FINAL REPORT

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"Conservation and Documentation of the Tomb of Menna"

Melinda Hartwig

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PREFACE

From 2007-2009, the Tomb of Menna (TT 69) Project -- a sponsored project of Georgia State University and the Egyptian Antiquities Conservation Project (EAC) and American Research Center in Egypt (ARCE) with funding from the United States Agency for International Development (USAID) – oversaw the conservation, archaeometric examination and digital recording of the world-famous painted tomb of Menna. The goal of the project was to set a new standard for the documentation and conservation of Egyptian monuments that focused on the non-invasive methods. Our aim was to examine every component of the tomb using a combination of interdisciplinary techniques. Archaeometry was introduced to help the conservators with their preservation strategies and art historians with their analysis of the decorative techniques. Digital photography and survey were brought in to create a complete condition survey and allow the archaeometrists to map their points. Digital photography and the survey also produced an exact replica of the chapel decoration and texts to document the tomb for the ages. The stitched photographs of the tomb decoration were also traced as line drawings. What follows in this volume is the result of a three-year interdisciplinary project that brought together some of the best technicians in their fields to preserve the tomb chapel of Menna (TT 69), one of the most beautiful and complete of the painted tombs in the ancient Egyptian Theban necropolis.

A project of this magnitude depends on the expertise and support of many people. First of all, the Menna Project would like to thank Dr. Zahi Hawass, Secretary General of the Supreme Council of Antiquities, for his keen interest and support of the project. Dr. Sabry Abdel Aziz, Director General for the Antiquities of the Nile Valley, was a fundamental supporter of the project early on. Mr. Magdy Ghandour, General Director of Foreign Missions Affairs, Dr. Monsour Bouriq, Director General of Antiquities- Luxor and Upper Egypt, Dr. Ali Asfar and the now Dr. Mostafa el-Weziry, Director General of Antiquities in West Thebes, facilitated work and offering a great deal of support over the three years.

The Tomb of Menna (TT 69) Project was a collaborative venture that worked in

partnership with a number of specialized authorities. An interdisciplinary team of scientists and researchers aided the archaeometric analysis of the chapel: Renata Garcia-Moreno, François Mathis, François-Philippe Hocquet and David Strivay from the *Centre Européen d'Archéométrie* of University of Liege, Belgium (CEA-ULg); Dimitri Laboury and Hugues Tavier from the University of Liege, Belgium (ULg); Peter Vandenabeele and Kerstin Leterme from the Department of Analytical Chemistry and the Department of Archaeology and Ancient History of Europe of Ghent University, Belgium; and Elsa Van Eslande from *Centre de Recherche et de Restauration des Musées de France*, France (C2RMF).

Our conservators skilfully restored the tomb chapel to its former glory: Bianca Madden (team supervisor), Cristina Berretta, our Egyptian conservator, Ahmed Yusef. The tomb was surveyed and mapped by a team of experts: Kai-Christian Bruhn, the University of Applied Sciences-Mainz, and Stefan Ziegler. The tomb chapel was digitally photographed by Andreas Paasch and Katy Doyle, aided by Kevin Doyle. Katy Doyle also negotiated the post-production survey and stitching of the digital photos, working tirelessly with abundant skill. Once completed, Pieter Collet digitally traced these stitched photographs as vector drawings, and opened a new avenue of non-invasive recording that we hope will set the standard for tomb publications to come.

At the Egyptian Antiquities Conservation Project (EAC), Michael Jones and Janie Abdel-Aziz offered much support as well as Safi Ouri, as the project accountant, who was the liason between the project and EAC/USAID. And a very special thanks goes to Gerry Scott who first encouraged me to apply for the USAID grant, suggesting that the tomb of Menna would be a great addition to the ARCE cadre of projects.

Melinda Hartwig
Atlanta, Georgia

LIST OF ABBREVIATIONS

AAAE	W. Stevenson Smith. *The Art and Architecture of Ancient Egypt*, 3d rev. ed. by W.K. Simpson. New Haven and London, 1998.
ÄA	Ägyptologische Abhandlungen. Wiesbaden.
ÄAT	Ägypten und Altes Testament. Wiesbaden.
ADAIK	Abhandlungen des Deutschen Archäologischen Instituts Kairo. Glückstadt, Hamburg, New York.
ÄF	Ägyptologische Forschungen. Glückstadt, Hamburg, New York.
AJSL	*The American Journal of Semitic Languages and Literature*. Chicago.
AOAT	Alter Orient und Altes Testament. Kevalaer and Neukirchen-Vluyn.
AOS	American Oriental Series. New Haven.
ASAE	*Annales du Service des Antiquités de l'Égypte*. Cairo.
ASE	Archaeological Survey of Egypt. London.
AV	Archäologische Veröffentlichungen. Deutsches Archäologisches Institut Abteilung Kairo. Vol. 1-3, Berlin; vol. 4ff, Mainz.
BABA	Beiträge zur ägyptischen Bauforschung und Altertumskunde. Cairo.
BARCE	*Bulletin of the American Research Center in Egypt*. Cairo.
BASOR	*Bulletin of the American Schools of Oriental Research*. New Haven, Cambridge, MA., Philadelphia.
BdÉ	Bibliothèque d'Étude. Cairo.
BES	*Bulletin of the Egyptological Seminar*. New York.
BiAeg	Bibliotheca Aegyptiaca. Brussels.
BIE	*Bulletin de l'Institut d'Égypte*. Alexandria, Egypt.
BIFAO	*Bulletin de l'Institut Français d'Archéologie Orientale*. Cairo.
BiOr	*Bibliotheca Orientalis*. Leiden.

BMMA	*Bulletin of the Metropolitan Museum of Art*. New York.
Boreas	Acta Universitatis Upsaliensis: Uppsala Studies in Ancient Mediterranean and Near Eastern Civilizations. Uppsala.
BSÉG	*Bulletin, Société d'Égyptologie Genève*. Geneva.
BSFÉ	*Bulletin de la Société Française d'Égyptologie*. Paris.
CAJ	*Cambridge Archaeological Journal*. Cambridge, U.K.
CANE	J.M. Sasson, ed. *Civilizations of the Ancient Near East*. New York, 1995.
CdÉ	*Chronique d'Égypte*. Brussels.
CDME	Raymond O. Faulkner. *A Concise Dictionary of Middle Egyptian.* Oxford, 1962.
CNS	Centre of Non-Western Studies. Leiden.
DIE	*Discussions in Egyptology*. Oxford.
DIFAO	Documents de fouilles de l'Institut français d'Archéologie Orientale. Cairo.
EG(3)	Alan H. Gardiner. *Ancient Egyptian Grammar*, 3d ed. Oxford, 1957.
EEF	Egypt Exploration Fund. London.
EU	Egyptologische Uitgaven. Leiden.
FIFAO	Fouilles de l'Institut Française d'Archéologie Orientale du Caire. Cairo.
GM	*Göttinger Miszellen*. Göttingen.
HÄB	Hildesheimer Ägyptologische Beiträge. Hildesheim.
HL1-Marburger ed.	Rainer Hannig, *Die Sprache der Pharaonen Grosses Handwörterbuch Ägyptisch-Deutsch (2800-950 v. Chr.) – Marburger Edition*. Kulturgeschichte der Antike Welt 64 (Mainz, 2006).
JARCE	*Journal of the American Research Center in Egypt*. Cambridge, MA., Boston, Princeton, New York, Evanston, IL.
JEA	*The Journal of Egyptian Archaeology*. London.

JEOL	*Jaarbericht van het Vooraziatisch-Egyptisch Gezelschap Ex Oriente Lux*. Leiden
JESHO	*Journal of the Economic and Social History of the Orient*. Leiden.
JNES	*Journal of Near Eastern Studies*. Chicago.
JSSEA	*The Journal of the Society for the Study of Egyptian Antiquities*. Toronto.
LÄ	*Lexikon der Ägyptologie*. Wiesbaden.
LÄS	Leipziger Ägyptologische Studien. Glückstadt, Hamburg, New York.
MÄS	Münchner Ägyptologische Studien. Munich.
Mem. Miss.	*Mémoires publiés par les membres de la Mission Archéologie Français au Caire*. Paris.
MDAIK	*Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo*. Before 1944: *Mitteilungen des Deutschen Instituts für Ägyptische Altertumskunde in Kairo.* Berlin, Wiesbaden, Mainz.
MIFAO	Mémoires publiés par les membres de l'Institut Français d'Archéologie Orientale du Caire. Cairo.
MMJ	*The Metropolitan Museum of Art Journal*. New York.
MMS	*Metropolitan Museum Studies*. New York.
NARCE	*Newsletter of the American Research Center in Egypt*. Princeton and New York.
OBO	Orbis Biblicus et Orientalis. Fribourg and Göttingen.
OEAE	Donald Redford, editor-in-chief. *The Oxford Encyclopedia of Ancient Egypt*. Oxford and New York, 2001.
OIC	Oriental Institute Communications. University of Chicago, Chicago.
OIP	Oriental Institute Publications. University of Chicago, Chicago.
OLA	Orientalia Lovaniensia Analecta. Leuven.
OLZ	*Orientalistische Literaturzeitung*. Leipzig.
OMROL	*Oudheidkundige medelelingen uit het Rijksmuseum van Oudheden te Leiden*.

	Leiden.
Or. Ant.	*Oriens Antiquus*. Rome.
PÄ	Probleme der Ägyptologie. Leiden.
PKG	Propyläen Kunstgeschichte. Berlin.
PM I,1(2)	Bertha Porter and Rosalind Moss. *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs, and Paintings. I. The Theban Necropolis. Part 1. Private Tombs*. 2d ed. Oxford, 1960.
PN	Hermann Ranke. *Die ägyptischen Personennamen*, 3 vols. Glückstadt-Hamburg-New York, 1977.
PMMA	Publications of the Metropolitan Museum of Art, Egyptian Expedition. New York.
PTT	Private Tombs at Thebes. Oxford.
RdÉ	*Revue d'Égyptologie*. Cairo and Paris.
Rec. Trav.	*Recueil de travaux rélatifs à la philologie et à l'archéologie égyptiennes et assyriennes*. Paris.
SAGA	Studien zur Archäologie und Geschichte Altägyptens. Heidelberg.
SAK	*Studien zur altägyptischen Kultur*. HamburgSAOC Studies in Ancient Oriental Civilization. The Oriental Institute of the University of Chicago. Chicago.
SAS	Schriften aus der Ägyptischen Sammlung. Munich.
SBAW	Sitzungsberichte der Bayerischen Akademie der Wissenschaften, Philos.-philol. u. hist. Klasse. Munich.
SDAIK	Sonderschrift. Deutsches Archäologisches Institut Abteilung Kairo. Mainz.
TTS	Theban Tomb Series. London.
URAÄ	Urkunden zum Rechtsleben im Alten Ägypten. Tübingen.
Urk. I	Kurt Sethe. *Urkunden des Alten Reiches*, 4 vols. Leipzig, 1933.

Urk. IV	Kurt Sethe. *Urkunden der 18. Dynastie*, 4 vols. (fasc. 1-16). 2d ed. Berlin and Graz, 1961.Wolfgang Helck. *Urkunden der 18. Dynastie* (fasc. 17-22). Berlin, 1955-1961.
VA	*Varia Aegyptiaca*. San Antonio.
Wb.	Adolf Erman and H. Grapow. *Wörterbuch der Aegyptischen Sprache*, I-VI, 4th ed. (Berlin, 1982); *Belegstellen* I-VI (Berlin, 1982).
WO	*Die Welt des Orients*. Wuppertal and Göttingen.
YES	Yale Egyptological Studies. New Haven.
ZÄS	*Zeitschrift für Ägyptische Sprache und Altertumskunde*. Leipzig and Berlin.
ZDMG	*Zeitschrift der Deutschen Morgenländischen Gesellschaft*. Leipzig.

UNPUBLISHED SOURCES

Chic. Or. Inst. Photos.	Taken by the Chicago University Oriental Institute Epigraphic Survey, Luxor, Egypt
Davies MSS.	Notebooks, etc. of Norman de Garis Davies, Griffith Institute, Oxford
Davies tracings	Tracings of TT 69 by Nina de Garis Davies, et al., Griffith Institute, Oxford
Gardiner MSS.	Papers of Sir Alan Gardiner, 1913-1915
MMA photos	Taken by the Egyptian Expedition. Series T. New York, The Metropolitan Museum of Art
Mond MSS.	Papers of Robert Mond, 1913-1915
Mond photos	Collection of photos of Robert Mond. Griffith Institute, Oxford
Schott photos	Taken by Siegfried Schott, University of Göttingen
Wb. Zettel	Notes from the Altägyptisches Wörterbuch, Berlin-Brandenburgische Akademie der Wissenschaften

Overview of the Tomb of Menna (TT 69)

Melinda Hartwig

The tomb of Menna (TT 69) is cut into the rock of the upper enclosure of Sheikh abd el-Qurna, adjacent to the tomb of the "high priest of Amun," Mery-Ptah (TT 68) which lies above TT 69 to the NW; C4 situated slightly to the NE belonging to Mery-maat, a "Wab-priest of Ma'at"; and the tomb of Nakht (TT 52), an "hour-watcher of Amun" below the hill (**Figure 1**).[1] The tomb is situated in a slightly sunken, enclosed forecourt that is accessed today by a stone ramp (**Figure 2)**. The plan of the tomb chapel is in the form of an inverted "T" composed of a broad transverse hall and a long inner hall with a shrine at the end (**Figures 3-4**).[2] The tomb chapel is remarkable not only for the quality of its paintings but the completeness of its decorative program.

The tomb of Menna (TT 69) as noted by many scholars has never been scientifically published.[3] The tomb was originally discovered by Maspero in 1886 and cleared by Robert Mond in 1903-4 for the Antiquities Service.[4] At the time Mond began the clearance, the tomb was already known by the local population and through guidebooks for visiting Europeans and was open to the public. Since then, numerous publications treat the decorative program in the chapel, beginning with Colin Campbell in 1910 and most recently, Mahmoud Maher-Taha in 2002.[5]

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[1] Karl-Joachim Seyfried, *Das Grab des Pa-en-khemenu (TT 68) and die Anlage TT 227*, Theben VI (Mainz, 1991), chapter 6.1. Nakht: Norman de Garis Davies, *The Tomb of Nakht at Thebes*, PMMA, Robb de Peyster Tytus Memorial Series I (New York, 1917). C-4: Lise Manniche, *Lost Tombs. A Study of Certain Eighteenth Dynasty Monuments in the Theban Necropolis* (London and New York, 1988), 100-124. The tomb of Nakht (TT 52) does not appear on Figure 1.

[2] Friederike Kampp, *Die thebanische Nekropole, Zum Wandel des Grabgedankens von der XVIII. bis zur XX. Dynastie* I, Theben XIII (Mainz, 1996), 294-297.

[3] Wolfgang Helck, "Menena," *LÄ* IV (1982), 46.

[4] Gaston Maspero, *L'archéologie égyptienne* (Paris, 1887), 147, fig. 151; idem, *Études de mythologie et d'archéologie egyptiennes*, vol. 1 (Paris, 1893), M. Robert Mond, "Report on work done in the Gebel esh-Sheikh Abd-el-Kurneh at Thebes, January to March 1903," *ASAE* V, 2 (1904), 102; idem, "Report of work in the necropolis of Thebes during the winter of 1903-1904," *ASAE* VI,1 (1905), 24. And see discussion below under "**The Structures of the Tomb."**

[5] Colin Campbell, *Two Theban Princes: Kha-em-uaset & Amenkhepesh sons of Ramesses II; Menna, a Land-Steward and their Tombs* (London, 1910), 85-107. Zahi Hawass (ed.) and Mahmoud Maher-Taha, *Le tombeau de Menna [TT. No 69]* (Cairo, 2002). See also **Chapter 2, n. 1.**

Textually, little is known about Menna other than the titles given in his tomb:

Scribe	*sš*
Overseer of Fields of Amun	*ímy-r 3ḥwt n Ïmn*
Overseer of ploughlands of Amun	*ímy-r ḫbsw n Ïmn*
Overseer of Fields of the Lord of Two Lands	*ímy-r 3ḥwt n nb -t3wy*
Scribe of the Fields of the Lord of Two Lands of South and North	*sš 3ḥwt n nb t3wy nw šmʿw mḥw*
Scribe of the Lord of the Lord of Two Lands	*sš n nb t3wy*

Menna's titles indicate he was a scribe and overseer of fields belonging to the Amun temple and a field scribe of the Lord of Two Lands in the south and north. As the "overseer of ploughlands of Amun," he also administered new temple land (*ḫbsw*) to be cultivated by a labor force.[6] As the overseer of the fields (*ímy-r 3ḥwt*), Menna would have supervised a number of field scribes, and reported to the central administration of the fields in the office of the granaries of the pharaoh.[7] From the scenes depicted in his tomb, Menna supervised delegations that measured the fields, brought defaulters to justice, inspected work in the field and recorded the yield of the crop.[8]

The administration of both state and temple fields at the same time by one person is unusual and limited to Menna during the eighteenth dynasty. Usually, the administration of temple fields was strikingly separated from fields under the state administration.[9] However, the Ramesside Wilbour papyrus may offer a clue. The Wilbour Papyrus illustrates how temple-owned lands were a special form of state property owned by the pharaoh.[10] During the reign of Amenhotep III and his vast building program, the wealth of Egypt and its office holders were given special favor as

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[6] Selke Eichler, *Die Verwaltung des"Hauses des Amun" in der 18. Dynastie*, SAK Beihefte 7 (Hamburg, 2000), 50, n. 192.

[7] Helck, *Verwaltung*, 113; Wolfgang Helck, "Felderverwaltung," *LÄ* II (1977), 154.

[8] Wolfgang Helck, *Zur Verwaltung des Mittleren und Neuen Reichs: Register* (Leiden, 1975), 114. See also scenes on BHNL.

[9] Eichler, *Haus des Amun*, 72. For example, Amenemhet Surer (T 48) only held the "Overseer of Fields of the Amun" (Torgny Säve-Söderbergh, *Four Eighteenth Dynasty Tombs*, PTT I (Oxford, 1957), 36).

[10] Alan H. Gardiner, *The Wilbour Papyrus* I-IV (Oxford, 1941-1952); Jac Janssen, rev. of L.A. Stuchevsky, *Zemledel'tsy gosudarstvennogo khozyaïstva drevnego Egipta epokhi Ramessidov (The Cultivators of the State Economy in Ancient Egypt during the Ramesside Period*) (Moskava, Izadtel'stvo 'Nauka', 1982) in *BiOr* 3/4 (May-July 1986), 352-366; Sally L.D. Katary, *Land Tenure in the Ramesside Period* (London and New York, 1989), 6. See also Richard Holton Pierce, "Land Use, Social Organization and Temple Economy," *Royal Anthropological Institute News* 15 (1976), 15-17.

the success crown depended on the stability, accumulation and redistribution of natural resources like grain. For this reason, the different offices of grain administration may have been centralized under Menna for greater efficiency.

In nearly every scene, Menna is depicted wearing the *šbyw*-collar known as the Gold of Honor. The Gold of Honor indicated that Menna received recognition from the king himself, and occupied a high office that directly concerned the king and the royal holdings.[11] In the reign of Thutmose IV, temple officials such as Amenhotep-sa-se (TT 75) and artists like Kha (TT 8) were awarded with the Gold of Honor. However, it was in the reign of Amenhotep III that high office holders concerned with the management of the resources of Egypt were awardees. It appears the king awarded the Gold of Honor to those whose loyalty was critical for the success of the pharaoh and Egypt's internal management.[12] In TT 182, Khaemhet is depicted before Amenhotep III wearing the Gold of Honor with the following caption:[13]

> The King appearing on the great throne in order to reward the controllers of Upper and Lower Egypt
> (1) Rewarding these stewards of these estates (2) of Pharaoh, l.p.h., and (3) these controllers of Upper and Lower Egypt (4) after this overseer of the two granaries had said about them: "They have given (5) more than their harvest of Year 30"

The text clearly states that a group of "controllers of Upper and Lower Egypt" had received the Gold of Honor after an exceptionally good harvest after the king's first Sed Festival of Year 30. Menna, a field overseer for Amun and the crown and scribe of the fields of North and South, was an official who controlled the distribution and taxation of grain. Menna probably received the Gold of Honor from the king after a year in which the harvest was particularly good. If he received the award the same year as Khaemhet, this would place Menna's career sometime at the end of the reign of Thutmose IV and well into the reign of Amenhotep III, near the ruler's year 30.

Menna also appears to have married well. His wife, Henuttawy, figures prominently in the tomb and appears in nearly every scene in the chapel. Her titles indicate she served as a "Chantress of Amun" (*šm'yt nt Imn*), a popular occupation for

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[11] Susanne Binder, *The Gold of Honour in the New Kingdom*, ACE 8 (Oxford, 2008), 257

[12] Ibid., 240-243, 311-312 [100].

[13] *Urk*. IV,1842.

noble women in the eighteenth dynasty. She also bore the title "Mistress of the House" (*nbt-pr*) which indicates that she probably came into the marriage with property.[14] About her parentage, Henuttawy may be the daughter of Amenhotep-sa-se, the second prophet of Amun – the next to highest office in the powerful Amun temple precinct at Karnak - and the owner of TT 75.[15] Theban tomb 75, which dates to the reign of Thutmose IV, depicts a daughter named Henuttawy who bears the title Chantress of Amun. Although the name Henuttawy (meaning "Mistress of the Two Lands") was a fairly common name in the eighteenth dynasty, the name is found primarily in Theban tombs dating to the reign of Thutmose III-Amenhotep II, and not later.[16] Another indicator of her parentage lies with the name of Menna's son Se who could have been named after Henuttawy's grandfather, Se. This lineage is recorded in the name of Henuttawy's father Amenhotep-sa-se that literally means "Amenhotep, son of Se."[17] Amenhotep-sa-se's wife, Ray, was a lady-in-waiting in the royal court (*ḫkrt nswt*), a position that was also held by Menna and Henuttawy's daughter, Amenemweskhet (*imn-m-wsḫt*). Another daughter, Nehemet (*nḥmt*), may also have served in this position because she is depicted with the distinctive crown associated with ladies-in-waiting.[18] Therefore, Henuttawy's genealogical link to Amenhotep-se-sa is accepted here but with caution. While Menna's representations were destroyed in the act *damnatio memoriae*, this did not befall his wife, his sons or his daughters in the tomb.

Menna had two sons whose titles are recorded: Se, a "scribe of counting grain of Amun," who followed his father's career, and Kha, a *wab*-priest. He also had four daughters: Amenemweskhet, a lady-in-waiting who also bore the epithet "praised of

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[14] Janet H. Johnson, "The legal status of women in ancient Egypt," in: A. Capel/G. Markoe (eds.), *Mistress of the House, Mistress of Heaven* (New York, 1996), 175-186.

[15] See discussion in Sheila Whale, *The Family in the Eighteenth Dynasty of Egypt*, The Australian Centre for Egyptology Studies 1 (Sydney, 1989), 208.

[16] The name Henuttawy is found primarily in Theban tombs dating to the reign of Thutmose III-Amenhotep II, as a wife of the tomb owner: TT 98 (Whale, op. cit., 130), TT 42 (Ibid., 120); TT 144 (PM1,1(2), 257); as a granddaughter of the tomb owner: TT 100 (Whale, op. cit., 132-133). Dating to the reign of Seti I: TT 51 (PM1,1(2), 98). See also Hermann Ranke, *Die Ägyptischen Personennamen*, vol. 1 (Glückstadt, 1935), 244, no. 12.

[17] Davies, *Two Officials*, 4, mentions that "sa-se" can mean "son of a gentleman." However, in his tomb, Amenhotep refers to himself as Amenhotep-sa-se, and on the west wall of the shrine, he is "born of the *nbt-pr* Pa'a," giving his complete parentage (Ibid, pl. XVI).

[18] Whale, *Family*, p. 278, n. 20. For the transliteration of the name see Ranke, *Personennamen* I, 208, no. 18.

Hathor." Nehemet was "praised of Amun" and also wears a crown similar to Amenemweskhet, suggesting that she too was also a lady-in-waiting to the royal court.[19] Two additional daughters held the titles of "Mistress of the House" and "Chantress of Amun," Way (*wii*) and Nefery, (*nfr(i)*i)[20] and the last daughter, Kasy (*kꜣsy*), appears on several walls but without titles. The name of another daughter (?) Tj….wy (*ṯ…wy*) appears on the left back wall of the broad hall, and was once was associated with the banqueting scene.[21] Other children may have appeared in the chapel decoration, but are unidentified.

In the majority of studies, the decoration in the tomb of Menna (TT 69) dates to Thutmose IV.[22] However, a few articles point to the tomb chapel's manufacture during the transitional period of Thutmose IV/Amenhotep III,[23] or solely dating to the reign of Amenhotep III.[24] The date of the tomb is a topic of debate with the bulk of the evidence pointing to its manufacture during the reign of Amenhotep III. Since no cartouche was ever recorded in the tomb, a number of factors must be weighed. As mentioned above, Menna probably received his Gold of Honor during the reign of Amenhotep III. Architecturally, the layout of the court and the tomb is toward the southwest, presumably to take into account the existing court of Meryptah (TT 68) that dates to the reign of

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[19] At the time the tomb was painted, Nehemet may have predeceased her father due to her epithet "true of voice."

[20] Comparing both MMA T801 (courtesy of the Metropolitan Museum of Art) and Mond photo no. 4051 (courtesy of the Griffith Institute), the "*nfr*" sign and the last reed leaf are preserved. The middle portion is destroyed but it is large enough to fit another reed leaf. Nefery is a fairly common name in the Theban necropolis and appears in TT 54 (Ranke, *Personnenamen* I, 203, no. 14).

[21] Please see the discussion in Chapter 2.

[22] For example, see Max Wegner, "Die Stilentwickelung der thebanischen Beamtengräber," *MDAIK* 4 (1933), 143; Georg Steindorff and Walther Wolf, *Die thebanische Gräberwelt*, LÄS IV (Glückstadt-Hamburg-New York, 1936); and more recently, Sydney Aufrère, Syvie Weens (trans.), *Menna, Cheik Abd-el-Gurnah No. 69*, Private Theban tombs and Mastabas 2nd serie (Paris, 1997), 2. A date of Thutmose IV (?) is followed in Bertha Porter and Rosalind Moss, *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs and Paintings*, vol 1,1, 2d ed. (Oxford, 1961),134. See also enumeration in Melanie Wasmuth, *Innovationen und Extravaganzen: Ein Beitrag zur Architektur der thebanischen Beamtengräber der 18. Dynasty* (Oxford, 2003), 144.

[23] For example, Kampp, *Die thebanische Nekropole* I, 294,

[24] Arielle Kozloff, "Theban Tomb Paintings from the Reign of Amenhotep III: Problems in Iconography and Chronology," *The Art of Amenhotep III: Art Historical Analysis*, edited by L.M. Berman (Cleveland, 1990), 268-273; Sigrid Hodel-Hoenes, D. Warburton (trans.), *Life and Death in Ancient Egypt, Scenes from Private Tombs in New Kingdom Thebes* (Ithaca and London, 2000), 302, notes 2-3.

Amenhotep III.[25] The court of TT 69 is surrounded on all sides by a sunken court that was accessed by a ramp. Parallels for this feature are found in tombs dating to the reign of Thutmose IV (TT 38) to Amenhotep III (TT 54, TT 139). Inside the chapel, painted details such as an elongated unguent cone on the head of deceased and his wife, similar ochre-toned skin color between men and women, faces with small noses and mouths, elongated eyes with pupils that disappear under the upper eyelid, and straying wig tendrils are common in figures that date to the reign of Amenhotep III.[26] However, the painting on right focal wall of the broad hall (BHFR) retains a few of the stylistic indicators of painting in the reign of Thutmose IV that may indicate an artist working in an earlier style (**see Chapter 3**).[27] The figural proportions and dress of the women in the tomb also supports a date in the reign of Amenhotep III. Furthermore, the painting style in TT 69 is also very similar to the chapels of Pairy (TT 139) and Neferrenpet (TT 249) both of which are dated to the reign of Amenhotep III by cartouche.[28] Also remarkable is the similarity between the Osiris hymn in TT 69 and that of TT 139.[29] Last, but not least, is the bust of Henuttawy in the Cairo Museum (JE 36550), one half of the pair statue from TT 69, sculpted in a style that can only be assigned to the reign of Amenhotep III (**Figure 5)**.[30] At the far end of LHR, the chapel of Menna also contains one of the first, if not the first, tomb representations of the "Weighing of the Heart," Chapter 151 from the *Book of*

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[25] Kampp-Seyfried gives a date of year 20 of Amenhotep III to TT 68. However, the cutting of the tomb and by extension, the forecourt, must have been in place well before this date.

[26] Nadine Cherpion, "Quelques jalons pour une histoire de le peinture thébaine," *BSFÉ* 110 (Octobre, 1987), 39. See also Betsy M. Bryan, *The Reign of Thutmose IV* (Baltimore and London, 1991), 303

[27] During the reign of Thutmose IV, painted female figures tend to be thinner than those that date to the reign of Amenhotep III, when they become more voluptuous with a distinct hourglass curve to the back. In the reign of Thutmose IV, facial details show oblique, elongated almond-shaped eyes, a dish-shaped profile, long curved eyebrow with a "open" eye where the pupil is relatively round and barely touches the lower lid. Cherpion, *BSFÉ* 110 (Octobre, 1987), 27-47; Kozloff, *Amenhotep III*, 60-61; Betsy Bryan, "Portrait Sculpture of Thutmose IV," *JARCE* 24 (1987), 20; idem, *Thutmose IV*, 300-301.

[28] Arpag Mekhtarian, "Personnalité de peintres thébains," *Chronique d'Égypte* 31 (1956), 238-248; idem, "Un peintre thébain de la XVIIIe dynastie," *MDAIK* 15 (1957), 186-192; Ariell Kozloff, "Tomb Decoration: Paintings and Relief Sculpture," in A. Kozloff/B. Bryan (eds.) *Egypt's Dazzling Sun: Amenhotep III and His World* (Cleveland, 1992), 280, 283, n. 34.

[29] Kampp, *Nekropole* I, 294, n. 5.

[30] Cairo JE 36550, 21 cm. high. List of objects in the Egyptian Museum- Cairo: R.L.B Moss and E.W. Burney, *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Statues, Stelae, Reliefs and Paintings*, vol. 1, 2, part 1, edited by Jaromir Malek, last updated September 3, 2010. Etienne Drioton, *Encyclopédie photographique de l'art: Le Musée du Caire* (Paris, 1949), no. 88.

the Dead. The only other contemporary scene occurs in the long hall of tomb of Haremhab (TT 78) that was painted during the reign of Amenhotep III.[31]

The last point concerns the placement of the tomb in the necropolis. Friederike Kampp-Seyfried traced ancient necropolis streets in the Theban necropolis that served as major processional ways during the various celebrations such as the Valley Festival.[32] One of these lies in front of the half-moon crescent formed by tombs in the lower enclosure of Sheikh abd el-Qurna with a festival site or processional collection point in the vicinity of the tomb of Ramose (TT 55). Another necropolis street extended from East to West along the two sides of the valley depression bounded by tombs dating to the reign of Amenhotep III (TT 48, 257, 47, 107) to the north and tombs dating to the reign of Thutmose IV to the south (TT 175, TT 38, TT 108). In fact, several tombs that lie along this depression use the 'Appeal to the Living' to call to the participants in the Valley Festival "as they walk (*stwt.sn*) in procession in the august valley..." presumably past the chapel doors of these tombs.[33] If one follows the geography of the necropolis, the valley depression processional route in Khokha leads directly into the road to Deir el-Bahri (the goal of the divine barques during the Valley Festival), and right past the courtyard of the tomb of Menna. Another possible processional route is from the Khokha depression past the tomb of Menna, down to the tomb of Nakht (TT 52) to the collection point in front of Ramose (TT 55). Therefore, the sighting of the tomb of Menna towards the NW took advantage of necropolis processional streets and joined the tomb owner in perpetuity with the festivities as a supplicant to the gods. The sighting of prominent tombs along necropolis streets likely reflected the tomb owner's desire to act both as a participant in the festivities in perpetuity and as a supplicant to its celebrants to say a prayer or leave an offering.

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[31] Artur and Annelies Brack, *Das Grab des Haremhab. Theben Nr. 78*, AV 35 (Mainz, 1980), 83-84. Although Haremhab served Amenhotep II-III, the scene is dated by the presence of the cartouche of Amenhotep III.

[32] Kampp, *Nekropole* I, 121-122.

[33] The "Appeal to the Living" in the tombs of Nefermenu (TT 184) and Nebsumenu (TT 183) are slightly behind and to the west of TT 48 in Khokha. The texts in TT 183 and TT 184 are published in: Miriam Lichtheim, *Maat in Egyptian Autobiographies and Related Studies*, OBO 120 (Freiburg and Göttingen, 1992), 178-179, no. 32.

The Structures of the Tomb

Cut into the cliffs or desert valley floor, eighteenth dynasty Theban tombs were composed of three levels: the upper level of the chapel superstructure that included a facade wall; a middle level composed of a walled forecourt leading to a rock-cut chapel; and a lower level made up of the subterranean burial complex. Often the forecourt was sunk into the ground in order to gain the necessary height for the facade, and it was accessed by ramp or stairway. Ideally, the forecourt was rectangular and opened to the east with the chapel facade facing west, creating a symbolic passage from the land of the living to the land of the dead in the "beautiful West." The facade was often crowned by a torus molding with a cavetto cornice and several rows of frieze cones set into the superstructure, each stamped with the name and titles of the deceased, his wife, and, sometimes, prayers and other dedications. Sometimes a niche was cut above the entrance to the chapel and housed a stelophoros statue. The chapel was entered from the forecourt through an entrance, sometimes closed by a wooden door that was easily opened for chapel ceremonies, celebrations, and other visits.

Most of what is known of the original structure of TT 69 comes from Robert Mond's clearance of the tomb for the Antiquities Service in 1903-1904. Mond noted that the courtyard of TT 69 was accessed by mud-brick steps and surrounded by a wall.[34] Today, the courtyard is sunk roughly 80 cm. below the floor of the necropolis, and accessed by a modern stone ramp (**Figure 6)**. Originally, the entrance to the chapel was framed by two inscribed doorjambs with an unpainted lime-plaster lintel, all of which no longer remain.[35] The modern entrance today is constructed of concrete.

The walls adjacent to the entrance are composed of modern mud brick (**Plate 28)**. The wall to the immediate right is covered with a light brown marl plaster with chips of limestone and the remains of a layer beige gypsum plaster (**Figure 7)**. Above this wall, the very brittle Theban limestone dips appreciably to the far right corner of the forecourt. Behind this wall, inside the chapel, Ernest Mackay noted that the ceiling above the right wing of the broad hall had collapsed leaving only 127 cm of decorated ceiling above the

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[34] M. Robert Mond, "Report on work done in the Gebel esh-Sheikh Abd-el-Kurneh at Thebes, January to March 1903," *ASAE* V, 2 (1904), 102.

[35] Mond MSS 1.3.1, courtesy of the Griffith Institute, Oxford University. Special thanks to Alison Hobby, Elizabeth Fleming and Cat Warsi. See also Wasmuth, *Innovationen und Extravaganzen*, 17.

left wing.[36] Three wooden beams, and later -four light iron girders - were set up to support the ceiling.[37] MMA T805 clearly depicts an arched ceiling composed of mud plaster at the far right of the broad hall and a beam running between the lateral walls as a support for the roof. As discussed in the **Conservation Chapter**, the long hall was secured with a similar arrangement of wooden beams.

Inside the broad hall on the right hand side nearest the entrance (BHNR), there are remains of a color band that bordered the initial entrance door of the tomb, ca. 150 cm from the edge of the modern entrance (**Plate 13)**. At some point, the broad hall of the tomb was extended to the southeast and a new entrance door was cut that roughly conforms to the modern door today. The original door was filled with a mixture of limestone chips and *muna*. Based on the similar pigment recipes from the first and second phases of decoration ascertained by x-ray fluorescence, the movement of the entrance was contemporary the decoration of the tomb. The artists also did not change the original scenes and texts (rendered in blue line), but simply moved them to the right to coincide with the new door.[38]

A 2 by 2 meter square was cleared in the forecourt floor directly on the other side of the wall with the color band in the broad hall to see if the remains of the original door could be found (**Figure 8 also noted on Figure 3 by a dotted line**). The inset shows the remains of the original entrance plaster that was part of the raised doorstep that led into the tomb.[39]

The question remains: why was it necessary to move the door? One reason could be the bad quality of the rock. When constructing a Theban tomb, a passage was hewn into the rock that conformed to the height (and perhaps length) of the structure. Red lines indicated the central axis of the tomb, and at right angles, the transverse hall, if cutting a T-shape tomb.[40] Once the basic tomb was cut, the plasters and painters would go to work.

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[36] Mond MSS 1.3.2-4.

[37] Gardiner MSS 19.2.

[38] Please see discussion in **Chapter 3.**

[39] Norman de Garis Davies, *Five Theban Tombs*, ASE 21 (London, 1913), 30. This entrance plaster was originally raised several inches above the floor of the forecourt.

[40] Ernest MacKay, "The cutting and preparation of tomb-chapels in the Theban necropolis," *JEA* 7 (1920), 154-168

If one looks carefully at the right wing of the broad hall in the chapel, the bottom corners of the shrine wall were not straightened due to the quality of the rock. The stability of the ceiling over the right wing may also have been a concern to the workmen.

Another reason may be the existence of another tomb to the right of TT 69 that was discovered when Menna's tomb chapel was already under construction. The debris mounds and hillocks between TT 69 and the forecourt of TT 68 remain unexcavated and could yield a previously discovered or unknown burial **(See Figure 1)**.[41] Whatever the reason, the artists quickly discovered the error and extended the tomb to the left, moving the decoration and texts with it.

Moving back outside to the forecourt and the walls to the right and left of the modern entrance, the layer of Theban limestone is capped with a modern stone wall that levels off roughly two feet above the modern doorway (indicated grey on **Plate 28)**. At the top of stone wall, a modern roof, covered with a layer of scree, stretches ca. 6 meters back from the tomb's entrance doorway to the beginning of the long hall (**Figure 3)**. A higher modern stone wall rises above the roof and forms a semicircle that is steps down towards the northeast and ends at the level of the necropolis floor. Two stone wings extend from the edge of the semicircular wall leaving a space of roughly 40 cm. for access to the stone ramp.

The northwest wing of the forecourt is largely reconstructed out of horizontal layers of modern stone (not indicated on the drawing). Horizontal layers (up to 1 meter) of the original grey mud bricks are preserved at the far left edge, and a few bricks remain in the center and to the far right. These original bricks can be distinguished from the modern mud bricks by their grey color and dimensions (31-32 x 13.5-14.5 x 9.5 cm.).[42] Below the stone wall, the irregular limestone face is covered in areas with a beige marl plaster with limestone chips to even out the surface.

The southeast wing of the court is composed of 3.1 meters of modern mud brick from the right edge to center of the wall at a height of 2 meters. The original entry jambs to tomb -312- can be seen made of mud brick covered with beige marl mortar. The remaining 3.3 meters of wall is the rock face.

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[41] Personal communication, Karl-Joachim Seyfried, 2008.

[42] Kampp, *Die thebanische Nekropole*, 297, see also Fig. 181.

The two small wings to either side of the ramp to the tomb were originally composed of two courses of mud brick in 1903-4 according to Mond. A few bricks remain on the northeastern wing. Today, they are constructed of the same type of modern stone used for the retaining walls around Menna. Below the wings, the rock face is coated in places with a layer of marl plaster with and without and limestone.

Although the various modern additions to the forecourt and enclosure wall of TT 69 make it hard to understand its original arrangement, a few suggestions can be offered. The forecourt was cut into the limestone floor, ca. 8.5 m. long x 9 m. wide, and 80-100 cm from necropolis floor to the rock cut entrance of the tomb. The façade and side walls were worked out vertically from the rock. The brittle limestone rock face of these walls was covered with a beige marl plaster, reinforced with straw and limestone chips of varying sizes, and whitewashed to create an even surface. Over the plaster was painted a light brown-beige whitewash. Above the limestone, mud brick walls were constructed to even out the irregular height of the rock face. The original height of the mud brick walls cannot be determined today due to the limited remains. The stone wall that encloses the tomb of Menna on three sides obscures any earlier construction and clearly stems from a much later time.

The tomb chapel is in the form of an inverted "T" composed of a broad transverse hall and a long inner hall with a shrine at the end surrounded by a painted entablature (**Figure 3**).[43] The plan conforms to Kampp's type Vb, one of the most common plans in the Sheikh abd el-Qurna necropolis.[44] The tomb measures 11.8 meters from the along the east-west axis, and 9.4 meters wide in the broad hall. The tomb chapel's elevation ranges from ca. 2.5 meters in the broad hall and ca. 1.25 meters in the long hall, but these are approximations due to the unknown level of the original ceiling in the broad hall and the original levels of the ancient floors. The tomb was cut into a layer of poor limestone so the surface was equalized with a combination of *muna*-plaster composed of mud and hacked straw, sometimes with limestone chips. The *muna* was coated with gypsum

[43] Melanie Wasmuth, *Innovationen und Extravaganzen: Ein Beitrag zur Architektur der thebanischen Beamtengräber der 18. Dynasty* (Oxford, 2003), section 2.3.2.4, notes that the tomb of Menna is one of eight Theban tombs with remains of entablatures inside the tomb in the eighteenth dynasty.

[44] Kampp, *Die thebanische Nekropole*, 27, 294-297.

plaster and then a smooth, fine layer of gypsum on which the images were painted. The techniques and materials used for the decoration will be discussed in **Chapter 3.**

As mentioned in the **Introduction**, the tomb of Menna (TT 69) project used non-invasive methods of examination. For this reason, archaeological excavation was never a part of the original conservation and documentation plan. This noted, a few words could be said about previous excavations to get an idea of the use and reuse of the monument. Mond recorded the presence of six burials, three of which were sunk into the floor of the tomb chapel or courtyard (pits 1-3). The other three burials (pits 4-6) were excavated "beyond the boundary of the courtyard" and can no longer be localized **(Figure 9)**.[45] Of these, Mond's pit no. 1, the sloping passage in front of the shrine wall, was destroyed by fire. In it were found an ivory spoon, gilt plaster fragments from a cartonnage, part of a pectoral ornament, a blue faience lotus column amulet, and a wooden furniture leg belonging to a chair or bier. Mond dated the finds from the sloping passage to a burial from the 26th dynasty. In the second burial, in front of the left focal wall of the broad hall, he found "fragments of a mummy of no importance." In the third pit to the left of the mud brick steps into the courtyard, Mond found a wooden staff that was bound at the top with a string. Outside of the courtyard, in the sixth pit, the upper part of a small limestone bust of a woman was found. This fragment belongs to Henuttawy, and was once part of the pair statue found in the tomb chapel's shrine (**Figure 5)**. In the debris surrounding the pits, Mond found a number of funerary cones of *Mn-ṯw*, *Nḫt-ỉmn*, and *Mry*.

Although these burials and their remains lie outside the scope of this publication, the shaft in the forecourt and the sloping passage in the chapel before the statue shrine likely originate from the time of Menna. Recent research indicates the sloping passage begins to be used in private tombs already in the Middle Kingdom.[46] Therefore, the later objects found by Mond probably stem from a later reuse of Menna's original burial.

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[45] Mond, *ASAE* V, 2 (1904), 102; idem, *ASAE* VI,1 (1905), 24.

[46] Kampp, *Die thebanische Nekropole*, 84-86, 294.

CHAPTER 2

The Paintings and Texts in the Tomb Chapel of Menna (TT 69)

Melinda Hartwig

The tomb of Menna has been treated by a number of publications.[1] After Reverend Colin Campbell's summary of the tomb chapel in 1910, many of these previous works focus on a particular scene, text or vignette while ignoring its place in the overall decorative program. The uniqueness of the tomb chapel lies in its state of completion and preservation that allows for the full scope of the decorative program to be analyzed. For this reason, the texts and images in the tomb chapel of Menna will be examined in terms of their placement, their cultural, historical and religious significance, and their meaning in the overall narrative of the program.

In the eighteenth dynasty, Theban tomb architecture and decoration for the elite (i.e. non-royal official) were organized to address four basic functions, which can be understood in broad terms as both magical and commemorative.

1, to protect the body of the deceased;

2, to provide a ritual complex for the tomb owner's regeneration and eternal well-being;

3, a point of transit where the identity of the dead was projected into the next world;

4, a site where the living could commemorate the dead.[2]

Magically, the tomb was a vehicle for the owner's rebirth, the projection of his identity, and the eternal effectiveness of the deceased's cult. Commemoratively, the tomb was a *liminal* space in which the living could celebrate the tomb owner and perpetuate his memory.

The tomb chapel of Menna is organized as an inverted "T" composed of a broad transverse hall and a long inner hall with a shrine at the end (**Figure 3**).[3] More will be said about

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[1] Most notably, Colin Campbell, *Two Theban princes, Kha-em-Uast & Amen-khepeshf, sons of Rameses III, Menna, a land-steward, and their tombs* (Edinburgh, 1910); Arielle Kozloff, "A Study of the painters of the Tomb of Menna, No. 69," *Acts, First International Congress of Egyptology*, edited by Walter F. Reineke, Schriften zur Geschichte und Kultur des Alten Orients 14 (Berlin, 1979), 395-402; Sydney Aufrère, Syvie Weens (trans.), *Menna, Cheik Abd-el-Gurnah No. 69*, Private Theban tombs and Mastabas 2nd serie (Paris, 1997); Sigrid Hodel-Hoenes, D. Warburton (trans.), *Life and Death in Ancient Egypt, Scenes from Private Tombs in New Kingdom Thebes* (Ithaca and London, 2000); Melinda K.Hartwig, "The Tomb of Menna," *Valley of the Kings: The Tombs and Funerary Temples of Thebes West*. edited by K.R. Weeks (Vercelli, Italy, 2001), 398-407; Mahmoud Maher-Taha, *Le tombeau de Menna [TT. No. 69]*, edited by Zahi Hawass (Cairo, 2002).

[2] For discussion see: Melinda K. Hartwig, *Tomb Painting and Identity in Ancient Thebes, 1419-1372 BCE. Monumenta Aegyptiaca X (*Turnhout and Brepols, 2004), 5-52.

[3] Friederike Kampp, *Die Thebanische Nekropole, Zum Wandel des Grabgedankens von der XVIII. bis zur XX. Dynastie* I, Theben XIII (Mainz, 1996), 294-297.

the architecture of the tomb in a later chapter, but, for our purposes here, the decorative program of the chapel will be investigated. It is important to note that the chapel was the place in which the tomb owner's cult was celebrated and so remained accessible to the living. For this reason, the focus of the decorative program was on the owner and his family, and included specific gods and goddesses from whom the deceased sought favor and protection.

Certain themes became associated with specific walls based on the meaning and use of the different rooms and their orientation.[4] T-shaped Theban tomb chapels were oriented metaphorically from east to west, and scenes were arranged along this axis to reflect the transition from life (in the east) into death (in the west). Thus, scenes in the outer, "eastern" broad hall of T-shaped Theban tomb chapels treated the life of the deceased, and scenes in the "western" long hall addressed the transition and provisioning of the dead in the hereafter. At the structural and visual intersection point between the transverse hall and the inner passage were the western back walls of the chapel known as the focal walls, which lay to either side of the entrance into the inner hall, opposite the outer doorway to the forecourt in the T-shaped tomb. Lying opposite the main exit from the tomb chapel, the back walls frequently received the best light and were the first to be seen by viewers entering the tomb chapel.[5]

In this study, the walls are organized along this axis and identified in terms of their placement. Beginning with the right and left entrance walls (EDR and EDL, respectively), the broad hall is further divided according to whether the walls lie near or far from the entrance (BHNL, BHFL, BHNR, BHFR). The walls at either side of the broad hall are identified as small walls (BHSL and BHSR). The inner door walls are defined as left and right (IDR and IDL). In the inner hall, the walls are described in terms of right and left (LHR and LHL) or far (LHF) which is the statue shrine. The ceilings of the broad hall (BHC) and long hall (LHC) will be

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[4] Discussion in Hartwig, *Tomb Painting and Identity*, 15-19. See also: Lise Manniche, *Lost Tombs: A Study of Certain Eighteenth Dynasty Monuments in the Theban Necropolis* (London and New York, 1988), 3-12, 31-42; Barbara Engelmann-von Carnap, "Soziale Stellung und Grabanlage: zur Struktur des Friedhofs der ersten Hälfte der 18. Dynastie in Scheich Abd el-Qurna und Chocha," in *Thebanische Beamtennekropolen: Neue Perspektiven archäologischer Forschung, Internationales Symposion Heidelberg 9.- 13.6.1993*, edited by J. Assmann, E. Dziobek, H. Guksch, F. Kampp, SAGA 12 (Heidelberg, 1995), 107-128; idem, *Die Struktur des Thebanischen Beamtenfriedhofs in der ersten Hälfte der 18. Dynastie: Analyse von Position, Grundrissgestaltung und Bildprogramm der Gräber*, ADAIK 15 (Berlin, 1999).

[5] Siegfried Schott, *Das schöne Fest vom Wüstentale. Festbräuche einer Totenstadt* (Mainz, 1952), 88; Jan Assmann, "Priorität und Interesse: Das Problem der Ramessidischen Beamtengräber." in *Problems and Priorities in Egyptian Archaeology*, ed J. Assmann, G. Burkard and V. Davies (London and New York, 1987), 31-42; Hodel-Hoenes, *Life and Death in Ancient Egypt*, 14.

treated separately. In all the line drawings (plates), the black lines indicate the decoration as it exists today; the green lines show the original decoration at the time the Mond photos were taken in 1913-1915.

EDL (Entrance Door Left) EDR (Entrance Door Right)

The entrance to the tomb chapel of Menna depicts the usual scene of the deceased and his wife stepping in (EDR) and out (EDL) of the tomb, the latter accompanied by the sun hymn [6] The right entrance door is painted with unfinished images of Menna with his arms raised in prayer entering the tomb followed by Henuttawy of whom only a raised hand remains (**Plates 1 & 2**). Menna is wearing a long bag tunic that is painted pink to indicate its transparency with white kilt tied over it. On his head is an unfinished unguent cone painted in a layer of white and then yellow. Remains of a yellow armband and collar indicate that Menna was wearing the Gold of Honor. Reference points were drawn for captions that were never completed. The wall displays a red, white and yellow color band (blue, green and black were never painted on this wall) at the top and left side of the wall. The rest of the decoration is destroyed.

The left entrance wall (EDL) contains several decorative changes (**Plates 2 & 3)**. In the initial design, Menna and Henuttawy were significantly larger than their figures in the second and final design, and were accompanied by a smaller daughter who is depicted between them. Menna holds two braziers in his upraised hands, his wife raises her arms in praise, and their daughter offers a bowl with two or three large unguent cones. Menna's skin tone is red-brown and Henuttawy and daughter have a bright yellow-brown tone. Menna wears a white kilt tied over a bag tunic, depicted pink to show transparency where the tunic overlays his skin, and a blue collar around his neck. The figure of Henuttawy is almost completely painted over, but enough remains of her enveloping wig and blue bracelets and collar to allow them to be identifed. The daughter is dressed in a simple white dress with a floral garland in her hair. It appears she once carried another item in her lower right hand, but it is not preserved.

The second phase of decoration began with the painting over of the first three figures with a heavy white wash. In this phase, only Menna and Henuttawy are represented, and are significantly smaller in order to accommodate the Sun Hymn text in the 14 columns above them. Menna is depicted in a gesture of praise and wears the same clothing as the first phase but

[6] Friederike Kampp-Seyfried, "Overcoming Death - The Private Tombs of Thebes," *Egypt: The World of the Pharaohs*, edited by R. Schulz and M. Seidel (Cologne, 1998), 25.

with the addition of the Gold of Honor. Henuttawy stands behind her husband carrying a *menit*-necklance in her right hand and a sistrum in her left. She wears an elaborate yellow collar with lotus petals, armbands and bracelets that are only slightly brighter than her yellow-brown skin. Light strokes of whitewash and delicate red lines are used to show where her white dress drapes over her straight arm. Her right shoulder and breast are bare.

The wall is bordered at the top and side (towards the tomb chapel) with a yellow, blue, and red color band. The green on this wall was a mixture of yellow and blue, with the blue now faded leaving only a lighter yellow. There is some indication that the border was also composed of this same mixture of green. The frieze and skirting band are completely destroyed.

Above the pair are 13 columns of hieroglyphic text of the "Hymn to the Sun." These hieroglyphs are blocked out in red, yellow, white and a faded blue and green. The text and images date to the 2nd phase of decoration, and much of it is destroyed. The text is reconstructed from Siegfried Schott's translation and Jan Assmann's hand copy of the text.[7] The text reads:

> (1)[You have appeared] in the Mansion of Shu, [having rested in] (2) the Western Horizon, [Your majesty has received] (3) veneration, the arms of (4) your mother behind (5) you, every day [as daily custom. I behold you in (6) at your beautiful festival, at your sailing (7) to] Deir el-Bahri (*Dsr-Dsrw*), when [your excellence] is manifest (8) on my breast.
> I worship you, your beauty in (9) my face. You let me rest in (10) the house (*ḥwt*, i.e. tomb) that I have built, in favor of (11) the perfect god. You let me be in [your] following, (12) that I be content with the bread of that you give, as is done (13) for the just on earth.

The text refers to Menna's eternal desire to see the god and participate in the celebration during the "beautiful festival" – the Beautiful Festival of the Western Valley. This was the Valley Festival, the most important visitor celebration in the Theban necropolis.[8] During the festival, the barks of Amun, his wife Mut, and their son Khonsu were ferried across the Nile from Karnak to tour the royal funerary temples on the West Bank of Thebes and stopped at the mortuary temple of the reigning king. The king (or his designate) led the procession to honor his dead royal ancestors, followed by the Amun priesthood. When the mortuary temple visits were

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[7] Siegfried Schott, *Das schöne Fest vom Wüstental: Festbräuche einer Totenstadt* (Mainz, 1952), 858, no. 4. The notes of Jan Assmann, were consulted at the Heidelberg Archive of Theban tombs. Many thanks to Friederike Kampp-Seyfried for her help to access the archive.

[8] On the Theban Valley Festival: Siegfried Schott, "The Feasts of Thebes." In *Work in Western Thebes 1931-1933*, ed. H. H. Nelson and U. Hölscher OIC 18 (Chicago, 1934), 63-90.73-74; idem, *Das schöne Fest* (Mainz, 1952); Lanny Bell, "The New Kingdom 'Divine' Temple: The Example of Luxor," *Temples of Ancient Egypt*, edited by B. Shafer (London and New York, 1997), 136-137.

completed, the procession moved through the elite necropolis where relatives celebrating in and around the tombs of their ancestors could watch and take part. Then the procession moved to the Hathor sanctuary at Deir el-Bahri, where Amun joined with the goddess to renew the fertility of the land. The bark spent the night floating on a “lake of gold” surrounded by four basins filled with milk, around which were placed burning torches. In the morning, the torches were extinguished in the milk, signifying the return of the dead to Hathor, and the barks of Amun set out again, this time to return to their home at Karnak.

It should be noted that the depiction of Menna and Henuttawy “stepping out” to see the valley festival is not just wishful thinking on the part of the tomb owner. As discussed in **Chapter 1**, TT 69 was extremely near a necropolis street in Khokha that served as a major processional way during festivals. The street extended east to west along the two sides of a valley depression bounded by tombs dating to the reign of Amenhotep III (TT 48, 257, 47, 107) to the north and tombs dating to the reign of Thutmose IV to the south (TT 175, TT 38, TT 108).[9] The “street” ended in the lower northern enclosure of Sheikh abd el Qurna where the tomb of Menna was situated. In fact, several tombs which lie along this depression use the "Appeal to the Living" to call to the participants in the Valley Festival “as they walk (*stwt.sn*) in procession in the august valley….”[10] An additional necropolis street existed along the half-moon crescent formed by tombs in the valley of Sheikh abd el-Qurna, with a festival site or processional collection point in the vicinity of the tomb of Ramose (TT 55).[11] This gathering point is slightly downhill from the tomb of Menna. Therefore, the actual placement of the tomb works in concert with the scene on the left entrance wall to reinforce Menna’s desired goal to see and participate in the god’s festivals.

BHNL (Broad Hall Near Left)

On the far left of this wall, Menna is depicted seated on two separate registers. In the upper register, Menna sits on a red and black field stool with yellow (metal) joints and chair legs

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[9] Kampp, *Nekropole* I, 122, n. 622, plan 4.

[10] From the "Appeal to the Living" in the tombs of Nefermenu (TT 184) and Nebsumenu (TT 183) which are slightly behind and to the west of TT 48 in Khokha. The texts in TT 183 and TT 184 are published in: Miriam Lichtheim, *Maat in Egyptian Autobiographies and Related Studies*, OBO 120 (Freiburg and Göttingen, 1992), 178-179, no. 32.

[11] Kampp, *Nekropole* I, 121, plan 2.

in the form of animal paws on a green papyrus mat (**Plates 4 & 5**). Draped across the stool is a black and white mottled animal skin, probably bovine but painted to suggest it was a more valuable panther skin. This stool is something only high elite officials could possess, and thus indicates Menna's high status.[12] He is wearing a bag tunic with a pleated kilt and sash tied over it, several *wesekh*-collars (one blue and green, the other of floral elements), holds a forked stave in one hand,[13] and a handkerchief in the other. The plaits of his wig are molded in plaster and painted black. Before him are offerings arrayed on three registers. Baskets of fruit, wine jars in netted string carriers, lettuce, a dish of honey, corn dollies and various types of birds are placed on the lowermost register.[14] On the middle register baskets of grapes and dates and three wine jars lie on a reed mat above which are arrayed two pink quail chicks, two red pottery vessels with tops, two corn dollies, two eggs in a nest and, on its own papyrus mat, two *Tilapia* fish which refer to their place as an important part of the New Kingdom diet.[15] Above, tables of grapes and dates with lotus bouquets draped over them indicate their eternal regeneration.[16]

The text above Menna is done in polychrome hieroglyphs arranged in eight columns. The caption reads:

> (1) Taking recreation with the work in the (2) fields by (3) the great confidant of the (4) Lord of Two Lands, the favorite (*ỉmy-ỉb*) (5) of [Horus] (6) in [his palace][17] (7) the eyes of the king in every place (8) and the overseer of fields [of Amun, Menn]a, justified with the perfect God

Oriented towards Menna are two sub-registers of officials who are to be understood as part of this scene. In the upper sub-register, a man in a white kilt prostrates himself before Menna, presumably to implore the deceased for a decrease in his taxes[18] or simply as a gesture of

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[12] See similar depiction in Richard Parkinson, *The Painting Tomb Chapel of Nebamun: Masterpieces of Ancient Egyptian Art in the British Museum* (London 2008), 92-94, fig. 101-102.

[13] Forked stave: Ali Hassan, *Stöcke und Stäbe im Pharaoischen Ägypten biszum Ende des Neuen Reiches*, MÄS 33 (Munich and Berlin. 1976), 38, n. 7, 130, 190, 193, pl. VIII, calls this the *awnt*-stave, whose name actually refers to the type of wood used to manufacture it (Fischer, *MMJ* 13 (1978), 28-29). Fischer suggests its Old Kingdom name may have been the *mAty*-staff based on a similar example in a sixth dynasty text (*Urk*. I, 216), but the New Kingdom name of this staff is not known (Fischer, *LÄ* VI (1986), 54). The tomb owner in TT 165, PM (5) holds a stave with the bottom missing.

[14] M. Lamberth, *Discovering Corn Dollies*, Shire Classics (Oxford, 2008).

[15] As evidenced by the inclusion of fish in a number of New Kingdom offering table scenes.

[16] Hartwig, *Tomb Painting and Identity*, 93-95.

[17] *Urk*. IV,1608. Reconstructed by Helck as "the favorite of Horus in his palace" (Wolfgang Helck, *Urkunden der 18. Dynastie, Übersetzung zu den Heften 17-22* (Berlin, 1961), 174.

[18] Maher-Taha, *Tombeau de Menna*, 18.

respect. In the lower sub-register, a group of seven men bow to Menna with an attendant holding the reins of a chariot powered by two spotted horses, one red and white and the other red with black legs and hair.[19] All wear a pointed white apron and a kilt tied in place with a sash over a half bag-tunic.[20]

The bent wood body of the chariot is red with areas of blue. Bands of white zigzags adorn the lower part of the chariot and the bowcase with additions of blue. The draught pole and the six-spoke wheels (both of which were attached to the axle) are made of wood as indicated by the stylized graining in the pole. The red (leather) reins that are pulled tight by the attendant go to the yellow ornamented yoke on the horses' backs that is held in place by padded girths around their bellies, and then to the bits in the horses' mouths. The bridle is formed by yellow cheek-pieces and cheek-straps.[21] The horses are restless, with both sets of hooves tapping the ground as if ready to go.

Below, Menna is seated on a chair with his wife beside him on a low yellow stool. Although her figure is completely destroyed today, the Mond photographs show her with her right arm bent towards her heart, and her left arm outstretched over her knee.[22] She wore a white pleated wrap-around dress, and long wig with an unguent cone and floral headband. Menna is wearing the same clothing as above except for his wig, which is not sculpted but rather painted with flecks of gray perhaps to emulate the play of light on the tendrils. In the lower register, Menna also wears the Gold of Honor known as the *šbyw*-collar. Composed of two rows of lenticular beads, the Gold of Honor was a gift from the king that signified the recipient's personal relationship with the king and his heightened status.[23] During the reign of Amenhotep III, the king awarded the Gold of Honor to high office holders concerned with the management of the resources of Egypt. Menna was one of these officials who, as field supervisor for the temple and crown, dealt with the distribution and taxation of grain. Clearly, the king awarded the

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[19] Notes gesture of respect of the hand to shoulder with the other hand grasping the forearm. Brigitte Dominicus, *Gesten und Gebärden in Darstellungen des Alten und Mittleren Reichs*, SAGA 10 (Heidelberg, 1994), 5-10.

[20] Gillian Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*. Studies in Textile and Costume History 2 (Leiden-New York-Cologne, 1993), Fig. 3:11(b).

[21] Wolfgang Decker, "Wagen," LÄ VI (1986), 113-1135.

[22] Mond photo no. 4019.

[23] Susanne Binder, *The Gold of Honor in New Kingdom Egypt*, ACE 8 (Oxford, 2008), 241-242, 264-271, 311-312 (#100).

Gold of Honor to those whose loyalty was critical for the success of the pharaoh and Egypt's internal management.

In the lower register, Menna raises his hand to receive the life-giving power of Hathor contained within the sistrum[24] that is offered by his daughter, Amenemweskhet. Two other daughters follow: Nehemet[25] holding a sistrum and Kasy carrying a string of fowl. Amenemweskhet and Nehemet wear the distinct crown associated with ladies in waiting and princesses.[26] It is composed of a yellow (gold) and red ornamented modius with two tall yellow feathers, and a diadem with a horned gazelle head and a lotus bud that is fastened around the forehead with a red sash. The modius of Amemwaskhet is made taller by the addition of two rows of yellow floral rosettes.[27] She wears a large black wig, big yellow earrings, and an ornate yellow broad collar with radial bands and white lotus petals at the end. She also wears similar radial banded armbands, bracelets and a hanging necklace. Nehemet wears a shorter black wig, a horizontal banded yellow broad collar with rows of red and white dots, and similar jewelry as her sister, Amenemwasket. Kasy steps behind Nehemet with a less complicated trousseau that includes a long black wig with an unguent cone and floral head garland as well as yellow earrings, a broad collar and bracelets. All the girls wear elaborate pleated wrap-around dresses that are knotted below their right breasts, leaving their right shoulders bare.[28]

The text above Menna and Henuttawy is arranged in seven columns of polychrome hieroglyphs, and the faded blue hieroglyphic text above the girls is divided into eight columns.[29] The texts read:

> (1) Enjoying oneself, beholding (2) good things in your funerary temple[30] (*ḥwt n*(*t*) *Mꜣʿ-ḫrw*) (3) by the confidant (4)… (5) excellent of his Lord (6) praised of the perfect God, the scribe (7) and overseer of the ploughlands (*ḫbsw*) [of Amun],

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[24] Hartwig, *Tomb Painting and Identity*, 96-97.

[25] Transliteration of her name: Hermann Ranke, *Die Ägyptischen Personennamen*, vol. 1 (Glückstadt, 1935), 208, no. 18.

[26] For similar crowns, see Arielle P. Kozloff, "The Artistic Production of the Reign of Thutmose III," edited by Eric H. Cline and David O'Connor, *Thutmose III: A New Biography* (Ann Arbor, 2005), 292-324, esp. 309; Artur Brack and Annelies Brack, *Das Grab des Haremhab. Theben Nr. 78.* AV 35 (Mainz, 1980)**,** Taf. 36a; Norman de Garis Davies, *The tombs of two officials of Thutmosis IV (nos. 75 and 90),* TTS 3 (London, 1923), 25, pl. XXII.

[27] Visible on Mond photo no. 4019. See also reconstruction by Campbell, *Two Theban Princes*, 86.

[28] Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, Fig. 7:10, from the tomb of Ramose (TT 55).

[29] The text is unfortunately badly faded. Text reconstructed from *Urk.* IV, 1608; Mond photos nos. 4018-4019; and remnants on the wall.

[30] Hannig, *HL1-Marburger ed*, 549.

Menna

(1) His daughter, his beloved, praised (2) of Hathor, the lady-in-waiting (*ḫkrt-nswt*) and beloved of their (sic) lord, (3) [Amen]-(4) emweskhet. (5) His daughter, (6) his beloved, praised (7) [of Amun], Nehemet, justified. (8) His daughter, his beloved, Kasy.

Of the daughters, only Amenemweskhet bears the title *ḫkrt-nswt*, sometimes translated as "royal concubine" or more often "lady in waiting" as is accepted here.[31] The fact that she and Nehemet wear the distinct crown that is associated with the *ḫkrt-nswt* supposes both daughters held that title. However, the addition of "justified" to the name of Nehemet indicates that she may have predeceased her sisters who do not bear that epithet.

The remaining wall is divided into four registers of agricultural scenes. The first or uppermost register illustrates the measuring of the crop that was part of Menna's job. After the Nile inundation, the land was measured and the anticipated taxes were assessed based on its surface area not its yield. In the spring during the harvest, scribes came to collect the taxes.[32] Papyrus Harageh indicates that a cadaster scribe oversaw a team of scribes (2), a rope bearer and a rope stretcher.[33] Two clean-shaven workmen hold coils of twine and stretch a calibrated rope knotted at intervals to measure the yield of the fields. The coiled rope on their shoulders was originally surmounted by a ram's head, the animal associated with the god Amun-Re. Accompanying the surveyors are five scribes who would write down the boundary limits and calculate the taxes to be assessed on that harvest. All hold palettes with red and black wells for pigment, and are dressed as members of the elite with white pointed aprons and kilts tied over a short bag tunic with a sash. A younger attendant walks with the delegation carrying a scribal kit and palette, and another follows behind an old, stooped man. This man is bald with wisps of hair on his forehead and carries a *was*-scepter in his left hand and touches the head of a naked boy in front of him who may be his grandson. This older man is likely the village elder or chief based on the hieroglyphic determinative of a man holding a *was*-scepter.[34] His role was to attest to that

[31] For discussion of the title see: Whale, *Family*, n. 20, 277-278; Robins, *Women*, 115-116.

[32] Paul C. Smither, "A Tax-Assessor's Journal in the Middle Kingdom," *JEA* 27 (1941), 74-76; Hodel-Hoenes, *Life and Death*, 91-94.

[33] Helck, *Verwaltung*, 139.

[34] See Fischer, *MMJ* 13 (1978), 22, Fig. 35a. Similar depiction in Parkinson, *Nebamun*, 113-115, Fig. 120.

the boundaries had not been moved during the inundation.[35] His kilt has an open front that is tied over a loincloth or cloth garment with the excess material pulled out over the front.[36] As an elder, he is guiding the delegation to the field to be assessed.

Standing before the lead surveyor, a man brings a corn dolly and a conical loaf of bread, while behind him, his wife offers a container and a bowl of food. Corn dollies were made of the first shafts of wheat straw and used to bring prosperity of a fruitful harvest.[37] Both man and woman are dressed simply: he is the same dress as the village elder and she in a white wrap-around dress with one strap. A young boy, probably their son, leads a donkey with a stick that later was excised, mostly likely for its association with Seth, the god of chaos.[38] The boy wears a leather net over his loincloth with the excess material pulled over the front and carries a kid goat in his arms.[39] Various authors have suggested this family is offering bribes intended for the surveyors and the scribes so that they will lower their taxes.[40] It is more likely, however, that these are welcome gifts.

Above the scene are three trees with nests laden with eggs. Intended to provide a background for the scene, these eggs relate to the fertility of nature. The grain field is rendered in different hues: light yellow for the background, brownish-yellow for the wheat stalks and grey for a few long stalks and the small brush growing on the ground. The idea of foregrounding the grain field is also done with brownish-yellow and grey. One notes the division of techniques between the rendering of the waving grain behind the lead surveyor that is very detailed and the grain behind the family that is more schematic.

The last scene depicts Menna as "the scribe of the fields of the Lord of Two Lands of the south and north, Menna" standing in a papyrus reed pavilion holding a *kherep*-staff (the symbol of his administrative authority) and a forked staff. Before Menna, the register is divided into two sub-registers. Below, a defaulter is beaten with a switch while his friend pleads for leniency with arms upraised. Above, four officials walk to a stone basin to wash their hands: the first

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[35] Aufrère, *Menna*, 8.

[36] Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, 26-27, fig. 2:14, 51, fig. 3:27.

[37] Geraldine Pinch, *Magic in Ancient Egypt* (Austin, 1994), 120.

[38] Hans Bonnet, *Reallexikon der ägyptischen Religionsgeschichte*, 3d ed. (Berlin, 2000), 171-172.

[39] Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, 26-31, fig. 2:15. The leather loincloth with a patch is associated primarily with laborers and officials with Nubian associations.

[40] Arpag Mekhitarian, *Egyptian Painting* (Geneva, 1954), 73; Maher-Taha, *Tombeau de Menna*, 19.

bends down helped by a servant, and the second bows to Menna with a gesture of respect. These men wear similar clothing to Menna with the addition of a brownish coating that may be unguent to protect the body from sunburn.[41] In previous scholarship, these figures are identified as agricultural supervisors or tax collectors, foreigners and tax defaulters: the latter is particularly untenable given the status of their clothing.[42]

The register ends with a wooden yellow-brown boat on the water, presumably moored by a rope attached to the shore. A boatman stands at the bow holding a red flail. The boat is equipped with a small box-like cabin at the prow and a rudder at the stern. The boat is equipped with a cabin decorated with a red door and a white and blue stylized floral design on a brown background.[43] A white band runs around the cabin, taking the form of a multicolored block border (side), a red palace facade design (below), and a polychrome cavetto cornice (top). Three yellow and white chests rest on top of the cabin, all surmounted by a stalk of lettuce or another plant. One can assume these are storage chests because the contents, symbolized by round or oval forms outlined in red, peek out between the yellow square of the box and its curved top. The fore and aft of the boat are painted with a lotus flower design above various geometric bands. The nature of the offloaded goods on the register line above cannot be identified due to their stylized rendering. This boat may be Menna's traveling office when the cadastral work took him through Egypt.[44]

The second register begins with a group of scribes recording the harvest for the purpose of collecting taxes. The grain is shown in two tall heaps with four laborers bent over, scooping up the grain in measuring baskets. Three scribes stand before the grain piles and four scribes squat on the ground behind it (two on each register). Their palettes have the usual red and black pigment wells, and their brushes have a black blob where the bristles meet the writing surface. Another scribe sits on top of one of the piles and keeps count with his fingers.[45] Originally, the preliminary drawing placed this scribe standing between the grain piles, but he was moved to

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[41] Nadim Shaath, ed., *Sunscreens: Regulations and Commercial Development*, 3d ed. (Boca Raton, 2005).

[42] Colleagues: Maher-Taha, *Tombeau de Menna*, 20; foreigners: Campbell, *Two Theban Princes*, 88; defaulters: Mekhitarian, *Egyptian Painting*, 74; Hodel-Hoenes, *Life and Death*, 94-95.

[43] Decorated boathouse from a New Kingdom model BM EA 37160 (Dilwyn Jones, *Boats* (London, 1995), fig. 46.

[44] Aufrère, *Menna*, 9.

[45] On the use of palettes and fingers for counting grains: Siegfried Schott, "Eine ägyptische Schreibpalette als Rechenbrett," *Nachrichten der Akademie der Wissenschaften in Göttingen, I. Philologisch-Historische Klasse, Jahrgang 1967*, Nr. 5 (1967), 91-114.

make way for the depiction of the laborers. Above the grain pile is a box to hold the scribes' writing materials.

The next scene shows Menna standing in a light shelter with papyrus columns as an attendant brings him refreshment in jars held in carrying nets. Menna's titles, painted as two columns of blue hieroglyphs, read: "the scribe of the Lord of Two Lands, Menna." From his pavilion, Menna inspects the treading and winnowing of the grain. Starting from the far right of the wall, four oxen tread the grain, driven by a man with a switch, while two men fork more grain onto the treading floor. One can presume that the oxen are moving in a circle as witnessed in Egypt today where they are tied to a wheel that gently turns. Several of the men have their hair tied in white kerchiefs to protect it from the dirt. The winnowing scene follows next. Two sets of three men toss up the grain with their winnowing fans while three men sweep the grain together with palm branches. The chaff is depicted against a background of light yellow while the grain is against a light rose that falls vertically to the floor because of its weight.

The third register from the top shows Menna seated on a folding stool similar to that on the upper left corner, holding a long staff in one hand and a handkerchief in the other. He wears a black wig, stylized lotus petal collar and long bag tunic wrapped with a white kilt. He is seated in a papyrus reed shelter with his feet raised on a brown wooden platform, attended by a servant who brings him another napkin and a jar of liquid. The text above Menna is destroyed. Behind the male servant is a green sycamore tree with hanging bunches of red figs on its brown branches. Cradled in the branches are three nests with eggs protected by several light pink birds that hover anxiously above while a crow readies to eat the eggs in the topmost nest. On the far right branch, four nestlings chirp as their mother flies towards the nest. In the red branches of the two smaller trees to the left are nestled five egg nests along with many black acacia pods, now faded. Below the tree are two boxes shown in side view, one with a gable lid and the other in shrine-form.[46]

The adjacent scene starts with a scribe holding his palette issuing orders to the two reapers working before him who hold sickles in their hands. The scribe and workers are clothed exactly like their colleagues on the uppermost register. In front of the reaper, a man wearing a leather loincloth drinks from a jar, holding his sickle under his arm. Facing him stands a female

[46] Example in Geoffrey Killen, *Egyptian Woodworking and Furniture*, Shire Egyptology 21 (Princes Risborough, 1994), 35 fig. 43.

gleaner with long black hair who is dressed in a long bag tunic with a white skirt tied over it and holds a reed pouch to carry the grain. In front of her, a young girl wearing a girdle of beads stoops to pick up grain stalks, while in front of her five male reapers gather grain stalks in preparation for cutting. Above, a mother is seated on a low stool under an acacia tree with seedpods (one of four above the grain field) taking some fruit out of a bowl. Her child is wrapped in a shawl and reaches up to tug at her hair. This image was copied and adapted some 750 years later in relief for the tomb of Mentuemhat (TT 34).[47]

In front of the reapers, the grain is already cut and packed for processing. Two groups of men carry wheat in panniers that are knotted and suspended from poles resting on their shoulders. These men wear leather nets in an arrangement that served to protect their linen loincloths. Between the two panniers, a woman dressed in simple skirt holds a jar of refreshment for the workmen in the field. Below the first pannier, a naked boy bends down to pick up sheaves of wheat that have fallen to the ground. Underneath the second pannier, two girl gleaners in long bag tunics are fighting over the contents of a bag that has split between them, pulling each other's hair while one grabs the other's wrist. As immortalized by Jean-François Millet in his painting *The Gleaners* (1857),[48] the lowest ranks of rural society would glean or collect stray sheaves of wheat left after the harvest. These limited amounts of grain probably led to squabbles between gleaners.

It is interesting to note that this vignette was the focus of a hieratic visitor graffito in black pigment that comments on the two girls fighting. Written across the pannier **(Figure 10)**:[49]

mˁḥ.w … sḥwi (*?*) …
the fighters .... list (?)

The word "list" suggests that once the graffito was followed by a list of offerings for the tomb owner, a practice in keeping with visitor inscriptions. As for the date, the signs are more consistent with 18th dynasty hieratic although some isolated 19th dynasty signs appear which

[47] Brooklyn Museum of Art 48.74. Richard Fazzini, et. al. *Ancient Egyptian Art in The Brooklyn Museum*, (New York, 1989), no. 71; Edna R. Russmann, "Relief Decoration in the Tomb of Mentuemhat (TT 34)," *JARCE* 31 (1994), 1-19, esp. n. 72.

[48] Jean-François Millet in his painting *The Gleaners* (1857), oil on canvas, Musée d'Orsay, Paris.

[49] My thanks to Dr. Hana Navratilova, Czech Institute of Egyptology, Charles University in Prague for her translation and digital rendering of the hieratic text.

would place the visit by author nearly 70 years after the scene was first painted. One would like to date this crudely painted graffito to the 25th/26th dynasty when the image of the fighting gleaners was copied in relief for the tomb of Mentuemhat (TT 34).[50] However, 26th dynasty grafittos were written in Demotic which precludes a Late Period date for the Menna inscription.[51]

In the next vignette, two men take refuge under a tree, one is asleep and the other plays a reed pipe under a water skin that he has hung from a branch. The register ends with the grain, already emptied from the panniers, being forked by two laborers while the aged supervisor with wispy hair and a receding hairline looks on, leaning on a stick. At the far left of the fourth and lowest register, the ground is being ploughed and sowed. A small naked boy stands holding a reed basket filled with seed below two round seed piles on a separate register. Two pairs of oxen pull a wooden plough driven by men with switches followed by sowers who throw seeds from their sacks on the newly tilled ground. The ploughmen lean into their task while the sowers rely on the wind to spread the seed on the ground. The next portion of the wall depicts nine men divided into two subregisters, tilling the soil with wooden hoes. On the top subregister, a naked boy follows the plough team throwing seeds into the furrows. On the lowermost register between the two teams with hoes, a man takes a rest from the back-breaking work of hoeing and crouches under a tree. Overall the style of painting is quick and sloppy as seen in the figure of the ploughman on the lower sub-register who was finished without taking the preliminary drawing into account. Here, the arm of the preliminary drawing comes out of the man's mouth in the final outline. Remains of the ploughman's head and back shoulder can be seen on the top sub-register line above. Green trees are drawn in the vacant space around the composition to give the idea of landscape.

Two acacia trees on the upper and lower sub-registers (the latter aided by a red vertical line) separate the hoeing, plowing and sowing scenes from the adjacent vignettes. On the upper sub-register, a girl pulls a thorn out of her companion's foot. The young girl sits on her basket

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[50] Helene J. Kantor, "A Fragment of Relief from the Tomb of Mentuemhat at Thebes (no. 34)," *JNES* 19, no. 3 (July 1960), 213, 216, pl. V-VI.

[51] At the Step Pyramid Complex at Saqqara a 26th dynasty black ink graffito in Demotic appears in the North Building at a time when Saite artists were covering the royal reliefs in the eastern subterranean gallery with the revised grid system in the attempt to record and reuse the Old Kingdom images (Cecil M Firth and J.E. Quibell. *Excavations at Saqqara: The Step Pyramid* I (Cairo, 1935), 79H; Alexander J. Peden, *The Graffiti of Pharaonic Egypt: Scope and Roles of Informal Writings (c. 3100-332 BC)*, PÄ 17 (Leiden-Boston-Köln, 2001), 279 with n. 7. On the dating and Demotic transcription see**:** Gunn MSS. XIII, 5.1).

and steadies herself with her right hand on the ground and rests her left foot the girl's knee. Both girls wear long tunics with areas painted pink to emulate the transparency of the fabric on their underlying bodies. Above them is the basket belonging to the thorn-puller. On the sub-register below, a girl dressed in a white wrap-around dress sits on a stool eating fruit out of the basket. Above her are two beverage jars and a wooden crate. Both of these vignettes of thorn-pulling and eating fruit were copied, adapted and sculpted in relief in the Later Period tomb of Mentuemhat TT 34.[52]

The last scene represents the harvesting and rippling of flax. On the lower sub-register, two men and two women harvest flax under the watchful eye of an overseer leaning on his staff before a tree. As above, this overseer is represented as a balding man who is better dressed than the others he supervises. Much of the green frit of the flax field has fallen off the wall due to the pigment recipe that did not include enough binder (**See Chapter 5**). In the sub-register above, three men separate flax seeds from the stems. This is accomplished by pulling the flax plant across the teeth of a rippling comb.[53] The seeds are depicted as yellow and brown dots on a white background. The flax to be retted lies in two bundles before the men at the end of the register.

The wall is framed at the top and sides by a green color band with red, yellow, blue and green blocks separated by white spacers lined in black. The frieze is composed of alternating checkerboard patterns of black and white and red and white strips; the lowermost band is a series of red semi-circles. A frieze of lotus petals set against a green and blue background follows. The final white strip is decorated with red ovals.[54] This same frieze decorates the lintel above the doorway. The skirting band at the bottom of the wall is composed of a yellow band sandwiched between two red bands, all of which are separated by black lines.

The agricultural cycle depicted on this wall reflects Menna's position as a field and cadaster scribe who supervised delegations that measured the fields, brought defaulters to justice, inspected work in the field and recorded the yield of the crop. If read from the bottom to the top registers, the narrative might go like this: furrowing and sowing, hoeing, ploughing (1st register); measuring the field (4th register); harvesting, carrying crops, threshing (3rd register); winnowing

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[52] John D. Cooney, "Three Early Saïte Tomb Reliefs," *JNES* 9, no. 4 (Oct. 1950), 193-204.

[53] Gillian Vogelsang-Eastwood, "Textiles," *AEMT*, 270-271.

[54] G. Jéquier, *Décoration égyptienne, plafonds et frises végétales du Nouvel Empire thébain {1400-1000 av J.C.}*, l'art décoratif dans l'antiquité, librairie centrale d'art et d'architecture, Paris, s.d. {1911}, pl. 39,6.

and measuring the corn (2nd register).[55] On another level, grain was life and also wealth in ancient Egypt. In the *liminal* space of the tomb, Menna would carry over his status and wealth into the next life and continue to provide for himself and his family with proceeds of the fields. Symbolically, these images relate to the natural cycle of the seasons from hoeing, plowing and seeding just after the inundation (*Akhet*) to growing (*Peret*) to the harvest and preliminary processing of foods and goods (*Shemu*). The seasons were generated by the solar cycle and equated in ancient Egyptian religious thought with *nḥḥ*-time or cyclic eternity. By the use of imagery connected to the complete seasonal solar cycle, Menna also expressed the desire of every ancient Egyptian to join eternal cycle of the sun that promised everlasting life and youth.[56]

BHSL (Broad Hall Small Left)

The small left-hand wall of the broad hall portrays Menna and Henuttawy worshiping Osiris, the god of the underworld (**Plates 7 & 8**). Depicted with green skin, the characteristic hue of vegetation and rebirth, Osiris wears the Osiris-crown (the white crown with two *Ma'at*-feathers), a blue and white striped tripartite wig, a divine beard, and a white mummiform garment with a green and blue broad collar and red and blue bracelets.[57] He holds the traditional Osirian insignia, the *ḥḳꜣ*-crook and the *nḥḥ*-flail. Osiris is seated on a polychrome-feathered *ḥwt*-block throne with a white cushion that rests on a reed mat. The throne resembles the enclosure hieroglyph used in the word "temple" (*ḥwt*) and "enclosure of the god" (*ḥwt-nṯr*). In meaning the *ḥwt*-block throne denotes a sacred space and relates to the divine nature of its occupant.[58] The red, blue, and green feather decoration of the throne is evocative of Horus, the son of Osiris who appears as the adjudicator of the "Weighing of the Heart" scene along with his father on the far left portion of the Long Hall Left in TT 69.

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[55] Aufrère, *Menna*, 5-9.

[56] The same desire to join with the solar cycle was expressed by the dead in the Coffin Texts and the *Book of Going Forth by Day*, see**:** Dimitri Meeks and Christine Favard-Meeks, *Daily Life of the Egyptian Gods*, trans. G.M. Goshgarian (Ithaca and London, 1997), 149-150; John H Taylor, *Death and the Afterlife in Ancient Egypt* (London, 2001), 196-198.See discussion with bibliography in Hartwig, *Tomb Painting and Identity*, 108, 112.

[57] On the dress and significance of the garments and insignia of Osiris, see: J. Gwyn Griffiths, "Osiris," *OEAE* II (2001), 615.

[58] Klaus Kuhlmann, *Der Thron im alten Ägypten. Untersuchungen zu Semantik, Ikonographie und Symbolik eines Herrschaftszeichens*, ADAIK 10 (Glückstadt, 1977), 82-83, 89.

Osiris is sheltered by a blue and yellow (gold) kiosk in the form of the shrine of upper Egypt (*pr-wr*), where the cult center resided.[59] The kiosk rests on a podium in the form of the phonogram for *Ma'at* meaning "truth", "justice"; signifying the role played by Osiris in the judgment of the dead.[60] The kiosk is painted with yellow-orpiment, huntite and perhaps beeswax (**See Chapter 5).** The result was a highly fluorescent yellow when viewed under ultraviolet light. More will be said about this mixture in the **Chapter 3**, however for our purposes here, the yellow background with its solar associations and the figure of Osiris, god of the underworld, evoke the regeneration and rebirth of the sun through the netherworld.[61]

Before Osiris rises a bouquet composed of three stems of papyrus, lotus buds and flowers, and mandrake fruit with tiers of red poppies and blue cornflowers tied with a rope or linen strips. The ancient Egyptian word for bouquet, *ankh* (*ꜥnḫ)* had the same consonantal value as the word for "life." Composed primarily of papyrus signifying life and lotus denoting rebirth, the bouquet symbolizes the necessities promised by Osiris for the afterlife of the dead.[62] The multicolor texts above Osiris read:

> Osiris, Wennefer, the great god, ruler, Lord of Eternity (*nḥḥ*), the Eye of Eternity (*ḏt)*

Menna stands with his hands raised in praise before Osiris in front of an offering table. He wears a short wig and a long tunic with a pleated wrap-around pointed kilt tied with a sash. Around his neck are the *šbyw*-collar or the Gold of Honor and a blue and green striped broad collar on top of which is a *wꜣḥ*-collar composed of fresh lotus petals. The *wꜣḥ*-collar, also known as the "collar of justification," was symbol of the vindication of Osiris and, by extension, a symbol of the dead after their successful judgment before Osiris.[63] Menna also wears gold armbands, blue and green bracelets and a short wig. Henuttawy walks behind Menna, carrying

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[59] Maya Müller, "Schrein," *LÄ* V (1984), 709-712.

[60] Helmut, Brunner, "Gerechtigkeit als Fundament des Thrones." *Vetus Testamentum* 8 (1958): 426-428.

[61] Parallels in Jørgen Podemann Sørensen, "Ancient Egyptian Religious Thought and the XVIth Hermetic Tractate," in *The Religion of the Ancient Egyptians: Cognitive Structures and Popular Expressions*, edited by G. Englund, Boreas 20 (Uppsala, 1989 (sic); 1991), 48-53; and idem, *The Religion of the Ancient Egyptians*, 119-121.

[62] See discussion in Hartwig, *Tomb Painting and Identity*, 63-64.

[63] Richard Lepsius, *Das Todtenbuch der Ägypter nach dem hieroglyphischen Papyrus in Turin* (Leipzig, 1842), chapter 19; Bonnet, *Reallexikon*, 121; Dieter Jankuhn, "Kranz der Rechtfertigung," *LÄ* III (1980), 764; Renate Germer, "Flowers," trans. J. Harvey, *OEAE* I (2001): 543.See also discussion in Hartwig, *Tomb Painting and Identity*, 91.

the sistrum, the insignia of her position,[64] and the *menit*-necklace with green and dark blue beads. Both instruments were also sacred to the goddess Hathor, and associated with female fertility and regeneration.[65] She is identified in the text above and behind her as "his sister, the lady of the house and Chantress [of Amun, Henut]tawy, justified with the great god." Henuttawy wears a long enveloping wig with a lotus petal headband, large golden (yellow) hoop earrings, multicolored bracelets and armbands, and broad collar of yellow, green and blue over which is the *wꜣḥ*-collar of justification. She wears a long, white diaphanous dress painted with cascading streams of thin whitewash to show the effect of the fine, thin fabric against her skin. She is also depicted with five toes on her right foot.

Over Menna and Henuttawy are 15 columns with 13 columns of text painted in blue hieroglyphs:

> (1) Giving praise to Osiris (2) and kissing the ground before Wennefer by the scribe and the overseer of (3) ploughlands of [Amun, Menna], (4) he says: It is with truth (5) foremost in my heart and with a heart without wrongdoing (6) that I have come to you. May you cause my body to unite with itself (7) in the sacred land while my soul goes to eternity, (8)[66] the overseer of fields of the Lord of Two Lands (9) [and the overseer of fields of Amun, Menna] (10) he says: I give you[67] praise, I extol (11) you, I affirm your beauty. May I be made (12) to rest in the beautiful[68] west (13) in the favor of your *ka*.

A similar text is found in the tomb of Pairy (TT 139).[69]

Between Menna and Osiris is an offering table with a blue base and a white top with short wavy lines red and yellow, indicating wood or the variegation of stone such as calcite.[70] The table is piled high with a basket of grapes, different types of bread, baskets of figs or dates, the foreleg of an ox (*ḫpš*), ducks, rib meat and the head of a cow, all surmounted by a lotus bouquet. Below are mud-sealed wine jars wrapped with stalks of lotus. Behind Henuttawy, two offering bearers are arranged on two registers: the top offerer with a bag tunic and kilt carries

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[64] Silvana E. Fantecchi and Andrea P. Zingarelli, "Singers and Musicians in New Kingdom Egypt," *GM* 186 (2002), 34 with notes 67-69. See also: Emily Teeter, "Female Musicians in Ancient Egypt," in *Rediscovering the Muses: Women's Musical Traditions*, edited by K. Marshall (Boston, 1993), 68-91.

[65] Hans Bonnet, *Reallexikon*, 450-451; Gay Robins, *Women in Ancient Egypt* (London, 1993), 145-146, 164.

[66] Scribal error: *nn f*

[67] Scribal error: *di.n.k* for *di.k*

[68] Scribal error: *nfrtt* for *nfrt*

[69] Vincent Scheil, "Le tombeau de Pârj," *Mém. Miss*. V, 2 (1894), 585.

[70] For a similar offering table see: Parkinson, *Nebamun*, 85-87.

three papyrus stalks and a coiled lotus bouquet; the lower one carries a table heaped with grain (?) with lotus stalks hanging from the rail below.

Nine male offering bearers are arranged on the register below. From left to right, the first seven men carry several geese, two containers of food, a garlanded cow, three pieces of conical bread in a dish, a large mud-sealed vessel, papyrus stalks, and a cow's head. To either side of the tall brazier offering tables, two men place items on the burning pile. The first holds a *ḫpš*-leg – the choice cut of meat from an ox - and the second holds out a duck-shaped utensil to spoon the fat onto the burning pile.[71] Heaped on the altars are an assortment of meats, fowl, fruits, vegetables and bread. Two large festooned wine jars lie below as well as two cones of fat in bowls. Four heads of lettuce (*Lactuca Sativa)* are interspersed below which, based on their high yield, are associated with fertility.[72]

The wall is bordered on three sides with a polychrome color band and a skirting of red and yellow with black lines below. The decorative frieze is the same checkerboard lotus petal pattern found on the adjacent wall (BHNL).

Since the reign of Thutmose IV, the depiction of the deceased worshipping Osiris is found on the small walls of the broad hall (in T-shaped tombs) usually reserved for the false door or stele in elite Theban tombs.[73] By Amenhotep III, this motif would move to other important cultic walls like the back walls of the transverse hall or the walls of the statue niche, where it would replace images concerned with provisioning the dead. By the Ramesside period, images of worshipping Osiris would become commonplace with the scenes now focusing on the veneration of the gods rather than the veneration of the deceased.[74] The tomb of Menna is at the beginning of this trend. By venerating this god, Menna stresses the importance of Osiris in his passage to the next world, which is the same realm in which Menna would reside eternally and through

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[71] Schott, *Das schöne Fest*, 24, abb. 6; Nina de Garis Davies, *Scenes from some Theban Tombs (Nos. 38, 66, 162, with excerpts from 81,* PTT IV (Oxford, 1963), 3, n. 3.

[72] Also associated with the god Min. Ludwig Keimer, "Die Pflanze des Gottes Min," *ZÄS* 59 (1924), 140-143; Renate Germer, "Die Bedeutung des Lattichs als Pflanze des Min," *SAK* 8 (1980), 85-87; idem, "Lattich," *LÄ* III (1980), 938-939; Klaus Kuhlmann, "Bemerkungen zum Lattichfeld und den Wedelsinsignien des Min," *WO* 14 (1983), 196-206; Michel Defossez, "Les laitues de Min," *SAK* 12 (1985), 1-4; Renate Germer, "Vegetables," translated from the German by J. Harvey and M. Goldstein, *OEAE* III (2001), 477.

[73] Joachim Spiegel, "Die Entwicklung der Opferszenen in den Thebanischen Gräbern," *MDAIK* 14 (1956), 201-203.

[74] See discussion in Nigel Strudwick, "Change and Continuity at Thebes: The Private Tomb after Akhenaton," *The Unbroken Reed. Studies in the Culture and Heritage of Ancient Egypt in Honour of A.F. Shore*, edited by C. Eyre, A. Leahy, and L. Leahy, Occasional Publications 11 (London, 1994), 321-336, esp. 327.

which he would pass to partake of offerings and contact the living in the tomb chapel.

BHFL (Broad Hall Far Left)

The far left wall of the broad hall has received very little attention in previous publications about the tomb of Menna due to its fragmentary state (**Plates 9 & 10)**. When Ernest MacKay restored the tomb in the fall of 1913, the majority of the wall had broken away when the ceiling fell.[75] The fragments were removed at some point to a nearby magazine and then reaffixed to the wall by MacKay with mud plaster in September 1913. By October of 1913, all but 15 painted fragments had been fixed to the wall. In a series of reports, MacKay discusses the difficulty of restoring the tomb and noted that due to the incomplete state of some of the scenes, he was unable to find a place for fifteen painted fragments. Mackay decided to keep these fragments "if anybody should find their right position."[76] If one looks at the Mond photograph mosaic[77] compared to the wall as it exists today, one notes the absence of a great deal of decoration. This can be attributed to the instability of the mud plaster matrix and a number of later conservation attempts that covered some of the fragments. For these reasons, the line drawing indicates what is on the wall today (black lines) and what was originally there (green lines) so that a better understanding of the original decoration can be reached (**Figure 11)**.

To the far right on the top register, Menna and Henuttawy are seated on two chairs (his is black and hers is yellow) before the remains of an offering table of which only the figs and coiled lotus bouquet on top of the pile still exist. Above his head were two small hieroglyphs *Mn[n*] spelling out the name of Menna.[78] In one hand, Menna appears to be holding a *kherep-*

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[75] Mond MSS 1.3.1. See also M. Ernest MacKay, "Report of the Excavations and Other Work," *ASAE* 14 (1914). 88-96, espc. 89-90.

[76] Gardiner MSS. 19.2.

[77] Mond used a simple camera attached with lighting equipment to a framework mounted on rails. This allowed him to take many overlapping photographs from a distance of 18-20 inches to cover an entire wall of the tomb. These photographs were then developed and the positive prints produced were cut and arranged in a mosaic fashion on cardboard. The resulting composite image represents an entire wall scene, evenly scaled and seen from a frontal orthogonal perspective. This composite print was then retouched by hand to hide the joins between the prints and the result photographed again. Mond mounted small samples of his work on cardboard to facilitate access, along with a small-scale plan of each tomb (M. Pendlebury, 3D Virtual Reality reconstruction on the Internet using VRML, M.A. thesis Manchester Metropolitan University 1996, p. 35). Thanks to Kai-Christian Bruhn for this synopsis.

[78] Although MacKay's reconstruction must be approached with a great deal of caution, the only figures that would appear seated on the upper register of the back wall of the transverse hall are the tomb owner and his wife (and sometimes family).

staff with his other hand outstretched towards the offering table. He wears a broad collar and *wꜣḥ*-collar, and a kilt tied with a sash over a bag tunic. Menna's skin was once brick red, but has faded to a bright rose. The remains of beeswax can be seen on his arm and hand that has hardened and cracked with time (*BHFL 1044*) (**See Chapter 4).** Henuttawy wears a white dress and carries lotus flowers in one hand (the remains of the pink coiled stems remain); the other hand is destroyed. Above the pair is an offering list of which only the vessel sign indicting the action to be performed is preserved (four vessels appear in the Mond photos). Before them was a *sem*-priest wearing his leopard skin robe with his arm outstretched reciting the list. Traces of red remain on what once was dark brown-red skin that has faded to a yellow-orange.[79] All that remains of the robe is the white under layer or perhaps an arsenic sulfide mixture that degraded into a white arsenolite (AS_20_3).[80] The three columns of text above and behind the *sem*-priest were barely legible when Mond took the photo series but read:

(1) …which has come forth (*prr*) from (2)/// (3) smell (*ḫnm m*)[81] ///

Behind him are the faint green remains of full-blown papyrus umbels that were once presented by an offering bearer.[82]

The lower register is almost completely destroyed. Today only fragments of a woman's wig and arm remain. Mackay reconstructed a standing woman wearing a flowing dress that was knotted under her right breast, holding a lotus bouquet to her chest. Above her were two columns of hieroglyphs that gave her title and name:

(1) his [beloved], the Chantress of [Amun] *Tj* (2)…*wy*

The name associated with this woman, *Tj…wy* only appears on this wall, and has not been noted in previous scholarship. Although only partially preserved, the top of the first column is missing the usual genealogical filiation (i.e. "his daughter" (*sꜣt.f*) for example) and the second column is missing the middle portion of her name that, based on remains, cannot be reconstructed. For these reasons, it is tentatively suggested that this name may belong to one of Menna's daughters.

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[79] Most likely this was a mixture with realgar that is extremely photosensitive and fades into a yellow to yellow-orange.

[80] For discussion, see: Janet Ambers, "Pigments," *The Nebamun Paintings*, ed. Andrew Middleton and Ken Uprichard (London, 2008), 37.

[81] Wb. III, 292, 4.

[82] See parallels in TT 38 (Davies, *Some Theban Tombs*, pl. III) and TT 89 (Roberta Shaw, "The Decorative Scheme in TT 89 (Amenmose)," JSSEA 33 (2006), Wall N, 207 and fig. 43,3).

There are problems with the placement of these fragments. The positioning of her outstretched right arm is a pose associated primarily with seated figures, a fact that is supported by the presence of a chair and the remains of a seated male figure in front of her. Thus, the lower fragment depicting the feet and dress of a standing female belongs somewhere else on the wall. In fact, the overall placement of this seated woman is suspect given her small size which is more similar to the seated female banqueting figures further left on the wall than those of Menna and Henuttawy above. It is fair to assume that once, seated figures of Menna and Henuttawy appeared on this lower register, mirroring their placement at the far left of the wall, given the ancient Egyptian predilection for symmetrical compositions.

In front of them is a fragmentary offering table with baskets of fruit, vegetables, bread and meat with wine jars below. Above the table, slightly to the left were four columns of hieroglyphs of which only two are readable due to water damage:

(1) Receiving (*šsp)* /// (2) food offerings (*snw*)[83]////

In front of the couple, Mackay reconstructed three male offering bearers and the legs of a fourth. The first, wearing a kilt, carried a white table piled with offerings of an unknown type.[84] The second man carries a composite bouquet and the third proffers an offering table crowned by a coiled lotus bouquet. Both wore long bag tunics wrapped with white kilts. Only parts of the faces and the shoulders of the third offerer remain today on the wall as well as four of the original six lines and two horizontal lines for texts that were never completed. In addition, Mackay reconstructed a lead offerer who once held a lotus flower bouquet to the immediate left of the offering table before the couple.

The middle part of the upper wall depicts a banquet which is divided into two sub-registers. On the topmost register, a woman wearing a wig with a lotus headband, hoop earrings, a broad collar and a *wꜣḥ* collar holds a lotus flower to her breast. Before her stretches a group of six male banqueters and the lower part of a seventh banqueter seated on square benches or folding stools. Some sniff lotuses or offer a lotus to a companion. One man cups his hand and drinks the contents from a small tubular vessel offered by a servant who stands in front of him. The men are dressed in their best; all wear pleated kilts and sashes with some wrapped over a

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[83] Wb. IV, 155, 6. Parallel: TT 38, Davies, *Some Theban Tombs*, 5, pl. III.

[84] The fragment was placed too low and should be moved higher. The torsos of all the male offerers are proportionally the same.

tunic, tall unguent cones on their heads and lotus petal *wꜣḥ*-collars around their necks. Eleven empty column lines (12 in Mond) are painted above their heads.

The lower register once held seven seated female banqueters served by two female attendants. Only parts of three women remain along with a serving girl. From right to left, the Mond mosaic shows a group of stands on a papyrus mat, followed by the bottom halves of two seated women clothed in long white dresses served by a girl who proffers a vase. The next fragment (which can be seen today on the wall) depicts a naked serving girl wearing a girdle, a broad collar and black wig. She was holding up a chalice for the seated woman to drink. In protest, the banqueter puts up her hand to say she does not want any (more?) wine. Behind her, a seated female participant sniffs a lotus and turns towards the banqueter on her left. The last woman turns towards the left to her companion and holds a lotus to her nose (only her legs and chair remain). All of the banqueting females wear unguent cones on their long wigs that are wrapped with lotus headbands. Their pleated dresses are colored a brownish-yellow indicating the trail of scented unguent that traveled from their unguent cones down their bodies. Their jewelry ranges from golden broad collars to large hoop earrings. The lowermost register shows two sets of male offering bearers, one headed right and the other left. This scene also never received its caption but only six lines for columns as seen on the Mond photograph.

On the upper far left register, Menna and Henuttawy are seated on a papyrus mat on separate high-back feline-legged wooden chairs; hers is yellow and his black.[85] Menna wears his usual short wig and unguent cone,[86] bag tunic with a pleated kilt and sash along with the *šbyw*- and *wꜣḥ*-collars and armbands. The Mond photographs show that he was rendered with four fat folds. Behind him, Henuttawy's left arm encircles his shoulder and her right clasps her left wrist. She wears an unguent cone atop a long wig, floral *wꜣḥ*-headband and collar, a broad collar, armbands, bracelets, and a long white veiled dress that is rendered with a thin whitewash at the bottom to indicate transparency.[87] Underneath her chair is a scribal palette and container that

[85] Many earlier details of the upper register are preserved in Mond photo 4146.

[86] The cone was composed of scented fat or beeswax that, when put as a dollop on the wig, would melt producing a perfumed oil to combat dryness. The cone-like appearance is simply a visual device that took the round or oval appearance of the tallow as it rested on the wig and tipped it up so that it could be seen.

[87] Hartwig, *Tomb Painting and Identity*, 92, n. 337.

may indicate her literacy skills;[88] or it may belong to Menna.[89] Above Henuttawy the caption reads: "his sister, the mistress of the house, Henuttawy" (*sn.f nbt-pr ḥnwt-tꜣwy*).

On the register below, an unnamed couple is seated on two black chairs, wearing similar clothes to those above.[90] The differences lie in the pleating of the woman's dress tied between her breasts and her diadem that is crowned by a lotus blossom. Instead of indicating the transparency of her dress, the lightness of the fabric is depicted by the undulating outlines along the lower half of the skirt. Below her chair rests a yellow (polished bronze) mirror and a stone kohl jar. The woman holds the man's upper arm with one hand while the other rests on his shoulder, a gesture indicative of loving relations between man and wife.[91] The man holds a lotus to his nose with his left hand and his right hand is outstretched. This couple is most likely Menna and Henuttawy again based on the presence of the Gold of Honor worn by both men, and the rarity of both father and son being rewarded.[92]

The figures and actions before both registers of Menna and Henuttawy are partially reconstructed. On the upper register appears a fragment of a woman's outstretched arm that once offered a chalice.[93] Tips of lotus flowers painted at the bottom left corner indicate she was also carrying a bouquet. Below and to the left is a painted section of her hips that should be moved higher and closer to her arms. Above her arm, Mackay placed a fragment of text that reads: "for the *ka* of the overseer of ploughlands [of Amun, Menna…]" that has parallels in other contemporary Theban tombs.[94] Behind the woman, Mackay reconstructed a sub-register of offering bearers above and lotus garlands on a group of unidentified offerings below that are completely out of place.

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[88] Betsy M. Bryan, "Evidence for Female Literacy from Theban Tombs of the New Kingdom," *BES* 6 (1984), 21, 24-25.

[89] Robins, *Women*, 113, suggests there was not enough room under Menna's chair so the scribal outfit found its way under Henuttawy's chair by default.

[90] Although this seated couple is not captioned, the presence of the Gold of Honor worn by both figures and the similarity of dress argues for their identity as Menna and Henuttawy and not the parents of Menna. See also parallel on LHR that depicts Menna and wife on both registers.

[91] Sheila Whale, *The Family in the Eighteenth Dynasty of Egypt*. The Australian Centre for Egyptology Studies 1 (Sydney, 1989), 241, pl. 7, V.

[92] See Binder, *Gold of Honor*, 229, with table 14.5.

[93] See parallels TT 175**:** Lise Manniche, *The Wall Decoration of Three Theban Tombs (TT 77, 175, 249)*, CNI Publications 4 (Copenhagen, 1988), figs. 29-32; TT 249: Ibid., figs. 48-49; TT 181: Hartwig, *Tomb Painting and Identity*, pls. 5.2, 7.1, 7.2.

[94] For similar images with this text see: Artur and Annelies Brack, *Das Grab des Tjanuni. Theben Nr. 74.* AV 19 (Mainz, 1977), 33-34, t**e**xt 22 with parallels.

On the lower register, a son presents an *ankh*- or life-bouquet to Menna and Henuttawy composed of lotus buds and flowers.[95] One would guess that this was their son based on three vertical lines (five in the Mond photo) that remain above the bouquet. Behind him, another man bears three stalks of green papyrus. A young boy follows who carries a table with a lotus draped over the offerings. All the men wear kilts with pleated aprons tied with a sash; the boy adds a tunic to his ensemble.

Behind the men was a section of a woman's face that did not belong on the lower register (it no longer remains on the wall). It is evident, based on the proportions of her chest and neck, and her *wꜣḥ*-collar, that she belongs instead to the daughter on the uppermost far left register offering a chalice to Menna and Henuttawy. Proportionally, she does not fit on the lower register.[96] Blank columns and horizontal rows, the top of a wig and the legs belong to another female figure that was once on the lower register.

The wall is framed above and on each side by a yellow-blue-red-green color band with white spacers outlined in black. The entire length of the band is bordered in green. The frieze is the same as found on all the walls of the left side of the broad hall. The lower part of the wall is decorated with two stripes of red and one of yellow that are separated by black lines.

Although the wall is in a bad state of repair, enough remains to reconstruct the entire composition. On the far right side are two registers of Menna and Henuttawy seated, above with the *sem*-priest reciting an offering list, and below with offering bearers. On the far left are two registers both of Menna and Henuttawy. In between are vignettes from the celebration of the Valley Festival including the offering of the *ankh*-bouquet and festival banquet with its copious amounts of drinking. During the Valley Festival, living family members, friends, and colleagues visited the tomb chapels and forecourts of their ancestors. Offerings to the sun god were burnt; animals were butchered; food offerings were made; and bouquets were presented. On the last night of the two-day festival, an all-night vigil was held with banqueting, music, and drinking. The goal of this vigil was to blur the limits between this world and the next so the living could communicate with the dead.[97] Many of these scenes decorated the walls of eighteenth dynasty

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[95] See the discussion of the *ankh*-bouquet on BHNR.

[96] On Mond photo 4151, the top of the daughter's head does not match her wig below. Instead, this wig belonged to a male offerer, while the face belongs to the outstretched hand of the daughter on the far left upper register.

[97] Discussion in Hartwig, *Tomb Painting and Identity*, 11-12, with bibliography in n. 52.

Theban tomb chapels as an eternal reinforcement of the festival rituals and the strengthening of ancestral ties.

BHNR (Broad Hall Near Right)

Moving to the right wing of the broad hall, the near wall shows Menna and his wife making offerings during the Valley Festival (**Plates 12 & 13)**. Menna steps forward holding two pink braziers filled with burning charcoal, the first holding one bird and the second, three fowl. Menna wears a shoulder-length wig, a blue and yellow broad collar and a short-sleeved, transparent bag tunic with a short kilt and sash. Behind him, Henuttawy stands holding a *menit*-necklace in her upraised hand and a composite bouquet and sistrum in her other. She wears a white wrap-around dress that is draped over her left shoulder and knotted just below her right breast.[98] At the bottom, a thin layer of whitewash is brushed on her ankles to indicate the sheerness of the linen. On her head, she is adorned with a black voluminous wig and a lotus petal headband with a lotus bud at her crown. Her jewelry consists of a yellow (gold) broad collar with green beads and spacers, and yellow bracelets with radiating bands of red, green and blue. Below, a small servant figure offers a cone of incense or scented fat in a bowl along with a duck-billed spoon to place it on the offerings to keep the fire burning.[99] In his other hand, he held an additional object that is unidentifiable due to destruction.

A layer of beeswax varnish was applied to both figures. Menna's arms, face and hair and Henuttawy's wig, jewelry and *menit*-necklace show a surface coating of beeswax that has hardened and darkened over time (**See Chapter 4**). Ernest Mackay first identified the use of beeswax as a varnish in a number of eighteenth dynasty Theban tombs, and noted it improved the brilliance of the colors.[100] More recently, beeswax was scientifically analyzed on the Nebamun fragments at the British Museum where it was used as a varnish. In the publication it

[98] See similar examples in Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, 108, figs. 7:10 and 7:11.

[99] Schott, *Das schöne Fest*, 24, abb. 7.

[100] Ernest Mackay, "On the use of beeswax and resin as varnishes in Theban tombs," *Ancient Egypt* 5 (1920), 35-38.

was suggested that beeswax was applied to the surface layer to help the larger-grain pigments adhere to the plaster.[101]

The use of beeswax varnish on Henuttawy's jewelry gave it a glossy finish perhaps in imitation of gold, and may have helped the black pigment of their wigs adhere to the wall. Likewise, the use of beeswax on Menna's face and arms brightened the color, creating a visual focus on the tomb owner.

The pile before them is packed with offerings. Below are three additional tall offering braziers holding, from left to right, rib meat and a *ḫpš*, a cow's head and a brisket, and some other choice cuts of meat. Packed around these choice cuts are grapes. Between the braziers are pointed cones of scented fat or incense resting in deep bowls. On the offering mat above are various loaves of bread, baskets of grapes and yellow sycamore figs with black vertical lines to distinguish them from mandrake fruits that lie at the very top of the pile on a reed mat. There are various cuts of meat including a cow's head, as well as several oxen forelegs (*ḫpš*), and fowl. A table full of grapes and mandrake fruits, a tray of yellow dates and a green cucumber complete the offerings. A coiled bouquet of lotus flowers and buds on the top indicates the freshness of the offerings and symbolizes their eternal renewal.[102] The top offering pile on the last papyrus mat was completely hacked out.

Below the couple, four male offering figures walk or run towards a low crenellated white offering table on which only an oxen *ḫpš*-leg remains. [103] The first brings a floral bouquet, the second proffers a pointed incense cone in a bowl. The third carries a wooden yolk with five pink wine jars plugged with leafy vegetables on each stand.[104] In his other hand, he grasps three papyrus stems. The fourth man holds the lugs of a round-shoulder Caananite amphora.[105] The yellow skin tone and facial physiognomy indicates that this man is from the ancient Near East,

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[101] Rebecca Stacey, "Paint media and varnishes," *The Nebamun Wall Paintings*, edited Andrew Middleton and Ken Uprichard (London, 2008), 58-59

[102] Davies, *Some Theban Tombs*, 3; and see discussion on BHNL.

[103] Mond photo no. 4063, See example of a crenellated table on LHL, bottom register right.

[104] Compare TT 38: Davies, *Scenes from Some Theban Tombs*, 3, pl. 1.

[105] M. Serpico, J. Bourriau, L. Smith, Y. Goren, B. Stern and C. Heron, "Commodities and Containers: A Project to Study Canaanite Amphorae Imported into Egypt during the New Kingdom," *The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium BC* II*: Proceedings of the SCIEM2000 Euro-Conference, Haindorf, May 2001*, edited by M. Bietak (Wien, 2003), 365-375. See also Torgny Säve-Söderbergh, *Four Eighteenth Dynasty Tombs*, PTT I (Oxford, 1957), 25-27, pl. XXIII.

either Caananite or Syrian in origin.[106] However, he wears the same white Egyptian kilt worn by the other men, suggesting his assimilation into Egyptian culture. Perhaps he was a friend of Menna, or this portrayal may have simply been chosen by the artist to add to the visual interest of the scene.

Above Menna and Henuttawy are 10 columns of polychrome hieroglyphs that show both Amarna damage and *damnatio memoriae* to the name of Menna. The texts read:

> (1) Offering everything good and pure (2) supplying the braziers (*ꜥḫw*) with incense (*snṯr*) (3) to [Amun-re] (4) king of the gods, to Re-Horakhty, (5) to Osiris, ruler of Eternity (6) to Hathor, Mistress of the Necropolis (*smt*) …(7) (by) the overseer of the ploughlands (8) of [Amun], the overseer of (9) fields of the Lord of Two Lands, (9) [Menn]a, justified.

One column of vertical text in front of Henuttawy gives her name and titles:

> (1) His sister, the Mistress of the House [the Chantress of Amun, Henuttawy, justified]

The middle section of the wall to the left of the break shows a change in the decorative program.[107] The results of the x-ray fluorescence survey indicate the same general mixture was used for both phases. When the light yellow used in the ties of the coiled lotus of the 1st phase of decoration is compared to the yellow used for the foreign offering bearer in the 2nd phase, the mixtures are basically the same: a yellow arsenic sulfide, probably orpiment, mixed with iron oxide and calcite (As_2S_3? + Fe_nO_n + $CaCO_3$). The difference lies in the greater amount of calcite white used in the bouquet ties. The similarity of pigment mixtures could indicate that either the two phases of decoration were done relatively close in time, and/or the same artist/apprentice did the pigment mixture. The similarity of the pigment mixtures (as well as the background whites) prove Menna did not usurp an earlier tomb but chose instead to change and extend the decorative program.

The earlier phase is done in green to the left of the break in the wall. On the top register, hieroglyphic signs of an earlier text are visible under the later layer of plaster. The text states: "Making a correct festival offering (*ỉrt wdn smꜣꜥ ꜥꜣbt*)."[108] Remains of the original color band can be seen above and to the right of the text that marked the original boundary of the wall.

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[106] Eric Cline, "Amenhotep III, the Aegean, and Anatolia," in *Amenhotep III: Perspectives on His Reign*, edited by D. O'Connor and E. Cline (Ann Arbor, 1998), 239-240.

[107] Also discussed above in Chapter 1.

[108] *Wb*. I, 391, 10.

Directly below the text, the remains of a lotus bouquet can be seen. Below the arms of the man carrying an offering stand are preliminary drawings from the earlier phase, including baskets on a mat and a number of coiled lotuses (the XRF reading was taken of the ties here). Below, on the middle register are the remains of two tall brazier offering stands with a bowl (of fat?). Under the fourth male (top register) and fifth female offering bearer (middle register) from the right is the painted figure of Menna wearing the same pink tunic, long under kilt and short white kilt seen at the far right of the wall. Standing behind her husband, under the fifth and sixth male offerers on the upper register is the figure of Henuttawy who faces the same rightward orientation as her husband. One arm is bent to her chest (and coated with beeswax) and the other is outstretched at her side, presumably holding a *menit*-necklace and a sistrum with a bouquet like her image at the far right of the wall. Faint traces of her long white dress and feet (one with five toes) can be made out on the middle register between the sixth and the seventh female offering figures.

The lower register depicts, from the end of the text right to left, two male offerering bearers and then three male singers who are clapping to the beat of the music. They all stand on a register line that ran roughly at the level of the rope that trussed the ox's legs. Remains of the song text can be seen above the slaughter scene extending left towards the first offering bearer with the papyrus stalk. The text is only partially preserved and but appears to be nearly identical to the text at the far right of the wall (please see full translation below):[109]

> (1-2) …..of your house…(3) incense (4) reaches the… (5) the door (*sbꜣ*) (6) what you have [offered] is received (7)….(8) A beautiful day! One remembers (*sḫꜣ*)… (9) Amun. [How} pleasant… (10) lifting praise up to the height of heaven…. (11) up to (your) face (11) …(12) to see….

When the wall was extended, the second phase of decoration was placed over the existing decoration and both the scene and texts were moved to the far right of the wall. The original scene (from left to right) depicted three male singers who are clapping, preceded by two striding male offering figures. The second phase follows the order precisely (only the arms of one singer are preserved to the right of the crack) but represents the two male offering figures running. At the same time, the scene of Menna standing with braziers before an offering pile was plastered over and moved to the far right hand part of the wall, adjacent the new doorway. In place of Menna (and Henuttawy) were painted two registers of family members bringing offerings.

[109] Schott, *Das schöne Fest*, 106, n. 2.

On the top register, nine men are depicted beginning with "his son, the scribe of accounts for grain [of Amun] Se" (*sš ḥsbw ỉt n ỉmn s*). His action is described in a column of black hieroglyphs below his left:

Bringing all young, good and [pure things] (that go up) in front of Amun.[110]

Se holds an offering stand loaded with fruits (grapes and sycamore figs[111]) and holds a floral arrangement in his other that includes lotus flowers and buds tied with pomegranates and grapes. He wears a short bag tunic and a white scalloped kilt kept in place with a sash. Behind Se, Kha was also identified by black hieroglyphs below his left arm that held a lotus bouquet (now lost). Seven anonymous men follow bringing (from right to left) a table of incense; a composite bouquet of lotus, poppies, mandrake fruits, and blue cornflowers as well as a string of fowl; a composite bouquet and a vine of grapes; two composite bouquets, one of lotus the other of papyrus, a table piled high with figs and bunches of grapes with a group of geese knotted together, two more lotus and papyrus composite bouquet, and three stems of lotus flowers with a lotus bouquet of mandrake and poppy. The men are dressed in short wrap-around kilts with sashes or short tunics and a white scalloped kilt tied with a sash. Some are clean-shaven and others wear a short black wig. Originally, all but the last three men were captioned but the text was too destroyed to translate, even in the Mond photographs.

On the second register, ten women walk towards the deceased couple bearing offerings. The first woman is "his daughter, his beloved, the Mistress of the House (*nbt-pr*), Chantress of [Amun] Way."[112] Way holds a sistrum in her upraised hand and a *menit* as well as three coiled stems with lotus flowers in her lower hand. The second daughter also holds a sistrum in her upraised hand and a grape vine in her other. She is described as "his daughter, his beloved, the Mistress of the House, Chantress of [Amun], Nefery.[113] Behind the void stands the third daughter who is captioned: "his daughter, his beloved Kasy." She holds five lotus flowers by the stem, a bouquet of lotus, poppies and mandrakes (?) and a *menit*-necklace.

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[110] See Mond photo 4050.

[111] Figs can be distinguished by faint black vertical lines which have faded, see Parkinson, *Nebamun*, 67, fig. 78.

[112] Ranke, *Personennamen* I, 76, no. 5.Translated as Uy, Nofera, and Kasi by Campbell, *Two Theban Princes*, 91.

[113] Text appears on MMA T801 to the left of the sistrum and Mond photo no. 4051. No longer preserved on the wall. See discussion in Chapter 1.

Seven unnamed women follow behind the three daughters of Menna and Henuttawy. Each bears a distinctive gift including papyrus stalks, *menit*-necklaces, sistrums, coiled stems of lotus flowers, bunches of grapes and bouquets of lotus flowers, red and yellow pomegranates, grapes and poppies. All of the offerers including the daughters wear the same ensemble: a white wrap-around dress that is draped over the left shoulder and knotted just below the right breast. The transparency of the linen over their left upper bodies is rendered with a thin wash of white. All wear black wigs with a lotus bud floral headbands, golden or beaded broad collars, bracelets and armbands and some, gold hoop earrings.

At the far left end of the wall, Menna and Henuttawy sit on two feline-legged high back chairs on a papyrus mat; his is black and hers yellow. In front of them, their son offers a complex bouquet of lotus flowers and buds with a mandrake fruit, red poppies, blue cornflowers, and green bouquets.[114] Although the scene is not captioned, the identity of the participants can be assumed given their size, the couple's primary rightward orientation and son's duty to provide for the cult of his parents. Menna and Henuttawy are dressed in their best. Around his neck, Menna wears a green and blue broad collar with the floral *wꜣḥ*-collar of rebirth and the ultimate statement of status - the *šbyw*-collar or Gold of Honor that shows his personal relationship with the king. Menna wears a short kilt with a long thin under-kilt and tunic that are tied with a sash around his waist. On his head, he wears a shoulder length wig and an unguent cone. The cone was composed of scented fat that, when dolloped on the wig, would melt producing a perfumed oil to combat dryness.[115] The cone-like appearance of the unguent was simply a visual device that took the round or oval appearance of the tallow as it rested on the wig, tipped up so that it could be seen. The perfumed substance cascading down his body is rendered brownish-yellow which is also used to pick out the folds of his sash. He wears two wristlets inlaid with green and blue bands and a pair of golden armbands. In his lower hand, he holds three lotuses and two lotus buds. His upper arm is outstretched to smell the bouquet proffered by his son who is bareheaded and dressed in a notched tunic with a short kilt and long under kilt. Above the two is a bright white square that was to be the foundation for the scene caption.

Henuttawy wears a dress similar to the other female dresses on the wall. The folds of the draped and knotted wrap are picked out in the same brownish-yellow as her husband.

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[114] See similar in Parkinson, *Nebamun*, 92 with n. 21.

[115] Hartwig, *Tomb Painting and Identity*, 92, n. 337.

Transparency is rendered in brownish-yellow diluted with white over her ankles. Henuttawy is bejeweled with red and blue inlaid bracelets and armbands, a broad golden collar, a *wꜣḥ*-collar of lotus petals, gold hoop earrings, a lotus headband fronted by a mandrake fruit and a long voluminous black wig. She holds a lotus bud and two lotus flowers in her hand and rests the other on the shoulder of her husband. Beneath Henuttawy's chair is a scribal kit and palette, seen also on the far left wall (BHFL).

The offering of the bouquet was a symbolic and ritual act in ancient Egypt. In the New Kingdom, the word for bouquet had the same consonantal value as the word for "life," *ankh* (*ꜥnḫ*).[116] During the Valley Festival, bouquets were stacked around the Hathor sanctuary at Deir el-Bahri (*Djeser-Djeseru*) to receive the life-force of Amun-Re and then were purchased for distribution to the outlying celebrants in the Theban necropolis.[117] The presentation of the *ankh*-bouquet to tomb statues or offering tables was the culmination of the Valley Festival, and was often presented by the son to his deceased parents, or less often, by the tomb owner's daughter or colleague. Through the symbolic act of smelling the divinely charged flowers and plants, the dead would take in the godly essence that was contained in the bouquet, assuring his and her eternal life. This gift, as it was passed between the living and the dead, also conveyed the idea of familial devotion towards their transfigured ancestors.

Directly below on the bottom register, six offering bearers proceed from left to right. Many of the offerings they bear have faded or are missing today, but can be seen in earlier photographs. The green in particular is almost completely destroyed due to the contraction of the binder that was too strong and took the pigment with it when it fell off the wall. Water damage also contributed to the poor preservation of this bottom register (**See Chapter 5**). The first three offering bearers carry from left to right:[118] a dish of honey, grape vines, two drinking cups in a rope holder and a stalk of papyrus, a honeycomb topped with a bunch of dates, a papyrus stalk and three tall wine jars also in a rope holder, a bunch of unripe dates, several lotus bouquets, and papyrus stalks, one of which completely open. The artist showed the man holding the

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[116] *Wb*. I, 204, 5. On the etymology of the term *anx* and its definition as "bouquet," see**:** Johanna Dittmar, *Blumen und Blumensträusse als Opfergabe im alten Ägypten*, MÄS 43 (Munich-Berlin, 1986), 132, 148. Its meaning is discussed by L. Bell, *Temples*, 137, 183, n. 43.

[117] Schott, *Das schöne Fest*, 49; Martha Bell, "Regional Variation in Polychrome Pottery of the 19th Dynasty," in *Cahiers de la ceramique égyptienne*, vol. I, ed. P. Ballet (Cairo, 1987): 57; L. Bell, *Temples*, 137.

[118] All are visible on Mond photo no. 4068.

honeycomb at shoulder height by folding his right arm back so his palm could lay flat. The man in front of him is shown bald and stooped as a sign of old age.

The next three men bring various animal offerings beginning with a boy carrying a small pink *Dorcas* gazelle[119] whose legs he wraps around his shoulders. The next bears another dish of honey and a corn doll around which a small bird is tied. In his other hand he grasps the tether to the small black and white spotted cow with a floral garland around its neck that walks beside him. The last man carries stalks of papyrus, a dish of unguent topped with a bunch of lotuses, and another corn doll with two birds hanging from its neck.[120] The men wear either triangular pointed aprons or simple kilts and short wigs.

The following vignette is badly damaged due to the fading of the top layer of pigment that makes visible the lower layer of decoration. The top layer or 2nd phase of decoration depicts the slaughter of an ox. The ox lies on its side on a papyrus mat with three of its legs trussed together with a yellow rope. Its head lies on the ground with a partly severed neck to show the cutting of the carotid artery that allowed the blood to drain. One man puts his left foot on the trussed legs and pulls the rope to his chest. Another man bends down and cuts the right foreleg, the *ḫpš*, and pumps it to force the blood out from the ox's severed veins.[121] Both men are clean-shaven and wear white kilts. Above them is a papyrus mat with six bowls: the first contains a white substance, the five others hold pear-shaped cakes.[122] Above the first three bowls are three coiled lotuses, while the last three vessels are topped with three long papyrus stems and a small lotus bouquet.[123]

The final part of the slaughtering scene depicts a naked kneeling boy holding four long sticks. He looks up to a bald man dressed in a short white kilt with a long thin under-kilt and tunic (both pink to imitate transparency) who bends down to arrange a bundle of long, thin,

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[119] See Parkinson, *Nebamun*, 120, fig. 126.

[120] These offerings can be seen on Mond neg 4067.

[121] Salima Ikram, "Meat processing," *Ancient Egyptian Materials and Technology*, edited by P.T. Nicholson and I. Shaw (Cambridge, 2000), 657.

[122] Compare TT 38, Davies, *Some Theban Tombs*, 3, pl. I.

[123] Visible on MMA T801 and Mond negs. 4065-6.

pointed white items. Below him is a red chalice that could hold the blood collected from the ox.[124]

At the far right, two singers remain of the three that originally were on the wall. The first man raises his chin as he sings and puts his hands together to keep the beat of the music. The second man claps his raised hands together while the third (now missing under previous restoration attempts) holds his hands closer to his chin.[125] All three have shaven pates and wear a combination of thin tunics, long under kilts (rendered pink) and short white kilts.

The song is written in 14 rows of black hieroglyphs above the slaughter scene extending left towards the first offering bearer with the papyrus stalk. The song they sing is a hymn to Amun-re and nearly identical to the text at the far right of the wall from the first phase of decoration:[126]

> (1) A beautiful day! It is a public appearance (*wn-ḥr*),[127] the clay (seal) is broken (*sḏ sỉn*). The doors of your house (2) are opened, and incense reaches the heavens. You offer, [the doors][128] (3) are open. (4-5) What you have offered is received. My Lord, Lord of [///], how beautiful (*nfr.wy*) is the beautiful thing (*sp*)[129] that I have done for you, (6) (by) the overseer of ploughlands, (7) every day, (8) so that you grant to the silent one (*grw)* a good life. Smell (?) (*ḫnm*) (9) //// (10) because your favor /// he comes to /// in the interior of your house. Great is your light (*šw*) (when it) comes a moment *(ỉy r ꜣt.k*).[130]
>
> (11) A beautiful day! One remembers the beauty (of) Amun. (12) How pleasant is the heart! Lifting (13) praise up to the height of heaven even into your face,[131] (14) each saying "Our wish[132] is to see it!"

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[124] See parallel in the tomb of Menkheperreseneb (TT 79) Schott photo 8293, courtesy of Das Digitale Schott-Archiv (DSA); Schott, *Das Schöne Fest*, 30-31. Also: Allan S. Gilbert, "Zooarchaeological Observations on the Slaughterhouse of Meketre, *JEA* 74 (1988), 69-89, esp. 80. This boy is referred to as a harpist in most publications on Menna.

[125] The rendering of the hands closer to the singer's chin was likely in response to the need for more space for the text.

[126] Reconstructed from wall text and Schott photo 4183, courtesy of Das Digitale Schott-Archiv (DSA), Mond photo no. 4065, and MMA photo T.801.

[127] *HL1*, Marburger ed., 209.

[128] Var. Wb Zettel 481, consulted at the Heidelberg Archive of Theban tombs.

[129] Wb III, 436.2-438.12.

[130] Or, perhaps "Greatness comes to a short moment *(iy r ꜣ.t ktt*)." Compare Neferhotep (TT 50), Harper's Song, text B: Miriam Lichtheim, "The Songs of the Harpers," *JNES* 4 (1945), 178-212, Tf. 7.

[131] Parallel text: TT 38, Vincent Scheil, "Le tombeau de Rat'eserkasenb," *Mém. Miss*. V, 2 (1894), 575, pl. 3; Davies, *Some Theban Tombs*, 6, pl. II.

[132] Alan H.Gardiner, *Egyptian Grammar*, 3d rev. ed. (Oxford, 1957), § 304.3.

Songs such as this sung by a group of singers were part of the celebration of the Theban Valley Festival. The song refers to the breaking of seal and the opening of shrine doors on the festival day. Offerings are burned ("incense reaches the heavens") for the benefit of Amun-Re. Also, the song intones the wish to "see it", namely the barque of Amun when it winds through the necropolis.[133] In the tomb of Menna, the song is placed below the scene of the burning offerings for Amun-Re, after the slaughter. Schott mentions how the second part of the song also relates to the festival meal based on its exact parallel in a banqueting scene in the tomb of Djeserkarasoneb (TT 38).[134] The conflation of meanings is typical of ancient Egyptian representations where both text and image can reference several meanings at once. Schott also suggests these singers made visits to the tombs after they were finished with the procession in the necropolis, and received alms for their songs.

Framing this wall is a hanging lotus frieze composed of red roundels with a blue lotus flower splayed out, and hanging lotus flowers and buds against a yellow background.[135] Part of the right-hand wall background above Menna and Henuttawy was painted with a brown substance. As with previous walls, the block border runs along three sides with a red, black and yellow skirting band below.

BHNR is a complicated wall to disentangle due to the two phases of decoration that lie one on top of the other. Nevertheless, both phases represent the same texts and procedures; namely the beginning of the Valley Festival. On this wall, the focus is an offering to Amun-Re that includes Menna and Henuttawy followed by their children and others, songs dedicated for the occasion and the presentation of the life-bouquet imbued with the power of the gods for the eternal life of the deceased couple.

BHSR (Broad Hall Small Right)

To the far right of the broad hall the "false door stela" that is to say a painted stela enclosed in the frame of a painted false door (**Plates 14 & 15)**. Hermann noted that the false

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[133] Parallel texts in Norman de Garis Davies, *The tomb of Puyemrê at Thebes*, 2 vols. PMMA 1-2 (1922-1923), vol. 2, pl. 52.

[134] Schott, *Das Schöne Fest*, 31, 46-47.

[135] Bryan, *Thutmose IV*, 300, mentions the hanging lotus frieze begins during the reign of Thutmose IV.

door and the stela were united on this wall because in the chapel, where one would expect the false door, the image of the deceased praying before Osiris appeared instead (BHSL).[136] To either side of the false door, Menna (above) and Henuttawy (below) raise their hands in adoration. The false-door is composed of a *cavetto* cornice painted with red or green bands above a torus roll. The pink frame was dabbed with a darker red brush to imitate granite, much like the procedure in faux painting today. At the center of the lintel is a winged sun disk that was originally painted blue but has turned black. To either side is a row of blue hieroglyphs that describe the winged sun disk as: **"**Many colored of plumage (*sꜣb-šwt*), Lord of Heaven, the Great God, Behdety (*Bḥdt*(*y*)).*"*[137] Directly below, are two antithetically placed symbols: a red incense cup, a green *shen*-ring (a symbol of life), the protective *udjat*-eye, and the jackal-god Anubis seated on his white shrine with a flabellum.

The jambs of the stela contain a simple offering formula to Osiris (left) and Anubis (right) for the benefit of Menna:

> (left) An offering which the king gives to Osiris, Lord of Djedu (Busiris, modern day Abusir Bana), the Great God, Lord of Abydos, May he give everything good and pure, everything good and sweet for [the overseer of] the ploughlands of Amun, Menna, [justified]
>
> (right) An offering which the kings gives to Re and Anubis, who presides over the divine booth, May they give all that comes forth everything (on) their altars for the *k*a of the overseer of the fields of Amun, Menna, justified.

Inside, the stela is divided into three registers and surrounded by a blue frame that symbolizes heaven. The top register depicts two groups of gods shown back to back, seated under a blue-winged sundisk. Facing left, Osiris sits[138] on a god's throne (*ḥwt*-throne)[139] on a blue platform in the shape of the *Maat*-sign meaning "truth", "justice." The Goddess of the West (*Imentet*) stands behind him. In front of Osiris is the god Anubis standing before a yellow (golden) libation table surmounted by a blue lotus. Facing right, Re-Horakhty sits on a platform before another libation table with Hathor behind him. The female goddesses wear tripartite black

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[136] Alfred Hermann, *Die Stelen der thebanischen Felsgräber der 18. Dynastie*, ÄF 11 (Glückstadt-Hamburg-New York, 1940), 60. See also: Melanie Wasmuth, *Innovation und Extravaganzen: Ein Beitrag zur Architektur der thebanischen Beamtengräber der 18. Dynastie*, BAR 1165 (Oxford, 2003), 96.

[137] *Wb.* 1, 470.9.

[138] Both Osiris and Re-Horakhty sit on Hwt-block thrones, commonly associated with divinities ; Kuhlmann, *Thron*, 82-83, 89.

[139] See above on BHSL.

wigs, blue broad collars, armbands, and long, red wrap-around dresses with straps.[140] Osiris, swathed in his white cloak, holds his usual insignia of a flabellum and *ḥḳꜣ*-scepter, both colored yellow. Anubis holds another flabellum and an *ankh* and the Goddess of the West, a *wꜣs*-scepter. On the goddess's wig are a headband and the hieroglyphic symbol for "West." In the other group, both Isis and Re-Horakhty hold *wꜣs*-scepters and *ankhs*.[141] Anubis and Re-Horakhty wear broad collars, blue striped corsets with straps, and yellow and white kilts with a bulls' tails. The depiction of Re-Horakhty is particularly noteworthy, as this is a rare appearance of Re-Horakhty who is found in only one other pre-Amarna Theban tomb.[142]

The next register shows the deceased couple, Menna and Henuttawy, seated together back-to-back on black and yellow chairs on a reed mat. These antithetical images are identical and depict Henuttawy with her hand on her husband's shoulder, holding a handkerchief, and Menna, with his lower hand outstretched, holding a lotus bouquet against his chest. Both figures have an unguent cone on their wigs and wear broad- and *wꜣḥ*-collars. Henuttawy wears a floral headband with lotus flowers, buds and poppies, yellow (gold) hoop earrings, armlets and bracelets, along with a wrap-around dress that is draped over one of her shoulders. An orange-brown color indicates the trail of unguent as it ran down the body.[143] Menna wears a short-sleeved tunic painted pink to show its transparency and a short kilt tied with a sash. Remains of Menna's Gold of Honor necklace can be seen on the right figure, and most likely decorated the left figure given the ancient Egyptian predilection for symmetry. Nevertheless, if the male figure did not bear the *šbyw*-collar, then this couple could be Menna's parents. Seven columns over each couple never received inscription, although one assumes an offering formula would have been written here based on contemporary examples.

Below, two sets of figures on a green papyrus mat walk towards a central blue offering table. Several sets of jars wrapped with lotus stems rest below. The men and women raise their hands in praise, and are followed by priests in simple white kilts bearing cups with cones of fat or incense, and papyrus stalks. One assumes the figures may well be Menna and Henuttawy

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[140] Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, 105 (d).

[141] Mond neg. 4094. Presumably the Goddess of the West once held an *ankh* as well, but it is not preserved.

[142] Kampp, *Nekropole* I, 295, n. 1, noting stela Brussels E 2156 was originally found in TT 257 and dates to the reign of Amenhotep III **(**M. Werbrouck, *Musées royaux d'art et d'histoire, Département égyptien, Album* (Bruxelles, 1934), pl. 3).

[143] Compare Parkinson, *Nebamun*, 55-57, figs. 68-69.

given the similarity of dress with the figures above and the presence of the *šbyw*-collar worn by both male figures.[144] The attending offerer may be their son, the *wab*-priest Kha.

To the side of the false door stela, two figures of Menna wearing the Gold of Honor (above) and two depictions of Henuttawy (below) raise their hands in praise before offering tables on a central blue stand with red patterned lines indicating they were made of calcite or perhaps painted wood. Menna, who is dressed in his usual outfit, stands on a reed mat slightly below the register line that holds the gods - a sign of decorum. The offering table before Menna contains bread, baskets of grapes, cuts of meat and onions. Beneath the table, a red jar decorated with white and black stripes above is wrapped with lotus buds. Menna and Henuttawy are dressed in a long, wrapped dress of the type seen on the middle register, and wear a number of bracelets and armbands. Before them, an offering table is heaped with bread loaves, grapes, vegetables, cuts of meat, and coiled lotus bouquets. Two red jars wrapped with lotuses rest below.

Henuttawy is dressed in almost the same outfit as seen to the far left of the adjacent wall (BHNR). The only differences lie with the stands that escape her wig, the blue, red and white lotus flower headband with yellow ovals, and the missing *wꜣḥ*-collar on the left-hand figure. On this wall, line is used to render the folds of her fabric rather than the orange-yellow unguent stain. Before her is the same offering table as above, with loaves of bread, baskets and bunches of grapes, cucumbers, dates, various cuts of meat, and onions topped with a coiled lotus bouquet. Below are several jars identical to those above. Above each figure are seven columns divided by red lines that never received their preliminary or final text. This led Hermann to suggest that the preponderance of gods and offering figures on the stela served as textual equivalents.[145]

The wall is framed on three sides by a multi-color block border with a skirting band of red and yellow bands divided by black lines below. The frieze is the only one of its kind in the tomb. Although the frieze was never completed, the top appears to be composed of red and blue rosettes, one yellow band and one yellow and black checkerboard band, and a band of multicolored half circles. Below are groups of three white lotus petals bordered by red and blue *khekhers*.

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[144] See also Hermann, *Stelen*, 72.

[145] Ibid., 60.

The small right-hand wall of the broad hall contains some interesting features. Besides uniting the stela with the false door, it follows the eighteenth dynasty formula of placing the gods in the upper register, followed by the deceased couple below. Furthermore, Re-Horakhty, the god associated with the morning sun, and Hathor, the goddess who accompanied the sun god on his daily journey, are facing "east" towards the outside of the tomb and to the rising sun. Osiris and the Goddess of the West, both funerary gods, face towards the "west" or the land of the dead. The antithetical groups also symbolize the daytime sun through the sky and the nocturnal sun as it passes through the underworld. All the gods are placed under two winged sun disks that was the standard depiction on eighteenth dynasty stelae. Also, the back-to-back figures of Menna and Henuttawy did not allow room for the offering table that should have been placed before them. Instead, it is placed on the lower register. And where one would expect the children or relatives to offer to their deceased parents, they are not depicted in the middle register.[146] Instead, the loose details are tied up in the uninscribed lower register. Here, Menna and Henuttawy are represented at either end, praying before the offering table that was missing in the middle register, and attended by a priest who could, in fact, be their son Kha. In this case, the priest/Kha is substituted for the venerating children.

BHFR (Broad Hall Far Right)

The broad hall far right wall (BHFR) is bounded by a multicolored block border with a red, yellow and black skirting band below and a hanging lotus frieze above (**Plates 16 & 17)**. At the far left, two images of Menna and Henuttawy are shown, seated on high-back lion-legged chairs, his black and hers yellow. Again, none of the main figures are identified by text, but their placement on one of the back walls of the broad hall -- the best-lit walls and the first to be seen upon entering the tomb – make it certain they represent Menna and Henuttawy.[147] Menna holds a *kherep*-staff to his chest- the symbol of administrative authority - and his other hand is extended outward towards the offering table. Menna is clothed in a thin tunic and a white kilt tied with a fringed sash. Although faded, Menna wears black wig with a tall unguent cone, a short beaded

[146] Hermann, *Stelen*, 60. See for example: British Museum E902, Stela of Amenhotep (Robins, *Art of Ancient Egypt*, 143, fig. 164) where the dead were represented before offering tables, worshiped or offered to by their children.

[147] This was surmised as well by Campbell, *Two Theban Princes*, 92. On the importance of the tomb chapel's backwalls, see: Hartwig, *Tomb Painting and Identity*, 16-18, 51-53, 121-122.

collar and a floral *wꜣḥ*-necklace. Behind him, Henuttawy holds a sistrum and lotus flowers in her right hand, and reaches behind Menna wither upper left arm, touching him on the shoulder. Henuttawy wears a black voluminous wig with tendrils that escape before a high unguent cone. Besides the standard floral headband and large hoop earrings, she sports a yellow and red beaded collar and a *wꜣḥ*-necklace. The transparency of her wrap is rendered in a thin whitewash on her chest and feet.

Before them are a series of mats holding food or vessels. From left to right, the vessels are: a green and yellow (gold) lotus chalice, a blue unguent jar and a blue and gold vessel, perhaps an Aegean import, filled with ointment. Each pot is surmounted by a lotus bouquet. The tied papyrus mat was painted much lower than the preliminary outline on which the vessels rest. Presumably, the vessels were intended to sit on stands.[148] Below is another mat heaped with the usual fare including sycamore figs, dates, bunches of grapes, mandrake fruits, green gourds, fowl, cuts of meat, and a yellow internal organ (?) of an ox. Below are four wine jars decorated with bands of red and black, and tied with grape vines and a floral garland. The jars' mouths are covered with clay seals and crowned with floral decoration in white, yellow, red and green, now barely visible.[149] Behind the offerings their son, who is identified by the hieratic sign for "son (*sꜣ)* several inches above his forehead, presents a life-bouquet to his parents.[150] Hieratic or cursive hieroglyphs identified the participants for the scribe who would come in later to write and tailor the text to the scene.[151] The son wears a simple white kilt and a thin under kilt, and has a shaven head linked with the priesthood, indicating this figure likely represents Menna's son Kha. The bouquet is composed of three stems of papyrus and seven tiers of lotus flowers, red poppies, blue cornflowers and mandrake fruits, all bound together at the base by a white rope or linen. As mentioned above, the word for bouquet had the same consonantal value as the hieroglyph for "life." When offered by children to their parents, the bouquet becomes a symbol of familial devotion and ancestral worship as well as an offering to ensure their eternal life.[152]

The register below shows Menna and Henuttawy seated again on a reed mat, this time before an offering list and offering tables of food and *ꜥprt*-bread loaves. The deceased pair is

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[148] Compare the d'Athanasi fragment from the tomb of Nebamun in Parkinson, *Nebamun*, figs. 75-76.

[149] Ibid. Compare p. 82, 85, fig. 94

[150] Compare Georg Möller, *Hieratische Paläographie* II (reprint : Osnabück, 1965), 216,B

[151] Other examples in Davies, *Two Officials*, 32, n. 5.

[152] For more on the meaning of the offering of the life-bouquest, see Hartwig, *Tomb Painting and Identity*, 94-97.

depicted as above. The only differences lie in the placement of their arms, a few details of clothing, and the missing *wꜣḥ*-collars. Above and to the right are the remains of an offering list. The offering list is similar to Type C.[153] Beginning with the top:

Row 1		
mw	Water	2 portions
ḥṯꜣ	*ḥṯꜣ*-bread	1 portion
psn	*psn*-bread	1 portion
dpt	*dpt*-bread	1 portion
ỉwr	*iwr*-meat	1 portion
ꜣšrt	Roasted meat	[]
ỉrp	Wine	[]
ḥnḳt špnt	Beer in a *špnt*-jug	[]
ḥnḳt	Beer	[]
hꜣ snḏ	Transfiguration ritual	[]
Row 2		
sn bỉt	Honey	1 portion
mw dšrt	Red Water	2 portions
bd	Natron	1 portion
ỉrṯt	Milk	2 portions
ꜣšrt	*ꜣšrt*-meat	1 portion
wr n ỉtf	*wr n ỉtf*-meat	1 portion
ḥwn	*ḥwn*-meat	1 portion
šʿwt	Biscuits	1 portion
pꜣt	*pAt* -biscuit	2 portions
Mw mnsꜣ[154]	Water in a *mnsꜣ*-jug	[]

Beneath the list is a mat filled with onions, a gourd, two bunches of grapes, the *ḫpš*-foreleg of an ox, a basket of grapes and figs, two oval loaves of bread, a basket of grapes, a basket of sycamore figs (?), and cut of meat. Menna reaches his hand out to touch the offering table of pink *ʻprt*-bread loaves that rest on the hieroglyphic sign for "offering" (*ḥtp*) with a flared green base. Beginning in the late Old Kingdom, *ʻprt*-bread loaves (bread in the form of tall, thin loaves with pointed tops) were interspersed with and gradually replaced by reed leaves, indicating an equivalence based on similar forms and symbolic links in ancient Egyptian

[153] This list conforms to Type C in Winfried Barta, "Opferliste," *LÄ* IV (1982): Abb. 6.

[154] Hannig, *HL1*, 360; Barta, *Opferliste*, 140-141, Abb. 8, Type E

thought.[155] The bread and reed were both associated with the provisioning of the dead: Bread was essential for eternal sustenance in the hereafter, and reed leaves symbolized the "Field of Reeds" where the deceased would obtain food in the next world.[156] Beneath the table is a tall jar with a mud seal wrapped with a lotus and a basket with offerings that no longer remain.

To the right of the offering table, a *sem*-priest raises his right hand symbolizing his "sending forth by voice -"[157] the magic utterances to activate the offerings that would provide eternally for Menna and Henuttawy. In ancient Egypt, the *sem*-priest acted as an intermediary between the dead and the next world. In private Theban tombs, the *sem*-priest was often the 'main' son closest to the father who, by performing acts of filial piety, aided in the deceased's resurrection.[158] The *sem* holds a white papyrus roll and wears a wig, a blue broad collar, and the leopard skin over a white kilt with a long, thin under kilt. The ceremony that the *sem* re-enacts is illustrated by scenes 69A and 69C from the Opening of the Mouth Ritual on the lower sub-register behind him.[159] The "Opening of the Mouth" ceremony had a long history in the visual tradition of ancient Egypt, where parts of this ritual were often attached to the image of the deceased seated before an offering table.[160] These rites were performed at the burial of the dead and subsequently thereafter, particularly during necropolis festivals.[161]

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[155] Miroslav Bárta, "Archaeology and Iconography: *b3* and *'prt* bread moulds and 'Speisetischszene' development in the Old Kingdom," *SAK* 22 (1995): 21-35, esp. Stage 3, fig. 4 (no. 3).

[156] Nadine Cherpion, *Mastabas et hypogées d'Ancien Empire: Le problème de la datation* (Brussels, 1989), 43; Charles E. Worsham, "A Reinterpretation of the So-called Bread Loaves in Egyptian Offering Scenes," *JARCE* 16 (1979), 10.

[157] James P. Allen, *Middle Egyptian. An Introduction to the Language and Culture of Hieroglyphs* (Cambridge, 2000), 358.

[158] On the duties and symbolism of the *sem*-priest: Bettina Schmitz, "Sem(priester)," *LÄ* V (1984), 833-836; Serge Saulneron, *The Priests of Ancient Egypt*, trans. D. Lorton (Ithaca, 2000),108-109; Denise M. Doxey, "Priesthood," *OEAE* III (2001): 69, 71; Taylor, *Death and the Afterlife*, 191; Hodel-Hoenes, *Life and Death in Ancient Egypt*, 40-41, 76, 169. See also excellent analysis of the literature concerning "the son whom he loves" *sem*-priest in: David Lorton, "The Theology of Cult Statues in Ancient Egypt," in *Born in Heaven, Made on Earth: The Making of the Cult Image in the Ancient Near East*, ed. M.B. Dick (Winona Lake, Indiana, 1999): 154, n. 47.

[159] Eberhard Otto, *Das ägyptische Mundöffnungsritual*, 2 vols, ÄA 3 (Wiesbaden, 1960), 153-154, Abb. 1. See parallel for Scene 65C in Eberhard Dziobek, *Das Grab des Ineni Theben Nr. 81*, AV 68 (Mainz, 1992), 73-74, taf. 22b, 23b.

[160] Karl Martin, "Speisetischszene." *LÄ* V (1984): 1129-1130, 1132, n. 25; Otto, *Mundöffnungsritual I, Scenes* 65A-72B, 146-164.

[161] Reinhard Grieshammer, "Mundöffnung(sritual)," *LÄ* IV (1982), 223-224; Ann Macy Roth, "The Social Aspects of Death," in *Mummies & Magic. The Funerary Arts of Ancient Egypt*, ed. S. D'Auria, P. Lacovara, and C. H. Roehrig (Boston, 1988): 57-59. See also discussion below about the Opening of the Mouth cycle on LHR.

The ritual cycle begins with a kneeling man holding his hands out over an offering chest while behind him, a man purifies him with water from a ewer (Scene 69C). Then we find the transfiguration spell (Scene 69A), where four kneeling and overlapping lector-priests are followed by another lector who recites the ritual text. These men are *wab*-priests identified by their white kilts with one strap that crosses from the waist to the opposite shoulder. Their actions are aided by offering-bearers on the upper sub-register in simple white kilts, who bring blue and red unguent jars, bags of linen, gold ingots, square reed boxes, and other items for the completion of the rituals that will result in the well-being of the deceased and his wife in the hereafter.[162]

Above, the wall is divided into two sub-registers with the larger section oriented towards the seated figures of Menna and Henuttawy. The top sub-register shows a son and a daughter offering to their parents who are depicted twice seated on papyrus mats before *ḥtp*-offering tables piled with *ꜥprt*-loaves (see above). The childrens' suggested identity is based on similar offering actions undertaken by a daughter (Amenemweskhet) and a son (Kha) on other walls. In both representations, the man wears the Gold of Honor that identifies him as Menna. Here, the color of the low-back chairs is different than on other walls: Menna sits on the yellow chair while Henuttawy sits on a black one. The son raises his hand in a gesture of address, and the daughter holds out a *menit* to Menna, who cups it in his hand. This action was symbolic since the *menit*-necklace was a life-giving object that imparted protection and eternal life to the recipient.[163]

The last vignette on the top subregister represents Menna and Henuttawy (based on their dress and insignia) followed by their children. The man with the shaven head is most likely their son Kha and the second man, probably Se or another unnamed son. Kha offers several lotus bouquets with mandrake-fruits, while Se proffers a cone of incense or a pointed cake and holds coiled lotus flowers. Before them, Henuttawy in a long white dress holds a *menit*-necklace and a sistrum in her lower hand. Unfortunately, the upper portions of the couple are destroyed so their offerings are unknown. Before them are two papyrus mats with the usual fare above, and below, choice cuts of meat in addition to an ox's carcass.

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[162] Martin, *LÄ* V (1984), 1129-1130, 1132, n. 25; Otto, *Mundöffnungsritual* II, Scenes 65A-72B, 146-164.

[163] See the text in Norman de Garis Davies and Alan H. Gardiner, *The Tomb of Amenemhet (no. 82)*. TTS I (London, 1915), 95, pl. 19; Manniche, *Music and Musicians in Ancient Egypt* (London, 1991), 64, fig. 37. Discussion in Hartwig, *Tomb Painting and Identity*, 96-97.

The white structure behind the offering pile went through several revisions. In one version, a fire altar was drawn.[164] In red outline, the top of the altar is rendered with 5 round peaks on which rest two *ḫpš*-legs and two other cuts of meat. In the other version, a tomb[165] or shrine[166] is represented with a cavetto cornice. It appears that the initial sketch of the altar was revised and covered with a layer of white that has faded over time to show the initial sketch. In its last conception, the action of the deceased and his wife illustrate the ritual practice of incensing and food offering before private ancestral and religious chapels.

Connected by a long reed mat in the second sub-register, five men kneel and sniff lotuses while the standing man in front of them engages in ritual recitation.[167] Behind and in front of this ritual practitioner are masses of food piled on top of jars and baskets that include various kinds of bread, sealed wine and other beverage jars, baskets of grapes and dates, groups of gourds and pomegranates, onions, honeycombs, and choice cuts of meat and internal organs, all topped with coiled lotus and lotus bud bouquets. Before the kneeling men, multicolored baskets contain a selection of the foods and beverages mentioned above, which indicates that the men are seated at a banquet. Dressed in white kilts and floral *wꜣḥ*-collars, the men also wear incense cones and red or white fillets tied around their heads. These fillets are found in scenes connected with funerary banquets.[168] More likely, this scene is a combination between a funerary banquet and a celebration associated with the Valley Festival.

On the right lower register, Menna and Henuttawy are seated on high-backed lion legged chairs and wear the same clothes seen at the far left of the same register, with the addition of the Gold of Honor that Menna prominently displays above his beaded collar. Both husband and wife hold lotuses, he a single stem in front of his nose and she a bunch of three. Menna also grips a

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[164] Schott, *Das schöne Fest*, 21, abb. 3-4; see also **Plate 21.**

[165] Marcelle Werbrouck and Baudouin van de Walle, *La tombe de Nakht: Notice Sommaire* (Brussels, 1929), facing 8, bottom register; Maher-Taha, *Le tombeau de Menna*, 27.

[166] In outline, the structure in TT 69 is identical to the hieroglyphic ideogram or determinative for *s-nr* or "shrine,"Gardiner, *EG*(3), Sign-List O 21; Faulkner, *CDME*, 237. See also: Patricia Spencer, *The Egyptian Temple. A Lexicographical Study* (London, 1984), 114-119. Bomann, Ann H. *The Private Chapel in Ancient Egypt* (London and New York, 1991), 57-79, notes well-excavated examples of private chapels at Deir el Medina and Amarna that had plant remains and preserved evidence of burning on portable offering tables. Ashraf Iskander Sadek, *Popular Religion in Egypt during the New Kingdom*, HÄB 27 (Hildesheim, 1987), 79-82, mentions chapels at Deir el-Medina outside of which people slept in order to affect cures or gain communication with the gods. See also: Ann H. Bomann, *The Private Chapel in Ancient Egypt* (London and New York, 1991), 338-339.

[167] Dominicus, *Gesten*, 93, Abb. 22g.

[168] See Davies and Gardiner, *Amenemhet*, 37, for similar fillets.

napkin in his extended arm while Henuttawy places her hand on his shoulder in a gesture of spousal affection. Before them is an offering table heaped with the usual offerings with beverage jars below.

Before the couple, a *sem*-priest wearing his distinctive leopard skin garment stands incensing and libating before an offering table.[169] The *sem* raises his *nemset*-jar and holds a censer below to consecrate the offerings on the table. Behind him, four *sem*-priests proceed, each holding a *st*-vase for libating.[170] Other offerers follow holding red rhomboidal-shaped lamps set on poles that are decorated with blue and white ribbons.[171] Two men carry an offering table laden with food and drink round out the vignette.

This wall is almost completely funerary in nature and depicts a number of offering scenes that have their roots in the Old and Middle Kingdoms. Through ritual recitation and the presentation of charged substances on this wall, Menna and Henuttawy are provisioned for eternity. Furthermore, banquet representations and offerings before the shrine and/or tomb indicate ancestral worship and commemoration to keep the family line "alive."

IDL (Inner Door Left) and IDR (Inner Door Right)

The two door thicknesses from the broad hall to the long hall are decorated with the images of Menna and Henuttawy leaving the tomb for the Valley Festival (IDL) and a roughly etched image of a boat or two boats (IDR). On the right wall, scratched into the plaster surface, is a boat with a papyrus bow and stern with umbels that curve back **(Plate 18)**. Another boat with papyrus umbel terminals and a central shrine rests within or on top of the larger boat. Inside the boat, it appears a hand was etched. At the top of the shrine/cabin are lotus flowers or flags.

Ancient Egyptian boats with papyrus boat cabins are rare if not nonexistent in pharaonic Egypt. However, the graffito could represent two boats, one stacked on top of the other, which

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[169] See similar figure in the tomb of Rekhmire (TT 100) Norman de Garis Davies, *The tomb of Rekh-mi-re at Thebes*, 2 vols. PMMA 11 (New York, 1943; reprint 1973)**,** pl. LXXVII; Spiegel, *MDAIK* 14 (1956), abb. 1. Otto, *Mundöffnungsritual*, 10, n.1.

[170] Gardiner, *EG*(3), Sign-list W 14, ideogram in water-pot (*st*) and phonogram in "praise" (*sí*).

[171] Norman de Garis Davies, "A peculiar form of a New Kingdom Lamp," *JEA* 10 (1924), 11, fig. 4. This vignette is similar to that found on the west wall of the tomb of Amenhotep-si-se (TT 75) where four *sem*-priests carry libation vases followed by two men with rhomboid-shaped lamps on poles intended for the mortuary ceremonies to be held in front of two booths at the far corner of the wall. TT 75: Davies, *Two Officials*, 17-18, pl. XVII. These candles are also found in tomb of Simut, TT 247: Hermann, *Die Stelen der Thebanischen*, 99, pl. 2c.

was a common convention of representation in ancient Egyptian art.[172] Boats with papyrus umbel finials were used in funerary ceremony scenes and the Voyage to Abydos. As such, the graffito would be a commentary on the burial of Menna. If the graffito was done later, the boats were sketched during the reuse of the tomb where the new owner sought to make his mark but also coexist with original tomb owner rather than change or destroy the existing decoration.[173] It is also not beyond the realm of possibility that the boats were drawn as an attempt to copy the chapel decoration during the early Christian period when many Theban tombs served as homes or temporary residences.

On the left wall, Menna and Henuttawy are leaving the tomb for the Valley festival (**Plate 19: IDL)**. The identification of the scene comes from the caption above that was published by Siegfried Schott.[174] Painted in blue, today only the preliminary outlines remain of the last three columns of text; the portions read by Schott are in brackets:

> [Stepping out of the tomb(?) to see] Ra [and to follow Amun in his Beautiful] Festival [of the Western Valley,] his sister, the mistress of the house, [Chantress of Amun] Henuttawy].

Both Menna and Henuttawy face eastward out of the tomb. Menna is depicted wearing a black wig, a long bag tunic over a short white kilt with the Gold of Honor, a blue broad collar and a *wꜣḥ*-collar around his neck. Henuttawy walks behind him in a white dress, adorned with a black enveloping wig, a yellow broad collar and bracelets with radiating bands of red and blue, and a floral *wꜣḥ*-collar. She holds a sistrum in her outstretched hand and a lotus in her other.

The wall is framed by a block border on its top and right sides, a white and red chain motif and crowned by a handing lotus frieze. The remains of the usual red, yellow and black skirting band are below.

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[172] See TT 278, Charles K. Wilkinson and Marsha Hill, *Egyptian Wall Paintings: The Metropolitan Museum of Art's Collection of Facsimilies* (New York, 1983), 156, no. 30.4.125.

[173] The reuse of the tomb occurred over a period of hundred of years (Mond, *ASAE* V,2 (1904), 102-103; idem, *ASAE* VI, 1 (1905), 88. **See also Chapter 1)**. On the non-invasive "sharing" of Theban tombs, see: Daniel Polz,"Bemerkungen zur Grabbenutzung in der thebanischen Nekropole," *MDAIK* 46 (1990), 301-336.

[174] Schott, *Fest*, 873, no. 71; see also Campbell, *Two Theban Princes*, 93-94.

LHL (Long Hall Left)

Passing into the long hall, one leaves the commemorative portion of the tomb and moves into the place of transit into the next world where the decoration relates to the deceased's passage and life in the hereafter. Beginning with the burial procession, it is divided between four registers and represents almost all of the traditional vignettes (after Settgast):[175] the voyage to the West and rituals in the "Sacred Precinct", the rites of the landing stake, the voyage to the Divine Booth of Anubis, and the sarcophagus and canopic chest procession. The vignettes do not follow sequentially and are, instead, conflated and abbreviated which is in keeping with burial scenes in early to mid-eighteenth dynasty Theban tomb chapels. Unfortunately, despite image captions and ritual texts, a number of these rituals are not completely understood.[176] The wall ends with the Weighing of the Heart scene that is one of the first, if not the first, representation of a image that becomes ubiquitous in the tombs of the Ramesside period. The wall was never finished and displays Amarna destruction to the name of Amun and *damnatio memoriae* to Menna as every other wall **(Plates 20 & 21)**.

The two lower registers from left to right show the procession of the body in the sarcophagus across the river to the place of mummification. On the bottom register, four green papyrus reed boats are featured lashed together with yellow ties. The first boat containing officiants embarks for the West to the sacred precinct in the necropolis. A similar vignette from the tomb of Rekhmire (TT 100) contains the caption "Getting in the *mrt*-bark (by) the *ỉmy-ḫnt*, landing at the necropolis" (*rdỉ r tꜣ r ꜥꜣt*)."[177] The *ỉmy-ḫnt* priest wears a short white robe that resembled the royal *sed*-festival garment. On the next reed skiff, two women wrapped in white kneel on either side of a stela that will be erected in the courtyard of the tomb. Three priests in short white kilts pull the rope attached to the skiffs, the last of whom ties the rope to a mooring post. In other eighteenth dynasty tombs, these women are labeled "the small consecrator" in the

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[175] Jürgen Settgast, *Untersuchungen zu altägyptischen Bestattungsdarstellungen*, ADAIK 3 (Glückstadt-Hamburg-New York, 1963), 3ff.

[176] Ibid., 2.

[177] Compare Davies, *Rekhmire*, 72, pl. xc. The seated man is labeled *ḫrj-ḥbt* «lector priest », and the crouching figure wrapped in a robe is captioned *ỉmy-ḫnt*. For the translation of *ꜥꜣt* as «necropolis» see Settgast, *op. cit.*, 84.

bow and the "great consecrator" in the stern,[178] while the priest who ties the rope to the mooring post is captioned as a funerary priest (*ḥrỉ-wr)*.[179] On the other side of the post, a woman wearing a white wrap dress with a shoulder strap ties the rope attached to the canopic papyrus skiff.[180] Together, the tying of the two ropes around the post is known as the "Rite of the Mooring Post," the symbolic act that marks the boat's landing on the west bank, the land of the dead.[181] Behind the man, the rope is fastened to another reed boat carrying a lion bier with a yellow and blue-niched canopic chest topped by a cavetto cornice. Two men in white kilts kneel on either side of the canopic chest. The scene moves to land with a man receiving the sarcophagus followed by two men pulling a sled with a red canopy over the same lion bier and yellow- and blue-niched sarcophagus. On top of the lion bier is the unfinished image of the wrapped mummy painted only in white. Taken in its entirety, these series of vignettes depict the first stage of voyage to the West in which the sarcophagus and mourners are brought by boat, moored, and then continue the journey on land.

The next episode begins with a lector priest before the tomb, depicted as a multi-colored shrine topped by a *khekher*-frieze, who recites prayers and holds a papyrus roll.[182] Behind are five red, blue, green and white-banded shrines, each composed of two posts, a lintel and a rounded roof in the form of the *ḫm*-chapel.[183] Inside the shrines is the god Anubis followed by the Four Sons of Horus wrapped in white garments kneeling against a yellow background, or red garments against a white background. The texts on the jambs from left to right read:

> [Lord of the sacred land] (*Nb tꜣw ḏsrtt*)[184]
> [Words spoken][185] by Hapy (for) the Osiris Menna (*ḏd mdw ỉn ḥpy wsỉr mnnꜣ*)
> Words spoken by Imsety (for) the Osiris, the scribe Menna (*ḏd mdw ỉn ỉmstỉ wsỉr sš mnnꜣ*)
> Words spoken by Duamutef (for) the Osiris Menna (*ḏd mdw ỉn dwꜣmwtf wsỉr mnnꜣ*)
> Words spoken by Qebehsenuef (for) the Osiris scribe Menna (*ḏd mdw ỉn Kbḥsnwf wsỉr sš mnnꜣ)*

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[178] Settgast, *Bestattungsdarstellungen*, 99.

[179] Davies, *Rekhmire*, pl. LXXXII. See also: Säve-Söderbergh, *Four Eighteenth Dynasty Tombs*, PTT I, pl. XXIV.

[180] Preserved on Mond photo 4137. In TT 100 this woman is labeled the *knwt* "mourning woman." Clothing in Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, fig. 7:7c.

[181] Settgast, *Bestattungsdarstellungen*, 105-111, taf. 13.

[182] The shrine is of similar type to that found in the tomb of Rekhmire (Davies, *Rekhmire* II, pl. XCIII).

[183] Settgast, *Bestattungsdarstellungen*, 52, n. 2.

[184] Preserved on Mond photo 4133.

[185] Ibid.

Beyond the shrines, the sarcophagus continues on its journey on a papyrus skiff. Three men, labeled from right to left as lector priest (*ḫrỉ-ḥbt*), an embalmer (*wt*) and a *sem*-priest, lay their hands on the sarcophagus while two women stand in white strapped dresses on the bow and stern of the boat symbolizing the sisters of Osiris, Isis and Nephthys.[186] The skiff is towed by a wooden boat manned by three rowers, a bowsman or captain, and a man tilling the rudder. The end point of the procession is the figure of Anubis, the jackal-headed god of mummification. Anubis faces left, and wears a blue tripartite wig, a bifurcated yellow apron over a white kilt and holds a *was*-scepter (dominion) in his outstretched hand, and an *ankh* (life) in his other. Taken together, the lower register depicts the journey of the coffin across the river to the cemetery and the Divine Booth of Anubis (*sḥ nṯr ỉnpw*), which was most likely the purification tent in which the body was embalmed.

The third register (from the bottom) begins with the slaughter and libation of an ox on a papyrus mat. A lector priest holding a papyrus roll and wearing a white kilt recites the ritual. Before him, an officiant cuts off the foreleg (*ḫpš*) from a dead, trussed ox with a yellow knife. The ox's throat has been cut and upper chest cavity exposed. A *wab*-priest (meaning "pure one") dressed in a strapped white kilt pours water from a jar over the sacrifice. Before them, two kneeling mourners wrapped in white cloaks travel on a reed boat with a wooden deck rowed by an oarsman.[187] Next, a man dressed in a white kilt stands before six multicolored reed *ḫm*-shrines with alternating red and blue stripes: shrines one, two, four and five have a central yellow band; and shrines three and six are decorated in a red checkerboard pattern with dots. All the shrines sit on a raised white plinth and relate to Osiris, the god of the underworld, and the sacred precinct of the West.[188]

The next portion is destroyed, but earlier publications and photos preserve part of the original scene. The remains of a man in a white kilt stood facing right before a banded shrine on a plinth. Immediately in front of him were feet dancing, perhaps belonging to *Mu*-dancers[189] Taken together, the lightly built chapels, priests and dancers conflate and recreate the landscape of the necropolis, its sacred precincts and rituals.

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[186] Campbell, *Two Theban Princes*, 95.

[187] Preserved on Mond photo no. 4137.

[188] TT53, TT 125 in Settgast, *Bestattungsdarstellunge*n, taf. 5; Aufrère, Menna, 16.

[189] Mond photo no. 4135. Settgast, *Bestattungsdarstellungen*, 98 suggests these are pseudo-*mww*-dancers.

After a 42” void of destroyed decoration, the voyage to the Divine Booth of Anubis continues. From left to right, the first reed boat carries on its wooden deck a rectangular black, yellow and white shrine with the colors divided by a band of white, blue and red. Parallels to this shrine-like structure are found in the tombs of Amenemhet (TT 123), Duauneheh (TT 125) and Thutmose (TT 347) belonging to the voyage to the Divine Booth of Anubis.[190] Further, these tombs suggest that an earlier sarcophagus transport scene existed where the large void is today. These parallels show a sarcophagus carried on land by several pairs of men accompanied by mourners.[191] The reed boat with the shrine-like object is manned by a lector priest at the stern[192] and three individuals on the bow: a standing priest, a kneeling man and a kneeling woman. The woman wears a white wrap-around dress with a strap and her hair is tied in a white kerchief. On the next boat, two similarly dressed women stand on either side of a white stela fulfilling the role of the two kites or sisters of Osiris, Isis and Nephthys.

In the last reed boat, a man presents a cow’s heart in a vessel and the *ḫpš* with a kneeling woman (possibly Menna’s widow) at the prow wrapped in a white cloak accompanied by their son.[193] The heart and foreleg are components of the Opening of the Mouth ceremony, often performed by the eldest son for the benefit of his father’s *ka*. The presentation of the *ḫpš*-foreleg and the heart completes the sacrifice vignette that began the third register.[194] At the end of the register is the jackal-headed god Anubis mentioned above. In sum, the first two registers consist of vignettes associated with the voyage to the necropolis to mummify the body in the purification tent (*sḥ nṯr ʾInpw*) and then continued to the broad hall of purification (*iʿbt wsḫt*) where sacrificial offerings were made.[195]

The first and second registers depict the next stage of the journey. The Nile has been crossed and the procession continues by the canal and then by land to the Theban necropolis signified by the Goddess of the West. On the second register, three mourning women dressed in

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[190] Settgast, *Bestattungsdarstellungen*, 97-98, 101-103. This shrine-like structure is discussed at length with, unfortunately, no satisfying conclusion. Is it a sarcophagus under a baldachin? Is it a conflation of a statue shrine and a coffin? For reasons here, the designation « shrine-like object » is acccepted.

[191] Ibid.. taf. 11.

[192] Mond photo 4132. Remains of the outstretched arm of the lector priest can be seen today.

[193] Aufrère, *Menna*, 16.

[194] Davies, *Rekhmire*, pl. XC, in Settgast, *Bestattungsdarstellungen*, 83. From the tomb of Rekhmire, this image is captioned *ḳmꜣ ḫpš ḥꜣty n mr m pḥww*[194] “producing the *ḫpš*-foreleg and the heart in the canal marshland,” indicating an offering for a successful voyage.

[195] For an excellent synthesis, see: Ann Macy Roth, “ Funerary Ritual,” *OEAE* I, 575-580.

white-strapped dresses kneel before (or rather under) a white cloth to protect them from the sun.[196] The first two reach down to grab dust that they then throw on their hair and foreheads. Facing opposite them, the third woman bends over in grief and raises her arm in distress. The women sit on a painted wooden deck on the boat that has papyrus terminals, a fluttering red ribbon and an *udjet*-eye decorating the bow. Three men guide the papyrus skiff: one who tills the rudder, a pilot, and a third who holds fast the rope attached to one of the three larger wooden boats ahead that tows them. These multi-colored wooden boats have rudders manned by a number of rowers of whom only six remain.[197] The three rudder oars are decorated with lotus flowers and apotropaic *udjet*-eyes. The sterns have a lotus-design in front of which are three bands. The cabin of the first boat is ornamented with a stylized floral pattern above a striped base, framed by a colorful band and topped by a cavetto cornice. The oarsmen wear leather loincloths over a cloth garment.[198] To vary the composition, the third oarsman from the left turns to his companion and the first oarsman's hairline is rubbed out as if it is receding.

After the void (approx. 21.5 inches), eight of the "Nine Friends" are represented in two groups of four. The men wear short black wigs and short white kilts over longer under-kilts, or short-sleeved long tunics with short white kilts above, all of which are tied with sashes. Each man holds a forked staff that signifies his authority as an official.[199] In front of the deceased's friends, two men in short white kilts carry large white jars. After these men, there is a void of roughly 40 inches. Almost nothing is preserved except for a sole male figure holding something above his shoulder. As recorded in green line on **Plate 21**, this man and two others carry a barque with the canopic chest in a latticework shrine on wooden poles.[200] The papyrus-form stern is tied with a streamer and is equipped with two rudders. In front of the barque, earlier photos show the front of the lattice-work *ḫm*-shrine under which was the sarcophagus.[201] The sarcophagus is pulled by four oxen and ten men wearing short black wigs and white kilts. Their overseer holds a small whip to motivate the four oxen that pull the bier. The oxen are painted

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[196] Aufrère, *Menna*, 17. Campell, *Two Theban Princes*, suggests the cabin represents the women's apartments.

[197] Mond photo 4125.

[198] Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, 24-31.

[199] Fischer, *MMJ* 13 (1978), 27-29, figs. 45 and 48 (MMA 26.7.1443).

[200] Mond photo 4122. Canopic shrine similar to Brack, *Horemhab (TT 78)*, 46, taf. 55a,, 61c.

[201] Mond photograph #4121. See parallels in TT 100 (Davies, *Rekhmire*, pl. XCIII) ; TT 139 (Lhote and Hassia, *La peinture égyptienne*, pl 15).

white, black and red with pink underbellies and muzzles. In front of the sarcophagus shrine, woman dressed in a long white shift with straps and a white headcloth wrings here arms in grief. In contemporary tombs, she is often labeled as the *ḏrt-wrt* or "the great mourner" and is rendered with yellow skin color.[202] In front of her, a priest dressed in a long Heb-Sed robe carries a long staff of which only the tip remains. In a number of tombs, he is captioned "priest (of the divine image)."[203] The Heb-Sed robe worn by this priest is often associated with the image of the "Attendant of the God" (*ỉry-nṯr*), which may suggest his role during the burial ceremony. Directly before the priest was originally the figure of the sem-priest dressed in a leopard-skin cloak, whose image was excised at Akhenaten's decree.[204]

The upper register depicts a procession of 25 men bearing funerary goods and gifts for the burial and cultic ceremonies. Proceeding from left to right, the first man, dressed in a short white kilt and black wig, holds a white tray with round and oblong loaves of bread. Draped over his outstretched hand are several lotus buds and a full-blown lotus flower. In his other hand, he carries three papyrus plants on long stems. Both of these plants are symbolic of resurrection (lotus) and eternal life (papyrus).[205] The second man is similarly dressed and holds the same bunch of papyrus, but in his outstretched hand he carries a bundle of herbs[206] topped by three lotuses and two lotus buds, and several lotus flowers interspersed with buds draped over his hand.

The next three men carry square tables heaped with offerings. From left to right, the first man carries a pile of grain, the second holds second a heap of incense (?), and the third a mixture of grapes and dates. Each table is composed of a gently pointed top attached to a vertical beam with cross bracing fastened to a central horizontal strut. Each strut is also draped with a lotus flower and buds. The next man holds a lotus bouquet and three papyrus stalks that he presses to his chest. The following offerer holds two beer or beverage jars in his outstretched hands along with the now ubiquitous lotus flowers and buds.

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[202] Settgast, *Bestattungsdarstellungen,* 36-37, taf 3. See also

[203] Wolfgang Helck, *Untersuchungen zu den Beamtentiteln des ägyptischen Alten Reiches,* ÄF (1954), 17, n.16.

[204] Compare the contemporary tomb of TT 139 (Lhote and Hassia, *La peinture égyptienne*, pl 15).

[205] Hartwig, *Tomb Painting and Identity*, 63-64.

[206] See similar in Christine Beinlich-Seeber and Abdel Ghaffar Shedid, *Das Grab des Userhat (TT 56)*, AV 50 (Mainz, 1987), 54, taf. 1.

The next two men hold tables, the first of stone (or painted wood)[207] on which are piled round flat loaves of bread, an ointment jar and a coiled lotus bouquet. The following offerer presents an offering table topped with three ointment jars, two of alabaster and the other of fired clay. The next offering bearer carries a wine jar with a mud sealing on his shoulder and the following balances on his head a small black and white striped chest with a central red rectangle, a cavetto cornice, and a rounded red top. In his other hand he holds a grey-feathered ostrich fan.

The following ten men wear kilts that are tied with a sash that drapes over the tab in multiple folds. In this set, two offerers are depicted as priests with shaven heads: the first clutches a bolt of linen and three papyrus stalks while the next holds a papyrus stalk and a coiled lotus bouquet. The next man balances a wooden chest similar to the one seen before, except for the black cover. Before him, an offerer brings a square table on which rest two stone vases (or perhaps painted wood model vases) and an unguent jar. While most of the men depicted on the register wear a short black wig, his wig shows tendrils around the face.

The next grouping of men carry a black wooden bed with cushion and headrest while a younger boy with a shaven pate balances another wooden chest on his head. The posture of the priest relays a position associated with laborers as he grasps the back leg with his bent near arm and steadies the bed with his outstretched far arm. Following is a priest balancing another wooden chest on his head, gripping its front leg to steady it. Before him is another priest depicted in an active posture who holds the two legs of a black wooden lion-legged chair.

Three offerers follow, bearing stone or wooden vases and jars on square white tables. One wearing a white apron carries two wooden ushabti coffins painted brown with blue wigs and beards.[208] The final offering bearer carries a black wooden chest on his head and holds Menna's colorful reed scribal kit in his outstretched arm. The procession ends with two herdsmen with switches egging two pairs of cattle along, the first painted black and white, and the second red and black.[209] To vary the monotony of the procession, the artist depicted the first herdsmen with a receding hairline with a tuft of hair.

The burial procession leads to the Goddess of the West who is depicted with the falcon as part of the hieroglyphic sign for the West (*imnt)* on her head. She is painted yellow, the

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[207] MMA 12.182.25-24: William C. Hayes, *The Scepter of Egypt. Part II: The Hyksos Period and the New Kingdom (1675-1080 B.C.)*, rev. ed. (New York, 1990), 229, fig. 136.

[208] Roth, *Mummies and Magic*, 136, no. 73.

[209] Aufrère, *Menna,* 17, suggests these cows would provide milk for the deceased.

traditional color associated with goddesses, and wears a white dress with two straps, blue bracelets, a broad collar and a black tripartite wig tied with a white strap. She holds an *ankh* (life) and a *was*-scepter (dominion) in her hands.

As mentioned at the outset of this section, the exact meaning of these funerary scenes is not well known. To further complicate the reading of the wall, scenes associated with particular rituals are mixed together and shortened to one or more episodes. With this in mind, if one interprets three-quarters of the wall broadly, it can be divided into roughly two sections: the bottom two registers which treat the voyage of the body to the West for embalming, and the two registers which depict the funeral procession with the sarcophagus, canopic chest and burial goods for the final rites.

The funerary processions end with a scene of the Judgment of the Dead, the first depiction of this scene in an elite tomb chapel.[210] The evolution of this scene begins early in eighteenth dynasty elite Theban tombs with the deceased depicted worshiping Osiris on the architrave over the entry to the inner hall of the chapel.[211] By the reign of Thutmose IV, this motif moves to the sidewalls of the front transverse hall in T -shaped tombs and takes the place of the stela or false door such as that in the tomb of Menna (BHSL). However, Menna goes one step further and instead of simply worshipping Osiris, he depicts his judgment before the god as well. By the Ramesside period, the Judgment of the Dead would be standard in private Theban tombs.[212]

The Judgment of the Dead was the final passage the dead made on their way to the afterlife. In ancient Egypt, the heart was considered the seat of thought, reason, insight and ethical behavior. For this reason, the heart was weighed against Maat who was the goddess of truth, justice and order. If the heart and the goddess (or her feather) were in balance, the deceased would be accepted into the hereafter. If not, the heart would be thrown to Ammit, a composite

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[210] The Judgment of the Dead scene is also found in the tomb of Haremhab (TT 78) in the inner hall, southern wall, in fact, the same placement as in the tomb of Menna. Brack, *Haremhab*, 83-84, dates the tomb to the reigns of Thutmose IV and Amenhotep III based on their cartouches. According to the Bracks, the transverse hall was completed under Thutmose IV, and the inner hall with the Judgment of the Dead was done in the reign of Amenhotep III. In the burial chambers of Amenemhet (TT 82) and Sennefer (TT 96), the weighing of the heart is also found (Mohamed Saleh, *Das Totenbuch om dem Thebanischen Beamtengräbern des Neuen Reiches*, AV 46 (Cairo, 1984), 95.

[211] See discussion on the placement and evolution of Osiris worshipping scenes in: Spiegel, *MDAIK* 14 (1956), 201-203

[212] Christine Seeber, *Untersuchungen zur Darstellung des Totengerichts im Alten Ägypten* (Berlin, 1976).

demon made up of parts of a lion, a crocodile and a hippopotamus, who would eat the heart and thus the dead would die a second death.[213] Needless to say, in ancient Egypt, the scale was always balanced to guarantee the acceptance of the deceased.

In the tomb, Menna is depicted before the god of the underworld Osiris sitting on his throne under a golden baldachin. He is described as:

> "Osiris, Wenennefer, the good god, lord of the sacred land (*tꜣ ḏsrtt*), the great god, lord of eternity"

The god's skin is green, symbolic of growth and resurrection, and he appears in his characteristic white garment that is meant to emulate mummy wrappings. He wears the Atef-crown and a blue beard, blue broad collar with a multi-colored counterweight, and carries his traditional implements, the crook and the flail. Osiris sits on a low-backed golden *ḥwt*-block throne decorated with green, blue and red bands with a red rectangle that represents a temple enclosure, characteristically associated with divine beings.[214] The throne rests on a tied papyrus mat and an elevated podium decorated in black with a stylized palace façade design. Above, the baldachin rises on two thin golden tent poles that intersect with the roof decorated with bands of red and blue. Together they form the *pr-wr*,[215] the shrine associated with Upper Egypt where Osiris' ritual center was located. The god of the underworld is seated against a yellow background which symbolic of the sun, thus creating a link between the themes of solar and Osirian regeneration; processes that Menna hoped to join in the hereafter.[216] Furthermore, Osiris and his entire structure are placed on a platform in the shape of the hieroglyphic sign for Maat, meaning "truth and justice." This is the white throne of Maat that indicates the god will judge fairly.

Before Osiris Menna puts his left hand on his shoulder and grabs his forearm with his right in a gesture of deference. Menna wears his best linen: a long bag tunic over which he has tied a bright white kilt. His black wig has tendrils around his face and he is barefoot. Menna

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[213] Christine Seeber, "Jenseitsgericht," *LÄ* III, 249-252. On Ammit, see Richard Wilkinson, *The Complete Gods and Goddesses of Egypt* (London, 2003), 216.

[214] Kuhlmann, *Thron*, 82-83, 89. The block throne has been described by Kuhlmann as the *ḥwt*-block throne because of its form, which resembled the enclosure hieroglyph used in the word "temple" (*ḥwt*) and "enclosure of the god" (*ḥwt-nṯr*). He explains that the *ḥwt*-block-throne was symbolic of a sacred space, relating to the divine nature of its occupant.

[215] Arnold, *Ancient Egyptian Architecture*, 174.

[216] For examples, see: Hartwig, *Tomb Painting and Identity*, 116.

recites the heart spell (Spell 30B) from the Book of the Dead that is written above in eight columns with quickly painted hieroglyphs. He says:[217]

> (1) The scribe of the fields of the Lord [of Two Lands, Menn] justified. He says: O heart of (2) my mother, O heart of my mother! My heart of transformation there (*ḥꜣtỉ.ỉ n ḫprw ỉm*): Do not stand up against me as an (3) associate (*ỉry*)[218] or as a witness (*mtrw*)! Do not be hostile (*ḥḏi*) to me in the tribunal! (4) Do not perform enmity against me (*m ỉrỉ rḳw.k r.ỉ*) in the presence of the guardian of the balance! You (*(n)tk*) are my *ka* (5) which was in my body! Khnum(6) makes healthy (7) my limbs. (8) Go forth to the happy place (*bw nfrw*) whereto we speed (*ḥn.n*). It is good for you (*nfr n.k*), good it is to hear on the Day of Judgement!

This spell from the Book of the Dead underscores the importance of the heart. The ancient Egyptians believed the heart was the seat of the intellect and emotions. As indicated in this text, the heart was believed to have a will and a life of its own, so the dead feared its betrayal.

Before Menna is a scale resting on a register line. The scale is composed of a blue and yellow balance beam with papyrus umbel terminals, and a vertical wooden post set into a base topped with the head of the goddess Maat. Resting on the left plate is the red heart of Menna, and on the right, a golden figure of the seated goddess Maat with the feather of truth on her head. Later scenes would weigh this feather instead of the goddess, but at this early stage her form is symbolic of the justice Menna is to receive. The falcon-headed god Horus, the son of Osiris, checks the precision of the results by steadying the plumb line, its plumb now hacked out.[219] The god wears a blue tripartite wig, a green-banded corselet, and a white kilt with yellow over-kilt. Later, this role was given to the god Anubis, the guardian to the gates of the underworld. Above the scale on his own register line, the ibis-headed god Thoth records the verdict on a palette. The god's beak is green, his tripartite wig blue and he wears the same kilt as Horus with the addition of a single white strap across his right shoulder. Thoth's caption reads: "Words spoken by the one who is in Hermopolis, true scribe."

On the bottom register, below the Judgement of the Dead, five men advance towards the right with offerings for the four pyres at the left. All wear short white kilts and have shaven

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[217] Transcription in Saleh, *Das Totenbuch*, 63.

[218] *Wb* I, 105,5.

[219] One could view the destruction to the plumb as part of the *damnatio memoriae* to Menna because the scale would not be balanced.

heads, suggesting their priestly status. The first carries raw incense on a white table, while the next carries a cone of fat in a vessel along with a fowl by the wings. The next two men bring meat offerings, the first two fowls and the other a severed cow's head that he elevates above a pile of incense on a tall white table. The last man who tends to the fire is depicted with three rolls of fat on his belly. He leans over to put an ox foreleg on the fire with black coals that engulfs five fowl and two other cuts of meat. The burning offerings are divided among three stands and one altar.[220] Below the stands are four vessels with large cones of incense or bread loaves and seven tall stalks of lettuce (*Lactuca Sativa*). The offerings are inserted in four semi-circles of black coal from which flames rise, supposedly to the god Osiris above. They include: *ḫpš* and other cuts of meat, fowl, and various types of bread.

The wall is framed on three sides by a color block of blue, yellow, green and red squares with white spacers. At the top, the band is crowned by a frieze of white lotus petals on a blue background with four alternating bands of red and black dots on a white background.[221] Bands of red-yellow-red separated by black cover the lower wall below the decoration.

Long hall left is concerned with Menna's provisioning and transit into the next life. Three general themes emerge: the burial procession leading to the Goddess of the West, the voyage of the sarcophagus to the embalming site symbolized by Anubis, and the Weighing of the Heart or the Judgment of the Dead. As with other eighteenth dynasty tombs, the weighing scene is depicted along with burial ceremonies.[222] Certainly, the ancient Egyptian insecurity about their provisioning in the hereafter led to the belief that the dead could take it with them. That coupled with the belief that one's ethical actions would be assessed by a fair and competent court in the Beyond gave the deceased the security that an equality of justice would prevail for all.

LHR (Long Hall Right)

The opposite wall in the inner hall, Long Hall Right, is divided into four major scenes from left to right: the deceased and wife seated before a table receiving offerings with a procession of offering bearers on the lowermost register, fishing and fowling, the voyage to Abydos, and the rites before the mummy **(Plates 22 & 23)**. As with the other walls in the tomb

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[220] Schott, *Das schöne Fest*, 21-22, abb. 4 , taf. 2.

[221] Jéquier, *Décoration égyptienne*, pl. 39, 6.

[222] Such as Haremhab (TT 78) and Roy (TT 255), Saleh, *Totenbuch*, 71.

chapel, the wall was never finished and shows Amarna destruction to the name of Amun-Re, the god's symbols and the sem-priest. Beginning on the top register, Menna and Henuttawy are seated on a green papyrus mat before an offering list and table while their son Kha recites a prayer. Menna wears a long sheer bag tunic with a white over-kilt and a short black wig. He is adorned with blue bracelets, a green-blue-white banded broad collar with black details, and a *wꜣḥ*-collar composed of lotus petals. In his left hand, he holds a lotus flower to his nose. Henuttawy is dressed in a long white garment with one strap that leaves her breast exposed. In addition to a full black wig, she wears a lotus flower diadem, and golden collar with red details that terminates in the same collar as her husband. Henuttawy wraps her arms around her husband in gesture associated with a loving relationship. Both are seated on high-backed feline-legged chairs; hers is yellow and his black.

The text above them painted in blue (which has faded) reads from right to left:

> (1) Everything that comes forth in the presence of all the gods (2) who are in necropolis (*ḫrt-nṯr*) for the *ka* of the (3) scribe of the fields (4) of the Lord of Two Lands (4-5) [Menn]a, (6) his wife (lit. sister - *snt*), the mistress of the house (*nbt pr)* (7) Chantress of [Amun] Henuttawy.

Before the couple is an offering list with two rows of ten columns that give the hieroglyphic name of the food, beverages or ritual in black, additional details in red and portions in black strokes. The list reads from left to right:[223]

Row 1		
mw	Water	2 portions
ḥṯꜣ	*ḥṯꜣ*-bread	2 portions
psn	*psn*-bread	1 portion
dpt	*dpt*-bread	1 portion
ỉwr	*ỉwr*-meat	1 portion
ꜣšrt	Roasted meat	1 portion
ỉrp	Wine	2 portions
ḥnḳt	Beer	2 portions
ḥnḳt-špnt	Beer in a *špnt*- jug	2 portions
hꜣ snḏ	Transfiguration ritual	
Row 2		

[223] Following Barta, *Opferliste*, Type C, 111-120, Abb. 6.

sn bỉt	Honey	1 portion
mw dšrt	Red Water	2 portions
bd	Natron	1 portion
ỉrṯt	Milk	2 portions
ꜣšrt	*ꜣšrt*-meat	1 portion
wr n ỉtf	*wr n ỉtf*-meat	1 portion
ḥwn	*ḥwn*-meat	1 portion
šʿwt	Biscuits	2 portions
pꜣt	*pꜣt* -biscuit	1 portion
Mw-mnsꜣ[224]	Water in a *mnsꜣ*-jug	2 portions

Before the list stands their son, Kha who is a minor priest, reciting the offering ritual. His head is shaven and he wears a white kilt with a shoulder strap and sandals. Above him are six columns of inscription in black reading from left to right:

> (1) His son the wab-priest, Kha, he says: (2) Making an offering that the king gives, pure, pure, to (3) his father and his mother, of bread, beer, oxen, fowl, (4) everything good and pure, (5) cool water, wine and (6) milk.

Between Menna and Henuttawy lies an offering table with a variegated stone or painted wood platform and a blue base. Although the painting is unfinished, one can discern three baskets full of grapes and yellow sycamore figs,[225] a bunch of grapes, a plate of dates or a date cake, and a fowl. Under the table are vessels wound with lotus buds and stalks of lettuce resting on a faint register line.

Behind Kha, a woman who is most likely a daughter[226] offers unguent in a red and blue jar,[227] and a bulbous blue glass vase with a white chevron design.[228] Both vessels are topped by blue lotus flowers referring both to the eternal renewal of the contents and to the dead. The woman wears a diaphanous white gown, a golden collar and bracelets with red and blue bands, an enveloping black wig and large golden hoop earrings. Blue lotus blossoms and flowers are

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[224] Hannig, *HL1-Marburger ed.*, 360*;* Barta, *Opferliste*, 140-141, Abb. 8, Type E.

[225] Parkinson, *Nebamun*, 67, fig. 78.s.

[226] Whale, *Family*, 209.

[227] Campbell, *Two Theban Princes*, 105, misunderstood that the writing of *ỉrṯt* referred to the first jar instead of belonging to the offering text. Note the first writing of the word to the left of the lotus which was then moved down to accommodate the flower on the vase. Unfortunately, this early interpretation is still followed today (Hodel-Hoenes, *Life and Death*, 105).

[228] Andrew Shortland, "Depictions of Glass Vessels in Two Theban Tombs and Their Role in the Dating of Early Glass," *JEA* 86 (2000), 159-161.

draped over her hands. Her face is much darker than the light yellowish red-brown of her body. The coating that appears on her face has faded on her arms, and originally appeared similar to the skin color of the girls below her.

The lower register depicts Menna and Henuttawy seated again on a papyrus mat before an offering table. Henuttawy's clothing varies slightly from above in the blue and yellow striped necklace and the green and yellow bracelets she wears. The figure of Menna differs only in the green *Kherep*-scepter he carries in his near hand while his far hand reaches out to touch the bread loaf in front of him. Both husband and wife are seated on high-back black feline-legged chairs. Before them lies a similar offering table to that above, this time finished. It contains bread of various types, dates or date cakes, meat, fowl, and vegetables surmounted by a coiled bouquet of lotus buds and flowers.

The blue text above the couple in 10 red columns reads from right to left:

> (1) An offering which the king gives to Osiris (2) that he may give and receive (*šsp*) *snw*-bread[229] (3) that goes up (*prrt*) in the presence of (4) the pure fire (*ḫt*)[230] upon the altar (*ḫꜣwt*) of Re, (5) for the *ka* of the scribe of the fields (6) of the Lord of Two Lands, (7) Menna, (8) his wife (lit. sister), the mistress of the house, (9) chantress of (10) [Amun, Henut]tawy.

Behind the offering table once stood Menna and Henuttawy's eldest son who was hacked out during the Amarna period because he was dressed as a sem-priest. Three columns of blue text remain that give his identity and explain the action:

> (1) His son, his beloved, Se, he says (2): a thousand of bread and [beer], oxen and fowl, a thousand of (3) everything, cool water, wine….

Two unidentified daughters follow behind Se, the first holding another unguent jar, topped by a blue lotus, a group of lotus buds and flowers and a stalk of papyrus; the second holding a lotus flower to her chest. These girls are dressed almost identically to the daughter above with small variations in their jewelry and garments. The dresses are particularly well done due to the thin strokes of white to indicate transparency and wavy red lines to suggest the draping of the fabric.

The next scene is the fishing and fowling scene for which the tomb of Menna is famous. Although none of the figures are labeled, we can assume that the main figures are Menna and Henuttawy, following the conventions of other eighteenth dynasty fishing and fowling scenes in

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[229] *Wb*. IV, 155, 6. A type of bread that was used in the reversion offerings from the God for the Dead.

[230] *Wb*. III, 217, 7.

which the wife is named.[231] The other participants are often assumed to be family members and anonymous servants.[232] Since the scene occurs in the long hall (symbolizing the deceased's transition into and life in the beyond), fishing and fowling scene represents one of Menna's passtimes in the afterlife. This is suggested by a text in the tomb of Haremhab (TT 78) that is painted on the north wall of the inner hall, the same wall as TT 69:[233]

> Enjoying oneself, beholding pleasant things and engaging in field sports with the art of the Fen goddess which is done there in the necropolis with birds and eggs of the Delta marshes…

Two figures of Menna are placed on either side of a papyrus bank, one fowling and the other fishing. Unfortunately, both faces were excised in an act of *damnatio memoriae*. On the left, Menna is shown vigorously striding towards the right on a papyrus skiff with left arm raised holding a snake-headed throw-stick. In this right hand, he holds the legs of flapping egrets (*Egretta* sp.) that are meant to be decoys or birds he already caught.[234] Menna is dressed in his finest white tunic with a pleated wrap kilt that ties in the front. He also wears an ornate floral collar and wristlets decorated with bands of green and blue. Menna is depicted with a short black wig, beard, and has fat folds on his torso. Henuttawy stands behind Menna with her hands raised in praise. She too is dressed in her finest pleated wrap-around dress,[235] elaborate blue-and-red banded floral collar and bracelets. On her head, she wears a heavy, black wig, a lotus garland tied around her hair, large hoop earrings, and a perfume cone. Over her left arm are draped blue lotus buds and flowers. Also note the delineation of five toes on right foot that begins in the reign of Thutmose IV.[236]

Also on the boat with Menna and Henuttawy is a young boy at the prow, a naked girl between the legs of Menna and a daughter behind Henuttawy.[237] The boy points to the papyrus thicket with the fluttering prey and holds a group of three ducks in his left hand. He is dressed in

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[231] See for example, Nebamun : Parkinson, *Nebamun*, 127 ; TT 52 : *Urk.* IV, 1605-1606 ; TT 123 : MMA T.2718.

[232] Whale, *Family*, 7ff with discussion; Hodel-Hoenes, *Life and Death*, 39, 79, 105.

[233] Brack, *Haremheb*, 60, text 48.

[234] Parkinson, *Nebamun*, 124 ; Hartwig, *Tomb Painting and Identity*, 104.

[235] Vogelsang-Eastwood, *Pharaonic Egyptian Clothing*, 106-111.

[236] Edna Russmann, "The Anatomy of an Artistic Convention : Representation of the Near Foot in Two Dimensions through the New Kingdom," *BES* 2 (1980), 64-65, 77.

[237] There is no reason to believe that Menna had young children since those that are labeled are depicted as adults.

a white wrap-around kilt and has a shaven head. Beneath Menna's legs, a young girl bends over the boat to pull up a lotus bud from the water. She is naked, as a sign of youth, but wears a red, blue and yellow girdle, bracelets and armlets. Although her face was destroyed, remains of a white lotus bud garland can be seen on her black wig.[238] At the stern of the boat is a daughter, turned toward the left, holding three ducks by their wings in her right hand and three blue lotus flowers in her left hand with seven blue lotus flowers and buds draped over her left elbow. This girl's white garment, yellow jewelry, and lotus headband are more summary than her mother's. Likewise, the painted lines that delineate her body are very shaky, and revision can be seen between the preliminary lines and her final outline, especially in her left leg and foot. Her youth is indicted by a wig style that is associated with younger girls who are unmarried.[239]

Above is another young girl kneeling and facing towards the right, possibly a daughter of the couple. The fact that she is kneeling on a papyrus mat is an artistic convention indicating that she is on the skiff to the left of the daughter at the back of the boat. She is wearing clothing identical to the daughter below, and holds one lotus in her right hand and three in her left. She is also summarily done with strokes of color slopping over the final sketchy outline. Clearly, these two girls, one above the other, were done by the same artist.

In the adjacent fishing scene, Menna steps vigorously to the left and leans into the action, pushing the spear with his right hand and guiding it with his left. He is dressed in the same garments as on the left, but instead of a blue broad collar, he wears the Gold of Honor. Directly above him are five vertical lines intended for a caption that was never done. Hennuttawy stands behind him, and wraps her right arm around his back, resting her fingers on his chest. In her left hand, she holds a bouquet of a lotus flowers and several buds. Henuttawy wears a garment identical to that in the fowling scene; the only difference lies in the arrangement of her wig in which a lock has escaped and falls over her head. Below and to the left of Menna, a young scout stands at the prow of the boat holding a pintail duck in one hand and a lotus in his other. Kneeling between Menna's legs, a daughter or a girl holds on to the calf of Menna and grasps a lotus in her other hand. She is dressed like Henuttawy except for the arrangement of the dress that leaves her breast partially exposed.

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[238] Garland preserved on MMA T784.

[239] Gay Robins, "Hair and the Construction of Identity," *JARCE* 36 (1999), 64.

Some particularly interesting details occur at the far right of the fishing and fowling scene. A goose was originally painted on top of the papyrus terminal at the stern of the ship, but was covered in white pigment that follows the outlines of the goose. Parallels exist such as in the fowling scene in paintings of Nebamun.[240] Also, directly above on the black register line, a bright white rectangle covers what once was the image of another daughter. Remains of cursive hieroglyphs just above the register line read "his daughter" (*sꜣt.f*) (**Figure 11).** There appears to have been a change in the composition of the scene during painting. This was not the work of Atenists who preferred to hack out insignia associated with the god Amun like the goose.[241]

What makes the fishing and fowling scene in the tomb of Menna a masterpiece of ancient Egyptian painting lies in the artist's understanding and rendering of nature. Between the boats rises the papyrus thicket teeming with life. The stems are done in broad green strokes against a muted turquoise background and topped by papyrus sedges of which the tops and capsules are drawn in red. Four umbels on thick stems line both sides of the papyrus thicket, while two sway and bend in the center. Within the thicket, a brown mongoose (*Herpestes icheumon*) creeps up a stem, bending it under its weight, following a genet (*Genetta genetta*) that stalks five abandoned nests with eggs. More than an idle depiction, the artist shows the diet, natural habitat and agility of both animals in the wild.[242] Above the thicket, six pintail ducks (*Anas acuta*) fly overheard, four of which are caught by the throw stick(s) propelled by Menna. Two more ducks rest on papyrus umbels as well as a lone heron (*Ardea purpurea*?). Two schematically drawn Tiger butterflies (*Danaus chrysippus*) fill in the remaining space. The entire scene is suffused with the flurry of wildlife as it is flushed out of the thicket.

At the base of the papyrus grove is an arc of water (*Wasserberg*) with two fish – both tilapia (*Tilapia nilotica*) one of which is about to be punctured by Menna's spear.[243] The fish represent an accomplished display of shading from the pink fins, gills and mouth to the subtle

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[240] Parkinson, *Nebamun*, fig. 129, 134,

[241] See for example Abdel Ghaffar Shedid and Matthias Seidel, *The Tomb of Nakht*, trans. M. Eaton-Krauss (Mainz, 1996), 60-61.

[242] See preliminary discussion in: Linda Evans, "Animal Behavior in Egyptian Art," *Abstracts of the Tenth International Congress of Egyptologists*, Rhodes 22-29 May (2008), 84-85; Joachim Boessneck, *Die Tierwelt des Alten Ägypten* (Munich, 1988), 50. Both the Egyptian mongoose and the genet are members of the Viverridae family.

[243] Douglas J. Brewer and Renée F. Freidman, *Fish and Fishing in Ancient Egypt* (Warminster, 1989), 77-79, pl. XIII, fig. 3.38. On the arc of water: Heinrich Balcz, "Zu dem 'Wasserberg,'" *MDAIK* 8 (1939), 158-160.

brownish-yellow wash along the upper three-fourths of their bodies. Red lines are used to delineate the spines of the dorsal, pectoral and anal fins and tails. Around the fish are blue zigzags in a blue background that indicates water. Symbolically, *Tilapia* was an important fish in ancient Egyptian religion, and represented fertility and rebirth, in part because of its mouth-brooding habits. The *Tilapia* takes the fertilized eggs into her mouth, and when the eggs hatch, the fry leave and return when they are in danger. The ancient Egyptians associated the *Tilapia* with the Creator God Atum, who took his seed in his mouth and spat out the world.[244] The stylized red triangles that border the arc of water depict pondweed (*Potamogeton schweinfurthii* A. Benn) that usually lies below the water. Symbolically, this red arc of triangles could symbolize the *Tilapia*'s connection to the sun god, whose journey the dead hoped to take with the god in his sacred bark.[245]

Swimming in the water under the reed boats are other types of fish including *lepidotus* (*Barbus bynni*), *oxyrhynchus (Mormyrus* spp.), *Tilapia*, *schall* (*Synodontis* genus), a type of mullet (*Mugil).* Of these, the *lepidotus* and the *oxyrhynchus* were most associated with Osiris, the god of the underworld.[246] Blue lotus flowers, buds and leaves float in the water, along with eight pintail ducks. Some quack, other alight, and one appears to be eating a blue lotus that is not unusual given the association of both with eternal renewal based on their appearance on palace floors.[247] One sobering vignette concerns a crocodile eating a tilapia. Nile crocodiles (*Crocodilus niloticus*) could reach a length of 20 feet, and were a menace to everything except an adult hippopotamus.[248] Here, the crocodile is diminutive (perhaps to curtail its power), and is shown in its natural aquatic habitat living among and eating fish – in this case a *Tilapia*. In ancient Egypt, the crocodile was worshipped as a god (Sobek) but also was associated with the gods Re and

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[244] Ingrid Gamer-Wallert, *Fische und Fischkulte im alten Ägypten*, ÄA 21 (Wiesbaden, 1970),110-111; Martin Dambach and Ingrid Wallert, "Das Tilapia-Motiv in der altägyptischen Kunst," *CdÉ* 41, no. 82 (1966), 283-294; Dietrich Sahrhage, *Fischfang und Fischkult im alten Ägypten*, Kulturgeschichte der Antiken Welt 70 (Mainz, 1998), 137-138; Gay Robins, "Problems in Interpreting Egyptian Art," *DIE* 17 (1990), 50; Brewer, *OEAE* I, 533. See discussion also in Hartwig, *Tomb Painting and Identity*, 105.

[245] The ancient Egyptians referred to the *Tilapia* as "red fish" and connected it with the sun as the guardian and protector of the solar boat on its daily cycle. The *Book of Going Forth by Day* addressed the deceased's hope to "see the *Tilapia* (*ínt*) in the stream of turquoise" while sailing with the sun god in his sacred bark (Raymond O. Faulkner, *The Ancient Egyptian Book of the Dead*, Rev. ed. (London, 1985).

[246] Ingrid Gamer-Wallert, "Fische, religiös, *LÄ* II (1977), 227-234.

[247] Gay Robins, "The world at dawn: the decoration of palace floors at Amarna and Malqata," *Paper presented at the annual meeting of the The 59th Annual Meeting of the American Research Center in Egypt, Grand Hyatt Seattle, Seattle, WA*, Apr 25, 2008 http://www.allacademic.com/meta/p237488_index.html

[248] Emma Brunner-Traut, "Crocodiles," *OEAE* I, 320-321.

Osiris, both of whom are referenced in the symbolism of fishing and fowling scenes. At some later point, the eyes of the crocodile were destroyed, probably to ward off evil.

The last two quarters of the wall represent the voyage to Abydos and the rites before the mummy. The top register is divided into two vignettes from right to left: the voyage to and from Abydos. Abydos, the holy city of the god of the underworld Osiris, was an important pilgrimage center where visitors participated in rituals relating to the death and the resurrection of the god. The voyage to Abydos was a journey that every Egyptian wanted to make in life. In death, the journey formed a part of the funerary ceremonies during which the mummy or statue of the dead was ferried from the east bank to the tomb in the western necropolis.[249]

On a strip of blue water, two wooden boats with papyrus terminals, painted green to emulate crafts made of papyrus reeds, carry statues of Menna and Henuttawy on a wooden platform seated under a canopy supported by four light columns. The statues are wrapped in long white garments and carry symbolic insignia: Menna holds a flail (the ritual implement of Osiris)[250] and Henuttawy sniffs a blue lotus flower (resurrection). Both statues are seated on low-back feline-legged chairs with a cushion curled over the back. The boat to the right has a blue offering table filled with bread, vegetables (?) and lotus. They are protected by colorful baldachins of red latticework with a lotus petal garland, or solid red with stylized lotus petal festoons. Before each pair once stood a *sem*-priest in his characteristic leopard skin garment, performing funerary rituals (now expunged). The boats are steered by men holding two rudders fixed to poles with falcon terminals and lotus/*udjet*-eye paddles. Both boats could not move on their own accord: they had to be lashed to the larger wooden boats that would tow them.[251] Unfortunately, the artist either did not understand or follow through with the initial drawing: the bowsman facing right holds a truncated rope, although preliminary outlines indicate it would have extended across to the stern of the steering boat.[252]

To either side of the ritual craft are two large wooden boats; one being rowed northward to Abydos with the Nile current, and the other sailing south to Thebes. The pilot holds a long

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[249] D. Brockelmann, Die Abydosfahrt in Den Altägyptischen Privatgrabern: Eine Ikonographische Untersuchung Ihrer Darstellung Bis Zum Ende Der 18. Dynastie, MONAEG 12 (Brepols, 2007); Hartwig Altenmüller, "Abydosfahrt," LÄ I (1975), 42-47.

[250] Henry G. Fischer, "Geissel," LÄ II (1977), 516-517.

[251] Jones, Boats, 57-58.

[252] For the usual configuration, see: Arne Eggebrecht (ed.), Sennefer: Die Grabkammer des Bürgermeisters von Theben, 2d ed. (Mainz, 1991), abb. 43 (TT 96); Lhote and Hassia, La Peinture Égyptienne, pl. 14 (TT 139).

pole with which to take soundings and turns backwards to give instructions to the man who operates the tiller. This boat was never completed. The background colors were blocked out and some of the preliminary drawings were filled in, but most of the details seen in the first boat are missing. What is unique is the depiction of the door in the cabin as well as the objects resting above it. Although they are summarily rendered, one can make out an ostrich fan, a red scribal kit, a bed with matting and headrest under which are a mirror, a kohl pot, and a footstool.[253] In front is the preliminary outline of a square table with two bread loaves and a vessel. The oarsmen as well as the captain at the bow all wear the latticework leather loincloths over white kilts.[254] To the far right of the scene, there are two white rectangles that were to serve as the background for texts.

The sailing boat shows a single mast positioned mid-ship with a broad sail. At the bow, the captain holds a long pole used to prevent the ship from running aground on a sandbank. However, he turns back to the steersman who rests the rudder ornamented with a lotus flower and *udjet*-eyes in the crook of his arm, indicating the boat has touched the river bank. The cabin in which the pilot stands is framed by a multicolored band with three panels of white flowers on a red background above a black and white palace façade motif. Above, a boy stands on the lower yard-arm, presumably readying to lower the sail.[255] Eight oarsmen are seated with one arm to their chest and the other stretched out towards their knee. Ten inserts for the oars are cut into the boat, depicted in red. To reduce the visual monotony, the third and fifth oarsmen from the left were depicted with receding hairlines. Likewise, the artist painted a man hanging down over the side of the boat to scoop water into a cup while clinging to the boat with his other hand. Behind the oarsmen rises a central yellow cabin decorated with a white and blue stylized floral design, a color band on a white background, and a multicolored cavetto cornice. The fore and aft are painted with a lotus flower above various geometric bands.

On the riverbank are two reed shelters, the upper behind the lower shelter on separate register lines, each composed of three stylized papyrus columns that hold up a multi-colored

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[253] Susanne Wohlfahrt, Grabbeigaben im Flachbild der Privatgräber des Neuen Reiches: Versuch einer ikonographischen und kompositionellen Bestimmung, München, Univ., Diss., 2002, 270.

[254] For more on this type of kilt, see: William Stevenson Smith, Ancient Egypt as Represented in the Museum of Fine Arts, Boston (Boston, 1960), 125, fig. 76-77; Torgny Säve-Söderbergh, The navy of the eighteenth Egyptian dynasty, Uppsala Universitets årrskrift, 6 (Uppsala, 1946), 75-78, fig. 14; Vogelsang-Eastwood, Pharaonic Egyptian Clothing, 31.

[255] Aufrère, Menna, 20.

cavetto cornice.[256] Inside the upper shelter are four large cones of fat in vessels between six red, wine jars wrapped with lotus garlands resting on pink stands. In the shelter below, the wine jars rest on pink stands with lotus garlands above a lower partition that contains bowls of grapes and mandrake fruits with some type of greenery on top to keep them fresh. These snacks for the celebrants were at the endpoint of the voyage to Abydos when the crew returned to Thebes.

The second and third registers contain 15 episodes from the Opening of the Mouth ceremony, one of the most important rituals associated with the funeral that restored the deceased's vital functions before he was interred in the tomb. Specialized officiants performed this ceremony on the mummy that was propped up outside of the tomb. These priests knew the correct formulas and gestures that would aid the deceased's passage to and existence in the next life. They can be identified by their dress such as the *sem*-priest with the panther skin and a priest with a white kilt and diagonal shoulder strap accompanied by an assistant. Although the captions were never completed, the vignettes in the chapel of Menna allow for the reconstruction of the ritual cycle of which a number of examples remain (Type 1B).[257]

In general, the actions begin in the first two vignettes on the third register and the first scene on the second register with the purification of the area (Episodes 2-3, 6). Next, specific priests conduct rituals to enliven the statue in the last two images on the third register (Episode 9). The rest of the second register is concerned with the transition from the statue rituals (Episode 25) to the fundamental offering rites that require special instruments (Episodes 26, 27, 36). The ceremony ends on this wall on the third register with the clothing of the statue/mummy (Episode 50). For purposes here, the scenes are read from right to left from the second to the third register.

At the far left of the two registers, Menna's eldest son holds the anthropoid sarcophagus of Menna on a white plinth (or a ritual mound of sand) while a *sem*-priest whose form is excised performed the necessary ritual.[258] This action would have taken place in front of the entrance to the tomb. The priest who props up the coffin up on the plinth wears an off-the-shoulder bag tunic wrapped with a white kilt and a black wig. The mummy of Menna is contained in a typical black

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[256] See similar shelters in the tomb of Nebamun and Ipuky: Norman de Garis Davies, *The tomb of two sculptors at Thebes*, PMMA, Robb de Peyster Tytus Memorial Series 4 (New York, 1925), 48-49, pl. xix.

[257] Otto, *Das ägyptische Mundöffnungsritual*, type 1B.

[258] Ritual mound of sand: Aufrère, *Menna*, 19.

and yellow anthropoid sarcophagus associated with the eighteenth dynasty.[259] The tripartite wig of the coffin is colored blue, although now it appears green through the devitrification of the copper-rich frit.[260] In front of the coffin rise four leafy papyrus plants symbolizing the transformation and continual life of the deceased.[261]

The second register from the top begins with a priest purifying the deceased with nuggets of *snṯr*-incense that he holds in a small bowl (Episode 6). His upraised left hand undertakes the action of holding the nuggets to the mouth, eyes and arms of the mummy.[262] The following scene is completely destroyed. The third scene depicts the presentation of the foreleg of an ox (*ḫpš*) to the mouth and eyes of the mummy (Episode 25) followed by another destroyed action undertaken by the *sem*-priest[263] and two others, one who carries a papyrus scroll. The next episode depicts the Opening of the Mouth with the priest holding the *netjerty* (*nṯrty*) adze to the deceased's mouth (Episode 26). Descended from root *nṯr* "god," the name of the *netjerty* adze relates to its purpose to make the ritually buried deceased a *nṯr* and the object of cult.[264] The next episode is destroyed, but enough of the tip of the yellow implement remains to identify it as the magic staff (*wr-ḥkꜣw*) (Episode 27).[265] In the following episode, a priest holds four white implements that may be polishing stones (*ꜥbt*) to the mummy to open its mouth and eyes (Episode 36).[266] The action taken by the *sem*-priest before the mummy in the last episode on the second register is completely destroyed.

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[259] John H. Taylor, "Patterns of colouring on ancient Egyptian coffins from the New Kingdom to the Twenty-sixth Dynasty: an overview," *Colour and Painting in Ancient Egypt*, edited by W.V. Davies (London, 2001), 168-169, pl. 51.

[260] Lorna Green, "Colour transformations of ancient Egyptian pigments," *Colour and Painting in Ancient Egypt*, edited by W.V. Davies (London, 2001), 44.

[261] As evidenced by epithets such s "the papyrus of life." See discussion in Hartwig, *Tomb Painting and Identity*, 63-64, esp. n. 96.

[262] Otto, *Mundöffnungsritual* II, 49, Szene 6.

[263] Ibid., 78-80, Szene 25. Please note that the dark spot before the mummy's mouth is the result of a former conservation attempt and not the remains of decoration.

[264] Lorton, *Born in Heaven, Made on Earth*, 149; Dimitri Meeks, "Notion de 'dieu' et structure du panthéon dans l'Égypte ancienne," *Revue de l'Histoire des Religions* 204 (1988), 425-446. See also discussions on the nature of the instrument in: Otto, *Mundöffnungsritual* II, 83.

[265] Mond photo 4022. Compare Davies and Gardiner, *Amenemhet (TT 82)*, 60, pl. XVII. Otto, *Mundöffnungsritual*, 86 mentions that scenes 25, 26 and 27 are often represented together.

[266] Otto, *Mundöffnungsritual*, 9, 96-97, Szene 36.

The third register from left to right begins with Episodes 2 and 3, purifying the mummy with liquids from the *nemset* and the *deshret*-jars.[267] Both of the jars are unfinished, but the preliminary outlines of both can be distinguished. The following episode is destroyed, but the fourth vignette from the left illustrated the priest bringing two bolts of white linen symbolizing clothing (*mnḫt*) followed by another priest (Episode 50).[268] The following episode is destroyed but the last two vignettes depict the waking of the *sem*-priest by the *imi-is* who stands behind the mummy (Episode 9).[269] Shown in two vignettes, the *sem* who is wrapped in a yellow cloak lies sleeping on a black lion-bed, and next awakens kneeling on the bed.

The final portion of LHR is the procession of offering bearers on the four registers that run three-quarters the length of the wall. Moving from left to right (under the Fishing and Fowling scene), the bearer is the well-know vignette of an elderly man leading a black spotted cow with a collar of lotus and red pomegranates. The man, dressed in a long kilt, has a receding hairline with wisps of hair on his forehead as well as a beard and body hair. The next man – as well as most men that follow - wears a wrap-around kilt and a short black wig. In his hands, he once held two hares by their ears. They were erased in antiquity perhaps due to the hare's role as an underworld demon.[270] The male offering bearers behind bring the following goods: covered vessels of food, green corn dollies, ducks and geese, *Tilapia*- fish, lotus flowers, bunches of grapes, square tables of figs and grapes, and stalks of papyrus and lotus. Eight female offering bearers bring lotus buds and flowers, green and blue patterned unguent and oil jars, granite and alabaster vessels filled with oil or wine. Each woman wears a wrap-around dress with a strap. The last seven male offering bearers are in various degrees of completion; only one received the final outline. These men bring lotus buds and flowers, stalks of papyrus, blue and red jars of beer, offering stands of various fruits, different loaves of bread and a black and white cow.

As with the opposite wall, LHR is framed on three sides by a color band outlined in green with blue, yellow, green and red squares and white spacers. At the top, the band is crowned by a frieze of white lotus petals on a blue background with four alternating bands of red and black

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[267] Ibid., 37-44, Szene 2 and Szene 3.

[268] Ibid., 112-114, Szene 50.

[269] Ibid., 53-55, Szene 9.

[270] Emma Brunner-Traut, "Hase," *LÄ* II (1977), 1023-1024.

dots on a white background.[271] Bands of red-yellow-red separated by black cover the lower wall below the decoration.

This wall, as with LHL, is exclusively concerned with the provisioning and vitality of Menna in the next world. The far left portion of the wall concerns the funerary cult of the dead as performed by the eldest son and other members of the family. The far right part depicts an abbreviated form of the Opening of the Mouth ceremony that allowed the *ka* or lifeforce of the deceased to inhabit the body. Episodes of purification, censing, anointing and touching parts of the mummy with different objects, would animate the senses that were critical for the deceased's eternal well being. The central scene of fishing and fowling not only reflects recreation and the securing of food in the next world but functioned apotropaically to ward off chaos and aid the eternal rebirth of the deceased.[272]

Long Hall Far (LHF)

The statue niche is the furthest "western" wall in the tomb of Menna (**Plates 24 & 25)**. Four male offering bearers are arranged around a statue niche with the bottom half of a seated statue of Menna and Henuttawy. Each offering bearer wears a variant of a bag tunic over a white wrapped kilt and a black short wig. The offerings range from a table of grapes and dates, bouquets of lotus buds and flowers, stalks of papyrus, and a papyrus mat with round bread loaves and a vessel for liquids or oil. Only one text remains above the offering on the upper right:

"Bringing (*ms*)[273] everything good for the Osiris, the perfect god"

The column of text in front of his left leg is destroyed.[274] The offer on the lower right had eight columns that never received text. Although the offerers are unnamed, they may represent Menna making offerings to Osiris, the god who would assure the deceased's passage and provisioning in the next life.[275]

The statue niche sits on a white plinth surrounded by a black border with yellow bands to either side. Below the niche is a multicolored mat design on a yellow background. Above, the

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[271] Jéquier, *Décoration égyptienne*, pl. 39, 6.

[272] See summary in Hartwig, Tomb Painting and Identity, 103-106.

[273] Scribal error: *mš*(sic) for *ms ḫt nbt nfrt in Wsir nṯr ꜥꜣ*.

[274] Also on Mond photo no. 4108. The text probably referred to the reversion of offerings from the table of Amun-Re.

[275] Aufrère, *Menna*, 22.

entablature is decorated with a paneled wall design that has parallels in other eighteenth dynasty tombs.[276] Broken into two sections outlined in black, the upper part shows two white central panels with two papyrus stalks tied together and two white side panels, each with five *Djed*-columns. The central panels are crowned by a row of hawk-heads against a blue background. In the lunettes are two blue *udjet*-eyes for protection. The lower partition has the same hawk-head border above a paneled wall with two *Djed*-columns to the side and a central panel with a green column topped by a yellow Hathor head wearing a blue wig and a red modius with stylized petal frieze. Both the Hathor column and the *Djed*-pillar have funerary associations: the column evokes the Hathor sanctuary which was the meeting place for Amun-Re and the goddess during the necropolis Valley Festival,[277] and the *Djed*-pillar symbolized the backbone of the god Osiris, the lord of the underworld, and stability.

Inside the niche of unpainted gypsum plaster rests the lower part of the statue of Menna and his wife Henuttawy.[278] Both are wrapped in a long white robe and place a hand on their right thighs. Remains of paint can be seen: red-brown for Menna, yellow-brown for Henuttawy. The upper part of Henuttawy remains in the Cairo Museum (JE 36550) (**Figure 5).**[279]

The borders of the wall are similar to those in the long hall: a multi-colored band topped by a frieze of four alternating bands of red and black dots and lotus petals. Only snapped red guidelines remain of the skirting band below.

The niche was the main focus of the deceased's cult. As the most "western" part of the tomb chapel, it was the most potent place where the dead could communicate with the living. Food and other goods would be placed before this shrine on an offering table for the benefit of Menna and those of his family interred with him. The sloping passage started immediately beneath this statue niche and extends to the right and then down into the burial chamber. In plan, the sloping passage was symbolic of the passage through the underworld that ended with the burial chamber in the realm of Osiris. The burial chamber and its connection to the statue niche would give Menna's *ka* direct access to the offerings left there. Thematically and symbolically,

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[276] TT 39, Puyemre: Davies, *Puyemrê*, pls. LVI, LVII, LXXVIII[b]; TT 82: Davies and Gardiner, *Amenemhet (TT 82)*, 101 with n.1, pl. XVIII.

[277] See discussion in Hartwig, *Tomb Painting and Identity*, 11-12.

[278] Campbell, *Two Theban Princes*, 106. See also Mond MSS 1.3.6, Wall I11.

[279] Etienne Drioton, *Encyclopédie photograpique de l'art, le Musée du Caire* (France, 1949), pl. 88.

the scenes and texts directly adjacent to the shrine, the niche itself and the burial directly relate to the realm of Osiris and the god's role as the judge and provider for Menna in the next life.

Broad Hall and Long Hall Ceiling

The design of ancient Egyptian Theban tomb ceilings is derived from colorful reed matting that overlaid wooden beams, creating the deceaseds "house for eternity." As mentioned in Chapter 1, the original ceiling can only be seen above the far left portion of the left wing **(Plate 26)**. A yellow band frames the ceiling and another horizonal runs down the middle. Originally intended to receive texts, they were never inscribed. These yellow bands are also bordered by a white line outlined in black with a red line running down its middle. Inside is found a pattern of zigzag lines with yellow squares containing rosettes of different colors in alternate rows. Along the tomb's central east-west axis is another yellow band (uninscribed), bordered by a black and white checkerboard pattern. To either side are remains of wide zigzag lines with alternating rows of yellow and white squares containing rosettes, roughly executed.

The long hall ceiling is in better condition **(Plate 27)**. Again, uninscribed yellow bands border the ceiling with a central band along the main axis of the tomb. These yellow bands are framed by a white line, outlined in black, with a red line painted down its middle. The rest of the ceiling is painted with in a pattern of zigzag lines with alternate rows of white and yellow squares that contain rosettes, some with black and red petals alternating with red and green petals.

CHAPTER 3

Visual Analysis of the Paintings

Melinda Hartwig and Kerstin Leterme

The painted decoration in the tomb of Menna was extensively surveyed using an interdisciplinary methodology that combined visual analysis with archaeometric techniques. Complimentary spectroscopic techniques were used to answer specific questions that arose from the visual examination of the painting, and provided objective clarification of the materiality of the painting, its matrix and its application. This proved to be an objective method with which to characterize, on a material basis, an artist's mixtures, work process and special effects as well as the techniques and characteristics of a group. In this chapter, the results of this methodology developed for the tomb of Menna will be discussed in two parts: Visual Analysis and Archaeometric Analysis.[1]

A new protocol of visual analysis was developed by Kerstin Leterme (University of Ghent) that examined the different stages in the execution of the painting and the pictorial techniques used by the artists.[2] This analysis followed the technological sequence of the paintings, stage by stage, from the preparation of the walls until the completion of the final coatings. The goal of visual analysis was two-fold: 1, through the stratigraphic examination of the painting, the working process of the painters and plastic subtleties of the images could be identified, thus elucidating the 'hands' of the artists and their individual contributions to the decoration; and 2, questions that arose based on the visual analysis of the painting led to a selection of points that were examined by archaeometric methods.

The visual analysis used in the tomb of Menna examined the following stages to

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[1] Special thanks to Laura Hunt who assisted with the translation and editing of this chapter.

[2] The method is based on the first protocol of visual analysis that was set out in Leterme's M.A. thesis *La picturalité dans la peinture thébaine de la XVIIIe dynastie*, completed at the Universtity of Liège in 2006, under the direction of Dr. Dimitri Laboury. This first draft was then expanded with significant contributions from Hugues Tavier within the framework of our collaboration during the 2007 season in the Tomb of Menna Project (TT69).

arrive at certain aims:[3]

Stage	Analysis	Aim
1	Coatings used to equalize mural surface from the rock to the painting surface; discernable in the voids	Sequencing, conservation strategies
2	System of reference marks (grids of proportions, guide-lines)	Importance of scene, work zones
3	Preliminary drawings, the surety or uncertainty of line, and their relationship to the final figure	Specific artists, work zones
4	Background wash and its relationship to the coloring of the figure or object ("reserve technique ")	Sequencing, work zones
5	Succession of colors, including skin tones on white	Specific techniques, work zones
6	Comparison of all skin colors, charted separately by men and women	Work zones, selection of archaeometric points, conservation strategies
7	Transparency of clothing and layering	Work zones, specific artists
8	Comparison of style and techniques of particular motifs	Work zones, specific artists
9	Color and brushstrokes of final outline	Work zones, specific artists
10	Corrections and retouching ("white-out ")	Work zones, specific artists
11	Varnishes and coatings	Work zones, selection of archaeometric points, conservation strategies

By examining the stratigraphy of the painting, the working process of the painters and plastic subtleties of the images can be understood, thus elucidating the 'hands' of the artists and their contributions to the project.

However, it is important to note that a number of workmen, artists and scribes were involved in the process of creating a painted tomb. In a recent ground-breaking

[3] Kerstin Leterme, Melinda Hartwig and Peter Vandenabeele, "Development of a new visual analysis protocol: a methodological examination of Theban tomb paintings," *GM* 222 (2009), pp. 41-46.

article, Bryan has examined the nomenclature of specific processes involved in creating a painted wall.[4] They are:

1. *ꜣꜥꜥ* Plastering the wall to even out the surface
2. *šꜥd* The layer of fine plaster and smoothing the surface
3. *sꜣḥ ḏrỉw* Laying out preliminary sketches for scenes with tA-ryt "red ochre"
4. *dḳw dgꜣ* Background painting or whitewash
5. *ḏrỉw* Application of color layers or mixtures
6. *sš* The final outline and details with red ochre and other pigments

Bryan observes that only scribes could complete the preliminary and final outlines (steps 3 and 6) while tomb artisans did the less detailed work. Bryan's lexicographical work on eighteenth dynasty painting terminology indicates that not one artist could do all processes. Indeed, the more detailed and finished work was done by scribes who had more training in the graphic arts. In this regard, by the reigns of Thutmose IV and Amenhotep III, the style of painting appears more homogeneous. This was perhaps due, in part, to a workforce drawn from certain institutions, an established tradition of tomb painting in the Theban necropolis, and a more streamlined workforce.[5]

Visual analysis was aided by extensive photographic coverage of the walls in the tomb chapel.[6] Photos were taken in both the visible (normal and raking light) and ultra-violet (ultra-violet fluorescence photography) spectral regions. An optic microscope was employed to examine the layers of painting. The information recorded using these techniques was also used to select the points to be examined spectroscopically.

In the tomb of Menna, visual analysis was complimented and enhanced through the use of archaeometry.[7] Archaeometry is the application of scientific devices and

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[4] Betsy Bryan, "Pharaonic Painting through the New Kingdom, *A Companion to Ancient Egypt*, edited by Alan B. Lloyd (UK, 2010), 990-1007, esp. 113-1004; idem, "The ABC's of Egyptian painting in the Mid-18th Dynasty," *Third Egyptological Colloquium of Montepulciano "Artists and Painting in Ancient Egypt,"* edited by Francesco Tiradritti and Valerie Angenot (Montepulciano, 2011).

[5] See: Hartwig, *Tomb Painting and Identity*, 22-36; Bryan, *A Companion to Ancient Egypt*, 1006.

[6] Thanks to our photographers Katy Doyle and Andreas Paasch, and our digital specialist, Kai Christian-Bruhn.

[7] Peter Vandenabeele, Renata Garcia-Moreno, François Mathis, Kerstin Leterme, Elsa Van Elslande, François-Philippe Hocquet, Saïd Rakkaa, Dimitri Laboury, Luc Moens, David Strivay, and Melinda Hartwig, "Multi-Disciplinary Investigation of the Tomb of Menna (TT69), Theban Necropolis

techniques from natural sciences to answer specific questions about different materials in art history or archaeology.[8] The analytical devices used in the tomb chapel were energy-dispersive X-ray fluorescence (XRF), UV- visible and near-infrared spectroscopy (UV-VIS and NIR spectroscopy), and Raman spectroscopy (Raman). These techniques were combined to obtain as much information as possible **(See also Chapter 4)**. X-ray fluorescence was combined with diffuse reflectance visible spectroscopy. Raman was used separately to refine and validate the exact chemical and organic properties of the various materials. These mobile analytical techniques were both efficient and non-destructive to the wall paintings. From the *in situ* examination of the paintings, these methods identified the pictorial materials such as the pigments and pigment recipes used by the painters, and the transformation of materials and past restorations. In this chapter, the pigment recipes and visual stratigraphy of the painting will be used to objectively illustrate the pictorial techniques, specific work zones and the contribution of individual painters.

Background

Situated at the center of a new pictorial movement in ancient Egyptian painting, the artists of Menna worked with their palettes to create new pictorial effects. As a result, these paintings have been the subject of a number of studies that use stylistic analysis. In order to situate our analysis in a historic context, a brief outline will be presented on the previous studies of the paintings in Menna, noting both their pluses and minuses.

In Theban tomb painting, the analysis of style is used primarily as an archival tool, namely: (1) as a criterion of dating and placing the origin of works, and tracing relationships between monuments or objects; (2) as a means by which innovations and individuality of works of art can be measured; and (3) as a way to investigate individual and group styles, and how they show the work process.

Necropolis, Egypt,*" Spectrochimica. Acta A: Molecular and Biomolecular Spectroscopy*, 73,3 (August 2009), 546-552.

[8] Antonio and Maria-Teresa Domenéch-Carbó, and Virginia Costa, *Electrochemical methods in Archaeometry, Conservation and Restoration* (Berlin-Heidelberg, 2009), 12ff.

One of the earliest stylistic studies of TT 69 was by Max Wegner, who examined the paintings' formal characteristics according to the principals of Heinrich Wölfflin.[9] Wölfflin devised five pairs of polar terms (linear-painterly, plane-recession, closed-open, multiplicity-unity, clearness-unclearness) that, he noted, defined characteristics in the evolution from Archaic to Baroque art.[10] Using these terms, Wegner divided eighteenth dynasty elite tomb painting into three stylistic periods – Early/Classic/Baroque -- and connected the traits of each period to the historical background from kings Hatshepsut to Aye. Using these criteria, Wegner situated the tomb of Menna in the characteristics of the Classic phase (plastic, balanced, lively, stately, and human) and dated it to the reign of Thutmose IV.[11]

The tomb of Menna has also been the focus of a number of articles that use stylistic analysis to distinguish the 'signature' or 'hand' of the specific artist or artists who painted the walls. Arpag Mekhitarian analyzed the color, form, and the techniques of the painting to pinpoint artists,[12] while Arielle Kozloff adapted the Morellian method used by John D. Beazley and Gisella Richter in their attributions of Greek vases.[13] In short, the Morellian method examines individual forms, their linear and proportional characteristics (draftsmanship), costume, the organization of pictorial composition and space, subject matter, and palette in order to identify the hands of specific artists. Both Mekhitarian and Kozloff identified a school of painters who decorated the tomb of Menna as well as the chapels of Nakht (TT 52) and Pairy (TT 139). Using the Morellian method, Kozloff identified the stylistic traits of five artists in the tomb of Menna whom

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[9] Max Wegner, "Stilentwicklung der thebanischen Beamtengräber," *MDAIK* 4 (1933), 38-164.

[10] Heinrich Wölfflin, *Principles of Art History. The Problem of the Development of Style in Later Art*, translated from the German by M D Hottinger (New York 1932).

[11] Wegner, *MDAIK* 4 (1933), 144, 152-153.

[12] Arpag Mekhitarian "Personnalité de peintres thébains," *Chronique d'Égypte* 31 (1956), 238-248; idem, "Un peintre thébain de la XVIIIe dynastie," *Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo* 15 (1957), 186-192.

[13] Ariielle Kozloff, "A Study of the Painters of the Tomb of Menna, No. 69," in W. Reineke (ed.), *Acts, First International Conference of Egyptology* (1979), 395-402. On the Morellian method, see D.C. Kurtz, "Beazley and the Connoisseurship of Greek Vases," *Greek Vases in The J. Paul Getty Museum* 2 (1985), 244-250.

she named Painters A-E, overseen by the "Menna Master." Later, she traced the work of one artist who painted the tomb chapels of Menna, Nakht, Nebseny, TT 226 and the royal tomb of Amenhotep III in the King's Valley; and another who created the secondary figures in the tomb of Menna (TT 69) in the decorative programs of tombs TT 139 and TT 249.[14] Most recently, the paintings of Nebamun in the British Museum were added to this artist's oeuvre (EA 37976-37986).[15]

All of these publications use stylistic criteria to determine the nature and identity of the hands behind the paintings. While stylistic analysis is a valid method of analysis for dating, it is limited to only one stage of work. Paintings in Theban tombs were crafted by many hands: from the plasterer who created a suitable surface on which the outline-draftsmen could draw their preliminary drawings and hieroglyphs to the apprentices who mixed the pigments. While valuable, these studies miss a number of steps which reflect other artists' contributions as well as the group's overall work organization in the tomb.

ANALYSIS

In the following pages, each wall will be examined according to the methodology set about above. For the sake of brevity, the technological sequence of paintings will be examined based on visual analysis of the paintings' stratigraphy (the preparation of the walls until the completion of the final layers), the photographic coverage in u.v. and raking light, and the pigment recipes ascertained by XRF and Raman. Using these criteria, the artist's mixtures, work process and techniques and pictorial processes of the group and individual painters will be identified.

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[14] Arielle Kozloff, "Tomb Decoration," *Egypt's Dazzling Sun*, edited by Arielle Kozloff and Betsy Bryan (Cleveland, 1992), 261-283.

[15] Richard Parkinson, *The Painting Tomb Chapel of Nebamun: Masterpieces of Ancient Egyptian Art in the British Museum* (London 2008), 41, 48, 63, who notes that the painting on the Nebamun fragments is of higher quality.

Preparation of the walls

The tomb chapel of Menna was cut into an area of poor quality, brittle limestone with chunks of flint. To create a suitable surface for painting, the plasterers covered the irregular wall surface with a mud plaster mixture (*muna*) of hacked straw and silt alluvium that came from the Nile riverbank.[16] In some areas where the rock was particularly bad, it was coated with combination of limestone chips set in mud plaster and straw. Next a layer of rough gypsum plaster was applied and smoothed, followed by a fine layer of gypsum plaster (intonaco) **(Figure 12)**. There are slight variations between the walls but they are minor.

The entrance walls to the chapel were covered with a dark mud plaster followed by a thin layer of gypsum on top of which was very thin beige intonaco. The dark mud plaster appears to be the same muna used on the exterior walls of the tomb, making it conceivable that the workmen used the leftover or extra material from the exterior wall on the interior of the chapel.[17] This dark muna also extends into the lower extremities of the agricultural wall (BHNL).

The intonaco of the entrance and inner passage walls is of a different composition than that found on the other walls. Its smooth, beige appearance indicates that it could be composed of clay. On other walls such as BHNL, the color of the intonaco is the same as the gypsum coating. This suggests that a mixture of gum Arabic and water or water alone were applied to the surface that caused the layers to fuse together.

The coatings of the walls are extremely useful to discover in what order the walls were executed. The small walls of the broad hall (BHSR and BHSL) were executed after those of the near and far walls. The preparatory coatings of these small walls clearly overlap the adjacent walls, and were painted with a yellow band while still wet, rendering a lighter yellow than the adjacent wall (**Figure 13).** The plaster and intonaco of the shrine wall may have been done after the long walls, but it is less evident. In a number of areas,

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[16] See similar in Andrew Middleton, "Arriccio to intonaco," *The Nebamun Wall Paintings: Conservation, Scientific Analysis and Display at the British Museum*, edited by Andrew Middleton and Ken Uprichard (London. 2008), 21.

[17] Thanks to Hugues Tavier for this observation.

the plaster of the ceilings overlaps the coatings on the walls which indicates that the ceiling was generally done last.

Grids, Lines and System of Proportions

The decoration in the tomb of Menna displays methods of creating guidelines from grid lines to horizontals, sometimes on the same wall. Horizontal guidelines were usually completed by three workmen: once the string was dipped in red ochre, two men would stretch it taut and then one would snap it against the wall to leave a red line. Workmen also formed horizontals by using a straight edge to draw the red line on the intonaco. The difference between the two is evident in the paint spatters left when the rope was snapped against the wall. Overall, there is greater consistency in the proportional system used in the long hall and left wing of the broad hall. In the right wing of the broad hall, the two lateral walls are slightly different from one another.

In the broad hall, representations of Menna and Henuttawy were drawn in grids. On the left wing of the broad hall, grid squares measured between 4-4.5 cm. and retain a degree of consistency on all three walls. On the right focal wall, grids were used for the most important figures with snapped horizontals to indicate the registers at the center of the wall (**Figure 14**). On the upper register to the left, three grids are used: one for the seated figures of Menna and Henuttawy (14 squares from feet to hairline), one for the offering table, and another for their son (18 squares from feet to hairline).[18] The register below had one grid with which to draw the deceased couple (3.5 cm. squares at 14 squares from base of the feet to hairline), the offering table and the *sem*-priest that did not connect with any of the grids above. At the far left, lower register, another grid was used for the seated couple, also 14 squares from base of the feet to the hairline. In all these representations, Henuttawy is the same height as her husband.

On BHNR, 1st phase of decoration saw the gridding of the center of the wall where the figures of Menna and Henuttawy once stood. Also the two ends of the wall were gridded for the deceased couple: the grid at the far left had 4.7 to 5 cm. grid squares measuring 14 squares from feet to hairline, and the standing figures were drawn in 18

[18] The 18 square grid was the only grid used in the tomb chapel of Menna.

square grids (**Figure 15**). Another system of horizontals 4.5 cm apart were used to construct the two registers of offering figures, sons and daughters who measured 10 horizontal lines from base of the feet to hairline. A few vertical lines exist to help with the placement of these figures. On the right small wall (BHSR) too few lines exist to tell what type of proportioning system was used (i.e. grids or horizontals).

On the left wing of the broad hall, grids were used on all three walls but only for important figures. On the agricultural wall (**Figure 16**) and the Osiris wall (BHSL) only the important figures were drawing in grids with squares measuring roughly 4 cm. Both seated figures of Menna measure14 squares from the base of the feet to the hairline on BHNL. Additional horizontals occur on the agricultural walls, as register marks or as guides to construct a motif like the grain field on one of the middle registers. The two red vertical lines on the bottom register appear to indicate where one scene ended and another began. On the Osiris wall, Menna registers at 18 squares from feet to hairline while on the far right of the left focal wall, only the grid for the seated image of Menna remains at 14 squares.

In the long hall, a proportional grid appears only once in order to construct the fishing and fowling scene on LHR (**Figure 17).** Horizontals done with a straight edge appear on the lower register of offerers, and appear at key points: at the ankles, knees, buttocks and nape of the neck. Central verticals were used to situate the offering figures and place the mummies. In the offering table scene to the far left of the wall, horizontal guides remain which were used to construct the two daughters on the upper and lower registers. To place the registers lines, the ochre stained rope was snapped against the wall.

On the left long wall (LHL), a series of horizontal lines were snapped against the wall to proportion the figures at the level of the knees, base of the buttocks, nape of the neck and hairline (**Figure 18)**. These appear on the top register of offering bearers, the men driving the cattle on the second register, and the figures in the fire offering scene below Osiris. Otherwise, where horizontals appear, they are simply used to position register lines and various objects like boat decks, etc. On the shrine wall, no reference lines remain.

Preliminary Drawings

Once the grid or guidelines were snapped or drawn, the preliminary drawings of the figures and objects were started. In Menna, the preliminary lines are an orangish-red, rather diluted and sometimes sketchy. These lines are sometimes larger than the final outline that allows them to be seen more easily. However, the advanced state of completion of the decoration often makes it difficult to distinguish this preliminary stage in the execution process. Nevertheless, if one can examine the preliminary drawings, one can discover errors, and compositional changes as well as areas in which the first drawing was followed carefully as opposed to those where the preliminary drawing was observed with less precision.

As with the proportional systems, the broad hall and long hall differ by the regularity with which the final drawings follow the preliminary outlines. In the long hall, the sketch lines literally spill out underneath the final outline. This could be indicative of the need to finish the long hall as quickly as possible, or is perhaps evidence of a painter with a lower level of artistic skill. It is interesting that in both rooms, the figures painted in the lower registers show less cohesion between the first and last outlines. This could be due to less qualified artists working on the lower registers, however, it is more likely that lower registers were more difficult to paint and required the artist to hunch down or view the drawing from the top rather than at eye-level. As always, the principal figures receive the most care and rarely show the preliminary outline spillage. This may be an indication that more experienced painters were charged with the main figures and the less skilled were relegated to minor scenes.

A similarity exists between the visible preliminary outlines on the walls of the left wing of the broad hall - particularly the BHNL, lower register of BHSL, and most of BHFL - and those of the long hall (**Figure 19**). Both share the inconsistency between the first and final outlines, the hasty execution, and guidelines in plain view instead of being covered. Also, certain motifs such as boats and “still lifes” were sketched directly on the white background wash. The overall impression of the initial sketches on the walls of the long hall indicates that they were done in a hurry. The outlines of the right wing of the broad hall are carefully done with a sure hand; there are no corrections or mistakes. In

fact, the preliminary and final outlines are in agreement which suggests a more skilled artist who faithfully followed his initial sketch of the figure, rather than another artist who didn't understand the action or sought to improve the figure.

The Use of Color in the Decorative Program: Background

Several procedures are examined here: the application of the background wash and then the sequence by which the colors were painted on the wall. The painters used three different procedures to apply the background color on the wall. First, painters "reserved" the figure or object, meaning they painted the wash around the preliminary drawing. Or, they simply put a uniform layer of whitewash across the entire wall. There is also evidence that the artists used both techniques, painting around the preliminary drawings but also painting a broad stretch of wall completely with wash. The choice of technique appears to be based on how teams of painters worked together as well as technological necessity.

In the tomb of Menna, the mixed technique was used. Certain elements were reserved and others were covered by the background wash before being painted (**Figure 20).** There are some similarities of technique found on all the walls of the tomb chapel. Offering tables were partly reserved: the black, blue and green areas were always painted directly on the intonaco. Human figures, both important and secondary, are reserved, either partly or entirely, with areas for black, blue and green left vacant. In particular, the principal figures are painted around with care, and show retouching and corrections (see below). Certain objects such as boats and hieroglyphs were painted directly on a block of white set aside for them. The register lines created areas of application that guided the artists as they painted the background. And the background wash was confined to the area between the block borders and skirting band.

The white background color on the lateral walls of the broad hall is slightly bluish-grey and very thin with fine granules visible when viewed under a microscope (**Figure 21)**. The whitewash used on the end or short walls of the transverse hall has a very bluish cast. Within the long hall, the background color of the shrine (LHF) is very white while the two lateral walls have a finer, bluish-white wash. One last note concerns

the application of the background wash: in the broad hall, the painters were careful to apply the wash uniformly while in the long hall, it was painted much more hastily. It appears once again that the broad hall was done over a period of time whereas the long hall was painted very quickly, resulting in all the problems that entails.

The Use of Color in the Decorative Program: Sequence of Application

In general, the colors in the tomb chapel of Menna were applied in the following order depending on the form:

Human figures with clothing that shows transparency:

1. White for the clothing (or sometimes beneath pink for transparency)
2. Pink for the transparency of clothing showing the underlying skin tone
3. Yellow for jewelry ensemble and bracelets, when present
4. Details of jewelry of various colors, when present
5. Red-brown skin tones, in mixtures and sometimes in two layers
6. Whitewash in a diluted beige color to create transparency of garments
7. Black for wigs

Secondary figures without transparent clothing

1. White for garments
2. Red-brown for skin tones
3. Black for wigs

Offering tables and boats:

1. White
2. Yellow
3. Red
4. Red details
5. Green
6. Blue
7. Detail lines or dots of white, red or black
8. Black for motifs or lines applied after the final contour

Mats

1. White (present sometimes beneath the yellow squares)
2. Yellow ties
3. Red lines in the ties
4. Green

Plant offerings (such as bouquets, draped lotuses)
Generally painted after the skin tones but before the wigs

1. White (principally for the lotus)

2. Red stalks (mainly for the lotus)
3. Green
4. Blue
5. Red and black finishing lines

Friezes

1. White
2. Yellow and red
3. Green and blue
4. Black

These results indicate the order in which the colors were most frequently applied, and reflect the general work process of the crew who followed this order. The succession of colors often points to the work of a particular artist or group of artists, but the recipes of those colors indicate the time in which the colors were applied. Some motifs were always painted according to the above outlined procedures such as friezes, ceilings, color and skirting bands; lotus flowers and bouquets; small secondary figures; mats, offering tables, and baskets. These are traditional motifs that painters were trained to reproduce with regularity.

Once again, there are differences of execution between the broad hall and the inner hall. In the broad hall, each wall is a work of art in and of itself; each demonstrates particular innovations and a level of expertise that is specific to that wall. This does not mean each wall in the broad hall was painted by a separate labor force, but instead, a group of painters treated the walls of the broad hall as places where they could play with color, hone their skills and develop new pictorial techniques. The differences in the application of color that occurred from figure to figure may also indicate the artist's desire to create an engaging viewing experience. In the broad hall, all the walls display diverse mixtures of red, pink and brown and each wall exhibits different pictorial effects but by the same hands. For example, the standing figure of Henuttawy on the false-door stele wall (BHSR) follows a specific color succession in her clothing that is much simpler than the seated figure of Henuttawy at the far left of BHNR (**Figure 22)**. An artist brushed on the white for her clothing, and then the first skin tone layer (brown for Henuttawy on the stele wall, yellow on the other), followed by yellow for the jewelry and shawl, the second skin tone layer (brown for both figures), a second yellow layer for the shawl (dark yellow), and last, the details of the jewelry and black wigs. In fact, when the

XRF data is added, Henuttawy's skin tone on BHSR is an equal distribution of arsenic sulfide/calcite/iron oxide mix rather than her light brown hue on BHNR that is higher in iron oxide due to the underlying layer of yellow goethite. The significance of the archaeometric results with the visual analysis data will be discussed below.

The scenes on the agricultural wall (BHNL) were painted with less rigidity than the offering bearers on walls of the right wing of the broad hall (BHFR and BHNR). This is most likely due to the different subject matter where the scenes to the right are more cultic in nature. Nevertheless, the agricultural wall exhibits a mastery of painting. Take for example the winnowing scene (**Figure 23**). A light yellow layer sets the background for the brown grain; later, after the figures were complete, another layer of pink was added. This play of color is typical for the painting of the broad hall.

Innovation plays a role in the representation of Menna and Henuttawy. First of all, the color succession in the main figures is varied in the applications and mixtures of white, yellow, red, and pink, with green, blue, and black. Menna's skin tone is often painted on a background layer of white that indicates that he was not "reserved" (BHNL, BHFR, BHNR, BHSR). At least on the agricultural wall, the plaits of the wigs on the two main figures of Menna are rendered in relief, perhaps to add to the wall's visual effects (**Figure 24)**.

Based on the succession of colors, the work zones in the tomb are easily discernable. The right portion of LHL with the Weighing of the Heart and the seated couple with their children on LHR are painted with the same haste and lack of care. Another work zone is formed by the voyage to Abydos and Rites before the mummy (as well as the offering bearers below) on LHR and the left half the opposite wall, LHL. All of these sections in the long hall follow the standard color application sequence, with the exception of a few main figures in the Weighing of the Heart scene. The different succession of colors in all of the figures around the niche may be indicative of a slap dash effort made in haste or of a few artists working closely together.[19] In fact, the rather basic color palette and lack of special pictorial effects are additional clues suggesting a rushed work process. If any scene received the most attention, it was the fishing and fowling

[19] Unfortunately, no XRF readings were done of this wall to verify if the pigment mixtures were the same or different.

scene to the center of the right lateral wall (LHR). Here, the figures are carefully done with a different application sequence of colors than seen on the most of the walls of the long hall. In the long hall, the end result was not without quality; instead, it is the liveliness of the line work that replaces the virtuosity of the color palette seen in the broad hall.

Pictorial Effects: Techniques of Transparency in the Clothing

One of the more innovative techniques used by the painters in the tomb chapel of Menna is their rendering of clothing transparency. In ancient Egypt, the fineness of the linen indicated high status[20] and this is what the artists probably sought to achieve with the use of transparency effects.

The depiction of transparency was done through separate applications of pigment and whitewash or by a mixture. The following illustrates the techniques used to create transparent effects in the clothing of the figures in the tomb chapel of Menna:

1. Applied directly on the intonaco, red + very diluted whitewash
2. Applied directly on the intonaco: pink + very diluted whitewash
3. Applied directly on the intonaco: whitish-pink + a diluted whitewash
4. Applied directly on the intonaco: a solid pink
5. Applied directly on the intonaco: brown + diluted white or beige-white whitewash
6. Applied directly on the white background layer: red + a diluted whitewash
7. Applied directly on the white background layer: a solid pink

The layering occurred as one of the steps in the application of colors on the figures. On male figures, pink was almost always applied before the skin color, whereas the whitewash was generally applied in the final phase (**Figure 25**). Certain walls display more uniformity than others with the layering and application of the colors. This is the case with some of the walls in the broad hall (BHSL, BHFL, BHNR, BHSR) and shrine wall in the long hall (LHF). The agricultural wall (BHNL) and the right half of LHR show a great deal of variety in how transparency was portrayed, both with the principal and secondary figures. Also, the right focal wall (BHFR) and the opposite wall (BHNR)

[20] Rosalind Hall. *Egyptian Textiles*, Shire Egyptology (Aylesbury, 1986), 62-66; Vogelsang-Eastwood, *Textiles*, 286.

resemble each other a great deal. Here transparent garments are created by a layer of pink directly on the intonaco followed by a diluted whitewash. A different type of pink that we call “Barbie pink” is used for the most important figures on the left wing of the broad hall and the fishing and fowling scene on the right lateral wall (LHR). For the transparency of garments on Henuttawy and her daughters, a brown ranging from beige-brown to red-brown was painted over by a diluted whitewash, either strong white or beige (**Figure 26**). For secondary figures, pink was applied directly on the intonaco or a whitewash on brown.

In the long hall, clothing transparency is virtually the same: a layer of pink on the intonaco followed by diluted pink-white whitewash. As with the succession of colors, it appears that all the figures in the long hall were done by the same work force. The fishing and fowling scene, voyage to Abydos, and rites before the mummy on LHR that show the same variety of transparency effects in the clothing of secondary figures and the attention bestowed on the principal figures as the agricultural wall (BHNL). Overall, the number and types of transparency effects are more prevalent in the figures of broad hall than those in the long hall that suggests that the artists had more time in the broad hall to innovate. The exception to this is, of course, the fishing and fowling scene that shows the “hands” of some careful and meticulous artists in the long hall.

One last note concerns the use of white as a base for important figures like Menna and certain objects (vases, canopic coffins, etc.). An underlying layer of white enhanced Menna’s red to red-brown skin tone that was painted over it. This technique is seen on the figures of Menna on nearly every wall in the broad hall (BHNL, BHFR, BHNR, BHSR), and the right entrance wall (EDR). In the long hall, this method was used only for vases and canopic coffins in the burial procession (**Figure 27).**

Variations of Red, Brown and Pink for Skin Tones

Principal figures, secondary figures and various motifs were painted with different hues of red, brown and pink in the broad hall. The painters undeniably achieved a diverse range of reds, browns and pinks that added visually to the composition and distinguished certain motifs from each other. In general, the different tonalities of the

same color are more masterful and calculated in the broad hall. A difference exists between the left wing where painters experimented with different tonalities, and the right wing where the colors are more controlled yet still show a wide range of hues. In the broad hall, the artists took the time to paint the skin tones of Menna on a layer of white in most cases. In the long hall, the hues are less varied and show a similar color scheme, particularly in the secondary figures. The difference in the tonalities suggests that the painters in the broad hall might have had more time to build up the tonal effects than those in the long hall who made use of what they had in their pots and extended the color based on addition of iron oxide, white, binders, etc. More about the artist's techniques and work process will be discussed in the Archaeometry analysis below.

Finishing Touches: Final Outlines

The final outline is the line that surrounds and redefines each figure, object and detail after the previous steps (preliminary outline, color succession, etc.). The color ranges from a pinkish or dark-red to brown to black. In the tomb chapel of Menna, the quality of line and thickness varies sometimes even on the same wall. These differences are often hard to quantify and may be the result of the type of brush, the quality of the surface, or the position of certain scenes on the walls. Rather than enumerating the various types of final outlines, the similarity of certain lines across the tomb will be examined to come to an understanding of workflow. The quality of line in the color band, friezes, and mats will not be treated here.

In general, there are some common outlines present on every wall of the tomb chapel:

1. Areas painted green or blue are always outlined with a very think black line
2. Areas painted black are very rarely outlined
3. The folds of loincloths, clothing and veils are almost always painted with thin, skillfully applied lines, and are often done before the final figural outline.

This very facile line used for clothing details may be the work of the most skilled painter in the group because it required a very sure hand and differs in quality from the final outline.

Based on the lexicographic work of Bryan, it is clear that specific workmen were charged with drafting and the final outlining of the figures. These individuals were likely scribes (*sš*) or perhaps outline-draftsmen (*sš-ḳd*) that worked in small groups, alone or under a master.[21] It also appears that the painter who outlined the figures in the chapel also outlined the texts as well (**Figure 28)**.

In the tomb of Menna, three types of outlines can be discerned in the right wing of the broad hall: outline no. 1, an even outline of average width found on the major and minor figures (BHSR/BHFR/EDL); outline no. 2, a very fine, even and precise line (BHFR/BHNR); in the left wing, the same even outline of average width as outline no. 1 is found again on both figures on the entrance wall right (EDR), all the figures on the agricultural wall (BHNL), BHSL, and the deceased and wife on the upper register of the focal wall (BHFL). Outline no. 4 delineates the figures of Menna and Henuttawy on the lower register with a very shaky line with lots of corrections. Although at first glance, one would believe several artists were engaged in outlining the figures on the agricultural wall (BHNL), the subtle differences are due to the height of the register, and the position of the figures on the wall where the figures closest to the ground are the hardest to complete. Outline no. 3 is a very fine, supple and fluid line found in clothing details, offering tables, bouquets on most of the walls that may belong to highly skilled artist using a thin brush.

In the long hall, two major types of outlines appear: outline no. 4, a crude, shaky line with many changes, is found on parts of LHL, LHF and LHR. A second type of outline, no. 1 again, is supple, well diluted and of average width on parts of LHR.

Since the final outlining was one stage in the overall stratigraphy of painting, we can assume that each of these final outlines belongs to a specific outline-draughtsman and exhibits his unique characteristics. The hallmark of outline-draftsman 1 is an outline that stops before the rounding of the nose, and a dot at the corner of the mouth (**Figure 29**). In smaller figures, the same pause often occurs at the outline of the nose with a dot to

[21] See n. 4 above.

indicate the nostril and a dab for the corner of the mouth. Upturned toes appear frequently. In the broad hall, the work of Painter 1 was found on walls EDR, BHNR, BHSR, the left half of BHFR, and the upper register of BHSL. In the long hall, he worked on the right half of LHR -- Opening of the Mouth, the Fishing and Fowling scene (except for Menna and the two daughters at the far left) and the offering procession in the lower row – and the right quarter of LHL as well as the top row offering bearers until the man carrying the scribal kit with a chest on his head.

Outline draftsman 2 is characterized by a facial outline with rounded nose and nostrils, and well-articulated lips on major figures (**Figure 30)**. Often the profiles are quite aquiline, and sometimes dish-shaped. This type of profile is reminiscent of the facial style of late Thutmose IV, yet the draftsman is working in the Amenhotep III proportional style. On minor figures, the point on the nose arches upwards, the lips pucker between a long mouth line, and the eye is large, topped by a thin eyebrow. Painter 2 worked on a number of walls in the tomb chapel: EDL, the right half of BHFR and BHNR, all of BHNL, BHFL (banquet), the lower register on BHSL, the lower registers on LHL (except for the first quarter to the right) and the last bit of the offering bearers; and on the LHR he did the two girls to the far left of the Fishing and Fowling scene, the two daughters on the lower register of the Offering Scene and the Voyage to Abydos. This artist may have worked during the reign of Thutmose IV and well into Amenhotep III's reign, so he was conversant with both styles.

Outline draftsman 3 is characterized by thin, expert line work and was clearly the most experienced artist of the group **(Figure 31**). His work is found in many of the main figures of the broad hall (BHFR, BHNL, BHNL, BHSL), and perhaps the standing figure of Menna. This painter may also have done many of the finishing details on clothing, offering piles, bouquets, etc.

Outline draftsman 4 exhibits a very shaky, sketchy line with lots of corrections (**Figure 32**). This outline-draftsman painted until the line became dry and then went over part of the line again with a newly dipped brush. One wonders if this shaky but certain outline might have belonged to an older painter. Painter 4 completed the deceased couple on the lower register of BHFL, and the westernmost portion of the long hall that includes

the Western Goddess, Anubis, the Weighing of the Heart scene, LHR, and the Offering Scene on LHR.

Finishing touches: corrections

In the tomb chapel of Menna, retouches and corrections were done with white pigment to hide the sloppy application of color and other errors. There are several types of corrections:

1. The “white-out” method in which a thick white line was used to cover preliminary outlines that spilled out beneath the finished painting.
2. The use of a second layer of background wash to hide messy preliminary outlines, color spillage and final outlines.

In the broad hall, most of the corrections were made before the final outline, after the application of color, and therefore were intended to clean-up errors that occurred during the course of painting. The paintings in the lateral walls of the right wing are much more precise than those on the stela wall (BHSR) where a number of mistakes are visible. The situation is very different on the walls of the left wing. “White-out” corrections are visible around the principal figures as well as several secondary figures before the final outline was painted. Generally, the retouching occurs around the faces, arms and legs -- rarely around clothing. On the Osiris wall (BHSL) and the left focal wall (BHFL) a number of mistakes were left and not covered over **(See Figure 32)**.

In the long hall, the corrections are contemporaneous on the shrine wall (LHF), the right side of LHL and the left side of LHR where the whiteout was applied before the painting was dry. The retouching in the fishing and fowling scene resembles the precise corrections on the walls of the right wing of the broad hall.

Archaeometric Analysis of the Paintings

Melinda Hartwig

The following survey of pigment mixtures on the chapel walls of Menna was done using archaeometric results and visual analysis, with the goal of identifying work

zones and specific artists based on pigment mixtures.[22] Roughly 500 points were analyzed by ultraviolet-visible and near-infrared spectroscopy (UV-VIS/NIR) and energy dispersive x-ray fluorescence (EDXRF). These points were selected based on questions arising from the visual analysis of the walls as well as the visible, raking and UV-light photographic survey of the paintings. If more precise information was needed, Raman spectroscopy (Raman) was utilized to confirm pigments with the same elementary composition like orpiment and realgar. Raman was also used to detect lighter elements like carbon (C for black) and magnesium ($CaMg_3(CO_3)_4$ used in huntite white) since EDXRF can only register elements with atomic numbers 16 (S = sulfur) and above.

However, these techniques proved to have a few limitations. The Raman Effect is a weak physical phenomenon that is easily overwhelmed if fluorescence is present. This was the case on Menna's chapel walls where previous applications of Paraloid B72™ (an acrylic polymer used in conservation work during the late 1970's and early 1980's) on the painted decoration fluoresced heavily and made the precise identification of the organic resins and gums impossible. Raman was also introduced to verify the identification of sulfur (S), but the strong fluorescence limited the identification of this element in all but a few places. More curious was the preponderance of arsenic (As) found along with sulfur (S) in the EDXRF survey of reds and yellows. In a number of points, the arsenic registered stronger than the sulfur, probably due to the presence of an organic binder or coating in the mixture that hindered EDXRF from obtaining a strong sulfur signal. In some areas where arsenic was present, sulfur was registered as a trace element or not at all. This suggests the presence of arsenolite, which is formed by the oxidation of arsenic sulfides in the paintings. According to a recent study of New Kingdom tomb paintings in the Louvre, arsenolite was also found in white underlayer on which the colors are painted, and may have played a role in the reflection of light much in

[22] Special thanks to the interdisciplinary team of scientists and researchers: Renata Garcia-Moreno, François Mathis, François-Philippe Hocquet and David Strivay from the *Centre Européen d'Archéométrie* of University of Liege, Belgium (CEA-ULg); Dimitri Laboury and Hugues Tavier from the University of Liege, Belgium (ULg); Peter Vandenabeele and Kerstin Leterme from the Department of Analytical Chemistry and the Department of Archaeology and Ancient History of Europe of Ghent University, Belgium; and Elsa Van Eslande from *Centre de Recherche et de Restauration des Musées de France*, France (C2RMF). While I discuss their archaeometric and visual analysis data in this chapter, the interpretation of those results is solely mine.

the same way as huntite was used.[23] Another difficulty occurred because EDXRF couldn't differentiate between pigment mixtures with the same elementary composition such as yellow orpiment (As_2S_3) and realgar red (As_2S_2). Orpiment and realgar are frequently found together in natural deposits.[24] For these reasons, when arsenic was present in a red or yellow pigment mixture, an arsenic sulfide was assumed. In cases where a clear arsenic and sulfur signature was obtained, yellow orpiment and realgar-red are named.

In eighteenth dynasty Theban tomb painting, red and yellow were used for the skin tones of men and women, respectively. Since red and yellow were mixed constantly by painters to form different hues, they offer the best means of tracking the work process. On the tomb walls of Menna, the plethora of skin tones suggest that the painters may have individualized human forms through the different mixtures of red, brown, and yellow.[25]

Beginning with the left wing of the broad hall, the red-brown used for the two large figures of Menna near the entrance door are identical mixtures of realgar-red with some additions of iron oxide and calcite (**Figure 34**) Since EDXRF registers the global composition of the wall, the calcite reading may also come from the layer of white on which Menna's figure was painted. The skin tones of the daughters of Menna on the bottom register are a mixture of arsenic sulfide (orpiment and/or realgar), iron oxide and calcite white painted on a layer of red iron oxide. Each daughter has a slightly different hue although the principal elements of the mixture remain similar. Transparency on the figure of Menna is achieved by a calcite white and red iron oxide wash over his skin color. The daughter's transparent wrap is rendered by a calcite white, yellow iron oxide wash with traces of yellow orpiment on a layer of white.

The slightly orange-red skin color of the other male figures was done with a similar mixture of calcite white and red iron oxide with or without traces of realgar-red. While there are slight differences from figure to figure, they are not significant enough to

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[23] Sandrine Pagès-Camagna, et al. "Non-destructive and in situ analysis of Egyptian wall paintings by X-ray diffraction and X-ray fluorescence portable systems," *Applied Physics A: Materials Science & Processing* 100.3 (2010), 671-681. *Academic Search Complete*. EBSCO. Web. 30 Aug. 2010.

[24] Gerald W.R. Ward, *The Grove Encyclopedia of materials and techniques in art* (Oxford, 2008), 512.

[25] See also the discussion in **Chapter 4.**

change the basic hue. In terms of clothing transparency, pinks ranged from a strong "Barbie" pink to a dusty rose to a neutral pink, depending how much calcite white was added to the mixture. An orange-pink appears also for clothing that may be the result of degraded realgar. With pink, it appears the painters continually mixed and remixed what they had on their palettes.

The light brown skin tone of the minor female figures is composed of equal portions of the arsenic sulfides (orpiment and/or realgar), iron oxide and calcite. A light brown with more white which was added to the iron oxide/arsenic sulfide mix is used for trees and baskets. A darker brown on the official's clothing on the topmost register to the far left is rendered with the same mixture as Henuttawy's transparent garment on the adjacent Osiris wall (BHSL), which makes one wonder whether the artist decided to use what was left in the pot (**Compare Figure 33 with Figure 26**).

The extraordinary rendering of the wheat fields was accomplished with varying mixtures of yellow orpiment. First on top of the background, a layer of white was painted followed by a calcite/yellow orpiment/iron oxide wash. On top of this, a combination of orpiment with a touch of calcite white was used for the dark yellow stalks. One notes that on the top register, the stalks were drawn in after the figures were finished, with lines that go from fine at the left end of the field to hasty at the right end.

In a number of areas on the agricultural wall, modern pigments with zinc and titanium indicate at some time retouching was done to the decoration.[26] Zinc white is found with yellow iron oxide and calcite on the second daughter's wrap (**Figure 34)**. The red of the cows shows traces of titanium and zinc in a mixture of calcite, and iron oxide. And the brown seeds separated from the flax plants in the rippling vignette were painted with a mixture of iron oxide/arsenic sulfide with titanium impurities or a modern pigment with titanium.

Due to the heavy fluorescence present in the tomb, hunitite ($CaMg_3(CO_3)_4$) was only found in one spot: the white coat of Menna's horse. However, a wider use of huntite

[26] Although zinc and titanium are common impurities found in earth pigments like red and brown, XRF readings were strong enough to rule this out. See: Shaaban Abd El Aal, A. Korman, A. Stonert, F. Munnik, A. Turos "Ion beam analysis of ancient Egyptian wall paintings," *Vacuum* 83 (2009), 54-58; Lorna Lee and Stephan Quirke, "Painting materials," *Ancient Materials and Technology*, ed. P.T. Nicholson and I. Shaw (Cambridge, 2000), 113-114.

can be assumed based on the laboratory reconstructions in **Chapter 4.** Huntite is a bright white color that was often used alone or under layers of colors in New Kingdom tomb painting where it reflected light and increased the saturation of the pigment layer.[27]

Under raking light, painterly effects on this wall become apparent. For example, Menna's hair and ear were molded in plaster to create a play of light across the surface (**Figure 24)**. The prominent bands of white on his necklace are built up as frames for the thicker blue and green pigment bands. A thick application of white was used as a base to enhance the brilliance of the colors that is characteristic of the use of huntite in eighteenth dynasty Theban tomb painting.[28] When the flat light and raking light photographs of the offering table before him are compared, one can see how the pink of the goslings was layered over white, and the feather impasto was used to build up the yellow, grey and blue tonalities of the geese (**Figure 35**). The blues and greens used in the tomb of Menna registered as cuprorivaite (a copper calcium silicate ($CaCuSi_40_{10}$) and parawollastonite ($CaSiO_3$ + Cu phase), respectively. Both were created by heating silica, copper/copper ore, lime and alkali, and are glassy pigments that needed to be applied as coarse particles to achieve a suitable saturation of color. These blues and greens used on the tomb walls are consistent in their formulations.

With the archaeometric results in hand, the far left of the wall forms a distinct grouping of principal figures (Menna, Henuttawy and their daughters) that are painted with mixtures of arsenic sulfide (realgar, orpiment), iron oxide and calcite. Menna's horse, considered a status item in the eighteenth dynasty,[29] is colored with red spots on bright white huntite body. The minor figures contain more iron oxide in their mixtures, sometimes with trace amounts of arsenic. Differences lie with the browns that contain combinations of arsenic sulfide, iron oxide and calcite, and the yellows that show lots of orpiment. What is clear is that the artist is constantly mixing, adding white or ochres to

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[27] A. Heywood, in *The use of huntite as a white pigment in ancient Egypt in colour and painting in ancient Egypt*, ed. by V. Davies (London, 2001),1–5**;** Sandrine Pagès-Camagna, et al., "Non-destructive and in situ analysis of Egyptian wall paintings by X-ray diffraction and X-ray fluorescence portable systems" *Applied Physics A: Materials Science & Processing* 100.3 (2010), 676. *Academic Search Complete*. EBSCO. Web. 30 Aug. 2010

[28] Janet Ambers, "Pigments," *The Nebamun Paintings*, ed. Andrew Middleton and Ken Uprichard (London, 2008), 31-40.

[29] Matthieu Heerma van Voss, "Pferd," *LÄ* IV (1982), 1009-1013.

vary tonality or painting on a layer of calcite white. When arsenic sulfides such as orpiment and realgar are added to a mixture, they brighten the hue. Furthermore, they both occur naturally together outside of Egypt in Asia Minor and had to be imported into the country. Orpiment, realgar and huntite were considered special status pigments that were used primarily on monuments and objects belonging to the royal family, high functionaries, close associates of the king, or artists who had access to the pigments by virtue of their job.[30]

Moving over to the adjacent wall, we find the Osiris worshipping scene (BHSL). Menna's red brown skin tone is composed primarily of iron oxide and realgar-red with a little calcite-white mixed in. The transparency of his clothing was rendered with several layers of a calcite-white wash. However, in the UV photographs, it is clear that the artist changed Menna's figure and painted over the original figure with a layer of gypsum and then repositioned Menna's arm and feet in order to fit the offering table between Menna and Osiris **(See Figure 63)**. The new red for Menna's skin tone appears darker and contains more arsenic than the previous mixture. The male figures on the lower register were painted at the same time with the same mixture as the original conception of Menna. Here, the figures' skin tones gradually show more quantities of calcite white, probably because the artist was trying to extend the red mixture he had left in the pot. One last note: on the offering table between Menna and Osiris, black areas were composed of carbon black (i.e. the cow) and Egyptian blue (cuprorivaite) mixed with carbon black for the grapes (**Photo 64)**.

Henuttawy's figure is particularly sophisticated (**Figure 36)**. The light red-brown of her face is a combination of arsenic sulfide, iron oxide and calcite, likely the same mixture as Menna with more additions of yellow and white. More iron oxide is added as the artist continued to paint her arms. The transparency of her garment was created by placing a light whitewash over her brown skin tone that even revealed traces of copper from an unwashed brush or pot. The high amount of yellow and white fluorescence seen in Henuttawy's clothing under UV light, may be the result of the ripples of huntite and animal glue over an orpiment-rich base mixed with an organic binder.

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[30] Ingrid Blom-Böer, "Zusammensetzung altägyptischer Farbpigmente und ihre Herkunftslagerstätten in Zeit und Raum," *Oudheidkungig Mededelingen* 74 (1994), 55-107, esp. 77-79.

The background of Osiris' shrine fluoresces yellow that is a characteristic of applying orpiment and an organic binder on a layer of bright, white huntite (**Figure 66).**[31] Furthermore, the parawollastonite-green for Osiris' face and hands, his cuprorivaite-blue wig and blue and yellow implements were painted on or with the same mixture used for the background.[32] The Osiris wall with its focus on transparency, the rendering of a right and left foot (Henuttawy) instead of two left feet, and the use of a huntite base as well as organic substances to enhance the viewing experience, illustrates the impact of the perceptual dimension in the usual object-based two-dimensional world of representation. This development towards more perceptual rendering may be engineered to impress the viewer – likely members of the tomb owner's socio-economic class – or reflect new pictorial and technical methods of painting advanced by the artists themselves. Perhaps by depicting more perceptual elements in the eternal realm of the tomb, the real world of the living was immortalized and carried into the next world. These devices may be the seeds that will be fully exploited under Akhenaten relating to immediacy and the treatment of space.[33]

On left focal wall, BHFL, which was done before the Osiris wall (BHSL), Menna's skin color is similar to that on the adjacent walls: predominantly iron oxide with bits of realgar and calcite added **(Figure 37)**. With Henuttawy, her light brown skin tone is composed of a mixture of orpiment, hematite and realgar on the upper register (confirmed by Raman), while below, her skin has more iron oxide (hematite?) and less arsenic sulfide. These mixtures would suggest that the artist worked from bottom to top where he added more orpiment and realgar to the pot for the upper figure of Henuttawy. Or perhaps, the figures were done at different times, although the difference in the mixtures is not great. The different styles of outlining the figures on each register appear to be the work of two separate artists.

To the far right of BHFL, several fragments that represent Menna's torso show it was covered with a resinous coating (**Figure 38)**. Under UV light, the coating has a

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[31] **See discussion in Chapter 4.**

[32] The UV also illustrates the proportional adjustments made to the figure of Osiris, particularly on his right forearm which was painted on the huntite/orpiment/beeswax background.

[33] Rita Freed, "Art in the Service of Religion and the State," *Pharaohs of the Sun: Akhenaten, Nefertiti, Tutankhamen*, editing by Yvonne J. Markowitz, and Sue H. D'Auria (Boston, New York and London. 1999), 110-130.

yellowish cast very similar to the coating found on Menna and Henuttawy on BHNR that was identified as beeswax based on laboratory reconstructions (**See below in Chapter 4).**

Moving to BHNR, beeswax was also applied to the red-brown skin tone areas of Menna, presumably to add a brilliance and sheen to the color. Although today, this wax coating has hardened and darkened with time, the original effect would have been quite vibrant. A layer of beeswax was painted over the jewelry of Henuttawy to create a glossy surface reminiscent of gold. Both figures wear wigs coated with beeswax, most likely as a consolidant for the black pigment. Beeswax also coated Henuttawy's hand on her first rendition on this wall. Beeswax is consistently applied to specific areas on the principal figures in the tomb (hands, arms, face, wigs, jewelry, insignia), while other areas that fluoresce such as backgrounds, chairs, etc. are achieved with a mixture of orpiment and an organic binder on a layer of huntite. The localization and consistent application of beeswax in the tomb of Menna suggests it was done by the artists who painted the tomb rather than the result of a modern conservation intervention.[34] Contemporary examples are found in the Nebamun fragments where beeswax coated the green, blue and black areas to help these large grain pigments adhere and enhance the brilliance of the color by reducing surface roughness.[35] Applied over red and yellow paints, beeswax may have been used to simulate the glossy surface of gold. Symbolically, beeswax was considered to be a primeval substance, associated with the sun god Re, and used in magical spells as well as mummification.[36] Its use in the shrine of Osiris can be seen as having solar properties, evoking the concept of rebirth promised by the god Osiris and the regeneration of the sun through the netherworld.

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[34] Eric Miller, "Conservation of the paintings," in *The Nebamun Wall Paintings*, ed. Andrew Middleton and Ken Uprichard (London, 2008), 75-89, notes a mixture of 60% beeswax, 10% resin and 30% carnauba wax was used to consolidate friable pigment areas in the 20th century. Also, James Parker, "Analysis of materials used in previous conservation treatments," *The Nebamun Wall Paintings*, ed. Andrew Middleton and Ken Uprichard (London, 2008), 71-74. Both suggest the consistent use of beeswax in specific features, argues for its use by the ancient artists rather than modern conservators.

[35] John K. Delaney, E. René de la Rie, Mary Elias, Li-Piin Sung and Kathryn M. Morales, "The Role of Varnishes in Modifying Light Reflection from Rough Surfaces," *Studies in Conservation* 53, no. 3, (2008), 170-186; Stacey, "Paint Media and Varnishes," 59.

[36] Robert Fuchs, "Wachs," *LÄ* VI (1986), 1088-1094; Margaret Serpico and Raymond White, "Oil, fat and wax," *Ancient Egyptian Materials and Technology*, edited by P.T. Nicholson and I. Shaw (Cambridge, 2000), 409-422.

In order to understand how an artist mixed and applied his pigments, the skin tone of four successive female offering bearers was sampled on the near right hand wall of the broad hall (**Figure 39)**. Two different hues of brown can be seen in these figures: a red-brown that belongs to the first two girls; and a rosy brown for the skin tones of the last two girls. The mixtures differ as well. The base mixture of the last girl is composed of iron oxide/calcite/arsenic sulfide (BHNR 1255) to which more calcite-white is added for the next figure (BHNR 1257). For the first two girls, more iron oxide is added for the second offerer (BHNR 1259) and then even more arsenic sulfide and iron for the first girl to the right (BHNR 1260). This progression measured by XRF indicates that the artist was constantly mixing his colors, perhaps to generate visual interest and differentiate the figures by tonality.

Menna and Henuttawy are depicted once again seated at the far left of BHNR, receiving a life-bouquet from their son **(Photo 68)**. Menna's reddish-brown skin tone is the same mixture seen on the other walls but Henuttawy's light brown is a yellow goethite, calcite-white and arsenic sulfide mix. What is notable is the way in which transparency was rendered with a brownish red-yellow wash composed of iron oxide and arsenic sulfide on a calcite base. The jewelry, scribal kit, mat ties, and Henuttawy's chair fluoresce heavily indicating the presence of a layer of huntite, orpiment and an organic, much like what was seen for the background of the Osiris wall, BHSL.

As mentioned above and in the previous chapters, the wall was extended to the left. The original scenes were copied almost exactly on the far left, and the earlier scenes in the middle of the wall were covered with a layer of whitewash over which new scenes were drawn. Near the top at the middle of the wall, a text is preserved on an earlier coat of plaster (**Figure 40)**. Campbell questioned whether Menna usurped the tomb from an earlier occupant.[37] Therefore, we tested the plaster and pigments to see if any similarities existed between the materials used on the lower layer and those utilized on the upper layer. In fact, the materials are exactly the same: gypsum for the plaster, calcite white for the background wash, and calcite with red iron oxide (and a strong sulfur reading from the plaster) for pink. The presence of the arsenic sulfides in the red and yellow stalks of the coiled lotus underneath confirms the two phases of decoration were painted by the

[37] Campbell, *Two Theban Princes*, 91.

same artists, given the value and relative scarcity of these pigments in elite Theban tomb painting.

Based on the available archaeometric evidence, the artists began painting BHNR from right to left. At this time, only the Valley Festival scenes of burning offerings and singing were painted. When the decision was made to lengthen the wall, these original scenes were whitewashed over and the new scenes, almost identical copies, were painted on the far right portion of the wall adjacent to the external door, along with the bouquet offering scene at the far left and the scenes of offering and slaughter in the center of the wall.

On the adjacent wall, BHSR, the skin tones of Menna and Henuttawy register slightly different than those on BHNR. Menna's brown-red is a combination of calcite-white, iron oxide and a bit of arsenic sulfide for brightness; while Henuttawy's beige-brown is a mixture of red and/or yellow arsenic sulfides, calcite-white and iron oxide. The brownish-orange color associated with the trail of the unguent cone was examined closely by Raman spectroscopy (BHSR 1402-1402). The stain is composed of a yellow background of calcite-white blended with yellow orpiment; a yellowish wash and brownish-orange of calcite, orpiment, goethite mixed with an organic (plant gum?).[38] (**Figure 41).** The pinks of the stele sides are particularly well done, and show the same mixture as Menna with the addition of varying amounts of calcite to indicate the mottling of the granite. Under UV light, a few areas fluoresce in the top left of the wall such as the mat ties below the figure of Menna and a few yellow rectangles in the color band, pointing to the use of huntite white/yellow orpiment with beeswax. Also interesting is the layering of red on white for not only the male figures but also for the goddesses' clothing.

On the right focal wall (BHFR), a plethora of colors were created with different mixtures (**Figure 42)**. Reds ranged from Menna's skin tone that was a red iron oxide/realgar red/calcite-white mix to the brown-red complexion of the secondary figures that shows less realgar and more iron oxide. Another orangish-red skin tone for secondary figures was achieved with a mixture of yellow and red arsenic sulfides. Henuttawy's complexion ranged from a light brown to light yellowish red-brown which

[38] One point on the wall associated with the unguent stain also registered a copper pigment that came from a badly washed brush.

was composed of almost everything the painter had in the pot (calcite-white/gypsum-white/orpiment yellow/realgar-red). Other items like chair legs were made of a mixture with more iron oxide, less orpiment, plus calcite-white. Beige also appears with a mixture of calcite/arsenic sulfide and iron oxide (middle register, offering pile, BHFR 1716). Pinks could be simple mixtures of red iron oxide and calcite white (offering pile, bottom register, BHFR 1731) or a "Barbie pink" composed of a mixture of red iron oxide/realgar-red/calcite-white to indicate transparency. In some cased, the artists are putting the red mixture on a layer of white (red headbands, BHFR 1717), particularly for the seated figures of Menna to the far left of the wall. Once again, we find that the arsenic sulfides are used primarily in mixtures for the larger figures of Menna and Henuttawy, with the focus on Menna, whose sparkling red skin is painted on a layer of white to enhance his figure (like BHNL, BHNR, BHSR).

A raking light photograph clearly displays the painterly mastery and varied color that is characteristic of the painters who worked on this wall. The yellows and the reds stand out prominently due to a layer of a white (huntite?) underneath that allowed light to reflect from the base to the pigment layer. Conversely, blues and greens were painted directly on the intonaco with a strong binder to hold the coarse particles together. One can see how a thin wash of blue was enhanced by the application of dark blue dots to indicate bunches of grapes. Otherwise, the colors on the far right focal wall are particularly varied and show, once again, the artist's experimentation with their palettes.

Moving into the long hall at the far end of the right hall (LHR), a two-register scene of offering before Menna and Henuttawy illustrates the work process. Here, the couples are seated at an offering table while their son Kha recites a prayer, activating the offering list (**Figure 43**). When color spectroscopy is consulted, the skin color of Henuttawy (no. 19) and Menna (no. 21) and Kha (no. 39) have the same basic curve indicating a red brown. The difference lies in the level of saturation: Kha's is the darkest, followed by Henttawy and Menna has the lightest. When the XRF data is examined in the second graph, Henuttawy (no. 19) is a mixture of realgar-red/orpiment-yellow and calcite-white with a little gypsum; Menna (no. 21) has the same base mixture as that of Henuttawy with the addition of red iron oxide and more white calcite and gypsum; Kha (no. 39) is a mixture red iron oxide with a little white gypsum and calcite and a trace of

an arsenic sulfide (realgar?). The visual analysis sequence indicates that the figures were painted by the same artist. Therefore, the painter might have begun with Kha's basic mixture and added varying amounts of realgar, white (calcite) to achieve lighter red-brown hues. The gypsum that appears in the mixtures also registers the plaster ground. The unfinished offering table also reveals that the basket was done with an entirely different color because of the different curve in the spectroscopy graph. The XRF data identifies the mixture as orpiment and calcite white, which, based on visual analysis, was probably at a later time since it was never finished.

Menna's skin color is fairly consistent across the wall. In the offering scene mentioned above, his light red-brown complexion is a mixture of calcite and gypsum white, realgar-red with varying portions of iron oxide. The darker red-brown skin tones of secondary figures are almost identical to the couple's son Kha: rich in red iron oxides and calcite with a trace of realgar. The daughters or female offerers are painted with a same base mixture of arsenic sulfides, calcite and iron oxide as Henuttawy with the addition of more iron oxide to darken, and more calcite-white to lighten the hue. Elsewhere on the wall, the female skin tones vary from light red-brown to almost brown. These browns were composed of essentially the same base combination of calcite-white, iron oxide, and arsenic sulfides with more ochre and realgar for slightly darker hues (see long line of female offering bearers below **Plate 22**). Overall, there seems to be a hierarchy in the use of the yellow and red arsenic sulfides in figural skin tones where they are used primarily in principal figures (Menna, Henuttawy, daughters, mummies, etc.) and in less or no amount in the secondary figures.[39] The exception lies in the LHR with the boatmen whose bodies are painted with a strong realgar mix, and may have been done by a specialized artist[40] or at a slightly later time than the rest of the decoration.

In terms of visual effects, clothing transparency is indicated through layers of calcite applied over the skin tone. In only a few cases with the secondary figures, calcite white is mixed with iron oxide to create a separate pink mixture. When the offering scene

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[39] As discussed in the **Chapter 4**, arsenic was also found in trace amounts in the color white used for background.

[40] Kerstin Leterme has suggested this possibility based on the fact that the preliminary outlines of the boats are sketched directly on the white background and the similarity of the boats across the tomb chapel walls.

is viewed under UV-light, the fluorescence on the yellow chair, baskets, mat ties and color band squares indicates the presence of orpiment painted over huntite using the same process in broad hall (BHNR, etc.) **(Figure 44)**. The same fluorescence appears on the faces of the anthropoid coffins as well as the mummy bands, suggesting the use of an orpiment wash over huntite as well as an organic coating to enhance the brilliance of the yellow. (**Figure 45).** The fluorescence on the mummies's wig is similar to that found on Osiris' wig in the Osiris worshipping scene (BHSL) (**Figure 66).** Also, the sketch characterizes the movement of the birds in the fowling scene as the backbone of the final painting which might indicate the same outline-draftsman did both.

The famous Fishing and Fowling scene is a separate work zone. In the fowling scene, Menna's complexion is almost a red-orange, composed of a rich realgar-red and hematite mix with a bit of gypsum. Henuttawy's skin tone is red-brown with a slightly yellowish tint and registers a mixture of the arsenic sulfides and iron oxides, with varying amounts of calcite-white added. A subzone appears in the fishing portion of the scene where the skin hues of Menna and the young boy are less orange-red and more red-brown which is created by adding a great deal of iron oxide to the mixture. Painterly effects are evident in this scene from initial movement inherent in the sketch of the birds to the subtle layering of washes and details of the fauna (**Figure 46)**.

In the Voyage to Abydos, the sailors' complexions are staggered from a red-brown mixture of realgar, iron oxide and a little calcite (LHR121) to a darker brown with less calcite (LHR 122). Furthermore, the use of pure orpiment wash on white calcite for the face of Henuttawy on the boat is mixed together and used for the faces of Menna's anthropoid coffins along with an organic coating below (**Figure 47)**.

On LHR, the pigment mixtures suggest the presence of four work zones along the walls: the offering scene to the far left including the two daughters in the fishing and fowling scene (who also have the light yellowish-red skin tone); the fowling scene with Menna's orange-red skin and the fishing scene in which great amounts of iron oxide are used to tone the skin down to a red brown. The Voyage to Abydos and the rites before the mummy is also a work zone in itself where similar mixtures of calcite white and yellow orpiment appear throughout the right side of the wall. The majority of the offering bearers on the register below can also be added to this zone.

On the left hand wall in the long hall (LHL), male red-brown skin tones register with varying amounts of calcite-white, iron oxide and realgar. This realgar-red mixture occurs on the top register from the far left up until the figure of the herdsman where realgar is only found as a trace element (**Figure 48)**. On the register below, a different mixture was used for the "Nine Friends" that did not contain realgar.[41] The light, bright yellow used consistently for the females is identical to that used on the right portion of LHR: a mixture of orpiment and calcite.[42] Items painted with Egyptian green (parawollastonite) and Egyptian blue (cuprorivaite) are coated with an organic, presumably to help these coarser grain pigments adhere to the wall. This is particularly apparent in the papyrus boats and strips of water. Certain areas painted yellow are also given special treatment, particularly for the background of the god's shrines, the skin and falcon of the Goddess of the West, the kilt, and the collar and wig of Anubis. In the Weighing of the Heart scene, the same yellow accoutrements are coating along with Osiris' shrine and the small figure of the goddess Maat. When we compare the background fluorescence of Osiris' shrine in the broad hall with that in the long hall, it is apparent that the same orpiment/huntite mixture is present. However, the different levels of fluorescence suggest the use of different binders.

Painterly effects occur on LHL as well. The form for the vases is painted in white and then overlaid with other colors to stand out (**See Figures 27 & 48).** This was done on the lower register for the mummy on the lion bier that was never finished. Another feature is the color application of the figures which does not follow the preliminary outline that suggests this wall was painted quickly. To this one can add that the basic color palette is relatively the same for both male and female skin tones.

Pigment mixtures on the left wall are similar to those found on the right wall of the long hall. A similarity exists between the use and application of orpiment and calcite for the skin tones of secondary figures. For secondary male figures, those on the top row differ in mixture from those on the bottom three rows. The principal figures, including the Goddess of the West, Anubis and those in the Weighing of the Heart scene show the

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[41] Raman readings 321-326 done on the skin tone of one of the nine friends. Because of fluorescence, Raman did not register any ochres, only calcite.

[42] It is important to note that the presence of orpiment was not verified by Raman on this wall. However, the similarity of hue and technique with LHR strongly suggests the use of orpiment on LHL.

application of yellow pigments (orpiment?) over a huntite base to increase their luminosity. The characteristic fluorescence of this layering mixture is almost always found on the first three registers as well as the far right portion of the wall. As with the other walls in the tomb, greens and blues are applied directly on the intonaco, but fluoresce under UV light indicating the use of a strong organic binder to help these large grain pigments adhere to the wall.

Given the time limits of the archaeometric season and technical difficulties with the instrumentation, the shrine wall was only briefly examined (LHL). Here, the white kilts of the offerers showed the presence of arsenic that is characteristic of arsenolite (As_2O_3). Is arsenolite being used along with huntite to enhance the luminosity of the white kilt, either as a layer or by itself?[43] This is not surprising given that the artists of Menna are working with a number of different "tricks" to enhance the painting surface.

Summary: Archaeometric Analysis

By this brief examination of the archaeometric data, a number of patterns arise that illuminate work zones, specific artistic techniques and the nature of painting in 18th dynasty Thebes. In terms of work zones, they are much easier to identify in the long hall than in the broad hall. As stated at the outset of this chapter, the colors for male and female skin tones were mixed constantly, and therefore, different proportions indicate work zone divisions. In the long hall, the painter used a basic mixture of red-brown ochre and calcite white with some red realgar. To darken the reds, the painter simply added more ochre; if the effect was to lighten the pigment, calcite was added. If yellow was required for female complexions, orpiment was layered on huntite. However, most of the women in the long hall have light red/yellow brown skin hues composed of a mixture of arsenic sulfides, calcite and iron oxides. One also notes that for the most part, the most important figures were painted with pigments rich in arsenic sulfide (realgar and/or orpiment) with the addition of iron oxide ochres and calcite. As mentioned above, some minor figures are painted with strong arsenic sulfide tones, but perhaps were done later since many of these vignettes are incomplete. In fact, in order to darken reds and yellows

[43] S. Pagès-Camagna, et al. "Non-destructive and in situ analysis," 671-681.

in the long hall, the painter added more ochres; if the effect was to lighten the skin tone, calcite was added. The consistency between the pigment mixtures used for red and yellow skin tones the long hall may be the product of a few artists who were working quickly side by side. Two work zones are hypothesized: one on the far right of the right hand wall (LHR) and to the far left of the left hand wall (LHL); and the other on the remaining walls around and including the shrine.

A third work zone can be attributed to the artists who painted the fishing and fowling scene. On the left portion, Menna's complexion is a strong orange red-brown of realgar-red and hematite with a bit of gypsum, while to the right Menna appears more red-brown due to the addition of a great deal of iron oxide. Here, the painters probably moved from left to right, adding more iron oxide as they went along. Painterly effects are evident in this scene from initial movement inherent in the sketch to the subtle layering of washes and details of the birds, animals, fish and plants.

The variation of skin tones in the broad hall is another story. What is clear is that the artists are constantly mixing, adding white or ochres to vary tonality or painting principal figures on a layer of white. On the agricultural wall (BHNL), the skin tones of the principal figures (Menna, Henuttawy and their daughters) are composed of the arsenic sulfides (realgar/orpiment), iron oxides and calcite. By contrast, minor male figures contain more iron oxide in their mixtures, sometimes with trace amounts of arsenic. Minor female figures are painted light brown, with of equal portions of the arsenic sulfides (orpiment and/or realgar), iron oxide and calcite. The small tonal differences between figures are due to the painters mixing and remixing what they have in their pot, rather than an indication of a new work zone. One of these painters works with impasto as seen in the moulding of Menna's hair and the feathery brush strokes of the geese on the offering table.

The link between the agricultural wall and the Osiris wall lies in the use of a dark brown formula composed of huntite/orpiment/organic used on the upper right of BHNL and throughout BHSL, especially for the background of Osiris' shrine. Two work stages occur on this wall: in the first phase Menna and Henuttawy were painted with similar mixtures (his: iron oxide/realgar-red with a little calcite-white; hers: more yellow arsenic sulfide and calcite); and the second where the artist corrected his work with a

huntite/animal glue concoction, added more realgar-red to the base mixture, and painted the minor figures gradually, adding more calcite as an extender. At this time, it appears the kiosk background and the transparency effects were created. These artists also focus on visual tricks and probably are the same group that worked on the agricultural wall.

The adjacent far wall (BHFL) shows the same skin pigment mixtures seen on the other walls of the left wing, and was likely painted at the same time. Here, the painter seems to have worked from bottom to top, but two different scribes outlined Menna and Henuttawy on each register to the far left. The use of beeswax as a coating for the face and hands of Menna link this wall (BHFL) with the near wall of the right wing (BHNR).

On BHNR, both decoration phases showed coatings of beeswax on Menna and Henutawy that were introduced as a pigment consolidant as well as a glossy surface layer. Since beeswax is also a magical substance, its use may have a more conceptual meaning as a vehicle for the deceased's rebirth. Menna's and Henuttawy's skin tones are composed of slightly different mixtures than those of the left wing, and are stronger in the iron oxides than in the arsenic sulfides. The minor figures also are comprised of a base mixture of iron oxide/calcite/arsenic sulfide of varying proportions. Transparency is rendered slightly different with a brownish red-yellow wash composed of iron oxide and arsenic sulfide. However, the layering of huntite and orpiment seen on the left wing continues to be done for various objects. This wall was also painted in two relatively close phases that resulted from lengthening the wall and moving the entrance door.

The male skin tones on the stela wall are lighter than those on the adjacent wall (BHNL) and register a greater degree of calcite white. Female complexions show more red and/or yellow arsenic sulfides and calcite white. Even clothing transparency is rendered differently with a yellow calcite-orpiment base over which a brownish-orange melange is painted (calcite, orpiment, goethite mixed with an organic). Artistic effects are present in the mottling of the stela frame to emulate granite.

Red-browns on the right focal wall ranged from Menna's skin tone that was a red iron oxide/realgar red/calcite-white mix to the brown-red complexion of the secondary figures that show less realgar and more iron oxides (BHFR). Henuttawy's complexion ranges from a light brown to light yellowish red-brown, composed of almost everything in the painter's pot. A layer of white is used to bring out the luminosity of Menna as well

as various yellow and red offerings. On this wall, the range of color is masterful and shows, once again, the artists' experimentation with their palettes.

Overall, the archaeometric and visual evidence suggests that the right wing of the broad hall was started first, followed by the left wing. The range pigment mixtures and layering effects point to a group of artists who had time to paint, experiment and lovingly detail their work. Each wing of the broad hall is a zone of work in and of itself, with more homogeneity on the left walls of the broad hall, than those on the right. That said, the sheer range of colors on the agricultural wall does not follow a regular scheme (i.e., different browns, beiges, pinks, etc.) and shows painters playing with their palettes. On the right wing, the two lateral walls are more cohesive than the small wall. This may be due to a group of artists learning to work with each other who develop a "group style" or work process. Conversely, in the long hall, the often-redundant palette and hasty painting indicates that it was executed quickly by some artists who previously worked together in the broad hall. This is not true of the fishing and fowling scene, which was expertly done and shares many characteristics with the offering table scenes that include the principal figures of Menna and Henuttawy. It is important to note that each stage of painting embeds a process, a process that can be elucidated through a combination of visual examination and quantitative archaeometric results. What is presented here is a global view of the painting process and the patterns that highlight the techniques and work processes of the painters of Menna.

CHAPTER 4

Archaeometry research on the wall paintings in the tomb chapel of Menna (TT 69)

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Introduction

Amidst the richness and diversity of the art of ancient Egypt, wall paintings occupy a privileged position. In contrast to the objects housed in museums and collections, many wall paintings of temples and tombs of the elite are still preserved in their original contexts, allowing a better comprehension of their function and meaning. Nowadays, portable analytical equipment has been developed and makes possible their technological research with a non-invasive method.

Egyptian art materials and technology have been examined visually and/ or through samples by A. Lucas, El Goresy and a number of recent projects which follow the same path by trying to determine technical variations and similarities through time.[1] Archaeometry research on wall painting techniques has been done on a number of detached fragments conserved in museums.[2] Some of the fragments have a well-documented provenance. This was not always the case however, as in the past archaeological remains were appreciated for their aesthetic, collectable qualities, with little regard for context. Even if a great variety of ancient Egyptian materials and techniques have been identified and described, new research techniques on well documented and in situ paintings, such as those of the Chapel of Menna, are still required

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[1] A. Lucas, and H.R. Harris, *Ancient Egyptian Materials and Industries* (London, 1962); A. El-Goresy, et al., *Ancient Pigments in Wall Paintings of Egyptian Tomb and Temples: An Archaeometric Project*, Max-Planck-Institut für Kernphysik – Heidelberg, vol. 12 (Heidelberg, 1986).

[2] M.A.Corzo, and M. Afshar, ed. *Art and Eternity The Nefertari Wall Paintings Conservation Project 1986-1992* (The Getty Conservation Institute, 1993); Andrew Middleton, and K. Uprichard, ed. *The Nebamun Wall Paintings: Conservation, Scientific Analysis and Redisplay* (London, 2008); Sandrine Pagès-Camagna, et al. "Non-destructive and in situ analysis of Egyptian wall paintings by X-ray diffraction and X-ray fluorescence portable systems," *Applied Physics A: Materials Science & Processing* 100.3 (2010): 671-681; M. Uda, S. Sassa, S. Yoshimura, J. Kondo, M. Nakamura, Y. Ban, H. Adachi, "Yellow, red and blue pigments from ancient Egyptian palace painted walls," *Nuclear Instruments and Methods in Physics Research B*, vol. 161-163 (2000), 758-761.

to achieve a broader documentation and to develop new conservation strategies.

The tomb chapel of Menna is covered by well-preserved wall paintings in both of its rooms, some of which are unfinished. Consequently, the different painting layers are exposed, allowing us to follow the subsequent steps and phases of the artists creating process. By these means, physicochemical analyses can also be performed on each of them to document the whole pictorial strata.

Most previous archaeometric investigations of Egyptian wall paintings examine samples in order to identify the organic and inorganic painting materials.[3] The study of cross sections reveals a great quantity of precise information on the pictorial strata and over-layers by submitting them to subsequent complementary analyses. Samples are necessary to study organic binder materials by chromatography techniques. Even if we agree that sampling is for the moment the most reliable way to approach the painting strata in detail, we must also consider its limits. First of all, it is an invasive method, and if used extensively may undermine certain conservation principles. Furthermore, the analysed material is very small and not necessarily representative of the entirety of the wall paintings, unless a considerable amount of samples are taken. Indeed, a thorough study of an entire tomb can require a great number of samples depending on the scope of the research.

At the present time, the Egyptian government limits the taking and exporting of samples and encourages the development of non-invasive analytical protocols. This situation led to the proposal of the present project, which follows in the footsteps of a few similar projects attempting *in situ* non-invasive techniques in Egyptian archaeological sites. One such project was conducted at the royal tomb of Amenophis III, where

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[3] Paul Nicholson, and Ian Shaw, *Ancient Egyptian Materials and Technology* (Cambridge, 2000); Vivian Davies, ed. *Colour and Painting in Ancient Egypt* (London, 2001); M.A. Corzo and M. Afshar, ed. *Art and Eternity The Nefertari Wall Paintings Conservation Project 1986-1992*, The Getty Conservation Institute (Los Angeles, 1993); Andrew Middleton and K. Uprichard, eds., *The Nebamun Wall Paintings: Conservation* (London, 2008); S. Pagès-Camagna, S. Colinart, C. Coupry, "Fabrication processes of Archaeological Egyptian blue and green pigments enlightened by Raman microscopy and scanning electron microscopy," *Journal of Raman Spectroscopy*, 30/4 (1999), 313-317.

analytical techniques for identifying inorganic materials were used.[4]

Similarly, the Menna project approached painting technology in an entirely non-invasive way. The techniques employed were **Energy Dispersive X-Ray Fluorescence** (EDXRF), **Ultraviolet – Visible and Near Infrared spectroscopy** (UV-VIS-NIR) and **Raman spectroscopy** (Raman). All of these have the advantage of being quick, non-invasive and complementary. This particular combination of techniques was chosen in order to explore for the first time in Egypt the properties of inorganic and organic matter *in situ* without any sampling. With a significant number of analysed areas, a semi-statistical approach can be used to achieve an entire survey of the tomb. To the best of our knowledge, this is the first time that this combination of on-site non-destructive techniques was performed in Egypt.

The paintings of Menna's tomb are characterised by a broad chromatic palette and the particular techniques used to diversify textures that result in vivid images. We focused on the identification of the material mixtures and overlayerings done to achieve certain visual effects such as transparent clothing and brilliant surfaces.[5] Following an interdisciplinary methodology is crucial to understand the complexity of the artistic techniques, and to track the artists' workshop organisation.[6]

A material approach is also necessary for the scientific-based conservation features of the Menna tomb project. Through specific analyses, it is possible to achieve a better documentation of the paintings' properties and the environmental effects on it. These analyses make it possible to infer material transformations such as the degradation of colored layers. Information derived from analytical methods is essential for the design and evaluation of more adequate and efficient conservation/restoration treatments and strategies. Even if paintings appear to be well conserved, special attention must be paid to

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[4] Sakuji Yoshimura and Jiro Kondo, ed. *Conservation of the wall paintings in the Royal Tomb of Amenophis III – First and Second Phases Report* (Tokyo, 2004).

[5] Stephen Rickerby, "Original Painting Techniques and Materials Used in the Tomb of Nefertari," in *Art and Eternity: The Nefertari Wall Paintings Conservation Project 1986-1992*, ed. Miguel Angel Corzo (Los Angeles, 1993), 43-54; Kerstin Leterme, *La picturalité dans la peinture thébaine de la XVIIIe dynastie*, M.A. Thesis, Universtity of Liège 2006.

[6] Betsy M. Bryan, "Painting techniques and artisan organization in the Tomb of Suemniwet, Theban Tomb 92," in *Colour and Painting in Ancient Egypt*, ed. W.V. Davies (London, 2001), 63-72.

the preservation of Theban tombs that continue to be visited by a great number of tourists on a daily basis.

Archaeometry survey aims

- Document the wall painting materials (mortars, pigments, binders, and coatings) and the techniques of application through complementary, mobile, and non-invasive techniques, including elementary (XRF) and structural (Raman, UV-VIS-NIR spectroscopy) analysis.
- Provide objective color data measurements (CIELab system) of the chromatic palette.
- Detect the degradation processes of the pictorial layers to better understand their characteristics and interactions in order to plan future conservation strategies.
- Prove the efficiency of mobile analytical techniques for non-destructive *in situ* examination of ancient Egyptian wall paintings.

The analytical techniques and team

EDXRF, Raman spectroscopy, and UV-VIS and NIR spectroscopy are techniques that have been used to analyse ancient Egyptian objects in museum contexts.[7] They were originally conceived as non-transportable devices, and were later adapted for mobility primarily for the safe study of architectural decoration that does not involve the physical transportation. These elementary and structural techniques are mainly operated in museums and historical monuments in controlled environments. Operating this type of

[7] Janet Ambers, "Raman analysis of pigments from the Egyptian New Kingdom," *Journal of Raman Spectroscopy* 35, no.8-9 (2004): 768-773; idem, "Pigments," *The Nebamun Paintings*, ed. Andrew Middleton and Ken Uprichard (London, 2008), 31-40**;** S. Pagès-Camagna, and S. Colinart, "The Egyptian green pigment: its manufacturing process and links to Egyptian blue," *Archaeometry* 45 (2003): 637-658; Sandrine Pagès-Camagna, S. Colinart, M. Menu, « Le bleu et le vert Egyptiens, pigments synthétiques de l'Egypte pharaonique, » *Ecole de Printemps 2000 – Le Pays d'Apt en Couleurs* (2000), 103- 110 ; Andrew Middleton and Sylvia Humphrey, "Pigments on some Middle Kingdom Coffins," in *Colour and Painting in Ancient Egypt*, edited by W.V. Davies (London, 2001), 10-16.

equipment in archaeological contexts is uncommon due to the technical and logistical challenges entailed.

To perform a non-destructive analysis on site, the following institutions and laboratories were involved through the Interuniversity Attraction Poles Program financed by the Belgian State (PAI – BELSPO):

- *Centre Européen d'Archéométrie* of University of Liege, Belgium (CEA-ULg*)*
- Department of Analytical Chemistry of Ghent University, Belgium
- Department of Archaeology and Ancient History of Europe of Ghent University, Belgium
- *Centre de Recherche et de Restauration des Musées de France*, France (C2RMF).

Logistics

Two short preliminary trips to Egypt were carried out in March and October 2007 in order to plan all the logistics for the analytical campaign. In order to study the paintings, the tomb was closed to the public, and the glass and wooden barriers that protected the decoration were taken away. The modern concrete floor of the tomb was removed and covered with a carpet to reduce the fine dust that could harm the electronic devices. The entrance and interior dimensions of the tomb were carefully measured to conform to the requirements of the equipment translation system. The full archaeometric season was planned during the coolest months in Egypt to avoid potential problems with the machines.

The archaeometric survey was carried out from November 15th to December 21st, 2007. The main challenge was to carry out this investigation under archaeological field conditions. The analytical devices including X-ray fluorescence (XRF), UV- visible and near-infrared spectroscopy (UV-VIS and NIR spectroscopy), and Raman micro-spectroscopy (Raman) were brought into Egypt via diplomatic pouch, courtesy of the Belgian government.

The techniques were utilized together in order to enhance their possibilities. X-ray fluorescence was combined with diffuse reflectance visible spectroscopy (**Figure 49**). Ultraviolet and near infrared diffuse reflectance spectroscopy were used separately

(**Figure 50**). A selection of the most relevant points were analysed by Raman spectroscopy to identify the precise chemical structure of the materials (**Figure 51**).

The first days *in situ* were dedicated to the installation and adaptation of scientific instruments in the tomb. A generator and stabilizers were used to ensure safe conditions for the equipment. As the instrumentation required grounding to prevent charge accumulation, the metal parts of the equipment were connected to survey nails, which were used by archaeologists during the topographic survey of the tomb chapel. All analytical techniques were performed more or less simultaneously in the tomb. Since space was limited and the different phases of research needed different working conditions, careful planning of the work order and instrument positions was vital. For example, visual examination and conservation treatments require light, whereas Raman, near-infrared, and UV-VIS spectroscopy require darkness. The door of the tomb chapel had to be closed during the experiments, causing a rise in temperatures inside the chapel. In order to facilitate simultaneous work, a screen made from black cloth and wooden posts was used to divide the long hall from the broad hall of the chapel into two sections.

Planning and selection of the measuring points

The points to be measured in the tomb chapel were based on a visual examination and photographic survey in visible, raking and UV -light. The selection of the points was governed by the possibilities and limits of each analytical technique as well as their relevance to the aims of the study, based on discussions among art-historians, conservators and spectroscopists of the team. Wherever possible, the points were grouped based on their neighbouring positions in order to minimize the time needed to position the instruments. Since the need to work on exactly the same spot was critical, each point to be measured was marked exactly on high-definition digital photographs of the paintings as a layer in Photoshop®. It is important to remember that the spot size for the different techniques varied, with diameters ranging from approximately 0.5 cm (NIR, UV-VIS) to 1 mm (XRF) and even 100 nm (Raman spectroscopy).

The mobile techniques

Ultraviolet - Visible and Near-Infrared Spectroscopy (UV-VIS and NIR)

Color is based on the individual visual perception of electromagnetic radiation. It depends on many factors, such as physicochemical composition, incident light, as well as factors specific to the individual. Defining a color can therefore be very subjective. However, color documentation in art is very important, since many of the materials used in paintings are unstable and decay, thereby changing their original aesthetic properties. Applying multiple analyses to a well-defined pictorial layer is critical.[8]

StellarNet® UV, Visible, and Near Infrared – InGaAs – EPP2000C spectrometers provided with a CCD detector in the retro diffusion mode were used both for color analysis and material characterization (**Figures 49-50)**. The sum of the spectra obtained by the three spectrometers covered approximately 350 to 1700 nm. InGaAs detector is a Sensors Unlimited linear photo diode array with 512 pixels. A bundle of optical fibers transport light from UV / Visible light source to the object under investigation and convey the diffuse reflected light to an adapted detector. Spectra were recorded by using an optical fiber probe instrument that allows for the solid sample size investigation of approximately 4 mm^2. The probe is set about 4 mm from the painting surface at an angle of 45° to avoid collecting direct reflection. Calibration must be done with a Halon D65 white reference in identical lightning conditions.

The software SpectraWiz® enables the acquisition of the characteristic reflectance spectra, which depend on the diffusion of the incident light by the studied material. These spectra can be specific for each pigment, and can permit an understanding of their composition.[9] CIELAB color values, calculated from the visible

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[8] M. Bacci, et al., “Non destructive spectrophotometry and color measurements applied to the study of the works of art,” *Techné* 5 (1997), 28-35**;** John-S. Werner and Floyd Ratliff, "Some Origins of Lightness and Darkness of colors--in the Visual Arts and in the Brain,” *Techné, Couleur et perception*, nos. 9-10 (1999), 61-73; Alain Chiron and Michel Menu, "La couleur des oeuvres d'art (caractérisation spectrocolorimétrique de l'oeuvre d'art : objectifs, contraintes, perspectives," *Techné, Couleur et perception*, nos. 9-10 (1999), 161-171.

[9] M. Bacci, “Optical Spectroscopy and Colorimetry in Physics Methods in Archaeometry,” in *Physics Methods in Archaeometry*, ed. M. Martini (Amsterdam, 2004); M.C. Elias, Chartier, G. Prévot, H. Garay, C. Vignaud, “The colour of ochres explained by their composition,” *Materials Science Engineering B* 127, (2006), 70-80.

reflectance spectra, are obtained by SpectraWiz® software. The conventional representation of the color parameters (*L**, *a**, *b**) is based on a three-dimensional system, composed of two color axes: a*: from green to red; b*: from blue to yellow; and a third axis, L*, corresponding to the lightness of the color from white to black (**Figure 52)**.

In this analysis, we present comparisons between the axes *a** and *b** since they are responsible for color or *chroma*. *L** indicates the reflection capability of the sample that corresponds to lightness. Hence, only a* and b* are shown on the figures. Furthermore, the pigment layer is usually very thin and deposited on a white substrate, which reduces the color saturation when compared to pure pigments. Consequently, only large variations were taken into account. Diffuse spectroscopy has the advantage of easily obtaining objective color values that then can be applied to future research.

Reflectance spectra of all analysed points were compared and classed in groups, taking into account the general results obtained by EDXRF. Reflectance spectra of the same color were then compared to reflectance spectra of in-house samples of pure pigments. In some cases, the first and second derivatives were used to distinguish materials. In the case of yellows and reds, reflectance spectra of orpiment/yellow iron oxide and realgar/red iron oxide pairs are generally similar. In fact, if each pigment was characterized by a specific spectrum under equal examination conditions, it is difficult to retrieve the precise mixtures of pigments (**Figure 53**). Thus, in order to characterize spectra and group the analyzed points, we took into account the wavelength range of the sharp slope as proposed by Elias[10] and the colorimetric coordinates L*a*b*.

In recent years, attempts have been made to model different mixtures of pigments. For the moment, good results have been obtained in a laboratory setting on the exact variations of these mixtures, assuming these mixtures are known.[11] Nevertheless, art materials are more complex than laboratory controls. Other factors such as unidentified

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[10] Elias, 70-80.

[11] Guilliame Dupuis, "Coleur de la matière Picturale: Caractérisation des Pigments et des Mélanges de pigments, modifications induit par l'adjonctions de liant et des charges," (Ph.D thesis, University of Paris, 2004).

materials, impurities, superposition and even degradation of pigments can affect the color measurements.

The application of UV and NIR in this project was done primarily to test their efficacy on ancient Egyptian wall paintings. In the case of the Menna project, results obtained by UV and NIR spectroscopy could not be thoroughly exploited, so only the visible spectra were examined. However, NIR helped to confirm the difference between calcium carbonate and calcium sulphate, which was also clearly identified by Raman. UV spectroscopy helped identify the presence of organic binders and coatings. This technique is very efficient for organic reference samples, but when these compounds are already applied and combined with other materials, their global fluorescence properties differ, making their detection and identification more complex. Reconstructing reference samples is another way to understand these types of material combinations, and will be addressed later (Cfr. Binders and coatings).

Energy Dispersive X-Ray Fluorescence (XRF)

Energy Dispersive X-Ray Fluorescence (EDXRF) spectrometry is based on a well-known physical phenomenon called fluorescence, which occurs when the inner shell electrons of an atom are ejected as a result of their interaction with a primary X-ray photon of sufficient energy. This interaction ionises the atom and makes it energetically unstable. The atom then tends to recover its stability via new electronic transitions. Electrons from the external shells reorganize and fill the holes vacated by the ejected electrons of inner shells. Since an electron from an outer shell is more energetic than one from an inner shell, the redundant energy after this transition will be lost as an X-ray photon that will have an energy characteristic of the atom and the electronic transition. By analysing this photon energy, it is possible to determine the atom from which the photon came.

The principal advantage of EDXRF is that it is non-destructive, provides fast and accurate readings, and detects major, minor or trace elements. When used in an open-air environment, the EDXRF technique is able to detect all inorganic elements beginning with sulphur (atomic number Z=16) up to the heavier elements. Lighter elements cannot

be detected because very low energy photons are absorbed by the matrix or the ambient atmosphere before reaching the detector, making the identification of organic material impossible by this technique. Even if a helium flux could have been used to identify atomic numbers as low as phosphorus (Z= 15),[12] it was not possible to apply this method to the Menna Project for logistical reasons.

EDXRF is currently used for cultural heritage analysis, and provides qualitative or quantitative elemental composition of a sample. Even if both methods are applied currently, quantitative analysis requires much more attention because it depends on a number of factors taking place under the excitation and detection process (i.e., X-ray primary energy beam, detector efficiency, and surface roughness). This is known as the "matrix effect," which is directly dependant on the elemental composition and concentration of the sample.[13] For this project, quantitative analysis was not utilized due to some instability of the portable EDXRF excitation and detection system working *in situ*. However, semi-quantitative analysis was done using the fluorescence elemental intensity ratio. When the fluorescence intensity of an element (A_1) is divided by the fluorescence intensity of another element (B_1) appearing in the same spectrum, it can be compared to the fluorescence intensity of the same element (A_2) divided by the fluorescence intensity of the second element (B_2) present in a second spectrum. In this way, we can compare the contribution of the elements in different spectra.

During the last decade, technology breakthroughs permitted the miniaturization of the EDXRF instrumentation. Many portable instruments are now frequently used for *in situ* analysis. Due to the recent improvement of powerful miniature devices, portable systems provide results that are now very close to those provided by tabletop systems. The portable EDXRF device used in the Menna Project was developed and built at the IPNAS (University of Liege) specifically for cultural heritage analyses.[14]

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[12] M. Mantler, and M. Schreiner, "X-ray fluorescence spectrometry in art and archaeology", *X-Ray Spectrometry* 29 (2000): 3-17.

[13] P.Moioli, and C. Seccaroni, "Analysis of Art Object using a portable X-Ray Fluorescencespectrometer," *X-Ray Spectrometry* 29 (2000): 48-52.

[14] F.P. Hocquet, et al., "A remote controlled EDXRF system for field analysis of Cultural Heritage objects," *X-Ray Spectrometry* 37 (2008): 304-308.

The quick acquisition of EDXRF in the field depends on the efficacy to position the device during the analyses. A portable translation system was designed to reduce the time needed to move the device from one acquisition point to another, making it possible to analyse a larger number of areas. This system was conceived as two interlocking 1 meter rails with an adjustable horizontal rail and 4 movable supports. A line level was integrated in the system to correct for the unevenness of the floor. A vertical column of variable height was fixed on a cart that moved along a horizontal rail. The XRF analysis detection system, fixed in a traditional configuration, was attached to the column by a platform in which four independent motors were embedded, allowing for X, Y, Z and rotation movements. By moving the platform back and forth, it was possible to focus the laser diode and keep a fixed distance between the head and target for each measurement, which is necessary for the normalization of the data. The vertical rotation also made it possible to analyse curved surfaces and ceilings. The translation system allowed for smooth and continuous movement, and provided security for the device as well as the paintings (**Figure 54)**.[15]

A CDD camera was fitted on the head, and the analyzed area was displayed on a microcomputer, thereby giving more precision to the acquisition of data. All displacements were remote controlled by a hand-held PDA via a Bluetooth interface. The software, which was specifically written for this application, is very easy to use and allows for full control of the four motors (X, Y, Z and rotation movement). Automation was also possible for all displacements via this software program. During displacements, positioning values were continuously transmitted to the controller, and the exact positions of analysed points were saved. This allows the position of all moving parts to be precisely monitored over a large surface (3m x 3m) that offers multiple applications for fieldwork research. The distance control ensures a safe range for the operators working near the X-Rays.

The data acquisition system measures the energy and the intensity of the outgoing fluorescence radiation. The detector signal is amplified and analysed by an electronic multichannel recorder within a microcomputer running an in-house program for

[15] Ibid.

visualising spectra. It also permits control of the shutter of the primary X-ray beam.

Compared to Raman spectroscopy, EDXRF can analyze a higher number of points in a shorter amount of time. Positioning and focusing the device is very fast and, because of the relatively large acquisition area, it is not necessary to record several spectra on micrometers. All of these features made EDXRF an excellent method for the survey of the tomb and the identification and characterization of the artist's palette. Nevertheless, EDXRF has its limits, especially concerning the precise identification of the composition of different layers and pigment mixtures with the same elementary composition. At this point, Raman entered the project as a complementary technique.

Raman Spectroscopy

Raman spectroscopy is an analytical technique that is used to gather information about the molecular composition of the painting materials.[16] This technique gives information about the way in which the atoms are bound together within the molecules. Raman spectroscopy is complementary to the other archaeometric techniques applied in the tomb of Menna. In Raman, a low-power laser is focused on the area to be studied. As the light interacts with the molecules of the painting, a small fraction of the scattered light is revealed to have a different wavelength when compared to the laser. By analyzing this wavelength shift, it is possible to study the molecular bonds and thus to identify the painting materials.

The main advantage of this approach, other than being non-destructive, is the recording of spectra from micrometer-sized particles as well as the investigation of inorganic and organic materials. Indeed, the diffraction limit of the laser light is about one micrometer. However in practice, this limit can only be reached in laboratory conditions. On the other hand, Raman spectroscopy is a molecular spectroscopic technique, thus, given adequate working conditions, inorganic as well as organic molecules can be investigated. The term 'organic' is related to natural materials (e.g.

[16] Peter Vandenabeele, H.G.M. Edwards, L. Moens, "A decade of Raman spectroscopy in art and archaeology," *Chemical Reviews* 107 (2007), 675-686.

resins, gums, etc.) as well as synthetic organic products, like polymers used during previous conservation treatments. Another advantage of Raman spectroscoy is its non-destructive nature. When working in laboratory conditions, the sample is not consumed during the analysis. Moreover, the use of mobile instrumentation for *in situ* analysis negates all need to take samples.[17]

During this survey, an optical fiber-based mobile Raman device was used: MArtA (Mobile Art Analyser; **Figure 51**).[18] The instrument is based on a modified portable Raman imaging microscope (PRIM) spectrometer (Spectracode, West Lafayette, Ind., USA), using a SpectraPro-150i 150-mm spectrometer and a thermoelectrically cooled, charge-coupled device detector (Roper Scientific/Princeton Instruments). For these investigations, a 1200 line/mm grating was used, and the area was illuminated with a 785-nm diode laser (Process Instruments, Salt Lake City, Ut., USA) with an output power adjustable up to 300mW at the source. During this survey, the probe head was mounted on an articulating arm in front of the paintings. Daily calibration was performed using several Raman standards as well as a neon lamp. One of the limitations of the approach is that the probe head needs to be well focused during the investigations. Moving from one point to another is also time consuming. The fact that Raman spectroscopy analyzes very small areas can therefore be considered both an advantage and a disadvantage. Indeed, in order to be able to compare the findings with the results of the other archaeometric investigations, it is necessary to work on exactly the same spot. Whereas other techniques work with larger spectral footprints, Raman spectroscopy is able to differentiate several different phases within few square millimetres. Therefore, documentation of the areas studied, as well as a full understanding of the research questions associated with that particular area, is indispensable.

Since the Raman Effect is a weak physical phenomenon, the presence of background light has to be avoided, thus investigations are often performed in darkness. Within the tomb of Menna, however, fluorescence turned out to be a serious limitation of

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[17] Peter Vandenabeele, et al., "In situ analysis of mediaeval wall paintings: a challenge for Mobile Raman spectroscopy," *Analytical and Bioanalytical Chemistry* 383 (2005), 707-712.

[18] Peter Vandenabeele, T.L. Weis, E.R. Grant, L. Moens, "A new instrument adapted to in situ Raman analysis of objects of art," *Analytical and Bioanalytical Chemistry* 379 (2004), 137-142.

the Raman technique. The weak Raman scattered light was easily overwhelmed by a much stronger fluorescence in the same spectral region (in our case the near-infrared). Unfortunately, since fluorescence is a much stronger physical phenomenon, even minute amounts of fluorescing molecules can overwhelm a Raman spectrum during *in situ* analysis.

In the tomb of Menna, the specific aims of Raman spectroscopy were to confirm and complete the results obtained by EDXRF. Raman was used to obtain information about the different layers in the painting structure; to identify the pigments, with special attention devoted to black, white and yellow areas; and gather information about the organic compounds used in the wall paintings of the tomb of Menna.

Results and discussion

By using complementary techniques outlined above, it was possible to identify the following pictorial materials used in the wall paintings: gypsum, calcite, carbon black, Egyptian blue and green, yellow and red iron oxides, orpiment and few spots of realgar. Huntite was detected by Raman in one spot, but its eventual greater presence may be assumed and is discussed below. Organic materials are definitely present, but their exact identification remains delicate. The possible presence of gum, wax and even animal glue is strongly suggested by the combination of analyses done on the tomb and experimental reconstructions (Cf. Binders and coatings).

Method for interpretations

A few technical difficulties with the XRF instrumentation, such as band broadening, occurred during the first two weeks of the campaign that may have been due to fine dust and high temperatures.[19] Nevertheless, the quickness of EDXRF acquisition

[19] Peter Vandenabeele, Renata Garcia-Moreno, François Mathis, Kerstin Leterme, Elsa Van Elslande, François-Philippe Hocquet, Saïd Rakkaa, Dimitri Laboury, Luc Moens, David Strivay and Melinda Hartwig. "Multi-Disciplinary Investigation of the Tomb of Menna (TT69), Theban Necropolis Necropolis, Egypt." *Spectrochimica. Acta A: Molecular and Biomolecular Spectroscopy* 73,3 (August 2009), 546-552.

allowed the analysis of 500 points. The presence of key elements (mainly S, Ca, As, Fe, Sr) in XRF investigations suggests a range of possible pigments combined in different mixtures throughout the tomb. Although EDXRF was not able to discriminate precisely between several pigment mixtures consisting of the same key-elements (such as As and S for realgar and orpiment or Fe for haematite and goethite), it was possible to determine different pigment groups by means of principal component analysis (PCA).

Principal component analysis is a multivariate statistical method used to reduce the amount of data. The aim of PCA is to define new variables as linear combinations of the original variables.[20] In this work, spectra treatment by principal component analysis (PCA) was done with homemade programs from the Ghent University.[21] By applying PCA to the data, it was possible to visualize outliners, groups or general patterns needed to interpret the original data. For example, pure haematite was easily detected (**Figure 55**), and different groups of pigment mixtures were obtained that corresponded to various hues and personages (**Figures 56-57**).

The wall paintings in the tomb chapel of Menna were remarkable in that the artists deliberately used mixtures and transparency effects in some scenes. With EDXRF, it is not always possible to distinguish whether a certain element is present in the top pictorial layer, in the underlying layer, or in both. Coupling EDXRF with UV-VIS diffused reflectance revealed the different layers of the paintings. EDXRF analyses give data from the global composition the pictorial layer. Diffused reflectance spectroscopy provides information about the external layer. Isolating the composition of surface pigments eventually gives a better idea of the nature of the underlying pictorial materials.

The elemental composition revealed by EDXRF helped enable a more efficient interpretation of Raman spectra, which confirmed the molecular composition of the

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[20] M.J. Baxter, "Distance and Transformation in the Multivariate Analysis of Archaeometric Data," in *Physics Methods in Archaeometry*, edited by M. Martini (Amsterdam, 2004), 17-30; B.Vekemans, L. Vincze, F. E. Brenker and F. Adams, "Processing of three-dimensional microscopic X-ray fluorescence data," *Journal of analytical atomic spectrometry* 19.10 (2004), 1302-1308.

[21] B.Vekemans, et al., "Automated segmentation of μ-XRF image set," *X-Ray Spectroscopy* 26.6 (1997), 333-346; idem et al., "Comparison of several background compensation methods useful for evaluation of energy-dispersive X-ray fluorescence spectra," *Spectrochimica Acta, Part B*, 50.2, (1995), 149-169.

analysed materials. For instance, identification of iron in red areas pointed to the use of iron oxide, but the presence of haematite (Fe_2O_3) had to be confirmed by Raman spectroscopy. Raman spectroscopy was hampered by fluorescence, which was probably caused by the presence of Paraloid B72 resin applied to the wall paintings during previous undocumented conservation treatments. However, in some areas it was possible to obtain a weak Raman signal, despite the fluorescence.

Raman spectroscopy can help confirm the chemical structure of pigments on a micro-scale, making it possible to differentiate between neighbouring pigments in the same layer or different layers. For example, the element Ca, which was present in all the XRF points, is the principal component of the gypsum plaster ($CaSO_4 \cdot 2\ H_2O$) with which the walls were prepared. In other cases, Ca also originated from the white pigments applied to the walls. By differentiating between the intense Raman bands caused respectively by the symmetric (CO_3^{-2}) and (SO_4^{-2}) stretching vibrations, a distinction between calcite and gypsum could be made. Similarly, the difference between orpiment (As_2S_3) and realgar (As_2S_2) could be determined as well. Until now no pararealgar, a degradation product of arsenic sulfide, could be identified in these wall paintings.

With the practical experience gained from the archaeometric survey in the tomb of Menna, it can be said that **VIS spectroscopy** is an excellent method with which to determine objectively the color in a certain area. In some cases, this technique can help identify specific pigments, such as Egyptian blue and Egyptian green. However, identifying mixtures of pigments is not always possible.

UV-Visible spectroscopy helped detect the presence of organic materials, but proper identification of a species was not possible using this technique. Laboratory tests yielded promising results, but the small quantity of the products used and maybe their degradation are obstacles to proper identification. **Near-infrared retro diffused spectroscopy** also aided the identification of the gypsum plaster. Three typical absorption bands in the 1450 - 1550 nm region were evident in almost all of the spectra primarily due to the water molecules of the gypsum layer. The global characterization of pigments and mixtures provided by these three techniques is of real interest for archaeometric fieldwork in future projects.

No analytical technique is enough by itself to answer all questions. Combining complementary techniques allows us to obtain a great amount of data. This must be studied in concert with archaeologists and art historians in order to link the data and achieve a coherent technological interpretation.

Summary of paintings materials

All paintings have a structure, which is dependant on the techniques used for their fabrication. A wall painting's structure is composed of:

- a support, composed by the wall and/or the rough mortars (*arriccio*) which give a regular surface
- a ground or preparation layer, that provides a smooth surface to the support (the last fine application of plaster or *intonaco* might be considered a preparation layer)
- the colored layers (which may contain pigments, dyes, binders, media, inert charges and/or other additives)
- a protection layer (varnishes and coatings), which strongly contributes to the optical properties and aesthetic qualities of a painting

To approach the pictorial techniques it is necessary to describe all the layers and their components. We will follow the above order to describe the identified materials. The present analyses focused on the study of the plasters that form part of the support layer of which the finest can be considered the ground. The colored layers start with an application of whitewash over the composition field, and continue with the superposition of a series of pure and mixed pigments. Organic coatings were detected only on only a few specific selected zones. These were located mainly in the broad hall (BHNR / BHFL) and were associated primarily with Menna's skin tone as well as the jewellery and the black wigs of important personages. Identified pigments are listed on **Table 1.**

Plasters

The tomb chapel is cut into the rock of Sheikh abd el-Qurna in the form of an inverted T. Since the walls were of brittle, friable limestone, a layer of thick mortar called ***muna***-plaster (a mixture of mud and vegetal fibres) was applied to the walls. Despite the interest that this plaster presents, no analyses were done on the *muna* since the analytical techniques employed are not suited to identify different types of clay or vegetal fibres. The *muna*, in this case equivalent of ***arriccio***, seems to be very similar to that of the tomb of Nebamun according to the recent publication of its complete study.[22]

In the tomb chapel, this mud substrate or *muna* was covered by a uniform thin **white plaster** or ***intonaco***, which provided a smooth surface on which to apply the paint (**Figure 58**). It is about 3 mm thick and has a yellowish-white hue. All mortars are-composed essentially of cement and charges, the latter stabilizing the mortar after the cement dries and contracts. The analyses revealed that the intonaco in the tomb of Menna is made up mainly of calcium sulphate, in both forms of gypsum and anhydrite, with some charges identified as calcite by Raman. XRF spectra show that iron particles and traces of strontium in some cases are systematically associated with the calcium of this layer (Figure 3). These particles might be part of the ground rock used as a charge for this plaster, since it might have interstitial clay impurities, as reported by Middleton.[23]

Pigments

The chromatic palette includes white, green, blue, black, grey, yellow, red, orange, pink and brown. Each of these colors is present in a multitude of shades, that are determined by a number of technical factors such as the preparation of the pigments (grinding, mixing with media), the amount of pigment spread with the brush, the opacity of each pigment, the heterogeneity of the pictorial layer, and the visual effect of overlaying different colored strata. Some hues may also be the result of the alteration of original materials (pigments, binders and/or coatings). In other cases, the colors might

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[22] Andrew Middleton, "Arricio to intonaco." *The Nebamun Wall Paintings: Conservation, Scientific Analysis and Redisplay*, eited by Andrew Middleton and Ken Uprichard (London, 2008), 19-24.

[23] Ibid., 22.

have changed after the application of modern consolidation products used in past restorations such as Paraloid B-72. It is convenient to consider that the colors of these paintings may have been slightly different in appearance, depending on the light used to see them in antiquity (daylight, oil lamps, etc). The colors that we describe are those observed under natural daylight and daylight lamps.

The entire wall surface was prepared with a **whitewash** or **white background**, principally composed of **calcium carbonate** (**Figure 59**). This may be in the form of a lime wash and appears similar to the Nebamun paintings.[24] The texture is homogeneous and very bright compared to the hue of the gypsum plaster (**Figure 58**). Traces of iron, strontium and arsenic were detected in the backgrounds. We can group the points according to the proportion of sulphur and strontium associated with the calcium by principal component analysis. Similar results were seen by Stulik, Porta and Palet in the Nefertari tomb.[25] The white areas blocked for hieroglyphic texts-have a significant quantity of strontium associated with the calcium, which may be due to several applications of the same white lime washes.

A **standard white**, broadly used throughout in the tomb to represent the **clothing** of many of the personages, contains mainly calcium, iron and strontium with lesser amounts of sulphur and arsenic. This white was identified by Raman as **calcium carbonate**. Only one analysed point had a very significant quantity of arsenic (LHF410) (**Figure 60**). It is interesting to note that arsenic particles have also been discovered in the white backgrounds of other Theban tombs. Perhaps this is the result of the degradation of arsenic yellow pigments into arsenolite,[26] or residues of products applied to stop biological attack. For the moment, this question remains unanswered. The same white pigment was dispersed in low concentrations over red, orange or yellowish skin areas to give the effect of **transparency** that is characteristic of light clothing. This choice was not systematic, since diluted gypsum was also used to produce a transparent effect. This suggests different workers or painting phases.

A very particular type of **white used for final details** was easily visible, since it

[24] Ibid.

[25] Corzo, *Art and Eternity*, 60.

[26] S. Pagès-Camagna, *Applied Physics A*, 671-681.

was extremely thick and shiny. It was used systematically for the fingernails of Menna and Henuttawy as well as for **corrections** over the polychrome areas. These white areas seem to be similar to those observed by Rickerby in the Nefertari paintings.[27] XRF analysis revealed a high proportion of calcium in this type of painting as well as very strong UV fluorescence. Our reconstructions further suggest that this type of painting may be the combination of huntite with animal glue (cf. Reconstructions). Huntite $CaMg_3(CO_3)_4$ was identified at one point on BHNL by Raman (**Figure 61)**. Since-light elements (Z<16) cannot be detected by EDXRF, there was no possibility of detecting magnesium to map huntite on the tomb walls. If huntite was used with an-organic binder, the fluorescence may have affected its identification on other points. The possibility remains that huntite white was used more extensively on these wall paintings, either alone or mixed with calcite.

Some **white retouches** are characterised by a rough, grainy textured surface very rich in charges. The retouches are composed mainly of calcite white with a higher percentage of arsenic and iron. In specific areas of repainting, this same mixture was detected where it appears as yellowish-white as seen on the skirt (**Figure 62)**. Some spots contained more impurities of iron mixed with calcite as well as very small particles of blue. We can consider that all of these are variations of calcite prepared with different proportions of charges and organic binders to enhance coverage. Ancient revisions appear clearly in the paintings. One example is Menna's arm which was corrected by a layer of gypsum (**Figure 63**).

Modern zinc and titan whites (possibly ZnO; $ZnTiO_3$; TiO_3Ba), which were analysed by EDXRF, are present as past restorations mainly in broad hall. On the small left hand wall (BHSL), tiny color reintegration areas are easily detectable to the naked eye.

Blacks were clearly identified as carbon pigments by Raman spectroscopy. **Greys** are the mixture of white and black. In some areas, the greyish hues are, in fact, light blue. In some cases it is difficult to ascertain if these hues were originally grey-blue, or if they are the partial remains of larger particles of bright Egyptian blue. Some points visually

[27] Corzo, *Art and Eternity*, 48.

classed as black were indeed very dark blue as in the case of the grapes in the broad hall (**Figure 64**). Very degraded Egyptian blue combined with organic coating can also be perceived as black, as on Osiris' wig on BHSL and LHL.

Greens and **blues** are synthetic pigments, better known as Egyptian blue (cuprorivaite : $CaCuSi_4O_{10}$) and Egyptian green (also called green frit in the literature), mainly composed of parawollastonite: $CaSi_4O_3$. Complete characterisation studies have been done by J. Riederer in West Fitzhugh,[28] S. Pagès,[29] and El Goresy, et al.[30] The elemental composition of green and blue is very similar, but the VIS spectra allow them to be distinguished with precision. Egyptian blue is characterized by two major absorption bands at about 560 and 628 nm (**Figure 65**). The difference in hue can be due to voluntary procedures such as the amount of pigment applied and the size of the ground particles. Nevertheless the most important differences in color correspond to degradation. Some areas have suffered detachments. In other places, organic coatings (original or more recent) were applied, which have a yellowish tint, as seen in the figure of Osiris on BHSL (**Figure 66**). When EDXRF showed significant quantities of Fe and As on green and blue areas, it is clear that under layers of iron oxide and arsenic pigments existed. Indeed green and blue were the last colors to be applied, most likely due to the large size of their particles.

The **reds** and **yellows** in the tomb chapel are composed of iron oxides, mainly ochre. These are natural compounds of clays, quartzite, different quantities of haematite (α-Fe_2O_3) and goethite (α-$FeO{\cdot}OH$). Ochre sources are indigenous to Egypt and offer a very broad palette ranging from red and orange to yellow and brown.[31]

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[28] Josef Riederer « Egyptian Blue, » in *Artists' Pigments A handbook of their History and Characteristics*, vol. 3, edited by Elizabeth West Fitzhugh (Oxford, 1997), 23-46.

[29] Pagès-Camagna, et al. 1999, 2000, 2003.

[30] El Goresy, et al. 1986.

[31] Moreno Garcia, R., H. Calvo, P. Vandenabeele, "Preliminary examination of natural Egyptian painting materials with Raman spectroscopy, X-ray fluorescence and X-ray diffraction," in *IV Conference of Raman Spectroscopy applied to Art and Archaeology* (Modena, 2007); Janet Ambers, "Pigments," in *The Nebamun Paintings*, edited by Andrew Middleton and Ken Uprichard (London, 2008), 31-40.

The preparatory sketches and the final outlining of the figures were done with iron oxides (Fe_2O_3), as was a red vase in the Long Hall Left. The elemental analyses indicate a link between arsenic and sulphur in other red areas, such as the red used for the goose offered to Menna depicted on BHNL where realgar (As_2S_2) was identified by Raman analyses. PCA shows that most of the red points are pigment mixtures containing iron, arsenic and sulphur (Figure 5). Nevertheless, these findings must be viewed with caution, since traces of arsenic have been detected even in the whites.

The **yellows** are also a mixture of iron oxide and sulphur-containing pigments (**Figure 67**). Some points have a significant quantity of Iron (Fe). Some yellow pigments have been mixed with calcite and/or gypsum to obtain lighter hues. Yellow and red ochre pigments can be directly detected and mapped by the UV photos, since they do not have - fluorescent properties and appear in the photos as black (**Figure 68**).

The presence of yellow pigments with arsenic suggests the use of orpiment for golden objects. The detection of orpiment was delicate since the proportion of sulphur found by EDXRF was generally poor, and curiously registered less than that identified in realgar. In many cases, this type of yellow seems to be associated with an organic material that was used as binder or coating (**Figures 66 and 68**). Raman could only confirm the presence of orpiment on some points. Fluorescence of many yellow areas under UV suggests that a yellow made of orpiment was applied over a layer of huntite (**Figure 69**).

This data forces us to also consider the possibility of the presence of arsenolite (As_2O_3) that is formed by the oxidation of arsenic sulphides in nature or in the paintings. Arsenolite has been detected in several Egyptian artefacts associated with yellow pigment,[32] and occasionally as an impurity associated with the white backgrounds.[33] Nevertheless, no arsenolite spectra were identified. Micro sampling would be a way of strengthening the evidence for the use of orpiment. Prepared as a cross-section, the direct access to the pigment grains would be possible, thus avoiding the organic coating which actually blocks its detection.

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[32] Sean J. Gilliam, "Raman Spectroscopy of arsenolite: crystalline cubic As4O6," *Journal of Solid State Chemistry* 173.1 (June 2003), 54-58.

[33] Pagès-Camagna, *Applied Physics A*, 671-681.

Mixtures

After identifying the materials used as pigments in the tomb chapel of Menna, we focused on the wide variety of pigment mixtures. It is interesting to note that human figures could be individualized through the application of different skin tones. We can see such a color separation between men and women represented in the tomb (**Figure 70**). To understand the variability of mixtures for the multiple skin hues, it would be necessary to perform XRD analyses or to sample representative points. For the moment, we can state that Menna's skin is composed of red iron oxides that could be either red ochre or pure haematite, and arsenic was detected indicating the use of either realgar or orpiment (**Figure 71**). Henuttawy's yellowish skin shows a wider variety of pigment mixture and a more important significant use of arsenic pigments. Taking into account the yellowish hues obtained, the results suggest Henuttawy's skin tone was made up of different mixtures of orpiment, yellow iron oxide, and gypsum (**Figure 72**).

Pinks are composed of the mixture of red and white. In the tomb of Menna, we can distinguish between two types of application. The first is a homogeneously prepared pink mixed directly before applying, such as the cuts of meat on the offering tables. This type of pink is generally composed of red iron oxides mixed with gypsum. The second type of **pink**, found primarily in the depiction of light clothing, was obtained by the superposition of white washes of calcite or gypsum over the skin hue. The final color depends on many factors. The first determining factor is the skin color on top of which the white is spread. These areas appear irregular due to the brush marks and the different amount of pigment applied. With the reconstructions, we confirmed the difficulty of applying a second pigment layer when using the gum arabic as binder. Gum is very easily rehydrated, and the second application effects the stability of the under layer, even when the first layer has dried. This irregular mixture of pink layers can indicate that both were done using a gum (cf: Binders and coatings).

Finally, for the **browns**, we detected the presence of all the different pigments used in the tomb which indicates a mixture of all the available colors. Thus, brown was created by combining complementary colors such as red/green, blue/orange, red/

blue/yellow mixtures.

Binders and coatings; ancient restoration materials (organic materials)

Binding media are mainly organic materials that help pigments to adhere other pigments and substrate. In antiquity, natural binders were generally of animal (eggs and animal glue) or vegetal origin. Basically two main types of plant exudates can be distinguished: gums and resins. Gums are polysaccharides that are soluble or form a gel in water. Resins on the other hand, are insoluble in water and consist of a complex mixture of organic substances such as alcohols, carboxylic acids, ketones, polycyclic hydrocarbon structures and aromatic components, many of which are of terpenoid origin. Most resins are vegetal in origin, although shellac is an animal resin.

Under laboratory conditions, Raman spectra can be obtained from binding media.[34] However, when examining areas *in situ*, different problems can arise when trying to identify the binding medium used in wall paintings. Unlike pigments, binders are not present as grains, but as diffuse films. Therefore it is quite difficult to focus the laser beam on the binder. Moreover, long measurement times are often required to obtain spectra, since these natural organic materials are usually weak Raman scatters. The spectra obtained must be compared against a database with reference spectra of well-known materials in order to achieve a formal identification of the binders.[35] In the tomb chapel of Menna, the overall presence of modern restoration materials (such as Paraloid B-72) caused severe spectral interferences, resulting in the poor quality of some of the spectra.

A number of resin and gum samples were collected by M. Hartwig in order to create this database, including *samgkh*, an plant gum that has been identified as a binder used in contemporary ancient tombs,[36] and gum Arabic, which has been identified on

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[34] Peter Vandenabeele, et al., "Analysis with micro-Raman spectroscopy of natural organic binding media and varnishes used in art," *Analytica Chimica Acta* 407 (2000). 261-274.

[35] See n. 19.

[36] Sakuji Yoshimura and Jiro Kondo, ed. *Conservation of the wall paintings in the Royal Tomb of Amenophis III – First and Second Phases Report* (Tokyo, 2004). Special thanks to Ahmed Fakhry for his identification of the modern gum samples collected by Hartwig.

samples taken from the tomb of Nefertari by TLC chromatogram.[37] Samples of animal glue and beeswax were also studied and used to create a database of UV-Visible and Raman spectra to be compared with the measurements done *in situ* in the tomb chapel of Menna.

Reconstructions

Inferring the techniques and the gestures used in ancient paintings is a challenge. The good conservation of materials is decisive for their proper identification. Many mineral pigments are quite stable and can therefore be clearly identified. Organic material, on the contrary, is very fragile and difficult to identify with precision using existing analytical techniques, even when samples are taken. In the case of a non-invasive approach, this task is even more delicate. Archaeometry must deal with all the remaining materials regardless of the state of conservation. Some original materials are altered like binders and coatings. Also, painting techniques are defined by the solvent or vehicle used. These ephemeral elements are very important in the gesture of the artist and in the final aspect of the painting, even though they are meant to disappear after their application.

The difficulty in the identification of binders led us to the realisation of a series of experimental reconstructions of the pictorial recipes. Indeed, the mixture of materials and the technique of application provide specific characteristics of the pictorial layers. Reconstructions were done in order to evaluate the technical difficulties of achieving layering with particular optical properties such as transparencies and brightness.

Reconstructions were made in the laboratory following the same stratigraphy seen in the tomb of Menna. These were done on gypsum plaster pellets. Calcite, huntite, and gypsum were used as white pigments; red ochre and realgar as red pigments; and yellow ochre and orpiment for yellow pigments. These were applied alone and in combination. The binders were gum Arabic and animal glue. The aim of these reconstructions was to observe the surface properties and hues that were used in the

[37] Corzo, *Art and Eternity*, 63.

tomb. These reconstructions were observed in UV light and compared with the UV photographic survey of the tomb where specific colors revealed a significant fluorescence.

Paraloid B-72 was also observed under UV light in the laboratory in order to evaluate if its presence affected the fluorescence of the pictorial layers. It turned out that Paraloid when applied in a thin layer does not fluoresce. Raw organic binders present a very high degree of fluorescence but the layers recreated in the laboratory reconstructions were very thin so that their fluorescence was minimal. Fluorescence of gums is less than that of animal glue, possibly due to the thickness of the layer obtained by the latter. The combination of pigments with the binders gave different UV fluorescence results from those of the raw products alone.

Of particular interest is the combination of huntite with animal glue on the gypsum plaster. The appearance in daylight is very thick and shiny, very similar to the white pigment used for painting the final details (**Figure 58**) such as fingernails, eyes and corrections. Huntite applied with animal glue fluoresces strongly under UV, while combined with plant gum does not (**Figure 69**). This experiment helps determine the possible presence of **huntite** in other zones of the wall paintings. The yellow areas of the tomb that show fluorescence under UV light may be the result of the application of orpiment on top of a layer of huntite (**Figures 66 and 68**).

Coatings of wax were applied to the reconstructed samples. The melted beeswax was applied with a spatula for the reconstructions, since no adequate solvents for wax were available in ancient Egypt to do otherwise. The thickness of the layer is important as seen on BHNR where UV photos of the wall show a yellow fluorescence characteristic of wax.

Conclusions

In sum, an extensive, multi-method archaeometrical approach was used to examine the painting techniques in the ancient Egyptian tomb of Menna (TT 69). For this research, only non-destructive techniques were employed. With the survey of the tomb we identified the use of at least nine different pigments as well as the intended use of

adhesives as binders and coatings.

This research allowed us to propose numerous hypotheses and gather a large amount of data and information useful for the study of the organisational aspects of the artists' workshops. Among the observations is the distinction of light grey from degraded blue that help one reconstruct the original appearance of the tomb painting. The data also helped with the detection of underlying pigments that were not visible to the naked eye.

Many questions were answered and others have been raised, such as the compound containing arsenic in most of the white analyzed areas of the paintings. Other portable techniques continue to be developed and adjusted for use in the field. In the future they will certainly help us to advance more in our knowledge of ancient art without sampling.

Non-invasive analyses can give a global view of the various painting techniques. Nevertheless, organic materials remain difficult to identify with precision non-invasively. Visual differences suggest the use of intended combinations of plant gums and animal glues that have also been reported in other Theban tombs in which samples were analyzed. With respect to the binders, their state of conservation and small quantity in pigment mixtures make them very difficult to analyze. Raman spectra point to the presence of a gum, but not the specific type. Good spectra were obtained from the raw materials in high quantity. Even if reference spectra are available for comparison, they might not really match archaeological samples. Degradation modifies the chemical structure of organic material, which can lead to some differences in the spectra.

During analyses we must also take into consideration the nature and variability of art techniques. Reconstructions are a good way to approach ancient techniques. These should be also submitted to artificial degradation to evaluate possible transformations, and to be included in analytical databases for the future. Finally, interdisciplinary study is essential for the global analytical interpretation of archaeological material given its inherent variability and complexity.

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Conservation of the Tomb of Menna (TT 69)

Bianca Madden
Additions by Cristina Beretta, Greg Howarth, Sasa Kosinova, Mark Perry, Doug Thorp, and Melinda Hartwig

Introduction

The tomb of Menna (TT 69) is one of the most popularly visited sites in the noble's Theban necropolis. Before the beginning of this project in October of 2007, no systematic documentation of the paintings had been done nor any active conservation plan in followed despite evidence of intermittent work on the tomb walls.

This conservation project was carried out over two seasons, October-November 2007 and in September – November 2008.[1] The 2007 season was focused primarily on the emergency conservation of the areas of vulnerable plaster and flaking paint. Methods and materials were also investigated that would be used during the full conservation treatment of the tomb in 2008. In addition, a major portion of the first season was spent producing a condition survey to record damaged areas and previous interventions on A3-size photographs taken of the tomb prior to the start of the conservation. These were then marked by hand using different colour codes to indicate changes due to time, damage or previous conservation efforts. Recorded on these photographs are areas with Paraloid B72, cracks, old mortar smears, vulnerable edges, loosely bound or flaking paint, wasp nests, retouching over fills or the original, salts, water damage and detached plaster.

The 2008 season continued the repair and consolidation of the remaining vulnerable areas. Old repairs were removed as necessary and replaced with lime mortar that created a fine surface to hold repairs with vulnerable edges. These lime mortar repairs were reintegrated with applications of a unifying lime-wash where appropriate.

An important part of the 2008 season was digitizing the photographic condition survey as a layered Photoshop file. The digital documentation of the condition survey is now complete and can be accessed as a fully layered record of the old damage and previous interventions.

****Figure 73**

[1] The team over the two seasons consisted of Cristina Beretta, Greg Howarth, Sasa Kosinova, Bianca Madden, Mark Perry, Doug Thorp and SCA conservator Ahmed Baghdali Yusef

Condition of the Support Layer

In general the condition of the original plaster was very stable with few detachments from the substrate. The majority of unstable areas were associated with old repair plaster. Numerous detachments and cracks were also found in the joins between the repair plaster and the original surface. Other unstable areas occurred in connection with failed repairs and previous damage. The removal of the cement floor before the start of the conservation season in 2007 resulted in the loss of old repair plaster along the bottom of the tomb walls. These losses left unsupported sections of plaster that were in need of grouting. There were also areas where the original plaster sounded hollow when tapped lightly, notably in both the long and broad hall ceilings, although the lack of movement indicated it was secure. The stability of the long hall ceiling was a concern in the past and led to a major previous intervention (see below) that required further investigation. Fortunately, due to the stable condition of the original plaster and the technique in which the ground and plaster were applied, there were very few areas requiring treatment where the ground had detached from the plaster.

Previous Surface Damage

The paintings in the broad hall had considerably more surface damage, scratch marks, and abrasions than those in the long hall. This was likely due to the fact that at one time, the outer hall was open to the elements. Furthermore, it is the first room that visitors would enter, and barriers had not always been in place to protect the paintings. On the near right hand wall of the broad hall (BHNR), there was also evidence of water damage directly under an area where the ceiling had fallen. As a result, the paint layer was faded and very thin. The red pigments were smeared, resulting in the loss of definition and detail to some figures and objects. Numerous pinholes occurred on the walls in both halls, probably from the use of pushpins used in the 20th century to hold up tracing paper. There were also old syringe holes from previous conservation interventions.

The paintings in both halls were covered with layers if dust and sand as well as a thick layer of Paraloid B72™ (see **Previous Interventions**). The outer and inner entrance walls had evidence of visitor hand grease. In some vulnerable areas such as the corner between the entrance and the broad hall, the missing plaster left the original *muna* exposed.

Early visitors, archaeologists, epigraphers, and conservators all left their marks on the paintings. Graphite, ink and chalk marks on the walls were probably associated with early recordings of the paintings. Additionally, there was a signature from the 1930s as well as traces of adhesive tape (which showed up clearly under ultraviolet (UV) light) around the 'fighting girls' scene on the agricultural wall in the broad hall (BHNL). Graffiti is still visible on the two doorways, some Pharaonic or Coptic and others from more recent times. There was also evidence of old wasp's nests that had already been partially removed, leaving only the muddy/clay traces of the nest often associated with paint loss.

****Figure 74**

The remains of a wasps' nest on the long hall right wall.

Powdering and Flaking Paint

The most dramatic example of flaking paint occurred on the shrine wall (LHF) at the end of the long hall. The black paint around the niche had cupped and flaked badly. The black paint was applied very thickly due to the amount of binder in the paint mixture. This resulted in dramatic flaking of the pigment.

Generally, flaking paint in the tomb was limited to blue and green pigments that were thickly applied and led to some sections with lifted edges, flaking and cracking. In some areas, the blues and greens were completely lost, and had taken the white ground and the immediate surface of the substrate with them. To hold coarse pigment grains like blue and green together, it appears that the binding media (likely beeswax, animal glue or even plant gum) used by the ancient artists was too strong. As a result, when the binder contracted it pulled off all associated material with it.[2] In other areas this contraction left an "incised" outline or "ghost" images of the leaves in the trees on the agricultural wall (BHNL).

****Figure 75**

3. Raking light photo showing the incised outline and lost green paint, BHNL.

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[2] Giovanni Verri, "The use and distribution of Egyptian blue: a study by visible-induced luminescence imaging," *The Nebamun Wall Paintings: Conservation, Scientific Analysis, and Display at the British Museum,* edited by Andrew Middleton and Ken Uprichard (London, 2008), 41-50; Eric Miller, "Painterly Technique," *The Nebamun Wall Paintings: Conservation, Scientific Analysis, and Display at the British Museum,* edited by Andrew Middleton and Ken Uprichard (London, 2008), 61-70; and Ambers, "Pigments," *The Nebamun Paintings,* 31-40.

****Figure 76**

4.Flaking green on the head of a mummy – long hall left wall.

Water Damage

Localised water damage and staining appeared in the long hall around cracks and repairs to the ceiling. In general the paintings were largely unaffected, with the exception of areas around some of the old fills. In these instances -- possibly as a result of a very wet fill or pre-wetting before filling -- tannins seeped out from within the wall as the fill dried. A dark brown stain was also visible on the ceiling above the shrine niche (LHF). Upon test cleaning, this dark brown stain smelled strongly of urine, suggesting the cause of the stain was leakage from the house this was once situated on the hill above the tomb. The house and another to the east of the tomb were destroyed in 2008 by the SCA's renovation of the Theban necropolis.

Previous Interventions

Very little documentation of previous conservation interventions in the tomb chapel of Menna is on record. Most of the available information has come from photographic records and the Gardiner and Mond correspondence from 1913-1915.[3] In a brief conservation report, Ernest Mackay (working at the expense of Robert Mond) mentioned fixing painted fragments into the largely destroyed far left wall focal wall (BHFL), and fitting 'light iron girders' to support the broad hall roof, presumably before the plaster ceiling repairs were made.[4] However, a great deal of information about previous restoration/conservation interventions was gained from visual examination while working on the paintings as well as from local knowledge.

The Mond photos taken from 1913-1915 and MacKay's documentation illustrate the use of dark *muna* for repairs on the left focal wall (BHFL) as well as larger repairs elsewhere. Otherwise losses appear to have been left open. The plaster of Paris repairs along the lower edge of the walls are not pictured in the Mond photos, but it is possible the photos were taken after the work on the left focal wall was carried out and before other conservation work was done in the chapel. In the Schott photographs between

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[3] Mond MSS 1.3.1, Mond MSS 1.3.2-4, Gardiner MSS 19.2 courtesy of the Griffith Institute, Oxford University.

[4] Traces of these girders that were attached to the walls can still be identified by the remains of plaster of Paris fills.

1931-1937, these lower edge repairs were already completed. Little else appears to have changed in the tomb chapel and on the walls. By the 1954 publication of *Egyptian Painting* by Arpag Mekhitarian, white *muna* repairs are clearly in place instead of the dark *muna* on the walls of TT 69. This indicates that another conservation treatment of the walls took place after 1937 and before 1954. The 2002 publication *Le Tombeau de Menna* (Mahmoud Maher-Taha) show the paintings still set with white *muna* repairs in a series of black and white photos from October 1965, February 1966, and March 1966,[5] and then with the most recent pink PVA (polyvinyl acetate) repairs in contemporary photos taken in November 2000. The PVA repairs were carried out by the Antiquities Service in the late 1980s or early 1990s.[6] Looking through the photographic evidence, it appears that the majority of the voids within the paintings were left untreated or filled with *muna* until the white *muna* repairs appeared sometime during the 16 years between 1938 and 1954.

While working on the paintings it was also possible to see the various repair phases. The pale *muna* and straw plaster is still in place on the left focal wall (BHFL), and the remains of white plaster are still found behind the pink PVA on the large repairs in the long hall.[7] The bracing system on the long hall ceiling (discussed later in this chapter) was first pictured in the 1966 photos but may have been done earlier.

The 2007 and 2008 archaeometric analysis found a number of paintings with modern retouching. It is not entirely clear in which phase of intervention these were carried out, although it is likely retouching was done during each phase. Retouching could also be identified by visual examination on the fills, notably on the plaster of Paris repair between the skirting band and the floor. Other retouching was found on various

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[5] Mahmoud Maher-Taha, *Le tombeau de Menna [TT. No. 69]*, edited by Zahi Hawass (Cairo, 2002); and M. Maher-Taha. "Les relevés documentaries du CEDAE et la mise en oeuvre du projet <necropolis de Thèbes-Ouest>" *Memnonia* XI (2000), 201-208, pl. XLVIII-LI.

[6] Personal communication, Ahmed Baghdali Yusef, the SCA conservator working with Menna's 2008 conservation team who knew of the conservator responsible for this work (who has since retired). Mr. Yusef mentioned the work was done about 20 years ago, making the latest conservation intervention sometime in the late 1980s or early 1990s. It is likely that the Paraloid B72 coatings (see later in this chapter) were applied to the paintings at this time.

[7] While working on these large repairs, it was clear that they were repaired twice. Unfortunately, the original instability of the wall decoration was unresolved: the white *muna* was not raked out to guarantee a stable base but instead applied over the original *muna*. This white *muna* repair was then followed by a very thin skim of the PVA repair plaster, which seems to have been a purely cosmetic intervention.

areas of the painting. Some were relatively well colour matched, while others such as those on the fills around the shrine in the long (LHF) were unsuitable.

The photographic archive also helped identify the extent and level of loss around older significantly repaired areas, as illustrated in the amended Mond photos of the large repairs on the broad hall far left wall (BHFL) and long hall left wall (LHL).

****Figure 77**

Showing deterioration between the time of the Mond photos, to the present.

At what point the extreme level of damage occurred is not clear. Although it is possible that the various conservation interventions left the edges in a very fragile condition so that they delaminated extensively, and were deemed beyond saving. In the Mond photos of the long hall large repair (LHL), cracks were visible in the pre-1954 brown *muna*, suggesting that some structural movement may have occurred (in adjacent areas, extensive horizontal cracks were also clearly visible). This shift may have been enough to cause large-scale delamination of the painted plaster and gypsum skin from the *muna*, particularly if the original adhesion of the two coats was not very strong.

Fills

Many of the old fills were cracked, and the repair mortar was often smeared over the edges of the painting. The majority of the fills were executed slightly under the level of the painting. Repeated refilling of the repairs and the manner in which they were cut back, had left extensive losses and scrape marks around the old fills.

****Figure 78**

Partially removed fill, showing extensive scrape marks and 'halo' effect from previous repairs.

Consolidation and Fixing

At least one earlier, non-Paraloid consolidant was used to fix flakes and grout lifted plaster, presumably before Paraloid came into wide use as a conservation material in the late 1970s/early 1980s. In normal light, Paraloid appears as a shiny film and does not dissolve in acetone. Paraloid B72 had been used extensively on the tomb chapel walls of Menna. On first examination, Paraloid appeared to be applied locally in order to consolidate the painting in specific areas. However, when tests were carried out it was found to cover almost all wall surfaces. As a result, Paraloid had been absorbed into the

plaster, and shone in areas where it had totally saturated the surface. In the lower skirting band, a large quantity of dust had adhered to it.

During a previous restoration, Paraloid was used to consolidate flaking paint around the shrine in the long hall (LHF), and thickly covered the black pigment causing it to shine. Remains of old cotton wool could be seen on the surface, presumably left over from an attempt to remove the excess Paraloid.

Long Hall Ceiling

The long hall ceiling undulates and was an area for concern. Water from a house that once existed above the tomb may have contributed to the movement of the ceiling. To secure the ceiling, a system was introduced that consisted of a series of metal plates that were cushioned against the painted plaster and held in place by a nut and bolt screwed into an armature inside the ceiling. These metal plates appear in the photographic record sometime after the Burton photos done sometime between 1914-1927,[8] and the 1965/6 photos done by the CEDAE.[9] There is no sign of recent movement since these early 20th century repairs based on the archival record and visual examination.

In order to gauge the ceiling's current stability, the structural design of the metal plate system was explored by carefully cutting back the corners of 54 cm x 58 cm square that was previously was cut out of the ceiling as part of an earlier stabilization plan in the inner hall. The system was comprised of two long steel plates, padded with paper and thick yellow felt between the plate and the ceiling face. These plates were fastened to the ceiling by several nuts at the end of threaded pins that perforated the decorated *muna* and were anchored to the rock face behind the ceiling. Between the rock face and the *muna* ceiling, a large amount of plaster of Paris was introduced as an adhesive to hold the square section in place. In the long hall behind the ceiling, some voids as deep as 25cm remain above the plaster fill. In addition, an arrangement of palm wood beams was discovered that crossed the width of the ceiling every ca. 40 cm. This technique was intended as a structural base for the *muna* and plaster ceiling. When these early

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[8] MMA 789. The Metropolitan Museum of Art, photography by Egyptian Expedition Fund. Harry Burton photographed the tomb of Menna (TT 69) sometime between 1914-1927: A.M. Lythgoe, "The Egyptian Expedition 1925-1927: List of Private Tombs at Thebes Recorded by the Museum's Egyptian Expedition during the Years 1907-1927," *The Metropolitan Museum of Art Bulletin* 23, no. 2, part 2: The Egyptian Expedition 1925-1927 (Feb., 1928), 73-75.

[9] Maher-Taha, *Menna*, pl. XLIII A-B.

conservators replaced the section (slightly out of plane) the damage around the square was filled and retouched with modern paint.

Since the corners of the original square were hidden by poorly done modern repainting, the modern paint was removed from the edges of the square and then stabilized with the same lime putty and sandstone mixture that was used for the other fills on the wall. The edges of a second smaller ceiling square were also excavated, filled and retouched at the end of the series of metal plates in the inner hall. A crack, probably associated with the original movement of the ceiling, spread out from a replaced ceiling square to the shrine wall. This was also filled and retouched. By excavating these small squares in the inner hall ceiling in several key areas, the metal plate armature, wooden beam and plaster of Paris system was assessed and deemed structurally stable for many years to come. The stabilization system will be discussed in further below.

****Figure 79**

The removed and replaced ceiling square and two metal holding plates – during the conservation investigation

**** Figure 80**

The second cut and filled section on the long hall ceiling, showing remains of brown earth and red retouching over the repair plaster, before conservation.

Conservation Treatment

Cleaning

Spider webs and surface dirt were removed from the ceilings, which had no evidence of Paraloid, using a soft brush. The Paraloid coatings almost everywhere else in the tomb were reduced as much as possible by swab cleaning with acetone. This had the added advantage of removing a great deal of the dirt that was mixed in with the Paraloid as well as any surface coatings. At the same time, acetone swabs were used to clear the smears of old repair material from around the old fills.

****Figure 81**

Conservation cleaning and consolidation kit, left, and Paraloid B72 removal in progress, rights (Sarah Livermore).

****Figure 82**

Long hall right, part cleaned, right hand side still with Paraloid coating and dirt.

The inner door and entrance were not coated with Paraloid, but were made up of a tighter and more polished plaster than found elsewhere in the tomb. These surfaces were covered with generations of hand grease. A considerable amount of this grime could be removed by degreasing it with acetone followed by a swab cleaning with saliva.

****Figure 83**

Left, cleaning test on the hand grease on the entrance door right hand wall (EDR), also showing the exposed muna on the corner between the entrance hall and broad hall right. Right, inner door right (IDR), partly cleaned.

Wherever possible, pencil and chalk marks were removed with an eraser, saliva, or both. In some cases, there was no safe method to remove the graffiti without the risk of damaging or losing the painting beneath, so it was left. The remains of the wasps' nests were softened with an ethanol/water mixture and then removed with acetone. Occasionally, wasps' nests were removed with a swab stick or other suitable tool after softening. If no safe method of removal was found, the remains of the wasps' nests were left alone.

Old retouching was removed with acetone or water and ethanol 4:1. The retouches to the blues and greens in the long hall proved difficult to dissolve and could only be partially removed. If the old retouching caused no adverse effect on the paintings and were not visually distracting, they were left in place.

The yellow staining around the old fills, syringe holes, and water marks could usually be reduced by swab cleaning with water or saliva once the Paraloid coating (which acted as a seal) was removed with acetone.

Powdering/Flaking Paint

The black paint cupping around the shrine was secured with a heated spatula using the existing Paraloid on the wall as an adhesive. Once the flakes were secured, any excess Paraloid was removed with acetone. The flaking blues and greens on the walls were fixed with Plextol B500™ (acrylic dispersion) in a 2:1 concentration after pre-wetting with IMS (industrial methylated spirit) and water (4:1).

****Figure 84**

The shrine, before conservation, with flaking paint and a thick Paraloid varnish; and below, after conservation.

Grouting

Around the old fills and unstable areas, detached plaster was secured by injecting PLM-A™ grouting (a natural hydraulic lime with a quartz element) under the detached areas and into the voids. Detachments and unsupported areas along the bottom edge were held together by a mortar fill or edge repair (see below), and often, with grouting. Where possible the PLM-A was used without pre-wetting to reduce the amount of water introduced into the walls. In areas where the detachments were too fine to introduce PLM-A, Syton X30 (a silica based consolidant) was used in mixtures of 25/30% as needed. Syton was also used to consolidate powdering plaster that occurred occasionally where original plaster joined an old repair. Syton X30 at 25% was also found to work well consolidating the original *muna* where it had detached from the substrate.

**** Figure 85**

Consolidating the lower edge with Syton X30, after grouting with PLM-A

Mortar Repairs

A series of tests were carried out in 2007 and at the beginning of 2008 to establish a suitable repair mortar[10]. After extensive sampling of a variety of sands and sandstones of various colours mixed with lime putty, two different mortars were selected for the tomb. The first was lighter coloured, consisting of one part lime putty, two parts finely sieved light yellow sandstone powder, and one part finely sieved light building sand. This mixture was more suitable in colour and tone for the left and right broad hall small and far walls (BHSL, BHFL, BHSR, BHFR). A second mortar was used, composed of one part lime putty, two parts light yellow sandstone (finely sieved), one part of light building sand (finely sieved) and one part pink sandstone (finely sieved). This worked well tonally

[10] Lime plaster (calcium hydroxide) was used for the mortar, not gypsum plaster (calcium sulphate) because it is easier to work with and mix with different colour and fraction sands to ensure a good visual and textual match to the original. It is stable, inert and compatible with the original materials used in the tomb, and produces breathable, permeable fills.

for the broad hall near walls (BHNL, BHNR) that received less natural light as well as the long hall (LHL, LHR, LHF).[11]

**** Figure 86**

Sand stone powders and sands for testing (with Cristina Beretta), left, and right, crushing light yellow sand stone.

Time was spent to establish the best method for applying the mortar without the fills cracking during the setting process or setting before there was time to cut them back. Additionally, it had to be decided how to achieve the desired finish and ensure a tight surface that worked with the slightly polished texture of the original without over-working the fills and bringing the lime to the surface. The repair areas were properly prepared prior to application of the mortar. All loose materials were removed and the surface thoroughly wetted in order to aid adhesion and slow the drying rate. This was done with a brush to avoid splashing or spraying the water onto sensitive paint layer. The mortar was then pushed into the edges of the original painted plaster to ensure good contact. Because of the rapid drying rate due to the Luxor heat, the mortar had to be applied quickly, taking care to avoid contact with the original painted surface. In previous interventions, contact with the original painted surface resulted in the creation of holes around the old fills and extensive paint loss. It was also important to ensure that the depth of the mortar was even and followed the plane of the wall. The repairs were cut back within 5 - 10 minutes of application depending on the thickness of the fill and its location. Raking light was used when cutting back the repairs to ensure the surface was even and did not display obvious tool marks. The surface was then lightly pressed in order to give a texture to the fill and avoid a polishing effect. This helped distinguished the new fill from the original and reduced the build up of future dust deposits.[12]

At the beginning of the conservation campaign, the pinkish PVA and sand repairs were left in place in areas where the level was flush with the surface and tight against the edges of the plaster. The materials were stable and inert, the colour match sympathetic,

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[11] It was found to be important to mix the mortars the day before use and leave them over night as it helped dissolve small white lumps of lime, which otherwise became evident when cutting back the fills.

[12] For full details on mortar filling and techniques see Mark Perry's notes on mortar filling and techniques in the 2008 Menna Conservation Report.

and the fills small enough for the reduced breathability of the PVA not to be a concern. However, once the majority of the old repairs were removed and filled with new lime plaster, the remaining PVA repairs became more prominent and distracting. In addition, most of the PVA repairs were concave, cracked, or did not run smoothly to the edges of the original plaster, thereby emphasizing the losses. Therefore, the PVA repairs were removed throughout the tomb and filled with the new lime plasters. In one or two areas such as the lower left hand section of the BHNR wall (where there was a very fine skim of the PVA mortar over numerous little dishes, holes and multiple tiny repairs), the PVA repairs were left, as it was felt to be more destructive to attempt to remove them. A unifying lime wash was then sponged over the new fills (see below) to even out the tone with the other repairs and the surrounding exposed plaster. On the corners of the entrance leading into the broad hall, new repairs were placed over old exposed losses. The large areas of structural repair plaster were left on the walls of the entrance and inner door as well as BHFL and ceilings because it would have been a major intervention and quite hazardous to attempt to replace. In these areas, the materials were compatible with the original substances, and the only distractions were cosmetic (see lime washes below).

****Figure 87**

Removing the old fill (Mark Perry). Right, removed repair with edges secured with adhesive repairs

**** Figure 88**

First layer of repair mortar, with adhesive repairs to the edges. Right, applying the top layer of mortar (Mark Perry and Cristina Beretta)

****Figure 89**

Left, cutting back the final layer. Right, the finished repair, LHL.

Edge repairs and small fills

A fine gypsum-based surface filler was used to fill the old pin and syringe holes and very fine cracks; it was also used to support the vulnerable edges of the blues and greens once they had been fixed.

****Figure 90**

Fine surface edge repairs on the greens, before toning with acqua sporca.

Long Hall Ceiling

As mentioned above, an investigation was carried out to discern the structural stability of the long hall ceiling. The plaster of Paris fill that held the cut and replaced square, was drilled into using a hand drill. This would reduce vibration, investigate above the section, and at the same time reduce the amount of plaster of Paris - and therefore the weight - around the area. This revealed two wooden beams above the cut section, (thought, by visual examination, to be date palm timber). This was an interesting discovery, as it showed a previously undocumented original technique to structurally strengthen a painted ceiling. One of the beams had been cut across the grain, in line with the square, with the space between the two beams measuring approximately 40 cm. Large voids, sometimes as deep as 25 cm, were found above the plaster of Paris fill behind the ceiling, but the ceiling square was well secured and structurally sound. The fill also covered the original edges of the painted ceiling, which could then be uncovered mechanically using a scalpel.

**** Figure 91**

Partially removed fill from, showing uncovered original paint beneath the repair on the replaced square of ceiling

**** Figure 92**

Long hall ceiling repair showing the uncovering of edges, partial drilling out of the plaster of Paris and showing the date palm

A second section of the long hall ceiling was similarly investigated.[13] This section was not cut out and replaced like the first ceiling square, but was opened to enable the introduction of grouting with plaster of Paris. Likewise, there were fills over the edge of the join, some of which covered the original polychrome decoration that could be uncovered using a scalpel. The fills were repainted in the past with an approximation of the original ceiling pattern and colours. Some of the retouching was reduced, but most of the modern repainting was left in place as this restoration proved too extensive to be removed completely. No evidence of metal corrosion was found on the holding plates nor was any movement of the ceiling discovered subsequent to the installation of the stabilization arrangement. The system appears to have served its purpose well.

[13] No wood was found above this piece.

A similar type of system exists for the broad hall ceiling as documented by a Burton photograph of the right wing of the broad hall. Here a wooden (?) beam spanned the two lateral walls, and was stabilized with layers of mud plaster and plaster. Today, the modern ceiling was fashioned as rock face.

****Figure 93**

The old bracing system on the right wing of the broad hall ceiling and the reconstructed modern rock face.

After the investigation into the two sections, conservation treatment followed the techniques used elsewhere in the tomb. The original *muna* plaster and one area of disintegrated wood were consolidated with Syton. Grouting was carried out as necessary with PLM-A, and the painted edges were fixed with Plextol B500. Very deep voids around the cut sections were filled with a lime mortar with the addition of local straw; this was used to reduce the weight of the new fills in an area which had already undergone much treatment and carried the additional weight of the plaster of Paris. Other treatment included filling numerous small fills with a fine gypsum-based surface filler and retouching them with watercolor.

****Figure 94**

The finished and repaired square section in the long hall ceiling.

Reintegration

A selection of color lime washes (diluted lime putty mixed with earth pigments, raw umber, burnt umber, green earth and raw sienna) were used to tone the remaining areas of old repair plaster, most notably on the fragmentary broad hall far left wall (HLFL).[14] This wall had different phases of repair plaster that were visually distracting. The application of lime wash had the effect of pulling the whole wall together, blending the later PVA mortar around the more recently lost pieces and vulnerable edges. The lime wash evened out differences of texture and colour in the earlier plaster repairs, making the surviving painting fragments clearer and easier to read.

A similar lime wash treatment was used on the two phases of repair plaster on the entrance walls in order to unify the colour of the two earlier plaster repairs. Adding sand

[14] The individual painting fragments on this wall were treated with the same methods used elsewhere in the tomb. It was cleaned, secured with grouting or small repairs as necessary, and flakes were fixed with Plextol.

to this lime wash brought together the textures of the two plaster phases of plaster. A similar treatment was used over old repair plaster on the walls of the inner door and the different repair plasters on the broad hall ceiling.

**** Figure 95**

Applying lime-wash to BHFL (Cristina Beretta), left. Right, the lime-washed BHFL wall, and foreground edge repairs to the broad hall ceiling (Sasa Kosinova).

**** Figure 96**

Entrance door left (EDL), after application of unifying lime-wash.

**** Figure 97**

Acqua sporca

**** Figure 98**

Fine surface repairs, left and right, after toning with acqua sporca.

Aqua sporca (water colour wash, mixed to make a dirty water colour) was used on the new mortar repairs along the lower edge of the walls to tone them to the old repair above. It was also used to tone out the 'halo effect' around the fills, where previous repairs and mechanical scraping had led to the loss of paint and ground. A fine, surface gypsum-based filler was utilized to tone out using a neutral colour. *Aqua sporca* was also used to reintegrate the losses of black paint around the shrine wall (LHF). The old plaster repairs with greyish modern retouching were toned out using a neutral blackish watercolour.

**** Figure 99**

The shrine after cleaning and reintegration.

Future Protection

On completion of the conservation treatment, barriers were designed and installed in the broad hall, along with a timber walkway, and LED lighting (a very low energy and long lasting lighting system). The barriers protect the paintings from incidental and visitor related damage while still allowing free viewing of the paintings without the use of glass panels. Access to the long hall (which is very narrow and vulnerable to inadvertent damage) is not accessible to visitors and can be viewed from the walkway in the broad hall. For specific information on the final presentation of the tomb, see **Appendix I**.

**** Figure 100**

Proposed final presentation and visitor protection for TT 69

**** Figure 101**

The barriers and walkway in the broad hall

It was not considered necessary at this point to install monitors to regulate the relative humidity in the tomb, because there was no evidence of damage to the paintings that was related to fluctuating relative humidity values. The humidity is controlled and within reasonable limits. However, should the circumstances change, an rH monitoring system could be installed along with a plan to regulate humidity.

APPENDIX I

Tomb of Menna (TT69)
Conservation and
Documentation Project.

Photography & Digital Epigraphy

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Overview

Intent of Photography

Photographs were taken for multiple purposes: One set of photos will be used to record the walls before and after conservation. A high resolution, softly lit set of photographs will be used for the digital epigraphy and another set of photos taken with hard, angled lighting (raking light), will be used to analyze the paintings for workflow and method.

Intent of Digital Epigraphy

The digital epigraphy process was designed to make a high resolution, highly detailed, photographic representation of the wall paintings inside the Tomb of Menna. It is a non-invasive method to take multiple pictures of one wall, correct for lens and camera distortion, and stitch together the pictures to a single file with minimal manipulation.

Workflow

Photographing the walls

Equipment

- Canon EOS 50D SLR Digital Camera, 15.1 Megapixel
- Canon EF 14mm f/2.8L II USM Autofocus Lens[1]
- Canon Wide Angle EF 24mm f/1.4L USM Autofocus Lens[2]
- Canon EF 50mm f/1.2L USM Autofocus Lens[3]
- Canon EOS Rebel Film Camera
- Two 500 Watt Hensel Integra Pro Monolights
- 500 Watt Hensel Integra Monolight[4]
- Two 23” Umbrellas, One 45” Umbrella & One 36” x 48” Softbox
- Bogen / Manfrotto 190XPROB Tripod Legs with 3039 Super Pro Head
- Sekonic L-758DR DigitalMaster Flash Meter
- Xrite Mini ColorChecker Card
- Remote shutter release

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[1] Used for IDL, IDR, EDL, EDR, BHC, LHC wall coverage and some raking light. http://tiny.cc/canon14

[2] Used for all other wall coverage and most of the raking light. http://tiny.cc/canon24

[3] Used for some detailed raking light photos. http://tiny.cc/canon50

[4] Purchased and used only after both 500 Watt Hensel Integra Pro Monolights broke; otherwise not necessary.

- Kodak E100G 135-36 Ektachrome Professional Color Slide Film (ISO-100)
- Fujifilm Neopan-100 135-36 Professional Black & White Print Film

High resolution Complete Wall Coverage

The initial photography of the walls is the basis, and therefore the most important part, of the digital epigraphy process. Each photograph for any given wall was taken at the same distance from the wall, with the same lens (see footnotes above), a shutter speed of 1/60th of a second and a small lens aperture (varying from 13 to 22) to achieve a maximum depth of field. Every attempt was made to get a soft, even light throughout the image using the monolights available.

Archival Film Coverage

An archival film coverage, shot with black and white film and slide film, was taken using work lamps that were available during the period that no working monolight was available, Per ARCE guidelines, the camera was on a tripod with a slow shutter speed and small aperture, using a cable release.

Example of a raking light from BHNL.

Selective Raking Light Photography

Raking light pictures were taken of selected scenes using a severely angled hard light. The purpose of raking light is to show more detail, including brush strokes, in the painting. The best effect is achieved when the wall ends without butting up to another wall and the light can be angled half on the wall and half off.

Surveying the walls

The purpose of surveying the tomb walls is to create a three-dimensional point cloud that can then be used for rectification, measurements, and possibly help with a virtual reconstruction of the tomb. Numbered points were recorded on the 2007 images with corresponding numbered points measured with the Total Station and viewable in AutoCAD.

Prepare pictures for Rectification

There are many minor steps to be taken after the images are shot and before they can be rectified in AutoCAD.

Color Correct Images

In an attempt to have accurately color corrected photographs a color chart was used in every photograph and the colors were corrected by numbers to erase any possibility of human subjection. It was determined to set the white values to 225, 225, 225 which is actually 12% gray. The black tone was corrected to be 15,15,15 which is actually 94% gray. To correct any hue shifts in the photograph a 60% gray marker was also used. The value for this tone was 110, 110,110.

The image above shows the color corrected image on the left and the original image on the right. The info palette with the color values for the correct image is viewable as well as the curves adjustment dialogue box.

Correct Lens Distortion

Even though the lenses had corrective aspherical elements already in their glass, some distortion is to be expected, especially when working with lenses as wide as 14mm. PTlens, a a batch automated plug-in program for Adobe Photoshop, was used to correct this problem.[5]

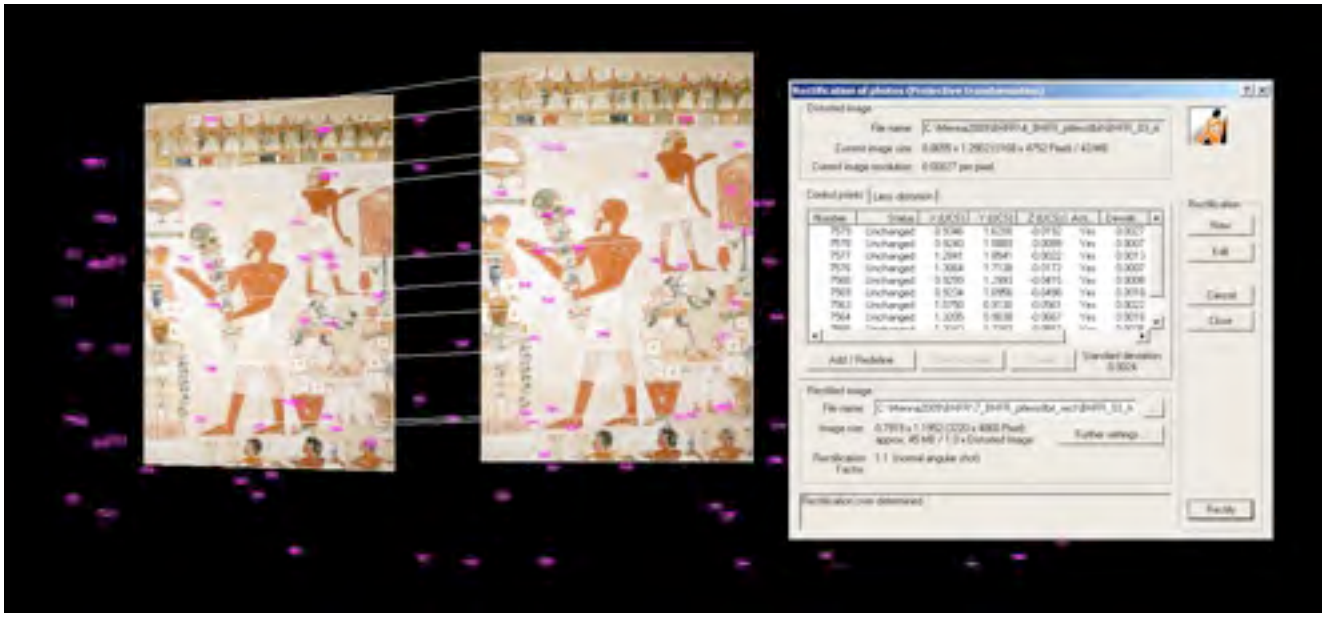
Convert to 8bit files

Before the images can be imported into AutoCAD they need be changed from 16 bit to 8 bit. This is a decrease in image quality because an 8 bit image has 256 colors per channel whereas a 16 bit image gives 32,769 colors per channel; however; the change is minimal since the color manipulation is corrected before the change.

[5] PTLens: http://epaperpress.com/ptlens/

Rectification

When rectifying images, PhotoPlan plug-in for AutoCAD is adjusting the images to take into account if the camera was not straight on the wall (which is near impossible to do). If the camera is slightly angled up then the bottom of the picture will be more narrow than the top of the picture once rectified since the top of the image was actually a little further away from the lens than the bottom of image. A real life example of this would be when one looks up at a tall building and through their eyes the top of the building looks more narrow than the bottom. To correct that perspective so that the two sides of the building are paralel, PhotoPlan would stretch out the top portion of the photo, making it wider. The rectification process consists of telling PhotoPlan/AutoCAD where specific points in the point cloud should be located on the picture. PhotoPlan/AutoCAD can then adjust the picture so that all points line up.



Primary Stitching

The primary stitching in Hugin lines all of the images up and puts them in the respective places on the wall.[6] Although Hugin is made for stitching images taken from a tripod mounted camera, by limiting the adjustments the program is allowed to make to just changing the size of the image (keeping the ratio controlled) it works for the digital epigraphy process.

Final Edit in Photoshop

Although Hugin works for initially getting the images on the wall in the proper place, there are too many variables between Hugin and PhotoPlan/AutoCAD for the walls to be stitched seamlessly together in this one step. The last step is to fix any gaps in Photoshop so that the lines between the different images are invisible.

The image above is an example of a minor glitch in the way the images lined up from Hugin. This needs to be corrected in Photoshop.

[6] Hugin: http://hugin.sourceforge.net/

Considerations

Color Correction

Color Chart

The color chart method used for color correction is the most reliable, economic method known at this time. However, it is not always accurate since the color values are dependent upon the way the light reflects off of the color chart. In the test below, the color chart was held up in the same position 5 times and each time a different value for the Red, Green and Blue tones was read for the Black, White and Gray values.

Black Value (R, G, B)	White Value (R, G, B)	60% Gray (R, G, B)
60, 51, 51	247, 242, 241	153, 145, 143
51, 43, 43	243, 238, 237	145, 136, 134
56, 49, 49	248, 243, 242	155, 146, 142
56, 47, 47	247, 241, 240	151, 141, 139
57, 49, 50	248, 243, 242	154, 145, 143

Light Metering

Another problem is the accuracy of light metering. It is impossible to stand completely out of the way of the reflecting light while still be close enough to the picture to take a measurement of the light in that corner. This was taken into account when the light measurements were read.

Surveying

One problem that was unaccounted in the 2007 season was what was to be conserved before the final photography season. Many of the nail holes and hay pieces found as rectification points in 2007 became covered up and unusable. With this in mind, more rectification should be taken around areas that will likely be conserved later.

Rectification

Resolution Change

If an image is taken at a sharp angle then PhotoPlan/AutoCAD is responsible for adding pixels and increasing the image size to the part of the picture that is further away from the lens. This tends to make the image slightly soft since PhotoPlan is not a serious image editing software.

Wall Contours

PhotoPlan/AutoCAD is also not set up to work with walls where there are large contours such as BHFL or LHL. Some of the rectifications are inaccurate due to this.

This image of EDL was taken at a severe angle, leaving a lot of work for PhotoPlan/AutoCAD. Note the poor quality on the right side of the image.

Placement of Survey Points

The most important part of rectification is the placement of survey points. There should be one well placed point in each corner of the picture. If there are too many points it is likely to have a mis-rectification because of unaccounted contours in the wall and if the corners are not rectified in the proper way then they will have trouble stitching to their surrounding pictures.

Since 2007 was used as trial season for the rectification process, and to prepare high resolution images to be traced for line drawings, the survey points used for the entire digital epigraphy process were determined from the 2007 images. When the walls were reshot in 2009, with a wider angle lens and in different positions, there was often a lack of rectification points in the proper places of the new images.

The image to the left, taken from BHFR, shows where the 2007 rectification points where taken. One can clearly see that this 2009 photo was taken in the middle of three columns from 2007, leaving only two lines of rectification points in the middle of the image and no points in any of the corners. This leaves for poor rectification in the corners of the images and difficulty when stitching images together.

Problems specific to Menna

These are all just examples of problems for Menna that effected my ability to work; they should not be used as commentary on the process as a whole.

Width of lens

The amount of pictures required for each wall was undecided when I was buying lenses. Kai was under the impression that the pictures would be with a wider angle lens, requiring less post production work and stitching. Melinda still wanted to keep the same resolution that Andi had in 2007. The first couple days in the tomb were spent deciding how much wall each image should cover.

Dirt Floor

The whole photography process would have gone much smoother if a smooth floor was in place. The tripod was very difficult to work with on minor adjustments because of holes and rocks in the floor. Also, the amount of dust in the air after two years of a dirt floor was greatly increased from Fall 2007 and many times I had to wait for dust to settle before I could continue with the photography.

Overlap and Program Problems

It was assumed that one of the major problems that we had in 2007 was due to insufficient overlap between photographs. Although the bigger overlap definitely made the stitching easier, I believe that we did not sufficiently take into account other factors such as the wall contours and placement of rectification points. These problems are mainly due to the fact that no one program is designed to do what we are trying to do and we therefore need to work with those available programs.

Missing files from 2007

We did not have any survey point files from LHR or BHNL from 2007. There were also insufficient survey points taken for EDR, EDL, IDR, IDL, BHC and BHFL. The time taken to resurvey these walls was not accounted for.

Lighting Troubles

Although there is no way to prepare for a disaster such as this, the two monolights failing due to poor electrical currents certainly put a damper on the work.

Conclusion

In the end, it was a successful epigraphy season and the final product fits the bill. However, with the numerous problems through the workflow and the excessive manipulation necessary in Photoshop, I would definitely like to research other technology available before repeating the process in another tomb.

FIGURES, PLATES AND TABLES

- All digital drawings by Pieter Collet
- All photographs by Katy Doyle, unless stated otherwise
- Other contributors: Kai-Christian Bruhn, Renata Garca-Moreno, Melinda Hartwig, Kerstin Leterme, Bianca Madden, Hana Navratilova, Andreas Paasch, Douglas Thorp

FIGURES

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