Thebes on a certain day of the civil calendar, the civil calendar or Julian date attributed to it at Memphis will be 16 years later.

The latitude of the northern coast of the Nile Delta is 31.33°. The distance between Elephantine and the Delta coast, being about 7° in latitude, amounts to a period of about 28 years in the Sothic cycle. Krauss notes that in the 28th century BCE Sothis rose 8–10 days later at the Mediterranean coast than at Elephantine.[15] It is always important to know where a specific heliacal rising was seen from. As noted previously, in the 1980s scholars spoke of a "high" date for Memphis, a "middle" date for Thebes, and a "low" date for Elephantine.[16] The "low" date of Elephantine is now favored, setting Ramesses II's accession date in 1279, rather than earlier options of 1290, or 1304. But this date is not compatible with the science-based dates for the early 18th Dynasty. We shall examine the dates for Ramesses II's reign later.

Sothic Dates and Kings' Regnal Dates

The heliacal rising of Sothis is dated by the civil calendar to a specific regnal year in the reign of a number of kings. When the dates of two Sothic risings are known, dated to specific regnal years of two kings in the same place, it is possible to determine the number of years between the two dates because it usually took four years for Sothis to move one day in the civil calendar.

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[14] R.A. Wells, "Some Astronomical Reflections on Parker's Contribution to Egyptian Chronology," *Egyptological Studies in Honor of Richard A. Parker: Presented on the Occasion of His 78th Birthday* (ed. L.H. Lesko; Hanover and London: University Press of New England, 1986) 170 n. 13.

[15] R. Krauss, "Egyptian Sirius/Sothic Dates," 440.

[16] *"High, Middle or Low?" Acts of an International Colloquium on Chronology held at the University of Gothenburg, 20th–22nd August 1987.*

For example, the Sothic rising in Amenhotep I's ninth year (early 18th Dynasty) dated to III *ŝmw* 9 and an earlier Sothic rising in the seventh year of Sesostris III (mid-12th Dynasty) dated to IV *prt* 16 shows that there is approximately 336 years between them. (The number of days between the two dates amounts to 84, and each day represents four years in the Sothic cycle). The individual reigns of the kings between these two dates, as derived from historical records, ought to agree with this span of years. Once the reign of one king associated with a helical rising is dated to a specific Julian date, it is theoretically possible to date other kings with heliacal risings associated with their reigns, assuming that the place of observation is the same for the others kings. If the rising of Sothis is observed from another location the difference in latitude must be taken into account.

The Julian dates to be attributed to the sightings of the heliacal risings also depend on whether the civil calendar has remained unchanged through the centuries or whether there has been an alteration to it at some time. A new Sothic cycle is known to have begun in 139 CE on I *3ḫt* 1 (see "Sothic Cycle ends/begins in 139 CE" in chapter 10). It is assumed by most scholars that one can calculate back nearly 1460 years to the beginning of the previous Sothic cycle, and another 1460 years for the beginning of its preceding cycle. However, this assumes that there had always been only one civil calendar, without change, over the centuries and that the recordings of the heliacal risings of Sothis have not been affected by any change—a precarious assumption as we shall see in chapter 10.

Amenhotep I's Ninth Year Reported at Thebes?

It is relevant to note that the Ebers papyrus recording the heliacal rising in Amenhotep I's ninth year was found *in Thebes* where Amenhotep resided. That suggests the observation was made in that vicinity. But the heliacal rising recorded in 139 CE is attributed to *Memphis*.

Most scholars presently reckon on an unchanged continuum of civil calendars and Sothic cycles, assuming that the date of III *šmw* 9 was recorded by the same calendar that recorded the one of I *3ḫt* 1 in 139 CE.[17] Krauss suggests that a shift was made from Upper Egypt to Memphis possibly in the 4th century BCE. (30th Dynasty).[18] A change did occur, but not at the time that Krauss assumes, as I will show.

The Civil Calendar

The civil calendar was given month-names. The origin of the names is uncertain and disputed. We shall discuss the early Egyptian month-names later, but in the Greco-Roman period they were given Greek pronunciation, as below.

I to IV *3ḫt*: Thoth, Phaophi, Hathor, and Choiak;
I to IV *prt*: Tybi, Mechir, Phamenoth, and Pharmouthi;
I to IV *ŝmw*: Pachons, Payni, Epiphi, and Mesore.

This calendar of three seasons was reformed in 238 BCE when Ptolemy III Euergetes I issued a decree in Canopus (near present-day Alexandria) requiring that every fourth year the Egyptian civil calendar should have a sixth epagomenal day. This decree was not generally implemented. In 46 BCE, the Roman Emperor, Julius Caesar, in consultation with the Alexandrian astronomer, Sosigenes, reformed their Roman calendar. The new calendar became known as the Julian calendar and added a 29th day to February every fourth year, giving the year 366 days.

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[17] Krauss, "Egyptian Sirius/Sothic Dates," 440.
[18] Ibid., 444.

It was not until 25 BCE, in the rule of the Emperor Augustus, that the Egyptians changed their civil calendar to include the leap-year day. The first day of this calendar, known as the Alexandrian, corresponded to the 29th day of August in the Julian calendar.

However, the Julian and Alexandrian calendars did not take into account that the solar year was 11 minutes shorter than the 365.25 day year, and over time it was realized that the years were too long and needed to be modified. In 1582, Pope Gregory XIII decreed that three leap-year days would be omitted every 400 years, in years evenly divisible by 100 but not by 400, as in 1700, 1800, 1900 but not 2000. This Gregorian calendar, now in use in many countries, is reckoned from January 1 and keeps in step with the seasons. However, it is the Julian calendar with its 365¼ days every year that is used to reconstruct ancient Egyptian chronology.

Dates of Heliacal Rising of Sirius (Sothis) Relating to Egyptian Kings

Modern computer programs can now calculate the heliacal rising of Sothis at any given location in Egypt going back over many millennia. Jean Pierre Lacroix provides tables in his HELIAC program for the heliacal rising (and setting) of Sothis and other stars seen from any location in Egypt over many millennia using the Julian or Gregorian calendars. For example, in 2000 BCE, using an altitude of 2° at Thebes (long. 32.6°; lat. 25.7°) Sothis rose heliacally on July 11, and at Memphis (long. 31.2°; lat. 29.9°) on July 16, and slowly changed so that it occurred on July 16 at Thebes and July 20 at Memphis in 139 CE. [19] However, Lacroix does not reference the rising of Sothis to Egyptian dates.

Gautschy provides tables from which one may download dates for the heliacal risings of Sothis at any location in Egypt with a range of options for the altitude and arc of vision from 3000 BCE to 2000 CE with Julian calendar dates converted to Egyptian calendar dates.[20] This gives a range of possible dates for the heliacal rising of Sothis in any one year so the appropriate altitude and arc of vision is important in order to obtain the correct date.

Some of the heliacal risings of Sothis discussed in this present work are shown in Table 3.2. (Question marks indicate that the dates are not recorded or preserved.)

Table 3.2: Heliacal risings of Sothis relating to Egyptian kings

5th Dynasty	1st or 2nd year of Neferefre on I *3ḫt* 1 at Abusir (near Memphis) based on a *w3gy* feast date on III *prt* 11
11th Dynasty	[1st] year Mentuhotep II on II *prt* 21, on coffin of Ashyat at Illahun
12th Dynasty	7th year Sesostris III on IV *prt* 16 at Illahun
17th Dynasty	11th (or 31st) year of unnamed king on II *ŝmw* 20 in Western Desert at Gebel Tjauti (this may be a new moon date not a Sothic date)
18th Dynasty	9th year Amenhotep I on III *ŝmw* 9 at Thebes; [? 33rd] year Thutmose III on III *ŝmw* 28 at Elephantine
19th Dynasty	41st year of Ramesses II on I *3ḫt* 22 at Thebes; 2nd or 4th year of Merenptah on 1 *3ḫt* 29 at Thebes
20th Dynasty	[?] year Ramesses III on I *3ḫt* [?]
Greek period	9th year Ptolemy III Euergetes I in 238 BCE on II *ŝmw* 1 at Canopus (near Alexandria); 11th year Ptolemy IV Philopator in 211 BCE on II *ŝmw* 7 at Memphis
Roman period	A new Sothic cycle started on I *3ḫt* 1 during the second consulate of Emperor Antoninus Pius and Bruttius Praeses in 139 CE at Memphis. In 238 CE, Sothis rose heliacally 100 years after 139 CE cited by Censorinus

[19] J-P. Lacroix, "Heliacal rising of Sirius in Thebes," http://www.ancientcartography.net/LEVERheliaqueAN.html

[20] R. Gautschy, "The Star Sirius in Ancient Egypt and Babylonia," http://www.gautschy.ch/~rita/archast/sirius/siriuseng.htm

The dating of these Sothic risings will depend on what calendar or calendars were used by the Egyptians—and whether they were all dated by the same calendar over the course of dynastic history. In an effort to answer that question, we turn first to determine what calendar(s) the Egyptians used *before* the civil calendar—or before civil *calendars*—came into existence.

Early Calendars Disputed

Evidence from calendar citations in ancient sources led scholars throughout the last century to attempt various explanations. The chronological puzzles and the controversies they have generated will be considered in depth in future chapters. Here, I offer a brief survey of significant viewpoints.

Two Civil Calendars?

Sir Alan Gardiner (1879–1963), a renowned Egyptologist, contended over 100 years ago that there were *two civil* calendars used in ancient Egypt: an early and a late calendar that ran simultaneously and overlapped each other so that the months of the later calendar were always one month behind those of the earlier calendar.

He assumed that Mesore was the first month of the earlier calendar and the last month of the later and the other 11 months followed suit.[21] Opposing Parker's idea in 1955 that the Egyptians had used an original lunar, a civil, and a later lunar calendar, Gardiner maintained that the month-names for both calendars were civil, with the festivals associated with various months having been moved back to the next month from the earlier to the later calendar. This accounted for the fact that some festivals had two dates one month apart.

He did not believe in Parker's lunar calendar.[22] Gardiner's and Parker's views will be discussed at length in later chapters.

Lunar Calendar(s)

The idea that the ancient Egyptians had originally used a lunar calendar was suggested by Heinrich Brugsch (1827–1894) and developed by Ludwig Borchardt (1863-1938). But the main proponent has been Richard A. Parker. Parker wanted to find the calendar behind the fourth century BCE 25-year cycle of new moons dated to the civil calendar on the Carlsberg 9 Papyrus (see chapter 5) and worked back to try to find evidence for an original lunar calendar.[23]

In 1950, he proposed that the ancient Egyptians had used an original lunar calendar, followed by a *civil* calendar, and then a *later lunar* calendar.[24] He wrote, "The season of inundation, and with it the year, would begin, we may suppose, with the lunar month which started after the river first began to rise, and the year would then run until the next inundation."[25] Then he writes:

> Primitive man, with the lunar month as his unit of time, would soon come to the realization that, while the interval between successive floods was highly variable, the interval between successive risings of Sothis was practically constant. Sothis' rising,

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[21] A.H. Gardiner, "Mesore as First Month of the Egyptian Year," *ZÄS* 43 (1906) 136-44.

[22] A.H. Gardiner, "The Problem of the Month-Names," *Rd'É* 10 (1955) 22-25.

[23] R.A. Parker, "The Problem of the Month-Names: A Reply," *Rd'É* 11 (1957) 92; O'Neil, *Time and the Calendars*, 66; R. Krauss, "Lunar Days, Lunar Months, and the Question of the 'Civil-Based' Lunar Calendar," *AEC* (2006) 389.

[24] Idem, *The Calendars of Ancient Egypt* (SAOC 26; Chicago, IL: Oriental Institute of the University of Chicago, 1950) 30-50; idem, "The Calendars and Chronology," *The Legacy of Egypt* (ed. J.R. Harris; Oxford: Clarendon, 1971) 13-26.

[25] Ibid., 32 §156.

> then, could be used as a point of departure for a calendar of lunar months with three seasons, a calendar completely agricultural and based on the Nile and governed by Sothis only because Sothis itself had come to be the herald of the Nile. A few decades of trial and error would certainly be sufficient to work out the simple rule of intercalation, so that the event of *wp rnpt* would be maintained properly in the last month of the year.[26]

By the "event of *wp rnpt*" he means the heliacal rising of Sothis. Parker proposed that an intercalary month was inserted whenever the first day of the lunar year fell before the first day of the civil year.[27] This was assumed necessary in order to keep the "great feast of the rising of Sothis, called *wep renpet*, 'opener of the year', … [in] the last month of the year … It was necessary therefore to arrange a calendar which would keep this event properly within the month which it named."[28]

Parker rejected Gardiner's idea that there had been two civil calendars. He assumed that the month-names for the civil calendar derived from an original lunar calendar, and that the appearance of festivals being held out of their eponymous months (the months that the festivals were named after) was due to the time that the month-names were transferred from the lunar to the civil calendar. He proposed a later lunar calendar introduced after the inauguration of the civil calendar to account for the fact that several of the annual festivals had two dates one month apart, one being a fixed date, and the other moveable, based on a lunar date moving in the civil calendar.[29]

Parker sought to support his theory by various lines of argument, which we shall look at in greater detail when we come to the Gardiner/Parker controversy. Based on Parker's arguments, most Egyptologists now accept that the first calendar of the ancient Egyptians was a lunar calendar, and it is little wonder that most Egyptologists dismiss the Ebers calendar from consideration, or that the puzzles in ancient Egyptian chronology remain unsolved.

A Schematic Calendar Based on the Sun-god Re

R.A. Wells proposed another theory that takes into account Parker's idea of a lunar calendar. He noted that in Upper Egypt, the rising of Sothis was celebrated at the beginning of the solar/agricultural year in an annual festival known as *prt Spdt* "the going forth of Sopdet."[30] However, in Lower Egypt the people celebrated the birth of Re, the sun-god, in the 12th month of the year.

Wells postulated two early calendars: a southern lunistellar calendar in Upper Egypt and a northern lunisolar calendar in Lower Egypt. He proposed that the sky mythology associated with the sun-god Re and the goddess Nut correlated with solar positions in the Milky Way, placed Re's conception at the spring equinox just before he entered the mouth of Nut. Nine months later (272 days in 3500 BCE[31]), Re exited at Nut's birth canal at the winter solstice.[32] Six months later, Re arrived at the summer solstice, at about the time of the rising of Sothis in Upper Egypt. Re's mythical travel through the horizons took 365 days or one solar year, understood as the time it took Re

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[26] Ibid., 32 §157.

[27] Ibid., 26 §126; idem, "Calendars and Chronology," 15-16; A.J. Spalinger, "Thoth and the Calendars," *Revolutions in Time*, 45-47.

[28] Parker, "Calendars and the Chronology," 15.

[29] Idem, *Calendars*, 54, §§269-72; 58, §290.

[30] Wells, "Re and the Calendars," 1, 20.

[31] Idem, "The Goddess Nut, Pharaoh's Guarantor of Immortality," *VA* 10 (1995) 208 and n. 8.

[32] Idem, "The Mythology of Nut and the Birth of Ra," *SAK* 19 (1992) 305-21; idem, "Re and the Calendars," 4-9; idem, "Goddess Nut," 205-14.

to make a round trip from Upper Egypt to Lower Egypt and back, or from winter solstice to winter solstice.[33]

The 12th month of the civil calendar in Lower Egypt was named Re Horakhty (*R^c-Ḫr-3ḫty*), that is, "Re Horus of the Two Horizons," inferring Re's year-long travel through the skies. According to Wells, the lunistellar calendar of Upper Egypt took precedence over the lunisolar calendar of Lower Egypt and the two calendars amalgamated before the emergence of the civil calendar.

In Pharaonic Egypt, Re's feast was celebrated at about the same time as *prt Spdt* in Upper Egypt, that is, at the time of the summer solstice, assumed to be a "secondary birthplace."[34] This was an appropriate time for Re, the sun-god, to be worshipped as the personification of the Sun.

In the Greco-Roman Period, the 12th month was called Mesore, from Egyptian *mswt R^c*, "the birthday of Re." When it was seen that the lunar calendar over time did not keep in step with the seasons, the Egyptians introduced a schematic calendar, the so-called civil calendar, which was based on the lunistellar calendar.[35] Wells adopted Parker's view of the lunar and civil calendars, both having *R^c-Ḫr-3ḫty* as a substitute for *wp rnpt* as the 12th month,[36] even though *wp rnpt* means "the opener."

Though Parker theorized a second, later, lunar calendar—to make up for the slippage after 200 years between the original lunar and the civil calendar, and to account for feasts with two dates a month apart, Wells pointed out that there is no textual evidence of any kind for a later lunar calendar.[37] He recognized one lunar and one civil calendar and proposed that the "dual calendar system co-existed throughout the remainder of Egyptian history until it was supplanted by the Julian calendar and later Alexandrian calendar reforms."[38]

A Calendar Based on the Stars

One of the earliest attested methods that Egyptians used to tell the passage of time was by observing the night positions of the stars, or decans as they were called. A new decan arose every 40 minutes, making it possible to divide the night sky into sections.[39] There were two decanal systems: the original one used the heliacal risings of certain stars or star groups, and the later one used meridian transits, being the time at which the decans reached the highest point in the sky; that is, the meridian.

The first system consisted of 36 stars used as markers on the eastern horizon, After an invisibility of 70 days, each star rose heliacally 10 days after the preceding star, thus marking a period of 10 days.

The pictorial representation of the decans in 36 columns, where the first is replaced by the second and so on, each moving upwards a row and from right to left every "ten days" gave the appearance of a diagonal line, thus their misnomer: "diagonal star calendars." These star clocks represented the year of 360 days, having 12 months of three decades (or three weeks of 10 days) as in the civil calendar.[40]

The five epagomenal days (that is, the five days remaining after the 360th at the end of the year) were treated separately as days of festivity for the five deities they

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[33] Ibid., 312; idem, "Goddess Nut," 205-14.
[34] Idem, "Re and the Calendars," 22.
[35] Ibid., 21-23.
[36] Ibid., 25, table 1.
[37] Ibid., 27.
[38] Ibid.
[39] See J.G. Read, "Placement of El-Lahun Lunar Dates and Resulting Chronology," *DE* 33 (1995) 105-6.
[40] Read, "Placement of El-Lahun Lunar Dates," 105-6.

represented: Osiris, Isis, Horus, Seth, and Nephthys. The first system was found drawn or carved on coffin lids primarily from the Middle Kingdom (11th and 12th Dynasties) when the civil calendar was already established, though the origin of the decans may have gone back much earlier. The second system was introduced when the earlier system was no longer useable because the ¼ day extra to the 365 days of the year was not accommodated by the civil calendar, so that by about the time of the 12th Dynasty the civil calendar was not synchronized to the decans. The new system used mostly different decans from the first system, and measured hours by means of the transits in half-monthly intervals, so that there were 24 half-month periods to every year.

The earliest surviving star clock is depicted on the southern ceiling of the tomb of Senmut,[41] vizier to Queen Hatshepsut (early 18th Dynasty). Senmut had two tombs, one at Sheikh Abd el-Qurna (TT71), and a larger one situated just east of Hatshepsut's mortuary temple at Deir el-Bahri (TT353). The latter has astronomical ceilings, with star maps on the southern and northern panels of the ceiling, but the tomb itself was never finished. On the southern ceiling, the decans are shown from right to left, Sirius, no. 36, is drawn just above the horizon, the last and most important of the decans.[42]

In addition to decans, the star clocks exhibited stars and other deities. Referring to the astronomical ceiling of Senmut's tomb, Ove von Spaeth claimed that judging from the positions of the planets at conjunction, with Mars significantly placed by itself on the extreme right and the possibility of a faint solar eclipse depicted in the same year, that the star map points to a specific time: 7th May 1534 BCE.[43]

Earlier scholars, however, suggested it was copied from a star clock dating from 400 years previously (presumed to be at the end of the 12th Dynasty).[44] It remains to be seen whether Spaeth's recent analysis and date of the star clock can be corroborated by, and correlated with, other chronological data.

Similar star conjunctions to that of Senmut's tomb appear on star maps of Amenhotep III, Seti I, and Ramesses II.[45] In addition, later astronomical *calendar* depictions appear also on the ceiling of the tomb of Ramesses VI, Ramesses VII, and Ramesses IX, of the 20th Dynasty. Water clocks, such as that of Amenhotep III, eventually replaced star clocks, which I explain later.

The decanal clocks show that, from early on, the Egyptians used star patterns to tell time during the night hours and the length of a year, and specifically that of the star Sirius whose heliacal rising was used as the harbinger of the solar year and coming inundation. Parker asserted that their calendar depictions of deities with month-names represented a *lunar* calendar, but this is contested by Anthony Spalinger. I examine their views later. With this succinct overview, I will now briefly introduce the calendar on the Ebers papyrus, leaving a fuller discussion to a later chapter.

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[41] See O. Neugebauer and R. Parker, *Egyptian Astronomical texts* III. *Decans, Planets, Constellations and Zodiacs* (Providence, RI: Brown University Press, 1969) 10.

[42] Ove von Spaeth, "Dating the Oldest Egyptian Star Map," *Centaurus International Magazine on the History of Mathematics, Science and Technology* 42 (Blackwell, 2000) 164. Also: at http://www.moses-egypt.net/star-map/dating_the_senmut_star_map.pdf

[43] Ibid., 159-179; date from p. 173. See star maps depicted on pp. 160 and 161.

[44] See, e.g., Neugebauer and Parker, *Ancient Egyptian Astronomical Texts*, III, 118; R. Krauss, Excursus 3, "Läst sich die astronomische Decke im Senenmut-Grab für die absolute Thutmosiden-Chronologie auswerten?" in "Das Kalendarium des Papyrus Ebers und seine chronologische Verwertbarkeit," *Ä und L* 3 (1992) 93-96.

[45] Von Spaeth, "Dating the Oldest Egyptian Star Map," 170.

The Ebers Calendar

The Ebers calendar (shown here in Figure 3.1), arguably the most famous calendar of ancient Egypt, is inscribed on a medical papyrus bought in Luxor by the German Egyptologist Georg Ebers in 1873—hence its name. Ebers bought the papyrus from an American dealer, Edwin Smith, acting on behalf of its owner who had access to it as early as 1862. The papyrus was wrapped in old mummy cloths and was in an excellent state of preservation.[46] It is 30 cm high and about 20 meters long.[47] Written in Egyptian hieratic script, it has 108 columns each containing 20–22 lines of text relating to a medical condition, possibly diabetes, and ends in a calendar on the first column of the verso.[48] Initially published in German by Heinrich Brugsch in 1870,[49] the papyrus now resides in the University of Leipzig library.

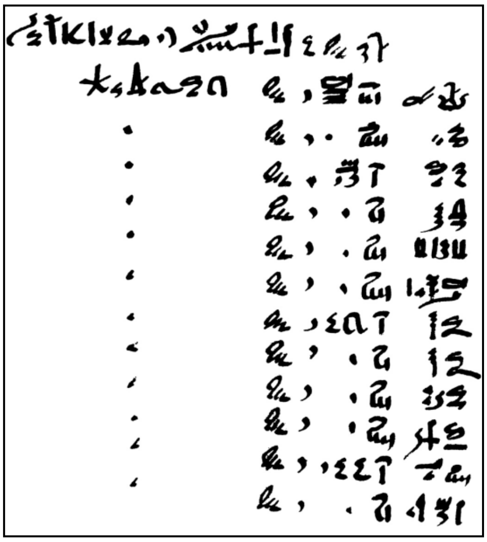

Figure 3.1: The Ebers calendar.

A hieratic copy is displayed above (Figure 3.1),[50] and a hieroglyphic transliteration[51] of the calendar with an English translation is displayed in Figure 3.2. In the original, the calendar is written from right to left, but for our orientation its columns are arranged from left to right.[52]

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[46] M. Clagett, *Ancient Egyptian Science, Vol. 2: Calendars, Clocks, and Astronomy* (Philadelphia, PA: American Philosophical Society, 1995) 193; L. Depuydt, "The Function of the Ebers Calendar Concordance," *Orientalia* 65 (1996) 61; S. Carpenter et al., *An Interlinear Transliteration and English Translation of Portions of the Ebers Papyrus Possibly having to do with Diabetes Mellitus* (Annandale-on-Hudson, NY: Bard College, 1998) 3.

[47] A.J. Spalinger, "Dates in Ancient Egypt," *SAK* 15 (1988) 257.

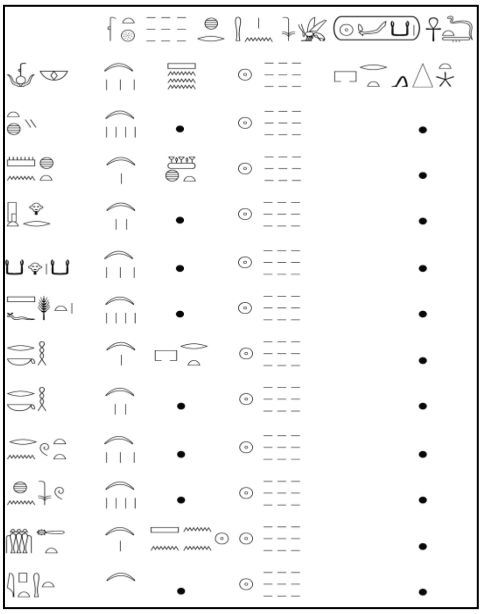
[48] Carpenter et al., *Interlinear Transliteration*, 3.

[49] H. Brugsch, "Ein Neues Sothis-Datum," *ZÄS* 8 (1870) 108-11.

[50] Copied from Krauss, "Das Kalendarium des papyrus Ebers," 76.

[51] Copied from Depuydt, "Function and Significance," 119 (unattributed). Other references cite K.H. Sethe, "Urkunden der 18. Dynastie," Vol. 1 of *Urkunden des aegyptischen Altertums*, 44.

[52] For a description and discussion of the Ebers calendar, see, e.g., L. Borchardt, *Die Mittel zur Zeitlichen Festlegung von Punkten der Ägyptishcen Geschichte und ihre Anwendung* (Quellen und Forschungen zur Zeitbestimmung der Ägyptischen Geschichte; Band 2; Kairo: Selbsterverlag, 1935) 19-29; Parker, *Calendars*, 37-42, §§188-219; idem, "The Sothic Dating of the Twelfth and Eighteenth Dynasties," *Studies in Honor of George R. Hughes, Jan 12, 1977* (eds. J.H. Johnson and E.F. Wade; SAOC 39; Chicago, IL: Oriental Institute of the University of Chicago, 1976) 185-86; E. Hornung, *Untersuchungen zur Chronologie und Geschichte des Neuen Reiches* (Ägyptologische Abhandlungen 11; Wiesbaden: Otto Harrassowitz, 1964) 14-23; idem, "'Lang oder kurz?' - das Mittlere und Neue Reich Ägyptens als Prüfstein," *High, Middle or Low?* (Pt. 1) 27, 31-32; R.D. Long, "A Re-examination of the Sothic Chronology of Egypt," *Orientalia* 43 (1974) 266-68; K.A. Kitchen, "The Basics of Egyptian Chronology in Relation to the Bronze Age," *High, Middle or Low?* (Pt 1) 42; R. Krauss, *Sothis- und Monddaten* (HÄB 20; Hildesheim: Gersternberg, 1985) 104-16; idem, "Das Kalendarium des Papyrus Ebers und seine chronologische Verwertbarkeit," *Ä und L* 3 (1992) 75-85, 96; U. Luft, "Noch Einmal zum Ebers-Kalender," *GM* 92 (1986) 69-77; idem, "Remarks of a Philologist on Egyptian Chronology," *Ä und L* 3 (1992) 112-13;"W. Helck's paper," *High, Middle or Low?* (Pt. 3) 40-45; J. von Beckerath, "Das Kalendarium des Papyrus Ebers und das Sothisdatum vom 9. Jahr Amenophis' I.," *SÄK* 14 (1987) 72-33; idem, "Das Kalendarium des Papyrus Ebers und die Chronologie des ägyptischen Neuen Reiches. Gegenwärtiger Stand der Frage," *Ä und L* 3 (1992) 23-27; W. Barta, "Das Kalendarium des Papyrus Ebers mit der Notiz eines Sothisaufgangs," *GM* 101 (1988) 7-12; W. Helck, "Erneut das angebliche Sothis-Datum des Pap. Ebers und die Chronologie der 18. Dynastie," *SÄK* 15 (1988) 149-64; A.J. Spalinger, "Dates in Ancient Egypt," *SAK* 15 (1988) 255-58;



Year 9 under the majesty of the king of Upper and Lower Egypt Dsr-k3-Rc may he live forever			
wp rnpt	III šmw	day9	going up of Sothis
ṯḫy	IV	day9	•
mnḫt	I 3ḫt	day9	•
ḥwt ḥr	II	day9	•
k3 ḥr k3	III	day9	•
šf bdt	IV	day9	•
rkḥ wr	I prt	day9	•
rkḥ nds	II	day9	•
rnnwtt	III	day9	•
ḫnsw	IV	day9	•
ḫnt ḫt	I šmw	day9	•
ỉpt ḥmt	II	day9	•

Figure 3.2: The Ebers calendar with hieroglyphic transliteration and English translation. (• = ditto.)

The Ebers calendar assists the reconstruction of Egyptian chronology in a number of ways.

a. It reports the solar year and months of Upper Egypt related to the seasonal or agricultural year.

b. It displays the civil months of the year used in Upper Egypt.

c. It connects the civil and solar calendars to the Sothic cycle for one particular year, and discloses the relationship between them.

d. It locates the ninth year of Amenhotep I in the Sothic cycle.

At this stage our purpose is only to introduce the features that relate to the solar calendar with its seasonal festivals of the agricultural year, and the civil calendar of Upper Egypt. In later chapters, we will see how it assists the reconstruction of the chronology of the Egyptian kings, especially with respect to Amenhotep I.

As shown, the inscription consists of 13 lines arranged in 4 columns.

Describing the Calendar

The heading of the calendar (two lines in English), is written in red ink and locates the calendar in the 9th year of *Dsr-k3-R^c^*, king of Upper and Lower Egypt. The prenomen (throne name) identifies the king as Amenhotep I, second king of the 18th Dynasty. The remainder of the calendar is written in black ink.

The first row of the calendar plainly indicates that the rising of Sothis occurred on the ninth day of III *ŝmw.*

Looking at the columns, scholars agree that the second column gives month designations of a civil calendar. III *ŝmw* is followed in the next line by IV *ŝmw,* then in

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idem, "A Return to Papyrus Ebers," *BES* 10 (1989/90) 137-44; idem, "Notes on the Ancient Egyptian Calendars," *Orientalia* 64 (1995) 19-22; idem, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson*, Vol. 2 (Boston, MA: Museum of Fine Arts, 1996) 755-63; C. Leitz, *Studien zur ägyptischen Astronomie* (Ägyptologische Abhandlungen 49; Wiesbaden: Otto Harrassowitz (1989) 23-34; idem, "Bemerkungen zur astronomischen Chronologie," *Ä und L* 3 (1992) 99; M. Clagett, *Ancient Egyptian Science*, Vol. 2, 37-48, 193-216; Depuydt, "Function of the Ebers Calendar," 61-68 (see bibliography on Ebers calendar pp. 86-88); idem, *Civil Calendar*, 90-95; idem, "Function and Significance of the Ebers Calendar's Lone Feast-Hieroglyph (Gardiner Sign-List W3)," *JEH* 1 (2008) 118-19.

the following lines by I to IV *3ẖt* and I to IV *prt*, ending with I and II *ŝmw*. The other months are indicated only by their numerical designations, II, III, or IV, followed by a mark like a large dot, which cannot be anything other than ditto marks referring to the season given above. This column reflects an underlying calendar originally based on the agricultural seasons with four months each of inundation (*3ẖt*), sowing (*prt*), and reaping (*šmw*). But the discrepancy between the actual agricultural seasons (the solar year) and the civil calendar is what the Ebers calendar displays.

The third column gives "day 9" for all 12 months. The word for "day" is a small mark shaped somewhat like an apostrophe and the "9" is a hieratic "squiggle."[53]

In the fourth column, under the "rising of Sothis," large dots appear in the subsequent 11 rows, similar to the dots used for the unnamed civil months, suggesting that they too are ditto marks. The first line of the second, third, and fourth columns are to be read together to give "going up of Sothis [on] III *ŝmw* 9," which refers to Amenhotep I's ninth year stated in the heading.

Thus, the civil calendar appears to begin with the rising of Sothis on III *ŝmw* 9, followed by the other months in the usual order. The repetition implies 12 months of 30 days without the five epagomenals. It is said that the epagomenals are not accounted for because the "day 9" of IV *ŝmw* ought to have been followed by "day 4" of I *3ẖt*.[54]

The civil months cannot start on "day 9" because they always start on day 1. Furthermore, lunar months consist of 29 or 30 days, not 12 months of 30 days, and they would not all start on day 9.

The oddity of all the remaining rows being designated "day 9," and the use of ditto marks indicates that the compiler is focusing on the same day in the successive months of the civil calendar. The civil calendar is in the orthodox order, except for the fact that it begins the 12 months of the year on III *ŝmw*. But that is merely because in the ninth year of Amenhotep I the rising of Sothis occurred on that date in the Sothic cycle.

The primary interest of the compiler is to construct a seasonal or agricultural calendar for that year beginning with the rising of Sothis, represented in the first column. This is the Sothis-related calendar of Upper Egypt. He lists the months of Upper Egypt. The first month is *wp rnpt* (the opener of the year), the second is *tẖy* and so on, aligning the solar year with the civil calendar for that year. Thus, columns one and four are the framework of the calendar, the rising of Sothis triggering the seasons and festivals of the year, while columns two and three display how they connect to the civil calendar in that same year.

Interpreting the First Column

The interpretation and application of the Ebers calendar has been extensively discussed by scholars in the past, especially the nature of the first column. Earlier scholars proposed that it represented a fixed Sothic year of 365¼ days, correlated with the 365-day civil calendar and the heliacal rising of Sothis on III *šmw* 9.[55] But more recent scholars rejected this idea because there is no evidence that Egyptians ever added a day every fourth year to attain a fixed-year calendar until the decree of Canopus in 238 BCE.[56]

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53 In the 1870s, scholars were unsure whether this mark was 3, 6, or 9, and "new moon" (*psḏntyw*) was suggested in 1935, but nowadays 9 is accepted as correct. See Depuydt, "Function and Significance," 120-21.

54 M. Clagett, *Ancient Egyptian Science*, Vol. 2, 196.

55 Ibid., 15, 193-95; L. Depuydt, "Function of the Ebers Calendar," 75.

56 See A.J. Spalinger, "The Canopus Stela," *Three Studies on Egyptian Feasts and their Chronological Implications* (Baltimore, MD: Halgo, 1992) 36-7.

In 1950, Richard Parker used various arguments for the existence of an original lunar calendar, and asserted that it was this lunar calendar that appears in the first column of the Ebers calendar.[57] Anthony Spalinger argued, in 1995, that the month representations on other calendars were not lunar but civil,[58] and, in 1996, that the first and second columns of the Ebers calendar were also civil. [59] However, Spalinger did not jettison the idea of a lunar calendar altogether because he needed it to account for the fact that in certain inscriptions some feasts were held out of their eponymous months.[60]

That feasts were held *in* their eponymous months in the Ebers calendar was one of Gardiner's prime items of evidence in 1906 and 1955 for two civil calendars, one starting with Mesore and the other with *tḫy*. Feasts were held out of their eponymous months in a latter calendar, as seen in the Greco-Roman calendar. Gardiner totally rejected the idea of a lunar calendar.[61] Spalinger did not want to resort to Gardiner's 1906 hypothesis that there were two civil calendars as he saw no need for it. [62] These matters will be dealt with at length in subsequent chapters.

The controversy over the interpretation of the Ebers calendar—whether the first column represented a lunar or civil calendar (instead of the solar/agricultural year as explained), and how to interpret the Sothic date, must be settled before we can decide what calendars the ancient Egyptians used to date their reigns and other events.

The Order of the Months on the Ebers Calendar

The order of the seasonal months beginning with *wp rnpt* "the opener of the year," which coincides with the helical rising of Sothis as shown in the Ebers calendar, is not replicated in most other calendars associated with Egyptian chronology.

In many later calendars, the feasts all appear to have been moved to the first day of the following month, and, therefore not in the month to which they gave their name.

This anomalous situation, of feasts apparently occurring outside their eponymous months in later calendars but within their appropriate months in the Ebers calendar, has remained an enigma to scholars for well over 100 years. The first column in the Ebers calendar contains what appear to be month-names of a calendar. These months are referred to on various other calendars and inscriptions.[63]

Opener of the Year *wp-rnpt* (wep-renpet)

The first name is *wp-rnpt* which means "opener of the year" and seems to be appropriately named for the first month in the list of 12 months. It is followed by *tḫy* (Tekhy) in the line beneath.

But other calendars have *tḫy* in *first* place. This is seen in calendar depictions on the northern ceiling of the tomb of Senmut, the Karnak water clock from the reign of Amenhotep III (both of the 18th Dynasty), on the Ramesseum ceiling of Ramesses II

[57] Parker, *Calendars,* 50 §252; idem, "The Problem of the Month-Names: A Reply," *Rd'É* 11 (1957) 96-97.

[58] A.J. Spalinger, "Month Representations," *Cd'É* 70 (1995) 110-22.

[59] A.J. Spalinger, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson* Vol 2; (Boston: Museum of Fine Arts, 1996) 762. Also at http://www.gizapyramids.org/pdf%20library/festschrift_simpson/s9t

[60] A.J. Spalinger, "Ancient Egyptian Calendars: How Many Were There?" *JARCE* 39 (2002) 241-50.

[61] Gardiner, "Mesore as First Month," 136-44; idem, "The Problem of the Month-Names," *Rd'É* 10 (1955) 9-31.

[62] Spalinger, "From Esna to Ebers," 761-62.

[63] The names have also been proposed as feast names (e.g. Clagett, *Ancient Egyptian Science*, Vol. 2, 46-7, 200).

(19th Dynasty), its copy at the Medinet Habu temple of Ramesses III (20th Dynasty), and elsewhere.

This is a major difference, and the cause of questions and controversy. Apart from this difference, the succeeding 11 months in the Ebers calendar are found in the same order as in the later representations. The Ebers calendar ends with the month of *Ipt ḥmt* (later Epiphi), as its 12th month. But in other calendars *Ipt ḥmt* is the 11th month, and the 12th month displays either *wp rnpt* (from the first month position in the Ebers calendar) or *R^c-Ḥr-3ḫty* (Re Horakhty) or Mesore.

In calendars dating from after the reign of Amenhotep I, *wp rnpt* is never in first place. It is always in last place unless that position is occupied by *R^c-Ḥr-3ḫty* ("Re Horus of the Two Horizons"), and *wp rnpt* does not appear at all. This repositioning is significant for our later discussion.

In summary, for an artefact like the Ebers calendar to exist, there needed to be:

- an underlying calendar originally based on the agricultural seasons with four months each of inundation (*3ḫt*), sowing (*prt*), and reaping (*šmw*) seen in the second column, which is termed the civil calendar; and
- the observance of the solar year related to the heliacal rising of Sothis in which the difference with the civil calendar is recorded (as the ninth day of III *šmw*); and
- an annual calendar of Upper Egypt related to the actual solar year and the heliacal rising of Sothis, beginning with the month named *wp-rnpt* meaning "opener of the year."

Chapter 4

Reviewing Gardiner’s and Parker’s Calendars

The previous chapter discussed the calendars that the ancient Egyptians used. Unless we employ their calendar(s) used to date the regnal years of kings, or Sothic or lunar sightings, Julian calendar dates we give to these events may be incorrect by as much as 100 years.

Egyptologists today prefer Richard Parker’s proposal of an original lunar calendar followed by a civil calendar (with their doubts about a later lunar calendar) rather than Alan Gardiner’s two civil calendars starting one month apart. Gardiner, who first published in 1906, later vigorously opposed Parker’s view published in 1950. Their 1955 and 1957 exchanges were heated. The debate continued amongst later scholars and remains unresolved to the present day.

I take the debate further and offer a solution. While some might dislike consideration of the Parker and Gardiner versions of the Egyptian calendars, and the controversy attached to their arguments, the quest for a solution is aided by their debate. The intricacies of a debate that searches for a coherent calendar system to account for the many inscriptional references to feasts held outside of their eponymous months is certainly tedious. Yet it has exercised the minds of Egyptologists for over a century, and ultimately provides the evidential data pointing to the eventual solution.

This chapter reviews the differing opinions of Sir Alan Gardiner (1879–1963) and Richard A. Parker (1905–1993), both esteemed Egyptologists, concerning the calendars they believed the ancient Egyptians used. Their views were introduced in chapter 3.

Central to the issue is how the Ebers calendar should be understood. Specifically, why is *wp rnpt* the first month in that calendar and the last month in later calendars? The attendant enigma is why the feast or birth of Re can be dated to I *3ḫt* 1 when its eponymous month, *R^{c}-Ḥr-3ḫty*, is the 12th month. Only when the calendars that the ancient Egyptians used have been identified can we proceed with the chronology.

Firstly, I review Gardiner’s 1906 article where he discusses examples of feasts having two dates usually one month apart. He gives examples of months that appear to derive from a calendar beginning with *wp rnpt* (understood by him to be synonymous with the later Mesore), and not with *tḫy* or Thoth—the first month of the Greco-Roman calendar.

Secondly, I review Parker’s theory of Egyptian calendars published in 1950,[1] and summarize his objections to Gardiner’s 1906 theory of two civil calendars. Then I review the arguments and counter-arguments in Gardiner’s and Parker’s articles in 1955 and 1957, respectively. Other scholars’ contributions to the discussion of the alleged month-shift, and my own explanation, will follow.

To avoid as much repetition as possible, I also add comments arising from my previous discussion of calendars.

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[1] R.A. Parker, *The Calendars of Ancient Egypt* (SAOC 26; Chicago, IL: Oriental Institute of the University of Chicago, 1950).

Gardiner's Two Civil Calendars Theory

Gardiner's theory began in the late 19th century when Egyptologists such as Heinrich Brugsch (1827–1894) and Ludwig Borchardt (1863–1938) assumed that the pre-dynastic Egyptian calendar was *lunar* and regulated by the heliacal rising of Sothis. Brugsch supposed that months were named after the festivals held in them, but then found from the Greco-Roman calendar that some festivals were *not* held in their eponymous months but were held in the *next* month. He noticed that in two tombs of the 18th Dynasty, those of Khaemhet and Neferhotep,[2] the feast of Pharmouthi in the Greco-Roman calendar was not dated to the month of Pharmouthi, IV *prt*, but to the first day of the next month of I *šmw*, or the month named Pachons.[3]

In 1906, Gardiner added more instances to Brugsch's two examples of festivals apparently falling in the month *after* the one to which they had (allegedly) given their name.[4] Gardiner provided the hieroglyphic text for the month-names and dates for the festivals as given in the original inscriptions so there could be no doubt about what he saw and read.

About a century after Gardiner wrote about feasts dated to a month after their eponymous month in the Greco-Roman calendar, the inscriptions from ostraca, plus papyri and weights, from Deir el-Medina were catalogued and made available on a website.[5] Heidi Jauhiainen wrote a thesis published in 2009, and posted on the internet the feasts mentioned in non-literary documents at Deir el-Medina using their classification numbers.[6] Where applicable, I seek to identify the examples cited by Gardiner with those discussed by Jauhiainen, and in the following chapter some additional items she identifies not mentioned by Gardiner or other scholars.

Feasts *not* Falling in their Eponymous Months cited by Gardiner

Added to Brugsch's two examples from the tombs of Khaemhet and Neferhotep, separated by several decades, Gardiner cites other examples shown in Table 4.1.

(1) In the 3rd regnal year of Ramesses X, workmen at Thebes celebrated the feast of Epiphi on IV *šmw* 2,[7] and not in III *šmw*, the month of Epiphi in the Greco-Roman calendar.

(2) Gardiner notes from the verso of the papyrus Boulak 19 words that he translates as: "Fourth(?) summer-month, day 15, in Epiphi." It is not clear whether this refers to a month-name or the day of an Epiphi festival "which is hardly likely to have

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[2] Khaemhet was Superintendent of Royal Granaries during the reign of Amenhotep III. His tomb is dated to the king's 30th regnal year (M. Andrews, "The Private Tomb of Khaemhat on the West Bank at Luxor," (1999-2003), http://www.touregypt.net/featurestories/khaemhatt.htm; "Sheikh Abd el-Qurna – Tomb of Khaemhet," http://planetware.com/egypt/sheikh-abd-el-qurna-tomb-of-khaemhet-egy-qena-tmbkha.htm Neferhotep was a priest in the reign of Horemhab, ("Sheikh Abd el-Qurna – Tomb of Neferhotep," http://www.planetware.com/egypt/sheikh-abd-el-qurna-tombs-in-the-plain-egy-qena-plain.htm). The tombs are numbered TT57 and TT50, respectively.

[3] H.K. Brugsch, *Die Ägyptologie* (Leipzig: Wilhelm Friedrich, 1891) 362-63, cited by A.H. Gardiner, "Mesore as First Month of the Egyptian Year," *ZÄS* 43 (1906) 137 n. 1.

[4] Gardiner, "Mesore as First Month," 137 and n. 1.

[5] "The Deir el-Medina Database", http://www.leidenuniv.nl/nino/dmd/dmd.html

[6] H. Jauhiainen, "Do not Celebrate Your Feast Without Your Neighbours": A study of References to Feasts and Festivals in Non-Literary Documents from Ramesside Period Deir el-Medina (Publications of the Institute for Asian and African Studies 10; Helsinki, Helsinki University Print, 2009) and http://www.doria.fi/bitstream/handle/10024/46975/donotcel.pdf

[7] Gardiner, "Mesore as First Month," 137-38; referenced to *Pap. Chabas-Lieblein* in Turin. Gardiner was unsure whether the day was 1 or 2. Since then the day date has been settled as day 2 (Parker, *Calendars*, 58 §286).

lasted fifteen days."[8] He omits this from consideration as an example of a Mesore-beginning calendar because of the uncertainty of the text's meaning.

(3) From a diary of the Necropolis (Thebes) dating to the 13th regnal year of Ramesses IX, the last day of the summer month, IV *šmw*, is followed by the five epagomenal days.[9] Gardiner translates, "'Year 13, first month of inundation day 1, birthday of Re-Horakhti.' The words *mśwt-Rᶜ* are obviously the prototype of the month-name Mesore." [10] This indicated to Gardiner that I *3ḫt* was the month of Mesore, not the 12th month or IV *šmw* as in the Greco-Roman calendar.

(4) In the 35th year of an unnamed king, but said to refer to Amenemhet III of the 12th Dynasty, a list of attendances of singers found at Illahun identifies Hathor as the month of IV *3ḫt*, whereas in Greek times the month of Hathor is III *3ḫt*.[11]

(5) The Medinet Habu calendar from the time of Ramesses II places the feast of Hathor on IV *3ḫt* 1, not III *3ḫt* 1.[12]

(6) In a later 1952 article, Gardiner also notes that IV *3ḫt* referred to the month of Hathor at the time of Thutmose III. He says it could not have been held in IV *3ḫt* according to the Greco-Roman calendar for, "Thutmose III reserved that date for the festival of Neḥeb-kau, which I impenitently continue to equate with the later Khoiakh."[13] Therefore, the feast of Hathor was also held on IV *3ḫt* in the reign of Thutmose III.

(7) On the same papyrus as that of the singers at Illahun (see (6) above), dated to the 12th Dynasty, the "uniting of the *ka*s" (the life force) is dated to I *prt* 1. Since the earlier name of the feast of Choiak was *k3 ḥr k3* "*ka* upon *ka*" and the feast of *nḥb-k3w* (Neḥeb-kau) fell in the New Kingdom on I *prt* 1, Gardiner conjectured that the feast of Neḥeb-kau and the feast of *k3 ḥr k3* "were but two names for one and the same festival." However, in Greek times Choiak was IV *3ḫt*. [14]

In two, less certain, instances Gardiner points out the following.

(8) In a Ramesside ostracon (oBM 29560), Erman, cited by Gardiner, "shows that certain groups of words that occur at intervals in the text are the originals of the Greek designations of the Egyptian months."[15] To Gardiner, the month/feast of Thoth seemed to be preceded by "the going forth of Horus" or an alternative expression for the month of Mesore, which would then put it in first place. In the same ostracon, between the months Choiak and Mechir is "the periplous of Mut," which corresponds to the sixth position or II *prt* if Mesore is in first place, but known as the month of Tybi or I *prt* in the Greco-Roman calendar. (Consequently, all the months listed would move down one place.)

However, Gardiner is doubtful about the festival of Mut being held in II *prt*, because in the 17th year of a king, assumed to be Ramesses IX, the "periplous of Mut" festival occurred on the last day of I *prt*.[16] On the other hand, because he thinks it unlikely for a feast that is typical of the month to be held on the last day and give its

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[8] Ibid., 138.

[9] I *3ḫt* 1 *Mswt Rᶜ ḥr 3ḫty*; P Turin Cat. 1999 + 2009 vs. I, 12; Jauhiainen, *"Do not Celebrate*," 79 n. 14.

[10] Gardiner, "Mesore as First Month," 138-39.

[11] Ibid., 139; referenced to Griffith, *Kahun Papyri*, 24-25. This appears to refer to Papyrus UC 32191.

[12] Ibid., referenced to Brugsch, *Thesaurus*, 364. (The Medinet Habu Temple ceiling calendar, however, assigns Hathor to III *3ḫt*, as discussed previously.)

[13] Idem, "Thutmosis III Returns Thanks to Amūn," *JEA* 38 (1952) 22; and see n. 7.

[14] Idem, "Mesore as First Month," 139; referenced to Illahun in the Middle Kingdom in Griffith, *Kahun Papyri*; and in the New Kingdom, Brugsch, *Thesaurus*, 335, 362, 364; Sethe, *Urk* IV, 107, 109.

[15] Ibid., 140; referenced to Adolf Erman, "Monatsnamen aus dem Neuen Reich," *ZÄS* 39 (1901) 128-30.

[16] Ibid., referenced to *Pap. Turin* 68, col. 3, 1; *ib*. 6.

name to that month, he suggests that it really lasted two days and continued into II *prt*, which could then be another example of Tybi being dated to II *prt*.

Gardiner is uncertain whether this is a valid example of a feast out of its eponymous month, and is prepared to discount the last two examples (of Mesore and Tybi).[17] We may discount the latter in the reign of Ramesses IX because it is not an actual example of a feast held out of its eponymous month in the Greco-Roman calendar. In the ostracon, the position of Tybi and the other months depends on the validity of the "going forth of Horus" being in first place. Since the above examples to do with Horus and Mut both come from ostracon oBM 29560, they will be designated collectively, and represented by "the going forth of Horus" in the first month in Table 4.1.

What Gardiner assumed about the position of the feasts is shown below (Table 4.1). The down-arrow indicates what Gardiner saw as a move of a feast from its eponymous month to the one following. Thus Thoth is associated with both the "birthday of Re" and the "going forth of Horus" in I *3ḫt* not IV *šmw* (the previous month). Hathor is celebrated in the month of Choiak or IV *3ḫt* as in the list of singers. Choiak is celebrated in the month of Tybi or I *prt*. Renutet, or the month later named Pharmouthi, is celebrated in I *šmw* as it was on the two tombs. And Epiphi is the 12th month or IV *šmw* as in the list of workmen at the Epiphi festival.[18]

Table 4.1: Gardiner's examples of feasts held in the next month after their eponymous month from the perspective of the Greco-Roman calendar

Feast date	Month named	Moved to	Out of their eponymous month
IV *šmw*		↓	
I *3ḫt*	Thoth		"Birthday of Re" & the "going forth of Horus" (3) and (8)
II *3ḫt*	Phaophi		
III *3ḫt*	Hathor	↓	
IV *3ḫt*	Khoiak	↓	Month of Hathor in list of singers at a festival (4), and Medinet Habu calendar (5)
I *prt*	Tybi		Feast of Choiak (6) and (7)
II *prt*	Mechir		
III *prt*	Phamenoth		
IV *prt*	Pharmouthi	↓	
I *šmw*	Pachons		Feast of Pharmouthi on 2 tombs (Brugsch)
II *šmw*	Payni		
III *šmw*	Epiphi	↓	
IV *šmw*	Mesore	↓	Feast of Epiphi (1) and (2)

↓ = the move of a feast from its eponymous month to the one following.

Gardiner's Conclusions

A result of the positioning of these feasts Gardiner concluded that the first month must have been *wp-rnpt* (called Mesore by Gardiner) and the second month *tḫy*, and so on, and the last month *ipt ḥmt* (Epiphi). From these examples, he believed that "all twelve month-names stood in early times one place ahead of their later position."[19] He thought this was confirmed by his last piece of evidence: the Ebers calendar.

Gardiner and the Ebers Calendar.

In the Ebers calendar the month-names stand in the same position as in the previous examples (Table 4.1). They start with *wp-rnpt* and end with *ipt ḥmt*, the later Epiphi. Gardiner writes, "All the month-names are seen to stand in the Ebers calendar

[17] Ibid.
[18] Ibid., 141.
[19] Ibid.

just where they ought to stand."[20] He saw in *wp-rnpt* not merely the feast of the New Year, but the name of the *first month* of the year, and assumed that it was synonymous with the "going forth of Horus" and the "birthday of Re" or Mesore. He also notes from the temple of Edfu that the month *wp-rnpt* is also the name of IV *šmw*, and he sees this as another example of *wp-rnpt* being synonymous with Mesore.[21]

Gardiner identified the first column of the Ebers calendar as composed of *civil* months as also in the Greco-Roman civil calendar. However, he could not explain why the Greco-Roman calendar had festivals celebrated out of their eponymous months. He suggested that some days may have been intercalated causing the monthly feasts to fall backward into the preceding calendar months, "which would naturally vitiate the whole of our chronology," or alternatively, that the festivals and not the months were, "transferred as a body from their original place," but he could not find a motive for such a proceeding.[22]

Furthermore, Gardiner noted that the month positions in the Ebers calendar were also being used concurrently with those months having positions known from the calendar of Greco-Roman times. On the one hand, in the reign of Ramesses XI (20th Dynasty) the festival of Epiphi *still* fell on IV *šmw* 1 (as it did in Ebers in the early 18th Dynasty), and under Ramesses IX the feast of the first day of the new year was the "going forth of Horus" (Mesore), while on the other hand, earlier on, in the reign of Ramesses II as witnessed in the Ramesseum, the *Greek* positions of the months had apparently already been adopted.[23]

Two Civil Calendars

Gardiner came to the conclusion that Egypt had had two calendars, an earlier and a later, which ran concurrently, with the earlier calendar starting with the month of Mesore, and the later beginning at the same time with the month of Thoth, so that the two overlapped.[24]

Though Gardiner did not provide a calendar, by using the civil calendar numerical designations and the Greek names of the months, Table 4.2 illustrates what he must have had in mind for his Mesore and Thoth years.

Table 4.2: Gardiner's supposed calendars

	Mesore year	**Thoth year**
I *3ḫt*	Mesore	Thoth
II *3ḫt*	Thoth	Phaophi
III *3ḫt*	Phaophi	Hathor
IV *3ḫt*	Hathor	Choiak
I *prt*	Choiak	Tybi
II *prt*	Tybi	Mechir
III *prt*	Mechir	Phamenoth
IV *prt*	Phamenoth	Pharmouthi
I *šmw*	Pharmouthi	Pachons
II *šmw*	Pachons	Payni
III *šmw*	Payni	Epiphi
IV *šmw*	Epiphi	Mesore

20 Ibid.
21 Ibid., 142.
22 Ibid., 143; see also 141 n. 2.
23 Ibid.
24 Ibid.

The Feasts of Thoth and Phaophi: Are they Further Examples of Feasts Falling *Out* of their Eponymous Months?

Gardiner's perplexity was heightened by a further problem regarding the feasts of Thoth and Phaophi. He noted that the feast of Thoth occurred on the 19th day of the first month at Medinet Habu during the reign of Ramesses III as well as in Greek times, and had not moved down to the next month as had other feasts.[25] Thoth's companion feast, the feast of *w3gy* (wagy), was held on the 18th day of Thoth in the Old Kingdom, which suggested to Gardiner that the feast of Thoth was also held on the 19th of the first month at this early time.

Gardiner did not think it likely that a feast on the 19th day of the first month could give its name to the second month, and, noticing that the Ebers calendar and the Ramesseum have the hieroglyphic sign for *tḫy*, whereas at Medinet Habu the sign for Thoth was used, he suggests that Thoth succeeded *tḫy* as a month-name, yet he notes that "Thoth is apparently a month-name on the Ramesside ostracon in the British Museum"[26] (and therefore was being used at the same time as *tḫy*). Gardiner was unable to determine whether the feast of *tḫy* had once been the feast of the second month, where if it had been, in the Greco-Roman calendar it would have fallen out of its eponymous month as he had noticed for other examples.

The situation with Thoth was similar to that of the month of Phaophi in the Greco-Roman calendar, where Phaophi was the later name for the second month, earlier known as *mnḫt* (Menche). During the Ramesside period, Gardiner thought the feast of Phaophi had "shifted its position considerably" and had "extended over from the latter part of the second month into the third." He then suggested that only after Mesore had become the 12th month did Phaophi become adopted as a feast of the second month, "which avoids the necessity of assuming that the name Phaophi ever belonged to the third month." This was an assertion he could not sustain because, contrarily, Phaophi appears to be third month or feast name in the Ramesside ostracon.[27]

The preceding examples were known to Gardiner in 1906. He ends his paper feeling inadequate to deal with it competently and hopes the materials will be of service to others.[28]

Heidi Jauhiainen's Observations

Gardiner does not discuss the feast of Phaophi again in 1955, so it is pertinent to add a further observation here. In 1982, R. van Walsem noted from the Ostracon Deir el Medina 46, 10, in a journal of rations, the feast of Phaophi is dated to III *3ḫt* 11, whereas Phaophi in Ostracon Deir el Medina 1265 col. I, 4-5 in a literary text is II *3ḫt*.[29] The latter is its position in the Greco-Roman calendar. Van Walsem accounts for the two dates by noting that the feast lasted 23 days, so extending from II *3ḫt* into III *3ḫt*, analogous to one in the time of Ramesses III lasting 27 days.[30]

That the festival of Phaophi, or Opet as it was later known, was held over the months of II *3ḫt* into III *3ḫt* is affirmed by Heidi Jauhiainen in her recent study.[31] She

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[25] Ibid., 143-44.

[26] Ibid. This is a reference to oBM 29560 noted earlier on page 59.

[27] Ibid., 144.

[28] Ibid., 144, referring again to oBM 29560.

[29] R. van Walsem, "Month-Names and Feasts at Deir el-Medina," *Gleanings from Deir el-Medina* (eds. R.J. Demaree and J.J. Janssen; Leiden: Nederlands instituut voor het Nabije Oosten, 1982) 220. See also, Jauhiainen, *"Do not Celebrate,"* 92 and works cited by Černý, Kitchen, and Helck in n. 11, where she notes that this ostracon has been attributed the date of Year 2 of Ramesses IV.

[30] Ibid., 236 n. 45, citing Schott, *Festdaten*, 76, 85, II, III and 85, 41.

[31] Jauhiainen, "Do not Celebrate," 95-96.

writes, "Since the Opet Festival, was, according to the Great Harris Papyrus (P. BM EA 9999), celebrated on the same civil calendar days (II *3ḫt* 19 – III *3ḫt* 15) for thirty-one years in the reign of Ramesses III, I am not convinced that the date was always determined by the lunar calendar."[32]

As such, it does not qualify for a feast being held out of its eponymous month in the Greco-Roman calendar. The feast of Thoth, being held on I *3ḫt* 19 in the Greco-Roman calendar does not appear to have a known counterpart on II *3ḫt* 19 though the month of t*ḫy* is second month in the Ebers calendar. The fixed (not moveable) feast of *w3gy*, held on I *3ḫt* 18 also does not appear to have a known counterpart on II *3ḫt* 18.[33]

These two feasts, *w3gy* and Thoth, are not valid examples of feasts being held out of their eponymous months. Note also that they do not date to the first day of the month. Our concern is about fixed feasts having a counterpart in the following month. We have more to say about the *w3gy* feast when we discuss the 12th Dynasty in later chapters.

Parker's Original Lunar Calendar, Civil Calendar, and Later Lunar Calendar Theory

Forty-four years after his first article appeared in 1906, Gardiner was not prepared for the attack on his "evidence" of two civil calendars that came from Parker.

In his book, *The Calendars of Ancient Egypt*, published in 1950, Parker proposed three Egyptian calendars: an original lunar calendar, a civil calendar, and then a later lunar calendar tied to the civil calendar.[34] His book was not written as a response *per se* to Gardiner's "theory" for he only tackles Gardiner's work in an excursus at the end.

Rather, he sought to find the lunar calendar that he thought was behind the Carlsberg 9 papyrus giving the dates of the first day of each month, that is, the day of each new moon, in a 25-year period. (See chapter 5, pp. 76-80). He explained the Carlsberg 9 calendar as "a schematization not of the original lunar calendar of Egypt but rather of what may more correctly be termed *the later lunar calendar*"[35] (emphasis his).

Believing that a lunar year must have preceded the civil year on which the later lunar calendar was based, he wrote in 1955, "One of my problems in my book was to identify this original lunar year and to try to formulate a theory of its operation which would pass the test of all the evidence. This I attempted to do in *Cal.*, Chapter III, and it is the theory I offered there which Gardiner has now so strongly challenged."[36]

Parker refers to a number of earlier Egyptologists (Gatterer, 1786; Lepsius, 1849; Martin, 1864; Hincks, 1865; Brugsch, 1891; Meyer, 1904; Sethe, 1920; Borchardt, 1935) who proposed that a lunar calendar was the original calendar used by the ancient Egyptians.[37] Borchardt's theory about the lunar calendar was very similar to the one

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[32] Ibid., 96.

[33] U. Luft sought to make a case for the fixed feast of *w3gy* falling in the second *lunar* month on II *3ḫt* 18 and then transferred to I *3ḫt* 18 of the civil calendar in *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992) 150-52, 221-22. This proposition was taken up by A.J. Spalinger, "Notes on the Ancient Egyptian Calendars," *Orientalia* 64 (1995) 23. Since the lunar calendar is hypothetical, so too are the dates assumed to be from it.

[34] See also idem, "The Calendars and Chronology," *The Legacy of Egypt* (ed. J.R. Harris; Oxford: Clarendon, 1971) 13-26.

[35] Parker, *Calendars*, 24.

[36] Idem, "The Problem of the Month-Names: A Reply," *Rd'É* 11 (1957) 92.

[37] Idem, *Calendars*, 30 §§142-49.

Parker adopted.[38] Parker gives his conclusions about the calendar before attempting to give evidence of its existence. He writes:

> Whatever it may have been in prehistory, the first Egyptian calendar of record was lunar, and it was based upon the heliacal rising of the star Sothis. This event was called by the Egyptians *wp rnpt*, "Opener of the Year." The twelve months of the normal year were divided into three seasons, *3ḫt, prt*, and *šmw*, of four months each. The individual months were named after the most important feasts which occurred in them. The first month of the year, the month of the *tḫy*-feast, began with the day of invisibility of the moon before sunrise after *wp rnpt*. This first day of the year was called *typ rnpt*. The twelfth month of the year was named *wp rnpt* after that feast, which always had to fall in it. Because the lunar year was normally but 354 days long, whenever the first month began within 11 days of *wp rnpt*, it was intercalary, lest at the end of that year the feast *wp rnpt* fall out of its month. This intercalary month which was intercalated every three, rarely two, years was dedicated to Thoth, and a feast of this god, *Ḏhwtyt*, was celebrated in it.[39]

Parker proposes several lines of argument for the existence of the original lunar calendar. Both Gardiner's comments and my own are added.

Parker: The Loango people used a lunar calendar.

Parker cites the use of a lunar calendar with an intercalary month based on Sothis by the people of Loango in western Africa south of the equator, to support his proposal that "the first Egyptian calendar need not have been the product of a highly developed culture" for "it had common roots with many other primitive calendars."[40]

Gardiner 1955: "Grounds [for an intercalary month] can hardly be found in the fact that the West African tribe of the Loango possessed a lunar year which reconciled itself with the Sothic year by just such an intercalary month," because—he says—the Decree of Canopus (238 BCE) shows that the Egyptians had not even used an extra day to put their calendar right, let alone had inserted a month.[41]

Tetley: The Loango calendar is not evidence for an Egyptian lunar calendar.

Parker: Primitive man used lunar months; therefore, Egyptians used a lunar calendar.

Since this is integral to his theory, we repeat his comments noted earlier. Parker writes:

> Primitive man, with the lunar month as his unit of time, would soon come to the realization that, while the interval between successive floods was highly variable, the interval between successive risings of Sothis was practically constant. Sothis' rising, then, could be used as a point of departure for a calendar of lunar months with three seasons, a calendar completely agricultural and based on the Nile and governed by Sothis only because Sothis itself had come to be the herald of the Nile. A few decades of trial and error would certainly be sufficient to work out the simple rule of intercalation, so that the event of *wp rnpt* would be maintained properly in the last month of the year.[42]

Tetley: Parker's idea that a lunar calendar with an intercalary month was used to determine the seasons of the Nile is at odds with my earlier discussion of the solar

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[38] Ibid., 30-31 §§149-51.
[39] Ibid., 31 §151.
[40] Ibid., 31 §§152-54.
[41] A.H. Gardiner, "The Problem of the Month-Names," *Rd'É* 10 (1955) 22.
[42] Parker, *Calendars*, 32 §157.

calendar and seasonal phases of the Nile in which the rising of Sothis occurred near the summer solstice at the beginning of the solar year, not in the last month of a lunar calendar. Agricultural seasons determined by the sun and starting with the rising of Sothis are not evidence for a lunar calendar.

Parker: The moon and Sothis either separately or together are associated with a form of year which could be lunar.

Parker cites several such texts, mainly from the late period. He admits that it is not clear what type of year was involved, but a lunar year would suit the passages.[43]

Tetley: The association of the moon and Sothis is not evidence for a lunar calendar.

Parker: The meaning of *wp rnpt* is assumed to have its equivalence in *prt spdt,* the "going forth of Sothis."

Parker points out that, "*wp rnpt* was in existence before the civil year was inaugurated, so that its application to the first day of that year can only have been secondary and through analogy with the lunar calendar."[44] He cites several late texts which seem to equate *wp rnpt* and *prt spdt*, and says that the primary meaning of *wp rnpt* was the "opener of the year." He writes, "As 'Opener of the Year' it would mean the heliacal rising of Sothis, assuming a lunar year based on Sothis."[45] But when the civil calendar was introduced from about the time of the Middle Kingdom, Parker says that *wp rnpt* came to mean the first day of the year and was synonymous with *prt Spdt*.[46]

Tetley: Spalinger notes that *wp rnpt*'s association with the rising of Sothis (*prt Spdt*) appears first only in texts from the Greco-Roman period.[47] He writes: "No festival calendar or dated feast writes *prt Spdt* and *wp rnpt* side by side."[48] Parker's presumed equivalence of *wp rnpt* "the opener" with *prt Spdt* "the going forth of Sothis" is unattested and there is no analogy with a lunar year, and therefore provides no evidence for a lunar calendar.

Parker: Lists of feasts from the mastabas (tombs) of the Old Kingdom are assumed to have a lunar origin.

Parker compares the *chronological order* of feasts in lists coming from the 4th and 5th Dynasties with the order of feasts in the *civil* calendar, to argue for an original *lunar* calendar. Parker cites 25 lists, not all of them complete, but 22 of them have five or more feasts and they *all* start with *wp rnpt*. The feasts are in the same order with the exception of two lists, which have a different order for the second, third, and fourth feasts.[49]

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[43] Ibid., 32-33 §§158-63.
[44] Ibid., 33 §165.
[45] Ibid., 34 §174.
[46] Ibid., 34 §§172-74.
[47] A.J. Spalinger, "The Canopus Stela," Three Studies on Egyptian Feasts and their Chronological Implications (Baltimore, MD: Halgo, 1992) 46; idem, "Thoth and the Calendars," Revolutions in Time: Studies in Ancient Egyptian Calendrics (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 46, 51.
[48] Ibid., 48.
[49] Parker, *Calendars*, 35 §§176-78. D 60 has the order: 1, 3, 4, 2, 10, 11, 12, and D 69 has 1, 4, 2, 3, 5, 6, 7, 10, 11.

Table 4.3 shows Parker's list of 12 festival names from the *mastabas* in their usual order, having *wp rnpt* in first position.[50]

Table 4.3: Order of feasts on Mastabas as noted by Parker

(1) *wp rnpt*	(5) *hb Skr*	(9) (*3bd*)* (*n*) *š3d*
(2) *Ḏḥwtyt*	(6) *hb wr*	(10) *(tp) 3bd*
(3) *tpy rnpt*	(7) *rkh*	(11) *tp šmdt*
(4) *w3g*	(8) *prt Mn*	(12) *hb nb rᶜ nb* or variant

Parker seeks to equate these names with *lunar* feasts, and thus with lunar months, as evidence for his original lunar calendar. However, he makes an exception for *wp rnpt*, which he states is not a lunar month, but believes that, in its first application, it refers to the rising of Sothis "which opened the new year, but which, in itself, did not form part of it."[51] After *wp rnpt* he identifies *Ḏḥwtyt* as the feast of the intercalary lunar month that occurred once every two or three years "dedicated to Thoth, the moon-god."[52] He assigns *tpy rnpt*, the third feast, to the first day of the month of *tḫy*, that is, to the first month of the *lunar* year. For feasts nos. 4-8 he assigns dates in their chronological order in the *civil year* (Table 4.4).

Table 4.4: Feasts 4–8 according to Parker

	Feast	Date
4	*w3g*	*I 3ḫt 18*
5	*hb Skr*	*IV 3ḫt 26*
6	*hb wr*	*II prt 4*
7	*rkh (wr)*	*II prt 9* (Edfu) and *III prt 1* (Illahun)
8	*prt mn*	*I šmw 11* (Medinet Habu)

The feast of *w3gy*, the fourth festival, is also considered to be lunar (see below).

The fifth name on the *mastaba* list, referring to the festival of *skr* (Sokar being the god of the dead and of the underworld) is not given an explanation by Parker. Of the feasts of [*rkḥ*] *wr* and *rkḥ* [*nḏs*], which follow in sixth and seventh positions, Parker writes: "*rkḥ* as the name of a lunar month cannot be other than lunar,"[53] by which he seems to mean that if the preceding months are lunar the *rkḥ* months must be lunar too. But since he's trying to prove that the feasts *are* lunar in origin, this statement proves nothing.

Parker refers the feast of *Mn* (eighth month) to a moveable feast falling on the day of the new moon in a lunar month, dated to I *ŝmw* 11 in the Medinet Habu calendar;[54] therefore, this lunar feast must indicate a lunar calendar. Referring to the 9th, 10th and 11th *mastaba* names, Parker notes that the feast of *3bd* was that of the new crescent moon, and *śmdt* that of the full moon, so Parker assumes that *ś3ḏ* was probably also lunar.[55]

Since these were lunar feasts he makes the comment: "There is no other plausible explanation for the sequence *wp rnpt*, *Ḏḥwtyt* and *tpy rnpt* than the assumption that the latter two also were lunar."[56] The last feast, the feast of Re (*hb nb rᶜ nb*), Parker does not

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50 Ibid., 35. The same list is shown by A.J. Spalinger, "The Private Feast Lists of Ancient Egypt," *Ägyptologische Abhandlungen* 57 (1996) 110.

51 Ibid., 36 §180.

52 Ibid.

53 Ibid., 36 §179.

54 Ibid., 36 §179; 39-40 §§203-04. See S. el-Sabban, *Temple Festival Calendars of Ancient Egypt* (Liverpool Monographs in Archaeology and Oriental Studies; Liverpool: University Press, 2000) 128.

55 Ibid., 36 §179.

56 Ibid.

refer to, but he says these last four feasts were "monthly feasts celebrated at least twelve times a year."[57]

Gardiner says in 1955: "Surely the logic of his argument demands that nos. 1–3 should, like nos. 4–8, be interpreted in terms of the civil calendar … instead … he attributes to them positions in a wholly imaginary lunar year."[58]

Tetley: Parker writes: "The proposed original lunar calendar fits the chronological order perfectly, and I know of no other explanation."[59] In order to achieve his "chronological fit" Parker has to remove *wp rnpt* from first place and assign *Ḏḥwtyt* to his lunar intercalary month.

But, *Ḏḥwtyt* is the first month on documents from Deir el-Medina, replacing the former *tḫy* in earlier calendar depictions, and is known as Thoth in the Greco-Roman calendar where it is a *civil* month-name. All the month-lists previously studied exhibit the same names (taking into account some later changes) and belong to the same civil calendar.

Parker, in all his discussions simply assumes that the civil calendar derived its names from the lunar calendar, but provides no proof. *Tḫy* or *Ḏḥwtyt* is in first position except in the Ebers calendar where *tḫy* is in second place directly after *wp rnpt* as in the *mastaba* lists. Twenty-two lists begin with *wp rnpt,* which suggests that the feast gave its name to the first month of a calendar—a calendar that is represented in the first column of the Ebers papyrus.

I conclude that the chronological order of the *mastaba* feasts is not evidence for a lunar calendar.

Parker: A fixed *w3gy* feast set in the civil calendar on I *3ḫt* 18 and a moveable *w3gy* feast set in the second month of *ŝmw* in the Middle Kingdom reveals a lunar calendar.

Parker notes that the festival of *w3g* (or *w3gy*) has two dates in the civil calendar: one fixed on I *3ḫt* 18 and the other moveable with various dates. He noted the example of a *w3gy* feast on II *ŝmw* 17 in the 18th year of either Sesostris III or Amenemhet III, and assumed that, "this moveable feast fell on a certain day in the first month of the *lunar* year"[60] (emphasis his).

Tetley: Parker assumes that because the *w3gy* feast was lunar in origin, it indicated that a lunar calendar existed.[61] The whole subject of the *w3gy* feast and how the days for its moveable feasts were determined is quite complex and will be discussed at length later. Suffice it to say that the presence of lunar phases dated to the *civil* calendar is no proof of a lunar calendar.

Parker: The temple year consisting of 12 lunar months of priestly service suggests a lunar year.

A papyrus known as pBerlin 10056 is a temple account from Illahun (12th Dynasty), which records six periods of service of its priests for 12 months. [62] It covers a full year but only alternate months are noted by date. It lists the monthly service of

[57] Ibid., 36 §178.
[58] Gardiner, "Problem of the Month-Names," 23.
[59] Parker, *Calendars*, 36 §180.
[60] Ibid., 36 §183.
[61] Ibid., 36 §§179, 181-85.
[62] Ibid., 37 §186, 63-64 §318.

phyle-priests starting with the month dated II *ŝmw* 26 and ending in III *ŝmw* 25 as shown below.

II *ŝmw* 26 down to (*nfryt r*) III *ŝmw* 25
IV *šmw* 25 down to regnal year 31, I *3ḫt* 19
Regnal year 31, II *3ḫt* 20 down to III *3ḫt* 19
IV *3ḫt* ‘19 or 18’ down to I *prt* 18
II *prt* 18 down to III *prt* 17
IV *prt* 17 down to I *šmw* 16[63]

Parker writes, “Since a twelve-month period is covered, the suggestion is strong that some sort of lunar year is involved.”[64]

Gardiner says in 1955: “If the priests possessed a special lunar calendar of their own, they did not content themselves with using it … We find them constantly quoting the civil year … we also have the explicit statement … that a temple-day was the 1/360th part of the year.”[65]

Tetley: Referring to pBerlin 10056, Rolf Krauss notes that “The complete account is headed ‘Account of earth almonds and honey over the course (?) of a year. List over the course (?) of six months of the temple scribe Hornakhte. Regnal year 31. Offerings from this list.’”[66] From this it appears that the months listed are the alternate months of the year in which Hornakhte was responsible for the almonds and honey for the priests. Thus *nfryt r* means “down to” the next date, which is the date of a new lunar month. Do they represent a lunar *calendar* as asserted by Parker or lunar phases dated by a civil calendar?

The following lunar table is supplied by Lee Casperson, in which the Egyptian calendar begins with the month of Thoth as in the calendar of Greco-Roman times. The dates come from my chronology for Amenemhet III’s 30th year in 1938 BCE (which is −1937) continuing into his 31st year (given in the temple account above). The 12 dates given below in the Egyptian calendar (Table 4.5) appear to be dates of new moons falling on the day of conjunction (0 column), except for the two bolded months in the -1 column (equated to January 9 and February 8), indicating that the moon was invisible the day before conjunction (and therefore the actual day of new moon) because the numbers are less than 100. The new moon fell on I *3ḫt* 19 and II *3ḫt* 19, not I *3ḫt* 20 and II *3ḫt* 20.[67]

Table 4.5: Amenemhet III, 30th and 31st years (new moon listing from −1937 to −1936)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1937	**9**	**12**	−1937	8	26	844	**9**	**26**	1	16:53	5:34	297	5:35	173	5:36	**53**
−1937	**10**	**12**	−1937	9	25	844	**10**	**26**	3	5:06	6:01	224	6:02	106	6:03	**−8**
−1937	**11**	**10**	−1937	10	24	844	**11**	**25**	4	19:39	6:27	284	6:28	163	6:29	**51**

[63] Ibid., 64 §318.

[64] Ibid., 37 §186.

[65] Gardiner, “Problem of the Month-Names,” 24.

[66] R. Krauss, “Egyptian Sirius/Sothic Dates, and the Question of the Sothis-Based Lunar Calendar,” *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006) 453.

[67] Please refer to Casperson’s tables in chapter 5, pp 81-84, where he provides a complete explanation in the context of his *JNES* articles, showing comparisons between several examples. A clear understanding of “how the tables work” is essential for their interpretation, and for evaluating the validity of this author’s chronology throughout the whole scope of this work.

−1937	**12**	**10**	−1937	11	23	844	**12**	**25**	6	12:27	6:49	227	6:49	108	6:50	**9**
−1936	**1**	**9**	−1937	12	23	845	**1**	**20**	1	6:49	6:57	169	6:57	**69**	6:57	−9
−1936	**2**	**8**	−1936	1	22	845	**2**	**20**	3	1:14	6:48	130	6:47	**53**	6:46	−8
−1936	**3**	**8**	−1936	2	20	845	**3**	**19**	4	18:05	6:27	221	6:26	113	6:25	**49**
−1936	**4**	**7**	−1936	3	21	845	**4**	**19**	6	8:23	6:01	188	6:00	100	5:59	**40**
−1936	**5**	**6**	−1936	4	19	845	**5**	**18**	7	20:08	5:37	302	5:36	155	5:35	**76**
−1936	**6**	**5**	−1936	5	19	845	**6**	**18**	2	5:59	5:15	224	5:14	113	5:14	**27**
−1936	**7**	**4**	−1936	6	17	845	**7**	**17**	3	14:49	5:03	300	5:03	158	5:03	**51**
−1936	**8**	**2**	−1936	7	16	845	**8**	**16**	4	23:26	5:07	359	5:07	211	5:08	**87**
−1936	**9**	**1**	−1936	8	15	845	**9**	**16**	6	8:25	5:25	264	5:26	135	5:27	**10**
−1936	**9**	**30**	−1936	9	13	845	**10**	**15**	7	18:17	5:50	316	5:51	187	5:52	**60**

DoW = day of week; ToD = time of day.

The exactitude of the phyle list, if planned in advance, with the actual new moon observations, is remarkable. Only two dates in the table differ *from the temple account* by a day, remembering that the Egyptian civil months and days are reconstructed by modern computers. The one-day difference in these dates may be due to the minor variations between the expected new moon and the actual, but are chronologically insignificant. The dates for the priests are fully explicable as dates for new moons on which they began their period of service dated to the *civil* calendar known from Greco-Roman times. I conclude that lunar dates in a civil calendar are not evidence for a lunar calendar.

Parker. The Ebers calendar is not a Sothic or fixed year but a lunar year.

Parker reasoned that because the second column of the Ebers calendar had civil-month designations, the first column could not also be civil, so therefore it must be either lunar or Sothic.[68] The Sothic year was the idea, argued by scholars who preceded Parker, that the Ebers calendar showed evidence of a Sothic or fixed year that kept the natural seasons in step with the civil year by the addition of a sixth epagomenal day every fourth year.[69] Since there is no evidence of this happening until the failed Decree of Canopus in 238 BCE, Parker eliminated the Sothic calendar, and thus was left with the lunar calendar.[70]

He viewed the Ebers calendar as "a table of concordance between the original lunar calendar and the civil year."[71] However, the presence of *wp rnpt* as the first month of the year had to be explained when all other month-lists placed *wp rnpt* in 12th position. He cited evidence from the tomb of Senmut, the Geographical Papyrus from Tanis, the Necho water clock, and three partly-parallel texts from Edfu (a, b, and c).[72] Texts (a) and (c) refer to "day 18 of the 4th month of *ŝmw*," whereas the parallel text (b) refers to "day 18 of *wp rnpt*," showing clearly that the fourth month is *wp rnpt*. Having asserted that the correct place for *wp rnpt* is the 12th month, he went on to explain why *wp rnpt* is in first place in the Ebers calendar, saying:

> The explanation is not complicated. The event which regulated the original lunar calendar was the rising of Sothis, called *wp rnpt*. The date of this event would, then, correctly go at the head of a calendar governed by it. But this event also gave its name to the last month of the year. In the first column of the Ebers calendar, therefore, the last month of the year appears at the head of the months merely because its eponymous feast determined the following year. The correct interpretation of the second line of the calendar seems to me to be that the date III *šmw* 9 is common both to the going forth of

[68] The Ebers calendar is depicted at chap. 3, pp. 50ff. and see chapter 9.

[69] Parker, 38-39 §§193-196.

[70] Ibid., 37-38 §§191-193.

[71] Ibid., 41 §211.

[72] Ibid., 41-42 §§212-17. The Edfu texts are referred to again below on pp. 24-28.

> Sothis and to the beginning of the lunar month *wp rnpt*. From this date as a starting point was projected a schematic lunar calendar of full months of 30 days.[73]

Tetley: Because Parker assumed only two possible types of calendar for the first column of the Ebers calendar—fixed Sothic or lunar[74]—he did not recognize the possibility that the first column of the Ebers calendar could be some other sort of calendar with names corresponding to the civil-month designations in the second column. As discussed in chapter 3 (p. 50ff.), Spalinger proposed that the first column of the Ebers calendar consists of civil not lunar months, and the month-lists (like those from the tomb of Senmut) cited by Parker as lunar (see next section), Spalinger attributes to a civil calendar. If all the month-lists are civil, they cannot be evidence for Parker's original lunar calendar. We also noted that the identification of *wp rnpt* with the rising of *Sothis* is a late, not early, phenomenon.

I conclude that the first column of the Ebers papyrus is not evidence of a lunar calendar.

Parker: The astronomical ceiling in the tomb of Senmut is a depiction of a lunar calendar.

The astronomical ceiling of the tomb of the vizier Senmut is shown in chapter 6, page 88. It is dated to the time of Hatshepsut of the 18th Dynasty. Parker notes that the names of the months above the 12 circles are the same as those on the first column of the Ebers calendar, which he has determined are lunar. He writes: "The circles represent the eponymous monthly feasts of the original lunar calendar, with the twenty-four segments each an hour of the feast day. The *tḫy* feast is here correctly in the first place and *wp rnpt* in the last."[75] He goes on, "It cannot be argued that the circles represent the civil months and the civil year. Not only does the Ebers calendar speak against that, but the clearest possible evidence that we are here concerned with a lunar calendar is the fact that the deities below the circles are deities of the lunar month."[76]

Of the 15 deities, Parker identifies 11 as gods representing days of the *lunar* months by comparing them with Greco-Roman lists. Considering that the latter are a thousand years later than the Senmut ceiling, Parker says of the deities, "The fact that four out of fifteen are unidentified is not enough to outweigh the strong presumption that they also are earlier lunar day deities who have been supplanted."[77]

Gardiner notes in 1955, that like the Ramesseum, the Senmut tomb ceiling has *tḫy* as the first month and *wp rnpt* "paradoxically stands as the last."[78] He cannot agree with Parker that the ceiling is lunar in character.[79]

Tetley: In later discussion the calendar portrayed by the 12 circles in Senmut's tomb, compared with other presentations of the same or similar month-names with their respective deities as established by Spalinger, are all civil.[80] The Senmut tomb ceiling is not evidence of a lunar calendar.

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[73] Ibid., 42 §218.
[74] Ibid., 37 §191, 38 §193.
[75] Ibid., 42 §221.
[76] Ibid., 42 §222.
[77] Ibid., 42-43 §§220-23.
[78] Gardiner, "Problem of the Month-Names," 25.
[79] Ibid., 25.
[80] See A.J. Spalinger, "Month Representations," *Cd'É* 70 (1995) 110-122, esp. 119.

Parker: The astronomical ceiling in the Ramesseum is a depiction of a lunar calendar.[81]

Parker notes that elements in the Senmut tomb ceiling are also present in the Ramesseum ceiling, though somewhat different in form. Concerning the lowest panel he notes that eight of the 12 names are also found on the Senmut circles, so that "the identification is certain."[82] Significant for Parker is the central blank strip in the upper panel that is directly above the cynocephalus (baboon) on the *Djed* pillar in the lower panel, the symbol for Thoth. Parker is convinced that this represents, "the intercalary thirteenth month of the original lunar calendar with its eponymous deity, *D̲hwty*, whose feast, *D̲hwtyt*, occurred in it."[83] Since the civil calendar does not have a 13th intercalary month, this section seems to Parker to settle the question that an original lunar calendar was depicted, "a more convincing representation is difficult to imagine."[84]

Gardiner, in 1955, sees the cynocephalus, not as an intercalary month of a lunar year, but the five epagomenal days of the civil year. He writes, "I need hardly repeat that I regard such an intercalary month as pure fantasy, and that I cannot admit the ceilings of Senenmut and the Ramesseum as being lunar in character in his [Parker's] sense of the word."[85]

Tetley: The Ramesseum ceiling depiction and its copy at Medinet Habu has been determined by Spalinger to be that of a civil calendar. He does not recognize the cynocephalus as Parker's intercalary month, or as the five epagomenal days proposed by Gardiner. Rather, he writes, "The Thoth symbol performs its duty as year closer and year opener … Is not Thoth the god associated with months—hence, with the year?"[86]

I conclude that the Ramesseum ceiling is not evidence of a lunar calendar.

Parker: The names of the civil months show an original lunar calendar.

Parker understood that lunar months had names and these were derived from festivals held in each month. After the civil calendar was introduced, the month-names were transferred from the lunar calendar, with newer festivals and month-names giving way to more popular ones, so that right down to Ptolemaic times, the lunar month-names were represented in the civil calendar.[87]

Table 4.6 is from *Calendars*[88] showing in column 1 the numerical designations of the months, recognized by Parker as lunar. Column 2 shows the presumed lunar calendar month-names beginning with Parker's intercalary month identified as *D̲ḥwtyt* (Djehuty). For the 12th lunar month he gives two names, *wp rnpt* and *R*^{c}*-hr-3ẖty*. In the third column are the names for the early civil calendar (supposedly transferred from the lunar calendar), with three names for the 12th month, followed in the fourth column by their late Greco-Roman names.

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81 Depicted in chapter 6.

82 Parker, *Calendars*, 43 §224.

83 Ibid., 43 §224.

84 Ibid., 43 §225.

85 Gardiner, "Problem of the Month-Names," 25.

86 Spalinger, "Month Representations," 110-22, esp. 115-17.

87 Parker, *Calendars*, 43 §226, 45-46 §230.

88 Ibid., 45 §230.

Table 4.6: Parker's original lunar and civil calendars

Lunar calendar month-names		Civil calendar month-names	
		Early	**Late**
Intercalary	Ḏḥwtyt		
I *3ḫt*	tḫy	Ḏḥwty	Thoth
II *3ḫt*	Mnḫt	p-n ʾIpt	Phaophi
III *3ḫt*	Ḥt-ḥr	Ḥt-ḥr	Hathor
IV *3ḫt*	k3 ḥr k3	k3 ḥr k3	Choiak
I *prt*	šf bdt	t3 ᶜ3bt	Tybi
II *prt*	rkḥ-wr	p-n mḫr	Mechir
III *prt*	rkḥ nḏs	p-n ʾImnḥtp	Phamenoth
IV *prt*	Rnwtt	p-n Rnwtt	Pharmouthi
I *šmw*	Ḫnsw	p-n Ḫnsw	Pachons
II *šmw*	Ḫnt-ḫty	p-n ỉnt	Payni
III *šmw*	ʾIpt ḥmt	ỉpỉp	Epiphi
IV *šmw*	wp rnpt Rᶜ-ḥr-3ḫty	(mswt Rᶜ-ḥr-3ḫty)[89] wp rnpt, p3 ŝmt n Ḥr[90]	Mesore

Parker notes that there are four months in his second lunar column that are the same as four months in the third civil column: *Ḥt-ḥr*, *k3 ḥr k3*, *Rnwtt*, and *Ḫnsw*. He writes, "This, to my mind, is a clear-cut indication that at some earlier time, nearer the date of origin of the civil calendar, all the months of the civil year had borrowed their popular names from the lunar year."[91]

Having assumed that he has provided evidence of an original lunar calendar in the month-names, Parker then seeks further support for its existence by appealing to the lunar nature of the deities on the frieze of the temple of Edfu. Near the end of the second half of the frieze, 12 deities are inscribed along with their month designations (I *3ḫt,* II *3ḫt*, etc.) and the individual names of the months they represent (for example, the deity of I *3ḫt* is named *tḫy*). Preceding the 12 deities, the frieze depicts 30 more deities with their names, which Parker assumes to be the deities of a 30-day *lunar* month, because, preceding the 30 deities are a further 14 deities, which Parker assumes to be those representing the waxing moon, coming before 14 steps on top of which is the *wḏ3t*-eye, the symbol for the day of the full moon.[92] Parker reasons that the 14 + 30 deities are lunar; therefore, the 12 that follow representing the month designations must be lunar too. Spalinger later argued, in contradiction to Parker, that the Edfu frieze depicts months of a *civil* calendar. He observes, "Not merely at Edfu but likewise earlier in the New Kingdom no specific lunar calendar can be found."[93]

Seeking to find further evidence for the *lunar structure* of the calendar Parker sought to confirm that the rising of Sothis coincided with the seasons beginning in the *12th month* of the year, which would then indicate that the lunar calendar regulated the seasons. He assumed that the Two Lands were united in 3100 BCE, and at that time Sothis rose heliacally about June 20 (Greg.).

The four winter months of *prt*, that is, *ŝf bdt*, the "swelling of the emmer," the two *rkh* or "fire" months, and *rnwtt* or harvest, coincided with the winter solstice, thus a year began approximately six months earlier at the time of the summer solstice when the

[89] Parker notes, "This is not yet attested as a month name in the 20th Dynasty," (*Calendars*, 45 §230 Table 7).

[90] "The going forth of Horus" comes from oBM 29560 formerly 5639a, which we discussed earlier, in which this name is found ahead of the others in the text. It is unclear whether this is a month-name or a feast name. See on p. 57, example (8), above.

[91] Parker, *Calendars*, 45 §230.

[92] See the extended frieze on pl. 4 and 5 of Parker, *Calendars*.

[93] Spalinger, "Month Representations," 119.

heliacal rising of Sothis was assumed to take place.[94] Believing that *wp rnpt*'s primary meaning was the heliacal rising of Sothis, which he alleges took place in the last month, and noting too, Gardiner's belief that *wp rnpt* was a solar feast, and that Re the sun-god, "in his first act of rising, opened the succession of months and years, as the originator of which he is so often eulogized,"[95] Parker combined the two events to give them their primary application.

He reasoned, "To the ancient Egyptians who used a lunar year based on the rising of Sothis, any other day than that one for the creation of the universe would have been unthinkable, for that event determined the months and the seasons in their proper succession."[96]

The result of this coincidence was one month having two names. "So easily also, when the one term "*wp rnpt* was taken over and applied to the first day of the civil year, could the second term *mswt Rᶜ* have been taken along with it and applied to the same day."[97] Spalinger amplifies, "In other words, as Sothis heliacally rose and inaugurated a new year, the sun god Re also rose and equally commenced the new year."[98]

Gardiner, in 1955, adds nothing to this argument since he doesn't believe in Parker's lunar calendar.

Tetley: Firstly, the month-names Parker assigns to the lunar calendar (*tḫy*, *mnḫt*, *ḥt-ḥr*, etc.) are the same as the months determined by Spalinger to be civil—apart from Parker's gratuitous inclusion of *Ḏḥwtyt* as the intercalary month at the beginning of the list. Parker says that alternative month-names in the civil calendar are due to newer names replacing older ones, and that in the Ptolemaic period archaizing tendencies meant that older names were once more, "taken over from the lunar months."[99]

Furthermore, he conjectures that the month-names of his *later lunar* calendar, "were the ones borne by the civil months, and not those of the original lunar calendar."[100] In other words, he cannot differentiate his later lunar calendar month-names from the civil calendar month-names because they are the same, and the civil calendar month-names were themselves taken over from the (alleged) *original* lunar calendar month-names, some of which were replaced with later names.

This infers that over the entire span of ancient Egyptian history only one list of month-names (with some replacements) is known, so that the existence of an original *lunar* calendar is *not* demonstrated by the fact that all the month-names come from one set. They could all be civil coming from a civil prototype, or from some other calendar. Spalinger has stated that "We do not have the names of the original lunar calendar; we have to derive those designations from later material."[101] Further on he writes, "The Egyptian civil calendar reveals the original lunar calendar through the names of its months. A few month-names changed after the early third millennium BC, but that had to do with historical causes over centuries, and not with the invention [of *sic*] a third calendar"[102] ("third calendar" means the later lunar calendar). So what evidence is there

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94 Parker, *Calendars*, 46 §§232-34.
95 Ibid., 47 §236.
96 Ibid., 47 §237.
97 Ibid.
98 Spalinger, "*Wp rnpt* in the Esna Festival Calendar," *Three Studies*, 54.
99 Parker, *Calendars*, 45-6 §§230-31.
100 Ibid., 46 §231.
101 A.J. Spalinger, "Ancient Egyptian Calendars: How Many Were There?" *JARCE* 39 (2002) 243.
102 Ibid., 249.

that the month-names in the civil calendar came from a lunar calendar? None whatsoever.

Though Spalinger does not agree with Parker's hypothesis of a later lunar calendar, he follows Parker in assuming that the original calendar can be found in the civil month-names because he sees the need for Parker's original lunar calendar to explain the anomaly of festivals being held out of their eponymous months in the Greco-Roman calendar. He accepts Parker's hypothesis that there was a transfer of lunar festivals and month-names from the original lunar to the civil calendar because he sees this as the answer to festivals being held out of their eponymous months.[103] But there is no evidence that the month-names were transferred from a lunar calendar, or even the existence of a lunar calendar.

Secondly, Parker's argument that the seasonal structure of the calendar is evidence for a lunar calendar is based on his own hypothesis that the primary meaning of *wp rnpt* was the rising of Sothis which gave its name to the 12th month of the year, and that this happened on June 20 in ca. 1300 BCE. Since the meaning of *wp rnpt* is the "opener of the year," and not the rising of Sothis (*prt spdt*) the equivalence is highly suspect.

Spalinger points out that any equation between *wp rnpt* and *prt spdt* comes only from the late period. Furthermore, it is the date of the annual rising of Sothis that has been used to fix New Year's Day in the solar year at the beginning of a seasonal cycle, not the alleged lunar calendar with the rising of Sothis in its 12th month. Spalinger discusses the agricultural orientation of the names of the months (citing Gardiner[104]), and sees at least three or four epochs in the civil calendar: ecological-agricultural, Sothic, solar, and the rebirth of agriculture.[105] He also speculates that there might have been "a whole series of local years in the Nile Valley."[106] So Parker's "seasonal structure argument" has no actual basis.

Parker presupposes a lunar calendar, for which he is actually trying to find evidence. He does not establish the lunar origin of the month-names or that the names of the civil months were transferred from a lunar calendar. Civil month-names are not evidence of a lunar calendar

The above arguments for the alleged lunar calendar were discussed by Parker in 1950. I return to the controversy with Gardiner in chapter 7. But to continue with Parker's hypothesis: How does the *assumption* of an original lunar calendar contribute to Parker's understanding of the civil calendar—the second of his three calendars?

Parker's Civil Calendar

Parker's idea of the introduction of a civil calendar arises from his belief in an earlier original lunar calendar. He assumes the civil calendar was introduced when the alleged lunar calendar, which inserted an intercalary 13th month every three (or two) years to keep the rising of Sothis in the 12th month, became a disadvantage to "a well organized kingdom."[107] This new, schematic calendar had three seasons of four months each, with 30 days to a month, and five additional days. Parker notes that the circumstances of the introduction of the civil calendar are not known, though he hazards

[103] Idem, "Notes on the Ancient Egyptian Calendars," *Orientalia* 64 (1995) 20, 24-25; idem, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson*, Vol. 2 (Boston: Museum of Fine Arts, 1996) 757; idem, "Ancient Egyptian Calendars," 250.

[104] A.H. Gardiner, "Review of J.G. Frazer, 'The Golden Bough: Adonis, Attis, Osiris; Studies in the History of Oriental Religion,'" *JEA* 2 (1915) 125; cited by Spalinger in "Ancient Egyptian Calendars," 27.

[105] Spalinger, "Ancient Egyptian Calendars," 27-28.

[106] Ibid., 30.

[107] Parker, *Calendars*, 53 §265.

a guess that it was ca. 2937 and 2821 because he calculates that the rising of Sothis, which had come to be recognized as its first day, took place ca. 2773 BCE.[108]

The old lunar year was not abandoned but ran concurrently with the new civil calendar and in accord with it as far as possible. It was not tied to Sothis at first but to some variable event, which disguised the fact that the two calendars were not actually synchronized to each other.[109]

After time had passed, the ancient Egyptians realized that the lunar calendar and the civil calendar were no longer in complete agreement due to the shift forward of the civil year. Parker emphasizes that there is no evidence of adjustment or tampering of the civil calendar to bring it into agreement with the lunar year.[110] To remedy the separation of the hypothetical original lunar calendar from the introduced civil calendar, Parker hypothesized a *later* lunar calendar.

Parker's Later Lunar Calendar

Parker proposed the creation of a special lunar year "whose sole purpose would be to provide the civil year the same sort of dualistic setup which had obtained when the civil year was first inaugurated … In this fashion the original lunar calendar would continue on independently as before, while the later lunar calendar and the civil calendar, the dual year, would be free to progress forward through the seasons."[111]

He assumed that this later lunar year took its names from the civil year because they were both components of the dual year.[112] He hypothesized that the presence of several lists of 59 divinities having decanal names and representations found in the late temples of Dendera, Edfu, and Esna, were evidence of the dual year.[113] He asserted that 48 of the divinities represented the 12 months of the normal lunar year and the remaining 11 were the difference between the 354 days and the 365 days of the civil year.[114] He concludes, "Could the essential duality of the year be more graphically portrayed?"[115]

Spalinger, who is critical of Parker's later lunar calendar, observed that the 59 divinities, "need not, on an *a priori* basis, support the existence of the hypothesized second lunar calendar but rather reflect upon the first lunar system."[116] In what way the divinities reflected upon the (alleged) first lunar system is not stated.

Parker used the original and later lunar calendars and the civil calendar to provide an alternative explanation to Gardiner's hypothesis that two civil calendars accounted for festivals being held out of their eponymous months in the Greco-Roman calendar.

In sum, Parker sought to connect the later lunar calendar to the schematic 25-year lunar cycle shown on papyrus Carlsberg 9. He thought that a later lunar calendar that kept in step with the civil calendar was behind the 25-year cycle of new moon dates.

Our analysis has shown that lunar phases were always dated by the civil calendar, and there is no evidence that the 25-year cycle of Carlsberg 9 was based on a lunar calendar with seasons and month-names, whether original or later.

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108 Ibid., 53 §§265-68.

109 Ibid., 52-54 §§260-71.

110 Ibid., 54 §270.

111 Ibid., 54 §271, 56 §281; see also, idem, "Calendars and Chronology," 18-19; J. von Beckerath explains that the later lunar calendar did not depend on the going up of Sothis but began with the first new moon after the first day of the civil calendar; thus, it was not tied to the natural year but to the civil calendar ("Der ägyptische Mondkalender und seine Schaltregulierung," *GM* 47 [1981]).

112 Parker, *Calendars*, 56 §281.

113 Ibid., 55 §274.

114 Ibid., 55-56 §§273-80.

115 Ibid., 56 §280.

116 Spalinger, "Thoth and the Calendars," 48.

Despite Parker's assertions that he found evidence for a lunar calendar, our scrutiny provides not a scrap of proof for the existence of either an original lunar or a later lunar calendar. All his arguments have lacked substance, even though he says that the lunar calendar "has met every test that can be brought against it at this time … Since the original lunar calendar must then be counted a certainty, we are confronted with the situation that in the later period there were three calendars in use."[117] In a chapter of a book written in 1971, he reaffirmed his belief in his three calendars "which continued in use to the very end of pagan Egypt."[118]

Only at the end of his *Calendars* does Parker finally interact with Gardiner's evidence for feasts being held out of their eponymous months written 44 years previously. Having already asserted his belief in the lunar, civil, and later lunar calendars, he then sought to provide from them an answer to this enigma, which I am about to explore further.

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[117] Parker, *Calendars*, 50 §§252-53.
[118] Idem, "Calendars and Chronology," 18.

Chapter 5

Dating by Lunar Months and Phases

Richard Parker and others espoused Egyptian chronology based on lunar calendars, in opposition to Alan Gardiner. Further exposition of that controversy will permit an assessment of Parker's views. A reasoned evaluation, and dismissal, of Parker's school of thought will consolidate the correct approach to reconstructing ancient Egyptian chronology.

But it is also important, while dismissing a lunar "calendar," not to dismiss the function and importance of lunar observations, months, and phases in the Egyptian view of their world and its times. References to lunar phases abound. And they can provide *crucial validation for confirming any attempted reconstruction of Egypt's chronology*, as I shall show. That does not mean that the chronology of Egypt was predicated on a lunar calendar. This chapter expands on the use of Lee Casperson's tables.

Lunar Months

The ancient Egyptians observed the Moon's orbit around the Earth with a day or so of invisibility prior to the reappearance of the first crescent, increasing to full moon about 15 days later, and then diminishing to its final crescent again, before the rotation began anew.[1]

A complete orbit of the Moon around the Earth is 27.3 days (a sidereal month), but because the Earth is also moving in the same direction as the Moon, the Moon takes on average two days longer so that 29.530589 days elapse to reach the point at which it began its orbit (a synodic month). The latter is the month used in lunar calculations.

Lunar months dated from conjunction to conjunction (when the Sun, Earth, and Moon are in a line and the Moon is not visible from the Earth) take 29 or 30 days depending on the Moon's proximity to the Earth. The closer to the Earth, the faster the Moon travels, resulting in a 29-day lunar month, and the farther the Moon is from the Earth the slower it moves, resulting in a 30-day month.[2]

The time between one new moon and the next can vary between 29.2679 and 29.8376 days, but never 28 or 31 days.[3] Twelve lunar months consisting of 29 or 30 days each, amount to only 354 days, whereas the Egyptian civil year of 12 months of 30 days plus 5 epagomenal days amounts to 365 days. Twelve lunar months do not fit

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[1] See R.A. Parker, *The Calendars of Ancient Egypt* (SAOC 26; Chicago, IL: Oriental Institute of the University of Chicago, 1950) 1-6 §§1-19 for a full discussion on the moon and crescent visibility.

[2] Ibid., 2 §7, 6 §18; R.A. Wells, "Re and the Calendars," *Revolutions in Time: Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 2, 15; idem, "The Role of Astronomical Techniques in Ancient Egyptian Chronology: The Use of Lunar Month Lengths in Absolute Dating," *Under One Sky: Astronomy and Mathematics in the Ancient Near East* (eds. J.M. Steele and A. Imhausen; Alter Orient and Altes Testament 297; Münster: Ugaret, 2002) 459.

[3] A.J. Spalinger, "Ancient Egyptian Calendars: How Many Were There?" *JARCE* 39 (2002) 247, citing B.E. Schaefer, "The Length of the Lunar Month," *Archaeoastronomy* 17 (supplement to *Journal for the History of Astronomy* 23 [1992]) 32.

comfortably into the length of a solar year being 11 days too short. Thirteen months give 384 days, being 19 days too long.[4]

What did Egyptians regard as the Beginning of a New Lunar Month?

Considerable discussion has taken place in the past regarding when the Egyptians began their lunar month.[5] A consensus of opinion now endorses Parker's conclusion that a new moon in ancient Egypt was reckoned to have occurred "on the morning of the day when the old crescent of the new moon was no longer visible in the eastern sky before sunrise."[6] The last appearance of the old crescent was a startling phenomenon occurring only a few hours before the sun itself rose near the same spot on the horizon.[7] The following dawn, when the Moon was actually *invisible* due to its proximity to the sun, was the day of a new moon, often the day of conjunction, and was recognized by the Egyptians as the first day of the new lunar month. The new moon also occurs but less often on the day preceding conjunction, and rarely on the day after conjunction.[8]

The Egyptian term for a new moon is *pśḏntyw*. The full moon occurs on average about 15 days after the new moon, but it may vary from 13.73 to 15.80 days after conjunction.[9] Egyptian festivals were often held on the day of the new moon or within several days of its reckoning, and others were held to coincide on or near the full moon, such as the installation of the Apis bull at Memphis.

Dating by Lunar Phases

Leaving aside the important issue as to whether the ancients used a lunar *calendar* with seasons and month-names, and an intercalary month when needed to keep the rising of Sothis in the 12th month, we now consider how lunar *phases* can be used in the reconstruction of Egyptian chronology.

Records of some of these festivals, dated to the civil calendar and tied to a specific regnal year of a king, have survived and make an important contribution to resolving Egyptian chronology. About 40 new moon dates come from the reigns of Sesostris III and Amenemhet III of the 12th Dynasty, and 40–50 other lunar dates that can be tied to new moons or full moons are found scattered in the 5th–26th Dynasties. These include the famous new moons of Thutmose III's 23rd year dated to I *šmw* 20 and his 24th year dated to II *prt* 30, and Ramesses II's 52nd year dated to II *prt* 27. A few dates come from the Ptolemaic period too, and we shall consider all these in context.

Carlsberg 9 Papyrus

Egyptians of the fourth century BCE possessed a table whereby they could reckon the date of every new moon in a 25-year cycle. This cycle table appears on a section of the Carlsberg 9 Papyrus and shows the civil dates on which a new moon fell on each month of a 25-year cycle timed to start when the first month began with a new moon on I *3ḫt* 1[10] (see Table 5.1).

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[4] See also, Wells, "Re and the Calendars," 2, 15; idem, "Role of Astronomical Techniques," 459.

[5] See, e.g., R. Krauss, "Lunar Days, Lunar Months, and the Question of the Civil based Lunar Calendar," *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006) 387-88.

[6] Parker, *Calendars*, 9 §25; see idem, "The Beginning of the Lunar Month in Ancient Egypt," *JNES* 29 No. 4 (1970) 217-20.

[7] Wells, "Re and the Calendars," 15, 33 n. 39.

[8] Parker, *Calendars*, 9-23 §§25-108.

[9] Ibid., 6 §19.

[10] Ibid., 15. For the background to the Carlsberg 9 papyrus, see L. Depuydt, "The Demotic Mathematical Astronomical Papyrus Carlsberg 9 Reinterpreted," *Egyptian Religion: The Last Thousand Years. Studies*

Table 5.1: The 25-year cycles of the Carlsberg 9 Papyrus

	3ḫt				***prt***				***ŝmw***			
Year	**Months**				**Months**				**Months**			
	I	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**
1		1		30		29		28		27		26
2		20		19		18		17		16		15
3		9		8		7		6		5		4
4		28		27		26		25		24		23
5		18		17		16		15		14		13
6		7		6		5		4		3		2
7		26		25		24		23		22		21
8		15		14		13		12		11		10
9		4		3		2		1		30		29
10		24		23		22		21		20		19
11		13		12		11		10		9		8
12		2		1		30		29		28		27
13		21		20		19		18		17		16
14		10		9		8		7		6		5
15		30		29		28		27		26		25
16		19		18		17		16		15		14
17		8		7		6		5		4		3
18		27		26		25		24		23		22
19		16		15		14		13		12		11
20		6		5		4		3		2		1
21		25		24		23		22		21		20
22		14		13		12		11		10		9
23		3		2		1		30		29		28
24		22		21		20		19		18		17
25		12		11		10		9		8		7

When Parker analyzed the information given in Papyrus Carlsberg 9 for the table of new moon dates, it seemed to him to give only the even months of each season: II & IV *3ḫt*, II and IV *prt*, II and IV *šmw*. He *calculated* the dates for the uneven months and the epagomenal days.[11] Sometimes he gives the same date on three consecutive months, followed by one date on one month before moving on to the next date for the next two or three months.[12] However, Depuydt's recent translation of the papyrus led him to understand that each of the dates given apply to both the *odd- and even*-numbered months; that is, each consecutive odd and even month has the same date for the new moon.[13] The outcome of this interpretation is that there are no changes in the dates for the first six months (I to IV *3ḫt*; then I to II *prt*), nor for the remaining even-numbered months, (IV *prt*, II *šmw* and IV *šmw*),[14] but the days of III *prt* and III *šmw* are all one day earlier in Depuydt's table (Table 5.2) than in the table reconstructed by Parker (Table 5.1).[15] Compare Parker's table above and Depuydt's table below. It is presumed by both scholars to be a schematic table produced to fit 309 lunar months into a period of 25

Dedicated to the Memory of Jan Quaegebeur, Part 2 (Orientalia Lovaniensa Analecta 85; Leuven: Peeters, 1998) 1277-79.

[11] See full discussion in Parker, *Calendars*, 13-17 §§49-64, 24-29 §§109-141.

[12] Ibid., 25 §119 Table 5.

[13] Depuydt, "Demotic Mathematical," 1277-97.

[14] On four occasions it is not certain whether day 30 or day 1 should be supplied. Depuydt marks with an *X* 30 and Parker with 1-30. The places are III *3ḫt* Year 1 (of cycle), I *šmw* Year 9, I *prt* Year 12, III *prt* Year 23.

[15] See Macedonian table compared with Parker's table: A. Jones, "On the Reconstructed Macedonian and Egyptian Lunar Calendar," *Zeitschrift für Papyrologie und Epigraphik* 119 (1997): 157-66. (From website: Uni-Koeln.de/phil-fak/ifa/zpe/downloads/1997/119pdf/119157pdf)

years, rather than one of observation. [16]

Leo Depuydt explains the synchronization between the lunar and civil years over a 25-year period:

> It is a fact of nature that 309 lunar months, each on average counting about 29.53059 days, with the shortest being 29.26 days long and the longest 29.80 days, are about as long as 25 Egyptian civil years of 365 days. The former count 9124.95231 days (309 × 29.53059); the latter exactly 9125 days (25 × 365). Or, the former is on average about an hour shorter than the latter. For example, if, in a given Egyptian civil year, the conjunction of sun, moon, and earth occurs at 5:00PM on I *3ḫt* 1, that is, New Year's Day, then 25 civil years of 365 days later, it will, on average, occur at about 4.00PM of I *3ḫt* 1. After about 500 years, the difference between 309 lunar months and 25 civil years will add up to a day.[17]

Parker provided the date of 357 BC for the first year of the table.[18] He and Leo Depuydt think the papyrus itself dates to about 144 CE.[19] Depuydt's table is presented below (Table 5.2) in all but the first column, in which I have inserted the years for the period.[20]

Table 5.2: New moon days in a recurring 25-year cycle (Cy yr) dated to the Julian Calendar (Jul.) 4th century BCE reconstructed from the Carlsberg 9 Papyrus

Jul. yrs recurring	**Cycle yr**	***3ḫt***				***prt***				***šmw***				**epag**
		I	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**	
382/57/32/07	1	1	1/X	30	30	29	29	28	28	27	27	26	26	
381/56/31/06	2	20	20	19	19	18	18	17	17	16	16	15	15	
380/55/30/05	3	9	9	8	8	7	7	6	6	5	5	4	4	*(4)*
379/54/29/04	4	28	28	27	27	26	26	25	25	24	24	23	23	
378/53/28/03	5	18	18	17	17	16	16	15	15	14	14	13	13	
377/52/27/02	6	7	7	6	6	5	5	4	4	3	3	2	2	*(2)*
376/51/26/01	7	26	26	25	25	24	24	23	23	22	22	21	21	
375/50/25/00	8	15	15	14	14	13	13	12	12	11	11	10	10	
374/49/24/99	9	4	4	3	3	2	2	1	1/*X*	30	30	29	29	
373/48/23/98	10	24	24	23	23	22	22	21	21	20	20	19	19	
372/47/22/97	11	13	13	12	12	11	11	10	10	9	9	8	8	
371/46/21/96	12	2	2	1	1/*X*	30	30	29	29	28	28	27	27	
370/45/20/95	13	21	21	20	20	19	19	18	18	17	17	16	16	
369/44/19/94	14	10	10	9	9	8	8	7	7	6	6	5	5	*(5)*
368/43/18/93	15	30	30	29	29	28	28	27	27	26	26	25	25	
367/42/17/92	16	19	19	18	18	17	17	16	16	15	15	14	14	
366/41/16/91	17	8	8	7	7	6	6	5	5	4	4	3	3	*(3)*
365/40/15/90	18	27	27	26	26	25	25	24	24	23	23	22	22	
364/39/14/89	19	16	16	15	15	14	14	13	13	12	12	11	11	
363/38/13/88	20	6	6	5	5	4	4	3	3	2	2	1	1	*(1)*
362/37/12/87	21	25	25	24	24	23	23	22	22	21	21	20	20	
361/36/11/86	22	14	14	13	13	12	12	11	11	10	10	9	9	
360/35/10/85	23	3	3	2	2	1	1/*X*	30	30	29	29	28	28	
359/34/09/84	24	22	22	21	21	20	20	19	19	18	18	17	17	
358/33/08/83	25	12	12	11	11	10	10	9	9	8	8	7	7	

epag = epagomenal.

[16] Parker, *Calendars*, 24 §111; L. Depuydt, *Civil Calendar and Lunar Calendar in Ancient Egypt* (Orientalis Lovaniensia Analecta 77; Leuven: Peeters, 1997) 200; idem, "Demotic Mathematical," 1292.

[17] Depuydt, *Civil Calendar*, 151-52; similarly, idem, "Demotic Mathematical,"1281-82.

[18] Parker, *Calendars*, 25 §120.

[19] Ibid., 13-17 §§49-64; Depuydt, "Demotic Mathematical," 1279.

[20] Depuydt, "Demotic Mathematical," 1292.

In the first column, each of the 25 rows contains digits for four years, 25 years apart, applied to the 4th century BCE with dates ending in 382/357/332/307.

In order to convert an Egyptian new moon date to a Julian date from the table above, one finds the Egyptian date and then the Julian years corresponding to that date in the first column. If the historical situation is known, one of the four dates should be applicable. The table shows that there is only one date for any new moon in the 25-year cycle, but there can be a date that is either one day earlier or later than the given date.

For example, the dates in cycle years 1–14 are one day less than in cycle years 12–25, and in cycle years 15–3 they are one year more. This can be illustrated using the Carlsberg 9 cycle for new moon dates falling in I *3ḫt* over a 25-year period (Table 5.3).

Table 5.3: Carlsberg 9 cycle new moons compared for I *3ḫt over 25 years*

Cycle Yrs 1–14	New moon dates	Cf. Cycle Yrs 12–25 with cycle yrs 1–14	1 or 2 days *more* than cycle yrs 1–14	Cf. Cycle Yrs 15–3 with cycle yrs 1–14	1 or 2 days *less* than cycle yrs 1–14
1	I *3ḫt* 1	12	I *3ḫt* 2	15	I *3ḫt* 30
2	20	13	21	16	19
3	9	14	10	17	8
4	28	15	30	18	27
5	18	16	19	19	16
6	7	17	8	20	6
7	26	18	27	21	25
8	15	19	16	22	14
9	4	20	6	23	3
10	24	21	25	24	22
11	13	22	14	25	12
12	2	23	3	1	1
13	21	24	22	2	20
14	10	25	12	3	9

The similarity of dates either one day earlier or later than the dates that begin the list in the 25-year cycle can result in the incorrect date being attributed to a feast (or other occasion) when trying to convert to a Julian date. However, once the date is defined within a few years, only one date will be applicable, resulting in conversion to the appropriate Julian date—assuming that the Egyptian date has been recorded correctly. In other words, a new moon date is not repeated (or one day higher or lower) in years *close* to any *given* date, so a new moon date applies to a specific year within a limited range.

Before modern computer technology was able to provide precise Julian dates for Egyptian dates, scholars were helped in their computations by the lunar tables of Carl Schoch (1928) [21] or P.V. Neugebauer (1929).[22] However, these are now known to be inaccurate and out-of-date.[23] Even with up-to-date software, the correct Julian date

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[21] C. Schoch, "Tables for Computation," *The Venus Tablets of Ammizaduga* (eds. S. Langdon and J.K. Fotheringham; London, 1928).

[22] P.V. Neugebauer, *Astronomische Chronologie* (Berlin and Leipzig, 1929).

[23] See also Wells, "Role of Astronomical Techniques," (460-61) where he also mentions the astronomical tables of H.H. Goldstine, *New and Full Moons 1001 BC to AD 1651* (Memoirs of the American Philosophical Society 94; Philadelphia: American Philosophical Society, 1973); M. Chapront-Touzé and J. Chapront, *Lunar Tables and Programs from 4000 BC to AD 8000* (Richmond, VA: William-Bell, 1991), and those of Fred Espenak: http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html. Wells commends only the latter two. C. Leitz refers to Sothic and lunar dates supplied to him by Prof. Mucke of the Astronomical Office of Vienna, in "Bemerkungen zur astronomischen Chronologie," *Ä und L* 3 (1992) 100-02; J.G. Read in "Placement of El-Lahun Lunar Dates and Resulting Chronology," *DE* 33 (1995) 87-113 also uses the lunar tables supplied to him by L.W. Casperson. Casperson has excerpts of tables in two of his articles: "The Lunar Dates of Thutmose III," *JNES* 45 (1986), and "The Lunar Date of Ramesses II," *JNES* 47 (1988). Casperson's tables are the ones used in this chronology.

depends on having the correct Julian year in the 25-year cycle for the Egyptian date. Unless the correct year is selected from the table there is a possibility that the wrong 25-year cycle has been attributed to the date. An added complication to ascertaining whether the correct date has been obtained is the possibility that there was an error in observation giving a date one day higher or lower than the actual.

Accuracy and Exactitude

A 1994 study by Doggett and Schaeffer details the incidence of accurate and inaccurate sightings. They write:

> For a group of experienced observers, the percentage who failed to sight the Moon when it should have easily been spotted is roughly 2%. The rate of positive errors, when an observer erroneously claims a sighting, is 15% ... If 100 observers look for the crescent, roughly 15 will mistakenly (yet honestly) claim to see the Moon. Therefore, lunar months based on a few positive sightings from a large number of observers will invariably and mistakenly start early."[24]

Rolf Krauss has recently commented on the situation with respect to the supposed repetition of lunar dates tending to repeat every 25 years. He points out that: "A lunar date repeats on the same calendar day, if 9125 days comprise 309 lunar months of which 164 are lunar months of 30 days and 145 are lunar months of 29 days: (164 × 30 days) + (145 × 29 days) = 4920 days + 4205 days = 9125 days."[25]

But, he notes that, because of the irregular movement of the Moon there can be 165 lunar months of 30 days and 144 lunar months of 29 days, in which case the repetition will be after 9126 days not 9125. Or alternatively, there can be only 163 lunar months of 30 days and 146 lunar months of 29 days over the 25-year period, which will mean a lunar day repetition after 9124 days.

Furthermore, Krauss writes, "On average only about 70% of the dates in a set repeat on the same day after a single 25 year shift. For multiples of 25 years, percentages of correct repetitions decrease. Shifts of 2 × 25 and 3 × 25 years yield exactly repeated dates in only 50% of the cases."[26]

Therefore, a record of an Egyptian new moon date is more likely to be an exact match in the appropriate 25-year cycle than in a 25-year period shifted from its historical setting. So if it is not an exact match but differs by a day, it may be because (1) the record is incorrect, perhaps due to poor visibility at the time of the supposed sighting (of an invisible new moon!); (2) the eyesight of the observer is defective or he mistook what he saw; (3) the wrong 25-year period is being applied to the date; or (4) an incorrect calculation of an Egyptian lunar date is applied to a Julian (or Gregorian) calendar.

In 2000, Bradley Schaefer warned Egyptian chronologists of five "astronomical difficulties" in attempting to reconstruct an absolute Egyptian chronology based on thin lunar crescent visibility,[27] and the same would apply to lunar crescent invisibility.[28]

In 2002, Ronald Wells examined the role of lunar month lengths and astronomical techniques used to date ancient Egyptian new moons and concluded that:

[24] L.E. Doggett and B.E. Schaefer, "Lunar Crescent Visibility," *Icarus* 107 (1994) 402.
[25] R. Krauss, "Lunar Dates," *AEC* (2006) 405.
[26] Ibid., 405-6.
[27] B.E. Schaefer, "The Heliacal Rise of Sirius and Ancient Egyptian Chronology," *JHA* 31 (2000) 153. Briefly, (1) discredited visibility algorithms; (2) lack of visibility of the Moon due to clouds; (3) visibility predictions uncertain in 20% of cases; (4) hundreds of strings of lunar month lengths provide multiple matches; and (5) start of the day and start of lunar month still disputed.
[28] Ibid., 153-54.

> None of the Egyptian lunar dates offer any promise of yielding an absolute date for two reasons: (1) the likelihood that any observed sequence of multiple month lengths contains at least one error, but maybe more, invalidates its use; and (2) the large number of consecutive month lengths, given perfect observations and perfect computations of past events, required for statistical validity far exceeds the available Egyptian record.[29]

This conclusion caused Kitchen to exclaim, “The lunar dates are all now to be discarded—see Wells 2002.”[30] Wells, however, was referring to attempts to resurrect an absolute chronology relying on lunar dates alone; he proposed they be used in conjunction with other available data.[31] This is the procedure I have adopted.

Casperson’s Application of Lunar dates to Ramesses II

I now consider how plausible new moon dates may be**,** based on the given data and applied to different centuries. In 1957, Parker proposed possibilities of accession years for Ramesses II in 1304, 1301, 1290, 1279 and 1276. Of these, he considered the 1290 date to be the most probable being based on a new moon date of II *prt* 26 falling in Ramesses II’s 52nd year on December 21, 1239.[32]

For this date to be correct an error had to be assumed for the date of II *prt* 27, which the text of the captain’s log reported in the 52nd year of Ramesses II, contained in *Papyrus Leiden* (I. 350, verso).

In 1988, Lee Casperson compared all five of Parker’s dates with those produced by his computer software. Reproduced below are two of the five sections of the new moon table (Table 5.4) supplied by Casperson giving new moon dates for the 52nd regnal year of Ramesses II with alternative accession years in 1290 and 1279.[33] An explanation of these dates is given to demonstrate how the tables are to be read, and Casperson’s subsequent tables throughout this book.

Table 5.4: New moon dates proposed for Ramesses II’s 52nd year in −1238 and −1227 with an accession date in 1290 and 1279 BCE

Heliopolos; Lat.30.1, Long.31.3; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1238	11	22	−1238	11	11	1544	5	27	1	9:51	6:42	227	6:43	123	6:43	22
−1238	**12**	**22**	−1238	12	11	1544	**6**	**27**	3	3:31	6:58	180	6:58	**83**	6:58	**−7**
−1237	1	20	−1237	1	9	1544	7	26	4	22:17	6:56	257	6:56	130	6:55	41
−1227	11	20	−1227	11	9	1555	5	28	6	19:00	6:41	336	6:41	181	6:42	56
−1227	**12**	**20**	−1227	12	9	1555	**6**	**28**	1	6:40	6:57	237	6:58	107	6:58	**5**
−1226	1	18	−1226	1	7	1555	7	27	2	19:00	6:57	325	6:56	155	6:56	62

DoW = day of week; ToD = time of day

Casperson explains: “The first eleven columns relate to the time of occurrence of the astronomical new moon, the instant of conjunction at which the ecliptic longitudes of Sun and Moon are equal.”[34] The first three columns give the new moon date: year, month, and day. In the table above the date of −1238 astronomical equates in the Julian

[29] Wells, “Role of Astronomical Techniques,” 470.

[30] K.A. Kitchen, “Ancient Egyptian Chronology for Aegeanists,” *Mediterranean Archaeology and Archaeometry* 2 (2002) 11.

[31] Wells, “Role of Astronomical Techniques,” 470.

[32] R.A. Parker, “The Lunar Dates of Thutmose III and Ramesses II,” *JNES* 16 (1957) 42-43.

[33] L.W. Casperson, “The Lunar Date of Ramesses II,” *JNES* 47 (1988) 183.

[34] L.W. Casperson, “The Lunar Dates of Thutmose III,” *JNES* 45 (1986) 146.

calendar system to 1239, and −1227 = 1228, and so on. "The astronomically expressed year with minus sign equals the civil year BC +1 because there is no zero civil year; 1 = 1 A.D.; 0 = 1 BC, –1 equals 2 BC etc."[35] Columns four to six give the dates in the Gregorian calendar, and columns seven to nine give the Egyptian dates.

Concerning the 10th–15th columns, Casperson writes, "The last six columns indicate the local time of sunrise and the visibility of the Moon at sunrise for three days near the date of conjunction. The zero column heading corresponds to exactly the date of conjunction; minus one is one day before; and minus two is two days before. The visibility numbers represent one hundred times the ratio of the lunar height at sunrise to the minimum height for visibility."[36]

Using the first example in the table above, in the row for Julian date "−1238 12 22" in columns eight and nine is the date "6 27". This refers to II *prt* 27 (that is the 27th day of the sixth month), the date of Ramesses II's new moon. In the last column under the 0 heading, appears the number −7, which means that the Moon was below the horizon. In the ninth column, under the −1 heading, the number 83 appears. Being between 1 and 100 means the Moon was *invisible* after sunrise. In column seven the number 180, that is greater than 100, indicates that the Moon was visible. For ease of reference I have presented significant numbers in bold type (including numbers in a table that are referred to later in the discussion).

New Moon Occurs on the First Day of Invisibility

Since the new moon is reckoned to occur on the first day of *invisibility* after the last crescent is seen, the 83 in the −1 column indicates it was invisible one day before conjunction, and therefore was not seen on the 26th day of the sixth month; that is, on II *prt* 26, one day before II *prt* 27, the new moon date recorded in the ship's log.

II *prt* 26 −1238 (1239 BCE) "In poor agreement with the text"

The date of II *prt* 27 recorded in the log reports that the observer(s) saw the last crescent on the 26th day, making the 27th the first day of invisibility; whereas the computer analysis indicates that the 26th was the first day of invisibility. Casperson found that the 1290 accession date based on II *prt* 26 in Ramesses II's 52nd year would have meant that observers would, "have 'seen' an invisible crescent;" therefore, in "poor agreement with the text" of the Leiden Papyrus.[37] This date is, therefore, not a good match on which to propose an accession date for Ramesses II, 52 years earlier in 1290 BCE.

II *prt* 28 −1227 (1228 BCE) "Almost consistent with the text"

Proceeding to the second date, above, with an accession proposed for Ramesses II in 1279, the date of conjunction on −1227 corresponds to 1228 BCE. In the row in Table 5.4 for Julian date "−1227 12 20" an Egyptian date is given of "6 28" or II *prt* 28, a day *later* than the given date. In the 0 column the number 5 appears, indicating that the moon was invisible, and in the −1 column the number 107 indicates that the Moon was visible (assuming ideal conditions). Therefore the new moon fell on the 28th day of *prt*, not the 27th. It could be assumed that the observer missed a marginally visible crescent on the 27th, thus citing it as the day of *pśdntyw* or new moon "when the lunar crescent was not visible before sunrise."[38]

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35 Wells, "Re and the Calendars," 32 n. 31.

36 Casperson, "Lunar Date Ramesses II," 182-83.

37 Ibid., 184.

38 Ibid., 181.

For the accession date of 1279, observers in −1227 would have, according to Casperson, “missed a marginally visible crescent (visibility 107) on II *prt* 27. This is not an unlikely kind of error, and thus a 1279 BCE accession date is almost consistent with the text.”[39]

Neither of these dates, however, gives the recorded date of II *prt* 27. Nevertheless, combined with an argument by Rolf Krauss for an Elephantine observation site for the “going up of Sothis,” which gives Ramesses II a “low” date, a 1279 accession date gained by lunar analysis is promoted by scholars in recent years.

II *prt* 27 −1337 (1338 BCE) Exactly Consistent with the Text

However, in 1996, Casperson provided me with the tables for Ramesses II’s 52nd year. I assumed Ramesses to have had an accession around 1390 BCE, which I gained from my chronology based on historical data, and inquired about new moon dates in a range which included −1337. He provided the following table (Table 5.5), to which I have added the heading for ease of reference.

Table 5.5: New moon dates proposed for Ramesses II’s 52nd year in −1337 with an accession year in 1390 BCE

Heliopolos; Lat. 30.1, Long. 31.3; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1338	12	18	−1338	12	6	1444	5	28	7	10:46	6:56	212	6:57	111	6:57	23
−1337	**1**	**17**	−1337	1	5	1444	**6**	**28**	2	1:39	6:57	180	6:57	**87**	6:57	**7**
−1337	2	15	−1337	2	3	1444	7	27	3	13:22	6:42	274	6:41	137	6:40	55

From this table, the row for Julian date “−1337 1 17” gives a date of 6 28 or II *prt* 28 for the Egyptian date. The last column shows the number 7 in the 0 column, and previous to that the number 87 in the −1 column. The 87 indicates the day of the new moon, the first day the Moon is invisible, and in this case it occurs the day before conjunction. So the day of new moon is II *prt* 27 as given in the record of Ramesses II’s 52nd year, which corresponds to 16 January 1338 BCE.

A side-comment at this point is timely. This is a significant use of Lee Casperson’s extensive contributions to this work. His articles, referred to above, alerted me to the material confirmation he could offer to fix Egyptian chronology by the use of tables establishing lunar phases and cycles. As in this present case, my work has derived from the examination of the historical and documentary evidence, which often included reference to lunar data.

And as in this case, my procedure with Casperson has always been to seek lunar tabular information based upon assumptions derived from the historical and documentary evidence described earlier. When I have requested data about lunar phases, Casperson has not known what I have been looking for. His tables have provided me with a completely independent source of information. But because many chronological references relating to ancient Egypt include documentary, historical, and lunar references, and these can be separately researched (such as my historical and chronological reconstructive work and Casperson’s astronomically-based lunar tables), the independent work of each provide potential for corroboration that may be regarded with a high degree of plausibility.

The visibility criteria used for Table 5.5 are the same as for the previous tables computed in 1988. As with all Casperson tables the location, with latitude and longitude in the top line, are critical for accuracy. This reading is from Heliopolis, but others will

[39] Ibid., 184.

be from Alexandria, Armana, Elephantine, Illahun, Megiddo, Memphis, Tanis and Thebes, depending on the context of the sightings under discussion.

The captain's log date and the computer generated date are in agreement for the 14th century, unlike the previous attempts generated for the 13th century. Thus a date that does not give an exact match may indicate that the wrong cycle of 25 years is being applied to it. For most chronologists, the 1338 new moon date giving Ramesses II an accession year of 1390 BCE is far too early to accept. It does not fit with *their* initial assumption that Rehoboam's 5th year and Shoshenq I's 20th year date to 925, instead of 977, as demonstrated in chapter 2. My purpose is to demonstrate that the 1390 date is accurate for Ramesses II's accession, both on the basis of astronomical data and the historical record.

Wells advised, "Two methods (in determining absolute dates) have proved very important in the past and must always be considered in any absolute date analysis. One is a study of the synchronisms with neighboring countries: the other, a review of the internal consistencies of the proposed dates, such as that initially drawn up, for example, by Kitchen, Hornung, or von Beckerath,[40] in which lengths of reign, genealogies, events, climatological changes, seasons, and the like, form a coherent data set relatable to similarly coherent data sets from other countries. Kitchen has given the most recent analysis of this type, which must be considered a fundamental comparison standard for Egyptian chronology."[41]

One naturally endorses Wells' desire for support from the combined evidence of synchronisms and internal consistencies before an absolute date (in Julian years) can be assigned to the kings' reigns. The discussion of dating systems and calendars is a step in this direction.

The Assyrian chronology, as represented by the Assyrian Eponym Canon, cannot be relied upon before the eclipse of 763 BCE, which rules out any predetermined dates for synchronisms before then. With regard to the length of reigns, Kitchen's seminal work will be the basis of the "comparison standard" as promoted by Wells when we come to discuss the Egyptian chronology and its correlation with that of Israel. It remains for a correlation of Egyptian and Hebrew dates to provide an absolute chronology for the ancient Near East, including Assyria, rather than attempting chronologies of Hebrew and Egypt on the basis of erroneous assumptions about the Assyrian Eponym Canon.

Lee Casperson's lunar tables giving new moons and full moons dated to the Egyptian civil calendar converted to Julian (and Gregorian) dates will be used throughout the reconstruction of Egyptian chronology. They will also help with Sothic rising dates. Lunar tables are also supplied by Dr. Fred Espenek (NASA's Goddard Space Flight Center) for new moon, 1st quarter, full moon, and 3rd quarter phases applicable to Universal Time; that is, Greenwich Mean Time.[42] They do not include conversion from Egyptian dates, but they corroborate Casperson's Julian dates for the Egyptian new moons and full-moon dates.

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40 Wells, "Role of Astronomical Techniques," 470, cites K.A. Kitchen "Supplementary Notes on 'The Basics of Egyptian Chronology'," *High, Middle or Low?* Part 3, 1989; E. Hornung, "Chronology of the New Kingdom," *High, Middle or Low?* Part 3, 1989; and J. von Beckerath, *Chronologie des Ägyptischen Pharaonischen* (Mainz: Phillip von Zabern, 1997).

41 Wells cites K.A. Kitchen, "Regnal and Genealogical Data of Ancient Egypt (Absolute Chronology I): The Historical Chronology of Ancient Egypt, a Current Assessment," *SCIEM II* (2000).

42 Fred Espenak, http://sunearth.gsfc.nasa.gov/eclipse/phase/phasecat.html or http://eclipse.gsfc.nasa.gov/phases/phasecat.html

Chapter 6

Pondering Egyptian Calendar Depictions

I have discussed the solar/agricultural calendar of ancient Egypt, the heliacal risings of Sothis and the Sothic cycle, the civil calendar, proposals about the original calendar, the Ebers calendar, the 25-year lunar cycle of the Carlsberg 9 papyrus, and new moon activity now accessible to us in a precise manner by computer-generated tables.

The Ebers calendar is introduced as the calendar of Upper Egypt based on the Sothic cycle. The rising of Sothis triggered the solar year—the seasonal agricultural year—in the early period of Upper Egypt. It was true to the solar timetable of 365 and a quarter days, and signaled the beginning of the actual agricultural seasons of inundation, sowing, and harvest, and their associated festivals. It had its counterpart in the calendar of Lower Egypt commencing one month later in the solar/agricultural year.

Also mentioned has been the adoption of the later schematic civil calendar, of 365 days, unsynchronized with the solar year, but recognized today as the calendar used by the ancient Egyptians for everyday affairs. Over the last century the discussion of Egyptian calendars has occupied the minds of Egyptologists intensely. This book concentrates upon the chronology of Egypt through the years, clearly tied to records that display the discrepancy between the timing of the heliacal rising of Sothis and the civil calendar. It offers solutions for dating the history of Egypt. The survey below suggests that the calendar of Upper Egypt represented by the Ebers calendar was progressively overtaken by the calendar of Lower Egypt.

Earliest Festival Calendars

Fragments of texts referring to temple offerings from the reigns of Sahure and Neuserre (Niuserre Iny) of the 5th Dynasty (Old Kingdom) appear to be the earliest existing evidence of calendars.[1] Festival calendars were specifically associated with the religious activities of the gods of Egypt.

The texts from Neuserre's reign come from inscriptions written on the left and right sides of a doorway in his solar temple found at Abusir (near Memphis).[2] Sherif el-Sabban proposes that the texts on either side represented different aspects of a whole calendar, or "twin calendars."[3] He notes that both texts contain: "a series of subjects; building texts and furnishings; estates supplying offerings [only left side preserved]; and the calendar proper of supplies for the cult, and of annual feasts on particular days."[4] He suggests that pyramid-complexes of the 3rd and 4th Dynasties may have had calendars and that they originated with the 1st and 2nd Dynasties.[5]

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[1] S. el-Sabban, *Temple Festival Calendars of Ancient Egypt* (Liverpool Monographs in Archaeology and Oriental Studies; Liverpool University Press, 2000) 1-8, pls. 1-5.

[2] Ibid., 2; A.J. Spalinger, "Festival Calendars," *The Ancient Gods Speak* (ed. D.B. Redford; Oxford University Press, 2002) 124.

[3] Ibid., 7-8.

[4] Ibid., 7.

[5] Ibid., 2.

Festival Calendars in the Middle and New Kingdoms

The presence of festival calendars in the New Kingdom (18th–20th Dynasties) presupposes their use in the Middle Kingdom (11th and 12th Dynasties) even though no calendars from the Middle Kingdom period have been found.[6] Materials in the Illahun archive, however, "give some idea of the range of feasts which would have featured in a Middle Kingdom calendar, if any had survived."[7] In the New Kingdom, for example, Amenhotep I had a festival calendar recopied from the Middle Kingdom.[8] Thutmose III had a calendar at Abydos[9] and three at Karnak: one at the Temple of Akhmenu, one south of the granite sanctuary, and another at the north wing of the sixth pylon; and also at Elephantine.[10] Another was found at Buto in the Nile Delta.[11] The latter mentions the famous rising of Sothis on III *ŝmw* 28 but without giving the king's regnal year (discussed later). Thutmose IV also has a temple festival calendar at Karnak.[12] Akhenaten too has one at Karnak.[13]

Other Lists of Month-Names

From the 18th Dynasty to the Greco–Roman period a number of calendar depictions, other than festival calendars, have survived. Leo Depuydt has assembled these as lists of "names pertaining to months" which greatly assist the following discussion.[14] Reproductions of the calendar depictions shown in the following pages are taken from his or other publications. Table 6.1 is an adaptation of his table with the main month-lists but omitting four that are quite fragmented.[15] The earliest of these lists is from the Ebers calendar that occupies the first column with which the other month-names can be compared.

Table 6.1: Comparison of month-names from month-lists

Ebers Papyrus (18th Dyn)	Senmut Ceiling (18th Dyn)	Karnak Water Clock (18th Dyn)	Ramesseum (19th Dyn) & Medinet Habu Temple Ceilings (20th Dyn)	Cairo Papyrus 86637 (20th Dyn)	Edfu Temple Frieze (late 2nd century BCE)
wp rnpt					
tḫy	*tḫy*	*tḫy*	*tḫy*	*(ḏḥwty)*	*tḫ*
mnḫt	*mnḫt*	*ptḥ*	*ptḥ*	*p n ipt*	*mnḫ(t)*
ḥwt ḥr	*ḥwt ḥr*	*ḥwt ḥr*	*ḥwt ḥr*	*ḥwt ḥr*	*[ḥwt ḥr]*
k3 ḥr k3	*k3 k3*	*sḫmt*	*sḫmt*	*k3 ḥr b (sic)*	*k3 ḥr k3*
ŝf bdt	*ŝf bdt*	*jmn rʿnsw ntrw*	*mn*	*t3 ʿbt*	*ŝf bdt*
rkḥ	*rkḥ*	*rkḥ wr*	*rkḥ wr*	*[p n p3] mḫr*	*rkḥ wr*
rkḥ	*rkḥ*	*rkḥ nḏs*	*rkḥ nḏs*	*[p n jmn ḥtp]*	*rkḥ nḏst*
rnnwtt	*rnnwtt*	*rnnwtt*	*rnnwtt*	*[p n] rnnwtt*	*rnn(wtt)*
ḫnsw	*ḫnsw*	*[ḫnsw]*	*ḫnsw*	*p n [ḫnsw]*	*ḫnsw*
ḫnt ḫt	*ḫnt (ḫty)*	*[ḫnt ḫty]*	*ḫnt (ḫt)y*	*p n i[nt]*	*ḫrty ẖd(?)*

[6] Ibid., 9.

[7] Ibid.

[8] Ibid., 141; Spalinger, "Festival Calendars," 125.

[9] Ibid., 187, pls. 7-8.

[10] Ibid., 187, pls. 8-12; Spalinger, "Festival Calendars," 125.

[11] Spalinger, "Festival Calendars," 125. This calendar has a Sothic rising in the interval of III *ŝmw* 5-29 (inclusive); idem, "Sothis and 'Official' Calendar Texts," *VA* 10/2-3 (1995) 176.

[12] El-Sabban, *Temple Festival Calendars*, 142-43; Spalinger, "Festival Calendars," 125.

[13] Ibid., 144-46, 189; Spalinger, "Festival Calendars," 125.

[14] L. Depuydt, *Civil Calendar and Lunar Calendar in Ancient Egypt*, (Orientalis Lovaniensia Analecta, 77 Leuven: Peeters, 1997) 109-119.

[15] Ibid., 116, fig. 15. The four fragmentary lists are from: the Necho water clock of ca. 600 BCE; Arrhidaeus water clock nos. I and II of ca. 320 BCE; and the Tanis Geographical papyrus from the Roman era.

	prty				
ipt ḥmt	*ipt ḥmt*	*ipt ḥm(t)*	*ipt ḥmt*	*ip[ip]*	*ipt (?)*
	wp rnpt	*rᶜ ḥr 3ḫty*	*rᶜ ḥr 3ḫty*	*wp rnpt*	*rᶜ ḥr 3ḫty*

[ ] = text that has been supplied but is not present in the source due to damage or lack of space.

Month-lists are found on the northern ceiling of Senmut's tomb (early 18th Dynasty: reign of Queen Hatshepsut), the Karnak water clock (late 18th Dynasty: Amenhotep III), the Ramesseum ceiling (19th Dynasty: Ramesses II) and its copy on the Medinet Habu Temple ceiling (20th Dynasty: Ramesses III), the Cairo Papyrus 86637, C verso XIV (early 20th Dynasty), and the Horus Temple frieze at Edfu (late 2nd century BCE), and several late fragments with a few month-names. Also an ostracon from the 20th Dynasty (O. BM 29560) gives the names of months or monthly feasts in chronological order. We briefly describe these lists, and focus on the nature of the calendars they represent.

An explanation of the differences between the calendars may emerge from later analysis, but it will be helpful for the reader initially to note that the Ebers calendar begins with *wp rnpt* and the others with *tḫy*; the calendars that begin with *tḫy* end with *wp rnpt or Rᶜ-Ḥr-3ḫty*.

Sen(en)mut Astronomical Ceiling

The southern ceiling of Senmut's unfinished temple at Luxor was noted when discussing the decanal star clocks. The northern ceiling is also of interest.[16] Both ceilings are represented below (Figure 6.1).[17] They are each approximately 3.60 m. long and 3 m. wide.[18] They join each other in the middle registers.

As can be seen on page 88, the northern ceiling displays 12 large circles in two rows. The upper and lower rows have six circles each, but are divided so that there are eight circles on the right separated from the four circles on the left. Between them is an arrangement of Egyptian northern constellations, including the Big Dipper or Great Bear represented by the bull at the top center.[19]

Each of the circles has a name above it of a month or a monthly feast. Starting from the top right and moving anti-clockwise, the names start with *tḫy*, then follow the same names and order as found in the Ebers calendar, except that *wp rnpt*, being above the last month of the third set of circles (bottom right), indicates that it was the name of the last month of the year, and not the first as in the Ebers calendar. This order of months suggests that at this location the festival months commenced with *tḫy* and ended with *wp rnpt*; an important observation to note. Scholars assume that the three groups of four circles represent the three seasons of the year, which are otherwise not indicated. Each circle represents a month, divided into 24 segments assumed to represent the 24 hours of

[16] See, e.g., R.A. Parker, *The Calendars of Ancient Egypt* (SAOC 26, Chicago, IL: Oriental Institute of the University of Chicago, 1950) 42-4 §§220-23 and pl. I; O. Neugebauer and R.A. Parker, *Ancient Egyptian Astronomical Texts*, III: *Decans, Planets, Constellations and Zodiacs* (Providence, RI: Brown University Press, 1969) 10-12; Depuydt, *Civil Calendar*, 92-95.

[17] Reproductions of the star maps may be found in various publications, e.g., Parker *Calendars*, pl. I; C. Leitz, *Studien zur ägyptischen Astronomie* (HÄB 49, Wiesbaden: Harrassowitz, 1989) 36; O. von Spaeth, "Dating the Oldest Egyptian Star Map," *Centaurus International Magazine on the History of Mathematics, Science and Technology* 42 (Blackwell, 2000) 160-61; also at http://www.moses-egypt.net/star-map/dating_the_senmut_star_map.pdf. The Metropolitan Museum has a full scan of the Senmut Astronomical Ceiling depiction.

[18] Neugebauer and Parker, *Ancient Egyptian Astronomical Texts* III, 10.

[19] M. Clagett, *Ancient Egyptian Science, Vol. 2: Calendars, Clocks, and Astronomy* (Philadelphia: American Philosophical Society, 1995) 115-21.

the day. Beneath the circles is a row of 15 deities, among which Parker identified 11 as gods representing days of the *lunar* months by comparing them with Greco–Roman lists.

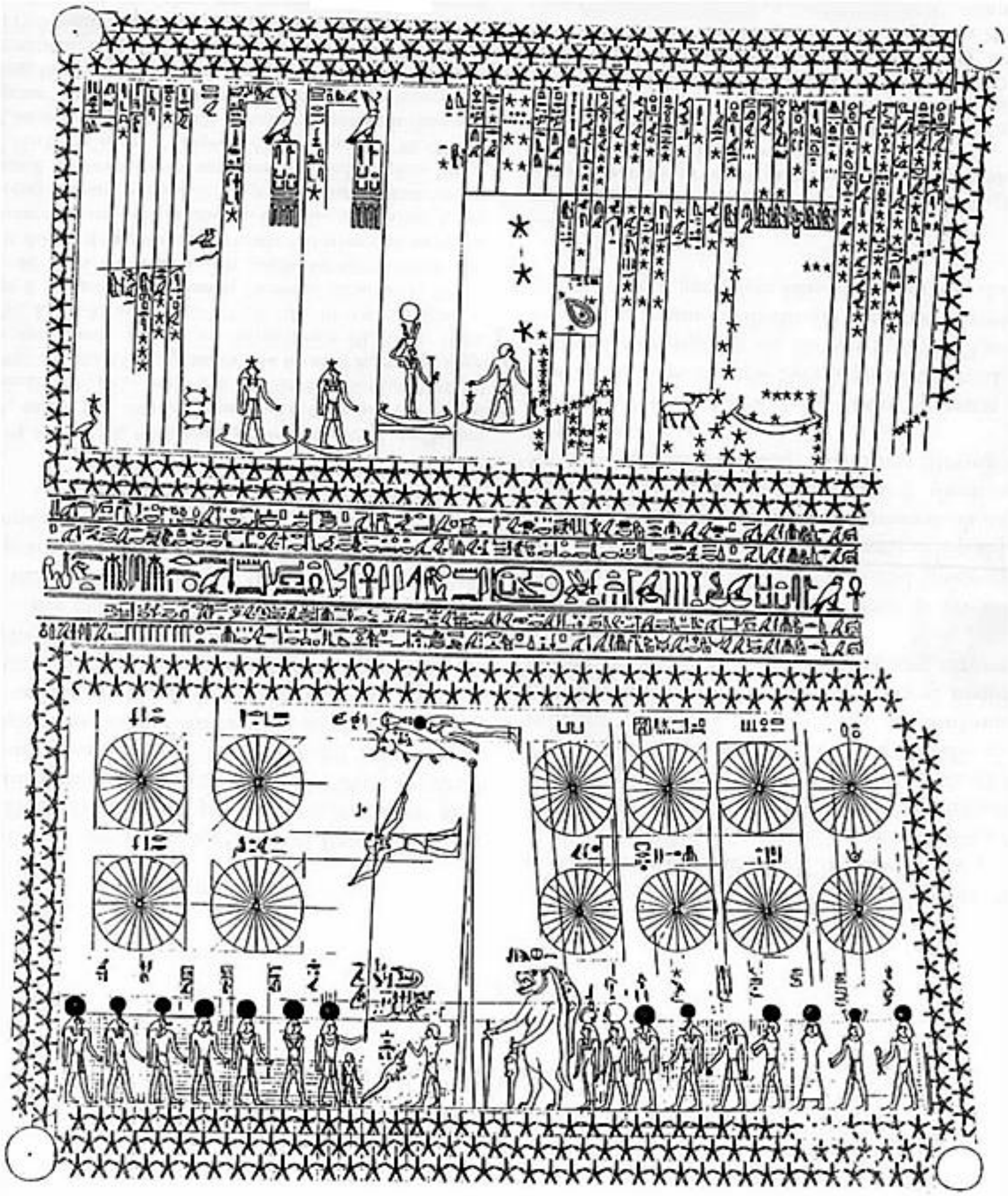

Figure 6.1: Senmut astronomical ceiling

Parker argued that the Senmut ceiling with its 12 circles represents "the monthly feasts of the original lunar calendar with the twenty-four segments each an hour of the feast day."[20] Spalinger argues for the *civil* nature of the Senmut ceiling. He notes that there is no explicit indication of a lunar-based calendric system: the 12 months appear with their expected names and "no gods are present."[21] He points out that the four

[20] Parker, *Calendars*, 42-43 §§220-23. Neugebauer and Parker assume the lunar nature of the calendar also in O. Neugebauer and R. Parker, *Egyptian Astronomical texts III. Decans, Planets, Constellations and Zodiacs* (Providence, RI: Brown University Press, 1969) 10.

[21] A.J. Spalinger, "Month Representations," *Cd'É* 70 (1995) 119.

seasons separated from each other must be *civil*, reinforced by the fact that no intercalary lunar month is represented.[22]

The 24 segments in each circle represent a 24-hour day, traces of which can be seen in the decanal systems of the Middle Kingdom and later coffin depictions, which were all based on the *civil* year. In summary, Spalinger believes that Senmut's ceiling is a *civil* depiction of the Egyptian year with the five epagomenal days omitted.[23] However, Spalinger's main argument, that the months depict a civil calendar, comes from his analysis of the Karnak water clock.

Karnak Water Clock of Amenhotep III

A water clock dating from the reign of Amenhotep III (mid-late 18th Dynasty) was found in the Karnak Temple in 1904 by the Egyptologist, Georges Legrain.[24] Karnak is part of the ancient city of Thebes. The water clock, made of alabaster and mostly intact, is shaped like a large flower pot, being 34.6 cm high, with a top diameter of 48 cm and a bottom diameter of 26 cm.[25] See representations below in Figure 6.2.[26]

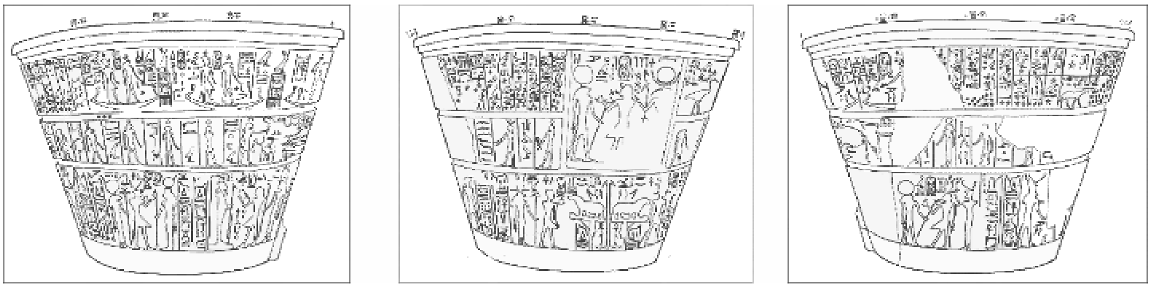

Figure 6.2: Karnak water clock

To record the passage of time, the clock was filled with water at a pre-arranged time (like sunset), which then drained slowly through a small hole at the bottom; the passing of the hours is indicated by scales (markers) on the inside of the vessel. On the inside of the rim, the months are represented by their numerical designations except for I *3ẖt*, which is given its month-name: *tẖy*. Again, instead of *wp rnpt*—the first civil month of Upper Egypt—*tẖy* appears first,[27] and then the usual order is followed: *tẖy* – IV *3ẖt*, I – IV *prt*, I – IV *šmw*. The time it took for the water level to drop from one mark to the next of the appropriate month was approximately one hour, so the time elapsed since the filling of the clock could be estimated by the level of the remaining water.[28]

On the outside of the clock are three horizontal registers. The top register displays a decan list and planets, and the middle register displays northern constellations and deities, except that in the center of the top and middle registers, combined under the

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[22] Ibid., 119.

[23] Ibid., 119.

[24] For information about Amenhotep III's water clock, see, e.g., Parker, *Calendars*, 40 §§207-08; Clagett, *Ancient Egyptian Science*, Vol. 2, 165-77; Spalinger, "Month Representations," 110-22; Depuydt, *Civil Calendar*, 111-16; for photo image see: http://www.sciencemuseum.org.uk/images/I012/10326214.aspx

[25] Neugebauer and Parker, *Ancient Egyptian Astronomical Texts* III, 12.

[26] This image comes from Depuydt's *Civil Calendar* 112-113. Permission to use the digital image was granted by www.culturediff.org. In Depuydt's, *Civil Calendar*, these depictions are attributed to *Ramsès le Grand*, [Catalogue of an exhibition with this title]. Paris: Galeries nationales du Grand Palais 1976, 142, 144, 146.

[27] Spalinger, "Month Representations," 111.

[28] Parker, *Calendars*, 40, §208, fig. 17.

months of II and III *prt*, is a scene of Amenhotep III offering to *R*ᶜ*-Ḫr-3ḫty*, the sun-god, who is on his left, with Thoth, the moon-god behind him on his right.[29]

Deities Represent Month-Names of the Civil year: Spalinger

Of most interest is the bottom register, which displays scenes of Amenhotep III and a deity behind him, both presenting offerings to the god they face. Each pair of month gods/goddesses is separated from the next by vertical lines of text, usually giving the king's names. Each god has a name; most names are recognized as the name of a month on the Ebers calendar and the Senmut ceiling. According to Spalinger, these 12 deities represent the 12 months of the *civil* year, and each is placed appropriately under the month they represent given on the inside of the rim.[30] A cynocephalus (dog-headed baboon) once came after the 12th month, but this is now lost.[31]

As on the astronomical ceiling of the Ramesseum, the cynocephalus separates the last month from the first, and on the water clock it is in the place for the spout, with no note given on the rim.[32] Neugebauer and Parker had earlier proposed that the deities on the bottom register represented 12 *lunar* months, and a "now lost figure of Thoth" (the cynocephalus) represented the intercalary 13th month between the first and 12th months.[33]

Civil Not Lunar Calendar: Spalinger

Spalinger, however, points out that there could be no equation between the bottom and top registers if the symbol of Thoth was equivalent to the intercalary month.[34] He maintains that the Karnak water clock must be based on a civil not a lunar calendar because it was the "only reasonable system into which the hours of the Egyptian day could be located."[35]

In 1955, Alan Gardiner, responding to Parker's identification of the cynocephalus as an intercalary month, proposed instead that the figure on Amenhotep III's water clock and on the Ramesseum represented the five epagomenal days—and not Parker's intercalary lunar month.[36] Spalinger, however, notes that there is no indication of the five epagomenal days on the bottom register, on the inside of the clock, or on the rim where they might be expected between IV *šmw* and *tḫy*, this place being occupied by the spout.[37] He attributes the absence of the five days to a lack of exactitude on the part of the Egyptians, which, he says, should cause no surprise in view of the fact that a temple year is based on 360 days.[38] Spalinger sees the cynocephalus as a central divider between the conclusion and the re-commencement of the year.[39]

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29 Neugebauer and Parker, *Ancient Egyptian Astronomical Texts* III, 12.
30 Spalinger, "Month Representations," 114.
31 Ibid., 111.
32 Ibid., 115, 116.
33 O. Neugebauer and Parker, *Egyptian Astronomical Texts*, 12.
34 Spalinger, "Month Representations," 116.
35 Ibid., 114.
36 A.H. Gardiner, "The Problem of the Month-Names," *Rd'É* 10 (1955) 23, 25-27.
37 Spalinger, "Month Representations," 111 n. 6, 113 and n. 14, 114, 115 and n. 24, 116, 119.
38 Ibid., 114.
39 Ibid., 115.

Do Civil Month-Names Represent Deities?

Spalinger questions whether the deities on the bottom register of the Karnak water clock represent the civil month designations on the inside of the rim. He notes that if a month-name is not already that of a god or goddess, an appropriate deity is assigned to represent it. Thus, *wp rnt*, the name of the 12th month on the Senmut tomb ceiling, is neither a fetish nor a god but an *idea*, and is represented by the god Harachty (*R^c ḥr 3ẖty*) on the water clock. Spalinger says that *wp rnpt* representing an idea "is connected to the beginning of the year—whence the well-known feast of *wp rnpt* on I *3ẖt* 1."[40]

According to Spalinger, the fact that Harachty was chosen as the god to represent the month of *wp rnpt* poses no problem because its later equivalent for the 12th month was *mswt R^c*, that is, Mesore (the "birthday of Re").[41] He notes that not only on the water clock but also at the Ramesseum and at Medinet Habu, and the late scene at Edfu, the expected month-names do not appear but instead are represented by the name of the god depicted (*R^c ḥr 3ẖty*).

Thus II *3ẖt*, *mnẖt* (Menche), is represented by the god Ptah; IV *3ẖt* is represented by *k3 ḥr k3* (Kaherka) the goddess *sẖmt* (Sekhmet); and I *prt* (*ŝf bdt* Shef bedet) "the swelling of the emmer" (grain) is appropriately represented by the fertility god Min (*mn*).[42] Spalinger concludes that, "Each deity of a month is directly linked with a civil month."[43] He does not believe that Ptah, Sekhmet, Min, or Harachty were month-names, but that the original names were *mnẖt*, *k ḥr k3*, *ŝf bdt*, and *wp rnpt*. Of these, Spalinger says the first three retained their month-names in the later Greek and Coptic designations, but *wp rnpt* was replaced by Re.[44]

The last comment raises several questions. Why does *wp rnpt*, the "opener of the year," which is appropriately in first place in the Ebers calendar, appear as the 12th month in later calendar lists? Secondly, why was *wp rnpt* replaced by Re? Was *R^c Ḥr 3ẖty* the name of a month or merely a god's name representing the 12th month of *wp rnpt* as Spalinger proposes? What is the connection between *wp rnpt* and the month later to be known as *mswt R^c* or Mesore?

The dislocation that places *tẖy* as the first month in Lower Egypt and *wp rnpt* as the final month of a 12-month cycle, a month behind the sequence in Upper Egypt, suggests that it is being assimilated to the Lower Egypt solar/agricultural calendar replacing the Upper Egypt calendar used at Thebes—Luxor. But this suggestion awaits further evidence.

Ramesseum and Medinet Habu Astronomical Ceilings

The most significant festival calendar in the New Kingdom, of which little now remains, is that of Ramesses II at the Ramesseum of Thebes across the River Nile from Luxor. But it was copied by Ramesses III onto the walls of his temple at nearby Medinet Habu with a few alterations and additions.[45]

The mortuary Temple of Ramesses II, which dates from the 19th Dynasty, and the Medinet Habu temple from the reign of Ramesses III, which dates from the early

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[40] Ibid., 120.
[41] Ibid., 119-20.
[42] Ibid., 120-22.
[43] Ibid., 114.
[44] Ibid., 122.
[45] El-Sabban, *Temple Festival Calendars*, 188; Spalinger, "Festival Calendars," 125.

20th Dynasty (about 100 years later) show the same astronomical ceiling.[46] However the latter is also damaged and the only complete preserved month-names are *sḫmt*, *ptḥ*, *tḫy*, and *ipt ḥmt*. Two fragmented names are *ḥwt ḥr* and *rkḥ nḏs*.[47] Since the latter ceiling is a copy of the former they can be discussed together.[48]

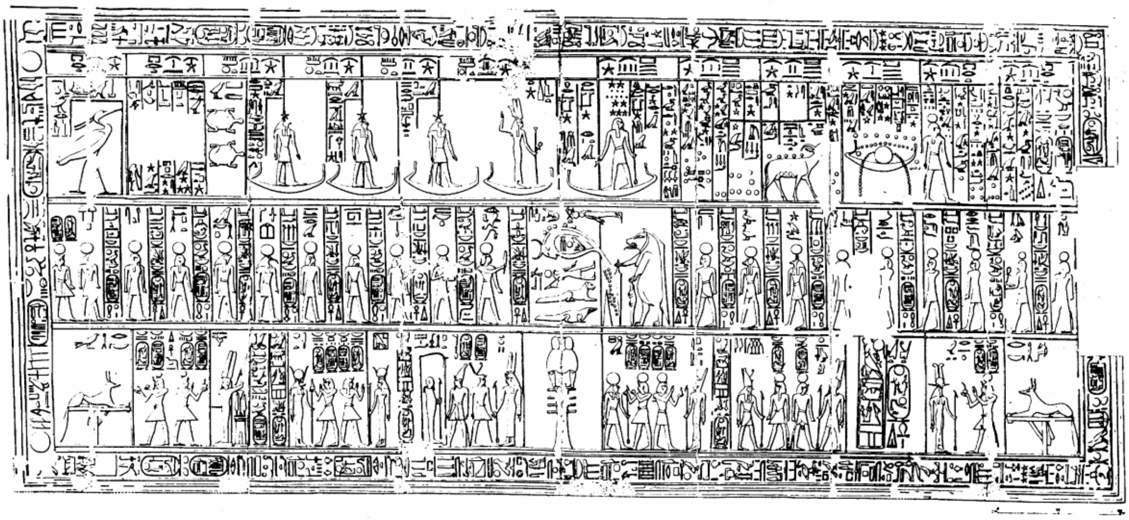

Figure 6.3: The astronomical ceiling in the Ramesseum at Thebes as depicted in Gardiner, *The Problem of Month-Names.*

The layout of the Ramesseum ceiling month designations and their month-names is shown schematically below in Table 6.2.[49]

Table 6.2: Ramesseum ceiling month designations and their month-names

II *prt*	I *prt*	IV *3ḫt*	III *3ḫt*	II *3ḫt*	I *3ḫt*	[blank]	IV *šmw*	III *šmw*	II *šmw*	I *šmw*	IV *prt*	III *prt*
rkḥ wr	*mn*	*sḫmt*	*ḥwt ḥr*	*ptḥ*	*tḫy*	baboon	*R^c-Ḫr-3ḫty*	*ipt- ḥmt*	*ḫnt ḫty*	*ḫnsw*	*rnnwtt*	*rkḥ nds*

The ceiling (Figure 6.3) is divided into three horizontal registers or panels surrounded on each side by a border. The upper register has decans corresponding to those found in the southern half of the Senmut ceiling, but with a few additions. Above the register is a horizontal strip divided into 13 equal sections, in which the middle section is blank, the other 12 having the numerical designations of the 12 months of the three seasons.

Moving left from the central blank space, the first six months begin with I *3ḫt* and go to II *prt*. The other six months start on the extreme right with III *prt*, and go left to the blank space ending in IV *šmw*. The month-names show the same arrangement on Amenhotep III's water clock, except that here they are on a flat surface as if the clock had been spread out. The blank space between IV *šmw* and I *3ḫt* corresponds in the bottom register to the figure of a cynocephalus, that is, the dog-headed baboon.

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46 See C.F. Nims, "Ramesseum Sources of Medinet Habu Reliefs," *Studies in Honor of George R. Hughes January 12, 1977* (SAOC 39; Chicago IL: Chicago: Oriental Institute of the University of Chicago, 1976) 169-75, esp. 169, 175.

47 Depuydt, *Civil Calendar*, 117.

48 For representations and discussions, see Gardiner, "Problem of Month-Names," 26-27; representation of ceiling between pp. 16 and 17; Parker, *Calendars*, 43 §§223-25 and pls. 1 and 2; idem, "The Problem of the Month-Names: A Reply," *Rd'É* 11 (1957) 94-6; Spalinger, "Month Representations," 110 and works cited in n. 1, 115-22.

49 This is adapted from Parker, *Calendars*, 44.

The middle register depicts the same deities found on the lower section of the northern ceiling of Senmut's tomb below the 12 circles, with a few more deities added.[50]

On the bottom register the king is depicted making offerings to the deities arranged in pairs, whose names are written above each. The names of the deities representing months equate to the seasonal month designations (I *3ḫt*, II *3ḫt*, etc.) shown in the upper strip.

The names are the same as appear on the Ebers calendar except that *wp rnpt* heads that list and *R*^{c}*-Ḫr-3ḫty* does not appear there as 12th month; that being occupied by *ipt-ḥmt* (Epiphi). Eight of the names on the Ramesseum ceiling are the same as those on the Senmut ceiling, while all 12 names are the same as those on the Karnak water clock.[51] (The two hippopotami of the water clock are represented instead by jackals for the months of *rkḥ wr* and *rkḥ nḏs* in the Ramesseum).[52] The four that are different to those of the Senmut ceiling and the Ebers calendar are *ptah*, *sḫmt*, *mn*, and *R*^{c}*-Ḫr-3ḫty* as noted previously in our discussion of the Karnak water clock.

Most provocative is the question whether *R*^{c}*-Ḫr-3ḫty* (Re Horakhty) was the original name for the 12th month or was the name of the god representing *wp rnpt* on pictorial representations, as Spalinger proposes. His idea seems premised on the view that there was only one Egyptian calendar. On the other hand, Wells understood that *R*^{c}*-Ḫr-3ḫty* was the 12th month of a pre-dynastic calendar of Lower Egypt separate from that of Upper Egypt. This infers an original month-name.[53] We proceed to further calendar depictions.

Cairo Calendar 86637, verso XIV

A papyrus known as Cairo 86637 was published by Abd el-Mohsen Bakir in 1966.[54] The main text, labelled by Bakir as 'Book II' is known as "The Calendar of Lucky and Unlucky Days" due to its subject matter.[55] Spalinger states that the papyrus comes from the workmen's village of Deir el Medina.[56] He dates the papyrus to the reign of Ramesses III[57] (early 20th Dynasty), which he asserts is more accurate than previous dates.[58] The text is written in an "abominable" hieratic script, attributed to the copyists being unable to decipher the original cursive hieratic.[59] Spalinger points out that the original text on verso pages XII, XIII, and XIV was erased and written over. On page XIV, a table gives the daylight and night-time hours of each month of the civil year. A

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[50] Parker, *Calendars*, 43 §224.

[51] Due to damage on the water clock the names *ḫnsw* and *ḫnt ḫty* are missing, but can be filled in by analogy to the Ramesseum ceiling.

[52] Spalinger, "Month Representations," 116.

[53] See chap. 3 pp. 47-8.

[54] A. Bakir, *The Cairo Calendar No. 86637* (Cairo: Government Printing Offices, 1966).

[55] A.J. Spalinger, "Calendars: Real and Ideal," *Essays in Egyptology in Honor of Hans Goedicke*, (eds. B.M. Bryan and D. Lorton; San Antonio, TX: Van Siclen, 1994) 297.

[56] Ibid., 299.

[57] Ibid., 298, 301.

[58] Ibid., 298. Based on previous publications by Bakir, *Cairo Calendar*, 6, and C. Leitz, "Tagewählerei. Das buch ḥ3t nḥḥ pḥ wy ḏt und verwandte Texte," *ÄA* 55 (1994) 7-8, Jauhiainen attributes the papyrus to the early 19th Dynasty (*"Do not Celebrate Your Feast Without Your Neighbours": A study of References to Feasts and Festival in Non-Literary Documents from Ramesside Period Deir el-Medina* [Publications of the Institute for Asian and African Studies 10; Helsinki: Helsinki University Print, 2009] e.g. 78, 82-83, 85-86, 103, 110).

[59] Spalinger, "Calendars: Real and Ideal," 299-300.

hieroglyphic representation is given in Figure 6.4,[60] followed by a translation (Table 6.3).

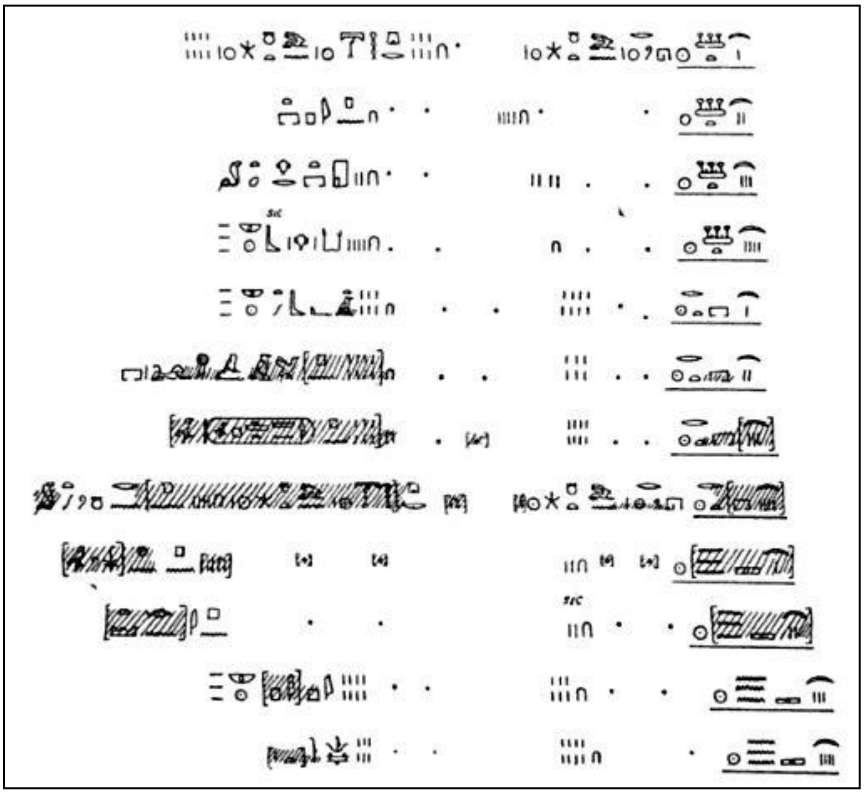

Figure 6.4: Table listing the lengths of day and night in Cairo Calendar 86637, C verso XIV.

Table 6.3: Translation of Cairo Calendar 86637, verso XIV

Month designation					Month-name
I *3ḫt*	Hours of daylight	16	Hours of darkness	8	
II *3ḫt*	"	14	"	10	Phaophi
III *3ḫt*	"	12	"	12	Hathor
IV *3ḫt*	"	10	"	14	Choiak
I *prt*	"	8	"	16	Tybi
II *prt*	"	6	"	18	Mechir
III *prt*	"	8	"	16	Phamenoth
IV *prt*	Hours of daylight	10	Hours of darkness	14	Pharmouthi
I *šmw*	"	12	"	12	Pachons
II *šmw*	"	12 [*sic*]	"	(blank)	[Payni]
III *šmw*	"	16	"	8	Epiphi
IV *šmw*	(blank)	18	"	6	Wp rnpt

The calendar consists of 12 rows. The top row has been added to assist in understanding the translation. In the original, the month designations are on the right side descending from I *3ḫt* down to IV *šmw*, but for our orientation they are given on the left in the translation above. Following the month designations, the hours of daylight are given for each month, beginning with 16 for I *3ḫt* then decreasing by two hours down to six for II *prt*, then ascending to 18 hours for IV *šmw*.[61] The next column gives the hours

[60] From Bakir, *Cairo Calendar*, pl. XLIV A; translation p. 54. For hieratic text see Clagett, *Ancient Egyptian Science*, Vol. II, fig. III.58a, and hieroglyphic transcription fig. III.58b; hieroglyphic text reprinted as Fig. 2 in Depuydt, *Civil Calendar*, 86 (with attributions).

[61] I *šmw* and II *šmw* are both given 12 hours indicating an error for II *šmw*.

of darkness in inverted order from the daylight hours. Though the hours add up to 24 for each day, it is more schematic than realistic.[62]

The last column gives the names of the months, though the name of the first month is missing—perhaps due to lack of space—as is the 10th, though here the name can be assigned to Payni as in other lists. Some of the month-names found on earlier lists have been replaced by later ones in the papyrus. The names are also found on documents from Deir el-Medina.[63] Accordingly, Depuydt assigns *dḥwty* (Thoth) to I *3ḫt* as its missing month-name. The later names correspond to those in the civil Greco–Roman calendar where II *3ḫt*, previously *mnḫt*, is replaced by *p n ipt* = Phaophi,[64] which refers to the important feast of Opet at Thebes. This took place in the second month at the time of the new Kingdom.[65] I *prt*, previously *ŝf bdt*, is replaced by *t3 ᶜbt* = Tybi, apparently derived from "the banquet."[66] II *prt*, previously *rkḥ wr*, is replaced by *p n p3mḫr* = Mechir; III *prt*, previously *rkḥ nds*, is replaced by *p n jmn ḥtp* = Phamenoth, in honor of Amenhotep I. II *šmw*, previously *ḫnt ḫty* is replaced by *p n int* = Payni, referring to the important Valley Feast held at Thebes.

On the nature of the Cairo calendar 86637 verso page XIV, Spalinger comments with regard to the entire Cairo papyrus, "This enormous literary composition runs through the entire *civil* year"[67] (emphasis his). He points out that the designations of I, II, III and IV *3ḫt* … are civil.[68]

The Cairo papyrus calendar 86637 verso XIV can be seen to be the same civil calendar as represented in the earlier lists, notwithstanding a few changes to some of the month-names. These changes are found also in the late Greco–Roman calendar.[69]

Wp rnt is 12th Month in the Cairo Calendar

The last month in the Cairo calendar is named *wp rnt*, previously noted as the 12th month in the Senmut ceiling calendar depiction Thus, unlike the other replacement or new names shown in the Cairo and Greco–Roman calendar, *wp rnpt* retains its name given in the Ebers calendar as the first month in the first column, but in 12th place in subsequent lists. It seems to share this position with *Rᶜ-Ḫr-3ḫty,* the latter being represented on the Karnak water clock and on the ceilings of the Ramesseum and Medinet Habu mortuary temples. *Wp rnpt* was not superseded by *Rᶜ-Ḫr-3ḫty* as it continued to be used also in 12th position in later calendar depictions such as the Necho clock of ca. 600 BCE and in the Tanis Geographical papyrus from Roman times.[70]

Birthday of Re on I *3ḫt* 1

The mystery of *wp rnpt*'s 12th month position deepens when we recognize that the Cairo papyrus witnesses to the fact that the "feast of Re" and "the birthday of Re" were celebrated not in the 12th month, as in the late Greco–Roman calendar with its name Mesore—"the birthday of Re"—but as the first day of the year, on I *3ḫt* 1!

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[62] C. Leitz, *Studien zur ägyptischen Astronomie* (ÄA 49; Wiesbaden: Harrassowitz, 1989) 22-23; Clagett, *Ancient Egyptian Science*, Vol. 2, 100-01.

[63] Depuydt, *Civil Calendar*, 116, fig 15 n. 1; 128-29.

[64] *P n* means "the one of" or "the month/feast of."

[65] A.J. Spalinger, "A Chronological Analysis of the Feast of *ṯḫy*," *SAK* 20 (1993) 294.

[66] A.H. Gardiner, "Thutmosis III Returns Thanks to Amūn," *JEA* 38 (1952) 23, citing J. Černý, "The Origins of the Name of the Month Tybi," *Annales du Service des Antiquities de l'Egypte* 43 (1943) 173-81.

[67] Spalinger, "Calendars Real and Ideal," 298.

[68] Ibid., 298 n. 3.

[69] See Table 6.4 on p. 99 below.

[70] Depuydt, *Civil Calendar*, 116-17.

On a related subject of the Lucky and Unlucky days, Spalinger notes that Cairo papyrus 86637 (Book II) has the date of I *3ḫt* 1 attributed to a good day and the birth of Re-Harakhty.[71] The same papyrus (verso p. 21) has for I *3ḫt* 1 the "Feast of Re. Do not cross the river." The same injunction appears in O. Turin 57304 recto, 2–3, where I *3ḫt* 1 is again designated the "Feast or Re."[72] In the Cairo papyrus 86637 Book I, recto I, the feast of Re is connected with *wp rnpt*, where, however, it is the "Second feast of *wp rnpt* ... The Nehebkau Feast occurs on this day …"[73] Since the Nehebkau feast is known to have occurred on I *prt* 1, why is it dated to I *3ḫt* 1? Spalinger reasons, "Nehebkau is associated with the new year, rejuvenation, and a renewal of kingship, and rather than I *prt* 1, I *3ḫt* 1 is understood, exactly as at Esna and in the Cairo papyrus."[74] This seems plausible.

However, it requires us to reconsider the situation in which the feast of Re, presumed to be associated with *R^c-Ḥr-3ḫty* the 12th month, is instead dated to I *3ḫt* 1 and associated with *wp rnpt* as the "opener of the year." Parker wanted to equate w*p rnpt* firstly to the heliacal rising of Sothis (which he puts in the 12th month) and secondly to the first day of the civil year.[75] In view of the fact that *wp rnpt* occurs as the first month on the Ebers calendar, and the 12th month on the Senmut ceiling and on the calendar of Lucky and Unlucky days in the Cairo papyrus 86637, there is an overt connection to *wp rnpt* as *a month,* and not just the day of I *3ḫt* 1.

In the Cairo papyrus 86637 Book II the "birth of Re Harakhty" is associated with the rising of the Nile, and the papyrus is dated to the reign of Ramesses III.[76] Ramesses III has a *heliacal rising of Sothis* attributed to him on I *3ḫt*, but the day of the month and his regnal year are not supplied.[77] The date, which comes in the first 120 years of a Sothic cycle, indicates that the Nile was in flood at the beginning of the solar year coinciding with the beginning of a civil year. Since the rising of Sothis and the feast of Re both took place near to the time of the summer solstice, the occurrence of Re's birth associated with I *3ḫt* 1 and *wp rnpt* as the first month at the time of the Sothic rising and Nile inundation is congruent. The question still remains: why was *wp rnpt* relegated to the 12th month position?

Edfu Temple Frieze

Another depiction of month-names associated with their respective deities comes from the famous Horus Temple at Edfu, situated approximately halfway between Thebes and Elephantine. The building was begun by Ptolemy III Euergetes I in 237 BCE and the festival hall and sanctuary were later completed by his son, Ptolemy IV Philopator. The Hypostyle Hall with its astronomical ceiling was added by Ptolemy VII who reigned 145–116 BCE. The building was finally finished in 57 BCE under Ptolemy XI.

The frieze on the Hypostyle Hall has the best preserved of any depiction of the months of the Egyptian year.[78] Among the figures on the frieze, 12 represent calendar months. The month designations, according to the seasons of *3ḫt*, *prt*, and *šmw*,

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71 Spalinger, "Calendars Real and Ideal," 302.
72 Ibid., 301, 303.
73 Ibid., 302.
74 Ibid., 308.
75 Parker, *Calendars*, 75 n. 37.
76 Spalinger, "Calendars Real and Ideal," 301.
77 Idem, "Sothis and 'Official' Calendar Texts," 176.
78 For representation of the Edfu frieze, see Parker, *Calendars*, pls. IV and V. The 12 gods are shown in pl. V in the right half of the fourth row, and the left half of the fifth row. See also Depuydt, *Civil Calendar*, 115, fig. 14. For bibliography see Spalinger, "Month Representations," 110 n. 1, and description pp. 118-19.

accompanied by the name of each month, are written vertically to the left of each deity. The calendar months are presented in two panels, each of six months (Figures 6.5a and 6.5b).

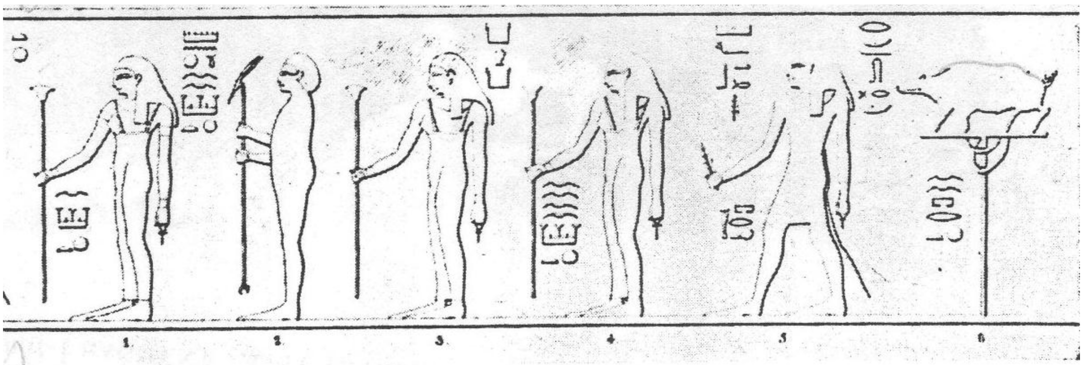

Figure 6.5a: Edfu Frieze (panel 1)

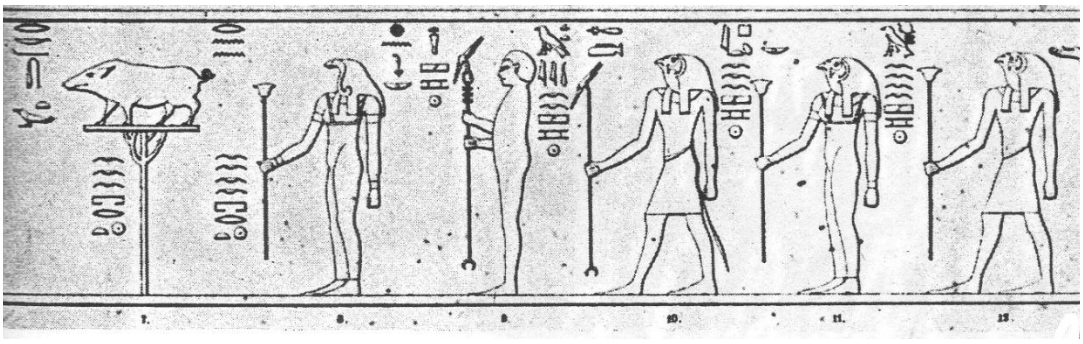

Figure 6.5b: Edfu Frieze (panel 2)

The deities begin with the month of *tḫy*, with figures proceeding to the right with their respective month-names. The deities have the same names as the month-names on the Senmut ceiling (above the 12 circles of 24 segments), except that the last month of the Edfu frieze is *R*ᶜ *Ḥr 3ḫty* not *wp rnpt*.[79] According to Spalinger, the civil month designations, *3ḫt*, *prt*, and *šmw*, given along with the month-names of the gods represented, identifies the Edfu frieze as consisting of civil, not lunar, month-names, with the five epagomenal days unaccounted for.[80]

Nevertheless, Parker sought to identify them with a *lunar* calendar, claiming that the 30 gods preceding the month-deities represented a lunar month of 30 days.[81] Equally, it could be a civil month of 30 days.

In the Edfu frieze the solar month of IV *ŝmw* is named *R*ᶜ *Ḥr 3ḫty* alongside its eponymous god Horus (= Re), the youthful sun-god.[82] This is the third occasion we have noted the name *R*ᶜ *Ḥr 3ḫty* appearing with the god Re, previously on the Karnak water clock and the Ramesseum ceiling (the Medinet Habu ceiling is damaged at this point and does not now bear the name).

In the two instances in which only the name (not the deity) of the 12th month appears, that is, on the Senmut ceiling and the Cairo papyrus 86637, it is *wp rnpt*. Spalinger assumed that the god Harakhty represented the month named *wp rnpt* because

[79] Spalinger, "Month Representations," 118.
[80] Ibid., 118.
[81] Parker, *Calendars*, 43 §227.
[82] Spalinger, "Month Representations," 118.

he understands that *wp rnpt* was the original name *of month 12*.[83] However, he notes that later Greek and Coptic designations replaced *wp rnpt* with Re.[84]

Spalinger proposed that the deities *ptḥ*, *sḫmt*, and *mn* depicted on the Karnak water clock and the Ramesseum and Medinet Habu temple ceilings were not the actual names of the months, but represented original or earlier ones of *mnḫt*, *k3 ḥr k3*, and *ŝf bdt*. The Edfu temple frieze has used these names for the gods of these months, but not the name of *wp rnpt* for the 12th month, making the latter an exception.

Rc Ḥr 3ḫty Represents its Eponymous month

If the three names of gods noted above actually refer to the month-names of *mnḫt*, *k3 ḥr k3*, and *ŝf bdt*, the use of *Rc Ḥr 3ḫty* and not *wp rnpt* suggests that the god *Rc Ḥr 3ḫty* may also be representing its eponymous month, as do the 11 other months in the Edfu frieze. This seems reasonable in view of the fact that it would not be expected that *wp rnpt*, "the opener," would originally have been the 12th month. And this is reinforced by its position as the first month in the Ebers calendar. However, it is undeniable that *wp rnpt* is also used as the 12th month on the Senmut ceiling and the Cairo papyrus (and three fragments noted below) which proposes that *wp rnpt* may have been used interchangeably with *Rc Ḥr 3ḫty*.

Are *Rc Ḥr 3ḫty* and *wp rnpt* Interchangeable?

That *Rc-Ḥr-3ḫty* and *wp rnpt* were used interchangeably is illustrated by four dating formulas from the Temple of Edfu for the 28th year of the reign of Ptolemy VIII Euergetes II in 142 BC. The dating formulas all refer to the same dedication, one of which names *wp rnpt* as the fourth month of summer (IV *ŝmw*).[85] So while the Edfu temple *frieze* does not use the month-name *wp rnpt*, it *is* used for the Edfu temple *dedication*.

The Twelfth Month has Two Names

From this it is clear that both *Rc Ḥr 3ḫty* and *wp rnpt* were used as names for the 12th month in the second century BCE. Is it permissible to infer from this that the use of the god's name, *Rc Ḥr 3ḫty*, on the earlier Karnak water clock and the Ramesseum was representative of the month-named *Rc Ḥr 3ḫty* and not that of *wp rnpt*? Was the god Re used to represent the month-named *Rc Ḥr 3ḫty* when a god was needed (as on the Karnak water clock, the Ramesseum ceiling, and the Edfu frieze), and on those occasions when a god was *not* needed to depict a month, the name *wp rnpt* was used (as on the Senmut ceiling, the Cairo papyrus calendar, and the three fragments noted below)?

If so, we have the situation in which the 12th month has two names; one, *wp rnpt*, "the opener" seems to be inappropriate, which leaves *Rc Ḥr 3ḫty* as the other, and presumably original, name. This is not unexpected considering that Re is assumed to have been reborn annually and in the 12th month the main celebration of his birth was held.[86] The feast of Re was also dated to I *3ḫt* 1 in the 20th Dynasty,[87] noted above. But *for the present discussion*, it seems as though the month *wp rnpt* was relocated from its first position to share 12th position with *Rc Ḥr 3ḫty*, seeming to be at variance with the dates of both feasts on I *3ḫt* 1.

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[83] Ibid., 119-20, 122, and elsewhere.
[84] Ibid., 122.
[85] For further discussion see p. 100.
[86] R.A. Wells, "Re and the Calendars," *Revolutions in Time: Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 22-23.
[87] Ibid., 22.

Other Fragmentary Attestations of *wp rnpt* as Twelfth Month

Wp rnpt as a month-name is also found in 12th place on a fragment of a water clock dating from the reign of Necho II (610–595 BCE) of the 26th Egyptian Dynasty,[88] and on a water clock from the time of Philip Arrhidaeus (323–317 BCE),[89] (who was a mentally retarded half-brother of Alexander the Great), and on the Tanis Geographical Papyrus of Roman times.[90]

The Greco–Roman Calendar

Of the calendars represented above, the Cairo Papyrus Calendar 86637 verso XIV shows the closest similarity in its month-names to those in the Greco–Roman calendar, though the latter does not differ substantially from the others discussed above. By Greco–Roman times (starting with the conquest of Egypt by Alexander the Great in 332 BCE) the month-names of the civil calendar had become Graecized as shown in the right-hand column in Table 6.4 below.

Table 6.4: Civil calendar month-names in Greco-Roman Period

Month designations	Earlier names	From ca. 20th Dyn.	Greco–Roman
I *3ḫt*	*tḫy* (Tekhy)	Ḏḥwtyt/	Thoth
II *3ḫt*	*Mnḫt* (Menche)	p n ’Ipt	Phaophi
III *3ḫt*	*Ḥt- ḥr* (Hathor)	Ḥt ḥr	Hathor
IV *3ḫt*	*k3 ḥr k3* (Kaherka)	k3 ḥr k3	Choiak
I *prt*	*šf bdt* (Shef bedet)	t3 ^{c}3bt	Tybi
II *prt*	*rkḥ-wr* (Great Rokeh)	p n Mḫr	Mechir
III *prt*	*rkḥ nḏs* (Small Rokeh)	p n’Imnḥtp	Phamenoth
IV *prt*	*Rnwtt* (Renutet	p n Rnwtt	Pharmouthi
I *šmw*	*Ḫnsw* (Chons)	p n Ḫnsw	Pachons
II *šmw*	*Ḫnt-ẖty* (Khenty-kety)	p n ỉnt	Payni
III *šmw*	*’Ipt ḥmt* (Ipet hemet)	Ipỉp	Epiphi
IV *šmw*	*wp rnpt* (Wep renpet) *R^{c}-ḥr-3ḫty* (Re Harakhty)	wp rnpt/ R^{c} ḥr 3ḫty	Mesore

Dyn = dynasty.

In the Greco–Roman calendar, the first month is Thoth, apparently replacing *dḥwty* (Djehuty), otherwise *tḫy* in the earlier month-lists. Then follows Phaophi replacing the earlier *mnḫt* (otherwise *ptḥ)* for II *3ḫt*; then come Hathor, Choiak, and Tybi (the latter replacing the earlier *šf bdt* (otherwise *mn*) for I *prt*); then Mechir and Phamenoth for earlier *rkḥ wr* and *rkḥ nds*, respectively, for II and III *prt*; then Pharmouthi replacing *rnwtt* for IV *prt*; then Payni for earlier *ḫnt ḫty* for II *šmw*; then Mesore for earlier *R^{c}-Ḫr-3ḫty*.

Mesore, meaning “the birthday of Re” comes from Egyptian *mswt r^{c}*, though its hieroglyphic equivalent is not given as a month-name in any of the above month-lists and Depuydt says it is “hardly attested as a designation of civil Month 12.”[91] Mesore, as a late derivative of *R^{c}-Ḫr-3ḫty*, is not unexpected in the 12th month position since it has the Re component. Depuydt notes six instances in which *mswt r^{c}* or its variants are designations for I *3ḫt* 1. He writes, “The only one dating to before the Ptolemaic period, concerns the longer variant *mswt r^{c} ḥr 3ḫty* found in a New Kingdom ‘necropolis

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[88] See Parker and Neugebauer, *Egyptian Astronomical Texts* III, 42-44. Fragment shown on p. 43, fig. 9; Parker, *Calendars*, 41, fig. 18; Depuydt, *Civil Calendar*, 88, fig. 3, 111, 116-17.

[89] Depuydt, *Civil Calendar*, 116-17, recorded in his fig. 15.

[90] Parker, *Calendars*, 41, fig. 18; Depuydt, *Civil Calendar*, 89, fig. 4, 113, 116-17. Depuydt notes that another fragment of the Turin papyrus has the names of *tḫ*, *jp*, and *ḥwt ḥr* following each other horizontally (p. 117). These refer to the months of Thoth, Phaophi, and Hathor (I, II and III *3ḫt*).

[91] Depuydt, *Civil Calendar*, 95.

journal' transmitted in a Turin papyrus." [92] This is a reference to I *3ḫt* 1, birthday of Re-Harakhty in the 13th year of the reign of Ramesses IX.[93]

"Re Corresponds to Ancestoral Feast of *Wp Rnpt*"

We also note that the feast of *wp rnpt* is found in an inscription from the festival calendar of Esna dating to about the first century CE. Referring to I *3ḫt* 9 it notes, "Feast of Amun; feast of Re, corresponding to what the ancestors called the Feast of *Wp Rnpt*."[94] In this statement the feast of Re has replaced the feast of *wp rnpt* of an earlier time.

The dating of the feast of *wp rnpt* to a day in I *3ḫt* in the time of the ancestors, points back to when *wp rnpt* "the opener" was the feast's eponymous month, and we have an example of this in the Ebers calendar. It seems the memory of this feast on I *3ḫt* 9 was still being celebrated in the Greco–Roman period.

A further reference from Esna, not connected to the calendar, refers to a ceremony that took place in the month of *R^{c}-Ḫr-3ḫty* on day nine, referring to IV *šmw* 9, one month earlier than in the previous citation.[95]

Ostracon British Museum 29560 (formerly 5639a)

To the above lists can be added names of months or monthly feasts derived from scattered groups of words as they appear in continuous text on an ostracon from the workmen's village in Deir el-Medina (20th Dynasty), now known as O. BM 29560, formerly 5639a. It refers to the giving of victuals by a lady Tadjepehu to a woman Henutshe in certain months.[96] See Table 6.5, which is derived from the ostracon.

Table 6.5: Ostracon British Museum 29560 (formerly 5639a)

Line	*Month/feast name*	Translation
4	*p3 šmt n Ḥr*	"going forth of Horus"
8	*Ḏḥwty*	Djehuty = Thoth
12	*Pn ipt*	Phaophi
15	*Ḥwt-Ḥr*	Hathor
18	*Kr-ḥr k3*	Choiak
Verso 4	*p3 ẖnw Mwt*	"periplous of Mut"
6	*Pn-p3-Mḫyr*	Mechir
8	*Pn-'Imn-ḥtp*	Phamenoth
–	[Not given]	[Pharmouthi]
–	[Not given]	[Pachons]
–13	[Not given]	[Payni]
	Pn-ipt	Epiphi

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92 Ibid., 96.

93 A.H. Gardiner, "Mesore as First Month of the Egyptian Year," *ZÄS* 43 (1906) 138-39; idem, "Problem of Month–Names," 13.

94 A.J. Spalinger, "*Wp Rnpt* in the Esna Festival Calendar," *Three Studies on Egyptian Feasts and their Chronological Implications* (Baltimore, MD: Halgo, 1992) 51-56. Later Spalinger said this overview is now obsolete. Idem "Calendars: Real and Ideal," 306; idem. "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson*, (Vol. 2, Boston: Museum of Fine Arts, 1996) 759 n. 15.

95 Idem, "Esna to Ebers," 761.

96 See Gardiner, "Mesore as First Month," 140; R. van Walsem, "Month-Names and Feasts at Deir el-Medina," *Gleanings from Deir el-Medina* (eds. R.J. Demaree and J.J. Janssen; Leiden: Nederlands instituut voor het Nabije Oosten, 215, 218-20, 233-34 n. 23, 242; J. von Beckerath, "Bemerkungen zum ägyptischen Kalender, Pt. 1: Zur Entstehung des 365-tätigen Kalenders; & Pt. 2: Zum Problem der Monatsnamen," *ZÄS*, 120, 1, 1993, 7-22; Depuydt, *Civil Calendar*, 119 and fig. 18; Jauhiainen, *"Do not Celebrate,"* 72; "Ostracon 29560" in the British Museum's online collection database.

The numbers in the left column refer to the lines of the ostracon.[97] In line numbered 4, the *first* month/feast is "the going forth of Horus" (Re, the youthful sun-god), synonymous with *Rc-Ḥr-3ḫty*, and regarded as being the name of the *12th* month. The following month-names are in the usual order as given below. The right side column with the later names for the months is not part of the ostracon. The recto of the ostracon with its 18 lines of hieroglyphic text is shown on the right. The verso has 16 lines.

If the "going forth of Horus" refers to the first month or monthly feast of I *3ḫt*, then the last month/feast must be Epiphi or IV *šmw* as in the Ebers calendar. However, in Ebers, the first month is *wp rnpt*, not the "going forth of Horus". As we have seen above, the months of *wp rnpt* and *Rc-Ḥr-3ḫty* can both be month 12 or IV *šmw*, but their *feasts* have been dated to I *3ḫt* 1.

It is not certain whether the names on the ostracon refer to months or monthly feasts, but Erman, Gardiner, van Walsem, and Depuydt[98] prefer to view them as names of *months*. Van Walsem, who published the O. BM 29560 along with another 11 partial lists from other ostraca,[99] suggested that the "going forth of Horus" was the *last* month of the year, and only put at the beginning of the ostracon because the memorandum about the giving out of victuals started at the end of the year.

To support this proposal, van Walsem refers to O. BM 1088, which *starts* with the feast of Renenutet, IV *prt* in the Greco–Roman calendar, but he says this does not mean that the feast took place in I *3ḫt*.[100] Thus, by analogy, a text beginning with "the going forth of Horus" does not mean that that month was at the beginning of the calendar year. Van Walsem thought his explanation would resolve Gardiner's perplexity at finding the month-feast held out of its eponymous month in the next month.

Van Walsem also pointed to another ostracon from Deir el-Medina designated O. BM 1265 that began with the month of *ḏhwty* (Thoth) in first place giving its civil designation as I *3ḫt* in which the feast of Thoth was held. He notes, "This is the only ostracon that gives the feast/month-names side-by-side with their correct month-numbers."[101] The text is quite damaged and gives only seven names of months/feasts in 26 lines of text.[102] From the palaeographical features of the ostracon, including paraphrases that became one word month-names, van Walsem assigns it to a period somewhat earlier than papyrus Cairo 86637 (discussed above). He uses this ostracon to argue by analogy that the "going forth of Horus" on O. BM 29560 refers to IV *šmw* and not I *3ḫt*.[103]

The assumption is that the feast of the "birthday of Re" will be held in its eponymous month, in this case indicating that the first month of I *3ḫt* is named *mswt rc* synonymous with "the going forth of Horus" or *Rc-Ḥr-3ḫty* "Re Horus of the Two Horizons". If "going forth of Horus" is in the first month position in O. BM 29560, it replaces *wp rnpt* as shown in the Ebers calendar. These two lists of month-names are the only lists that do *not* start with *tḫy* or its synonyms *ḏḥwty* or Thoth.

The "going forth of Horus" on the ostracon cannot unequivocally be assigned to a month or a feast on I *3ḫt*, but nor can it be assigned to IV *šmw* on the present evidence. If

97 Van Walsem, "Month-Names," 242.

98 A. Erman, "Monatsnamen aus dem Neuen Reich," *ZÄS* 39 (1901) 128-30; Gardiner, "Mesore as First Month," 140; Van Walsem, "Month-Names," 218, 233-34 n. 23; Depuydt, *Civil Calendar*, 119-20.

99 Van Walsem, "Month-Names," 242-44.

100 Ibid., 234 n. 23; 242.

101 Ibid., 217.

102 Ibid., 216-17, 242.

103 Ibid., 217.

the "going forth of Horus" refers to a feast in I *3ḫt* why was it moved from *R*ᶜ*-Ḥr-3ḫty* (IV *šmw*), its eponymous 12th month? I return to O. BM 29560 in my review of Gardiner's evidence of feasts held out of their eponymous months, and later seek to answer the above question.

A Calendar Conundrum Involving *wp rnpt* and *R*ᶜ*-Ḥr-3ḫty*

The above discussion highlights a problem concerning *wp rnpt* and *R*ᶜ*-Ḥr-3ḫty*, which are both attested as the 12th month in the preceding lists of month-names, while *wp rnpt* is also placed as the first month in the Ebers calendar. However, there is no corresponding attestation of *R*ᶜ*-Ḥr-3ḫty* as the *month* of I *3ḫt* in any of the lists unless it occurs in O. BM 29560 in the synonymous "going forth of Horus." If *R*ᶜ*-Ḥr-3ḫty* was once understood as the first month, it infers a stage of calendric development such as a merging of calendars. This has already been suggested in the relegation of *wp rnpt* to the 12th month. Calendric "evolution" may explain why *mswt r*ᶜ *ḥr3ḫty* in the Turin necropolis journal, dating to the reign of Ramesses IX of the 20th Dynasty, fell on I *3ḫt* 1.

The problems raised by the analysis of the calendars centered in Ebers having *wp rnpt* as the first month and *'ipt hmt* (Epiphi) as the last—while the others have *tḫy* (Thoth) first and *wp rnpt* or *R*ᶜ*-Ḥr-3ḫty* last—continues in the next chapter in a wider application.

Chapter 7

Revisiting Gardiner and Parker

We have surveyed calendar depictions and come to the conclusion that *wp rnpt* occupied the first month position as in the Ebers calendar, but in later calendars it is located as the 12th month interchangeably with *Rc-Ḫr-3ḫty*. I now tackle the reason that this repositioning occurred, and how Gardiner and Parker accounted for the change. If there were two calendars dating a month apart, as proposed by Gardiner, the entire chronology of Egypt must be reconfigured to the dates applying to each of the calendars.

Following the discussion of his later lunar calendar, which concludes his main thesis, Parker adds three excursuses. Excursus A, entitled "The Transfer of Feasts from the Lunar to the Civil Calendar" is relevant. Here Parker finally interacts with Gardiner's article of 1906. He shows how his hypothesis responds to Gardiner's "theory" of two civil calendars.

The next chapter will pursue the problem of feasts not being held in their eponymous months. This matter features significantly in these chapters and contributes to an eventual solution that paves the way to reconstruct the chronology of ancient Egypt.

Parker Objects to Gardiner's Evidence of Two Civil Calendars

Parker summarized the six examples stated by Gardiner[1] for demonstrating that festivals were not held in their eponymous months according to the Greco–Roman calendar, but in the month that followed. Parker mistakenly thought that Gardiner's theory was that feasts *had* to move out of their eponymous months into the following month. In order to disprove the theory, he observed the following:

1. The feast of Renenutet (dated to I *šmw* 1 on the 18th Dynasty tombs) never moved to IV *prt* 1.[2]

2. The date of the feast of Epiphi was IV *šmw* 2, not IV *šmw* 1, and therefore not the first day of the month as required by Gardiner's theory.[3]

3. The feast of *mswt R^c* never moved to IV *šmw* 1; it was always held on I *3ḫt*. The reason why the feast of *mswt R^c* fell on I *3ḫt* 1 was because it was "the companion feast to *wp rnpt* and originally meant the day of the rising of Sothis; but when *wp rnpt* came to mean also the first day of the civil year, so too did *mswt R^c*."[4] But Parker did not see this as an example of a feast that had moved out of its eponymous month to day one of the next month.

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[1] A.H. Gardiner, "Mesore as First Month of the Egyptian Year," *ZÄS* 43 (1906) 136-44.

[2] R.A. Parker, *The Calendars of Ancient Egypt* (SAOC 26; Chicago, IL: Oriental Institute of the University of Chicago, 1950) 58 §286.

[3] Ibid., 58 §286.

[4] Ibid., 58 §288, cf. 47 §237.

4. The feast of Hathor at Edfu occupied the whole month of III *3ḫt*, and in the same calendar a special festival was held from III *3ḫt* 29 to IV *3ḫt* 1, inferring that it never moved from III *3ḫt* 1 to IV *3ḫt* 1.[5]

5. Gardiner had proposed that the feasts of *Nḥb k3w* (Neheb-kau) and Khoiak were the same, with dates of I *prt* 1 and IV *3ḫt* 1. But Parker argued that they were not the same feasts.[6]

6. In 1906, Gardiner had proposed that *wp rnpt* (or Mesore as he called it) was the first month in the Ebers calendar, and all the month-names in the Ebers calendar stood exactly where they ought to have stood, and accounted for feasts falling a month ahead of those in the Greco–Roman calendar. But Parker writes, "The Ebers calendar is most satisfactorily explained as equating the original lunar calendar with the civil year, and the reason for the appearance of *wp rnpt* at its head is simply that that event (the rising of Sothis) controlled the lunar year."[7] And because *wp rnpt* in Parker's opinion was the 12th lunar month, and not the first, "The Ebers calendar cannot be regarded as proof … of feasts falling on the first day of the month after that to which they give a name."[8]

7. Having disposed of the feasts of *mswt Rᶜ*, Neheb-kau/Khoiak, and the Ebers calendar with *wp rnpt* in first position, Parker was still left with three feasts that he admitted fell out of their eponymous months in the Greco–Roman calendar: the festivals of Hathor, Renenutet (Renutet), and Epiphi. For these he sought an explanation involving his three calendars. Parker proposed that the feast of Hathor had fallen in "the third *lunar* month of the year and a feast of Renutet in the eighth *lunar* month if for no other reason than the fact that each feast named its month"[9] (emphasis added).

Parker then had to explain why the Renenutet feast was dated to I *šmw* 1, the ninth month, as in the tombs of Khaemhet and Neferhotep. Parker writes:

> The explanation lies, I believe, in the transfer of feasts from the lunar to the civil calendar. The feast of Renenutet in the lunar calendar was a full-moon feast. At the time when it was given a fixed day in the civil year we may suppose that IIII *prt* 15 lunar was the same day as I *ŝmw* 1 civ., or, as seems somewhat more likely, was near the latter date and that the first day of the month was adopted as a more significant and appropriate day.[10]

However, he had earlier stated in *Calendars* a refutation of an earlier Sethe–Weill theory:

> But mere double-dating in the civil and later lunar calendars would never account for the feast of Renenutet falling *in every known instance from the 18th dynasty to the Roman period*, on I *šmw* 1. Moreover, the calendar of Medinet Habu differentiates between feasts determined by the moon and feasts fixed in the civil year and there is nothing to indicate that the feast of Renenutet on I *ŝmw* 1 was lunar[11] (emphasis his).

When confronted with Gardiner's evidence that the feast of Renenutet was out of its eponymous month in I *ŝmw* 1, Parker changed his earlier view that the Renenutet feast was not determined by the lunar calendar to stating that it fell on or near the day of

5 Ibid., 58 §286.
6 Ibid., 58 §§286, 288.
7 Ibid., 58 §286, cf. 42 §§217-18.
8 Ibid., 58 §288.
9 Ibid., 58 §290.
10 Ibid., 58 §289.
11 Ibid., 80 n. 12.

the full moon in the lunar calendar, and was transferred to fall on or near the date of I *ŝmw* 1 in the civil calendar.

Parker's explanation of the feast of Hathor being celebrated on IV *3ḫt* 1 instead of III *3ḫt* 1, where it named the month, is the same as for the feast of Renenutet, except that for Hathor he did not know what lunar day was involved.[12] To explain why these two feast dates had moved, he applied his hypothesis of the later lunar calendar. Parker writes,

> It may very well have been that the fixed feasts actually supplanted their lunar prototypes while the original lunar year and the civil year were still running concurrently and that it was not until the civil year had moved away from nature and the later lunar calendar had been introduced as its companion that the lunar feasts of the original calendar were revived. From then on one might have two dates for each festival, one fixed to the civil year, the other determined by the lunar with varying dates in the civil calendar.[13]

Parker's assertion relies on the hypothesis of a lunar calendar, yet the passages from which the dates come *never differentiate between a lunar and a civil calendar.* The civil calendar, however, is accepted as fact. Parker's "explanation" does not account for the evidence Gardiner accrued for one festival having two dates set one month apart on the first day of each month; the examples usually came from widely separated time periods. *There is not a single example of the feasts described by Parker*; that is, one feast having a fixed date and another date set by a lunar calendar then transferred to varying days in the civil calendar. Parker's "explanation" *does not explain* feasts being held out of their eponymous months and, therefore, the problem of "the shift" remains.

The third feast noted in Parker's "objections,"[14] which Gardiner tentatively proposed had been held out of its eponymous month, is that of Epiphi.[15] Parker referred back to Gardiner's discussion of the third regnal year of Ramesses X when the workmen did not work on IV *šmw* 2. Gardiner also noted that the papyrus Boulak 19 also appears to have the date of an Epiphi feast dated to the 12th month, IV *šmw* 15,[16] though III *šmw* is also possible.[17] The month of Epiphi in the Greco–Roman calendar is III *šmw*.

Parker theorizes that the earlier name for Epiphi was *ipt hmt* in the *original* lunar calendar, and that *ipip* is used in the *later* lunar calendar for the month of III *ŝmw*. Parker supposes that the later lunar calendar had the same names as the months of the *civil* calendar, and that "if the [Epiphi] feast began on almost any day after the sixth lunar day, it would have been possible for it, in some year of the cycle to have fallen on IV *ŝmw* 2." He calls this "double-dating,"[18] which, for him, solves the problem of a feast being assigned to both III *ŝmw* and IV *ŝmw*.

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[12] Ibid., 58 §289.

[13] Ibid., 58 §290.

[14] Ibid., 58 §§287-91.

[15] Gardiner, "Mesore as First Month," 137-39.

[16] R. van Walsem refers to this papyrus as "a journal of necropolis workmen," in "Month-Names and Feasts at Deir el-Medina," *Gleanings from Deir el-Medina* (ed. R.J. Demaree and J.J. Janssen; Leiden: NINO, 1982) 221. Papyrus Bulaq is equated with P Cairo CG 58096 verso 2 in Jauhiainen's index, but as she points out the latter refers "to a jeweller's account from Saqqara" in the reign of Ramesses II. See H. Jauhiainen *"Do not Celebrate Your Feast Without Your Neighbours": A study of References to Feasts and Festival in Non-Literary Documents from Ramesside Period Deir el-Medina* (Publications of the Institute for Asian and African Studies 10; Helsinki: Helsinki University Print, 2009) 69 n. 11, 153 (quote from here), 155, 404 (index). On p. 155 Jauhiainen notes that the feast of Epiphi took place on IV *šmw* 16, a day later than in papyrus Bulaq 19. Clearly, they are not the same passages.

[17] Gardiner, "Mesore as First Month," 137-38; Parker, *Calendars*, 58-59 §291.

[18] Parker, *Calendars*, 59 §291.

But we observe that the dates given above for the Epiphi feast do not fall on IV *šmw* 1 and III *šmw* 1 indicating that Epiphi is not a fixed feast set on day one. Therefore, there must be a different explanation for the dates of the Epiphi feast falling in both III *šmw* and IV *šmw*. We discuss the Epiphi feast dates again in chapter 8.

Nothing that Parker has stated in his "objections" to Gardiner's theory is evidence for his own hypothesis of two lunar calendars, with transference of lunar dates from a lunar calendar to a civil calendar.

Gardiner Responds in 1955 and Parker Replies in 1957

Parker's dismissal in 1950 of Gardiner's "evidence" brought an indignant response from Gardiner in 1955. He wrote, "I was startled to find the contents of the said paper described as 'theory,' since I myself had always regarded them as statements of fact."[19] By "statements of fact" he presumably refers to the feasts dated to *the month after their eponymous months* as in the Greco–Roman calendar, but not his theory about the Mesore- and Thoth-beginning calendars.

We now consider more examples adduced by Gardiner that festivals had once been held in their eponymous months but when applied to the Greco–Roman calendar are located in the next month, and how Parker sought to explain them according to his own calendar theory.

Gardiner and Parker on the Feast of Renenutet

Contrary to Parker's first "objection," as previously discussed in connection with the 18th Dynasty tombs of Khaemhet and Neferhotep (that the feast of Renenutet had always been celebrated on I *šmw* 1) Gardiner was able to cite from Parker's own *Calendars* a feast of Renenutet that was held on IV *prt* 1. An ostracon from Deir el-Medina (No. 35, 14)[20] dating from the first half of the 20th Dynasty[21] recorded when palm dates and wood were delivered. According to Gardiner's translation, it was on the "Fourth month of Winter, day 1, Pharmouthi,"[22] which Gardiner takes as the *month* of Pharmuthi.

However, Parker translated it to read, "IV *prt* 1, the one of Renenutet (Pharmuthi)."[23] Parker assumes "the one" of Renenutet/Pharmuthi to be the *month-name* of IV *prt*, since Pharmuthi is IV *prt* in the Greco–Roman calendar, but Parker attributed the *festival* of Renenutet/Pharmuthi to I *šmw*. He thought this interpretation explained Gardiner's new evidence.

Gardiner on the Feast of Epiphi

In 1950, Parker criticized Gardiner's theory that feasts fell on Day One of the next month by pointing out that the feast of Epiphi was now known to have fallen on IV *ŝmw* 2, not IV *ŝmw* 1.[24] In 1955, Gardiner protested that he had never said that feasts *had to fall* on Day One of the next month. He referred to new evidence from an oracle inscription from Karnak[25] in which the feast of Epiphi started on III *šmw* 28 and finished

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[19] A.H. Gardiner, "The Problem of the Month-Names," *Rd'É* 10 (1955) 9.

[20] Parker, *Calendars*, 77 n. 95.

[21] This is now attributed to the reign of Ramesses III. See Jauhiainen, *"Do not Celebrate,"* 146 and n. 3.

[22] Gardiner, "The Problem of Month-Names," 11.

[23] Parker, *Calendars*, 45 §229; Gardiner, "Problem of Month-Names," 11; R. A. Parker, "The Problem of the Month-Names: A Reply," *Rd'É* 11 (1957) 101 n. 1.

[24] Ibid., 57-58 §286.

[25] The Nesamun oracle inscription found "on the outer face of the festival hall of Amenhotep II"; cited by Jauhiainen (*"Do not Celebrate,"* 155 n. 5) from C.F. Nims, "An Oracle Dated in 'the Repeating of Births'," *JNES* 7 (1948) 157-62.

on IV *ŝmw* 2 in the seventh year of the Renaissance, which was the 25th year of Ramesses XI.[26] Gardiner translates:

> The "Renaissance. Year 7, Renewal of Births, third month of Summer, day 28, under the majesty of the King of Upper and Lower Egypt Menma^{c}rē^{c}-setapenamūn, etc., the day of the appearance of this august god Amen-Rē^{c}, king of the gods [at ti]me of morning in his beautiful festival of *'Ipt-ḥmts*."[27]

Furthermore, Gardiner assumed that the feast of Epiphi occurring in the third year of Ramesses X and dated to IV *ŝmw* 2 had taken place on the latter date, presumed to be more important because it came at the beginning of the month.[28] He thought it was almost impossible to give a reason for the dates of festivals, though he acknowledged that, "the dates were sometimes adjusted to suit lunar requirements."[29]

He saw an analogy of the Epiphi feast with the feast of the Periplous (Sailing) of Mut, which in Greek times was held in Tybi or I *prt*, the fifth month.[30] He noted that in a Papyrus from Turin (68, col. 3, 1),[31] which refers to the 17th year of an unnamed king, whom Gardiner presumed to be Ramesses IX, the feast of Mut began on I *prt* 30, the last day of the fifth month—consistent with the Greco–Roman calendar.

However, he thought it unlikely that a feast typical for its month would be dated to the last day, and thought that it would have lasted for two days and really belonged to II *prt*, the sixth month.[32] He noted further support for the analogy from Papyrus Lansing, 13b, 7, where the feast of Tybi extended over into the sixth month.[33]

Parker on the Festival of Epiphi

Responding in 1957, Parker disagreed that the festival of Epiphi would have lasted five days or would have given its name to the following month. He said instead that the Epiphi feast was, "a moveable feast, dated in one year to III *ŝmw* 28 and in another to IV *ŝmw* 2. This is precisely what we should expect in the case of a *lunar* feast of Epiphi."[34]

Parker suggests both dates were probably full-moon dates, which would have fallen on lunar day 15. He reasons that the preceding new moons would have fallen in the *lunar* month named Epiphi on days 14 and 18, respectively, so that the full moons fell on *civil* III *šmw* 28 and IV *šmw* 2.[35] He also proposes that the Periplous of Mut could be dated to I *prt* 30 if it had fallen on a lunar day such as a full moon,[36] and therefore need not be dated to II *prt*.

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[26] The "Renaissance" (*wḥm-mswt* literally "the repeating of birth") refers to the division of Egypt into two provinces with their boundary at El Hibeh in the 19th year of Ramesses XI. The southern region was ruled by Herihor and the northern by Smendes, over which Ramesses XI reigned supreme; thus his 25th year was the 7th year of the Renaissance. See K. A. Kitchen, *The Third Intermediate Period in Egypt (1100-650 BC)* (Warminster: Aris and Phillips 1986) 248-54 §§209-12. Hereafter *TIP*.

[27] Gardiner, "Problem of Month-Names," 12. Now P Turin Cat. 1898 + 1926 + 1937 + 2094 rt. V, 19; Jauhiainen, *"Do not Celebrate,"* 155 and n. 8.

[28] Ibid., 12.

[29] Ibid., 12-13.

[30] Idem, "Mesore as First Month," 140.

[31] P. Turin Cat. 2008 + 2016 rt. III, 1 (Jauhiainen, *"Do not Celebrate,"* 121 and n. 15).

[32] Gardiner, "Mesore as first Month," 140.

[33] Idem, "Problem of Month-Names," 12. P. Lansing is now P. BM EA 9994. See Jauhiainen, *"Do not Celebrate,"* 122 and n. 3.

[34] Parker, "Problem of Month-Names: A Reply," 102.

[35] Ibid., 102-03; idem, "The Length of Reign of Ramses X," *Rd'É* 11 (1957) 163-64.

[36] Parker, "Problem of Month-Names: A Reply," 103.

Another article, written by Parker and published in the same journal and issue as the above, also concerned the two dates for the Epiphi feasts in the reigns of Ramesses X (Year three, IV *šmw* 2), and Ramesses XI (Year 25, III *šmw* 28).[37] He writes, "The assumption is that the feast in each date falls on the same day of the lunar month of Epiphi (III *šmw*), probably full moon day, and therefore that the two feast-dates are separated by an integral number of lunar months."[38] He checks out the dates using the 25-year cycle of the Carlsberg 9 papyrus and finds that IV *šmw* 2 falls in cycle year 6 and III *šmw* 28 falls in cycle year 12. He considers this a better result than III *šmw* 30 in cycle year 9, III *šmw* 26 in cycle year 15, or III *šmw* 29 in cycle year 23. The best results give him a difference of 31 years between the two dates.[39] Thus, Parker uses his assumption that the feasts fell in a *lunar month named Epiphi* to explain their different dates in the civil calendar.

The festival of the Periplous of Mut dated to I *prt* 30 in the 17th year of an unnamed king is incorrectly assigned to Ramesses IX by Gardiner. My chronology indicates it belonged to the reign of Ramesses VIII and the year 1217. The date appears in Casperson's table as a new moon.[40] The feast does not need to extend to II *prt* 1 as suggested by Gardiner.

The dates of IV *ŝmw* 2 and I *prt* 30 will not be recorded as evidence for feasts held out of their eponymous months in the tables that follow. We discuss these two Epiphi dates again when reconstructing our chronology for the reigns of Ramesses X and Ramesses XI in chapter 33.

Parker on Texts from Edfu

In 1957, after discussing the two Epiphi feast dates above, Parker called attention to three other partly parallel texts from Edfu, the third of which has two dates. Parker attributes a *civil* calendar month of Epiphi to the first date, IV *ŝmw* 18, and a *lunar* month of Epiphi to the second date, III *ŝmw* 23, which he proposed fell on the same day, supposedly proving his point that there was a later lunar calendar running concurrently with a civil calendar. Later, Leo Depuydt also used these texts to argue for evidence of a civil and lunar calendar.[41] Can these dates finally prove the existence of a lunar calendar which is distinct from the civil calendar?

Previously in *Calendars*, Parker showed the hieroglyphic text for all three Edfu (Edfou) inscriptions,[42] but in his 1957 article, just the hieroglyphic text of (c) (as shown in the list below). Obvious breaks in the text are shown in (a) and (b) but not in (c). Parker does not indicate the length of the lacuna in each text. He provides the following translations.

(a) Edfu, VII, 7. "Year 28, day 18 of the 4th month of *ŝmw* (Mesore) under Ptolemy VIII Euergetes II … making 95 years since the foundation to the feast of entering it."

(b) Edfu IV, 8–9. "Year [28], day 18 of *wp rnpt* … Ptolemy VIII Euergetes II … making 95 years from the stretching-of-the-cord to the feast of entering it."

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[37] Idem, "Length of Reign," 163-64.

[38] Ibid., 164.

[39] Based on the difference of 31 years Parker assigned six years to Ramesses X (giving him a reign of nine years) since the remaining 25 years fell in the reign of Ramesses XI ("Length of Reign," 164).

[40] Table 33.11 in chapter 33, p. 459.

[41] L. Depuydt, *Civil Calendar and Lunar Calendar in Ancient Egypt* (Orientalis Lovaniensia Analecta 77; Leuven: Peeters, 1997) 161-63.

[42] Parker, *Calendars*, 42 §§214-16.

(c) Edfu, IV, 2. [line of hieroglyphs here] "Day 18 of the 4th month of *ŝmw* (Mesore), being day 23 of the 3rd (lunar) month of *ŝmw (*Epiphi), this beautiful day of the feast of entering it." [43] Parker writes:

> The event is the dedication of the original nucleus of the Temple of Edfu under Ptolemy VIII Euergetes II in 142 BC. From text (c) alone we learn, with absolute certainty, of the existence of lunar days (*dnit śn-nw*, "last quarter"), of lunar months (*3bd* III), and a lunar year (the season *ŝmw*), of the lag between lunar and civil months (lunar Epiphi begins on civil Epiphi 26 and runs to civil Mesore 25, with but five days in common between lunar and civil Epiphi), and of the importance throughout Egyptian history of certain lunar days as being especially proper for the celebration of certain feasts.[44]

These three texts are all dated to Year 28, IV *ŝmw* 18, though the year is missing in (c). Only (a) and (b) mention the name of Ptolemy VIII Euergetes II, and his name is separated from the second phrase in (a): "making 95 years since the foundation." In (b) the name of Ptolemy is separated from both the preceding and succeeding phrases, indicating omissions in the text. The phrase in (a) "since the foundation" is made more explicit in (b) by the explanation "from the stretching-of-the- cord".

In (c) where the name of Ptolemy is expected, but absent, we find a phrase not in the other two texts: "being day 23 of the 3rd month of *ŝmw*." The word "(lunar)" is supplied by Parker but the parentheses show that it, and the word "(Epiphi)", are not in the original. Text (c) does not mention the "95 years since the foundation" or "the stretching-of-the-cord". Texts (a) and (b) finish with the words "the feast of entering it", while (c) finishes with "this beautiful day of the feast of entering it." In (c) there is no mention of the foundation or of the stretching-of-the-cord, so it appears that these phrases are missing after the initial date, as the ellipses in (a) and (b) after the name of Ptolemy suggest. (See Table 7.1.)

Table 7.1: Actual sections of the text separated by the ellipses in (a) and (b), and apparently by unmarked omission in the case of (c)

List item	Text
(a), (b), and (c)	"Year 28, day 18 of the 4th month of *ŝmw* (*wp rnpt*) …
(a) and (b)	under Ptolemy VIII Euergetes II …
(a) and (b)	making 95 years since the foundation/from the stretching-of-the-cord
(c)	being day 23 of the 3rd month of *ŝmw*
(a), (b), and (c)	to/of this [beautiful day of] the feast of entering it"

Reinstating the text of (a) and (b) after the first date in (c) and before the second date, gives the following sense:

Year 28, day 18 of the 4th month of *ŝmw* (*wp rnpt*) … under Ptolemy VIII Euergetes II … making 95 years since the foundation from the stretching-of-the-cord, being day 23 of the 3rd third month of *ŝmw*, to/of this beautiful day of the feast of entering it.

The first phrase in (a), (b), and (c) is separated from the second phrase by missing text, but the IV *ŝmw* 18 date comes *before* the date of III *šmw* 23 inferring that they do not apply to the same event. The 28th year of Ptolemy VIII Euergetes II is reliably set on 142 BCE, and 95 years before that is 237 BCE, which is reliably dated to the 10th year

[43] Parker, "Problem of Month-Names: A Reply," 103. Shown also in Parker, *Calendars*, 42 §§214-16.

[44] Ibid., 103-04. Day 23 is understood from the words *dnit śn-nw*, meaning last quarter.

of the reign of Ptolemy III Euergetes I.[45] In this year, the foundations of the Edfu temple, including the important stretching-of-the-cord ceremony, was celebrated. The date is not given in the texts above. However, two other texts from Edfu, which immediately *precede* texts (a) and (b), do record the date. According to Edfu texts VII, 5, and IV, 7, cited by Parker, Year 10 of Ptolemy III Euergetes I records a date of III *ŝmw* 7, where III *ŝmw* is indicated by the month-name Epiphi, and equated with the sixth lunar day. The year is 237 BCE. [46] Parker writes"

> On this particular date [III *ŝmw* 7] the cord was stretched to lay out the foundations of the present temple at Edfu, an indication of the importance of *śnt* [6th day] as a building day. *Pśd̠ntyw* is III *ŝmw* 2.[47]

Pśdntyw is generally understood to refer to the day of the new moon, being the first day of the lunar month. Parker equated *pśdntyw* with III *ŝmw* 2 in the year 237 BCE, which was the sixth day from III *ŝmw* 7 (Epiphi 7). However, in Table 7.2, supplied by Casperson, it is conjunction that fell on III *šmw* 2 (−23 in the 0 column) with the first day of invisibility, that of the new moon, on III *ŝmw* 1 indicated by the number 88 (being lower than 100) in the −1 column. In this instance, *pśdntyw* appears to refer to the day of conjunction.[48]

Table 7.2: Ptolemy III Euergetes I's 10th year in −236

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−236	7	19	−236	7	15	2546	10	2	1	14:51	5:03	273	5:03	132	5:03	25
−236	**8**	**18**	−236	8	14	2546	**11**	**2**	3	1:14	5:22	206	5:23	**88**	5:23	**−23**
−236	9	16	−236	9	12	2546	11	1	4	11:18	5:48	266	5:49	145	5:50	28

DoW = day of week; ToD = time of day.

For a further check of Casperson's date for the new moon in 237 BCE, we note the table provided by Fred Espenak (Table 7.3), which also attributes the new moon to 17 August −236 BCE,[49] which confirms the new moon on III *ŝmw* 1. *Pśdntyw* on III *ŝmw* 2 equates to the Julian date of 18 August 237 BCE (−236). The stretching-of-the-cord ceremonies always started in the evening so that the axis of the temple could be aligned with a star in the constellation of the Great Bear by which true north was located.[50]

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45 Ptolemy III Euergetes I was the third king of Egypt's Ptolemaic Dynasty, reigning from 246 to 222 BCE. In 238 BCE, the Decree of Canopus was instituted adding an extra day every fourth year to the civil calendar. The Edfu temple foundations were laid the following year in 237. The main buildings were finished in 231 but the temple was not formally opened until 142 BCE. See J. Dunn, "Ptolemy III Euergetes: The Third King of Egypt's Ptolemiac Dynasty," http://www.touregypt.net/featurestories/ptolemyiii.htm

46 Parker, *Calendars*, 21 §102, 73 n. 74.

47 Ibid., 21 §103.

48 Other examples of *pśdntyw* falling on the day of conjunction rather than on the first day of invisibility, are recognized in subsequent discussions.

49 Fred Espenak, "Six Millennium Catalog of Phases of the Moon: Moon phases from -1999 to +4000 (20000 BCE to 4000)" http://eclipse.gsfc.nasa.gov/phase/phasecat.html His observations are taken from Greenwich in England.

50 D. Greenwell, "Ancient Egyptian Temples: The Foundation Ceremony and Foundation Deposits," *The Ostracon* 16 (Summer, 2005) 3.

Table 7.3: New moon for August −236

Year	New moon, time	First quarter, time	Full moon, time	Last quarter, time	ΔT
−236		Jan 2, 03:59	Jan 9, 19:18	Jan 16, 14:06	03h41m
	Jan 23, 20:41	Feb 1, 00:42	Feb 8, 06:53	Feb 14, 22:30	
	Feb 22, 13:16	Mar 1, 18:01	Mar 8, 16:31, t	Mar 15, 07:58	
	Mar 23, 06:15, P	Mar 31, 07:19	Apr 7, 00:40	Apr 13, 19:11	
	Apr 21, 22:26	Apr 29, 16:59	May 6, 07:58	May 13, 08:38	
	May 21, 12:55	May 28, 23:54	Jun 4, 15:20	Jun 12, 00:19	
	Jun 20, 01:33	Jun 27, 05:09	Jul 4, 00:00	Jul 11, 17:41	
	Jul 19, 12:44	Jul 26, 09:59	Aug 2, 11:06	Aug 10, 11:50	
	Aug 17, 23:06	Aug 24, 15:48	Sep 1, 01:23, p	Sep 9, 05:44	
	Sep 16, 09:11, T	Sep 23, 00:01	Sep 30, 18:38	Oct 8, 22:29	
	Oct 15, 19:19	Oct 22, 11:52	Oct 30, 13:43	Nov 7, 13:15	
	Nov 14, 05:44	Nov 21, 03:49	Nov 29, 08:59	Dec 7, 01:28	
	Dec 13, 16:45	Dec 20, 23:10	Dec 29, 02:55		

When the foundation of the building was celebrated 95 years later on III *ŝmw* 23in 142 BCE, it would have been dated to the same calendar as the one that recorded the temple's foundation rites. On what lunar day then did the date of III *ŝmw* 23 fall in the year 142 (−141) BCE?

According to Casperson's table below (Table 7.4), III *ŝmw* 23 was the day before the new moon, which fell on the day of conjunction on III *ŝmw* 24 (11 24 in the Egyptian column and the number 89 in the −0 column).

Table 7.4: Ptolemy VIII Euergetes II's 28th year in -141 (new moon listing from −141)

Heliopolis; Lat. 30.1, Long. 31.3; visibility coefficients: c1 = 11.5, c2 = 0.008															
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**				
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**
−141	7	19	−141	7	16	2641	10	25	7	15:04	5:05	341	5:06	163	5:06	42
−141	**8**	**17**	−141	8	14	2641	**11**	**24**	1	23:11	5:23	359	5:23	211	5:24	**89**
−141	9	16	−141	9	13	2641	12	24	3	8:58	5:48	252	5:49	135	5:50	19

DoW = day of week; ToD = time of day.

Ninety-five years after the foundations of the Edfu temple were laid in 237 BCE on III *šmw* 1, the event was celebrated again on III *ŝmw* 23 in 142 BCE. The dates of III *ŝmw* 1 and III *ŝmw* 23 both come from the civil calendar of Greco–Roman times. The date of IV *ŝmw* 18, referring to some unnamed event (due to lacunae as shown by the ellipsis) in the 28th year of Ptolemy III Euergetes I, must also derive from the same civil calendar. IV *ŝmw* 18 does not equate to III *ŝmw* 23 in a hypothetical lunar calendar.[51] Furthermore, it is not the date of the initial laying of the temple's foundations.

Parker proposed that the date of III *ŝmw* 23 came from a *lunar* calendar, and the date of IV *šmw* 18 from a *civil* calendar. The analysis of the Edfu texts and the dates of the new moons coming 95 years apart show irrefutably that there was no lunar *calendar* running concurrently with the civil calendar associated with these dates. I conclude that the Edfu texts show no evidence of a lunar calendar.

Depuydt on Ptolemy VIII's 30th year

Backing Parker's efforts, Leo Depuydt also discussed evidence for the existence for what he termed his "civil-based lunar calendar."[52] Depuydt proposed three "double dates"[53] one of these being text (c) from the 28th year of Ptolemy VIII Euergetes II

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[51] Depuydt makes the equation which he refers to as a "double date," *Civil Calendar*, 222.

[52] Depuydt, *Civil Calendar*, 163, cf. 223, 229; idem, "Sothic Chronology and the Old Kingdom," *JARCE* 37 (2000) 180; idem, "The Two Problems of the Month-names," *Rd'É* 50 (1999) 117.

[53] Ibid., 161-63.

discussed above.[54] Depuydt's second "double date" also comes from the reign of Ptolemy VIII Euergetes II, this time in his 30th year, in 140 BCE.[55] Parker said of both these dates that they "name the lunar month as well as the civil month."[56] Parker wrote: "Ptolemy VIII Euergetes II. Year 30, II *ŝmw* (Payni) 9 (July 2, 140 BC) = 6th day of lunar Payni."[57] The month is expressed in hieroglyphs as *ḥb ìnt*—the earlier name for II *ŝmw*. Parker adds the word "*lunar*" to the month of Payni to infer a lunar calendar.[58]

Depuydt saw this text as having a "double date," which he hoped might support the existence of his proposed civil-based lunar calendar. He wrote, "There is only one instance in which a non-seasonal name denotes a lunar month at Edfu. The name is *ḥb jnt* (*CivLun*, p. 163). An event is dated to both II *ŝmw* 9 and *ḥb jnt* 6. The lunar month called *ḥb jnt* therefore began on Day 4 of II *ŝmw*, civil Month 10. Lunar *ḥb jnt* is therefore the lunar twin of civil Month 10."[59]

In the lunar table below supplied by Casperson (Table 7.5), the 58 in the 0 column indicates the day of the new moon that fell on 10 4, that is, the fourth day of II *ŝmw* as Parker stated. This means that the sixth day of the lunar month fell on II *ŝmw* 9, the date given in the text. There is nothing here to indicate that the lunar day was from a lunar *calendar* with the month-name *ḥb jnt* (*ḥb ìnt*). It was the sixth day of a lunar month dated to a *civil* calendar having a month named *ḥb jnt,* that is, II *šmw,* which was later known as Payni in the Greco–Roman calendar.

Table 7.5: Ptolemy VIII Euergete II's 30th year −139 (new moon listing for −139)

<table>
<tr><td colspan="17">Alexandria; Lat. 31.2, Long. 29.9; visibility coefficients: c1 = 11.5, c2 = 0.008</td></tr>
<tr><th colspan="3">Julian</th><th colspan="3">Gregorian</th><th colspan="3">Egyptian</th><th>DoW</th><th>ToD</th><th colspan="6">Morning visibility</th></tr>
<tr><th>Yr</th><th>Mo</th><th>D</th><th>Yr</th><th>Mo</th><th>D</th><th>Yr</th><th>Mo</th><th>D</th><th></th><th></th><th colspan="2">−2</th><th colspan="2">−1</th><th colspan="2">0</th></tr>
<tr><td>−139</td><td>5</td><td>29</td><td>−139</td><td>5</td><td>26</td><td>2643</td><td>9</td><td>5</td><td>1</td><td>9:23</td><td>5:10</td><td>183</td><td>5:09</td><td>72</td><td>5:09</td><td>−1</td></tr>
<tr><td>−139</td><td>6</td><td>27</td><td>−139</td><td>6</td><td>24</td><td>2643</td><td>10</td><td>4</td><td>2</td><td>20:57</td><td>4:58</td><td>314</td><td>4:58</td><td>155</td><td>4:58</td><td>58</td></tr>
<tr><td>−139</td><td>7</td><td>27</td><td>−139</td><td>7</td><td>24</td><td>2643</td><td>11</td><td>4</td><td>4</td><td>7:09</td><td>5:07</td><td>233</td><td>5:07</td><td>120</td><td>5:08</td><td>18</td></tr>
</table>

DoW = day of week; ToD = time of day.

The text would appear to have meant: "Edfu. Ptolemy VIII Euergetes II. Year 30, II *ŝmw* 9 = 6th lunar day in the month of *ḥb jnt*." Since the sixth day after the foundation ceremony of the Edfu temple was the first significant building day, the sixth day of an event two years later also points to a similar event.

My conclusion is that the sixth lunar day in the month of *Payni* in Ptolemy VIII Euergetes II's 30th year is not evidence of a lunar calendar.

Parker and Depuydt on Amasis' 12th Year

A further text was described by Parker as a "double date" in another 1957 article,[60] and subsequently adopted 40 years later by Leo Depuydt in 1997 as evidence for his own "civil-based lunar calendar."[61] The purpose of Parker's article was to show that the 12th year of Amasis, fifth ruler of the 26th Saite Dynasty, was 559 not 558 BCE. The text he used for the revision comes from Louvre papyrus 7848 lines 4–5, dating to I *ŝmw* 21 in the 12th year of Amasis. Written in abnormal hieratic, the lines refer to an

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[54] Ibid., 123, 161, 175, 222-23.
[55] Ibid., 161, 223, 229-31.
[56] Parker, *Calendars*, 26 §124.
[57] Ibid., 19 §83.
[58] Ibid., 19 §84.
[59] Depuydt, "Two Problems," 117.
[60] R.A. Parker, "The Length of Reign of Amasis and the beginning of the Twenty-Sixth Dynasty," *MDAIK* 15 (1957) 208-12, see p. 211.
[61] Depuydt, *Civil Calendar*, 161-63, 175, 223; idem, "Sothic Chronology," 180.

oath that was about to be taken.[62] Parker translates, "Before Khonshu … in Year 12, II *ŝmw* 13, being the 15th lunar day of (lunar) I *ŝmw*."[63]

The word "lunar" in parentheses is not in the text but inserted by Parker and shows that he interpreted the date to be from a lunar *calendar*. Later Parker writes:

> If Amasis had 43 full years then his Year 12 was 558 BCE. If he had 44 full years then it was 559 BCE. In both 559 and 558 BCE, II *ŝmw* 13 was October 19. From our text we know that II *ŝmw* 13 was also the 15th day of the lunar month which must have begun on I *ŝmw* 29, or October 5.[64]

Parker finds that in the year 559 BCE "a lunar month did begin on October 5, or I *ŝmw* 29, and its 15th day did fall on October 19, or II *ŝmw* 13."[65] But the second date of 558, in which the lunar month began on September 24, was "a result impossible of reconciliation with the given date."[66] Therefore, 559 was Amasis's 12th regnal year, leading to the conclusion that he reigned 44 full years and died in his 45th year.[67]

However, there is an error in assigning II *ŝmw* 13 to the 15th day of the lunar month, an equation accepted by Depuydt. He wrote: "CIVIL II *ŝmw* 13 = LUNAR I *ŝmw* 15 (19 October 559 BCE)."[68] These dates can be checked from tables provided by Casperson (Tables 7.6 and 7.7).

The full moon in −558 (559) appeared on II *ŝmw* 15 in Amasis' 12th year and not on II *ŝmw* 13 as Louvre papyrus 7848 lines 4–5 states.

Table 7.6: Full moon table for Amasis's 12th year in 559 (−558) (full moon listing from −558)

Alexandria; Lat. 31.2, Long. 29.9; visibility coefficients: c1 = 11.5, c2 = 0.008												
Julian			**Gregorian**			**Egyptian**				**ToD**		
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**	**DoW**	**Full moon**	**Sunrise**	**Sunset**
−558	9	22	−558	9	16	2224	9	16	6	0:35	5:53	18:53
−558	**10**	**21**	−558	10	15	2224	**10**	**15**	7	11:56	6:21	17:21
−558	11	19	−558	11	13	2224	11	14	1	22:59	6:46	17:46

DoW = day of week; ToD = time of day.

The new moon prior to the full moon date occurred on I *ŝmw* 29, seen in Table 7.7. Therefore, there were 15 days between new moon and full moon, which could not have been the case with a date of II *ŝmw* 13. Both dates of II *ŝmw* 15 and I *ŝmw* 29 are from a civil calendar.

Table 7.7: New moon table for Amasis's 12th year in −558 (new moon listing from −558 to −557)

Alexandria; Lat. 31.2, Long. 29.9; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−558	9	6	−558	8	31	2224	8	30	4	11:21	5:36	248	5:37	130	5:37	19
−558	**10**	**6**	−558	9	30	2224	**9**	**30**	6	1:58	6:04	188	6:05	**79**	6:06	**−23**
−558	11	4	−558	10	29	2224	10	29	7	19:34	6:32	257	6:33	144	6:34	44

DoW = day of week; ToD = time of day.

62 For more background to the text see Depuydt, *Civil Calendar*, 161-62.

63 Parker, "Length of Reign," 210-11.

64 Ibid., 211.

65 Ibid., 212.

66 Ibid.

67 Ibid.

68 Depuydt, *Civil Calendar*, 223.

The three "double dates" proposed by Parker and Depuydt are not evidence for a lunar calendar with month-names. Therefore, Parker's attempts to explain feasts held out of their eponymous months by appropriating a lunar calendar have no factual basis.

Gardiner cites further evidence for feasts held outside their eponymous months in the Greco–Roman calendar. Parker attempts to explain the anomaly by his lunar calendar.

Gardiner on the Birthday of Re on I *3ḫt* 1

In 1906, Gardiner cited from a Necropolis (Theban) diary of Ramesses IX's 13th year, an instance of *Mswt Rᶜ ḥr 3ḫty* ("the birthday of Re Horakhty") as the first day of the first month, which he attributed to the true location of Mesore. He assumed Mesore's earlier equivalent to be *wp rnpt*, indicating that it was secondarily placed as the 12th month.[69]

In 1955, Gardiner cited a further fragmentary reference from a Necropolis journal in which I *3ḫt* 1 is followed by *Mswt Rᶜ ḥr 3ḫty,* writing, "Recently I found another reference in the fragment of a Necropolis journal written on the verso of one of the portions of a papyrus duplicate to P. Anastasi I published by Farina."[70] He notes that the designation of I *3ḫt* 1 appears, but the month-name is partly broken away in the line in question, yet it is confirmed from the previous broken line as being *Mswt Rᶜ*.[71] This entry is now dated to the 15th year of Ramesses IX (two years after the above).[72]

Gardiner also mentions an ostracon from Turin that identifies I *3ḫt* 1 as "the feast of Re."[73] Gardiner proposed the above inscriptions as evidence for a civil calendar having Mesore as first month, since Re's birthday fell on I *3ḫt* 1. (For Gardiner, Mesore is synonymous with the month of *wp rnpt.*) Parker, on the other hand, saw *wp rnpt*'s original place as the 12th *lunar* month, taken over as the designation of the 12th *civil* month, with a secondary application to I *3ḫt* 1—the day also known as *Mswt Rᶜ ḥr 3ḫty* in the early 20th Dynasty.[74]

Gardiner on the Feasts of Khoiak, Hathor and *šf bdt*

In 1906, Gardiner had noted that the feast of the "uniting of the *ka*s" was dated to I *prt* in an Illahun papyrus recording the attendance of singers, dating from the 35th year of an unnamed king, but identified as Amenemhet III of the 12th Dynasty.[75]

Gardiner also reports that in a number of inscriptions from the New Kingdom the feast of Neḥeb-kau (*Nḥb k3w*) was held on I *prt* 1, the month of *k3 ḥr k3* (*ka* upon *ka*). The words "*ka* upon *ka*" suggested to Gardiner that this and the previous inscription

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69 Gardiner, "Mesore as First Month," 138-39, citing *Papyrus de Turin*, 152-153. This is now P. Turin Cat 1999 +2009 verso I, 12 (Jauhiainen, *"Do not Celebrate,"* 79 n. 14).

70 Gardiner, "Problem of Month-Names," 13 and n. 3.

71 Ibid., 13.

72 Jauhiainen writes, "P. Turin Cat. 1884 + P. Turin Cat. 2067 + P. Turin Cat. 2071 + P. Turin Cat. 2015 rt. I. 4, (year 15 of Ramesses IX), I *3ḫt* 1 is referred to as the 'Birth of Re-Horakhty, i.e. the day may have been designated a feast day," in *"Do Not Celebrate,"* 79-80, and n. 1. For the date attributed (p. 80 n. 2) Jauhiainen cites *KRI* IV (1983) 644-50; W. Helck, *Die datierten und datierbaren Ostraka, Papyri und Graffiti von Deir el-Medineh* (Bearbeitet von Adelheid Schlott; *ÄA* 63; Weisbaden, 2002), 511-14.

73 Gardiner, "Problem of Month-Names," 13 n. 3. See also Depuydt, *Civil Calendar,* 97. This ostracon is now O. Turin N 57034. See also A. J. Spalinger, "Calendars: Real and Ideal," *Essays in Egyptology in honour of Hans Goedicke* (eds. B. N. Bryan and D. Lorton; San Antonio, TX: Van Siclen, 1994) 297 and n. 1.

74 Parker, *Calendars*, 47 §236. For further references to the feast of Re attributed to I *3ḫt* 1 see chapter 6, pp. 95ff.

75 Gardiner, "Mesore as First Month," 139. This papyrus is now known as UC 32191. See: www.digitalegypt.ucl.ac.uk/lahun/festivallistmk.html

from the Middle Kingdom were dated to the calendar with Mesore as the first month. Noting that a calendar of Greco–Roman times would have had the feast of Neḥeb-kau on IV *3ḫt* 1, in the month of Khoiak, he suggested that the feast of Khoiak and the feast of Neḥeb-kau were the same.[76]

The alternative date, IV *3ḫt* 1, was mentioned by Gardiner in 1955, when referring to a text supplied by Parker, mentioning a stela from Karnak.[77] The first line records gifts made by King Amosis (or Ahmose), first king of the 18th Dynasty, to his wife Queen Nefretari (or Nefertari), in an unknown year, dated to the fourth month of Inundation (IV *3ḫ*t) day seven. At the end of the text the transfer of property occurs beside the shrine of Amun in the festival of Khoiak, suggesting that it too took place in IV *3ḫt*. Thus Gardiner adduced two dates for the feast of Khoiak/Nehebkau: I *prt* 1 in the 12th Dynasty, and IV *3ḫt* 1 in the early 18th Dynasty.

Prior to 1953 Parker had noted on an obscure magical text (date not attributed) that the Khoiak feast lasted seven days in the 19th and 20th Dynasties, a fact that was transmitted to Gardiner prior to his 1955 article.[78] Parker proposed that the feast also lasted seven days in the 18th Dynasty from IV *3ḫt* 1 to IV *3ḫt* 7, though he says that IV *3ḫt* 7 to IV *3ḫt* 13 is possible.[79] Gardiner accepted that the feast lasted seven days on the evidence cited by Parker.[80] Since Parker knew only of feasts of *Nḥb k3w* dated to I *prt* he concluded that the feasts of Khoiak and *Nḥb k3w* were not identical. However, he identifies one exception in which the goddess Hathor celebrated a *Nḥb k3w* feast from IV *3ḫt* 29-30 in a late Edfu calendar (Edfu V, 350, 9-10);[81] that is, in the month known as Khoiak, suggesting that *Nḥb k3w* and Khoiak were the same feast.

Several supporting arguments that the feasts of Khoiak and *Nḥb k3w* were the same and held on I *prt* 1 were given by Gardiner in 1955. Gardiner also reports from an 18th Dynasty papyrus, that chapter 42 of *The Book of the Dead* seems to set the festival of Khoiak in the fifth month (I *prt*), saying "perhaps even explicitly to equate it with the festival of *Nḥb k3w*." Gardiner translates: "being first month of Winter, day 4, in making the **C**hoiak-feast as first (day?) of Neḥeb-kau(?)…"[82] In this translation, the Khoiak feast seems to be in its fourth day in the month of I *prt*, but its equation with the "first (day?) of Neḥeb-kau" is uncertain. Parker rendered the passage differently from Gardiner to give: "…being I *prt* 1, the fourth day of celebrating the Khoiak-feast and the first of *Nhb k3w*…".[83] On this interpretation the Khoiak feast began on IV *3ḫt* 28 and ended on I *prt* 4 when *Nhb k3w* began. Parker concluded, "Clearly, the two feasts cannot be identical."[84]

Parker knew that the inscription from the reign of Amosis I (Ahmose) dated the Khoiak feast to IV *3ḫt* 7 (noted above). Since the feast of Khoiak lasted seven days he

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[76] Ibid., 139.

[77] Parker, "Problem of Month-Names: A Reply," 104-5, citing Drioton, *Bull. Soc. Fr. Eg*. 12 (1953); Gardiner, "Problem of Month-Names," 15. A. Spalinger refers to this as the Ahmose-Nofretari Donations Stela in"Egyptian Festival Dating and the Moon," *Under One Sky: Astronomy and Mathematics in the Ancient Near East* (eds. J.M. Steele and A. Imhausen; Alter Orient und Altes Testament 297; Münster: Ugarit, 2002) 398 and n. 115.

[78] Gardiner, "Problem of Month-Names," 15 and n. 3; Parker, "Problem of Month-Names: A Reply," 104 and n. 1, 105 and n. 1. Gardiner references the text to Posener, *Ostraca Hiératiques littéraires* I, no. 1059 [1938], (O. DeM 1059, pl. 32).

[79] Parker, "Problem of Month-Names: A Reply," 105 and n. 1.

[80] Gardiner, "Problem of Month-Names," 15 and n. 3.

[81] Parker, "Problem of Month-Names: A Reply," 105.

[82] Gardiner, "Problem of Month-Names," 15.

[83] Parker, "Problem of Month-Names: A Reply," 105.

[84] Ibid., 105.

said it could have lasted from IV *3ḫt* 1 to IV *3ḫt* 7, or IV *3ḫt* 7 to IV *3ḫt* 13.[85] However, these dates conflict with his assumption that the Khoiak feast referred to in *The Book of the Dead* lasted from IV *prt* 28 to I *prt* 4. In view of the dates proposed by Gardiner (see further below), the Khoiak feast would have been celebrated from IV *3ḫt* 1 to IV *3ḫt* 7 (not 7–13) in Gardiner's "Thoth" calendar, but if celebrated in the month of *k3 ḥr k3* on I *prt* 1 to I *prt* 7, it would have been held at the beginning of the first month of winter, its eponymous month in the "Mesore" calendar. Thus the feast "moved" from I *prt* 1–7 to IV *3ḫt* 1–7.

In 1955, in a postscript to his article, Gardiner also mentioned the Berlin ostracon P. 12635 "which contains references to month-names from the Ramesside period, in which a 'restaurateur' recorded what someone ate. Lines 9-10 (recto) and read: 'Again, first month of Winter, day 2, in the Khoiak feast, he ate 1 large cake (*s^{c}b*) and 2 (pieces of) dressed (*dr*) meat'."[86] This was further confirmation for Gardiner that the feast of Khoiak was celebrated in I *prt* in Ramesside times, and not in IV *3ḫt* as in the Greco–Roman calendar.

Parker replied in 1957, "All we have is a memorandum of what someone ate on 'I *prt* 2, in the Khoiak feast'. There is no mention of *Nḥb k3w* at all, and the day could be one of the seven days of the feast."[87] Then Parker seeks to explain why the feast of Khoiak was being celebrated on I *prt* 2 and not in IV *3ḫt*. He writes, "The Khoiak feast was lunar and moveable. It seems likely that it began on the first day of its lunar month, but this is not certain. … When it began late in the civil month of Khoiak it would run over into civil Tybi. This is the simple explanation that solves all Gardiner's problems."[88]

Parker introduces the idea of the Khoiak feast being determined by a new moon in a *lunar calendar*, in order to maintain that the Khoiak feast could have started late in the month of Khoiak and extended into the month of I *prt*. This is in accord with his translation of the passage from *The Book of the Dead*, in which he proposes that the feast of Khoiak began on IV *3ḫt* 28 and lasted through to I *prt* 4 when the feast of Neḥeb-kau began. Parker's assumption of a *lunar calendar* to explain the feast of Khoiak falling in civil IV *3ḫt* and I *prt* is introduced as a counter-argument to Gardiner's theory of two civil calendars, but he provides no evidence of Khoiak's supposed lunar origin.

Gardiner notes that the late, fragmentary, Geographical Papyrus of Tanis fragment 38, explicitly dates the feast of Khoiak to I *prt* 1.[89] This papyrus also related to two other examples as follows. In fragment 36 of the Geographical Papyrus of Tanis the feast of Hathor is dated to IV *3ḫt* 1, not III *3ḫt* as in the Greco–Roman calendar.[90] And, in fragment 37 of the Geographical Papyrus of Tanis the feast of *šf bdt*, forerunner to Tybi, is dated to II *prt* the sixth month of the year, not to the fifth month.[91]

Referring to the above fragments, Parker agreed that, "A Khoiak feast is listed under I *prt* 1, but the right half of the name rectangle is missing. *K3 ḥr k3* is preserved on

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85 Ibid., 104-5 and n. 1; Gardiner, "Problem of Month-Names," 15 and n. 3.

86 Gardiner, "Problem of Month-Names," 30-31. This is also mentioned by Jauhiainen, *"Do not Celebrate,"* 112 n. 4. She cites Manfred Gutgesell's attribution of the inscription to the reign of Ramesses IV in *Die Datierung der Ostraka und papyri aus Deir el-Medineh und ihre ökonomische Interpretation I .Die 20. Dynastie.* Band 1-2. (HÄB 37; Hildesheim: Gerstenberg, 1983) 354-55.

87 Parker, "Problem of Month-Names: A Reply," 105.

88 Ibid., 105-6.

89 Gardiner, "Problem of Month-Names," 31.

90 Ibid., 31.

91 Ibid.

only the left half and one can but guess at what was originally on the right half."[92] He says it could have been "last day of" and a missing date for "the beginning of the Khoiak feast" though he doesn't insist that it was. He notes that under II *prt* is listed "The Periplous of Anubis" and on the right side the letters *ŝfd* are preserved in a vertical order, which might be the month *ŝf bdt*, possibly associated with the goddess Hathor mentioned on the left half. Since *ŝf bdt* is I *prt*, the later Tybi in the Greco–Roman calendar, it reinforces Gardiner's claim of a calendar beginning with "Mesore."

Referring to the feast of Anubis in the month of *ŝf bdt*, Parker asserts: "Again just as with the feasts of Hathor and Khoiak, the simplest explanation is that we have a lunar feast, the one which gave its name to I *prt* in the original lunar calendar, given a date (perhaps even a fixed date) in the civil year on II *prt* 1."[93]

Gardiner and Parker on the Ebers Calendar

Previously, we noted that the Ebers calendar (see chapter 3) was understood by Gardiner to represent in its first column his earlier civil calendar where he saw *wp rnpt* as the prototype of Mesore in the first place. Parker, on the other hand, saw the first column as evidence of his original lunar calendar and explained *wp rnpt* at the head of the list because its eponymous feast determined the following year, and it was kept in 12th place by the intercalation of a 13th lunar month when necessary.[94]

In 1955, Gardiner continued to argue against Parker's two lunar calendars. He reiterated two passages written in 1906, reaffirming his position regarding the Ebers calendar, which he thought Parker had ignored or misrepresented in 1950. He increased his objection to Parker's original lunar calendar because of the theory of an intercalary month. Not even *one day* was known to have been intercalated until the Decree of Canopus instituted a day on every fourth year in 238 BCE, let alone the intercalation of one month.[95]

Parker's dismissal of the Ebers calendar as an example of a civil calendar having Mesore (*wp rnpt*) at its head drew an indignant response from Gardiner, who writes:

> Obsessed by his conviction that the final arrangement of the month-names, having at its head Thoth, represents the original state of affairs, he imagines the true position of *Wpt-rnpt* "Opening of the Year" and its admitted (*Cal.*, § 213-7) equivalent *Mswt Rᶜ* (Mesorē, "Birthday of Rēᶜ") to have been in the twelfth and last month (§ 218) where it is obviously out of place, and regards as secondary (*ibid.*) its excellently attested position as first day of the civil year, where it is obviously in place. Is it possible to conceive of a contention more irrational?[96]

Further on Gardiner writes:

> I myself am puzzled to understand why, if the Ebers Calendar really represents a comparison between the merely postulated lunar year and the civil calendar, the intervals between the months are not of alternating lengths as in the Illahûn papyrus, and why the number of months named is not thirteen so as to include the intercalary month. Parker simply tells us that from the starting date of III *ŝmw* 9 'was projected a schematic lunar calendar of full months of 30 days'.[97]

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92 Parker, "Problem of Month-Names: A Reply," 107.
93 Ibid., 107.
94 Parker, *Calendars*, 42 §218.
95 Gardiner, "Problem of Month-Names," 22.
96 Ibid., 23.
97 Ibid., 24.

In 1957, Parker replied heatedly to Gardiner's criticism of his theory of lunar calendars. [98] He wrote:

> Sir Alan is a master of all the tricks of debate … from an opening surprise to find me referring to his paper as 'theory'… to a rousing climax in which he uses the terms 'irrational' and 'obsessed', so that one may well conclude that for him an upholder of an Egyptian lunar calendar and a lunatic are almost equivalent.[99]

But Parker did not have anything further to add to the Ebers calendar debate. He wrote, "We have already dealt with this in our review of the original calendar. I continue to affirm that my theory offers a better explanation of it than does Gardiner's."[100]

Gardiner and Parker on the Feast of *w3gy*

In 1955, Gardiner did not refer to the feast of Thoth again, which in 1906 had puzzled him because it appeared *always* to have been held on the 19th day of the month of Thoth, the first month of the calendar, though *ṯḫy* (the earlier name for the month of Thoth) was the second month in the Ebers calendar.

However, Thoth had a companion feast that fell on I *3ḫt* 18 and a moveable feast set on varying days in the civil calendar. In 1955 Gardiner disputed an earlier explanation by Borchardt and Parker that a lunar calendar was involved, but he himself was at a loss to explain them.[101]

Parker replied in 1957 that his theory of the construction of the lunar calendar "and its rule of intercalation gives a very clear and simple explanation to the moveable *w3g*-feast."[102] We discuss the *w3gy* feast again later, but suffice it here to say that it too does not provide any proof of Parker's idea of an original lunar calendar on which his rule of intercalation depends for its existence.

Gardiner Reiterates His Two Civil Calendars Proposal

At the end of his 1957 paper, Gardiner elaborated on his theory of two civil calendars and sought to assign their origin to two schools of different theological thought: one school attributing the invention of the year to the sun-god Re, and the other to the moon-god Thoth. The original calendar had Mesore ("birthday of Re") as its first month, but after the god Thoth (mythically) invented the five epagomenal days in the year, this somehow displaced Mesore who was relegated to 12th position.[103] Gardiner writes, "I strongly suspect that the substitution of the month-name Thoth for the month-name *wpt rnpt* or Mesore as the name of the first calendar month had its root in the strange and anomalous status of the epagomenal days. The Ramesseum ceiling bears testimony to this hypothesis."[104]

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[98] Parker, "Problem of Month-Names: A Reply," 85-107.
[99] Ibid., 85.
[100] Ibid., 106.
[101] Gardiner, "Problem of Month-Names," 21 n. 4.
[102] Parker, "Problem of Month-Names: A Reply," 98.
[103] Gardiner, "Problem of Month-Names," 26-27, 30.
[104] Ibid., 26.

Chapter 8

Recovering a Calendar with *Wep Renpet* as the First Month

Wep Renpet (*wp rnpt*) means "opener of the year". Gardiner and Parker were unable to accept the other's viewpoint concerning the original calendars of ancient Egypt, and the subject lay unresolved. However, discussion about the anomaly of the feasts dated out of their eponymous months continues up to recent times in the writings of other Egyptologists, including Anthony Spalinger and Leo Depuydt.

The feasts discussed below are mostly annual feasts set on the first day of a civil month such as *wp rnpt*, Hathor, Choiak, and Renenutet. The month to which each applies depends on the calendar each derives from. The Medinet Habu Festival Calendar gives a range of feasts set in chronological order, of which three are associated with the new moon. *The quest remains to fix annual dates to the Egyptian dating system with sufficient certainty to propose an Egyptian Chronology*.

This chapter concludes with two tables showing the data gathered, with *wp rnpt* originally first as displayed in the Ebers calendar. The discussion below substantiates this positioning while also acknowledging variances. This chapter leads towards chapter 9 and the place of the Ebers calendar in Upper Egypt's initial observation of months and feasts, and towards the subsequent chapters that account for later variants.

Thomas James on *rkḥ wr*

In 1955, T.G.H. James noted from a Middle Kingdom Illahun papyrus, Berlin 10069, col. 1, line 1, the words, "Regnal year 3, 3rd month of Winter, day 1, the Great Burning …" where the "Great Burning" is *rkḥ wr*.[1] This date refers to the third month of *peret* dated in the Middle Kingdom to the calendar used at Illahun; that is, the seventh month, whereas in the New Kingdom *rkḥ wr* is II *prt* as in the Greco–Roman calendar, the sixth month. James writes, "… fixing the 'Great Burning' on the first day of the seventh month of the year, lends additional support to Gardiner's contention that there was a shift in the position of the month-names in later times."

James queries whether *rkḥ wr* used in the date is a month-name, but he points also to, "a certain case of *rkḥ* …? used in an account among Hekanakhte Letters (VII, 15)." He translates: "'Nefersebau begins with the rations in Rokeḥ ….'."[2] It seems clear that *rkḥ* [*wr*] is a month-name and not a festival. See further in echapter 24.

Ulrich Luft on *rkḥ wr* and *rkḥ nḏs*

In 1986, Ulrich Luft refers not only to *rkḥ wr*, but also to *rkḥ nḏs* ("Little Burning") dated to IV *prt* 1, the eighth month, also from Illahun papyrus Berlin 10069 as above, where it is found in recto 5, line 2.[3] This date would otherwise be III *prt* in the

[1] T.G.H. James, "The Date of the Month *rkh wr*," *JEA* 41 (1955) 123.
[2] Ibid., 123. See A.J. Spalinger, "Calendrical Evidence and Hekanakhte," *ZÄS* 123 (1996) 90.
[3] U. Luft, "Noch Einmal zum Ebers-Kalender," *GM* 92 (1986) 71, 76 n. 25.

New Kingdom. In 1992, Luft translated the "Great Burning" passage as "Year 3, III *prt* 1, the Great Burning, the web-priest on the phyle, Sobek-snofru."[4]

The two examples of *rkḥ wr* and *rkḥ nḏs* from Illahun dating to III *prt* and IV *prt* respectively, whereas in the later New Kingdom the same months date to II *prt* and III *prt*, is further evidence that feasts in two consecutive months appear to be dated out of their eponymous months in the original calendar.

Anthony Spalinger on *wp rnpt*

In 1992, Anthony Spalinger pointed out that an inscription dating to the reign of Thutmose III has two different meanings for the term *wp rnpt*, the second of which, he writes, "is explicitly connected to 1 *3ḫt* 1 with respect to a feast of Amun."[5] He continues, "The fragmentary Karnak Festival calendar of the same king likewise denotes the first day of the civil year as *wp*<*rnpt*> … and Hatshepsut, as is well known, more than once indicates her interest in the New Year (*wp rnpt* and 1 *3ḫt* 1)."[6]

In his opinion, "Hatshepsut's famous Deir el Bahri inscription which links 1 *3ḫt* 1 with *wp rnpt* must be viewed in either an idealizing framework, or more explicitly, in a religious-traditional setting."[7] Though Spalinger, in this context, is talking about the lack of occurrences of *wp rnpt* together with *Spdt* until the Late Period, he nevertheless provides examples of dates in the early 18th Dynasty in which *wp rnpt* is connected to the first day of the year, and not to the 12th month. He notes, "In all our calendrically associated texts before the New Kingdom *wp rnpt* refers solely to day one of the civil year if it is the associated feast or else indicated month 1 (civil or lunar)."[8]

Previously, we noted that the "birthday of Re Harakhty" could be dated to I *3ḫt* 1, and the above references demonstrate that the same also applies to the feast of *wp rnpt*. A feast of *wp rnpt* held on I *3ḫt* 1 is entirely consistent with *wp rnpt* being the first month of the year as in the Ebers calendar. That I *3ḫt* 1 can also apply to the "birthday of Re Harakhty," (though Re Harakhty (as Mesore) is the last month of the year in the Greco–Roman calendar, which it shares with *wp rnpt*), illustrates that the feast of Re appears to have moved to a later month; that is, from IV *ŝmw* to I *3ḫt*. On the other hand, the month of *wp rnpt* appears to have moved from I *3ḫt* to IV *ŝmw*—in the opposite direction! This contradictory data requires explanation.

Anthony Spalinger on "the birth of Re Harakhty"

As referred to earlier in chapter 6, p. 93, Spalinger noted that Book II of the Cairo Papyrus 86637 recto III, 3–5 refers to I *3ḫt* 1, being a good day, followed by "The birth of Re Harakhty."[9] The papyrus dates to the reign of Ramesses III and was composed by the workmen of Deir el Medina.[10]

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[4] Idem, "Remarks of a Philologist on Egyptian Chronology," *Ä & L* 3 (1992) 110, 17.

[5] A.J. Spalinger,"Canopus Stela," *Three Studies on Egyptian Feasts and their Chronological Implications* (Baltimore, MD: Halgo, 1992) 46. According to Jauhiainen, during the reign of Thutmose III the *wp rnpt* feast began on I *3ḫt* 1 and lasted 3 days, according to the Feast List of Amon of Elephantine. ("*Do not Celebrate Your Feast Without Your Neighbours": A study of References to Feasts and Festivals in Non‐Literary Documents from Ramesside Period Deir el‐Medina* [Publications of the Institute for Asian and African Studies 10; Helsinki: Helsinki University Print, 2009] 73 n. 1, 79 n. 9).

[6] Ibid., 46-47.

[7] Ibid., 45. Spalinger set the "ideal coronation day of Hatshepsut "on I *3ḫt* 1, which, he says, "may also reflect Middle Kingdom tradition," in "A Remark on Renewal," *SAK* 17 (1990) 293 n. 9.

[8] Ibid., 50.

[9] Idem, "Calendars: Real and Ideal," *Essays in Egyptology in Honor of Hans Goedicke,* (eds. B.M. Bryan and D. Lorton, San Antonio, TX: Van Siclen, 1994) 301-2.

[10] Ibid., 298, 299, 301.

He notes also that "Cairo papyrus 86637 verso 21 dates the "feast of Re" to I *3ḫt* 1, as does the recto of the Turin ostracon 57304, both with the added injunction, "Do not cross the river on this day".[11] These two latter texts and Cairo papyrus 88637 recto pages 1–2 have a tradition "closer to the Middle Kingdom,"[12] which may infer that the "feast of Re" was also known on I *3ḫt* 1 at that earlier time.

Anthony Spalinger: Feast of Re on I *3ḫt* 9

In the Esna calendar, written on the walls of the Esna temple dating to the Greco-Roman period, the date of I *3ḫt* 9 is attributed to the "feast of Amun, feast of Re, corresponding to what the ancestors called the feast of *wp rnpt*."[13] Spalinger described the text as a "thorn in the side of virtually any scholar interested in the calendrics of Egypt, if only as the same calendar presents one as well with the 'normal' *wp rnpt* located on I *3ḫt* 1."[14] Other Esna inscriptions cite the ceremony of the "Union with the Disk" referring to a rebirth and a new year dated to day nine of the month of Re-Horakhty, assumed to be IV *ŝmw* 9.[15] This seems to be the identical feast to *wp rnpt.* Spalinger was disinclined to explain the equation by resorting to Gardiner's hypothesis of two civil calendars one month apart.[16]

In the same article, Spalinger had proposed that the feast of *tḫy* (later the feast of Thoth), which was known to have been held on I *3ḫt* 20, was celebrated on this day because it was the beginning of a new year. He explained that 13 lunar months of 384 days fell on civil Thoth 19 with the New Year on Thoth 20. Or, if one was to subtract 11 days from civil Thoth 20, the lunar year would begin on civil Thoth 9. Or to put it another way, Spalinger writes, "Civil *tḫy*, set on day 20 of the first month of the civil year, has its lunar homologue located on Thoth 9. Hence both are identical … The conclusion is clear in any case: since the first day of *tḫy* is a *wp rnpt*, Thoth 9 can be a *wp rnpt*. QED."[17]

Having come to this conclusion, he then sought to make a connection with the Ebers calendar where the month *tḫy* in the first column is on the same line as IV *ŝmw* 9 in the second column. He regards *tḫy* as the *first* civil month in the Ebers calendar, and the feast of *wp rnpt* on I *3ḫt* 9 is viewed as the "old commencement of the New Year."[18] Spalinger asserts that the IV *ŝmw* 9 date is the partner of the *wp rnpt* set on I *3ḫt* 9. He concludes: "Nothing could be more simple: Esna and Ebers coincide."

It is not that simple. *Tḫy* is the *second* month in Ebers. In order to make the equation *tḫy* has to become the *first* month, to be a *wp rnpt*, an "opener of the year." It is only in later calendars that *tḫy* occupies first place.

Spalinger's recourse to coincide *tḫy* with the beginning of a new year, and its supposed equation with IV *ŝmw* 9 is invalid because *wp rnpt* is *first* month in the Ebers calendar and is not aligned with IV *ŝmw* 9, but with the previous month III *ŝmw* 9.

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11 Ibid., 301-2.
12 Ibid., 298.
13 Idem, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson*, Vol. 2; Boston: Museum of Fine Arts, 1966) 759. See http://www.gizapyramids.org/pdf%20library/festschrift_simpson/59_Spalinger.pdf In "Calendars Real and Ideal," Spalinger writes, "1 *3ḫt* 9 has 'Feast of Amun. Feast of Re, corresponding to what the ancestors called 'Feast of the Opening of the Year'," (p. 306).
14 Ibid., 759.
15 Ibid., 761-62.
16 Ibid., 761.
17 Ibid., 760.
18 Ibid., 759.

The citation from the Esna calendar placing the "feast of Amun, feast of Re" on I *3ḫt* 9, "what the ancestors called the feast of *wp rnpt*" concurs with *wp rnpt*'s position as first month in the Ebers calendar. The citations concerning the ceremony of the "Union with the Disk" mentioning the date of IV *šmw* 9, is in 12th position in later calendars. The two dates for the one event may be viewed as further evidence for feasts being held out of their eponymous months in the Greco–Roman calendar.

Heidi Jauhiainen on *wp rnpt* on I *3ḫt* 1

Heidi Jauhiainen's 2009 thesis discusses references to feasts and festivals at Deir el-Medina in non-literary documents from the Ramesside period.[19] Some of the feasts she attributes to having being held out of their eponymous month, in the following month.

Since Gardiner wrote his articles in 1906 and 1955, the Deir el-Medina ostraca and papyri have been catalogued and posted to a website. Those referred to by Gardiner or Parker can be identified from the database. These new references and others are supplied by Jauhiainen in an appendix. Throughout the thesis she cites several authors for the attribution of a dynasty or a king's regnal year for many of the inscriptions. Her citations are used here.

Jauhiainen often notes that many of the workmen at Deir el-Medina had work-free days at the end of one month, which carried through to days at the beginning of the next month. Thus it is not always clear when a feast started, since feast days usually involved work-free days. Nevertheless, the following instances appear to be feast days out of their eponymous month in the Greco–Roman calendar.

Jauhiainen notes that the feast of *wp rnpt* took place on I *3ḫt* 1 during the Middle Kingdom according to P. Berlin P 10007 recto 22.[20] In Greco–Roman calendars, *wp rnpt* is the 12th month, IV *šmw*.

On O. DeM 209 verso 20, the New Year feast is specifically dated to I *3ḫt* 1–3, with the work-gang being absent in *wp rnpt*.[21] The ostracon is attributed to the reign of Amenmesse or Seti II (late 19th Dynasty).[22]

Heidi Jauhiainen on Hathor Celebrated in IV *3ḫt* not III *3ḫt*.

P. Berlin P 10282 recto 2 cites a feast of Hathor being held on IV *3ḫt* 1.[23] This date is attributed to the Middle Kingdom.[24] A graffito from the Temple of Thutmose III

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[19] H. Jauhiainen, "*Do not Celebrate Your Feast Without Your Neighbours": A study of References to Feasts and Festivals in Non-Literary Documents from Ramesside Period Deir el-Medina* (Publications of the Institute for Asian and African Studies 10; Helsinki: Helsinki University Print, 2009).

[20] Ibid., 73 n. 1, 79 and n. 8.

[21] R. van Walsem, "Month-Names and Feasts at Deir el-Medina," *Gleanings from Deir el-Medina* (eds. R. J. Demarée and J.J. Janssen; Leiden: Nederlands Instituut voor het Nabije Oosten, 1982) 223; Jauhiainen, *"Do not Celebrate,"* 79 and nn. 11-12.

[22] Jauhiainen, *"Do not Celebrate",* 79 n. 13, citing, J. Janssen, "Two Personalities" *Gleanings from Deir el-Medina*, 112 (Amenmesse or Seti II); *KRI* IV (1982) 217-19; R. Krauss, *Sothis- und Monddaten: Studien zur astronomischen und technischen Chronologie Altägyptens* (HÄB 20; Hildesheim: Gerstenberg, 1985), 130 (year 2 of Seti II); W. Helck, *Die datierten und datierbaren Ostraka, Papyri und Graffiti von Deir el-Medineh* (Bearbeitet von Adelheid Schlott; *ÄA* 63; Weisbaden: 2000), 103-105 (year 2 of Amenmesse).

[23] Ibid., 73 n. 2, 108 n. 7.

[24] Ibid., 108 n. 7, citing U. Luft, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992) 116 note d; S. Schott, *Altägyptische Festdaten* (Akademie der Wissenschaften und der Literatur in Mainz, Wiesbaden, 1950) 89.

at Deir el-Bahri dates the procession of Hathor to IV *3ḫt* 4.[25] The Medinet Habu Festival Calendar List 40 (line 917) attributed to the reign of Ramesses II,[26] gives IV *3ḫt* 1 as the date for the feast of Hathor.[27] O. Michaelides 33 recto 9 refers to a procession of Hathor on IV *3ḫt* 1 during which workmen were freed from the work on the Royal Tomb, which extended into IV *3ḫt* 2.[28] The date is attributed to the first half of the 20th Dynasty.[29]

Jauhiainen notes that in the Greco–Roman period the feast of Hathor was celebrated at the Temple of Dendera during the whole month of III *3ḫt*, with processions taking place on III *3ḫt* 29 to IV *3ḫt* 1, and at Kom Ombo from III *3ḫt* 28 to IV *3ḫt* 5, but at Esna only on III *3ḫt* 29.[30] However, Jauhiainen writes that *in the 19th and 20th Dynasties*, "The first and second day of IV *3ḫt*, might, indeed have been annually occurring work-free days at Deir el-Medina."[31] Jauhiainen cites O. Cairo CG 25515, dated to Year 6 of Seti II,[32] and O. Cairo CG 25545 + JE 72454, the date also attributed to Seti II,[33] that the crew was work-free from III *3ḫt* 29 to IV *3ḫt* 2. Also, in O. Turin N. 57047 recto 6–7, in Year 22 of Ramesses III, the men were freed from work on the Royal Tomb from III *3ḫt* 28 to IV *3ḫt* 6.[34] Jauhiainen mentions other similar instances of work-free days, as well as working days at the end of III *3ḫt* through to the first few days of IV *3ḫt* in the Ramesside period.[35] However, she does not note the above-mentioned work-free days as being specifically related to the feast of Hathor, though this is implied. It would seem that the feast of Hathor took place on IV *3ḫt* 1–2 within the period of the work-free days at the end of the third month/beginning of the fourth month.[36] If so, the instances cited are further evidence for a calendar beginning with the month of *wp rnpt*, as in the Ebers calendar. The feast dates given by the Medinet Habu Festival calendar are discussed further below.

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[25] Ibid., 107 and n. 10, 108 and n. 8.

[26] Ibid., 108 n. 10 citing H. H. Nelson, "The Calendar of Feasts and Offerings at Medient Habu," *Work in Western Thebes 1931-33* (eds. H.H. Nelson and U. Hölscher; OIC 18; Chicago, IL: Chicago Oriental Institute (1934) 25-29; A.J. Spalinger, "Sovereignty and Theology in New Kingdom Egypt: Some Cases of Tradition," *Saeculum* 47 (1996) 226; B.J.J. Haring, *Divine Households: Administrative and Economic Aspects of the New Kingdom Royal Memorial Temples in Western Thebes* (EgUit 12; Leiden: NINO, 1997) 53-55.

[27] Van Walsem, *Temple Festival Calendars*, 103; *"Do not Celebrate,"* 73 n. 2; 108 and n. 9 citing, Kitchen, *KRI* V (1983) 159.

[28] Jauhiainen, *"Do not Celebrate,"* 104, 108-9.

[29] Ibid., 108 and n. 2, citing H. Goedicke and E.F. Wente, *Ostraca Michaelides* (Wiesbaden: Harrassowitz 1962) 20, (Ramesses III); *KRI* V (1983) 612-13 (Ramesses III); Helck, *Die datierten* 374-75 (year 2 of Ramesses IV).

[30] Ibid., 108, nn. 11, 12, 13.

[31] Ibid., 109.

[32] O. Cairo CG 25515 recto VII, 14-17, Jauhiainen, *"Do not Celebrate"*, 109 and n. 4 citing J. Černý, *Ostraca Hiératiques Nos 25501-25832: Catalogue general des antiquités égyptiennes due Musée due Daire* (Le Caire: L'Institut Français d'Archéologie Orientale (1935) 7; Kitchen, *KRI* IV (1982) 322-27, 382-84; Helck, *Die datierten* (2002) 141-47, 160-63.

[33] O. Cairo CG 25545 + JE 72454; Jauhiainen, *"Do not Celebrate"*, 109. For the date attributed Jauhiainen cites Helck, *Die datierten* (2002) 146-47; D. van Heel and K. and B.J.J. Haring, *Writing in a Workmen's Village: Scribal Practice in Ramesside Deir el-Medina* (EgUit 16; Leiden: Instituut voor het Nabije Oosten (2003) 34 (Jauhiainen, *"Do not Celebrate"*, 109 n. 6).

[34] Jauhiainen, *"Do not Celebrate"*, 109 and nn. 7 and 8. For the date attributed, Jauhiainen cites J. López, *Ostraca ieratici N 57001-57092: Catalogue del Museo Egizio di Torino.* Serie seconda – Collezioni, 3, Fascicolo 1; Milano: Instituto Editoriale Cisalpino-La Goliardica (1978) 32; Kitchen, *KRI* V (1983) 483; Helck, *Die datierten* (2002) 246-47 in Jauhiainen, *"Do not Celebrate"*, 109 n. 8.

[35] Ibid., 109-10.

[36] Ibid., 110.

Heidi Jauhiainen on Khoiak

Concerning the feast of Khoiak, Jauhiainen writes, "The festival [of Khoiak] normally seems to have been celebrated during the month of IV *3ḫt* and to have culminated in the feast of Lifting the *Djed*-pillar on IV *3ḫt* 30."[37] But she also writes, "At Deir el-Medina, *Khoiak* (*k3 ḥr k3*) seems to have been the name of a feast at the beginning of I *prt* … an eponymous feast at the beginning of the subsequent month after the one named after it."[38]

Jauhiainen notes an example of a Khoiak feast held at the beginning of I *prt* (not noted here previously). From Graffito 2087, 1–3, she notes that the work crew at Deir el-Medina brought *k3 ḥr k3* to Meretseger on I *prt* 5 in the reign of Ramesses V.[39] The *k3 hr k3* may have been a ritual vessel associated with the feast of *k3 ḥr k3/*Khoiak.[40] The magical literary text O. DeM 1059 recto 7-8 (no date) cites the feast as lasting seven days,[41] so I *prt* 5 may have been the fifth day of the feast. Putting these two citations together it seems probable that the feast of Khoiak began on I *prt* 1. Jauhiainen's analysis of the Khoiak feast dates, led her to say, "… the royal artisans may, in general, have celebrated the feast of *k3 ḥr k3* for two days on I *prt* 1–2."[42]

Jauhiainen then associates the Khoiak feast dates with those of work-free days. In O. Cairo CG 25542, a lamp account dated to Year 5 of Seti II, cites work-free days on IV *3ḫt* 29, which lasted to I *prt* 3.[43] Also, in Seti I's sixth year (O. Cairo CG 25515) the workmen were free from IV *3ḫt* 29 to I *prt* 4. Jauhiainen cites a similar document from the first year of the reign of Siptah,[44] successor to Seti II. She also notes from O. Cairo CG 25536 verso that the wicks for the lamps were brought out of storage on I *prt* 4, seeming to indicate the first working day of the month.[45] She concludes, "Thus, it appears, that, at least during the 19th Dynasty, the work-free period due to the feast of *k3 ḥr k3* at Deir el-Medina may have started on IV *3ḫt* 29 and ended on I *prt* 2 or 3."[46] Since the work-free days are not attested as celebrating the Khoiak feast, but can be attributed to the workmen having "days off" at the end of each month, the celebrating of the feast of Khoiak beginning on I *prt* 1 is a natural continuation of the work-free days. As such, the feast is out of its eponymous month in the Greco–Roman calendar.

Jauhiainen notes from O. Demarée H 6, 1–2, 8, attributed to Year 3 of Seti I,[47] "the crew received deliveries of wood and pottery on IV *3ḫt* 30. Among the containers were 40 *k3 ḥr k3* vessels, the name of which seems to derive from the *Khoiak* Festival."[48] This suggests they were for the feast of Khoiak starting the next day on I *prt* 1.

Regarding the feast of *nḥb k3w*, which Parker had proposed as being separate from *Khoiak*, Jauhiainen writes, "According to various sources from the Middle and the

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[37] Ibid., 113-14 and n. 1.
[38] Ibid., 114.
[39] Ibid., 114 and n. 4, and in n. 5 citing the date attributed by Kitchen, *KRI* VI (1983) 271; Helck, *Die datierten* (2002) 420.
[40] Ibid., 116.
[41] Ibid., 115 and n. 10.
[42] Ibid., 114.
[43] Ibid., 114 and n. 11, citing the date attributed by Kitchen, *KRI* IV (1982) 305-9; Helck, *Die datierten*, 137-39.
[44] Ibid., 114-15 and n. 1; from O. Cairo CG 25521 recto 4-5.
[45] Ibid., 115 and n. 4; from O. Cairo CG 25536 verso 1-2.
[46] Ibid., 115.
[47] Ibid., 116, and n. 2 citing the date attributed by Kitchen, *KRI* VII (1989) 30.
[48] Ibid., 116.

New Kingdom, I *prt* 1 was, in fact, dedicated to a feast of the god *nḥb k3w*."[49] She explains the celebration of the feast of *nḥb k3w* at the time of the feast of *k3 ḥr k3* at Deir el-Medina as *nḥb k3w* being an extension of *k3 ḥr k3*.[50] She writes, "The Khoiak Festival ended in the resurrection of Osiris while the feast of *nḥb k3w* celebrated the accession of his son Horus as the King of Egypt."[51] She notes from an inscription from the tomb of Amenmose (TT9) attributed to the reign of Ramesses II, "the name of the deceased is said 'not to be forgotten in the morning of *nḥb k3w*'." She also observes that, "In the tomb of the official Nakhtamon (TT341), reign of Ramesses II, I *prt* 2 is called the 'morning of *nhb k3w'*."[52] Thus the feast of Neḥeb-Kau was already being celebrated on I *prt* 2, a date also attributed to the feast of Khoiak, and presumably started on I *prt* 1.

Noting that the feast of Neḥeb-Kau was held in the month of *k3 ḥr k3* at the time of Ramesses II on I *prt* 1, but by the time of Ramesses IV the feast was called Khoiak,[53] Jauhiainen suggests that the name of the feast changed from *nḥb k3w* to *k3 ḥr k3* (Khoiak) between the reigns of Ramesses II and Ramesses IV.[54] However, the feast of Khoiak was also dated to IV *3ḫt* in the 20th Dynasty as a number of inscriptions attest,[55] this being its position in the Greco–Roman calendar. Thus the feast is out of its eponymous month in IV *3ḫt*.

Jauhiainen notes that O. Ashmolean Museum 70, recto 9, records the work gang having a *wp* feast on I *prt* 1.[56] Since *wp*, and not *ḥb* (the usual word for feast), is used it implies an association of *wp rnpt* as the first day of the new year (I *3ḫt* 1) and I *prt* 1 as the first day of the Neḥeb-Kau feast.[57] I *prt* 1 can be viewed as a secondary New Year with the death of Osiris and the accession of Horus.[58] The inscription is attributed to the mid-20th Dynasty, possibly to the reign of Ramesses VI.[59]

Parker's attempt to translate the passage from *The Book of the Dead* so that the feast of Neḥeb-Kau began on I *prt* 4, after the feast of Khoiak had ended on I *prt* 3, is not corroborated by the above texts. Also, as with the feast of Renenutet, work-free days at the end of the previous month seem to have extended into work-free days at the beginning of the next month; that is, from the end of IV *3ḫt* into the beginning of I *prt*, incorporating the feast of *nhb k3w/k3 ḥr k3*.

Heidi Jauhiainen and Renenutet on IV *prt*

Previously, I noted that the feast of Renenutet (*rnnwtt*) was dated specifically to I *ŝmw* 1 on the tombs of Khaemhet and Neferhotep of the 18th Dynasty. As Jauhiainen notes, in various Theban tombs the feast of Renenutet is dated to I *ŝmw* 1.[60] This is wholly explicable as the Renenutet festival celebrates the beginning of the harvest season; that is, *ŝmw*. In the Ebers calendar, Renenutet is the month of I *ŝmw*. But the feast and month of Renenutet is IV *prt* in the Cairo Calendar (P. Cairo JE 86637 verso

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[49] Ibid., 116; for bibliography see n. 7.
[50] Ibid., 116; for bibliography see n. 13.
[51] Ibid., 116 and n. 14.
[52] Ibid., 117.
[53] Ibid., 112-18.
[54] Ibid., 117.
[55] O. BM EA 29560, O. DeM 1265, O Berlin P 14214, cited in Jauhiainen, *"Do not Celebrate,"* 118, nn. 10-14.
[56] Jauhiainen, *"Do not Celebrate,"* 118 and n. 1.
[57] Ibid., 118. See Spalinger, "Calendars Real and Ideal," 302-08.
[58] Ibid., 116; Spalinger, "Calendars Real and Ideal," 307.
[59] Ibid., 118 and n. 2.
[60] Ibid., 144.

XIV, 8).[61] (The month is later known as Pharmuthi in the Greco–Roman calendar). Jauhiainen notes there are further references from Deir el-Medina for this feast falling on IV *prt*.[62] In the Greco–Roman calendar, the month of Renenutet is also IV *prt*.

But, Jauhiainen writes, "From the New Kingdom on, the Feast of Renenutet occurred at the beginning of I *ŝmw* 1."[63] She notes a feast of Khnum dated to I *ŝmw* 1 in the Festival Calendar of the Temple of Esna (1st century CE), where, however, the feast day is also called the feast of Renenutet.[64] Therefore, the feast of Renenutet falling on IV *prt* is out of its eponymous month.

Medinet Habu Festival Calendar Lists Renenutet on I *ŝmw* 1

The feast of Renenutet is also attributed to I *ŝmw* 1 in the Medinet Habu Festival calendar in List 64.[65] Sherif el-Sabban, who published the list in 2000, translates this passage.

> (Line 1402 reads, First month of Summer, day 1; day of the *Renenutet* festival; offerings for Amon-Re, and the portable image of King of Upper and Lower Egypt, *Wosermaatre Meriamon*, [Ramesses III] in this day of festival.[66]

It is assumed by scholars that the name of Ramesses III has replaced the original name of Ramesses II (Usermaatre-Setepenre) as the Medinet Habu calendar is a copy from the Ramesseum. However, it is quite clear that the text assigns the feast of Renenutet to I *ŝmw* 1 where it is applicable at the beginning of the harvest but not to IV *prt* 1.

The First Month Must Be *wp rnpt* as in the Ebers Calendar

The dating of Renenutet to IV *prt* 1 cannot be attributed to a mistake, as the numeration of the preceding and following lists of dated months and feasts are in chronological order. This indicates that the other feasts listed at Medinet Habu also derive from the same calendar as List 64 having the feast of Renenutet on I *ŝmw* 1. The first month must then be *wp rnpt* as in the Ebers calendar. There are three feasts dated to the new moon listed in the Medinet Habu Festival calendar. We discuss these now.

New moon festivals at Medinet Habu preceding List 64 (discussed above) is List 63 where the heading is damaged and only "Feast of [..]*k*[..]" is legible.

> Line 1388 reads, "4th month of winter, 1st day; day [of] the festival of [..]*k*[ ] it is the new moon which brings it," etc.[67]

Because the name of the feast is missing we come back to this after discussing the two remaining texts associated with the moon. List 66 is headed "The Processional Festival of Min."

> Line1430 reads, "1st month of summer, 11th day; day of Min's procession to the terrace when the new moon is in the morning; offerings for Amon and the portable image of Wosermaatre Meriamon, in this day."[68]

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[61] Ibid., 145 and n. 14; A. Bakir, *The Cairo Calendar No. 86637* (Cairo: Antiquities Department of Egypt, Government Printing Offices, 1966) 54.

[62] Ibid., 145-46.

[63] Ibid., 144.

[64] Ibid.

[65] Ibid.

[66] S. el-Sabban, *Temple Festival Calendars of Ancient Egypt* (Liverpool Monographs in Archaeology and Oriental Studies; Liverpool: Liverpool University Press, 2000) 126. The heading is followed by lines 1403-1415 giving an inventory of the offerings for the feast.

[67] Ibid., 125.

The date for the new moon is I *ŝmw* 12, being the day after the procession.

Spalinger applies the Medinet Habu Festival calendar to a year early in the reign of Ramesses II.[69] He notes that a decree for new offerings on II *prt* in Year 4 means that the list must have been commenced later than that date.[70] In my chronology, Ramesses II's sixth year is 1384 (−1383). A new moon fell on I *ŝmw* 12 (9 12) in −1383 as shown in Casperson's table (Table 8.1).

Table 8.1: Ramesses II's sixth year −1383: Medinet Habu feasts (new moon listing from −1386 to −1381)

Thebes; Lat. 25.7, Long. 32.6; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1383	2	13	−1383	2	1	1398	7	14	7	5:50	6:36	233	6:35	64	6:34	−34
−1383	**3**	**14**	−1383	3	2	1398	**8**	**13**	1	14:13	6:16	355	6:15	**94**	6:14	**−2**
−1383	**4**	**12**	−1383	3	31	1398	**9**	**12**	2	22:42	5:54	606	5:54	143	5:53	**36**
−1383	**5**	**12**	−1383	4	30	1398	**10**	**12**	4	8:05	5:33	217	5:32	**87**	5:32	**11**
−1383	6	10	−1383	5	29	1398	11	11	5	19:03	5:17	299	5:17	149	5:16	60

DoW = day of week; ToD = time of day.

However, Casperson's table (Table 8.1) is dated to a calendar beginning with *ṯḫy* (or Thoth) as in the Greco–Roman calendar, which means that the month name of I *ŝmw* is Khonshu, not Renenutet, that being the previous month. But in the Medinet Habu calendar, in List 64, the feast of Renenutet is dated to I *ŝmw* 1, and because the feast of Min is also dated to I *ŝmw* it must also refer to the month of Renenutet not the month of Khonshu (later Pachons). The date of the new moon fell on I *ŝmw* 12 in a calendar beginning with *wp rnpt*. This means that IV *prt* 12 in the table above converts to I *ŝmw* 12.

The third feast associated with the new moon is that of List 67, which has the heading "The Processional Feast of Amon."

> Line 1451 reads, "First month of summer, the new moon's festival of Amon-Re, in his first festival of the first month of summer, when this god goes out on the 4th occasion of the new moon's festival," etc.[71]

This inscription refers back to the preceding list in which the new moon fell on I *ŝmw* 12. Four days later, still in the first festival of I *ŝmw*, Amun-Re received offerings. This also refers to the month of Renenutet.

To return to List 63, with the damaged heading and lost month name we note that the new moon fell in the fourth month of winter. Since the following month was I *ŝmw* (in Lists 64, 66, and 67) attributed to the month of Renenutet, the preceding month must be *rokeḥ nḏs* ("Little Burning") or IV *prt*. The name *rkḥ* incorporates the "*k*" seen in the inscription,[72] thus concurring with the identification.

In the table above, the new moon fell on IV *prt* 12, which, in the Greco–Roman calendar, is the month of Pharmuthi, but when converted to a calendar beginning with *wp rnpt*, the month is *rokeḥ nḏs*, otherwise IV *prt*. In List 63, the day date is given as IV

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[68] Ibid., 127-28. For more about the Medinet Habu Calendar and the Feast of Min, see A.J. Spalinger, "Egyptian Festival Dating and the Moon," *Under One Sky: Astronomy and Mathematics in the Ancient Near East* (eds. J.M. Steele and A. Imhausen; Alter Orient und Altes Testament; Münster: Ugarit, 2002) 384-87.

[69] Spalinger, "Egyptian Festival Dating," 386.

[70] Idem, "Sothis and 'Official' Calendar Texts," *VA* 10/2-3 (1995) 182.

[71] El-Sabban, *Temple Festival Calendars*, 129.

[72] El-Sabban had suggested that the feast was named Sokar (ibid, 125), but this feast was celebrated on or around IV *3ḫt* 25-26 (Jauhiainen, *"Do not Celebrate,"* 165-66).

prt 1. This is a damaged entry, and is in conflict with the preceding heading for List 62 in which the “Feast of Chewing Onions for Bast” fell on IV *prt* 4. Thus List 63 must be dated to some day after the fourth, and the new moon date reveals this to be IV *prt* 12. The heading (line 1388) may now be emended to “4th month of winter 12th day; day of the festival of *rkḥ nḏs*; it is the new moon which brings it; offerings for Amon-Re with his ennead in this day of festival.”[73] In the lunar table, the month is represented by III *prt* 12.

Medinet Habu Festival Lists are based on a Calendar Beginning with *wp rnpt*

The conclusion is that the Medinet Habu festival lists are based on a calendar that began with *wp rnpt* as attested by IV *prt* being the month of *rokeḥ nḏs*, and I *ŝmw* being the month of Renenutet, This infers that the other months in this section of the calendar also derive from a calendar beginning with *wp rnpt*.

This is borne out by further investigation. List 52 refers to the feast of Neḥeb-Kau on I *prt* 1,[74] not IV *3ḫt* 1. List 59, the Festival of the Navigation of Anubis was held on II *prt* 1, followed a month later by (List 60) the “Feast of Lifting up the Sky,” which was held on three consecutive days: II *prt* [2]9, II prt 30, and III *prt* 1. This was, itself, followed a month later by (List 61) the “Feast of Entering the Sky,” which was also held on three consecutive days, III *prt* 29, III *prt* 30, and IV *prt* 1. Then follows (List 62) the “Feast of Chewing Onions for Bast,” which was held on IV *prt* 4. This feast precedes that of List 63, the just discussed “Feast of *rokeḥ nḏs*,” which was held on IV *prt* 12. If the fourth month of winter is *rokeḥ nḏ*s, then working backward, the third month (List 61) is *rokeḥ wr* (“great burning”), and the second month (Lists 59 and 60) is *ŝf bdt* (Shef bedet). In List 65, the “Feast of Clothing Anubis” held on I *ŝmw* 10, is in the same month as List 64; therefore, it must also refer to Renenutet.

Jauhiainen comments that the feast of “Lifting Up the Sky” (List 60) held on III *prt* 1, was a variant for the Memphite feast of Ptah, held on II *prt* 29-III *prt* 1,[75] the name by which the feast was known during the New Kingdom and also in Greco–Roman temples.[76] The feast of Ptah was held on III *prt* 4, attributed to the second year of the reign of Ramesses IV,[77] and held on III *prt* 1 in the third year of the reign of Ramesses X.[78] Various inscriptions from Deir el-Medina indicate that the feast of Ptah lasted at least four days.[79] Thus the feast of Lifting Up the Sky equated with the feast of Ptah fell on III *prt* 1 in the month of *rkḥ wr* in the Medinet Habu Festival Calendar, but in the Ramesseum and Medinet Habu temple ceilings the month of *rkḥ wr* is II *prt*, as in the Greco-Roman calendar. The Medinet Habu calendar dates for the feast of Ptah/Lifting Up the Sky held on II *prt* 29-III *prt* 1 applied to the months of *ŝf bdt* and *rkḥ wr* give another example of a feast held out of its eponymous month in the Greco–Roman calendar.

Referred to above is List 52, another example of the date for the month of Neḥeb-Kau.

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[73] Ibid., 125.
[74] Ibid., 115.
[75] Jauhiainen, *“Do not Celebrate,”* 170.
[76] Ibid., 127.
[77] Ibid., 170; O. DeM 401 rt. 1-5; see nn. 7 and 8. The date probably implies the fourth day of the festival (see p. 171).
[78] Ibid., 170; P. Turin Cat. 1898 + 1926 + 1937 + 2094 recto I, 5.
[79] Ibid., 170-71.

> Line 1191 reads, "First month of winter, 1st day; day of the Neḥeb-Kau festival of the royal appearance of the king of Lower Egypt Wosermaatre Meriamon."[80]

The first month of winter in the Greco–Roman calendar is IV *prt*, thus its attribution to Neḥeb-Kau, also known as Khoiak, is out of its eponymous month. This reinforces the conclusion of the previous discussion concerning the feast of Khoiak/Neḥeb-Kau: that it was once dated to I *prt* 1.

The above examples of months in the Medinet Habu Festival calendar demonstrate a calendar beginning with the month of *wp rnpt*, while also having a second designation a month later out of its eponymous month in other contexts. These indicate the presence and simultaneous use of two calendars in the early 19th Dynasty (reign of Ramesses II), a situation also pertaining to the 18th Dynasty attested in the Ebers calendar with the alternative calendar depiction in the tomb of Senmut among other examples.

Month Names from Other Calendars *One Month Before* the Greco–Roman Calendar

Other evidence not yet discussed arises from the Hekanakhte Letters pertaining to the 12th Dynasty. Months named *ḫnt-ẖty-prty*, *ŝf-bdt* and *rkḥ* appear to derive from a calendar beginning a month earlier than in the Greco–Roman calendar. The Hekanakhte Letters will be discussed in chapter 24 in the context of its associated dynasty.

Also, in chapter 13, I will discuss the *w3gy* feast dates of the 12th Dynasty provided by Ulrich Luft.[81] Spalinger understood from Luft that the *w3gy* feast date changed from day 18 of the second *lunar* month to day 18 of the *first civil* month, which he assumed to be another example of a feast held out of its eponymous month.[82] My investigation points otherwise and leads to the recognition of an early date for a heliacal rising of Sothis, which, in turn, supports my chronology.

In the preceding discussion I have brought together evidence gleaned by Gardiner and other scholars for feasts apparently held out of their eponymous months as in the Greco–Roman calendar. There may be other examples that have not come to my attention. Table 8.2 lists the evidence discussed in this and previous chapters ordered as far as possible by the time period. Table 8.3 gives the dates according to their position in a calendar beginning with the month of *wp rnpt*, as in the Ebers calendar.

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[80] El-Sabban, *Temple Festival Calendars*, 115.

[81] U. Luft, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992).

[82] A. J. Spalinger, "Notes on the Ancient Egyptian Calendars," *Orientalia* 64 (1995) 23.

Table 8.2: Chronological tabling of festivals, lists, or months that suggest a calendar starting one month earlier than the Greco–Roman calendar

	Source of festivals/lists/months	Period	Feast/list/month	Date given
1	Old Kingdom *mastabas*	4th–5th Dyn.	*Wp rnpt* first in lists of feasts	I *3ḫt* 1
2	P. Berlin P 10007 rt. 22	Middle Kingdom	Feast of *wp rnpt*	I *3ḫt* 1
3	Illahun Berlin Papyrus 10069 rt. col. 1, line 1; col. 5, line 2	12th Dyn.	Month *rkh wr* Month *rkḥ nḏs*	III *prt* 1 IV *prt* 1
4	P. Berlin P 10282 rt. 2	Middle Kingdom	Feast of Hathor	IV *3ḫt* 1
5	Illahun Papyrus UC 32191	35th yr Amenemhet III, 12th Dyn.	Feast of Hathor Feast of *k3 ḥr k3*	IV *3ḫt* 1; I *prt* 1
6	Ebers papyrus calendar	9th yr Amenhotep I, early 18th Dyn.	*Wp rnpt* heads the list of month-names, ending in Epiphi	I *3ḫt* to IV *ŝmw*
7	Deir el-Bahri inscription of Hatshepsut	Hatshepsut, early 18th Dyn.	New Year's day is *wp rnpt*	I *3ḫt* 1
8	Karnak Festival calendar	Thutmose III, early 18th Dyn.	Feast of *wp rnpt*	I *3ḫt* 1
9	Feast List of Amon of Elephantine	Thutmose III.	Feast of *wp-rnpt*	I *3ḫt* 1
10	Graffito from Thutmose III's Deir el-Bahri temple	Thutmose III	Procession of Hathor	IV *3ḫt* 4
11	Tomb of Khaemhet (TT57)	Tomb dated to 30th yr of Amenhotep III, mid 18th Dyn.	Harvest festival: Renenutet = Pharmouthi	I *šmw* 1
12	Book of the Dead, ch. 42	18th Dyn.	Khoiak feast	I *prt* 1
13	Tomb of Neferhotep (TT50)	Reign of Horemheb, late 18th Dyn.	Harvest festival: Renenutet = Pharmouthi	I *šmw* 1
14	O. Demarée H 6, 1, 2–8	Year 3 Seti I, early 19th Dyn.	Delivery of wood, pottery, and 40 *k3 ḥr k3* vessels	On IV *3ḫt* 30, for *k3 ḥr k3* feast on I *prt* 1?
15	Tomb of Nakhtamon (TT341)	Ramesses II, early 19th Dyn.	"morning of *nhb k3w*" (Neḥeb-Kau)	I *prt* 2
16	Medinet Habu Festival calendar, list 40	[6th yr] Ramesses II	Feast of Hathor	IV *3ḫt* 1
17	Medinet Habu Festival calendar, list 52	[6th yr] Ramesses II	Feast of Neḥeb-Kau	I *prt* 1
18	Medinet Habu Festival calendar, list 60	[6th yr] Ramesses II	Feast of Lifting Up the Sky = Feast of Ptah in *rkḥ wr*	III *prt* 1
19	Medinet Habu Festival calendar, List 63.	[6th yr] Ramesses II	Feast of "[ ]k[ ]" = *rkḥ nḏs* on new moon IV *prt* 1[2]	IV *prt* 12
20	Medinet Habu Festival calendar, List 64	[6th yr] Ramesses II	Feast of Renenutet	I *ŝmw* 1
21	Medinet Habu Festival calendar, list 66	[6th yr] Ramesses II	Procession of Min Feast of Min on new moon	I *ŝmw* 11 I *ŝmw* 12
22	On O. DeM 209 vs. 20.	Late 19th Dyn.	Feast of *wp-rnpt*	I *3ḫt* 1–3
23	Cairo Calendar Papyrus 86637 rt. III, 3–5	Early 20th Dyn.	"Birthday of Re-Harakhty"	I *3ḫt* I
24	O. Berlin P 12635 vs. 9	Ramesses IV, 20th Dyn.	Feast of Khoiak	I *prt* 2
25	O. DeM 401 rt. 1–5	2nd yr Ram IV	Feast of Ptah = Feast of *rkḥ wr*	III *prt* 1
26	Graffito 2087, 1–3 with O. DeM 1059 rt. 7–8	Ramesses V, 20th Dyn. no date	"*k3 ḥr k3* taken to Meretseger" feast lasted 7 days	I *prt* 5 I *prt* 1–5?
27	O. Ashmolean Museum 70 rt. 9	Mid-20th Dyn., Ramesses VI?	*wp* feast	I *prt* 1
28	Necropolis journal, P. Turin Cat 1999 + 2009	13th yr Ramesses IX, 20th Dyn.	"Birthday of Re-Horakhty" follows last epagomenal day	I *3ḫt* 1
29	Necropolis journal, P. Turin Cat. 1884 + 2067 +2071 +2015	15th yr Ramesses IX	"Birthday of Re-Harakhty"	I *3ḫt* 1
30	P. Turin Cat. 1898 + 1926 + 1937 + 2094 rt. I, 5	3rd yr Ramesses X	Feast of Ptah = Feast of *rkḥ wr*	IV *prt* 1
31	Ramesside ostracon BM	20th Dyn.	"Going forth of Horus"	"Going forth of

	29560			Horus" is first month cited = I *3ḫt*?
32	Cairo Calendar Papyrus 86637 vs. 21	20th Dyn.	"Feast of Re"	I *3ḫt* 1
33	O. Turin 57304	20th Dyn.	"Feast of Re"	I *3ḫt* 1
34	Medinet Habu Festival calendar, list 60	20th Dyn.	Feast of Lifting up the Sky =	III *prt* 1
35	O. Michaelides 33 rt. 9	20th Dyn.	Procession of Hathor	IV *3ḫt* 1
36	Tanis Geographical Papyrus	1st century CE, Roman period	Feast of Hathor	IV *3ḫt* 1
37	Tanis Geographical Papyrus	1st century CE, Roman period	Feast of Khoiak (*k3 ḥr k3*)	I *prt* 1
38	Tanis Geographical Papyrus	1st century CE, Roman period	Feast of *šf bdt* (uncertain)	II *prt* 1
39	Esna Temple calendar	1st century CE, Roman period	"Feast of Re … feast of *wp rnpt*"	I *3ḫt* 9 = IV *šmw* 9
40	Esna, Edfu & Dendera Temples	1st century CE, Roman period	Feast of Ptah = Feast of Lifting up the Sky	III *prt* 1
41	Esna Temple calendar	1st century CE, Roman period	Feast of Knum = Feast of Renenutet	I *ŝmw* 1

ch. = chapter; col. = column; Dyn. = dynasty; rt. = recto; vs. = verso.

The table shows that at least from the time of the Old Kingdom *mastabas* of the 4th and 5th Dynasties, if not before, *wp rnpt* was known as the name of the first month or feast of the year. Since *wp rnpt* means "the opener of the year" it is very appropriate as the first name in the first column of the Ebers calendar, dating to the early 18th Dynasty. Attestations of other months dated a month earlier than in the Greco–Roman calendar witness to a calendar having *wp rnpt* at its head. These examples are found in the 12th Dynasty from the Berlin papyri, then from the 18th Dynasty in the Ebers calendar, and in the 19th Dynasty in the Medinet Habu Festival calendar dating to the reign of Ramesses II, and various inscriptions from the 20th Dynasty. Perhaps significantly, there are no further attestations of feasts out of their eponymously named months after the end of the 20th Dynasty until the late Roman period is reached—the latter in the Tanis Geographical papyrus. The latter is explained by scholars as an archaizing tendency. The absence of such feast dates after the 20th Dynasty suggests that the calendar used to date them might have become obsolete; a perception pursued in later discussion of the Era of Menophres.

Table 8.3 arranges the month and day dates for the examples cited above showing *wp rnpt* as the first month with its feast on I *3ḫt* 1.

Table 8.3: Month and day dates with *wp rnpt* as the first month with its feast on I *3ḫt* 1 (arranged by calendar date in the last column)

	Source of festival/list/month	**Period**	**Festival/list/month**	**Date shown**
1	Old Kingdom *mastabas*	4th–5th Dyn.	*Wp rnpt* first in lists of feasts	I *3ḫt* 1
2	P. Berlin P 10007 rt. 22	Middle Kingdom	Feast of *wp rnpt*	I *3ḫt* 1
3	Ebers Papyrus calendar	9th yr Amenhotep I, 18th Dyn.	*Wp rnpt* heads the list of month-names, ending in Epiphi	I *3ḫt* to IV *šmw*
4	Deir el-Bahri inscription of Hatshepsut	Early 18th Dyn.	New Year's day = *wp rnpt*	I *3ḫt* 1
5	Karnak Festival calendar	Thutmose III, early 18th Dyn.	Feast of *wp rnpt*	I *3ḫt* 1
6	Feast List of Amon of Elephantine	Thutmose III	Feast of *wp-rnpt*	I *3ḫt* 1
7	Cairo Calendar Papyrus 86637 rt III, 3–5	Ramesses III; 20th Dyn.	"Birthday of Re-Harakhty"	I *3ḫt* I
8	Necropolis journal: P Turin Cat. 1999 + 2009	13th yr Ramesses IX. 20th Dyn.	"Birthday of Re-Horakhty follows last epagomenal day	I *3ḫt* 1
9	P. Turin Cat. 1884 + 2067 + 2071 + 2015	15th yr Ramesses IX	"Birth of Re Harakhty"	I *3ḫt* 1

10	Ramesside ostracon: BM 29560	20th Dyn.	"Going forth of Horus"	First month cited = I *3ḫt*?
11	Cairo Calendar Papyrus 86637 vs. 21	20th Dyn.	Feast of Re	I *3ḫt* 1
12	O. Turin 57034	20th Dyn.	Feast of Re	I *3ḫt* 1
13	O. DeM 209 vs. 20	Late 19th Dynasty	Feast of *wp-rnpt*	I *3ḫt* 1–3
14	Esna Temple calendar	1st century CE, Roman period	"Feast of Re … feast of *wp rnpt*"	I *3ḫt* 9 = IV *šmw* 9
15	P. Berlin P 10007 rt. 22	Middle Kingdom	Feast of Hathor	IV *3ḫt* 1
16	P. Berlin P 10282 rt. 2	Middle Kingdom	Feast of Hathor	IV *3ḫt* 1
17	Papyrus UC 32191	35th yr Amenemhet III, 12th Dyn.	Feast of Hathor	IV *3ḫt* 1
18	O. Michaelides 33 rt. 9	20th Dyn.	Procession of Hathor	IV *3ḫt* 1
19	Tanis Geographical Papyrus	1st century CE, Roman period	Hathor	IV *3ḫt* 1
20	Graffito from Thutmose III's Deir el-Bahri temple	Thutmose III, early 18th Dyn.	Procession of Hathor	IV *3ḫt* 4
21	O. Demarée H 6, 1, 2–8	Year 3 Seti I, early 19th Dyn.	Delivery of wood, pottery, 40 *k3 ḥr k3* vessels	On IV *3ḫt* 30 for *k3 ḥr k3* feast on I *prt* 1?
22	Medinet Habu Festival calendar, list 40	Ramesses II, 19th Dyn.	Feast of Hathor Feast of *k3 ḥr k3*	IV *3ḫt* 1 I *prt* 1
23	Illahun Papyrus UC 32191	35th yr Amenemhet III, 12th Dyn.	Feast of *k3 ḥr k3*	I *prt* 1
24	Book of the Dead, ch. 42	18th Dynasty	Khoiak	I *prt* 1
25	Medinet Habu Festival calendar, list 52	Ramesses II	Feast of Neḥeb Kau	I *prt* 1
26	Tomb of Nakhtamon (TT341)	Ramesses II, early 19th Dyn.	"Morning of *nhb k3w*" (Neḥeb-Kau)	I *prt* 2
27	O. Berlin P 12635 vs. 9	Ramesses IV, 20th Dyn.	Feast of Khoiak	I *prt* 2
28	O. Ashmolean Museum 70 rt. 9	mid-20th Dyn., Ramesses VI?	*wp* feast	I *prt* 1
29	Tanis Geographical Papyrus	Roman period	Feast of Khoiak (*k3 ḥr k3*)	I *prt* 1
30	Graffito 2087 1–3, with O. DeM 1059 rt. 7–8	Ramesses V (no date)	"*k3 ḥr k3* given to Meretseger". Feast lasted 7 days	I *prt* 5 I *prt* 1-7?
31	Tanis Geographical Papyrus	Roman period	Feast of *šf bdt* (uncertain)	II *prt* 1
32	Illahun Berlin Papyrus 10069, col. 1, line 1	Middle Kingdom	*rkh wr*	III *prt* 1
33	Medinet Habu Festival calendar, list 60, lines 1350, 1368–1369	[6th yr] Ramesses II	Feast of Lifting Up the Sky = Feast of Thoth	III *prt* 1
34	Esna, Edfu & Dendera Temples	1st century CE, Roman period	Feast of Ptah = Feast of Lifting Up the Sky	III *prt* 1
35	O. Dem 401 rt 1–5	2nd yr Ramesses IV	Feast of Ptah = Feast of *rkḥ wr*	III *prt* 1
36	P. Turin Cat. 1898 + 1926 + 1937 + 2094 rt. I, 5	3rd yr Ramesses X	Feast of Ptah = Feast of *rkḥ wr*	IV *prt* 1
37	Illahun Berlin Papyrus 10069, col. 5, line 2	Middle Kingdom	*rkḥ nḏs*	IV *prt* 1
38	Medinet Habu Festival calendar, list 63, line 1388	[6th yr] Ramesses II	Feast of "[ ]k[ ]" = *rkḥ nḏs* on new moon IV *prt* 1[ ]	IV *prt* 12?
39	Tomb of Khaemhet (TT57)	Tomb dated to 30th yr of Amenhotep III, mid 18th Dyn.	Harvest: *Rnnwtt*	I *šmw* 1
40	Tomb of Neferhotep (TT50)	Reign of Horemheb, late 18th Dyn.	Harvest: *Rnnwtt*	I *šmw* 1
41	Medinet Habu Festival calendar, list 64, line 1402	[6th yr] Ramesses II	Feast of Renenutet	I *ŝmw* 1
42	Medinet Habu Festival calendar, list 66, line 1430	[6th yr] Ramesses II	Procession of Min (Feast of Min on new moon)	I *ŝmw* 11 I *ŝmw* 12
43	Esna Temple Festival calendar	1st century CE, Roman period	Feast of Khnum = Feast of Renenutet	I *ŝmw* 1

ch. = chapter; col. = column; Dyn. = dynasty; rt. = recto; vs. = verso.

From Table 8.3 we note that the feast of *wp rnpt* is dated to I *3ḫt* 1 down to the 18th Dynasty, but in the 20th Dynasty the feast has become the "Feast of Re" or the "birthday of Re" and possibly synonymous with the "going forth of Horus." The 1st century BCE Esna Temple Festival calendar attests that the Feast of Re is what the ancestors called *wp rnpt,* and its celebration is dated to IV *ŝmw* 9. It appears that the month of *wp rnpt* has moved from 1st position to 12th position. The subsequent months must then also automatically follow. The three seasons are represented in Table 8.3 with the first month of each dominating the feasts held out of their eponymous month in the Greco–Roman calendar. What could have caused this phenomenon?

Gardiner suggested that theological differences between a "Re school" and a "Thoth school" might account for calendars beginning with the months of Re (Mesore) and Thoth, but this is not convincing. On the other hand, we have not found any evidence for Parker's three-calendar hypothesis of two lunar calendars and a civil calendar to account for the transfer of feast dates. So the question remains—Gardiner's old conundrum—what situation caused feasts set on the first day of a month to have two different designations one month apart?

Chapter 9

Exploring the Ebers Calendar

The previous chapters listed evidence of feasts apparently held out of their eponymous months in the Greco–Roman calendar, discussed by Gardiner in 1906 and 1955, and by recent scholars. We now review the opinions held by scholars since the 1980s on how to interpret the Ebers calendar and the conundrum of the out-of-place feasts.

The two topics are intrinsically related because the first column of the Ebers calendar (Table 9.1) is a prime example of a calendar that begins with *wp rnpt* and not *tḫy.* In the Ebers calendar, the various feasts all appear in their eponymous months. An understanding of the Ebers calendar can resolve the problem of why some feasts are out of their eponymous months in the Greco–Roman calendar.

Table 9.1: The Ebers Calendar

Year 9 under the majesty of the king of Upper and Lower Egypt *Dsr-k3-R*ᶜ **may he live forever**			
wp rnpt	III *šmw*	day9	going up of Sothis
tḫy	IV	day9	•
mnḫt	I *3ḫt*	day9	•
ḥwt ḥr	II	day9	•
k3 ḥr k3	III	day9	•
šf bdt	IV	day9	•
rkḥ wr	I *prt*	day9	•
rkḥ nds	II	day9	•
rnnwtt	III	day9	•
ḫnsw	IV	day9	•
ḫnt ḫt	I *šmw*	day9	•
ỉpt ḥmt	II	day9	•

• = ditto.

Problems Associated with the Ebers Calendar

Scholars recognize that the first column of the Ebers calendar with its 12 month-names corresponds in some way with the civil calendar of the second column shown by its seasonal designations. The first column starts with the month of *wp rnpt*, which means “the opener,” but this month is reckoned by almost all scholars to be the 12th month. In what way then does *wp rnpt* in the Ebers calendar correspond with the second column of civil month designations? It begins with III *ŝmw*, the *11th* month in the Greco–Roman calendar, and adjacent to “day9” in the third column. This date, III *ŝmw* 9, is the date for the “going up of Sothis” in the fourth column.

How can scholars justify *wp rnpt* as a 12th *lunar* month or a 12th *civil* month?

Furthermore, those who attribute the first column to a *lunar* calendar have a problem in correlating it with the civil calendar because the repetition of "day9" in the third column for all 12 months suggests that each month consists of 30 days, not 29 or 30 as in a lunar calendar.[1]

Scholars also point out that the five epagomenals (at the end of the year) are omitted, so that the year has only 360 days, but after the 12th month "day 9" should advance to day 14. Furthermore, the ditto marks under the "going up of Sothis" in the fourth column for all 12 months seem to suggest a monthly rising of Sothis on day 9 of every month. But the "going up of Sothis" is an *annual* event.

These are some of the problems associated with understanding the Ebers calendar. Now, what answers have scholars proposed?

Many Egyptologists support Parker's theory of lunar calendars and have applied his original lunar calendar to the first column of the Ebers calendar.[2] Others, such as Winfried Barta in 1983, followed by Jürgen von Beckerath in 1993, have applied the first column to Parker's later lunar calendar.[3]

However, there are other Egyptologists who regard the first column of the Ebers calendar as a civil calendar, such as Christian Leitz, Ulrich Luft, Marshall Clagett, and Anthony Spalinger.

Gardiner's novel idea of *two* civil calendars has lacked general scholarly support because it is not understood how feasts could "shift" from one month back to the previous month.

Scholars Views on the Ebers Calendar

In 1983, Wolfgang Helck suggested that the Ebers calendar date of III *ŝmw* 9 was not a specific Sothic date, but that Sothis rose sometime between III *ŝmw* 9 and IV *ŝmw* 8.[4] Subsequently, in 1986, Franz-Jürgen Schmitz, recommended what was previously suggested by Donald B. Redford in 1966,[5] namely, that two feasts that fell in the reign of Amenhotep I, on III *ŝmw* 11 and 13 mentioned on a Turin papyrus and a British Museum ostracon, respectively, should be applied to the accession feast of Amenhotep I lasting several days.[6] Schmitz then proposed that the feast lasted five days beginning on III *ŝmw* 9, Amenhotep I's alleged accession day, which coincided both with the rising of Sothis in his ninth regnal year and the day of a new moon.[7] The idea that "day 9" was the first day of a regnal year and that each regnal month began on day nine of the civil year was

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[1] See depictions in chap.3, pp 50-51, Figures 3.1 and 3.2 and discussion.

[2] For literature on earlier views, see C. Leitz, "Studien zur ägyptischen Astronomie," *Ägyptologische Abhandlungen* 49 (1989) 28-34; M. Clagett, *Ancient Egyptian Science* Vol 2: *Calendars, Clocks, and Astronomy* (Philadelphia, PA: American Philosophical Society, 1995) 193-200; L. Depuydt, "The Function of the Ebers Calendar Concordance," *Orientalia* 65 (1996) 74-77.

[3] W. Barta, "Zur Entwinklung des ägyptischen Kalenderwesens," *ZÄS* 110 (1983) 21-22; J. von Beckerath, "Bemerkungen zum ägyptischen Kalendar: I. Zur Entstehung des 365-tägigen Kalenders," *ZÄS* 120 (1993) 20; "Bemerkungen zum ägyptischen Kalendar: III. "Zum Kalendarium des Papyrus Ebers," *ZÄS* 120 (1993) 131-36.

[4] Discussed by W. Helck, "Schwachstellen der Chronologie-Diskussion," *GM* 67 (1983) 49.

[5] D.B. Redford, "On the Chronology of the Egyptian Eighteenth Dynasty," *JNES* 25 (1966) 115-16.

[6] F-J. Schmitz, *Amenophis I* (HÄB 6; Hildesheim: Gerstenberg, 1978) 27-29.

[7] Schmitz, *Amenophis I*, 29.

accepted by various scholars, such as Rolf Krauss in 1986,[8] and Ulrich Luft also in 1986, and reiterated by the latter in 1989.[9]

Jürgen von Beckerath

However, in 1987, Jürgen von Beckerath rejected the view held by Helck and Luft that the Ebers calendar did not contain a Sothic date,[10] and the idea of Schmitz and Luft that a regnal year was portrayed by "day 9," because he found no evidence for a regnal calendar.[11] Instead, Von Beckerath proposed that the first column of Ebers represented *feasts of lunar months*; the lunar month of *wp rnpt* being equated with the third *ŝmw* month of the civil calendar, and day nine being the rising of Sothis.[12] Helck responded in 1988 to von Beckerath's rejection of his and Luft's view that the Ebers calendar did not have a Sothic date, by trying to reconstruct the chronology of the 18th Dynasty from the known regnal years of its kings and alleged dates, and whether or not a Sothic date of III *šmw* 9 could be proven for Amenhotep I's ninth year. On his dates he found it was not possible! He reiterated III *šmw* 9 as the accession day of the king.[13]

Wolfgang Helck

In 1989, Helck followed Parker's proposal that the rising of Sothis had to happen in the first *lunar* month and that it was not connected to a specific date. Thus Helck suggested that Sothis rose heliacally sometime in the month III *šmw* 9 and IV *šmw* 8. He asserted, "We are not allowed to use this entry for chronological calculations."[14]

Winfried Barta

Winfried Barta, in his article of 1988,[15] understood the first column of the Ebers calendar to represent a lunar calendar with *wp rnpt* being the last month and the date of III *šmw* 9 being the ninth lunar day,[16] and the day of Amenhotep I's accession, rather than the day of the heliacal rising of Sothis. He reasoned that the "day9" refers to the beginning of each regnal year since it cannot refer to the annual heliacal rising of Sothis, which he thinks may have occurred any time between III *šmw* 9 and IV *šmw* 8 of the civil year.[17]

Christian Leitz

In 1989, three years after Luft's 1986 article, Leitz proposed a different interpretation of the Ebers calendar.[18] He noted that *wp rnpt* was in the 12th month

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[8] R. Krauss, *Sothis- und Monddaten: Studien zur astronomischen und technischen Chronologie Altägyptens* (HÄB 20; Hildesheim: Gerstenberg, 1985) 115-16.

[9] U. Luft, "Noch Einmal zum Ebers-Kalender," *GM* 92 (1986) 70; idem, "Illahunstudien IV: Zur chronologischen Verwertbarkeit des Sothisdatums," *SAK* 16 (1989) 223.

[10] J. von Beckerath, "Das Kalendarium des Papyrus Ebers und das Sothisdatum vom 9. Jahr Amenophis' I.," *SAK* 14 (1987) 27.

[11] Ibid., 29-30.

[12] Ibid., 28-29.

[13] W. Helck, "Erneut das Angebliche Sothis-Datum des Pap. Ebers und die Chronologie der 18. Dynastie," *SAK* 15 (1988) 163-64.

[14] From discussion reported in *High, Middle or Low? Acts of an International Colloquium on Chronology held at the University of Gothenburg 20th–22nd August, 1987* (ed. P. Åstrom; Gothenburg: Paul Åströms Förlag; Part 3, 1989) 40-41.

[15] W. Barta, "Das Kalendarium des Papyrus Ebers mit der Notiz eines Sothisaufgangs," *GM* 101 (1988) 7-12.

[16] Ibid., 7-8.

[17] Ibid., 8-11.

[18] C. Leitz, *Studien zur ägyptischen Astronomie* (ÄA 49; Wiesbaden: Harrassowitz, 1989) 22-30.

position in the Cairo Papryrus 86637 where it had the highest number of daylight hours, indicating the summer solstice month; whereas, in the Ebers calendar, *wp rnpt* was in first month position.[19] He was not convinced that the first column of Ebers was a schematic lunar calendar having 30 days to each month with *wp rnpt* as its last month. He considered Gardiner's rejection of a lunar calendar valid.[20] He proposed two calendars: a solar one in the first column with the month of *wp rnpt* identical to the month of III *ŝmw*, with the summer solstice falling on III *šmw* 1,[21] and another calendar in the second column starting with the "going up of Sothis" on III *šmw* 9 where it had shifted eight days in relation to the solar year.

The dots under the "going up of Sothis" in the third column indicated the beginning of each successive month starting on the ninth day.[22] He particularly disagreed with the idea that the Ebers calendar represented regnal years in its second and third columns with the assumed accession of Amenhotep I on III *šmw* 9.[23]

Anthony Spalinger

In 1989/1990, Anthony Spalinger rejected Parker's view that the first column in Ebers was a list of lunar months, proposing instead that they were the names of civil months, whose numerical designations appear in the second column beginning with III *šmw* 9. He recognized III *šmw* 9 either as the date of *prt Spdt* beginning a new civil year,[24] or the accession date of Amenophis I (Amenhotep I).[25] However, he viewed *wp rnpt* at the head of the first column as the 12th month of the civil year. He gives two explanations for this "odd" order.[26]

(1) *Wp rnpt* can be seen as the feast day for the rising of Sothis on III *šmw* 9 equated with I *3ḫt* 1, which leaves the remaining months in the order of 1 through 12.

(2) *Wp rnpt* is 12th month at the head of the first column, followed by *tḫy* as month 1, *mnḫt* month 2, and so on; this arrangement being described as idealized and schematic, but linked with the *real* civil date of III *šmw* 9.[27]

The repetition of "day9" in the third column, referring to day nine of the going up of Sothis, shows that each month had 30 days, illustrating the schematic nature of the calendar,[28] which is also shown by the omission of the epagomenal days.[29]

Gardiner's evidence for feasts held in the month after their eponymous month is explained as "the transference of month-names from the older [lunar] calendar to the newer [civil] one,"[30] thus Spalinger recognizes an original lunar calendar—but not in the first column of Ebers.

In 1992, in the context of asserting that the equation of *wp rnpt* as the first day of the civil year with *prt Spdt* is rare until the Late Period, Spalinger wrote, "Ebers, with its remarkable month orientation, offers more problems than solutions and I prefer to follow

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[19] Ibid., 24.
[20] Ibid.
[21] Ibid., 25, 28, 34.
[22] Ibid., 28.
[23] Ibid., 31-34.
[24] A.J. Spalinger, "A Return to Papyrus Ebers," *BES* 10 (1989/90) 139.
[25] Ibid., 141.
[26] See lists in "Return to Papyrus Ebers," 143; idem, "A Chronological Analysis of the Feast of *tḫy*," *SAK* 20 (1993) 293.
[27] Idem, "Return to Papyrus Ebers," 140.
[28] Ibid., 142.
[29] Ibid., 140-42.
[30] Ibid., 143.

the present scholarly interpretations by considering it to be more of an intellectual product than a true source for chronology."[31]

Ulrich Luft

In 1992, Luft registered strong doubts concerning the existence of a lunar calendar. He writes:

> The weak position of the lunar calendar in general lessens the possibility of explaining the month-names of the Ebers calendar as lunar ones … The so-called lunar month-names known since the Middle Kingdom are only alleged lunar ones with the exception of the Dressing of the God's Statue (*mnh.t*) that was moving in the second lunar cycle after the beginning of the Civil Year. In the Illahun archives the Opener of the Year (*wp-rnp.t),* Before the Plummet (*tp-ᶜ thj*), Hathor (*hw.t hrw*), the two Burnings (*rkh*) are fixed in the Civil Year in the same order as in the Ebers calendar or in the Tomb of Senenmut. The *wp-rnp.t*, the two *rkh,* probably the *hn.t hw.t-hrw* (Navigation of Hathor), and the *nhb-k3w,* as the possible predecessors of the *hw.t-hrw* and *k3-hr-k3,* the later Khoiak, fall on the first day of a month. This fact could support Gardiner's thesis that the eponyms fell on the first day of the month following the month it gave its name to, but I concede that this argument is valid in the Illahun material only for the mentioned feasts.[32]

Further on, Luft concluded, "The Ebers calendar is an aborted experiment to substitute the Regnal Year for the Civil Year. The Egyptians did not put into use this totally unsuitable idea."[33]

Spalinger Speculating and Soul-searching

In 1993, Spalinger reiterated the evidence collected by Gardiner concerning feasts held out of their eponymous months in the Greco–Roman calendar.[34] He noted that Gardiner was unable to appreciate "Parker's hypothesis of lunar determined feasts," citing in particular the lunar base of the Epiphi feasts. Spalinger continued:

> Gardiner and Parker both, in fact, became more than a tad outraged when neither could accept the other's pronouncements concerning the calendrical reasons for various religious events. In particular, their controversy centred on the names of the months in the (final) Civil Calendar and their relation to key feasts.[35]

In 1993, von Beckerath recounted Gardiner's examples of 1906 and his assumption that feasts had been shifted out of their eponymous months, an assumption that von Beckerath found impossible to accept.[36] Instead, he agrees with Parker that the explanation lies in the transfer of feasts from the later lunar calendar to the civil calendar.[37]

In 1994, a doubt about how feasts were originally dated enters Spalinger's discussion. He writes:

> By and large without ample textual data of a chronological sort it is impossible to determine the reasons why certain events were set on specific days in the civil calendar.

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[31] Idem, "The Canopus Stela," *Three Studies on Egyptian Feasts and their Chronological Implications* (Baltimore, MD: Halgo, 1992) 47.
[32] U. Luft, "Remarks of a Philologist on Egyptian Chronology," *Ä und L* 3 (1992) 111-12 and n. 31.
[33] Ibid., 113.
[34] Spalinger, "Chronological Analysis," 293.
[35] Ibid., 292.
[36] Von Beckerath, "Bemerkungen zum ägyptischen Kalender," Part 1, 20.
[37] Ibid., 21.

> That they were originally lunar-based goes without saying … it is fair to state that the dates of virtually all civilly-set feasts are still hard to fathom. Indeed, I doubt that all of the known festivities can be solved by assuming a day in the lunar calendar equivalent to the same in the civil calendar, the months remaining the same.[38]

In 1995, in the context of discussing the origin of civil month-names, Spalinger returns to the problem of feasts being held out of their eponymous months and Gardiner's explanation of his Mesore and Thoth years. Spalinger writes:

> Parker rejected Gardiner's hypothesis of a "Mesore year" with great efficiency although the latter tried to maintain his earlier position in a very strongly worded presentation in 1955. For Parker, it was necessary to examine the original lunar-based calendrical system of the Egyptians, the one in which names of the months were always given (e.g. *Ḫnsw*) instead of any numerical arrangement (I *šmw*). From this position it emerged that no alteration in the civil arrangement ever took place even though the calendrical discontinuity between a month and its identically-named feast occurring in the following civil month still remained. Nevertheless, Gardiner persisted in defending his viewpoint in an [*sic*] rather extreme fashion. His convenient, if inaccurately-labelled statement, that his 1906 work produced "statements of fact" rather than hypotheses, may be seen by many to be a telling example how deeply upset one can become when earlier cherished hypotheses are demolished.[39]

Of course, Gardiner *did* produce "statements of fact" in gathering evidence that some feasts were dated to the first day of two consecutive months widely separated in time. His suggestion as to why this came about remains a hypothesis. From the point of view that the original lunar and later lunar calendars are merely hypotheses of Parker's—for which no evidence has been produced—it is not surprising that Gardiner was upset at the attempted demolition.

Spalinger picks up on Luft's statement that months fall in the same order in the Ebers calendar as in the Senenmut tomb ceiling, and uses this to argue that:

> No alteration in month names occurred with a hypothetical 'Mesore Year' standing side-by-side with a 'Thoth Year', the latter having displaced the former by moving New Year's Day ahead by one month. Quite to the contrary, the Egyptian civil year always began with the *wp rnpt* feast, itself set on I *3ḫt* I. The first month of *3ḫt* was originally designated *tḫy* but later was called Thoth, in honor of the lunar deity.[40]

Luft, followed by Spalinger, ignores *wp rnpt*'s position as the first month in the Ebers calendar, viewing it as the 12th month. Therefore, they can say the order is the same as in Senemut's tomb calendar. But, on this assumption, Spalinger can only recognize *wp rnpt* as the *feast* of I *3ḫt* 1 set in the month of *tḫy* (how odd is that?!) and assumes that no alteration to month-names and positions ever occurred. By not attributing *wp rnpt* to a first month he was able to dispense with Gardiner's two civil calendars hypothesis.

Continuing with his theme, Spalinger reiterates the problem of feasts being held on the first day of the month following the one to which they had given their name (which he says was from a lunar-based calendar).[41] And he says, "Unless we want to

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[38] A.J. Spalinger, "Thoth and the Calendars," *Revolutions in Time*: *Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 52.

[39] Idem, "Notes on the Ancient Egyptian Calendars," *Orientalia* 64 (1995) 19.

[40] Ibid., 20.

[41] Ibid.

return to the position of Month XII = earlier month I, month I = earlier month II, and so forth, it is clear that some resolution … must be advocated."[42]

Spalinger then turns to Ebers again to point out that Parker's lunar interpretation of the calendar was jettisoned by Luft's civilly based one. Luft, in company with earlier scholars, thought that the Ebers calendar showed regnal years starting with the accession of Amenhotep I on III *šmw* 9, but which as we noted, he regarded as an "aborted experiment."[43] Spalinger agreed with Luft, though he thought the word "aborted" was far too strong.[44] Luft's evaluation of Ebers as a civilly based calendar led to "much soul-searching" among scholars: Helck, Krauss, Leitz, von Beckerath, and Spalinger himself.[45]

Spalinger sums up his view regarding Ebers:

> This calendar has to be seen from a viewpoint that is not solely concerned with Sothis. In other words, the Ebers insert is one of the rare documents that reveals ancient Egyptian intellectual thought trying to grasp a very complicated pattern. With Luft (and later Leitz), I cannot but maintain that a civil interpretation has to be placed upon the whole document and recent attempts to provide a counter-example to this perspective have in my opinion so far failed. (Whether or not one wants to consider the heliacal rising of Sothis, which is listed for all twelve months, as valid is another matter.) Nevertheless, since Ebers has proved to be a major thorn in the side of modern calendrical experts if not chronologists themselves, then it may be best to place this document to the side and to return to the apparently more sober problem of the feasts themselves.[46]

In summing up, Spalinger refers to "the clear-cut difference of 'minus one month' when the later civil system is compared to the earlier lunar one," and "we moderns must take into consideration the 'décalage' between the civil month-names and their identically-named feasts … one that is based on the situation at the time that the civil year came into existence."[47] Thus he follows Parker in thinking that the problem of the months is to be resolved in a transfer of earlier lunar month-names and feasts to a later civil calendar.

Also, in 1995, Spalinger refuted Parker's idea that the month-lists on the ceiling of Senmut's tomb, the Ramesseum ceiling and its copy in the Medinet Habu temple, the Karnak water clock from the time of Amenhotep III, and the later Edfu frieze, were lunar. As noted previously, Spalinger concluded that all the month-lists were of a civil nature.[48] The Ebers calendar was not part of this discussion.

Another of Spalinger's articles of a different nature to the above, though still relevant, was also published in 1995. Summing up this article about the lunar system in festival calendars with reference to new moon days, Spalinger writes:

> The official festival calendars reflected a system in which only human sight was utilized; no detailed papyrus rolls of lunar + civil correlation were needed. Hence, it did not matter what lunar month occurred in which a certain feast was to take place; the importance of civil I *3ḫt* 1 for the determination of the lunar year–I am now referring to Parker's hypothetical second lunar calendar–was nil. Likewise, the heliacal rising of Sothis as a benchmark for the new lunar year played no role at all. The presence or absence of a (lunar) intercalary month similarly can be dismissed if this hypothesis is

42 Ibid., 21.

43 Luft, "Remarks of a Philologist," 113; Spalinger, "Notes on," 22.

44 Spalinger, "Notes on," 22. Also in 1995, Spalinger regarded the king's accession date to equate with the heliacal rising of Sothis ("Sothis and 'Official' Calendar Texts," *VA* 10/2-3 (1995) 180.

45 Idem, "Notes on," 20.

46 Ibid., 22.

47 Ibid., 32.

48 Idem, "Month Representations," *Cd'É* 70 (1995) 110-22.

> followed. All … that was necessary for the priests was to see the moon and to find when their lunar date took place within a given civil month.[49]

This view was reiterated later in 2002,[50] which we note below.

Marshall Clagett

In 1997 Spalinger critiqued a volume by Marshall Clagett published in 1995.[51] Clagett covered a wide range of Egyptian oriented subjects: calendars, clocks, and astronomy. Concerning the subject of months, Clagett's view was that "feast days were celebrated in the months following those to which the feast days gave their names."[52]

This explains for him why *wp rnpt* is at the beginning of the Ebers calendar even though later it is a month-name in 12th place.[53] He viewed all 12 months in the first column of the Ebers calendar as eponymous feast days rather than months.[54]

Concerning Parker's description of the old lunar calendar, Clagett writes, "He has given us an account that is only barely possible and is quite speculative in detail and not convincing in its over-all argument."[55] Clagett, himself, viewed the first column of Ebers as "an ad hoc correlation of (1) twelve feast days (30 days apart) marking a fixed Sothic year beginning with the Feast of New Year's Day determined by the heliacal rising of Sirius with (2) the corresponding days of the civil year extending from III Shemu 9 in civil year 9 of Amenhotep I's reign to II Shemu 9 in civil year 10 of that reign,"[56] and that it was, "a correlation needed when seasonal dates have to be converted to civil dates."[57]

Spalinger's critique of Clagett's book appeared in 1997. [58] Spalinger noted that it was written by an "outsider" and was out of date because Clagett had not mentioned the contributions of scholars virtually since 1989, such as those of Leitz, Wells, Luft, von Beckerath, and Spalinger himself.[59] But Spalinger concedes this was probably due to the completion date of the manuscript.[60] Nevertheless, Spalinger writes of Clagett, "His discussion of P. Ebers (page 47 and Document III 2) is close to that of myself and Luft-Leitz."[61]

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[49] Idem, "The Lunar System in Festival Calendars: From the New Kingdom Onwards," *BSÉG* 19 (1995) 40.

[50] Idem, "Ancient Egyptian Calendars: How Many Were There?" *JARCE* 39 (2002) 249.

[51] M. Clagett, *Ancient Egyptian Science* Vol 2: *Calendars, Clocks, and Astronomy* (Philadelphia: American Philosophical Society, 1995).

[52] Ibid., 14.

[53] Ibid., 14-15.

[54] Ibid., 46.

[55] Ibid., 21.

[56] Ibid., 200, similarly 15.

[57] Ibid., 15.

[58] A.J. Spalinger, "Review of Marshall Clagett's *Ancient Egyptian Science* Vol 2: *Calendars, Clocks, and Astronomy*" *BibOr* 54 (1997) 677-84; and a review by Leo Depuydt in *JAOS* 118 (1998) 75.

[59] Spalinger, "Review of *Ancient Egyptian Science,*" 677.

[60] Ibid., 682.

[61] Ibid.

Spalinger's "From Esna to Ebers"

In 1996, Spalinger's article "From Esna to Ebers" appeared[62] in which he sought to make a connection between the date of 1 *3ḫt* 9 attributed to the "Feast of Amun, feast of Re, corresponding to what the ancestors called the Feast of *Wp rnpt*"[63] in an Esna calendar and IV *šmw* 9 in the Ebers calendar.[64]

The date of IV *šmw* 9 was also found on another Esna inscription in which the month was Re-Horakhty.[65] Spalinger points out that in the third line of the Ebers calendar the month of *tḫy* is in the first column (under *wp rnpt*) and is in line with IV *šmw* 9 in the second column, and with the ditto marks in the fourth column under the "going up of Sothis."[66] He concludes, "Esna and Ebers coincide."[67]

I have dealt with the two Esna passages earlier, the former as an instance of the feast of *wp rnpt* held out of its eponymous month in the Esna calendar, so I will not repeat it here.[68]

However, Spalinger's view of the Ebers calendar is pertinent to our present discussion.

> I consider this very perturbing document to be more valuable as an intellectual aspect of ancient Egyptian calendrics than as a solution to the chronology of the New Kingdom. And if I take for granted that the coverage of this small calendar by Luft, Helck, Leitz, and even by myself, has advanced our interpretation to a new level, this is because grave doubts surrounding its applicability to absolute chronology cannot be dispelled.[69]

In Spalinger's comprehensive work about feasts his comments on the names of days are worth noting, "The 'name' of a day by itself says nothing with regard to what calendar is assumed by the speaker or the writer."[70]

He gives the example of *3bd*, the second day of an Egyptian month (by which I understand him to mean lunar month) when set in a 365-day lunar calendar could be second day of that calendar, or if standing alone *3bd* could be the second day of a 30-day civil calendar. Spalinger writes, "After all, the names of the days in the Egyptian civil calendar were simply borrowed from the presumed original lunar calendar of an earlier time."[71]

The point here is that Spalinger acknowledges that the lunar calendar is only *presumed*, so even he does not have tangible evidence for it. Rather, he points out that day-names could be civil (but from a lunar calendar!), and insists that the Medinet Habu calendar consists of civil—not lunar—months and days.[72]

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62 Idem, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson* Vol 2; (Boston: Museum of Fine Arts, 1996).

63 See Spalinger's earlier comments on this text in "*Wp rnpt* in the Esna Festival Calendar," *Three Studies*, 51-56, though he admits that this article is now obsolete ("From Esna to Ebers," 759 n. 15).

64 Idem, "From Esna to Ebers," 759-62.

65 Ibid., 761.

66 Ibid., 762.

67 Ibid.

68 See chap. 6, p. 100.

69 Spalinger, "From Esna to Ebers," 761; similarly, previously, "Notes on," 22. The "new level" refers to the recognition that the Ebers calendar does not contain a lunar system (761-62).

70 Idem, *Private Feast Lists of Ancient Egypt* (*ÄA* 57, 1996) 2.

71 Ibid., 2.

72 Ibid.

Leo Depuydt

Also in 1996 Leo Depuydt's article "The Function of the Ebers Calendar Concordance"[73] appeared. Based on the old view of Borchardt, followed by Parker, and other scholars referred to above, he assumed the month-names in the Ebers calendar were lunar, and he writes "The original lunar calendar is now accepted by most as it is here."[74] And further on:

> "I am confidently accepting the original lunar calendar. But since its existence is not independently confirmed here, I fully realize that, logically speaking, this existence functions within the confines of this article as a principal assumption or axiom on which the theory proposed above stands or falls."[75]

Notably missing from Depuydt's bibliography is Luft's 1992 article "Remarks of a Philologist on Egyptian Chronology" (discussed above), in which Luft concludes, "The weak position of the lunar calendar in general lessens the possibility of explaining the month-names of the Ebers calendar as lunar ones."[76] If the first column of the Ebers calendar consists of civil month-names and not lunar month-names, Depuydt's thesis is demolished—as he himself is aware.

A curious aspect of Depuydt's theory in 1996 is that he says there are no time intervals stated in the Ebers calendar, just points of time. He writes, "Day 9 dates serve as anchors identifying the name of the lunar month in which they fall in the same line, just as *prt-spdt* in line 2 serves as the anchor of *wp-rnpt* in the same line."[77] And, "The civil Day 9 dates are *individual days* serving as anchors and heralds. Importantly, the Calendar *does not mark time intervals* from one Day 9 to another, including a 35 day interval from IV *šmw* to I *3ḫt*"[78] (emphasis his). The dots in the fourth column under the rising of Sothis represent, "not the name or the event of the rising of Sirius, but the function of anchor and herald that this rising exercises in relation to the lunar months listed in the same line and the following line."[79]

Depuydt's major work on the nature of the lunar and civil calendars was published in 1997 as *Civil Calendar and Lunar Calendar in Ancient Egypt,* followed by an article in 1999 entitled, "The Two Problems of the Month Names."[80] Primarily his book was written to answer the "Brugsch phenomenon"—why "the last month of the Egyptian civil year can be named as if it were the first."[81] Secondly, he discussed the "Gardiner phenomenon"—why "a feast day occurring on Day 1 of a civil month bears the same name as the preceding month."[82]

While most Egyptologists see these as being one problem, Depuydt separates them. He writes, "The difference is that the Brugsch phenomenon concerns a transfer or

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[73] L. Depuydt, "The Function of the Ebers Calendar Concordance," *Orientalia* 65 (1996) 63.

[74] Ibid., 77.

[75] Ibid.

[76] Luft, "Remarks of a Philologist," 112. Depuydt refers to other articles by von Beckerath, Krauss, and Leitz, in the same issue of *Ä und L* (3) as Luft's article, but he does not refer to Luft's counter view. Spalinger's important "Month Representations," (1995) identifying the month-lists on the Karnak water clock, Ramasseum, Senmut tomb, Edfu frieze ceiling as *civil* in origin was probably too late for inclusion by Depuydt in his 1996 article.

[77] Depuydt, "Function of Ebers Calendar," 66.

[78] Ibid., 66.

[79] Ibid., 67.

[80] L. Depuydt, "The Two Problems of the Month Names," *Rd'É* 50 (1999) 107-33.

[81] Idem, *Civil Calendar and Lunar Calendar in Ancient Egypt* (Orientalia Lovaniensia Analecta 77; Leuven: Peeters, 1997), 61; similarly "Two Problems," 113.

[82] Idem, *Civil Calendar*, 63; similarly "Two Problems," 114.

derivation of month *names*, whereas the Gardiner phenomenon concerns a transfer of monthly *feasts*. In instances of the Gardiner phenomenon, a month has the same name as the feast celebrated on Day 1 of the following month."[83]

Depuydt recognizes three sets of month-names, one of which is the seasonal set with designations such as I *3ḫt*, II *3ḫt*, etc.[84] Of the other two sets, he calls one the Theophoric Set X, which he attributes to a *lunar* calendar having months beginning with *tḫy*, *mnḫt*, and so on, and he derives this set from the Ramesseum ceiling, the Edfu temple frieze, and water clocks.[85]

The third set he calls the Theophoric Civil Set, which he attributes to a *civil* calendar having months beginning with *ḏḥwty*, *p n jpt*, etc.[86] This set of month-names comes from the Cairo papyrus 86637 verso XIV, represented later in Greek–Coptic names.[87] It will be recalled from our earlier discussions that Spalinger argued that all the month-lists, those of the Ebers calendar, Senmut tomb ceiling, Karnak water clock, Ramesseum and Medinet Habu temple ceilings, and the Edfu frieze, were *civil* in nature.[88] In other words, the Theophoric Set X and the Theophoric Civil Set are one and the same civil calendar, with some names changed over the centuries. However, Depuydt proposes that:

> Unambiguous evidence shows that the Egyptians conceived of the civil months and the lunar months in terms of pairs. This pairing found expression in the naming of the months. Civil months and their lunar twins were linked by receiving the same name. Joined to one another by nomenclature, civil calendar and lunar calendar spiraled forward in time like a double helix. This double calendar is a structure with both civil features and lunar features. The lunar component of this composite calendar may be called the civil-based lunar calendar."[89]

Based on the results of our previous discussions it is hard to conceive what Depuydt found as evidence, let alone "unambiguous evidence" for civil and lunar months spiraling together as in a double helix. Depuydt's calendars are shown in Table 9.2.[90]

Table 9.2: Depuydt's Lunar and Civil Calendars

Seasonal month-names	Theophoric Set X Month-names = lunar origin	Theophoric Civil Set Month-names = civil	
		Early	**Greek/Coptic**
I 3*ḫt*	*tḫy*	*ḏḥwty*	Thoth
II *3ḫt*	*mnḫt or ptḥ*	*p-n jpt*	Phaophi
III *3ḫt*	*ḥwt-ḥr*	*ḥwt-ḥr*	Hathyr
IV *3ḫt*	*k3 ḥr k3*	*k3 ḥr k3*	Choiak
I *prt*	*šf bdt or mn*	*t3 ᶜbt*	Tybi
II *prt*	*rkḥ-wr*	*mḥr*	Mechir
III *prt*	*rkḥ nds*	*p-n jmn ḥtp*	Phamenoth
IV *prt*	*Rnnwtt*	*p-n rnnwtt*	Pharmouthi
I *šmw*	*ḫnsw*	*p-n ḫnsw*	Pachons
II *šmw*	*ḫnt-ḥtjj or ḥb jnt*	*p-n jnt*	Payni
III *šmw*	*jpt ḥmt.s*	*jpỉp*	Epiphi
IV *šmw*	*wp rnpt or rᶜ ḥr 3ḫty*	*mswt rᶜ*	Mesore

83 Ibid., 56; similarly 105 (emphasis his).
84 Idem, "Two Problems," 111-15. See also, *Civil Calendar*, 208-9.
85 Idem, *Civil Calendar*, 209-10, 238.
86 Ibid., 52, 208; idem,"Two Problems," 120-22.
87 Ibid., 109-36; "Two Problems," 112-13.
88 Spalinger, "Month Representations," 110-22; cf. Depuydt, *Civil Calendar*, 209-10, 238.
89 Depuydt, "Two Problems," 116.
90 Ibid., 122.

Depuydt's Theophoric Set X is the same as Parker's original lunar calendar except that Parker added *Ḏhwtyt* at the beginning as the name of the hypothetical intercalary month, and Depuydt's Theophoric Civil Set is the same as Parker's civil calendar, except that he gives only *mswt r^{c}* as the name of the last month, whereas Parker had *mswt r^{c}*, *Rc-hr- 3ḫty*, and *wp rnpt*.[91]

Depuydt has simply followed Parker's earlier attribution of month-names to form two separate lists. However, what Parker saw as an original lunar calendar, Depuydt now dates to about 1300 BCE, at which time it was supposedly anchored to the civil calendar allowing the alleged transfer of names, from one to the other, to take place.[92] Spalinger, writing in 1998, says, "It does not seem possible that a new lunar calendar appeared at this point in history." [93] He points out that evidence for month-names appears as early as the 18th Dynasty as in the Ebers calendar.[94] To these may be added month-names with civil calendar designations in the Hekanakhte letters dating to the 12th Dynasty.[95]

Armed with his later lunar and civil calendars Depuydt attempts to resolve the "Brugsch phenomenon," having elected not to interact with any earlier lunar calendar.[96] He writes, "The explanation for the Brugsch phenomenon [how a 12th month can be named as if it were the first] will have much to do with the transfer of a set of month-names from a calendar with a straddle month to one without."[97] He defines a straddle month as: "the lunar month that sits astride the yearly marker of a lunisolar calendar. It has properties of both a beginning and an end."[98] Depudyt proposes that this "involves a shift". [99] He writes:

> When the name of the lunar counterpart of civil I *3ḫt* was rolled backwards onto civil I *3ḫt*, the preceding lunar month name, **wp rnpt* or **mswt r^{c}* was pushed backward, entirely out of civil I *3ḫt*, with which it overlapped as a designation of the lunar straddle month … the name *wp rnpt* was pushed backward across these five [epagomenal] days to land squarely on the last or twelfth civil month of the year, IV *šmw*.
>
> Thus the links with its former signifier, the year's beginning, were entirely severed … the month *jpt ḥmt* was moved back to civil III *šmw*. This left civil IV *3ḫt* [*sic šmw*] without a name. The effect is a kind of vacuum into which *wp rnpt* was readily pulled, or sucked as it were … It is this double force, combining pushing and pulling, that tore loose *wp rnpt* from its signifier. The name *wp rnpt* was attached to another signifier, namely civil Month 12. But at the same time it remained in use as a designation of New Year's Day. This makes for an odd contrast, the Brugsch phenomenon.[100]

Depuydt's explanation boggles the mind. What is that force he is talking about? How can names roll backwards from a lunar calendar to a civil calendar?

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[91] Parker, *Calendars*, 45 §230 Table 7.
[92] Depuydt, *Civil Calendar*, 50-51.
[93] Spalinger, "Review of *Ancient Egyptian Calendars*," 245.
[94] Ibid., 245.
[95] According to von Beckerath, the earliest surviving examples of feast-names used for month-names are found in the Hekanakhte letters, ("Bemerkungen zum ägyptischen Kalender, Pt. 1: Zur Entstehung des 365-tätigen Kalenders," *ZÄS*, 120 [1993], 19). See also, A.J. Spalinger, "Calendrical Evidence and Hekanakhte," *ZÄS* 123 (1996) 85-96.
[96] Depuydt, *Civil Calendar*, 10; similarly p. 138.
[97] Ibid., 45.
[98] Ibid., 43.
[99] Ibid., 66.
[100] Ibid., 237; similarly 54-55, 219, 234.

He touches lightly on the "Gardiner phenomenon," saying, "It concerns the fact that a civil month can have the same name as Day 1 of the civil month following it."[101] Depuydt accepts Parker's theory as the most plausible, as a "transfer of feasts from the lunar to the civil calendar."[102] Regarding Gardiner's theory that a shift of month-names took place, Depuydt says that if a month had been skipped from the calendar, so that the feast of the months were all put forward into the next month, it could account for the fact of feasts held out of their eponymous months. But, as he points out, there is no known motive for such a "skipping", and he doesn't give credibility to Gardiner's "Re" and "Thoth" clans to explain the phenomenon.[103] Thus, at the end of his book he relies on Parker's theory.

Depuydt's 1999 article, "The Two Problems of the Month Names", reiterates many of the issues already discussed in his *Civil Calendar* of 1997. Part of the abstract can suffice:

> This article attempts to sharpen the distinction between the two problems [Brugsch and Gardiner phenomena] as much as possible. It is suggested that failure to make the distinction has caused much confusion in the debate on Egyptian calendars. The events leading to the two problems of the names are described as the actions and decisions of anonymous calendar-makers. Identifying with these actions and decisions as if they were our own may promote understanding of the difficult problems regarding Egyptian calendars and of why these problems have so much to do with the names of months.[104]

In his article about Sothic chronology, published in 2000,[105] Depuydt admits he is apprehensive of the refutation of Parker's later lunar calendar by Spalinger,[106] because he equates the latter with his own civil-based lunar calendar. He asks: "But how else can one interpret the three civil-lunar double dates from the reigns of Amasis and Ptolemy VIII Euergetes (Depuydt 1997:161–69)?"[107]

I discussed the "double dates" in chapter 7, and determined that in the three instances both "double dates" in each text are *civil* month-dates from a civil calendar, and in no way witness to an original lunar calendar with seasons and month-names.[108]

As a final attempt to identify a lunar calendar Depuydt itemises seven facts, which, taken together, allegedly supply evidence of lunar months, which for him infers a lunar calendar.[109] He writes, "A set of lunar months has to begin somewhere … The point of reference for the original lunar calendar is the rising of Sirius."[110] Having presupposed that there was an original lunar calendar that began with the rising of Sothis, he then cites an equation of *prt spdt* with *wp rnpt* as evidence for his lunar calendar. For example, "*Second fact*: In the Illahun archive, the rising of Sirius (*prt spdt*) falls generally in late IV *prt*", and, " *Fourth fact*: In the Canopus Decree of 238 B.C., *prt spdt* is explicitly equated with *wp rnpt*; other sources point to the same equation," and

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101 Depuydt, "Two Problems," 110, similarly 113.
102 Idem, *Civil Calendar*, 243.
103 Ibid., 248.
104 Idem, "Two Problems," 107.
105 Idem, "Sothic Chronology and the Old Kingdom," *JARCE* 37 (2000) 181.
106 Spalinger, "Thoth and the Calendars," 45-60; idem "Notes on," 22 n.19; Depuydt, "Sothic Chronology," 180.
107 Depuydt, "Sothic Chronology," 180.
108 See chap. 7, pp. 104-105, 111-114.
109 Depuydt, "Sothic Chronology," 181-83.
110 Ibid., 180.

again, "*Fifth fact*: At Illahun and elsewhere, civil *w3g* (see section 4) falls on I *3ḫt* 18, that is, at the very beginning of a year or of a set of months."[111]

It is not easy to see in these and the other four facts why a lunar *calendar* is inferred. Of themselves there is no evidence that *prt spdt* with *wp rnpt* have anything to do with a *lunar* calendar. Spalinger's analysis sees them as being associated only in the Late Period with a *civil* calendar.[112]

We conclude our discussion concerning Depuydt's views with an article that appeared in 2008.[113] This article seeks to explain the hieroglyph accompanying the name *wp rnpt* in the first column of the Ebers calendar as a determinative, which marks it as a feast day.[114]

As the only one of 12 names that has this hieroglyph, it requires explanation. Depuydt proposes that the hieroglyph indicates that *wp rnpt* is the name of a lunar feast day, whereas the other 11 names are those of lunar months.[115]

He notes that if it has been written carelessly or randomly then his explanation has no foundation.[116] If it is a day, then how can the 11 alleged lunar month-names correspond to the 12 civil-month designations? Depuydt reasons that *prt Spdt* "the going forth of Sothis" marks the beginning of the lunar year, and that its related term, *wp rnpt*, "opener of the year" also means New Year's Day; thus, "The rising of Sirius presumably owes the designation *wp rnpt* in large part to its original function as marker of the beginning of the lunar year."[117]

He theorizes that since the new moon that marks the beginning of the new lunar year always falls after the rising of Sothis, varying between 1 day and 30, this constitutes the lunar month preceding *tḫy*, so that sometimes there will not be enough time at the end of the 11th month to include a 12th month before the first month, *tḫy*, commences. He writes, "In other words, 11 is the constant factor. That explains why only 11 lunar month-names are known and why only 11 names follow the graphic in the first column of the Ebers calendar."[118] The function of the Ebers calendar was to provide the name of the lunar month corresponding to a date in the civil month in the same line in the second column.[119]

In earlier articles, Depuydt has used the notion of *wp rnpt* as a lunar month, even as a 12th straddle month, to account for the "Brugsch phenomenon." Now that *wp rnpt* in the Ebers calendar is a feast day and not a month, this adds a further complication to his theory—which is not mentioned in the article.

Rolf Krauss

In the Proceedings of the SCIEM 2000 EuroConference published in 2003, Rolf Krauss discussed the Ebers calendar in the context of arguing for a low chronology for the Middle and New Kingdoms.[120] He recalled Helck's proposal in 1986 concerning the

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[111] Ibid., 182.
[112] Spalinger, "Canopus Stela," *Three Studies*, 46-49.
[113] L. Depuydt, "Function and Significance of the Ebers Calendar's Lone Feast-Hieroglyph (Gardiner Sign-List W3)," *Journal of Egyptian History* 1 (2008) 117-38.
[114] Ibid., 117, 123.
[115] Ibid., 117, 120, 123, 133.
[116] Ibid., 121, 125.
[117] Ibid., 127.
[118] Ibid., 128.
[119] Ibid., 131.
[120] R. Krauss, "Arguments in Favor of a Low Chronology for the Middle and New Kingdom in Egypt," *SCIEM II* (2003) 175-97.

Ebers calendar that Sothis could have risen heliacally on any day between III *šmw* 9 and IV *šmw* 8. Krauss saw this as an attempt by Helck to shorten the chronology (having given only 15 regnal years to Horemheb), and do away with the implications of the Ebers date and Parker's astronomical chronology for the Middle Kingdom (the Illahun dates).[121]

Krauss stated, "By 1980, however, Egyptologists agreed that the first column did indeed list lunar months, and that in 9 Amenhotep I the first day of the lunar month Wep-renpet coincided with the rising of Sothis on III Shemu 9."[122] Krauss assumed that lunar years were known from Illahun and used a *lunar year* to say that Sothis rose heliacally in the *lunar* month of *wp rnpt*, which was the 12th month of the year, the first month being *tḫy*[123] (emphasis added).

Based on this interpretation of the Ebers calendar, and his calculations that led to 1506 as Amenhotep I's ninth year when Sothis rose heliacally on III *šmw* 9 (lunar), he calculated back to the Sothic rising in Sesostris III's seventh year in 1830, leading him to propose the emending of the date of IV *prt* 16 to IV *prt* 18.[124] He wrote, "Either IV Peret 16 was a scribal error or we must refrain from attempting to use the Illahun Sothic date ... until new information is available."[125]

Thus in 2000 Krauss was still committed to a lunar calendar in the Ebers papyrus, and that Sothis rose heliacally on the first day of a *lunar* month,[126] and furthermore continued to assume that Amenhotep's accession fell on the same day as the Sothic date.[127] He does not refer to Spalinger's corpus of literature giving his counter view that the first and second columns of Ebers relate to a civil calendar. Nor does he refer to Ulrich Luft's article in the same edition of SCIEM 2000 reiterating that there were only lunar feasts and months mentioned in Illahun material, but not lunar years,[128] the view Luft previously mooted in 1992.[129] On the other hand, Luft continued to regard the Ebers calendar "as evidence for the failure to establish the regnal year."[130]

Anthony Spalinger in 2002

In 2002 Spalinger writes again.[131]

> The evidence for a Predynastic lunar calendar is explicit in 'double-dated' inscriptions that occur throughout ancient Egyptian history. In particular, correlations of a lunar month-and-day date with a civil month-and-day date confirmed Parker's theory that a functioning lunar calendar co-existed with the civil calendar.[132]

He references these "double dates" back to Depuydt's *Civil Calendar* chapters 9–11. Depuydt used Parker's "double dates" concerning the 26th and 28th year of Ptolemy VIII Euergestes II and the 12th year of Amasis of the 26th Saite Dynasty. I have shown

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121 Ibid., 190.
122 Ibid., 188.
123 Ibid., 189.
124 Ibid., 187, 188, 190.
125 Ibid., 190.
126 Ibid., 189.
127 Ibid.
128 U. Luft, "Priorities in Absolute Chronology," *SCIEM II* (2003) 201, 203.
129 Idem, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992) 222-23.
130 Idem, "Priorities," 203.
131 Spalinger, "Ancient Egyptian Calendars," 241-50.
132 Ibid., 241.

earlier that the alleged lunar month-names turned out to be civil months, by which a new or full moon was dated.

Convinced that the existence of a lunar calendar was a fact, Spalinger writes,

> "When the civil calendar was invented, early in the history of Pharaonic Egypt, perhaps ca. 2750 B.C., it was necessary to place lunar-based religious events into a civil setting. In addition, the newly invented civil months had to be named and placed into a set order; they were also based upon an original lunar system."[133]

His statement involves the assumption that there was a lunar calendar and that the "invention" of a civil calendar had to gain its month-names from a prior lunar calendar. Yet, in this connection, Spalinger writes, "In [*sic*] the festival calendars of the New Kingdom and later the references to lunar events significantly ignore the name of a lunar month. The common phrase *i͗n psḏntyw i͗n sw* simply indicates that the event fell upon a new moon within a given civil month. There was no necessity to write down the name of a lunar month; only the sighting was important."[134]

The lack of lunar month-names suggests that lunar months did not have names, which concurs with the lack of evidence of lunar month-names in supposed "double dates", and by extension, the lack of evidence for the existence of *any* lunar *calendar*.

Concerning new moon festivities, Spalinger writes,

> "All that was necessary was to look to the east and to witness the non-occurrence of the lunar crescent and then begin the festival when the moon reappeared. In other words, no second lunar calendar was necessary to determine the starting date of these celebrations. Although their beginning required a lunar event, no separate lunar calendar was required. So even Parker's 'first lunar calendar' was not necessary."[135]

So even before a civil calendar was used the Egyptians could hold festivals by observing the phases of the moon. Since there is no attestation for lunar months having names, the origin of month-names can be attributed to the civil calendar for which there is ample evidence for all 12 months (no intercalary month is known!). So why did Spalinger retain the notion of Parker's original lunar calendar when there was no need for it? As noted above, he (mistakenly) thought there was evidence for an original lunar calendar because of the supposed "double dates," and because he thought feasts had been transferred from a lunar to a civil calendar.[136]

But the acceptance of the idea of lunar to civil transfer troubled Spalinger because of the change of name for the 12th month. He asks:

> Why was the last civil month (twelve) changed to *R^{c}-Hr- 3ẖty* from the earlier *wp rnpt*? After all, the *wp* (that is the opening) of the year happens on New Year's Day, I *3ẖt* 1. The name of the first civil month in the year ought to be *wp rnpt* and not *tẖy*. The Epiphi festival (in civil month twelve) and the name of civil month eleven can be brought into discussion. Whatever one's solution to this difficulty, the changeover of month names occurred very early. (I do not find the alteration of *wp rnpt* to *R^{c}-Hr- 3ẖty* as significant as the original position of *wp rnpt*; i.e., civil month twelve.)[137]

Thus, Spalinger is left with the unresolved problem of the change of name of the 12th month from *wp rnpt* to *R^{c}-Hr- 3ẖty* while at the same time recognizing that *wp rnpt*

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133 Ibid., 243.
134 Ibid., 245 n. 29.
135 Ibid., 248-49.
136 Idem, "Return to Papyrus Ebers," 143; idem, "Notes on," 23, 25.
137 Idem, "Ancient Egyptian Calendars," 244.

ought to have been the first month of the year. (Yet he does not recognize *wp rnpt* as the first month in the Ebers calendar.)

Mention must be made of Spalinger's skepticism concerning the use of lunar phases (new moons) to date Egyptian chronology. He writes,

> "In the last fifteen years Bradley Schaefer has demonstrated the inherent weaknesses of lunar dating: no exact Julian date can be derived from the small data set of lunar-civil equations. At the minimum, synchronisms are necessary."[138]

The "small data set" cited by Spalinger, suggesting a few lunar dates, actually, on investigation swells to about 40 scattered dates, plus about 40 Illahun dates from the consecutive reigns of Sesostris III and his son Amenemhet III, making the total nearer 80–90.

Many festivals, the inductions of priests, and the laying of temple foundations were associated with either the new moon or the full moon. Added to these dates are a number of inscriptions recording the heliacal rising of Sothis. Since lunar and Sothic dates are tied to specific regnal years of various kings throughout the dynastic period, they provide a significant mesh of Egyptian dates and years that can be converted to the Julian calendar, whereby a chronology *can* be established. This will be demonstrated in forthcoming chapters.

John Nolan

John S. Nolan, in a paper published in 2003, sought to tie cattle counts to regnal years in the 5th and 6th Dynasties assuming their timing to an original lunar calendar with an intercalary 13th month. [139] The problem with cattle counts is in the uncertainty of how often they were held. Some texts refer to the *x*th year, such as the "1st occurrence" or the "15th occurrence," while others of less frequency refer to the "year *after* the *x*th year," which seems to imply that cattle counts were held every second year. If the notation was, for example, "the year after the fourth occurrence," does this mean the fifth year, or, if biennially, the ninth year?

Nolan proposed that cattle counts were numbered from the beginning of a king's reign and "over the course of every third civil year (occasionally every other year), the *Ḏḥwtyt* feast would be celebrated when the rising of Sirius and the start of the next lunar month required the intercalation of an extra month … The celebration of *Ḏḥwtyt* would in some way mean that the ritual cattle count was to be skipped in the following civil year."[140] Nolan relied heavily on Richard Parker and Leo Depuydt for his information on the supposed original lunar year for which I have found no evidence in preceding discussions. I will clarify the important matter of cattle counts during discussion of the 6th Dynasty.

For many decades until the present, scholars have attempted to find a resolution to the problem of feasts held out of their eponymous months in the Greco–Roman calendar. Due to the importance of establishing the appropriate calendar(s) in reconstructing the Egyptian chronology, and the different interpretations scholars placed on the Ebers calendar, I now offer my own explanation.

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[138] Ibid., 246.

[139] J.S. Nolan, "The Original Lunar Calendar and Cattle Counts in Old Kingdom Egypt," *Aegyptiaca Helvetica* 17 (2003) 75-97.

[140] Ibid., 92.

Chapter 10

Resolving the Eponymous Month Conflict

The core puzzle in much of the dialogue over Egyptian calendars in the last century is the problem of feasts held out of their eponymous months in the Greco–Roman Calendar.

Examining the evidence presented for Parker's and Depuydt's lunar calendars with seasons and month-names, as undertaken in the previous chapters, has led me to conclude that Egypt did not utilize a lunar timetable to record the passage of a solar year.

There are, of course, lunar months and days, with phases such as new and full moons dated to a so-called civil calendar. The timing of various festivals and celebrations were prescribed to be held on new or full moons. But no transference of lunar feasts from a lunar calendar to a civil calendar can explain the anomaly of feasts apparently celebrated out of their eponymous months in the Greco–Roman calendar.

Moreover, there are *no examples* of the kind of transfer proposed by Parker, "two dates for each festival, one fixed to the civil year, the other determined by the lunar year, with varying dates in the civil calendar."[1] In this context Parker was referring to Gardiner's examples of feasts set on day one of a civil month, but these feasts do not reappear as lunar feasts set on varying dates in the civil calendar. Conversely, feasts dated to the new or full moon occur on varying days of the month in the civil calendar but they do not have a *counterpart* set on day one of another month.

Furthermore, there is no attestation of a 13th intercalary lunar month to keep the rising of Sothis in the 12th civil month of *wp rnpt*—Sirius/Sothis rises at the beginning of the solar year whenever this occurred in its cycle through the civil calendar—and all theses resting on a 13th intercalary lunar month are invalid, including Nolan's cattle counts.

If lunar calendars are eliminated from consideration, scholars must still deal with the evidence of feasts, which appear to have moved back to day 1 of the previous month as seen in the Greco-Roman calendar beginning with the month of *tḫy* or Thoth. These same feasts are held *in* their eponymous month in a calendar beginning a month earlier such as *wp rnpt* in the Ebers calendar.

This situation caused Gardiner to propose two civil calendars, one beginning with "Mesore" the later name for *wp rnpt*, and one beginning with Thoth, the later name for *tḫy*. Thus Mesore and Thoth both ran concurrently as I *3ḫt*.

However, Gardiner was puzzled about how or why this situation had come about. He suggested that it was due to a philosophical difference between a "Re school" and a "Thoth school," but this idea has not convinced Egyptologists. How, then, can the calendar situation be resolved? I propose the following answer based on the timing of the seasons in the south and north of the country. This discussion will advance from basic simplicity at first, and proceed to the complexities that Egyptologists have grappled with in the descriptions that have already been detailed.

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[1] R.A. Parker, *The Calendars of Ancient Egypt* (SAOC 26; Chicago, IL: Oriental Institute of the University of Chicago, 1950) 58 §290.

Egypt is "Two Lands": Upper Egypt and Lower Egypt

Ancient Egypt was known as the "Two Lands" because it had two defined regions, Upper Egypt and Lower Egypt (see Figure 10.1). Upper Egypt began at its southern border at the first cataract near Elephantine and followed the Nile north almost 1200 kilometers to the south of Memphis. Lower Egypt included Memphis and the region of the Delta with its northern border at the Mediterranean Sea. Thebes was the civil capital of Upper Egypt, Memphis the hub of Lower Egypt. Agriculturally their seasons differed between the highlands of Upper Egypt and the lowlands of the Nile delta.[2]

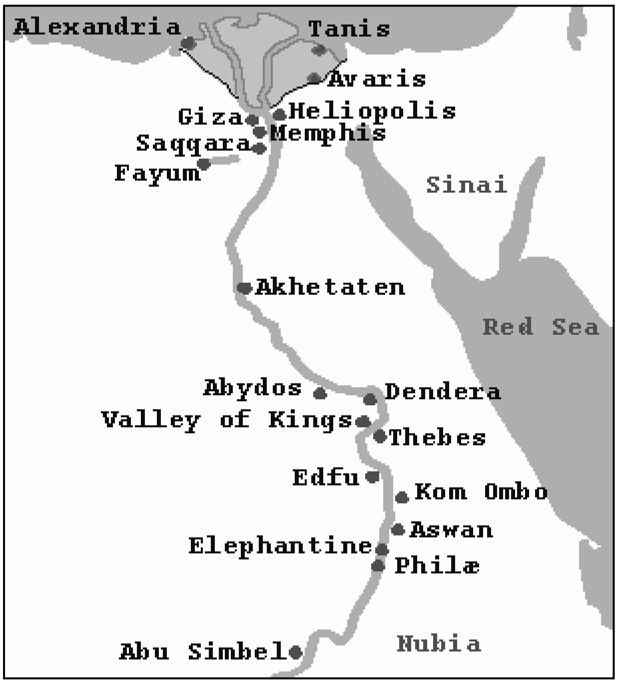

Figure 10.1: Map of Upper and Lower Egypt.

There were differences between the Upper and Lower Egyptians in the ancient world: they spoke different dialects and had different customs that impacted on national life with its festivals and calendars. The regimes of political, military, and civil life also ebbed and flowed over the centuries. Kings of Upper Egypt wore the *hedjet* or White Crown, and kings of Lower Egypt wore the *deshret* or Red Crown. The two kingdoms of Upper and Lower Egypt were united ca. 3000 BCE. The pharaohs were known as the rulers of the Two Lands, and wore the *pschent*, a double crown, each half of the crown representing sovereignty over each of the two kingdoms.

The Nile River was the main communication and transportation route linking north and south. But more importantly it was responsible for the life and livelihood of ancient Egyptians. Every year torrential rains from the Ethiopian Highlands brought rich, silt-laden waters into the Nile, which Egyptians used to fertilize and irrigate the surrounding lands to produce their crops. Without the annual inundation, the crops would fail and the people would starve.

Modern calculations for ancient Egypt set the appearance of the inundation at Aswan by the end of June or early July (using the Gregorian calendar) and at the Delta in August, swelling to its *highest* at Cairo (north of Memphis) by September or October. An average time for the inundation to travel the length of the Nile in Egypt would be

[2] Image from http://www.ancient-egypt.info/2013/09/ancient-egyptian-nile-river.html

about one month.[3] The height of the Nile was unpredictable from one year to the next. The levels fall quickly in November and December, with the lowest levels between March and May/June.

The inundation of the Nile waters lasted about four months, and was known as the season of *akhet* (*3ḫt*) before they receded sufficiently to allow sowing and planting to begin. The growing season of *peret* (*prt*) also lasted approximately four months, and afterwards came the season of *shomu* (*šmw*) when the harvesting took place, which was also a period of four months.

Astronomical time.

While the agricultural seasons provided an annual calendar, the Egyptians were well aware of a celestial timetable. The seasonal phases gave convenient names to the three seasons corresponding to the solar year, the time it takes for the Earth to orbit around the Sun from one starting point until its return to that same point. But the solar year consists of 365¼ days. The timing of the inundation or flooding of the Nile could vary by several months from one year to the next,[4] and was unreliable as an indicator of a new solar year. So the Egyptians reckoned with an astronomical timetable, the solar year that coincided with the heliacal rising of the star Sothis.

The Solar Year Began with the Heliacal Rising of Sothis in the South

The flooding of the Nile was preceded in the south by the heliacal rising of Sothis. When the star was first seen after a period of 70 days invisibility the Egyptians reckoned this as the beginning of their solar and agricultural year because they knew a year had passed since the last time the star had risen. This event occurred near the time of the summer solstice, or when the sun was at its height. The time between each heliacal rising of Sothis was the time it took for the earth to orbit around the sun back to the point where the rising of Sothis could again be seen in early daylight.

In Upper Egypt the Calendar was Regulated by the Sothic Cycle

The heliacal rising of Sothis was first seen in the south. It eventually regulated the calendar used in Upper Egypt.[5] The people of Upper Egypt held a feast at the beginning of each year on I *3ḫt* 1 calling it *wp rnpt*, "the opener," or the feast of *prt Spdt*, the "going up of Sothis." The occurrence of the *prt Spdt* festival, on the occasion of the heliacal rising of Sothis, becomes significant in subsequent inscriptional evidence.

Lower Egypt

The people in the north, Lower Egypt, could not begin planting at the same time as those in the south because the flood waters would recede about a month later. So the *first* planting month of Lower Egypt was concurrent with the *second* planting month of Upper Egypt. This meant that the agricultural year *started one month later* in the north than in the south. The difference in the start of their respective years was no problem in early periods when the people of each region conducted their farming and Nile-based activities with various degrees of geographical and political separation.

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[3] H.E. Winlock, "The Origin of the Ancient Egyptian Calendar," *Proceedings of the American Philosophical Society* 83 (New York: Metropolitan Museum of Art, 1940) 452; C. Seawright, "The Inundation," at http://www.touregypt.net/featurestories/nile.htm.

[4] The beginning of inundation could vary from 335 to 415 days, according to Winlock, ("Origin," 452).

[5] Wells proposed a luni-stellar calendar for Upper Egypt based on Sothis, using Parker's idea of a lunar calendar. R.A. Wells, "Re and the Calendars," *Revolutions in Time: Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 16-23.

Unlike those in the south, the northerners celebrated their year by the feast of their sun-god Re. According to Wells, Re's mythical birth occurred at the time of the winter solstice and then he began to travel through the horizons over the Two Lands. Six months later he had reached his northern-most point, when the sun was at its height at the time of the summer solstice.[6] This meant that the heliacal rising of Sothis, which was regarded as the beginning of the agricultural year, and the "feast of Re" both occurred near the time of the summer solstice.

The phases of the Nile naturally divided the year into three seasons that were given appropriate names: *3ḫt*, *prt*, and *šmw*. Presumably, with the passing of time, seasons were divided into four months each, and months gained their names from the festivals held in each, such as *wp rnpt* "the opener." Re's travel through the horizons is perhaps implicit in the month-name *R^c ḥr 3ḫty* "Re Horus of the Two Horizons." Renenutet was the harvest goddess, and Renenutet was the name given to the first month of harvest, I *šmw*.

Emergence of a Civil Calendar

At some stage, a calendar emerged having 30 days to each month and 5 epagomenals, becoming the basis of the two calendars: civil calendars using the names of the agricultural seasons of the solar year; inundation, sowing, and harvest.

When numerical designations were applied to these calendars, I *3ḫt* was the month of *wp rnpt* in the calendar of Upper Egypt followed by II *3ḫt*, the month of *tḫy*, and so on. But *tḫy* was I *3ḫt* in the calendar of Lower Egypt because the inundation, equated with the first month of that region, arrived about a month later in the north than in the south. Thus the month of *tḫy* had two designations, and likewise the following months. Feasts set on the first day of each month also had the same two designations, such as the seasonal feast of Hathor on IV *3ḫt* 1 and III *3ḫt* 1, but the month-name of both in the civil calendar was Hathor. How this evolved is lost in the mists of antiquity, but the evidence points towards similar but different calendars in Upper and Lower Egypt.

This arrangement meant that *months of the same names were aligned with each other, but their numerical designations were always one month apart.* The only two months, one in each calendar, that did not have the same names were *wp rnpt* and *R^c-ḥr-3ḫty* and they were aligned with each other, being the first month and the 12th month, respectively. *This simple alignment resolves the problem of feasts supposedly being held out of their eponymous months in the Greco–Roman calendar.*

No "shift" of any feast from a lunar calendar to a civil calendar ever took place. Thus Parker's and Depuydt's lunar calendars, which were proposed to solve the problem, have no basis in fact.

My alignment of the two calendars is displayed in Table 10.1.

6 Wells proposed that when the Two Lands amalgamated early in predynastic history, the birth of Re falling on the winter solstice in the sixth month had to be moved to the 12th month of the summer solstice. He attributes this to a secondary birthplace of Re in Lower Egypt. ("Re and the Calendars," 4, 6, 21–23). There is no attestation that the birth of Re was ever celebrated in the sixth month, and it may always have been celebrated at the time of the summer solstice in the 12th month.

Table 10.1: Alignment of Calendars of Upper and Lower Egypt

Upper Egypt	Lower Egypt	Month-name
I *3ḫt*	IV *šmw*	*wp rnpt* in Up. Eg. and *Rc-ḥr-3ḫty* in L. Eg.
II *3ḫt*	I *3ḫt*	tḫy
III *3ḫt*	II *3ḫt*	mnḫt
IV *3ḫt*	III *3ḫt*	ḥwt ḥr
I *prt*	IV *3ḫt*	k3 ḥr k3
II *prt*	I *prt*	šf bdt
III *prt*	II *prt*	rkḥ wr
IV *prt*	III *prt*	rkḥ nḏs
I *šmw*	IV *prt*	rnnwtt
II *šmw*	I *šmw*	ḫnsw
III *šmw*	II *šmw*	ḫnty ḫty
IV *šmw*	III *šmw*	ipt ḥmt

Table 10.1 shows that the months, and therefore the feasts that named the months, have two designations one month apart. In previous discussions *wp rnpt* "the opener" and the "feast of Re" or the "Birthday of Re" were both dated to I *3ḫt* 1. In this case, the feast of the 12th month, concurrent with the feast of the first month, took on the latter's designation. The feast of Hathor was held on IV *3ḫt* 1 in the calendar of Upper Egypt, but was out of its eponymous month if applied to III *3ḫt* 1 in the calendar of Lower Egypt. The same situation applies to the other months having two designations set on the first day of two consecutive months. These nation-wide festivals were held on the *same day* throughout Egypt, but their numerical designations differed by one month.

Gardiner's alignment, which had the *numerical* designations aligned (I *3ḫt* with I *3ḫt*, II *3ḫt* with II *3ḫt*, etc.) meant that the feasts of their eponymous months always seemed to be one month earlier in his "Mesore"-beginning calendar, than in his Thoth-beginning calendar. Had he aligned the 11 *months with the same names* in his two calendars he would have resolved the alleged "Brugsch and Gardiner phenomena." These phenomena never actually existed as they are based on an incorrect interpretation of the feasts supposedly held out of their eponymous months in the Greco–Roman calendar.

Ebers Calendar, Upper Egypt, Early 18th Dynasty

The first column of the Ebers calendar represents the month order and names of the calendar of Upper Egypt as it was in the early 18th Dynasty. It differs from the calendar of Lower Egypt represented in the Senmut tomb ceiling only in having *wp rnpt* at its head, whereas *wp rnpt* is the 12th month depicted in Senmut's tomb. The later depictions, as we have noticed previously, have the same order as that of Senmut's ceiling with a few variations in names of months. In the Karnak water clock, the Ramesseum and Medinet Habu temple ceilings, and the Edfu temple frieze, the last month is given as *Rc ḥr 3ḫty*, though *wp rnpt* is 12th month in the Cairo papyrus 86637. It is found elsewhere in a fragment of the Tanis Geographical Papyrus,[7] in the Esna temple calendar,[8] and in Edfu text IV, 8–9 where *wp rnpt* is the name for IV *ŝmw* in Edfu texts VII, 7 and IV, 2,[9] discussed earlier in regard to supposed "double dates."

By the time of the 18th Dynasty, any earlier differences in month-names in the two regions had merged. The two calendars were operating at the same time as attested in various inscriptions from ostraca and papyri from the 18th to the 20th Dynasties.

7 L. Depuydt, *Civil Calendar and Lunar Calendar in Ancient Egypt* (Orientalis Lovaniensia Analecta 77; Leuven: Peeters, 1997) 116-17.

8 Spalinger, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson* Vol 2; (Boston: Museum of Fine Arts, 1996) 759.

9 R.A. Parker, "The Problem of the Month-Names: A Reply," *Rd'É* 11 (1957) 103.

Heliacal Risings of Sothis used in Upper Egypt

It might be wondered why the ancient Egyptians tolerated two calendars from antiquity down to the New Kingdom. A very important reason is that the calendar of Upper Egypt was used to date the heliacal risings of Sothis as it moved through the days of the civil calendar in its nearly 1460 year cycle. The date of III *šmw* 9 in the ninth year of Amenhotep I in the Ebers calendar not only demonstrates the significance that Egyptians attributed to dating key events by the Sothic cycle, it also shows its referential starting point at the commencement of the Sothic cycle some 1356 years earlier.

Significant dates were located within the Sothic cycle, by reference to the time it took Sothis to move through the civil calendar from I *3ḫt* 1 until IV *šmw* 9. Thus, from I *3ḫt* 1 to III *šmw* 9 are 339 days, which equates to 1356 years. Having commenced dating by the Sothic cycle using the calendar of Upper Egypt, it was necessary to use the same calendar for subsequent sightings at the same latitude (in this instance, Thebes), in order for the passage of time to be measured with relative accuracy.

Since heliacal risings were dated to a king's specific regnal year, the time between two kings could be measured by the civil dates attributed to each *providing that* the observations were taken from the same latitude and dated by the same calendar. If two kings are at *different locations* at which the heliacal risings were recorded, then adjustments are required to take account of the difference of one year per 1 degree of latitude proceeding north when reckoning the time interval between them. For example, Thutmose III has a date of III *šmw* 28 recorded at Elephantine.[10] If the recording had been made at Thebes, it would be dated to III *šmw* 30 because there are about 2 degrees of difference in latitude between the two centers.

Sothic Calendar is Important for Recording Long Passages of Time

The use of the heliacal risings of Sothis to reckon on years between kings or events was important for keeping track of time covering long periods. Each solar year—the period between Sothic risings—was 365¼ days long, as the latter's appearance in the morning sky was regulated by its same position relative to the sun every year.[11] The appearance of Sothis after 70 days of invisibility (due to its closeness to the sun) was recorded using the civil calendar of Upper Egypt. But unfortunately, the *civil* calendar was short of the solar year because it was only constructed to have 365 days not 365¼ days. Because of the deficiency, the civil calendar gained 6 hours every year, and 24 hours or one day every four years.

Without the addition of an extra day every four years, the civil calendar of Upper Egypt clicked one day forward every four years, so that after about 730 years the civil calendar date of I *3ḫt* 1 was six months ahead of the heliacal rising of Sothis. In other words, the seasons of the civil calendar were displaced by six months from their original position in the solar/agricultural year.

The correspondence of the solar year to the calendar of the civil year gradually but constantly changed over the centuries. The solar and seasonal year inexorably continued year after year, but a device was needed to locate any particular year in the long-term calendar, in the manner that the Gregorian calendar is our internationally accepted measure of the passage of time.

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[10] A.J. Spalinger, "Sothis and 'Official' Calendar Texts," *VA* 10/2-3 (1995) 176.

[11] According to Teije de Jong, "In the course of 4000 years the date of the heliacal rising of Sirius moves forward with respect to the summer solstice by one day in about 120 years," ("The Heliacal Rising of Sirius," *Ancient Egyptian Chronology*, [eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006] 438).

Ebers Calendar

The reason that the Ebers calendar (as shown in Table 10.2) is significant to Egypt's chronology is that it displays the correspondence between the solar/agricultural months and the civil calendar. It indicates that the "going up of Sothis" on III *šmw* 9 fell in Amenhotep I's ninth year in the calendar of Upper Egypt. III *šmw* 9 was the first day of the new solar/agricultural year, equated with the first day of *wp rnpt*, and the Inundation (*3ḫt*) *season.*

Table 10.2: The Ebers Calendar

Year 9 under the majesty of the king of Upper and Lower Egypt *Dsr-k3-R*^{c} **may he live forever**			
wp rnpt	III *šmw*	day9	going up of Sothis
tḫy	IV	day9	•
mnḫt	I *3ḫt*	day9	•
ḥwt ḥr	II	day9	•
k3 ḥr k3	III	day9	•
šf bdt	IV	day9	•
rkḥ wr	I *prt*	day9	•
rkḥ nds	II	day9	•
rnnwtt	III	day9	•
ḫnsw	IV	day9	•
ḫnt ḫt	I *šmw*	day9	•
i͗pt ḥmt	II	day9	•

• = ditto.

The purpose of the calendar was to show that III *šmw* 9 was the beginning of the solar/agricultural year and that the following months could be counted off from day 9 as given in the third column. The four months of Inundation were equated in the calendar from III *šmw* 9 to III *3ḫt* 8, corresponding to the *seasonal* (not civil) months of *wpr npt*, *tḫy*, *mnḫt*, and *ḥwt ḥr*. When the waters had receded sufficiently, the Nile workers could begin their planting. Approximately four months later, the harvesting could begin around III *prt*. (This applies to an agricultural scenario, but the calendar could be used for other purposes—noting that the other side of the papyrus appears to be a record of medical treatment.)

Such a calendar enabled the Egyptians to keep track of the months and seasons of the solar/agricultural year by equating the seasons with the civil calendar commencing with the day of the rising of Sothis as it moved through the centuries. While the Ebers calendar may have been constructed as an occasional document for a particular year, the heading of the calendar assists us to locate it within the full Sothic cycle, and relate it to other years within the cycle.

Following the ninth year of Amenhotep I, Sothis would take another 228 years to reach the end of the cycle before its heliacal rising coincided with I *3ḫt* 1 again at the beginning of a new Sothic cycle. By knowing the civil date of the Sothic rising that began the solar/seasonal year, any particular date can easily be computed.

The repetition of the large dots under the "going up of Sothis" in the fourth column of the Ebers calendar (Table 10.2), understood as ditto marks, infer that the solar/agricultural months changed to the next solar/agricultural month at "day 9" in the civil calendar. This assumes a 30-day month. The "day 9" for all months is somewhat schematic as another 5¼ days have to be taken into account in the 365¼ days of the solar year. But "day 9" would be used for convenience and the extra five days would not matter materially because for four years (rarely three or five years) the "going up of Sothis" would remain on III *šmw* 9 then move on to III *šmw* 10 in the civil calendar.

The Ebers Calendar's Significance for Egyptian Chronology

The Ebers calendar has a more significant role to play than merely stating the correspondence of months of the calendar of Upper Egypt and the solar/agricultural year, or being used to give the time between specific regnal years of two kings dated to a heliacal rising of Sothis. With the help of another Sothic cycle date, the Ebers calendar can provide a Julian date for Amenhotep I's ninth year.

The discovery that the calendar of Upper Egypt ran concurrently with the calendar of Lower Egypt throws into disarray the chronology of ancient Egypt as it is now understood by scholars. Dates based on the calendar of Upper Egypt must be considered independently of those of the calendar of Lower Egypt.

A difference of one month between the start and finish of both calendars amounting to a 30-day month, will, in terms of the Sothic cycle, take Sothis 120 years to traverse. For example, if III *šmw* 9 for Amenhotep I's ninth year is dated to the calendar of Upper Egypt it will occur 120 years earlier than if dated to the calendar of Lower Egypt, which has a further month of its calendar to run. Therefore, a date of III *šmw* 9 in Upper Egypt equates to II *šmw* 9 in Lower Egypt.

This difference also means that a Sothic cycle dated to the calendar of Upper Egypt will start and finish one month ahead of a calendar dated to Lower Egypt if the star's rising is observed from the *same* location. But observations from Upper or Lower Egypt would be from different latitudes, which would mean that the distance between the sites must be taken into account when reckoning the time between the beginning of one Sothic cycle and another. Provided the location and Egyptian date of a heliacal rising of Sothis is known, and depending on which calendar is used to record it, we can convert a Sothic date to the Julian calendar and find the commencement date of the Sothic cycle. I take up this subject again below with respect to various records of the rising of Sothis including the Ebers calendar date.

Merging of the Calendars of Upper and Lower Egypt

By the end of the 20th Dynasty, it seems that a gradual merging of the calendars was virtually complete since examples of two calendars are no longer found. The calendar of Lower Egypt predominates during the merger, with *tḫy* as its first month and *R^c-ḥr-3ḫty* in 12th place. The calendar of Lower Egypt supplanted the calendar of Upper Egypt regulated by the heliacal rising of Sothis, with *wp rnpt* in first place and *ipt hmt* (later Epiphi) in 12th place.

The calendar of Lower Egypt was the precursor of the Greco–Roman calendar having *tḫy* at its head, and *wp rnpt* and *R^c-ḥr-3ḫty* vying for last place. It is evident that the calendar of Lower Egypt spread south, no doubt taken there as the population itself spread southwards with its kings taking up residence at Thebes in the 18th Dynasty, contrary to a spread from south to north as Wells has stated.[12]

[12] Wells, "Re and the Calendars," 21-23.

Two Calendars in Operation for a Time

The two civil calendar designations given to fixed feasts demonstrate that two calendars were in use concurrently long after they had reached a written form.[13] A result of the merger of calendars is seen in the fact that the feasts of *wp rnpt*, the "opener of the year" and the "birthday of Re" could both be celebrated on I *3ḫt* 1, with the latter feast taking on the designation of I *3ḫt*. This situation, however, would have pertained only while *wp rnpt* was in first month position and *R^{c}-ḥr-3ḫty* ran concurrently with it. One can imagine, with the spread of the population from north to south and vice versa, that the existence of two calendars running concurrently would cause problems in dating transactions, festivals, etc. It would be much less complicated if one calendar was used throughout.

Lower Egypt Calendar Prevails in the New Kingdom

By the New Kingdom, the calendar of Lower Egypt predominated over that of Upper Egypt. This meant that the month of *wp rnpt* "the opener" aligned with *R^{c}-ḥr-3ḫty* had to share 12th position with *R^{c} ḥr 3ḫty*—or otherwise be lost from the calendar altogether. Apparently reluctant to let go of *wp rnpt* and its same-named feast, the Egyptians retained both *wp rnpt* and *R^{c}-ḥr-3ḫty* as names for the 12th month down to Greco–Roman times. Mesore ("the birthday of Re") replaced *R^{c}-ḥr-3ḫty* in the Greco–Roman calendar. Unlike *wp rnpt* and *R^{c}-ḥr-3ḫty* competing for the 12th month position, the other 11 months with the same names merged into the calendar of Lower Egypt. Only the different numeration for their months reveals their "pre-merger" identity in the two different calendars.

The Senmut tomb ceiling calendar (18th Dynasty), and the Ramesseum and Medinet Habu Temple ceiling calendars of the 19th and 20th Dynasties, show the calendar of Lower Egypt; whereas the Ebers calendar (18th Dynasty) and the Festival Calendar of Medinet Habu originating with Ramesses II (19th Dynasty) attest to the calendar of Upper Egypt. Both calendars were in use in the days of Ramesses II, which led to their inevitable merger by the 20th Dynasty.

Dates for Sothic Risings in Upper and Lower Egypt

By identifying two calendars, one in Upper Egypt and another in Lower Egypt, which begin and end one month apart, we are able to positively date Amenhotep I's ninth year by the date of the Sothic rising on III *ŝmw* 9. Two calendars or two observation sites for the "going up of Sothis" imply two Sothic cycles beginning and ending at different times. In order to date Amenhotep I's ninth year, one must first date the Sothic cycle known from later times, and then work backward to the 18th Dynasty. To do so, I review the following well-known records.

Sothic Cycle Ends/Begins in 139 CE

Censorinus, a Latin writer living in the 3rd century CE, recorded that the first day of the Egyptian month Thoth—the first month of the year—fell in 238 CE in the Roman calendar on VII Kal. Iul. Scholars equate this with June 25th.[14] Censorinus also noted

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[13] Contrary to Wells, who asserts that the two calendars had amalgamated before Upper and Lower Egypt had unified in the first two dynasties, with the spread of writing necessitating a simple calendar ("Re and the Calendars," 2, 23).

[14] Cited from XXI, 10 in *Censorini de die natali liber*, (ed. F. Hultsch, 1867, p. 46) by J. Finegan, *Handbook of Biblical Chronology: Principles of Time Reckoning in the Ancient World and Problems of Chronology in the Bible* (Princeton, NJ: Princeton University Press (1964) 27 §46. For the Roman method of reckoning dates, in which Kal stands for Kalends or the first day of every month, see p. 75 §141. See also R. Long, "A Re-examination of the Sothic Chronology of Egypt," *Orientalia* **43 (**1974) 272-73.

that 100 years previously in the second year of Antoninus Pius who was consul for the second time along with Bruttius Praesens,[15] the Egyptian Thoth 1 fell on XII Kal. August = 21 July 139 CE. Scholars note that this date should be corrected to XIII Kal, August or 20 July 139 CE, a day earlier, to agree with the date of the heliacal rising of Sothis for that period.[16] But the two dates, 100 years apart for the beginning of new Sothic cycles, invite further consideration of the differences for the commencement of the Sothic cycles for Upper and Lower Egypt, respectively.

Additional support for the 139 CE date for the end/beginning of a Sothic cycle also comes from coins minted in Alexandria at the time of the aforementioned Antoninus Pius and Bruttius Praesen's consulship in 139 CE. The coins show a phoenix with a shining crown and the word ΑΙΩΝ (denoting a significant period of time; an era) on it. Dated to the proconsulship, the minting of the coins suggests the end of one cycle and the commencement and celebration of a new Sothic cycle.[17]

Casperson's lunar table for the year 139 CE (Table 10.3) demonstrates that IV *šmw* 29 equates to 13 July. IV *šmw* 30 equates to 14 July, and a further five epagomenal days concludes the Egyptian civil year on 19 July. I *3ḫt* 1 occurs on 20 July, thus confirming the date for the end of the Sothic cycle on 19 July 139 CE. This provides a fixed end-date from which to work backward.

Table 10.3: Sothic cycle ends/begins in 139 CE (new moon listing from +139)

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
139	6	14	139	6	13	2921	11	30	7	6:49	5:03	203	5:03	77	5:03	−8
139	**7**	**13**	139	7	12	2921	**12**	**29**	1	19:36	5:04	279	5:05	148	5:05	52
139	8	12	139	8	11	2922	1	24	3	10:45	5:21	214	5:22	117	5:22	26

DoW = day of week; ToD = time of day.

The Decree of Canopus in 238 BCE Gives a Date for the Heliacal Rising of Sothis

Centuries before, an earlier reference to the heliacal rising of Sothis concurs with the date 139 CE, which is assumed to have been observed at Memphis. This is referred to in the Decree of Canopus (in the western Delta), which was instituted in the ninth year of Ptolemy III Euergetes I in 238 BCE (reigned 247–221 BCE), when it was decreed that a sixth epagomenal day would be added every fourth year to keep the calendar adjusted to the appropriate seasons.[18] The relevant part of Spalinger's translation states:

> "Let each year a celebration at public expense be celebrated in the temples and throughout all the land to King Ptolemy and Queen Berenice, Benefactor Gods, on the day on which the star of Isis heliacally rises, which is regarded/considered by the sacred writings to be a new year, and is now celebrated in the 9th year, the first day of the month of Payni …"[19]

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15 Years were dated by Roman consuls two of whom gave their name to one year at a time (Finegan, *Handbook*, 26 §46, 93-95 §§172-78).

16 Ibid., 26 §46; R.A. Parker, "The Sothic Dating of the Twelfth and Eighteenth Dynasties," *Studies in Honor of George R. Hughes* (SAOC 39; Chicago, IL: Chicago: Oriental Institute of the University of Chicago (1976) 182; U. Luft, "Priorities in Absolute Chronology," *SCIEM II* (2003), 201.

17 E. Hornung, *Untersuchungen zur Chronologie und Geschichte des neuen Reiches* (Ägyptologische Abhandlunen II; Weisbaden: Harrassowitz, 1964) 17; Parker, "Sothic Dating," 182 and n. 15.

18 Hornung, *Untersuchungen zur Chronologie*, 17-18; R.D. Long, "A Re-examination of the Sothic Chronology of Egypt," *Orientalia* 43 (1974) 271-72; Parker, "Sothic Dating," 186-8; A.J. Spalinger, "The Canopus Stela," *Three Studies on Egyptian Feasts and their Chronological Implications* (Baltimore, MD: Halgo, 1992) 35, 44, and n. 1 on p. 31 for more references to the Canopus Stela.

19 Spalinger, "Canopus Stela," 35.

The Sothic rising dated to the first of Payni is otherwise II *šmw* 1.[20] Casperson provides the information in Table 10.4.

Table 10.4: Ptolemy III Euergetes I's ninth year in −237 (new moon listing from −237)

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**		**ToD**			**Morning visibility**		
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**					**−2**	**−1**		**0**
−237	6	2	−237	5	29	2545	8	14	1	8:12	5:08	206	5:08	74	5:07	−16
−237	7	1	−237	6	27	2545	9	13	2	17:18	5:01	329	5:02	145	5:02	28
−237	**7**	**31**	−237	7	27	2545	**10**	**13**	4	1:32	5:11	221	5:12	**86**	5:12	−30
−237	8	29	−237	8	25	2545	11	12	5	9:57	5:32	277	5:33	142	5:34	19

DoW = day of week; ToD = time of day.

II *šmw* 13 equates to 31 July 238 BCE, so II *šmw* 1 equates to 19 July, applicable to a Sothic rising in this year according to the HELIAC Program.

Sothic Cycle Starts in 1314 BCE

A late reference to a Sothic cycle was recorded by a certain Theon, an Alexandrian astronomer, who lived during the reign of Theodosius the Elder (379–395 CE).[21] Jack Finegan writes:

> Expressly using the Egyptian shifting year, Theon reckons 1605 years "from Menophres" (ἀπὸ Μενόφρεως) to the end of the era of Augustus. The era of Diocletian began on Aug 29, 284 C.E. and the last year of the Augustan era was accordingly 283/284. One thousand six hundred and five of the shorter shifting Egyptian years are equal to 1604 Julian years less thirty-six days; and 1604 years before A.D. 283/284 brings us back to 1321/1320 B.C."[22]

It was earlier thought that the Sothic cycle observed from Memphis and ending in 139 CE had begun 1460 years earlier in the quadrennium 1321–1318. However, it is now known that the Sothic cycle was somewhat shorter. M.R. Ingham computed that a Sothic cycle took approximately 1453 years with a constant *arcus visionis*, and 1452 years with a changing *arcus visionis*;[23] therefore, less than the projected 1460 years of earlier scholars. This can be explained by the fact that Sothis does not follow a strictly linear pattern but sometimes advances and retracts, and that on two occasions in the cycle Sothis rose heliacally on only three, not four, days; thus, accounting for the 7–8 years' difference.[24]

Theon's estimate that there were *1604* years from 283/284 CE back to the beginning of the "Era of Menophres" in 1321/1320 BCE (284 + 1320) has to be corrected to *1598/1597* years. The 1453 years of the Sothic cycle that ended in 139 CE began in 1314 BCE and ended in 139 CE. Despite slight modifications, Theon affirms the ending/starting point of the Sothic cycle based on the Egyptian calendar for Lower Egypt, which subsequent examples confirm.

The "Era of Menophres"

We noted above that Theon referred to the "Era of Menophres" (ἀπὸ Μενόφρεως) by which he seemed to be referring to a Sothic cycle. Scholars have long

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[20] Ibid., 34-35.

[21] Long, "Re-examination," 269.

[22] Finegan, *Handbook*, 27 §47. The Greek of Theon's statement is given by Long in, "Re-examination," 269.

[23] M.F. Ingham, "The Length of the Sothic Cycle," *JEA* 55 (1969) 39-40.

[24] Spalinger, "The Canopus Stela," 44.

understood that the “Era of Menophres” refers to a Sothic cycle but have been undecided who or what was meant by “Menophres.”

The date of 1321/1320 BCE, proposed by Theon, led scholars to look to pharaohs whom they thought reigned about this time; that is, prior to their dates for Ramesses II (1304 or 1290, now touted as 1279). Horemheb was eliminated because his name could not be construed as “Menophres.”[25] Ramesses I, whose prenomen was *Mn-phty-r*’, was considered by some as a possible candidate.[26] Merenptah, son of Ramesses II, presumed by scholars to have reigned from 1224 to 1214, was a century too late as a candidate for “Menophres.”[27] Sety I, whose common epithet is Merenptah (*Mr-n-ptah*) received favorable support,[28] but Redford wrote, “The name Menophris can only with great difficulty be derived from ‘Merneptah’. The same is true of a derivation from *Mn-pḥty-rc*.”[29]

Rowton, Redford, and other scholars suggested instead that “Menophres” refers to the city of Memphis by its earlier name Men-efer.[30] Redford writes, “... there is a perfect *Vorlage* to be found in *Mn-nfr*, ‘Memphis’. Linguistically this is precisely the vocalization that would be expected”.[31] No linguistic problem prevents the derivation of Memphis from “Menophres”.

That Memphis was chosen as the new site for the observation of the heliacal rising of Sothis is inferred by a certain Olympiodorus, who, in the year 6 CE, noted that the Alexandrians observed the heliacal rising of Sothis at Memphis in the late Roman period.[32] It is apparent that the Sothic cycle using the calendar of Lower Egypt starting in 1314 initiated the “Era of Menophres,” which can now be understood as the “Era of Memphis.” This appellation differentiates it from the previous Sothic sightings, which were observed using the calendar of Upper Egypt.

Memphis Sothic Cycle Beginning in 1314 BCE

The commencement of a new Sothic cycle in 1314 BCE (−1313) can be demonstrated from Casperson’s lunar table (Table 10.5), which uses the Greco–Roman calendar applicable to a Sothic observation at Memphis.

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25 Long, “Re-examination,” 269-70.

26 For discussion on Ramesses I as “Menophres” see J. Černý, “Note on the Supposed Beginning of a Sothic period under Sethos I,” *JEA* 47 (1961) 151-52; Finegan, *Handbook*, 26 §47; R. O. Faulkner, “Egypt: From the Inception of the Nineteenth Dynasty to the Death of Ramesses III,” *CAH* 2/2 (1975) 218; D.B. Redford, *History and Chronology of the Eighteenth Dynasty of Egypt* (Toronto: University of Toronto Press, 1967) 212 and n. 108; Long, “Re-examination,” 269-70.

27 Long, “Re-examination,” 269.

28 See discussion by M.B. Rowton, “Mesopotamian Chronology and the ‘Era of Menophres’,” *Iraq* 8 (1946) 107-10; Černý, “Supposed Beginning,” 150-52; Long, “Re-examination,” 269-71.

29 Redford, “History and Chronology,” 214. See R. Krauss for earlier attempts at derivation in *Das Ende der Amarnazeit: Beiträge zur Geschichte und Chronologie des Neuen Reiches* (HÄB 7; Hildesheim: Gerstenberg, 1981) 269.

30 See discussion by Rowton, “Mesopotamian Chronology,” 108-10; Redford, *History and Chronology of the Eighteenth Dynasty*, 214-15; Long, “Re-examination,” 269-71; E.R. Wente and C.C. van Siclen, “A Chronology of the New Kingdom,” *Studies in Honor of George R. Hughes*, SAOC 39; Chicago, IL: Oriental Institute of the University of Chicago (1976) 233 and n. 100.

31 Redford, *History and Chronology*, 214.

32 M. Bietak, “The Middle Bronze Age of the Levant—A New Approach to Relative and Absolute Chronology,” *High, Middle or Low?* Part 3, 92, 103 n. 61; W.A. Ward, “The Present Status of Egyptian Chronology,” *BASOR* 288 (1992) 59.

Table 10.5: Sothic cycle beginning at Memphis in 1314 BCE (new moon listing from −1313)

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1313	6	17	−1313	6	5	1468	12	5	1	9:47	5:05	186	5:05	70	5:05	−6
−1313	**7**	**17**	−1313	7	5	1468	**13**	**5**	3	1:11	5:02	156	5:02	**63**	5:02	**−18**
−1313	8	15	−1313	8	3	1469	**1**	**29**	4	18:01	5:15	240	5:16	140	5:16	51
−1313	9	14	−1313	9	2	1469	2	29	6	11:09	5:39	216	5:40	122	5:41	27

DoW = day of week; ToD = time of day.

The last day of the Egyptian year in −1313 fell on 17 July corresponding to the fifth epagomenal (13 5). The following day, I *3ḫt* 1 coincided with 18 July, an appropriate date for the heliacal rising of Sothis at this period of history using the calendar of Lower Egypt. According to the HELIAC Program using an altitude of 2–3 degrees, the date of the Sothic rising fell on the dates of 18–19 July at Memphis,[33] concurring with the above table.

The above references confirm that a Sothic cycle ran from 1314 BCE to 139 CE based on the calendar of Lower Egypt.[34]

Heliacal Rising of Sothis in the Reign of Ptolemy IV Philopator (221–205 BCE)

An enigmatic reference to the passage of Sothis through the civil year comes from the reign of Ptolemy IV Philopator (reigned 221–205 BCE.). It was found on an inscription at Elephantine (Aswan). Unfortunately, it does not mention the king's regnal year. The heliacal rising of Sothis referred to seems to have been observed at Memphis as it comes from the same sequence of dates as those of Ptolemy III in 238 BCE.

Marshall Clagett provides the inscription:

> Col. 1. Hail to you, Isis-Sothis …
>
> Col. 2. Lady (?) of 14 [centuries?] and mistress of 16 [what?], who has followed her dwelling place (i.e. been advancing through the civil year up to now?) for 730 years, 3 months, 3 days, and 3 hours.[35]

According to Leo Depuydt it is the "only such reference to the cycle in hieroglyphic sources."[36] Clagett affirms his confidence in his interpretation of it "as the recording of the position of Sirius rising on a specific year relating to a datable year of the reign of Ptolemy IV" but believes "it has not been so recognized because it is presented in numbers that are mixed measures."[37]

The confusing text appears to refer to the time-span from the beginning of a Sothic cycle until a certain year in the reign of Ptolemy IV Philopator. Clagett reckoned that the period added up to 1102½ years. Because Sothis stays on the same day for four

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33 Jean-Pierre Lacroix, "Heliacal Rising of Sirius in Thebes," at http://www.ancientcartography.net/LEVERheliaqueAN.html. Hereafter denoted as HELIAC.

34 Long refers to two additional dates, one from Theon claiming that in 26 BCE a period of 1460 years terminated in the fifth year of the reign of Augustus, after which the Egyptians found themselves every year a quarter of a day in advance again. The other date comes from Alburuni, an Arabian chronologist (lived 973–1048 CE), claiming that Augustus delayed reforming the calendar for five years in order to wait for the completion of a Sothic cycle in 26 BCE ("Re-examination," 273-74). Where this Sothic cycle originated and ended is not stated, and whether the date is correct is open to doubt.

35 M. Clagett, *Ancient Egyptian Science, Vol 2: Calendars, Clocks, and Astronomy* (Memoir Series vol. 214; Philadelphia, PA: American Philosophical Society, 1995) 331.

36 L. Depuydt, Review of M. Clagett's *Ancient Egyptian Science, Vol. 2: Calendars, Clocks, and Astronomy* in *JAOS* 118.1 (1998) 75.

37 Clagett, *Ancient Egyptian Science, Vol. 2*, 331.

years, the “months” and “days” have to be multiplied by four to obtain the number of “years” it took Sothis to travel through the cycle. The 730 years is half a Sothic cycle. Three months of 30 days equals 90, which is multiplied by four to total 360 years through the cycle. The 3 days = 12 years, and the 3 hours = ½ year. Three hours is an eighth of a day, and an eighth of any four-year “day” (a quadrennia) in the Sothic cycle is half a year. Altogether it is 1102½ years.[38]

In order to date the year of Ptolemy IV Philopator’s reign when the Sothic rising was observed, Clagett subtracted 1102½ years from the quadrennium 1321–1318 that he believed the Sothic cycle started on. Consequently, he dates the Sothic rising in Philopator’s reign to the year 218 BCE.[39] However, this is incorrect because he should have subtracted 1102½ years from the date of 1314 BCE. The result is half-way through the year 211 BCE. Philopator began to reign in 221, so 211 is his 11th year. This date comes only 27½ years after the Sothic date falling on 19 July in 238 BCE in the reign of Ptolemy III Euergetes II on II *šmw* 1. Therefore, 27½ years later, in the year 211, the Sothic rising in Philopator’s reign was observed on II *šmw* 7. This is illustrated schematically in Table 10.6.

Table 10.6: Quadrennia between 238 and 211 BCE in the reigns of Ptolemy III Euergetes II and Ptolemy IV Philopator

		Year date range
Sothic rising falling on 238 in reign of Ptolemy III Euergetes II	II *šmw* 1	238–235
	II *šmw* 2	234–231
	II *šmw* 3	230–227
	II *šmw* 4	226–223
221: 1st yr Ptolemy IV Philopator	II *šmw* 5	222–219
	II *šmw* 6	218–215
211: 11th yr Ptolemy IV PhilopatorI	II *šmw* 7	214–211

The date of II *šmw* 7 for the Sothic rising in Ptolemy IV Philopator’s 11th year in 211 BCE can be confirmed by its coincidence with the Julian date in that year. According to the HELIAC Program, the rising of Sothis in 211 fell on 22 or 23 July at Memphis. We can use Casperson’s new moon table, not for establishing a new moon date, but to determine when the Egyptian date of II *šmw* 7 coincided with the Julian date. In the Table 10.7, II *šmw* 21 equates to August 1 in −210 (211 BCE). Fourteen days earlier, on II *šmw* 7, the Julian date would be July 23 at Memphis, concurring with the date of the HELIAC Program.

Table 10.7: Ptolemy IV Philopator’s 11th year −210 (new moon listing from −210)

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−210	7	2	−210	6	28	2572	9	21	2	23:43	5:02	332	5:02	194	5:02	95
−210	**8**	**1**	−210	7	28	2572	**10**	**21**	4	8:51	5:12	252	5:12	141	5:13	31
−210	8	30	−210	8	26	2572	11	20	5	17:44	5:33	303	5:34	186	5:35	67

DoW = day of week; ToD = time of day.

The date affirms that the obscure reference at Elephantine can be understood to refer to the progress of Sothis through the civil calendar. There were 1102½ years before 211 BCE, indicating the beginning of a Sothic cycle in the year 1314 BCE, and 350 years after 211 BCE, indicating the end/beginning of a Sothic cycle in 139 CE. The length of the Sothic cycle was 1453 years, which is in accord with modern estimations.

[38] Ibid., 331-33. L. Depuydt recommends Clagett’s book as “very reliable and useful,” and cites the interpretation described here as “an original contribution” 75-76.

[39] Clagett, *Ancient Egyptian Science*, *Vol. 2*, 333.

Heliacal Rising of Sothis in the Reign of Ramesses III?

Another date for the heliacal rising of Sothis is found in List 23, Section 21, (line 629) of the Medinet Habu Festival calendar followed by a list of food for the festival offerings (lines 630–645).

> The inscription states, "First month of inundation, the coming out of Sothis on its day, offerings for Amon-Re, King of the gods and the portable image of King of Upper and Lower Egypt, *Wosermaatre meriamon*, with his Ennead in this day of festival.[40]

The king named is Ramesses III. The regnal year is not stated and there is no day-date. Nevertheless, a general timeframe can be determined for this Sothic rising. The preceding lists, Lists 20, 21, and 22, refer to the coronation of the king. List 21 states, "First month of summer, 26th day; day of the accession of King of Upper and Lower Egypt, Wosermaatre Meriamon; offerings for Amon-Re with his Ennead." List 24 dates the eve of the *w3gy* feast to I *3ḫt* 17, and List 25 dates the day of the *w3gy* feast to I *3ḫt* 1[8]. Therefore, the rising of Sothis appears to have taken place between the king's accession on I *ŝmw* 26 and I *3ḫt* 17.

A heliacal rising in I *3ḫt* indicates a day near the beginning of a Sothic cycle. Since Sothis rises on the same day for four consecutive years, I *3ḫt* 17 would fall 68 years after the beginning of a Sothic cycle. If this Sothic cycle was dated to the calendar of Lower Egypt (the calendar of Upper Egypt seems to have become obsolete), and began in 1314, the Sothic rising date in the reign of Ramesses III occurred sometime between 1314 and 1246. In my chronology, Ramesses III reigned for 31 years from 1293 to 1262 BCE. One of these years would allude to his Medinet Habu Sothic date, but without a regnal year, this is about as close as can be determined.

Recognizing the Sothic Cycle for Upper Egypt at Thebes

Our present search is for a date from another Sothic cycle by which we can ascertain the date of the Sothic rising in Amenhotep I's ninth year, on III *ŝmw* 9, given in the Ebers calendar.

Evidence for the date of 1314 for the commencement of a Sothic cycle dated to the calendar of Lower Egypt at the latitude of Memphis has been presented. Now it is necessary to adjust this date to the criteria of the Ebers calendar date of III *ŝmw* 9, assuming it records an observation at Thebes where the papyrus was found; where Amenhotep I resided; and where the calendar of Upper Egypt would apply.

According to the HELIAC Program, the heliacal rising of Sothis at Memphis fell on 18 or 19 July 1314, and in Thebes on 13 or 14 of July, depending on the factors taken into account, such as the height of the sun, etc. The latitude of Thebes at 25.7 degrees and Memphis at 29.9 degrees north is equivalent to about five days' difference in the sighting of the heliacal rising of Sothis in any one year. In terms of the Sothic cycle, the star is about 20 years further through the calendar at Memphis than at Thebes using the same calendar. If a month of 30 days had passed at the same location, the difference would amount to 120 years in the Sothic cycle, but because Sothis is further through its cycle at Memphis, the 20 years have to be deducted from the 120 years, leaving 100 years between the Sothic cycle ending at Thebes and the Sothic cycle beginning at Memphis in 1314. This 100-year period between 1414 and 1314 is fully documented by the reigns of kings of the 18th and 19th Dynasties, as we shall see.

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[40] S. el‑Sabban, *Temple Festival Calendars of Ancient Egypt* (Liverpool Monographs in Archaeology and Oriental Studies; Liverpool: Liverpool University Press, 2000) 88.

The end of the Sothic cycle observed at Thebes can be demonstrated from Casperson’s lunar table for the year −1413 (Table 10.8), when another cycle would also have commenced.

Table 10.8: End of Sothic cycle at Thebes in −1413 (new moon listing from −1413)

Thebes; Lat. 25.7, Long. 32.6; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1413	6	13	−1413	5	31	1368	11	6	5	17:16	5:16	262	5:16	139	5:15	45
−1413	**7**	**13**	−1413	6	30	1368	**12**	**6**	7	4:34	5:11	208	5:11	93	5:11	−12
−1413	8	11	−1413	7	29	1368	13	5	1	14:45	5:20	279	5:20	155	5:21	37

DoW = day of week; ToD = time of day.

In addition to using Casperson’s lunar tables for listing new moons, they also provide the synchronisms between the Egyptian calendar and Julian dates. The above table is based on the calendar of Lower Egypt (that is, the civil calendar of Greco–Roman times). Note **12 6** in the Egyptian column. When adjusted to the calendar of Upper Egypt by aligning the Egyptian months with a month earlier in the Julian calendar than that shown, 13 July corresponds to 13 6 (i.e. the sixth day of the 13th month). But since there is no 6th epagomenal day, the date equates to I *3ḫt* 1, validating the end of a Sothic cycle at Thebes in the Julian year of year −1413 or 1414 BCE.

Amenhotep I’s Ninth Year

To determine when Amenhotep I’s ninth year fell, we reckon the days between III *ŝmw* 9 and the last epagomenal, which is 57 days, and multiply it by four to bring it to years, which amounts to 228. Add 228 years to the date of 1414 and the ninth year of Amenhotep I is the year 1642!

Table 10.9 reports the Egyptian-dated column showing II *ŝmw* 9 and the Julian-dated column showing 13 July –1641. We have to convert II *ŝmw* 9 (the Lower Egyptian date to which the table is aligned) to III *ŝmw* 9 (the Upper Egyptian date).

Table 10.9: Amenhotep I’s ninth year in 1642 BCE (new moon listing for −1641)

Thebes; Lat. 25.7, Long. 32.6; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1641	6	13	−1641	5	30	1140	9	9	7	22:36	5:17	277	5:16	162	5:16	81
−1641	**7**	**13**	−1641	6	29	1140	**10**	**9**	2	13:59	5:11	229	5:11	136	5:11	**50**
−1641	8	12	−1641	7	29	1140	11	9	4	5:55	5:19	199	5:20	104	5:20	**8**

DoW = day of week; ToD = time of day.

II *šmw* 9 in the Lower Egyptian calendar equates to the Julian date of 13 July of the year –1641 (1642 BCE), also confirmed by the HELIAC Program, which supplies the date of either 12 or 13 July at Thebes using an altitude of 3 degrees for Sothis.[41] Coincidentally, the table also shows that II *šmw* 9 (10 9), the date given for the Sothic rising, is also the date of a new moon![42]

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[41] De Jong, “Heliacal Rising of Sothis,” *AEC* (2006) 438; M.G. Firneis and M. Rode-Paunzen, “Progress-Report on Egyptian Astrochronology,” *SCIEM II* (2003), 85.

[42] Borchardt had earlier suggested that the squiggle now read as “day 9” should be read as “new moon,” but this view has now been rejected by scholars (*Die Mittel zur Zeitlichen Festlegung von Punkten der ägyptischen Geschichte und ihre Anwendung*, [Quellen und Gorschungen zur Zeitbestimmung der ägyptischen Geschichte 2; Kairo: Selbstverlag, 1935] 20).

The Ebers date also provides a means of dating other heliacal risings of Sothis that are attributed to a specific regnal year dated to an Egyptian calendar, when converted to the Julian calendar. A more significant date would be hard to find.

Why Was the New Sothic Cycle Based on Memphis?

Recall that by the 18th–19th Dynasties the expanding population was moving southward from the Delta into Upper Egypt, and had virtually made obsolete the calendar of the south—its main remaining function being to date the heliacal risings of Sothis. If the heliacal rising of Sothis was to continue to be recorded, it must connect to the calendar now being used throughout Egypt: the calendar of Lower Egypt.

The appropriate time to make a change would be when the new year on I *3ḫt* 1 in the calendar of Lower Egypt coincided with the heliacal rising of Sothis at Memphis; that is, at the beginning of a new Sothic cycle. This occurred 100 years after the end of the cycle of Upper Egypt observed at Thebes.

The old Sothic cycle ended at *Thebes* in 1414 BCE, and the new one began at *Memphis* 100 years later in 1314 BCE. The end of the Theban-based cycle presented a not-to-be missed opportunity for the ancient Egyptians to make a change to an *official* observation site for the recording of Sothic dates by the calendar of Lower Egypt. The inauguration of a new Sothic cycle meant that not only Sothic rising dates, but all events, records, and festivities could be dated by the same calendar over the *entire* country.

Thanks to the Ebers calendar, we can attribute the explanation and solution of the puzzling ἀπὸ Μενόφρεως, the "*Era of Menophres.*" Without the *Ebers papyrus explicitly showing us a calendar that began with wp rnpt* and recording the date of III *ŝmw* 9 for a Sothic rising in Amenhotep I's ninth year, the transition of the Sothic cycle recordings to the calendar of Lower Egypt would have been much more difficult to detect, and the "*Era of Menophres*" may have remained an enigma.

Conclusion

The Ebers calendar, which has caused so much discussion and bewilderment, is really quite a simple little table, and easy to understand in its corresponding months and seasons using the calendar of Upper Egypt. It is of profound chronological significance with its record of the Sothic rising on III *ŝmw* 9 in Amenhotep I's ninth year.

There is no lunar calendar in the first column, and the second column is not an "aborted experiment" of a regnal year calendar beginning with Amenhotep I's accession eight years earlier on III *šmw* 9. Nor is it what Spalinger described as being "more valuable as an intellectual aspect of ancient Egyptian calendrics than as a solution to the chronology of the New Kingdom."[43]

Far from being of no chronological value, and its use disallowed for chronological purposes as stated in the Gothenburg colloquium of 1987,[44] the Ebers calendar is probably the most valuable chronological tool from Egypt that we are ever likely to possess.

In the preceding chapters I have sought to determine the calendars used by the ancient Egyptians, recognizing an unresolved problem concerning certain feasts that appeared to be dated out of their eponymous months in the Greco–Roman calendar. The search has led to recognizing two calendars, those of Upper Egypt and of Lower Egypt used by Egyptians in their respective regions. These calendars merged into one with the inauguration of the Sothic cycle at Memphis in 1314 BCE. This cycle became known as the "Era of Menophres." From 1314 on there was only one calendar of note: the civil

[43] Spalinger, "From Esna to Ebers," 761.

[44] See chap. 1 pp. 8–10.

calendar, which was based on the calendar of Lower Egypt—the prototype of the later Greco–Roman calendar.

Until now, the reconstruction of Egyptian chronology has relied on the assumption of only one civil calendar by which the heliacal risings of Sothis were recorded. No difference was understood between the calendar used to record the Sothic rising in Amenhotep I's ninth year at Thebes, and the calendar used to record the Sothic cycle that began in 1314 BCE at Memphis.

With the identification of a calendar of Upper Egypt, we can now reconstruct the chronology of ancient Egypt taking into account the effect that this calendar has had on the dates attributable to the regnal years of the kings. The date of 1642 BCE can be used to fix other Sothic risings considering the calendar and location.

From these dates, the regnal year dates recorded for kings—especially when set on lunar phases dated to the calendar of either Upper or Lower Egypt—give us the opportunity to reconstruct a credible chronology for ancient Egypt.

In the next three chapters, the utilization of the Sothic cycle and lunar phases at Illahun (Middle Kingdom) is demonstrated in the reigns of Sesostris III and his son Amenemhet III. The remainder of this book establishes the dynastic chronology of Egypt.

Chapter 11

Studying Sesostris III and Illahun - Sesostris III's Seventh Year

The reign of Sesostris III in the 12th Dynasty, documented by papyri found at Illahun, provides the earliest case with sufficient data of a chronological kind for the study of Sothic information, regnal dates, and Egyptian feasts. It permits a case study in the application of the Sothic cycle with corroboration by lunar observances. The full 12th Dynasty of regnal reigns will be presented later in the book.

Famous in this dynasty is the important Sothic date in the seventh year of Sesostris III, and some 40 lunar-based feast dates attributed to the reigns of Sesostris III and his son Amenemhet III.

This chapter discusses Sesostris III's seventh year in particular; and

Chapter 12 discusses various feasts in the light of identified dates; and

Chapter 13 looks at the *w3gy* (wagy) feast in particular.

Illahun Papyri

In 1889, the English archaeologist and Egyptologist, Sir Flinders Petrie, examined the pyramid district of Illahun dating to the Middle Kingdom (11th–12th Dynasties). In the débris of the mortuary temple of Sesostris II, many ancient papyri documents were found that were written in the Egyptian middle-hieratic script. The papyri were later identified as belonging to the time of Sesostris III and his son Amenemhet III—sixth and seventh kings of the nine kings of the 12th Dynasty. Further materials were found between 1889 and 1899. In 1899, L. Borchardt published the most important of the papyri,[1] with a further publication in 1935.[2]

However, problems of access to the Berlin Museum, which purchased most of the papyri, meant that much was unavailable for examination. In 1992, Ulrich Luft published a comprehensive account of the Illahun papyri, and an article that recognized three groups of texts relating to feasts, such as attendance lists, letters, and temple diaries or day books.[3]

The Sothic Date Attributed to Sesostris III's Seventh Year

In the diaries, a date appeared in the heading, followed by the feast name, and the name of the serving priest.[4] The temple diary on III *prt* 25 predicted a heliacal rising of

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[1] L. Borchardt, "Der zweite Papyrusfund von Kahun und die zeitliche Festlegung des mittleren Reiches der ägyptischen Deschichte," *ZÄS* 37 (1899) 89-103.

[2] Idem, *Mittel zur zeitlichen Festegung von Punkten der ägyptischen Geschichte und ihre Anwendung* (Band 2; Kairo: Selbstverlag, 1935).

[3] Papryus Berlin 10012 A recto II lines 18-21. See U. Luft, "Zur Chronologischen Verwertbarkeit des Sothisdatums aus Illahun, Illahunstudien IV," *SAK* 16 (1989) 221; idem, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992), 57; R. Krauss, "Arguments in Favor of a Low Chronology for the Middle and New Kingdom in Egypt," *SCIEM* (2000), 186.

[4] Borchardt, *Mittel zur zeitlichen*, 109-10.

Sothis on IV *prt* 16, a date 22 days hence. A further fragment of three incomplete lines (pBerlin 10012 B)[5] written by the same hand, dated to Year 7, eighth month, 17th day, recorded the receipt of festival offerings (200 assorted loaves, 60 jars of beer …) for the celebration of the rising of Sothis.[6] Comparing the writing of these papyri with other writings, Borchardt and other scholars determined that the temple book was from the seventh year of Sesostris III.[7]

The predicted (not observed) date of IV *prt* 16 has been discussed and accepted by most scholars as the festival day of the heliacal rising of Sothis, though Rolf Krauss' alternative proposal is noted later.

Illahun Sothic Cycle Dates

To assign a Julian calendar date to the heliacal rising of Sothis in Sesostris III's seventh year we must determine the place where the predicted rising of Sothis was to be observed and by what calendar it was dated, and convert it to the Julian calendar. We may assume that the predicted observation was at Illahun where the presumed feast was held. Illahun was situated in the northern region of *Upper* Egypt where Sothic risings were dated by the Sothic calendar of Upper Egypt.

We estimate the date for the Sothic rising in Sesostris III's seventh year by reckoning on the time-span from the beginning of the cycle on I *3ḫt* 1 and the date of the Sothic rising prediction for IV *prt* 16; likewise, from that date to the end of the current Sothic cycle down to the last epagomenal. This Sothic cycle observed at Illahun then must be adjusted to the dates known from Thebes in order to arrive at a Julian date for the cycle's commencement, and Sesostris III's seventh year. These dates then must be checked against the stated lunar dates for the king's sixth and eighth years.

The Julian Date for the Heliacal Rising of Sothis on IV *prt* 16

In chapter 10 we concluded that I *3ḫt* 1 equated to 13 July at Thebes in the year 1414 BCE. Ingham has calculated that the length of Sothic cycles vary becoming marginally shorter in more recent times. In the period ca. 2000 BCE, he calculated that the Sothic cycle lasted about 1456 years, not 1460.[8] The Sothic cycle that ended in 1414 BCE with an approximate length of 1456 years would have begun around 2870 BCE. Casperson's table (Table 11.1) can confirm the beginning of the Sothic cycle in 2870 BCE by confirming that I *3ḫt* 1 fell on the date of the Sothic rising.

Adjusting the table to the calendar of Upper Egypt, 12 23 becomes 13 23, or I *3ḫt* 23; that is, 18 days after the fifth epagomenal counted as the fifth day of the 13th month (13 5). Eighteen days before 29 July −2869 (2870 BCE), I *3ḫt* 1 fell on 12 July, as demonstrated by the lunar table. This concurs with the HELIAC Program, which gives variants of 11 or 12 July.[9] This date would apply for four years.

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[5] D. Franke, "Zur Chronologie des Mittleren Reiches (12-18. Dynastie) Teil 1: Die 12. Dynastie," *Orientalia* 57 (1988) 132.

[6] W.F. Edgerton, "Chronology of the Twelfth Dynasty," *JNES* 2 (1943) 308.

[7] Ibid., 308.

[8] M.F. Ingham, "The Length of the Sothic Cycle," *JEA* 55 (1969) 36-40.

[9] J-P. Lacroix, "Heliacal Rising of Sirius in Thebes," at http://www.ancientcartography.net/LEVERheliaqueAN.html (hereafter HELIAC Program), or R. Bywater and J-P. Lacroix, http://geocities.com/CapeCanaveral/Launchpad/4633/heliacJAVA.html

Table 11.1: Beginning of a Sothic cycle at Thebes in 2870 BCE (new moon listing from −2870)

Thebes; Lat. 25.7, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−2869	6	29	−2869	6	6	−89	11	23	7	18:34	5:14	291	5:14	164	5:13	73
−2869	**7**	**29**	−2869	7	6	−89	**12**	**23**	2	8:35	5:11	218	5:11	120	5:12	27
−2869	8	28	−2869	8	5	−89	1	18	4	1:38	5:23	178	5:24	83	5:24	−12

DoW = day of week; ToD = time of day.

Illahun, with a latitude of 29.2 degrees is approximately 3.5 degrees further north than Thebes at latitude 25.7 degrees, which means that I *3ḫt* 1 falls 3½ days later than at Thebes in any given year, and about 14 years further on in terms of the Sothic cycle. Thus the heliacal rising at Illahun on I *3ḫt* 1 would have been observed about 14 years earlier (in the civil calendar) than the heliacal rising of Sothis on I *3ḫt* 1 at Thebes in the same year, thus about 2884 BCE on a 1456-year cycle. (Put another way, the civil calendar would have to click over another 14 years before the civil calendar at Illahun would record the rising of Sothis on the same civil date as previously it was recorded at Thebes).

Assuming that 2884 BCE is *near* the date for the beginning of the Sothic cycle at Illahun on I *3ḫt* 1, we can estimate the date when the Sothic rising might have fallen on IV *prt* 16—the date recorded in Sesostris III's seventh year. Each month has 30 days equating to 120 years in the Sothic cycle. The months of I–IV *3ḫt* equate to 480 years, plus three months of *prt* equate to 360 years, and another 16 days equate to 64 years, which brings the total to 904 years. Subtracting 904 years from 2884 yields the date of 1980 BCE for the Illahun Sothic date of IV *prt* 16.

Casperson's lunar table (Table 11.2) demonstrates that a new moon occurs on IV *prt* 1 (8 1 Lower Egypt), which converts to 9 1 (I *ŝmw* 1 Upper Egypt). A heliacal rising of Sothis on IV *prt* 16 in the civil calendar in Upper Egypt would occur about 16 days earlier than I *ŝmw* 1 and equates to 14 July, since I *ŝmw* 1 equates to 29 July.

Table 11.2: Heliacal rising of Sothis at Illahun in −1979 (new moon listing from −1979)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1979	6	30	−1979	6	13	802	7	2	1	11:24	5:12	231	5:12	124	5:12	38
−1979	**7**	**29**	−1979	7	12	802	**8**	**1**	2	22:37	5:13	306	5:13	191	5:14	89
−1979	8	28	−1979	8	11	802	9	1	4	9:03	5:27	252	5:28	140	5:29	24

DoW = day of week; ToD = time of day.

This date is in accord with the HELIAC Program dating the rising to 14 July using a Sothic altitude of 3 degrees. Two other options are for 15 and 16 July, but it is 14 July that equates to IV *prt* 16.

Dating Lunar Phases for Sesostris III's Sixth and Eighth Years

The year 1980 appears to be Sesostris III's seventh year when the heliacal rising of Sothis was observed at Illahun on IV *prt* 16. Further checks of this date can be made by comparison with new moon dates for Sesostris III's sixth and eighth years. On the current projections, we would expect Sesostris III's sixth year in 1981 BCE (−1980) and his eighth year in 1979 BCE (−1978).

For Sesostris III's sixth year, we turn to an Illahun papyrus having the Berlin catalogue number 10282. It contains three civil dates in texts classified as 10282_1, 10282_2, and 10282_3. A date for a feast of Joy is found in pBerlin 10282 recto 3 heading (siglum 10282_1) and is dated to I *3ḫt* 18, which is held on the fourth lunar day, making the new moon I *3ḫt* 15.[10] The other two festivals on the same papyrus (10282_2 and 10282_3) are described only as "month feasts" and dated to II *3ḫt* 14, and III *3ḫt* 13(?), respectively. (The question mark indicates that Luft queried the latter date.)[11]

On which lunar day did these feasts fall? See Casperson's table below (Table 11.3). Note that lunar dates are recorded using the calendar of Lower Egypt; therefore, the following table does not have to be converted to the calendar of Upper Egypt. *Lunar* phases appear on the same day throughout Egypt.

Table 11.3: Sesostris III's sixth year in −1980 (new moon listing from −1980)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1981	12	16	−1981	11	29	800	12	20	6	21:20	6:45	268	6:45	159	6:45	59
−1980	1	15	−1981	12	29	801	**1**	**15**	1	15:18	6:57	219	6:57	104	6:57	**14**
−1980	2	14	−1980	1	28	801	**2**	**15**	3	9:05	6:44	153	6:44	**50**	6:43	**−23**
−1980	3	15	−1980	2	27	801	**3**	**15**	5	1:22	6:21	93	6:20	**13**	6:20	**−47**
−1980	4	13	−1980	3	27	801	4	14	6	15:39	5:56	182	5:55	58	5:55	−7

DoW = day of week; ToD = time of day.

In −1980 the "month feast" falling on II *3ḫt* 14 is a new moon day or the first day of the lunar month, as is the second "month feast" falling on III *3ḫt* 14. These two "month feasts" falling on the day of the new moon suggests that they are applicable to the year −1980, and presumably also the feast of Joy on the fourth lunar day.

This result can be further checked by two dates given in pBerlin 10130_1 and 10130_2 for Sesostris III's eighth year**.** The first text dates a Sand Moving festival to II *3ḫt* 22 and a Clothing festival to II *3ḫt* 24.[12] The second text date refers to a feast of the Line of the Nile Mile on IV *3ḫt* 11. Accordingly, we look for new moons before the Sand Moving and Clothing dates, to determine what lunar day they fell on, and whether the dates here are consistent with those of the sixth year. See Casperson's table below (Table 11:4).

Table 11.4: Sesostris III's eighth year −1978 (new moon listing from −1978)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1978	1	22	−1978	1	5	803	1	23	4	16:29	6:55	306	6:55	115	6:55	7
−1978	**2**	**21**	−1978	2	4	803	**2**	**23**	6	5:07	6:39	150	6:38	**36**	6:38	**−35**
−1978	**3**	**22**	−1978	3	5	803	**3**	**22**	7	18:46	6:16	232	6:15	**76**	6:14	**7**
−1978	4	21	−1978	4	4	803	4	22	2	9:26	5:50	148	5:49	58	5:48	2

DoW = day of week; ToD = time of day.

The new moons fell on II *3ḫt* 22 and III *3ḫt* 21 in the year −1978, which indicates that the Sand Moving festival fell on the day of the new moon followed by the Clothing festival on the third lunar day. The Line-of-the-Nile-Mile festival on IV *3ḫt* 11 fell on the 20th lunar day following the new moon on III *3ḫt* 21. The fact that the Sand Moving festival falls on the new moon seems to be intentional and consistent with the dates for the month feasts falling on the new moon in Sesostris III's sixth year.

[10] Luft, *Fixierung*, 117, 211.
[11] Ibid., 211.
[12] Ibid., 99, 209.

Corroborative Significance of Sothic and Lunar dates

We may assume, therefore, that the dates for the other named feasts are also reliable. *These dates produce a conclusion that Sesostris III’s seventh year must have fallen in 1980* BCE, reinforced by the consistent lunar dates in 1981 and 1979. That the Sothic date and the lunar dates support each other is a compelling argument for their reliability. It would be possible to give the lunar dates different years based on different 25-year cycles, but then the Sothic date would not fall on IV *prt* 16. So the predicted Sothic rising on IV *prt* 16 in Sesostris III’s seventh year can be dated with confidence to the year 1980 BCE. Before turning to the other Illahun feast dates in the reigns of Sesostris III and Amenemhet III, the Julian dates attributed to them by Luft and Krauss require some review.

Luft’s Illahun Dates Tested

At the outset we owe a debt of gratitude to Luft for publishing the Illahun papyri, which provide the basis for the following discussions of feast dates from the reigns of Sesostris III and Amenemhet III. However, when Luft published the Illahun papyri in 1992, he incorrectly assumed that the heliacal rising in Sesostris III’s seventh year was observed from Memphis and occurred between 1867 and 1863 BCE, or if from Elephantine, between 1843 and 1840 BCE.[13] He found what appeared to be a good match in 1866. From his calculations, he deduced a date for the heliacal rising of Sothis on IV *prt* 17 (not 16) at Memphis, which equated to 17 July, and at Elephantine he found the date of IV *prt* 17, which equated to 11 July in 1841 BCE.[14] He explained the date of IV *prt* 17 as the day on which the Egyptians *celebrated* the feast, not the date of the actual observation.[15]

Furthermore, the sixth and eighth years appear to provide a reasonable match for the feast dates in those years. Since Luft does not provide tables, Casperson’s lunar table for the relevant months for the years −1867 to −1864 with Memphis as the observation site is supplied below (Table 11.5). This can be compared with the previously provided tables for the relevant dates in Sesostris III’s sixth, seventh, and eighth years for the dates −1980, −1979 and −1978 (1981−1979 BCE) at Illahun.

Table 11.5: Luft’s dates for new moons in Sesostris III’s sixth, seventh and eighth years for −1867 to −1864 at Memphis (new moon listing from −1867 to −1864)

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1867	12	16	−1867	11	30	915	**1**	**14**	2	6:60	6:54	181	6:54	**79**	6:55	**−13**
−1866	1	15	−1867	12	30	915	**2**	**14**	4	1:56	6:58	133	6:58	**36**	6:58	−43
−1866	2	13	−1866	1	28	915	3	13	5	18:56	6:45	220	6:45	**80**	6:44	**2**
−1866	3	15	−1866	2	27	915	4	13	7	9:20	6:22	148	6:21	46	6:20	−15
−1865	6	1	−1865	5	16	916	7	1	2	4:09	5:16	194	5:15	97	5:15	25
−1865	**6**	**30**	−1865	6	14	916	**7**	**30**	3	13:24	5:02	282	5:02	153	5:02	**59**
−1865	**7**	**29**	−1865	7	13	916	**8**	**29**	4	21:60	5:04	343	5:04	207	5:05	**95**
−1865	8	28	−1865	8	12	916	9	29	6	6:53	5:21	256	5:22	135	5:23	13
−1865	12	24	−1865	12	8	917	**1**	**22**	5	5:39	6:57	205	6:57	**76**	6:57	−26
−1864	1	22	−1864	1	6	917	**2**	**21**	6	20:38	6:57	293	6:56	115	6:56	**20**
−1864	2	21	−1864	2	5	917	3	21	1	12:43	6:40	175	6:39	66	6:38	1

DoW = day of week; ToD = time of day.

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[13] Ibid., 226.

[14] Ibid., 226-27; see also, idem, “Illahunstudien IV: Zur chronologischen Verwertbarkeit des Sothisdatums,” *SAK* 16 (1989) 231-32; idem, “Priorities in Absolute Chronology,” *SCIEM II* (2003) 202.

[15] Idem, “Illahunstudien IV,” 222.

On the surface, the dates seem to match those of the Illahun texts for the sixth and eighth years, so Luft has dated the seventh year of Sesostris III to 1866, and the heliacal rising to IV *prt* 17. However, the chronology has been incorrectly derived from the assumption that only one civil calendar was used continuously throughout Egyptian history. No recognition is given to the fact that there are 100 years between the end of the Sothic cycle observed at Thebes, and the Sothic cycle instituted at Memphis in 1314, nor for the adjustment for the location of Illahun.

Luft's date for Sesostris III's seventh year in 1866 BCE is 114 years later than 1980—the extra 14 years being attributable to Luft assigning a year in which the new moon fell on IV *prt* 17 in 1866 in cycle-year 23 instead of in cycle-year nine as it is in 1980 BCE.

According to the HELIAC Program, Sothis rose heliacally in 1866 BCE on 17, 18, or 19 July. Casperson's table (Table 11.5) equates I *šmw* 29 (adjusted to the calendar of Upper Egypt) with 29 July. This means that IV *prt* 17 equates to 17 July as Luft believed. But this is a day later than in 1980 BCE when Sothis did rise heliacally on IV *prt* 16, the correct day.

Krauss' Dates for Sesostris III

Rolf Krauss also sought to date the heliacal rising of Sothis in Sesostris III's seventh year. In 2003, Krauss summarized the situation, noting that in 1950 scholars were forced to revise their assumption that Memphis was the observation site for the heliacal rising of Sothis due to new information from Assyrian–Babylonian king-lists shortening the chronology by 20 years. This could be achieved by shifting the observation site from Memphis to Thebes.[16] However, in the 1970s, due to Morris Bierbrier's work on genealogies,[17] it was believed that the chronology must again be shortened by 10–15 years.[18]

In 1978, Krauss had already argued for an Elephantine observation site rather than a Memphite or Theban site to accommodate lower dates proposed for Thutmose III (1479 accession) and Ramesses II (1279 accession) and to accommodate the Ebers Sothic date in the reign of Amenhotep I. He pointed out, among other arguments, that Elephantine was on the southern border of Egypt at which location the heliacal rising of Sothis would be seen in the country first.[19]

In 1998, based on the lower chronology, he searched Viktor Neugebauer's astronomical tables compiled in 1929[20] for dates that would fit the feasts in the reigns of Sesostris III and Amenhotep I, ranging from 1900 to 1700 BCE. He took into account dates for synchronisms between Assyria and Egypt, which he assumed were reliable. Because lunar dates tend to repeat themselves (not exactly) every 25 years he proposed

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[16] R. Krauss, "Arguments in Favor of a Low Chronology for the Middle and New Kingdom in Egypt," *SCIEM II* (2003) 184.

[17] Ibid., 184 n. 59 citing M. Bierbrier, *The Late New Kingdom in Egypt (c. 1300 – 644 B.C.)*, (Warminster: Aris and Phillips, 1975) 109ff.

[18] Ibid., 184.

[19] Idem, *Das Ende der Amarnazeit: Beitrage zur Geschichte und Chronologie des Neuen Reiches* (HÄB 7; Hildesheim: Gerstenberg, 1978; rep. 1981) 189-93. The inconsistency of proposing Elephantine as the observation site for the Ebers Sothic date when the Ebers papyrus was found at Thebes is pointed out by K.A. Kitchen in his review of Krauss's book (*JEA* 71 [1985] 44).

[20] A reference to O. Neugebauer and R. Parker, *Egyptian Astronomical Texts III. Decans, Planets, Constellations and Zodiacs* (Providence, RI: Brown University Press, 1969).

the dates of 1830, 1855, and 1880. Of these he found that 1830 gave the highest number of matches (14 out of 20) for the lunar dates given in the papyri.[21]

In 2003, his astronomical calculations were based on the computer program UraniaStar release 1.1. For his calculations of the old lunar crescent, he followed Mucke (1992), and for the heliacal rising of Sothis, he followed Pachner (1998).[22] Over the years, Krauss has reiterated his arguments for Elephantine as the observation site.[23]

Table 11.6 shows the Egyptian feast dates for Sesostris III's sixth, seventh, and eighth years from the Illahun papyri using the Julian dates proposed by Krauss for an observation at Elephantine. Casperson provides the relevant years for −1831/1830 to −1828. The middle section (−1829) represents Sesostris III's seventh year for the predicted heliacal rising.

Table 11.6: Krauss's dates for Sesostris III's sixth, seventh and eighth years in −1831 to −1828 (new moon listing from −1831 to −1828)

Elephantine; Lat. 24.0, Long. 32.85; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1831	11	8	−1831	10	23	950	12	20	2	10:30	6:21	230	6:21	123	6:22	19
−1831	**12**	**8**	−1831	11	22	951	**1**	**15**	4	4:10	6:38	186	6:39	**85**	6:39	**−13**
−1830	**1**	**6**	−1831	12	21	951	**2**	**14**	5	22:56	6:46	264	6:46	143	6:46	**45**
−1830	**2**	**5**	−1830	1	20	951	**3**	**14**	7	17:06	6:39	218	6:38	**92**	6:38	**5**
−1830	3	7	−1830	2	19	951	4	14	2	9:28	6:22	156	6:21	50	6:20	−22
−1829	5	24	−1829	5	8	952	7	2	4	6:51	5:30	183	5:30	89	5:29	18
−1829	**6**	**22**	−1829	6	6	952	**8**	**1**	5	18:26	5:17	282	5:17	158	5:17	**68**
−1829	7	22	−1829	7	6	952	9	1	7	4:37	5:15	224	5:15	118	5:16	13
−1829	12	16	−1829	11	30	953	1	23	7	9:35	6:42	254	6:42	120	6:42	1
−1828	**1**	**14**	−1829	12	29	953	**2**	**22**	1	22:21	6:45	356	6:45	160	6:45	**41**
−1828	**2**	**13**	−1828	1	28	953	**3**	**22**	3	12:06	6:35	217	6:35	**78**	6:34	**−7**
−1828	3	14	−1828	2	27	953	4	22	5	2:54	6:17	130	6:16	41	6:16	−22

DoW = day of week; ToD = time of day.

As discussed previously, the dates for Sesostris III's sixth year come from Illahun papyrus pBerlin 10282_{1-3}, in which a feast of Joy is dated to I *3ḫt* 18, and being held on the fourth lunar day gives a date for the new moon on I *3ḫt* 15 as in Casperson's table for 1981 BCE (Table 11.3). According to his table for the Krauss date of −1831 (Table 11.6) the new moon fell on I *3ḫt* 14. The other two days are "month-feasts," and fell on II *3ḫt* 14 and III *3ḫt* 14 as shown in Table 11.3, though in −1830 (Table 11.6) they are II *3ḫt* 14 and III *3ḫt* 13.

For Sesostris III's eighth year, pBerlin 10130 has three feast dates. A Sand Moving and a Clothing feast are held on the 22nd and 24th of II *3ḫt*, which occurred on the new moon and third lunar day according to Table 11.2, and Table 11.6 in –1828. The third feast is a Line-of-the-Nile-Mile feast dated to IV *3ḫt* 11. It takes its date from the new moon on III *3ḫt* 21, which indicates the feast was held on the 21st lunar day. This is shown in Table 11.4 and Table 11.6 (at −1828).

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21 R. Krauss, "Altägyptische Sirius- und Monddaten aus dem 19. und 18. Jahrhundert vor Christi Geburt (Berliner Illahun-Archiv)," *Ä und L* 8 (1998) 117-18.

22 H. Mucke, *Sichtbarkeitsverhältnisse und Sonnenlauf* (Sternfreunde-Seminar: Wiener Planetarium, 1992); N. Pachner, "Zur Erfassung der Sichtbarkeitsperioden ekliptikferner Gestirne," *Ä und L* 8 (1998) 125-36.

23 See for example, Krauss, "Sothis, Elephantine und die altägyptische Chronologie," *GM* 50 (1981) 71; idem, *Sothis- und Monddaten: Studien zur astronomischen und technischen Chronologie Altägyptens* (HÄB 20; Hildesheim: Gerstenberg, 1985) 63-67.

These dates demonstrate that Krauss's dates *seem* to match the feast data in the years given, but this is because he has appropriated the cycle of lunar dates (cycle year nine for Sesostris III's seventh year in 1830) that apply to the actual date of 1980, 150 years or six cycles of 25 lunar years earlier.

For Sesostris III's seventh year, in which the heliacal rising of Sothis was predicted for the date of IV *prt* 16, Krauss says that the offerings for the Sothic celebration were entered in the temple diary on IV *prt* 17. He notes that offerings were usually delivered a day or two before a festival, and suspects that a mistake was made by the scribe and the date for the Sothic rising ought to have shown IV *prt* 18.[24]

As we have determined above, the actual date was predicted accurately as IV *prt* 16 in 1980 BCE (see Table 11.3). In Table 11.6, in the year −1829, IV *prt* 1 (8 1) equates to 22 June (jul.), so IV *prt* 17 in the calendar of *Lower* Egypt (that Krauss used) would equate to 9 July, and IV *prt* 18 to 10 July. Krauss wrote:

> In 1830 BC, IV Peret *18 was the 9th of July. This date cannot be interpreted as an actually observed rising of Sothis, because during that epoch, Sothis did not rise before the 10th of July at any site within Egypt. Instead, IV Peret *18 in 1830 BC should be understood as a schematically determined date with reference to the southern border where Sothis rose on July 9th in the 28th century BC when the schematic Sothic calendar was introduced.[25]

The HELIAC Program sets the Sothic rising date on 12, 13, or 14 July in 1830 BCE observed at Elephantine with an altitude for Sothis of 2 degrees, demonstrating that the date of IV *prt* 18 is inappropriate. Krauss recognized the discrepancy but sought to explain it as a schematic date going back to the 28th century, not an observed date. The reason his Julian date did not comply with the Sothic rising date was because the year 1830 was 150 years later than the actual seventh year of Sesostris III in 1980 BCE.

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[24] Krauss, "Arguments," 186.
[25] Ibid., 187.

Chapter 12

Studying Sesostris III and Illahun - Feast Dates

From the Illahun papyrii that he published in 1992, Luft calculated 14 new moon dates from feasts dated to the civil calendar in the reign of Sesostris III, and a further 25 new moon dates from the reign of Amenemhet III. Some dates have been discussed so often that scholars have given them letters from A to G. This chapter examines the consistency between the dates I have proposed for Sesostris III and the timetable of dates for various feasts recorded in the Illahun papyrii.

But rather than discussing these dates in the chronological order of the kings' regnal years, I shall instead discuss them under the *civil* calendar feast names to show that they fall almost consistently on the same day of the *lunar* month in their respective years. There are a few exceptions, but these amount to only one day's difference and can have various explanations.

The feast groups are:
Phyle transfers from one priestly phyle (clan) to the next phyle;
Sand Moving followed by a Clothing feast;
The Feast of Joy;
The Excursion of the Land feast;
The Feast of the Line of the Nile Mile;
The Departure/Excursion Feast;
An Unnamed Feast;
Moveable and fixed *w3gy* (wagy) feasts (these will be covered in the next chapter.

The dates of feasts, if not held on the date of the new moon, are at least located to the same day or date relative to a new moon—making allowances for the estimates of phyle prediction, based on the experienced regularity of lunar cycles, which may not be as exactly precise as a Casperson table.

Phyle Dates

I begin with the priests' phyle dates, the dates when one priestly clan handed over their priestly duties to another phyle, occurring on a new moon. The *earliest* date is from Sesostris III's ninth year mentioned in pBerlin 10003 A recto III (16)–(19) (siglum 10003; known as E), when the fourth phyle completes its service and is replaced by the first phyle.[1] The day this occurred is not stated, but the text follows with entries dated from III *prt* 10 to IV *prt* 3. Krauss writes, "Luft dates the protocol to [III Peret 9], the day before the first preserved dated entry."[2] Luft understands this to be the day of the

[1] U. Luft, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992) 31-34, 204. The fourth phyle is replaced by the first phyle (lines 12-16), p. 33. See also Krauss, "Lunar Dates," *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006) 425.

[2] Krauss, "Lunar Dates," 425.

new moon.[3] Casperson's lunar table below (Table 12.1) reviews this date using the location of Illahun. If Sesostris III's seventh year is 1980 BCE then his ninth year will be 1978 BCE (−1977).

Table 12.1: Sesostris III's ninth year −1977 (new moon listing from −1977)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**						
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**		
−1977	6	8	−1977	5	22	804	6	10	2	16:23	5:14	238	5:13	128	5:12	57	
−1977	**7**	**8**	−1977	6	21	804	**7**	**10**	4	7:38	5:03	200	5:03	112	5:03	**33**	
−1977	8	6	−1977	7	20	804	8	9	5	23:44	5:08	271	5:09	175	5:09	84	

DoW = day of week; ToD = time of day.

Table 12.1 shows a new moon on III *prt* 10, the *first* preserved date given in the text. If, as assumed, one phyle ended and another began on the day of the new moon, it would occur on the 10th, not on the ninth day as Luft proposed. The date equates to 8 July in −1977. Luft wrote that his date of III *prt* 9 was confirmed by the delivery of an offering on the day of the *full moon* on III *prt* 24,[4] which, in his understanding, is the year 1864 (−1863). First, I check the full moon dates for the year −1977 given by Casperson (Table 12.2).

Table 12.2: Sesostris III's ninth year in −1977 (full moon listing from −1977)

Illahun; Lat. 29.2, Long. 31.0.												
Julian			**Gregorian**			**Egyptian**			**DoW**	**Time of Day**		
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**		**Full moon**	**Sunrise**	**Sunset**
−1977	6	23	−1977	6	6	804	6	25	3	15:34	5:06	18:06
−1977	**7**	**22**	−1977	7	5	804	**7**	**24**	4	22:51	5:04	18:04
−1977	8	21	−1977	8	4	804	8	24	6	7:31	5:18	18:18

DoW = day of week.

A full moon is recorded for III *prt* 24 in −1977, equating to 22 July, agreeing with the new moon on III *prt* 10. Fred Espenak's table (Table 12.3) provides the same dates for the new moons and full moons as given by Casperson's tables, confirming that the new moon date fell on III *prt* 10.

Phyle service in Amenemhet's 30th and 31st years all have dates belonging to a new moon.[5] Each phyle began and ended on the day of the new moon, as demonstrated here. This is contrary to Luft's understanding that the handover day is on the new moon but is the *last* day of the phyle month, so that the phyle starts on lunar day two.[6] Thus, for Luft, the first day of the phyle is the second lunar day. Espenak's table below (Table 12.3) shows that the new moon fell on 8 July and the full moon on 22 July[7] in agreement with Casperson's Julian date.

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[3] Luft, *Fixierung*, 34.

[4] Ibid., 204.

[5] Table 4.5, chap. 4, .p. 66.

[6] Luft writes, "I accept that the service ends on the New Moon's day … I have consequently used this new result in my forthcoming publication [*Fixierung*] with complete success." (U. Luft, "Remarks of a Philologist on Egyptian Chronology," *Ä und L* 3 [1992] 110). See Luft, *Fixierung*, 233-34. Krauss writes, "According to Luft, this 'month' designates a lunar month of temple service which started on a LD 2 and ended on a LD 1" (Krauss, "Lunar Dates," 426; citing *Fixierung*, 42-44).

[7] "Eclipse Predictions by Fred Espenak, NASA/GSFC" at http://eclipse.gsfc.nasa.gov//phase/phasecat.html

Table 12.3: Phases of the Moon for selected months of the year −1977

Year	New moon		First quarter		Full moon		Last quarter		ΔT
	Date	Time	Date	Time	Date	Time	Date	Time	
−1977							Jan 5	12:05	12h, 48m
−1977	Jun 8	13:51	Jun 16	16:52	Jun 23	13:02	Jun 30	04:56	
−1977	**Jul 8**	05:08	Jul 16	04:37	**Jul 22**	20:13	Jul 29	17:28	
−1977	Aug 6	21:15	Aug 14	14:24	Aug 21	04:49	Aug 28	09:52	

This offers corroboration for Sesostris III's ninth year being dated to 1978 BCE.

The second phyle date comes from the temple day book, pBerlin 10112 Bc recto (1–7) (siglum 10112), and is dated to the 10th year of Sesostris III.[8] It refers to the day of the handing over of service from one phyle to the next, and the date given is the last day of a month in the season of *3ḫt*, the month figure being broken away (line 6).[9] Line seven notes that the phyle begins on the day of the monthly feast, which infers the new moon day.[10] We look to Casperson's table for the year −1976 (1977 BCE).

Table 12.4: Sesostris III's 10th year −1976 (new moon listing from −1976)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			Gregorian			Egyptian			DoW	ToD	Morning visibility						
Yr	Mo	D	Yr	Mo	D	Yr	Mo	D			−2		−1		0		
−1976	3	30	−1976	3	13	805	4	1	4	0:39	6:08	159	6:08	55	6:07	−9	
−1976	**4**	**28**	−1976	4	11	805	**4**	**30**	5	9:56	5:43	234	5:43	102	5:42	**33**	
−1976	5	27	−1976	5	10	805	5	29	6	20:28	5:21	327	5:20	157	5:19	74	

DoW = day of week; ToD = time of day.

The only new moon that fell on the *last* day of *3ḫt* applies to IV *3ḫt* and day 30, consistent with our previous conclusion that the changeover of the phyles occurred on the first day of the lunar month; that is, the day of the new moon, and counted as the first day of the phyle's service.

By comparison, the new moon in −1862 (Luft's date for Sesostris III's 10th year) was IV *3ḫt* 28, with conjunction on the 29th. (See Casperson's table [Table 12.5] below). Luft dates the new moon to IV *3ḫt* 29, which is actually the second lunar day, but he applies this to the first lunar day, so that the 30th is the *second* lunar day, and the first day of the new phyle.[11]

Table 12.5: Sesostris III's 10th year according to Luft (new moon listing from −1862)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			Gregorian			Egyptian			DoW	ToD	Morning visibility					
Yr	Mo	D	Yr	Mo	D	Yr	Mo	D			−2		−1		0	
−1862	2	28	−1862	2	12	919	3	29	4	15:34	6:33	301	6:32	119	6:32	39
−1862	**3**	**30**	−1862	3	14	919	**4**	**29**	6	2:36	6:08	173	6:07	**82**	6:06	**20**
−1862	4	28	−1862	4	12	919	5	28	7	14:31	5:43	247	5:42	127	5:41	58

DoW = day of week; ToD = time of day.

The alternative dates given by Luft, where the new moon day usually occurs one day earlier in the civil month for his dates than those for the earlier range beginning in the 1980s, appear throughout his calculations. In an effort to not prolong the discussion, we concentrate now on the feasts dated to our chronology in which the seventh year of Sesostris III fell on 1980 BCE, and not on Lufts's dates, which can be found in his

[8] Luft, *Fixierung*, 96, 209.

[9] Ibid., 95-96, 209.

[10] Ibid., 96.

[11] Ibid., 209.

publication. Our conclusion is that the year −1976 for the second phyle date in Sesostris III's 10th year concurs with the data of the Illahun text pBerlin 10112.

The third phyle date is from pBerlin 10090 recto (7) **(**siglum 10090; known as document A), found in the temple day book, and dates to the third year of Amenemhet III.[12] Referring to the temple day book, Krauss writes, "The entries mention offerings on III Shemu 15, followed by '*sw3 ḥr* III Shemu 16' in turn followed by 'LD 1'. According to Luft '*sw3 ḥr* III Shemu 16' means that III Shemu 16 was skipped. If so, the LD 1 [Lunar Day 1] mentioned after III Shemu 16 has to be III Shemu 17."[13] In other words, lunar day one, equated with the new moon, ought to fall on III *šmw* 17, two days after the 15th day of the civil month. Amenemhet's third year can be ascertained because scholars now recognize that Sesostris III reigned 19 sole years then shared a co-regency with his son, Amenemhet III, for about 20 years.

Accordingly, Sesostris III's 19th year in 1968 BCE (−1967) is followed three years later by Amenemhet III's third year in 1965 (−1964). Casperson's table for Amenemhet's third year in −1964 is provided below in Table 12.6.

Table 12.6: Amenemhet III's third year −1964 (new moon listing from −1964)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1964	10	9	−1964	9	22	817	10	17	2	23:16	5:58	300	5:59	190	6:00	82
−1964	**11**	**8**	−1964	10	22	817	**11**	**17**	4	15:11	6:26	247	6:26	145	6:27	**43**
−1964	12	8	−1964	11	21	817	12	17	6	9:24	6:48	208	6:49	112	6:49	19

DoW = day of week; ToD = time of day.

A new moon fell on III *šmw* 17 in −1964, which concurs with the date of offerings on III *šmw* 15 two days previously, the 16th day being "skipped." My conclusion is that the −1964 date conforms to the text for Amenemhet III's third year.

The fourth phyle date comes from pBerlin 10056 A recto III (13) (siglum 10056_1) in which a list of offerings presented at the change of the phyles included those made in Amenemhet III's eighth year, dated to IV *3ḫt* 26.[14] By my chronology, Amenemhet's eighth year is 1960 BCE Casperson provides the lunar table (Table 12.7).

Table 12.7: Amenemhet III's eighth year −1959 (new moon listing from −1959)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1959	3	22	−1959	3	5	822	3	27	3	9:31	6:15	203	6:15	59	6:14	−10
−1959	**4**	**20**	−1959	4	3	822	**4**	**26**	4	20:28	5:50	323	5:50	111	5:49	**34**
−1959	5	20	−1959	5	3	822	5	26	6	8:53	5:26	189	5:25	89	5:24	25

DoW = day of week; ToD = time of day.

The new moon fell on IV *3ḫt* 26 in Amenemhet's eighth year in −1959 (1960 BCE), agreeing with the papyrus date, and confirming the date of the changeover of phyles on the first lunar day.

A fifth "pair" of phyle dates "reduced" by Luft both come from pBerlin 10006 recto III and II (sigla $10006_{1–2}$; known as Document C) and refer to Amenemhet III's 32nd year. Recto III gives dates of II *3ḫt* 9 and III *3ḫt* 7, indicating a lunar month for a

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[12] Ibid., 86-88, 208.

[13] R. Krauss, "Arguments in Favor of a Low Chronology for the Middle and New Kingdom in Egypt," *SCIEM II* (2003) 176; idem, "Lunar Dates," 425, citing Luft, *Fixierung*, 88.

[14] Luft, *Fixierung*, 70-73, 205.

phyle's period of service, and recto II gives dates of III *3ḫt* 6 and 7 for the deliveries of bread and wine for the feast on the day of the new moon.[15]

Casperson's table for Amenemhet III's 32nd year in –1935 (1936 BCE) is given below (Table 12.8).

Table 12.8: Amenemhet III's 32nd year −1935 (new moon listing from −1936 and −1935)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1936	12	28	−1936	12	11	846	1	9	5	9:23	6:56	217	6:57	96	6:57	4
−1935	**1**	**27**	−1935	1	10	846	**2**	**9**	7	1:41	6:53	151	6:53	**64**	6:52	**−6**
−1935	**2**	**25**	−1935	2	8	846	**3**	**8**	1	18:23	6:36	232	6:35	120	6:34	**54**
−1935	3	27	−1935	3	10	846	4	8	3	10:27	6:11	189	6:10	104	6:09	45

DoW = day of week; ToD = time of day.

New moons fell on II *3ḫt* 8 and III *3ḫt* 8; thus, the lunar month consisted of 30 days ending on III *3ḫt* 7, which is the second date from recto III, and the day before the new moon, indicating that the offerings for the feast on III *3ḫt* 6 and 7 (recto II) were delivered appropriately on the two days before the feast on the new moon day on III *3ḫt* 8.

The earlier date of II *3ḫt* 9 was apparently understood as the first day of the lunar month, though according to Table 12.8 it is the day *after* the new moon. In no other instance does a phyle begin on a second lunar day. But if this is a record for planning for being "on duty," and the list anticipates the approximate timing of a new moon, as rosters do, then the difference is immaterial.[16]

Sand Moving (ḫnp-šc) and/or Clothing (Mnḫt) Festivals

The next group of Illahun dates comes from the temple day book, which mentions the Sand Moving and/or Clothing festivals.

The first example comes from papyrus pBerlin 10092 b recto (8), (siglum 10092), and refers to offerings for a Clothing festival on II *3ḫt* 27 dated to Sesostris III's fifth year.[17] Casperson's table below (Table 12.9) gives the date for the year −1981 (1982 BCE).

Table 12.9: Sesostris III's fifth year −1981 (new moon listing from −1981)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1981	1	26	−1981	1	9	800	1	26	4	15:38	6:54	213	6:54	101	6:53	16
−1981	**2**	**25**	−1981	2	8	800	**2**	**26**	6	7:54	6:36	153	6:36	**49**	6:35	**−25**
−1981	3	26	−1981	3	9	800	3	25	7	21:01	6:13	276	6:12	88	6:11	4

DoW = day of week; ToD = time of day.

The new moon fell on II *3ḫt* 25, indicating that the offering for the Clothing festival on the 27th was dated to the third day of the lunar month (or two days after the new moon).

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[15] Ibid., 39-44, 204; Krauss, "Lunar Dates," 426; idem, "Arguments," 177.

[16] Krauss defends the beginning of a phyle on the second lunar day on the basis that it would avoid priests who had arrived on the 29th day expecting to start service on the next day having to go home because the old crescent appeared on the 30th day and having to return the following night (Krauss, "Arguments," 177). According to Table 12.8, II *3ḫt* 9 would have been the 31st day since the previous new moon and therefore inadmissible as a new moon day.

[17] Luft, *Fixierung*, 88-89, 208.

A second example comes from another Illahun papyrus, pBerlin 10130 Bc recto heading (siglum 10130_1), listing a Sand Moving festival on II *3ḫt* 22 and a Clothing festival on II *3ḫt* 24, dated to Sesostris III's eighth year.[18] This is discussed earlier in chapter 11 where Casperson's table (Table 11.4) appears for the year −1978.[19] The table shows that a new moon fell on II *3ḫt* 22. The Sand Moving festival, therefore, fell on the new moon day, or first lunar month day, and the Clothing festival on the 24th on the third lunar day, the same day as in the previous example in Sesostris III's fifth year.

A third example, in a third papyrus, is a copy of a letter known as pBerlin 10248 recto II (14) (designated F; siglum 10248). It refers to Sand Moving and Clothing festivals giving the dates of II *3ḫt* 18 and II *3ḫt* 20 in Sesostris III's 14th year.[20] Casperson's table for the year −1972 follows (Table 12.10).

Table 12.10: Sesostris III's 14th year −1972 (new moon listing from −1972)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1972	1	17	−1973	12	31	809	1	19	6	10:19	6:57	183	6:56	88	6:56	15
−1972	**2**	**16**	−1972	1	30	809	**2**	**19**	1	3:50	6:43	155	6:42	**77**	6:41	**15**
−1972	3	16	−1972	2	28	809	3	18	2	18:25	6:20	255	6:20	133	6:19	64

DoW = day of week; ToD = time of day.

The new moon is dated to II *3ḫt* 18, concurring with the date for the Sand Moving festival, and the Clothing festival on II *3ḫt* 20, the third lunar day, as in previous examples.

The fourth example shows another Clothing festival, which is noted on pBerlin 10166 verso heading (siglum 10166), attributed to Amenemhet III's ninth year and to II *3ḫt* 19, with a query by Luft concerning the date.[21] Casperson's table below (Table 12.11) gives the new moon as II *3ḫt* 17, so the Clothing festival would have been dated to II *3ḫt* 19, in agreement with the given date, and would have fallen on the third lunar day.

However, the text says the Clothing festival fell on the fourth lunar day, and the new moon on II *3ḫt* 16. It is quite possible that the first invisibility of the moon was observed on the 16th, given that the −1 column shows 110; therefore, the moon was barely visible.[22] But this date would give a 28-day lunar month, which is inadmissible. The date of II *3ḫt* 17 with the Clothing feast on the third lunar day appears to be correct.

Table 12.11: Amenemhet III's ninth year −1958 (new moon listing for −1958)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1958	1	12	−1959	12	26	823	1	18	5	6:17	6:57	239	6:57	80	6:57	−29
−1958	**2**	**10**	−1958	1	24	823	**2**	**17**	6	15:26	6:46	383	6:46	110	6:45	**4**
−1958	3	11	−1958	2	22	823	3	16	7	23:49	6:25	906	6:24	153	6:23	38

DoW = day of week; ToD = time of day.

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[18] Ibid., 99, 209.

[19] See chap. 11, p. 174.

[20] Krauss, "Lunar Dates," 425. Luft gives only the date of II *3ḫt* 18 in *Fixierung*, 110-11, 211.

[21] Luft, *Fixierung*, 104-05, 161, 210. He omits the feast date on page 210. The sketch on p. 104 shows the number 19 clearly.

[22] See n. 36 below.

Examples five and six are located in two Illahun papyri, pBerlin 10018 recto (1) (siglum 10018)[23] and 10079 recto heading (siglum 10079_1),[24] both from the 10th year of Amenemhet III. The first has a date for a Sand Moving festival on II *3ḫt* 6 followed by a Clothing festival, but the date is lost. However, it may be reconstructed as the eighth day since on the previous evidence it always follows two days after the Sand Moving feast.

The second text (10079_1) mentions a Sand Moving festival on II *3ḫt* 6; evidently the same feast as in the previous text since they both fall on the same year. Casperson's table for the year −1957 follows (Table 12.12).

Table 12.12: Amenemhet III's 10th year −1957 (new moon listing from −1957)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1957	1	1	−1958	12	15	824	1	7	2	20:12	6:57	321	6:57	148	6:57	33
−1957	**1**	**31**	−1957	1	14	824	**2**	**7**	4	7:26	6:52	220	6:51	**71**	6:51	**−19**
−1957	3	1	−1957	2	12	824	3	6	5	16:41	6:33	380	6:32	114	6:32	22

DoW = day of week; ToD = time of day.

The new moon fell on II *3ḫt* 6, indicating that the Sand Moving festival fell on a new moon day, concurring with the previous examples.

A seventh example of a Clothing festival comes from pBerlin 10206a recto heading (siglum 10206) dated to II *3ḫt* 27 in Amenemhet III's 36th year.[25] Casperson's table for the year −1931 is given below (Table 12.13).

Table 12.13: Amenemhet III's 36th year −1931 (new moon listing from −1931)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1931	1	13	−1932	12	27	850	1	26	5	14:09	6:57	289	6:57	154	6:57	55
−1931	**2**	**11**	−1931	1	25	850	**2**	**25**	6	23:30	6:45	464	6:45	205	6:44	**93**
−1931	3	13	−1931	2	24	850	3	25	1	7:37	6:23	267	6:22	116	6:21	26

DoW = day of week; ToD = time of day.

The new moon fell on II *3ḫt* 25, so II *3ḫt* 27 is the third lunar day, agreeing with the previous examples for the day of the Clothing festival. The dates for the Sand Moving and Clothing festivals fall on the civil month of II *3ḫt* and date to the first and third lunar days, respectively, as given in the lunar tables compiled for Illahun dated to the reigns of Sesostris III and Amenemhet III from 1982 down to 1932 BCE.

Feast of Joy (ihhy)

As already discussed in chapter 11, a feast of Joy is referred to in pBerlin 10282 recto 3 heading (siglum 10282_1) dated to I *3ḫt* 18 in the sixth year of Sesostris III.[26] The feast was celebrated on the fourth lunar day, the new moon being on the 15th, and dates to −1980 (1981 BCE).

A second feast of Joy is referred to in pBerlin 10412 d recto III (2) (siglum 10412) and dates to I *3ḫt* 24 of Sesostris III's 11th year.[27] Casperson provides the table (Table 12.14).

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[23] Luft, *Fixierung*, 60-61, where it is attributed to pBerlin 10018 recto (2), (5)–(6); but on p. 205 to recto (1).

[24] Ibid., 85-86, 208.

[25] Ibid., 105-6, 210.

[26] Ibid., 117, 211-12.

[27] Ibid., 131-32, 212.

Table 12.14: Sesostris III's 11th year −1976 and −1975 (new moon listing from −1976 and −1975)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**						
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**		
−1976	12	21	−1976	12	4	805	12	27	4	11:39	6:54	252	6:55	112	6:55	2	
−1975	**1**	**19**	−1975	1	2	805	**1**	**21**	5	23:05	6:56	448	6:56	165	6:55	**43**	
−1975	2	18	−1975	2	1	805	2	21	7	8:37	6:41	246	6:40	82	6:40	−2	

DoW = day of week; ToD = time of day.

The new moon fell on I *3ḫt* 21 so the feast of Joy on I *3ḫt* 24 is the fourth lunar day as in the previous example.

A third feast of Joy appears in pBerlin 10052 verso 9 (siglum 10052), in Amenemhet III's 24th year, for a date in I *3ḫt*. The text shows what is assumed to have been three rows of three horizontal strokes, but the top row has been damaged.[28] According to Luft, the number nine seems certain.[29] Casperson provides the table for −1944 (1945 BCE) (Table 12.15).

Table 12.15: Amenemhet III's 24th year −1944 (new moon listing from −1944 and −1943)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1944	10	28	−1944	10	11	837	11	11	4	21:12	6:16	326	6:17	205	6:18	81
−1944	11	27	−1944	11	10	837	**12**	**11**	6	8:35	6:41	253	6:42	132	6:42	**14**
−1944	**12**	**26**	−1944	12	9	837	**1**	**5**	7	21:05	6:56	320	6:56	175	6:56	**59**
−1943	1	25	−1943	1	8	837	2	5	2	10:30	6:54	224	6:54	89	6:53	−6

DoW = day of week; ToD = time of day.

The new moon fell on I *3ḫt* 5, so the feast of Joy, if held on I *3ḫt* 9, fell on the *fifth* lunar day unlike the two previous examples in the reign of Sesostris III where the feast fell on the fourth lunar day. Table 12.15 shows that the lunar month beginning on IV *šmw* 11 on day six of the week and ending on I *3ḫt* 4 also on day six, comprised a month of 30 days, so there is no chance that the new moon could have fallen on I *3ḫt* 6—to give a feast on lunar day four—which would have given an impossible lunar month of 31 days. It seems possible then that the top line of pBerlin 10052 verso 9 (siglum 10052), which has suffered some damage, originally read the number eight, consistent with the feast date on the fourth lunar day as in the previous examples. If there was no mistake in the recording of the date for the feast then it appears that for some unknown reason the feast was held on the fifth lunar day in the reign of Amenemhet III, not the fourth as in the reign of Sesostris III. The difference of one day does not mean that the feast cannot be attributed to Amenemhet III's 24th year in 1945 BCE.

Excursion of the Land Feast (ẖnt-nt-t3)

A fourth group of feasts is known as the Excursion of the Land. Four examples come from five texts, one of them being duplicated.

The first of these feasts comes from pBerlin 10009 recto II (17), (siglum 10009), in which payment for the delivery of the offering for the Land Excursion feast was dated to III *prt* 1 of Sesostris III's fifth year.[30] We have already noted Sesostris III's fifth year

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[28] Ibid., 67.

[29] Ibid., 68, 205, facing p. 224. See also discussion concerning the *w3gy* feast on this same text, p. 50.

[30] Ibid., 47-49, 204.

in connection with the Clothing feast dated to II *3ḫt* 27 falling on the third lunar day.[31] Casperson provides the table (Table 12.16) for the year −1981 and the dates for the season of *prt*.

Table 12.16: Sesostris III's fifth year −1981 (new moon listing from −1981)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1981	5	24	−1981	5	7	800	5	24	3	16:04	5:23	329	5:23	104	5:22	14
−1981	**6**	**22**	−1981	6	5	800	**6**	**23**	4	23:50	5:07	559	5:06	191	5:06	**68**
−1981	**7**	**22**	−1981	7	5	800	**7**	**23**	6	7:34	5:03	268	5:04	128	5:04	**20**
−1981	8	20	−1981	8	3	800	8	22	7	16:02	5:16	309	5:17	180	5:17	62

DoW = day of week; ToD = time of day.

The new moon in III *prt* fell on the 23rd day (7 23) so the Excursion feast on III *prt* 1 is dated from the previous new moon, which fell on II *prt* 23. There being 30 days to the lunar month, III *prt* 1 fell on the ninth lunar day.

A second Excursion of the Land feast fell in Sesostris III's 16th year, 1971 BCE by my chronology. This comes from pBerlin 10011 recto II (11)–(12), (siglum 10011).[32] It refers to a payment of the offering for the Excursion feast on III *prt* 2.[33] See Casperson's table below (Table 12,17).

Table 12.17: Sesostris III's 16th year −1970 (new moon listing from −1970)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1970	5	22	−1970	5	5	811	5	25	1	19:06	5:25	248	5:24	123	5:23	42
−1970	**6**	**21**	−1970	6	4	811	**6**	**25**	3	8:37	5:07	198	5:07	**86**	5:06	−1
−1970	**7**	**20**	−1970	7	3	811	**7**	**24**	4	20:45	5:03	304	5:03	158	5:03	**48**
−1970	8	19	−1970	8	2	811	8	24	6	7:47	5:16	241	5:16	115	5:17	0

DoW = day of week; ToD = time of day.

The new moon fell on III *prt* 24 so III *prt* 2 dates from the previous new moon on II *šmw* 24. The month has 30 days so III *prt* 2 falls on the ninth lunar day. This is the same result as for the previous Excursion of the Land feast.

A third Excursion of the Land feast is found on two Illahun papyri dating to III *prt* 11 of Amenemhet III's 24th year, 1944 BCE by my chronology. One feast is found in an attendance list in pBerlin 10104 recto heading (siglum 10104),[34] and the other is an announcement of the feast found on pCairo JE 71583 recto (1) (siglum 71583).[35] Casperson gives the table for the year −1943 in Table 12.18.

Table 12.18: Amenemhet III's 24th year −1943 (new moon listing from −1943)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1943	5	23	−1943	5	6	838	6	3	1	21:27	5:24	242	5:23	100	5:22	28
−1943	**6**	**22**	−1943	6	5	838	**7**	**3**	3	12:04	5:06	205	5:06	**100**	5:06	**26**
−1943	7	22	−1943	7	5	838	8	3	5	1:40	5:04	183	5:04	89	5:04	1

DoW = day of week; ToD = time of day.

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31 See Table 12.9, p. 183.

32 Luft, *Fixierung*, 50-52, 204.

33 Ibid., 204.

34 Ibid., 93-95, 209.

35 Ibid., 137-38, 212, facing page 224.

The question here is whether the moon was visible or invisible on the day before conjunction given the figure 100 in the −1 column. The figure 100 represents the position on the horizon at which point the moon becomes visible or invisible to an observer.[36] Assuming from the previous examples that the Excursion of the Land feast fell on the ninth lunar day on III *prt* 11, then in this year, the new moon would have fallen nine days earlier on III *prt* 2, indicating that the 100 figure in the −1 column meant that the *moon was invisible*. If the moon had been *visible* that day, the feast date would have fallen on the 10th lunar day, which would be one day later than in the previous two examples. It seems then that the Excursion of the Land feast can be attributed to the 10th lunar day in −1943.

Line of the Nile Mile Feast (šspt itrw)

The first of three Line of the Nile Mile feasts comes from pBerlin 10130 Bc recto heading (siglum 10130_2) dated to IV *3ḫt* 11 in the eighth year of Sesostris III.[37] We noted his eighth year previously when discussing the Sand Moving and Clothing feasts dated to II *3ḫt* 22 and 24, respectively, which fell on the first and third lunar days.[38] Casperson provides the table for −1978 below (Table 12.19).

Table 12.19: Sesostrish III's eighth year −1978 (new moon listing from −1978)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**						
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**		
−1978	2	21	−1978	2	4	803	2	23	6	5:07	6:39	150	6:38	36	6:38	−35	
−1978	**3**	**22**	−1978	3	5	803	**3**	**22**	7	18:46	6:16	232	6:15	**76**	6:14	**7**	
−1978	**4**	**21**	−1978	4	4	803	**4**	**22**	2	9:26	5:50	148	5:49	**58**	5:48	**2**	
−1978	5	21	−1978	5	4	803	5	22	4	0:39	5:25	130	5:25	58	5:24	1	

DoW = day of week; ToD = time of day.

The new moon fell on IV *3ḫt* 21, so the feast on the 11th must date from the previous month when a new moon fell on III *3ḫt* 21. This month has 30 days, which indicates that the Nile feast fell on the 21st lunar day (but see the comment in the next paragraph).

The second and third dates for this Line of the Nile Mile feast come from the 10th and 11th years of Amenemhet III. His 10th year is referred to in pBerlin 10079 recto heading (siglum 10079_2) where the date is III *3ḫt* 25,[39] and his 11th year in pBerlin 10344 (siglum 10344) where the date is IV *3ḫt* 14.[40] Casperson's table for the years −1957 and −1956 is given below in Table 12.20.

Table 12.20: Amenemhet III's 10th and 11th years −1957 and −1956 (new moon listing from −1956 and −1956)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1957	1	31	−1957	1	14	824	2	7	4	7:26	6:52	220	6:51	71	6:51	−19
−1957	**3**	**1**	−1957	2	12	824	**3**	**6**	5	16:41	6:33	380	6:32	114	6:32	**22**
−1957	3	31	−1957	3	14	824	4	6	7	0:32	6:08	175	6:07	63	6:06	−5

[36] Casperson writes, "A visibility number greater than one hundred means that if the weather was good the crescent of the moon should have been visible … A number less than one hundred means that the moon should have been invisible, and a negative number means that the moon was still below the horizon at sunrise" ("The Lunar Dates of Thutmose III," *JNES* 45 [1986] 146).

[37] Luft. *Fixierung*, 99, 209.

[38] See Table 11`.4 in chap. 11, p 174.

[39] Luft. *Fixierung*, 85-86, 208.

[40] Ibid., 120-21, 212.

−1956	2	19	−1956	2	2	825	2	26	3	7:31	6:41	192	6:40	73	6:39	−1
−1956	**3**	**19**	−1956	3	2	825	**3**	**25**	4	17:16	6:18	338	6:17	127	6:16	**45**
−1956	**4**	**18**	−1956	4	1	825	**4**	**25**	6	0:56	5:52	195	5:51	**86**	5:50	**15**
−1956	5	17	−1956	4	30	825	5	24	7	7:31	5:28	274	5:27	126	5:26	41

DoW = day of week; ToD = time of day.

In −1957 the new moon fell on III *3ḫt* 6, so the Line of the Nile Mile feast on III *3ḫt* 25 fell on the 20th lunar day. In the next year, −1956, the new moon fell on IV *3ḫt* 24 so the Nile feast on IV *3ḫt* 14 dates from the previous new moon on III *3ḫt* 25. This lunar month has 29 days (III *3ḫt* 25 to IV *3ḫt* 24) indicating that the Line of the Nile Mile feast fell on the 19th lunar day. These are one day and two days earlier, respectively, than for the feast in the eighth year of Sesostris III. However, the Egyptians may have understood the day of conjunction to be the first day of the lunar month, whether due to bad weather or some other reason, in which case the Line of the Nile Mile feast in Sesostris III's eighth year may also have fallen on what was understood to be the 20th day of the lunar month in all three instances.

Departure/Excursion Feast (ẖnt)

Another group of feasts called a Departure/Excursion feast (different from the Excursion of the Land feast) has just two examples.

The first comes from pBerlin 10165 (siglum 10165_1) in Sesostris III's 12th year dated to IV *prt* with a possible day of either 28 or 27.[41] Casperson's table for the year −1974 is provided below (Table 12.21).

Table 12.21: Sesostris III's 12th year −1974 (new moon listing from −1974)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1974	7	4	−1974	6	17	807	7	7	4	14:36	5:03	312	5:03	163	5:03	55
−1974	**8**	**3**	−1974	7	17	807	**8**	**7**	6	0:49	5:07	204	5:07	**90**	5:08	**−17**
−1974	9	1	−1974	8	15	807	9	6	7	13:60	5:25	251	5:26	140	5:26	34

DoW = day of week; ToD = time of day.

The new moon fell on IV *prt* 6 so IV *prt* 27 or 28 will fall on the 22nd or 23rd lunar day. The second date is from pBerlin 10218 (siglum 10218) and the feast date is I *šmw* 16 in Amenemhet III's eighth year.[42] Casperson's table for −1959 is provided below (Table 12.22).

Table 12.22: Amenemhet III's eighth year −1959 (new moon listing from −1959)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1959	8	17	−1959	7	31	822	8	25	4	6:59	5:15	202	5:15	110	5:16	18
−1959	**9**	**15**	−1959	8	29	822	**9**	**24**	5	23:57	5:37	272	5:38	176	5:38	**78**
−1959	10	15	−1959	9	28	822	10	24	7	16:19	6:04	248	6:05	148	6:06	44

DoW = day of week; ToD = time of day.

The new moon fell on I *šmw* 24, so the date of I *šmw* 16 dates from the previous new moon on IV *3ḫt* 25. IV *3ḫt* is a 29-day lunar month; therefore, the date of the feast fell on lunar day 22. This suggests that the previous Departure/Excursion feast date in Sesostris III's 12th year also fell on lunar day 22; thus, the feast date was IV *prt* 27, not 28.

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[41] Ibid., 101-03, 210.

[42] Ibid., 107-09, 210-11, facing p. 224.

An Unnamed Feast

The Illahun papyrus, pBerlin 10103 recto III (6) (siglum 10103; known as Document B) dates to Amenemhet III's 29th year, and refers to a lunar day nine. [43] Krauss writes, "In a letter dated I Shemu 15, an official complains that a LD9 [Lunar Day 9] had occurred, without the delivery of a bull for an offering which had been due. Luft argued that the non-delivery should have prompted an immediate reaction, 'so that in view of the small distances between the offices the 9th lunar day in all probability coincided with I Shemu 15,' i.e. LD 1 would fall on I Shemu 7."[44] We check this latter date with Casperson's table below for the year −1938 (Table 12.23).

Table 12.23: Amenemhet III's 29th year −1938 (new moon listing from −1938)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008															
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**				
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1938	7	26	−1938	7	9	843	8	8	1	6:03	5:04	250	5:05	128	5:05	16
−1938	**8**	**24**	−1938	8	7	843	**9**	**7**	2	16:39	5:19	285	5:20	167	5:21	**54**
−1938	9	23	−1938	9	6	843	10	7	4	6:11	5:44	215	5:44	107	5:45	0

DoW = day of week; ToD = time of day.

The new moon fell on I *šmw* 7. Therefore, nine days later, the date would be I *šmw* 15 when the letter was written, thus concurring with Luft's assumption that the non-delivery of the bull provoked an immediate reaction. It was due on the ninth, presumably the feast day, and had not arrived!

Summary

The analysis of the feasts according to their groups led to their establishment of the following lunar days.

The beginning of each phyle's period of service began on the new moon day and finished on the following new moon day (not the second lunar day as Luft proposed). The Sand Moving feast fell on the first lunar day, followed two days later by the Clothing feast on the third lunar day. The feast of Joy fell on the fourth lunar day; the Excursion of the Land feast fell on the 10th lunar day; the Line of the Nile Mile feast fell on the 20th lunar day; and the Departure/Excursion feast fell on the 22nd lunar day. The feasts were predetermined to fall on specific days in a lunar month dated to the civil calendar. We would expect the same practice to be followed with the last group of feasts, the so-called *w3gy* feasts, discussed in our next chapter.

The *w3gy* feasts have received concentrated attention from scholars and are treated here with the rigor appropriate to their importance in discussions of the Illahun papyri and the dating of the reigns of Sesostris III and Amenemhet III.

The inscriptional data in the Illahun materials offer numerous dates that can be checked and corroborated by lunar phases. The confirmation of multiple and connected chronological evidence shown in the detail of this chapter affords a high level of confidence in the accuracy for the dates of the reigns of Sesostris III and Amenemhet III and provides a secure anchor for dating the rest of the 12th Dynasty, which we come to later.

[43] Ibid., 90-93, 208-09.

[44] Krauss, "Lunar Dates," 425.

Chapter 13

Studying Sesostris III and Illahun - The *W3gy* Feast

Scholars recognize two types of *w3gy* feasts: the fixed, held on I *3ḫt* 18; and the moveable, with varying dates in the civil calendar. I alluded to the *w3gy* feasts earlier in chapter 4 when discussing feasts that Gardiner thought were from two civil calendars. Parker thought the moveable *w3gy* feasts could be explained as a transfer from a lunar to a civil calendar. Spalinger explained: "*W3gy* was originally located in the lunar calendar on day 18 of the *second* (lunar) month … it was moved to day 18 of the *first* civil month. Here, the parallelism with those seven civil months is overt"[1] (emphasis his).

The *w3gy* feast is not associated with an eponymous month, or the problem of feasts held out of their eponymous months, but is part of the discussion of feasts featured in the Illahun papyri. *W3gy* feasts had both fixed and moveable dates.[2] In this they were unique. The fixed *w3gy* feast dates occur on the 17th or 18th day of the first month of the civil calendar. The moveable *w3gy* feast falls on the 17th or 18th day of a lunar month dated to the civil calendar coming some months after the heliacal rising of Sothis. Determining when the movable *w3gy* feast fell after the rising of Sothis has important implications for dating Neferefre's reign in the 5th Dynasty (chapter 14). Before entering that discussion, I comment briefly on some examples of fixed *w3gy* dates, confirming their date on I *3ḫt* 18.

Fixed *W3gy* Feasts

The best example of a fixed *w3gy* feast comes from pBerlin 10282 recto 3rd headline (siglum 10282_1) where I *3ḫt* 18 is noted as the feast of Joy followed by mention of the *w3gy* feast. It seems that the *w3gy* feast is also dated to I *3ḫt* 18.[3] Luft dates this text to the sixth year of Sesostris III.[4] Confirmation that the feast of Joy and the *w3gy* feast were held on the same day comes from Casperson's table for Sesostris III's sixth year. This is shown in Table 11.3 in chapter 11 for the years −1981 and −1980. The new moon falls on I *3ḫt* 15, indicating that the feast of Joy fell on the fourth lunar day as in the previous examples. The feast of Joy coincided with the date for the *w3gy* feast. The *w3gy* feast cannot be the moveable one on the 17th lunar day, so must be the fixed *w3gy* feast on I *3ḫt* 18. It falls on 18 January 1981 BCE.

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1 A.J. Spalinger, "Notes on the Ancient Egyptian Calendars," *Orientalia* 64 (1995) 23; see also, idem, "Thoth and the Calendars," *Revolutions in Time: Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994) 49-52.

2 These terms, used in academic dialogue, are very unhelpful for understanding how they applied. The fixed feast was fixed to a date in the civil calendar (*I 3ḫt 18*), a calendar that we know moved forward through the Sothic cycle one day every four years. The movable feast was "movable" in relation to dates of the civil calendar, but as we shall see, was fixed to a certain period (October) in the agricultural year.

3 Luft, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992) 114-18 esp. 117, 210-11; idem, "The Date of the W3gy Feast: Considerations on the Chronology of the Old Kingdom," *Revolutions in Time*, 39.

4 Ibid., 210-11; facing page 224.

A second example of a fixed *w3gy* feast is cited by Luft from pBerlin 10007 recto 23, dated to I *3ḫt,* but it lacks the day date, and falls in year two of an unnamed king.[5] Luft applied the papyrus to Amenemhet III.[6] Year two appears in line 22 with the date of I *3ḫt* 1, followed by the notation "offerings of the new year." In line 23 there is no date, but the notation begins with a damaged "*w3gy* feast."[7] One assumes that this is the fixed *w3gy* feast with the date of I *3ḫt* 18, the date given in the first example above, and that I *3ḫt* 18 applies to the second *w3gy* feast date in Amenemhet III's second year in 1965 BCE.

Luft's third example of a fixed *w3gy* feast date comes from pBerlin 10052 verso 11.[8] He assigns this to Year 24 of Amenemhet III's reign. I discussed this papyrus fragment earlier and assigned it to the year 1945 BCE.[9] The relevant part is cited below in Table 13.1.

Table 13.1: Data from Papyrus Berlin 10052 Verso

Line	Year	Date
(9)	24	I *3ḫt* 9
(10)		17
(11)		18
(12)		20, day [
(13)		22 day of the [

Line nine refers to Year 24 followed by the reconstructed date of I *3ḫt* 9 assigned to the feast of Joy which fell on the fourth lunar day.[10] Under the day-dates for I *3ḫt,* line 10 has a number 17, line 11 a number 18, line 12 a number 20, and line 13 a number 22. The last two entries can be understood as a feast day, "day" being legible. The day 18 in line 11 is interpreted to refer to I *3ḫt* 18 and, therefore, a *w3gy* feast.

Other citations to the fixed *w3gy* feast are found in the Medinet Habu festival calendar. List 24 (line 646) reads "First month of inundation, 17th day; day of the eve of the *W3g* festival; offering for Amon-Re," etc.[11] This is followed in List 25 (line 667) with "First month of inundation, 1[8]th day; day of the *w3g* festival, offerings for Amon-Re," etc. [12] There appears to be a connection between lunar day 17 on which the moveable *w3gy* feast was held in the 12th Dynasty and the eve of the *w3gy* fixed feast on I *3ḫt* 17, followed by the fixed *w3gy* feast on I *3ḫt* 18 in the civil calendar in the 19th Dynasty (time of Ramesses II) based on the evidence of the Medinet Habu festival calendar. It seems that the examples of the feast of *w3gy* falling on lunar day 17 in the 12th Dynasty refers to the eve of the *w3gy* feast and the feast on the 18th being the main day of the feast. This could explain why the *w3gy* feast is dated to the 18th lunar day and not the 17th in pBerlin 10165_2.

Spalinger refers to the fixed *w3gy* feast as a sombre occasion "connected with the ingrained mortuary rituals of pharaonic Egypt … We see it as early as the Fourth Dynasty in the brief private feast lists that every tomb owner eventually felt it necessary

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5 Idem, "Date of the *W3gy* Feast," 39.

6 Idem, *Fixierung*, 152.

7 Ibid., 44-47.

8 Ibid., 67-68, 150f., idem, "Date of the *W3gy* Feast," 39.

9 See Table 12.15; chap. 12, p. 186.

10 See chap. 12, p.185.

11 S. el-Sabban, *Temple Festival Calendars of Ancient Egypt* (Liverpool Monographs in Archaeology and Oriental Studies, Liverpool University Press, 2000) 88.

12 Ibid., 89. According to Clagett the date is the 19th but should be the 18th (M. Clagett, *Ancient Egyptian Science, Vol. 2: Calendars, Clocks, and Astronomy* [Philadelphia: American Philosophical Society, 1995] 272).

to inscribe in his funerary monument … in historical times, there were actually two separate Wagy feasts, one set according to the cycle of the moon and a later one firmly placed at day eighteen of the first civil month."[13] The moveable *w3gy* kept the feast at approximately the same time in each solar/agricultural year whereas the fixed *w3gy* held on I *3ḫt* 18 would move away from the fourth month of the inundation (*3ḫt*) due to the civil calendar not keeping in step with the seasons and the heliacal rising of Sothis.

While the fixed *w3gy* feasts are straightforward, the moveable *w3gy* feasts are not.

Movable *W3gy* Feasts

Luft discussed five moveable *w3gy* feast dates in *Fixierung*.[14] Two years later, in 1994, he sought to demonstrate that the five *w3gy* feasts fell on the 18th lunar day and not the 13th as previously assumed by Richard Parker.[15] Luft noted, though, that the distance between the new moon and the *w3gy* feast amounts to 17 days. Then he says, "The calculations occurred with the omission of one day. Hence, the moveable *w3gy* is identical to the 18th day of a lunar month." He continues: "The result explains the date of the fixed *w3gy* as I *3ḫt* 18."[16]

Spalinger followed Luft's attribution of the fixed *w3gy* on I *3ḫt* 18.[17] Krauss, on the other hand, viewed Luft's *w3gy* dates as being one day late because Luft added a day to his calculations to bring the date into line with the *fixed w3gy* date. Krauss understands that the *w3gy* feast fell on the 17th lunar day.[18]

Luft also asked the question in 1994, "In which lunar month after the New Year was the moveable *w3gy* located?"[19] Or, to put it another way, how did the ancient Egyptians know when to celebrate a *w3gy* feast? Lunar months had to be attached to some recognizable lunar phase dated to the civil calendar. Luft proposed that in the Middle Kingdom *w3gy* feasts were celebrated exclusively in "the second lunar month after the heliacal rising of Sothis."[20] Luft's proposal has been followed by Krauss.[21]

It must be remembered that Luft and Krauss based their calculations for the Illahun dates on the assumption that there was only one civil calendar used in ancient Egypt. For this reason they gave incorrect dates to the Sothic rising on IV *prt* 16 in Sesostris III's seventh year. It was demonstrated in the previous chapter that Luft's dates for the Illahun feasts were always one day later in the month than those given by Casperson's tables because the new moon day falls one day earlier in Luft's incorrectly

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13 A.J. Spalinger, "Festival Calendars," *The Ancient Gods Speak* (ed. D.B. Redford; Oxford University Press, 2002) 126.

14 U. Luft, *Die chronologische Fixierung des ägyptischen Mittleren Reiches nach dem Tempelarchiv von Illahun* (Veröffentlichungen der Ägyptischen Kommission, 2; Wien: Verlag der Österreichische Akademie der Wissenschaften, 1992) 150-51, 204-5, 210, 212, 221-22.

15 U. Luft, "The Date of the *W3gy* Feast: Considerations on the Chronology of the Old Kingdom," *Revolutions in Time*, 39-41.

16 Ibid., 41.

17 A.J. Spalinger, "A Chronological Analysis of the Feast of *tḫy*," *SAK* 20 (1993) 291; idem, "Thoth and the Calendars," *Revolutions in Time*, 49 (in 1994); idem, "From Esna to Ebers: An Attempt at Calendrical Archaeology," *Studies in Honor of William Kelly Simpson*, Vol 2 (Boston: Museum of Fine Arts, 1996) 756; U. Luft, "Remarks of a Philologist on Egyptian Chronology," *Ä und L* 3 (1992) 111.

18 R. Krauss, "Fällt im Illahun-Archiv der 15. Mondmonatstag auf den 16. Mondmonatstag?" *GM* 138 (1994) 87-88; idem, "Wenn und Aber: Das Wag-Fest und die Chronologie des Alten Reiches," *GM* 162 (1998).

19 Luft. "Date of the *W3gy* Feast," 41.

20 Ibid., 41.

21 R. Krauss, "Arguments in Favor of a Low Chronology for the Middle and New Kingdom in Egypt," *SCIEM II* (2003) 187.

derived dates. The dates that Luft gives to the *w3gy* feasts in the reigns of Sesostris III and Amenemhet III also suffer from the same misconception.

Leaving aside the incorrect dates that Luft and Krauss proposed for Sesostris III and Amenemhet III, we need to determine on what day the moveable *w3gy* dates fell in the lunar month. Even more importantly, we need to ascertain in which civil month after the heliacal rising of Sothis the *w3gy* feast was celebrated, because that will give us information necessary for determining when a Sothic cycle started in the reign of Neferefre (Raneferef) of the 5th Dynasty.

Moveable *W3gy* Feasts from Illahun

The first example of a moveable *w3gy* feast comes from pBerlin 10165 recto (siglum 10165_2), dating a *w3gy* feast to II *šmw* 22.[22] The regnal year is missing, but Luft's calculations from this date and one in the 18th year of Sesostris III (pBerlin 10016), plus the paleography of the script, led him to place the *w3gy* feast in the 12th year of the reign of Sesostris III.[23] Casperson's table is given below (in Table 13.2) for the 12th year (−1974 in my chronology).

Table 13.2: Sesostris III's 12th year −1974 (new moon listing from −1974)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1974	7	4	−1974	6	17	807	**7**	**7**	4	14:36	5:03	312	5:03	163	5:03	55
−1974	8	3	−1974	7	17	807	8	7	6	0:49	5:07	204	5:07	90	5:08	−17
−1974	9	1	−1974	8	15	807	9	6	7	13:60	5:25	251	5:26	140	5:26	34
II *šmw* 22 falls in the third lunar month, after the rising of Sothis on 15 July																
−1974	**10**	**1**	−1974	9	14	807	**10**	**6**	2	6:10	5:51	201	5:51	**98**	5:52	**−2**
−1974	10	31	−1974	10	14	807	11	6	4	0:43	6:18	169	6:19	69	6:20	−28

DoW = day of week; ToD = time of day.

The new moon fell on II *šmw* 5 (day before 10 6), so II *šmw* 22 is the 18th lunar day, (same as for the fixed *w3gy* feast).

According to the HELIAC Program, Sothis rose heliacally on 15 or 16 July at an altitude of 3 degrees in 1975 BCE. However, throughout the reigns of Sesostris III and Amenemhet III, the HELIAC Program also gives the date of 14 July when it gives three optional dates, and only 15 and 16 July when it gives two options. We will recall from chapter 11 that in Sesostris III's seventh year the rising of Sothis on IV *prt* 16 fell on 14 July, since I *ŝmw* 1 equated with 29 July in Casperson's lunar table (Table 11.2).[24] It may be that the correct date is 14 July for the heliacal rising in Sesostris III's 12th and subsequent years. In deference to the HELIAC program, I use 15 July for the Sothic risings associated with the *w3gy* dates.

In the calendar of Lower Egypt by which lunar dates were reckoned, 15 July equates to III *prt* 18. II *šmw* 22 equates to 17 October, which fell at the beginning of the fourth solar/agricultural month after the heliacal rising on 15 July, which was, therefore, in the agricultural *season* of *3ḫt* (inundation). II *šmw* 22 does *not* fall in the second lunar month after the heliacal rising of Sothis in mid-July as Luft proposed.

[22] Luft, *Fixierung*, 101-03, 210; cited by Krauss, "Arguments," 176. L. Depuydt discusses pBerlin 10165, giving a hieroglyphic transcription of the text. He notes that the text says that civil day 19 equates to *smdt* or lunar day 15, followed in the next row by civil day 22 equated to the lunar day of *w3gy*. The word *šmw* is only partly preserved. He notes that Luft read the month as II *šmw* and Krauss as III *šmw*.("Sothic Chronology and the Old Kingdom," *JARCE* 37 [2000] 177).

[23] Luft, "Date of the *W3gy* Feast," 39-40.

[24] See ch. 11, p. 173.

The second example of a *w3gy* feast date comes from pBerlin 10016 recto (1), (siglum 10016; known as Document G). The *w3gy* feast is dated to II *šmw* 17 of Sesostris III's 18th year.[25]

Krauss writes,

> "Lunar date 3 is contained in pBerlin 10016, a letter written in 18 [Sesostris III], in which the scribe of the temple orders an offering animal for the (moveable) Wagi festival on II Shemu 17. After the date II Shemu 17, the scribe added: *2-nw n mddj-nt*. Luft understands this to mean 'on the second of full moon', whereas I render it as 'on the second (day) of lunar day 15' and understand it as a reference to lunar day 17. On the latter premise, the corresponding lunar day would be II Shemu 1."[26]

Commenting on this, Leo Depuydt points out that pBerlin 10016 gives the explicit statement in line 1 that, "the *w3gy* feast will occur in Year 18, II *šmw* 17."[27] Following this, at the beginning of line two, are the words *snnw n smdt*, which he says Luft and Krauss both translate as, "'two days after *smdt*.' But according to Luft, the reading of *snnw* [two days] is doubtful."[28] Depuydt discusses the meaning of the word *smdt*, which is usually understood to refer to the 15th lunar day, which he also understands it to be.[29] He points out that Luft "even goes as far as proposing to transcribe the word [*smdt*] as *md-dj-nt* '15(10 + 5)th'."[30] The new moon date in II *šmw* can be determined from Casperson's table for Sesostris III's 18th year in −1968 given below in Table 13.3. Then I consult the *full* moon table to determine what is meant by "*2-nw n mddj-nt*."

Table 13.3: Sesostris III's 18th year −1968 (new moon listing from −1968)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008															
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**				
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1968	6	28	−1968	6	11	813	7	3	6	3:10	5:04	150	5:04	48	5:04	−32
−1968	**7**	**27**	−1968	7	10	813	8	2	7	19:05	5:05	254	5:05	129	5:05	33
−1968	8	26	−1968	8	9	813	9	2	2	11:41	5:21	220	5:21	114	5:22	18
−1968	**9**	**25**	−1968	9	8	813	**10**	**2**	4	4:12	5:46	194	5:47	**92**	5:47	**−8**
−1968	10	24	−1968	10	7	813	11	1	5	19:38	6:12	271	6:13	165	6:14	61

DoW = day of week; ToD = time of day.

The new moon fell on II *šmw* 1, therefore, the *w3gy* feast date of II *šmw* 17 fell on the 17th lunar day counting inclusively. This would normally be two days after full moon. Casperson's *full* moon table is given below (Table 13.4) to help clarify what is meant by the expression "*2-nw n mddj-nt*."

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[25] Luft, *Fixierung*, 58-59, 204-05; idem, "Date of the *W3gy* Feast," 39-40; R. Krauss, "Lunar Dates," *Ancient Egyptian Chronology* (eds. E. Hornung, R. Krauss, D.A. Warburton; Leiden and Boston: Brill, 2006) 424.

[26] Krauss, "Arguments," 176; see also, idem, "Fällt im Illahun-Archiv," 87-88; idem, "Lunar Dates," 425.

[27] Depuydt, "Sothic Chronology," 178.

[28] Ibid., 178.

[29] Ibid., 178-79.

[30] Ibid., 178, giving a reference to *Fixierung*, 163.

Table 13.4: Full moon listing for Sesostris III's 18th year −1968 (full moon listing from −1968)

Illahun; Lat. 29.2, Long. 31.0.												
Julian			**Gregorian**			**Egyptian**			**DoW**	**Time of Day**		
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**		**Full moon**	**Sunrise**	**Sunset**
−1968	9	9	−1968	8	23	813	9	16	2	16:52	5:33	18:33
−1968	**10**	**9**	−1968	9	22	813	**10**	**16**	4	5:11	6:00	17:00
−1968	11	7	−1968	10	21	813	11	15	5	20:05	6:26	17:26

DoW = day of week.

The full moon fell on II *šmw* 16, which is the *16th lunar* day counting from the new moon on II *šmw* 1 as shown above. The *w3gy* date of II *šmw* 17 fell two days after the 15th *lunar* day on II *šmw* 15, not the full moon on II *šmw* 16. Thus if the "2 days" (*ssnw*) is the correct number, *2-nw n mḏdj-nt* appears to mean "two days after the 15th lunar day." My conclusion is that the moveable *w3gy* feast fell on the 17th lunar day, which in this instance equates to II *šmw* 17. This day equates to 9 October in 1969 BCE. It is dated from the *third new moon* after the Sothic rising on 15 or 16 July provided by the HELIAC Program. II *šmw* 17/October 9 fell in the latter half of the third month of the *season* of *3ḫt*, when flood waters would have been receding.

A third exemplar, designated as pCairo CG 58065 recto (3) (siglum 58065), dates the *w3gy* feast to II *šmw* 29. This applies to Amenemhet III's ninth year.[31] Casperson provides the table for the year -1958 below (Table 13.5).

Table 13.5: Amenemhet III's ninth year −1958 (new moon listing from −1958)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1958	**7**	**7**	−1958	6	20	823	**7**	**14**	6	15:50	5:03	259	5:03	149	5:03	**62**
−1958	8	6	−1958	7	20	823	8	14	1	6:56	5:08	205	5:09	111	5:09	20
−1958	9	5	−1958	8	19	823	9	14	3	0:32	5:28	172	5:29	78	5:30	−17
−1958	**10**	**4**	−1958	9	17	823	**10**	**13**	4	19:31	5:53	243	5:54	148	5:55	**53**
−1958	11	3	−1958	10	17	823	11	13	6	14:01	6:21	227	6:22	128	6:23	28

DoW = day of week; ToD = time of day.

The new moon fell on II *šmw* 13, therefore II *šmw* 29 when the *w3gy* feast occurred on the 17th lunar day. The *w3gy* feast is again dated from the third new moon after the rising of Sothis on 15 July. II *šmw* 29 equates to 20 October in −1958, which falls at the beginning of the fourth month in the season of *3ḫt*, when the flood waters were reaching their lowest level.

This date, and the second *w3gy* date above, indicate that the *w3gy* feast was held on the 17th lunar day, which suggests that it also applies to the first date (pBerlin 101652) although there it falls on the 18th day. In this case, the day of conjunction might have been reckoned as the first day of the lunar month on II *šmw* 6, rather than II *šmw* 5, or it might be that the 17th refers to the eve of the *w3gy* feast and the 18th to the next day, the main day of celebration.

A fourth example derives from two other *w3gy* feasts, but without day-dates, also found on Illahun papyri. One is pBerlin 10007 recto 19 of a year one of an unnamed king, in II *šmw*.[32] Luft applies this date to the first year of Amenemhet III.[33] Casperson supplies Table 13.6 for the year −1966.

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[31] Luft, *Fixierung*, 135-36, 212; idem, "Date of the *W3gy* Feast," 39-41; Krauss, "Arguments," 176; idem, "Lunar Dates," 425.

[32] Ibid., 44-46; idem, "Date of the *W3gy* Feast," 44-47.

[33] Idem, *Fixierung*, 152.

Table 13.6: Amenemhet III's first year −1966 (new moon listing from −1966)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																	
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**						
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**		
−1966	**7**	**6**	−1966	6	19	815	7	11	2	1:17	5:03	179	5:03	55	5:03	−35
−1966	8	4	−1966	7	18	815	8	10	3	13:58	5:08	255	5:08	126	5:08	26
−1966	9	3	−1966	8	17	815	9	10	5	5:56	5:26	196	5:27	96	5:28	2
−1966	**10**	**3**	−1966	9	16	815	**10**	**10**	7	0:31	5:52	168	5:53	**75**	5:54	**−19**
−1966	11	1	−1966	10	15	815	11	9	1	20:09	6:19	244	6:20	152	6:21	59

DoW = day of week; ToD = time of day.

The new moon fell on II *šmw* 9, and assuming that the *w3gy* feast fell on the 17th lunar day, the feast date is II *šmw* 25, which equates to October 19. Again the feast is dated from the third new moon after the rising of Sothis and takes place in the first half of the fourth *seasonal* month of *3ḫt*.

As a fifth example, the second moveable *w3gy* feast date without a day number comes from pBerlin 10419a recto II (4) of a Year 38 dated to III *šmw*. This date applies to Amenemhet III.[34] Casperson gives Table 13.7 for the year −1929.

Table 13.7: Amenemhet III's 38th year −1929 (new moon listing from −1929)

Illahun; Lat. 29.2, Long. 31.0; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−1929	**7**	**17**	−1929	6	30	852	**8**	**1**	3	5:37	5:03	256	5:03	95	5:03	−15
−1929	8	15	−1929	7	29	852	8	30	4	15:01	5:13	306	5:14	156	5:14	39
−1929	9	14	−1929	8	28	852	9	30	6	3:09	5:36	209	5:36	97	5:37	−10
−1929	10	13	−1929	9	26	852	10	29	7	18:13	6:02	262	6:03	157	6:03	**54**
−1929	**11**	**12**	−1929	10	26	852	**11**	**29**	2	11:47	6:29	221	6:29	125	6:30	**29**
−1929	12	12	−1929	11	25	852	12	29	4	6:50	6:50	195	6:51	105	6:51	16

DoW = day of week; ToD = time of day.

The new moon fell on III *šmw* 29 (11 29). Therefore, the *w3gy* feast dated to a day in III *šmw* must have been counted from the preceding new moon that fell on II *šmw* 29. II *šmw* has 30 days to the month so 17 days later the feast would have fallen on III *šmw* 16, which equates to 30 October. According to the HELIAC program, Sothis rose on 15 or 16 July at 3 degrees altitude in 1930. This *w3gy* feast dates from the *fourth* new moon after the rising of Sothis. However, the first new moon on IV *prt* 1 (8 1) comes only three days after the Sothic rising on 15 July, and the *w3gy* date still falls within the month of October; that is, within the first half of the fourth *seasonal* month of *3ḫt.* If the feast had been dated from the third new moon, it would have fallen on II *šmw* 16 equated with 29 September, which would mean that it fell at the end of the *second* seasonal month and not in the third; that is, in the month equated with October—as do all the others. This was perhaps too early in the season for the feast so the later date was preferred in anticipation of sowing and planting.[35]

These last two Illahun dates without the day number are provided to show what the *w3gy* date would have been, assuming that the feasts were celebrated on the 17th lunar day as in the other examples noted above.[36]

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[34] Ibid., 134-35, idem, "Date of the *W3gy* Feast," 40.

[35] For the context of inundation and sowing/planting in October in the early 12th Dynasty, see A.J. Spalinger, "Calendrical Evidence and Hekanakhte," *ZÄS* 123 (1996) 90-93 and n. 26 for basic studies cited. Note, however, that Spalinger uses the Gregorian calendar, which is dated approximately two weeks later than the Julian calendar used above.

[36] For Luft's calculations see *Fixierung*, 152.

Summary of Moveable *W3gy* Feasts

To summarize the results obtained from the preceding discussion of the moveable *w3gy* feasts, I conclude the following. The *w3gy* feast fell on the 17th day of the lunar month, which may have been the eve of the celebration, with the 18th day (as in one example) the main day of the feast. The *w3gy* feast fell in the month of October, in the third lunar month after the rising of Sothis on 15 July.

The first moveable *w3gy* feast date, from pBerlin 10165_2 from Sesostris III's 12th year, fell on II *šmw* 22, which equates to 17 October in 1975 BCE. The second *w3gy* feast date, from pBerlin 10016 from Sesostris III's 18th year, fell on II *šmw* 17, which equates to 9 October in 1969 BCE. The third *w3gy* feast date (from CG 58065) from Amenemhet III's ninth year, fell on II *šmw* 29, which equates to 20 October in 1959 BCE. The reconstructed *w3gy* feast date, from pBerlin 10007 from Amenemhet III's first year, fell on II *šmw* 26, which equates to 19 October in 1967 BCE. The second reconstructed *w3gy* feast date, from pBerlin 10419a from Amenemhet III's 38th year, fell on III *šmw* 15, which equates to 30 October in 1930 BCE.

The earliest of these dates is 9 October and the latest is 30 October, all within the space of one Julian calendar month. The month of October coincides with the second half of the third month and the first half of the fourth *seasonal* month of *3ḫt* (inundation). The feasts were all timed to fall in the third or fourth *seasonal* month of *3ḫt* regardless of their designation in the civil calendar. The feasts were tied to the agricultural/solar calendar commencing with the rising of Sothis each year.

In relation to the *civil calendar*, the moveable *w3gy* feasts would move through the Sothic cycle, occurring later and later in the civil calendar until arriving back at the beginning of the Sothic cycle. At the time of Sesostris III and Amenemhet III they had moved to the months of II and III *šmw*.

The date of a movable *w3gy* feast in the reign of Neferefre (Raneferef) secures a date in the 5th Dynasty. This results in exciting implications for Egyptian chronology.

Chapter 14

Securing Neferefre's *W3gy* Feast Date

Neferefre's W3gy Date

As noted in the previous chapter, *w3gy* dates are always associated with a Sothic rising date and a new moon date. There is another *w3gy* date from Abusir (near Memphis) inscribed in the tomb of a king known as Neferefre (or Raneferef) who is the fifth king of the 5th Dynasty. The new moon date associated with the *w3gy* date can pinpoint the year of the feast once the appropriate time period has been ascertained, and this can be done with the aid of the Sothic rising with which the *w3gy* date is associated.

The special significance of the *w3gy* feast in Neferefre's reign is that it appears to provide the earliest *secure* date for the Egyptian chronology. From this date it becomes possible to work backward and forward using the Turin Canon and other sources to gain dates for the other kings of the early dynasties.

The length of Neferefre's reign must also be ascertained. The king's name is now lost from the Turin Canon, although it can be positioned with the help of the associated fragmentary text. The upper tip of a vertical stroke that has a space between it and the year sign is read by some scholars as the stroke for year one.[1]

Neferefre's Premature Death

A short reign for Neferefre is inferred because the construction of Neferefre's pyramid at Abusir was cut short with only the lowest level partially completed,[2] suggesting that Neferefre died prematurely. The building was hastily converted to a square-shaped mastaba (a flat-roofed tomb) and Neferefre's mummy in his red granite sarcophagus was installed in its funerary apartments.[3]

After the king's demise, a mortuary temple was erected in front of the eastern side of the pyramid by Niuserre, Neferefre's successor. Papyri, recording the temple's archives of Neferefre's successors, mostly those of the late 5th Dynasty: Niuserre, Menkauhor, Djedkara, and Unas; and from the early 6th Dynasty: Teti and Pepi I, were found there. Clay sealings from their reigns were stored in its many rooms. Possibly in the 6th Dynasty, robbers ransacked the archive and the papyri were thrown about and trampled underfoot only to be covered by layers of dust and debris, which saved them from utter destruction in the ensuing 4500 years.[4]

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[1] A.H. Gardiner, *The Royal Canon of Turin* (Oxford: Griffith Institute, 1959) pl. II, col. III, line 21; J. Malek, "The Original Version of the Royal Canon of Turin," *JEA* 68 (1982) 95, col. 6, line 3.

[2] For a description of Neferefre's pyramid and mortuary temple see M. Verner, *The Pyramids: The Mystery, Culture, and Science of Egypt's Great Monuments* (tr. Steve Rendall; New York: Grove Press, 2001) 301-10; A. Winston, "The Pyramid of Neferefre (Raneferer) at Abusir," at http://www.touregypt.net/featurestories/neferefrep.htm.

[3] "Czech Egyptologists Open Shaft Tomb" at http://archive.archaeology.org/online/news/egypt2.html; online news May 27, 1998, of the Archeological Institute of America.

[4] P. Posener-Kriéger, M. Verner and H. Vymazalová, *Abusir X: The Pyramid Complex of Raneferef: The Papyrus Archive* (Prague: Czech Institute of Egyptology, Charles University, 2006) 20-23.

In 1982, a Czech expedition from the Prague Egyptological Institute, led by Miroslav Verner, excavated the Abusir site, one of the main cemeteries for ancient Memphis. In the pyramid's substructure, Verner noted that a year one had been inscribed by a mason. It was found "on a large corner block situated at the end of the tunnel for the [pyramid's] descending corridor … at about two thirds of the height of the extant core of the monument."[5] Pauline Posener-Kriéger, who later was largely responsible for the cleaning, conserving, and translation of papyri found in Neferefre's tomb, stated that the inscription indicated a reign no longer than one or two years.[6] Anthony Spalinger, however, noted that both the cult of Neferefre's mortuary temple and sun temple were in operation and stated, "I would think that a reign of at least a few years is more probable as the traces in the Turin Canon (verso III 21) seem to indicate a reign greater than one year."[7]

However, Verner reports two recently discovered inscriptions from Neferefre's unfinished pyramid, "on a big block of fine white limestone discovered *in situ* as part of the northern wall of the pit for the burial chamber." The first (no. 7) on the east side of the block refers to the "Year of the first occasion of the count," and the second (no. 8) also written in black paint and on the south side, refers to "Year of the first occasion (of the count), 4th month of the inundation, day 1+x."[8] Although there was no king's name, Verner attributes these two counts to Neferefre.[9] Since census counts are generally understood to begin in a king's *second* year, his "first count" refers to his second regnal year. It is possible that Neferefre can be attributed at least two years, and perhaps more.

Analysis from tiny remains of Neferefre's mummy wrappings and bones found in the mortuary temple ruins indicate that Neferefre died at the age of about 20–23 years indicating a *short reign* for the king.[10] This fact is significant because the moveable *w3gy* date is determined by a *new moon date* in the Egyptian civil calendar that always equates to October in the Julian calendar. Therefore, there are only a limited number of years to which the *w3gy* date in the reign of Neferefre can apply.

The Czech expedition found over 2000 papyri fragments in Neferefre's unfinished mortuary temple, many concerning daily services, festivals, inventories of furnishings, registers of accounts, and activities undertaken after the king's burial.[11] Of these, three were later found to refer to Neferefre's *w3gy* date.

Neferefre's *W3gy* Date

After Posener-Kriéger first published the *w3gy* dates in 1982, followed by a lexicon article in 1986,[12] there has been ongoing interest by scholars, particularly in the hope that the *w3gy* date might lead to an absolute date. Ulrich Luft attempted to date the

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[5] M. Verner, "Archaeological Remarks on the 4th and 5th Dynasty Chronology," *Archiv Orientální* 69 (2001) 400, cited in "Neferefre, " at http://en.wikipedia.org/wiki/Neferefre.

[6] Posener-Kriéger et al., *Abusir X*, 325.

[7] A.J. Spalinger, "Dated Texts of the Old Kingdom," *SAK* 21 (1994) 298 n. 60.

[8] Posener-Kriéger et al., *Abusir X*, 319.

[9] Ibid., 332.

[10] Verner, *The Pyramids*, 305-6.

[11] "Dynastic Periods: Old Kingdom: Neferefre," at http://www.aldokkan.com/egypt/neferefre.htm, 1.

[12] P. Posener-Kriéger, "Remarques preliminaries," *Ägypten: Dauer und Wandel. Symposium anlässlich des 75jährigen Bestehens des Deutschen Archäologischen Instituts, Kairo am 10. und 11. Oktober 1982,* (Mainz: von Zabern, 1985) 35-43; idem, "Wag-Fest" in *Lexikon der Ägyptologie* (eds. W. Helck and W. Westendorf; Wiesbaden: Harrassowitz, 1986) Vol. 6, 1135-39. Posener-Kriéger died in 1996.

Abusir archive in a 1994 article.[13] Krauss interacted with Luft's article in 1998,[14] and Depuydt discussed more extensively the *w3gy* feast dates in 2000.[15] The edition of Neferefre's archive, published jointly by Posener-Kriéger (posthumously), Verner, and Vymazalová in 2006, designates the *w3gy* fragments as 11E and 12A.[16] More recently (2008), Hana Vymazalová updated some aspects of the texts and I use these as the basis for discussion.[17]

Vymazalová refers to three texts (11A, 11E, and 12A) but only two dates. The badly damaged fragment 12A, formerly known as Document III by Posener-Kriéger, is one of the largest of its kind, consisting of approximately 15 partial lines. Vymazalová supplies a drawing.[18] The beginning of the scroll has not survived but a partial heading is present at the top right of the first line. It reads, "Month I of the *3ḫt* season, day 26: the scribe of the treasury, Tjeneni and the inspector of the custodians of the property, Khenty."[19]

The day is not clear but day 26 is most probable because of the traces of ink and the positioning of the strokes for the number.[20] Luft thought the reading in Document III (12A) could allow for more than one month-stroke, and opted for a date in III *3ḫt* the same as for the *w3gy* feast in Document IV. However, Depuydt points out that Luft did not have access to the text, and that Posener-Kriéger, who did, unambiguously read I *3ḫt*.[21] I *3ḫt* has been affirmed by Vymazalová.[22]

The fragment records "the distribution of linen to the phyles of the funerary temple."[23] Vymazalová goes on to note that the association with the feasts of *ḏḥwtyt* and *w3g* is not clear. The way the two festivals (unnamed) are written out seem to suggest that they were held at the same time. The attribution of the festivals to *ḏḥwtyt* and *w3g* seems to be predicated on their association with a partly preserved heading in large semi-hieratic signs on the right side of the fragment designated as 11A. It reads, "… after the *w3g*-festival …"[24] Vymazalová understands this to refer to an annual temple transaction in which temple attendants received quantities of linen that were recorded in an account table.[25] Thus the linen distribution of 12A is tied to the *w3gy* feast of 11A. If so, the date of I *3ḫt* 26 refers to the distribution of linen after a *w3gy* festival. But which *w3gy* festival?

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13 Luft, "Date of the *W3gy* Feast: Considerations on the Chronology of the Old Kingdom," *Revolutions in Time: Studies in Ancient Egyptian Calendrics* (ed. A.J. Spalinger; San Antonio, TX: Van Siclen, 1994), 39‑42.

14 R. Krauss, "Wenn und Aber: Das Wag-Fest und die Chronologie des Alten Reiches," *GM* 162 (1998) 53-58.

15 L. Depuydt, "Sothic Chronology and the Old Kingdom," *JARCE* 37 (2000) 172-80.

16 Posener-Kriéger et al., *Abusir X*, 222-24, 402-3.

17 H. Vymazalová, "Some Remarks on the *w3g*-festival in the Papyrus Archive of Raneferef," *Chronology and Archaeology in Ancient Egypt (The Third Millennium B.C.)*, (eds. H. Vymazalová and M. Bárta; Prague: Czech Institute of Egyptology, Charles University, 2008) 137-43.

18 Ibid., 139.

19 Ibid.

20 Ibid., 139-40.

21 Depuydt, "Sothic Chronology," 174; citing Krauss, "Wenn und Aber," *GM* 162 (1988) 54.

22 Vymazalová, "Some Remarks," 141.

23 Ibid., 140.

24 Ibid.

25 Ibid.

Posener-Kriéger at first associated this with the fixed *w3gy* feast, which always fell on I *3ḫt* 17/18, but then she considered that a date of I *3ḫt* 26 was too far removed.[26] Since there are only two *w3gy* festivals in any given year (the fixed and the moveable) the date of I *3ḫt* 26—if it does refer to the *w3gy* feast—must refer back to the *fixed w3gy* feast on the 18th since the second date refers to the moveable *w3gy*.

The second fragment, 11E, is the one of most interest. Vymazalová gives a drawing of this small fragment.[27] At the upper edge a date is written of which the month and day are preserved but not the season. The papyrus is completely broken away at this point. It reads “IIIrd month […] day 28.” Underneath the date is the sign of the *w3gy* festival.[28] The *season* that the *w3gy* date referred to is important in determining when the *w3gy* festival took place in the reign of Neferefre. It can only be III *3ḫt* 28, III *prt* 28, or III *šmw* 28. This date is not a fixed *w3gy* date falling on the 17th/18th day of I *3ḫt*, so it must be a *moveable w3gy* date.

As determined previously, the moveable *w3gy* feast in the 12th Dynasty fell on the 17th day (or the 18th if the 17th referred to the eve of the *w3gy* feast) after the date of a *new moon* in the *civil* calendar. If we apply the date of III *3ḫt* 28 to the *w3gy* festival we need to look for a new moon on III *3ḫt* 11 or 12.[29]

Third New Moon after the Rising of Sothis

This date implies a *w3gy* feast *early* in the Sothic cycle since the new moon for a *w3gy* festival is the *third* new moon after the rising of Sothis, so Sothis would have risen heliacally either at the end of IV *šmw* or at the beginning of I *3ḫt* in a month that equated to July in the Julian calendar. The III *3ḫt* 28 date would have to fall on some day in the second half of the third seasonal month or the first half of the fourth seasonal month, which equates to October in the Julian calendar.

The question arises, when did the new moon of III *3ḫt* 11 or 12 fall near to the *beginning of a Sothic cycle at Memphis* in the 5th Dynasty? I have already identified the commencement of a Sothic cycle that was inaugurated at Memphis in 1314 (see chapter 10, page 163ff.). The previous Sothic cycle would have begun somewhat less than 1460 years before, approximately 1456 years, indicating a Sothic cycle starting ca. 2770 BCE. Thus Neferefre’s reign would have fallen sometime before or after this date. The new moon on III *3ḫt* 11 falls only in one year in any 25-year lunar cycle. In this period of history, III *3ḫt* 11 fell in dates ending in years 75, 50, 25, 00, which is the 25 cycle-year. The closest date to 2700 is 2775; that is, five years *before* the earliest date for the Sothic rising, right at the end of a Sothic cycle. See Casperson’s table here (Table 14.1).

Table 14.1: New moon dates in −2774

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−2774	6	29	−2774	6	6	6	12	17	7	1916	5:05	256	5:04	147	5:04	65
−2774	**7**	**29**	−2774	7	6	7	1	12	2	10:42	5:02	218	5:02	118	5:02	26
−2774	8	28	−2774	8	5	7	2	12	4	1:36	5:16	188	5:17	84	5:18	−20
−2774	**9**	**26**	−2774	9	3	7	**3**	**11**	5	15:23	5:41	263	5:42	153	5:42	**41**
−2774	10	26	−2774	10	3	7	4	11	7	3:49	6:09	224	6:10	103	6:11	−17

DoW = day of week; ToD = time of day.

[26] Depuydt, “Sothic Chronology,” 174; Vymazalová, “Some Remarks,” 140.

[27] Vymazalová, “Some Remarks,” 141.

[28] Ibid., 140-41.

[29] Luft cites III *3ḫt* 11 (“Date of the W3gy Feast,” 42); Krauss, “Wenn und Aber,” 54.

In 2775, the date of III *3ḫt* 11 corresponds to *September* 26 in −2774 (2775 BCE). According to our previous analysis the *w3gy* date always corresponded to a day in *October*; thus, this date is not applicable. Looking at the next closest date, 2750, in Casperson's table below (Table 14.2), the line for −2749 9 20 (2750 BCE) also has a new moon date on III *3ḫt* 11.[30]

Table 14.2: New moon dates in −2749

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−2749	6	24	−2749	6	1	31	12	18	5	0:14	5:07	145	5:06	37	5:06	−46
−2749	**7**	**23**	−2749	6	30	32	**1**	**12**	6	10:54	5:01	258	5:01	108	5:01	2
−2749	8	21	−2749	7	29	32	2	11	7	21:08	5:12	355	5:12	190	5:13	66
−2749	**9**	**20**	−2749	8	28	32	**3**	**11**	2	7:30	5:35	256	5:36	129	5:37	**8**
−2749	10	19	−2749	9	26	32	4	10	3	18:14	6:02	312	6:03	185	6:04	63

DoW = day of week; ToD = time of day.

Eighteen days later, the *w3gy* feast would have been held on III *3ḫt* 28. This date equates to 7 October, so it falls in the third lunar month after the rising of Sothis on 11 July 11; thus, being in the appropriate month. Neferefre's new moon date fell in −2749 on III *3ḫt* 11.

The date of 2750 BCE meets the criteria for a *w3gy* feast in Neferefre's reign. A date 25 years later is not applicable because in the year 2725 the new moon fell on III *3ḫt* 10; therefore, not an exact date. The relevant lines are shown below in Table 14.3.

Table 14.3: New moon dates in −2724

Memphis; Lat. 29.9, Long. 31.2; visibility coefficients: c1 = 11.5, c2 = 0.008																
Julian			**Gregorian**			**Egyptian**			**DoW**	**ToD**	**Morning visibility**					
Yr	**Mo**	**D**	**Yr**	**Mo**	**D**	**Yr**	**Mo**	**D**			**−2**		**−1**		**0**	
−2724	8	14	−2724	7	22	57	2	11	4	11:58	5:08	290	5:09	163	5:09	48
−2724	9	12	−2724	8	20	57	**3**	**10**	5	21:34	5:29	329	5:30	208	5:31	**88**
−2724	10	12	−2724	9	19	57	4	10	7	9:05	5:56	253	5:57	135	5:58	18
−2724	11	10	−2724	10	18	57	5	9	1	22:56	6:24	299	6:25	187	6:26	76

DoW = day of week; ToD = time of day.

A date of III *3ḫt* 11 would have fallen on the *second* lunar day and there are no instances of a record of a new moon falling after conjunction in the records studied. This exercise, surveying three 25-year periods, confirms that the date of 2750 BCE meets the criteria for a *w3gy* feast in Neferefre's reign. A new moon on III *3ḫt* 11 in 2750 BCE with a *w3gy* festival 18 days later on III *3ḫt* 28 meets the criteria of fragment 11E, indicating that the season of *3ḫt* was originally written into the date.

The date of 2750 BCE for Neferefre's *w3gy* date, possibly the king's first or second regnal year, can be further confirmed by the chronology for the succeeding kings—some of whom have lunar dates recorded in specific years of the kings' reigns. Neferefre's successor, Niuserre, has a new moon date. The eighth king of the 5th Dynasty, Djedkare Isesi, also has a new moon date, and following him, Unas, the last king of the 5th Dynasty has two new moon dates.

In the 6th Dynasty, its third king, Pepi I, has a full moon date, and its fifth king, Pepi II, has both a new moon and a full moon date. In the following 8th Dynasty (the 7th not belonging to this line of kings) the penultimate king, whose name will be established, has a full moon date. Supplied with this number of lunar dates, and paying attention to regnal years in king-lists, we are able to determine the number of years and dates for the

[30] Casperson's tables show only new moon dates on III *3ḫt* 11 not III *3ḫt* 12, so III *3ḫt* 12 can be eliminated from consideration.

reigns of the kings following Neferefre to the end of the 8th Dynasty, which the following chapters detail.

See Volume Two for chapters 15 to 39

ISBN 978-0-473-29338-3 www.egyptchronology.com