THE VALLEY OF THE KINGS

A Site Management Handbook

Kent R. Weeks
Nigel J. Hetherington

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With a Kings Valley Condition Survey
by Dina Bakhoum

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Preface

The Theban Mapping Project (TMP) began work in the Theban Necropolis in 1979. Since then, it has devoted much of its time to the preparation of an archaeological map of the Valley of the Kings (KV), to conducting existing-condition surveys of all its accessible tombs, and to developing a comprehensive site management plan, the first ever undertaken in Egypt. KV has come to be recognized as a fragile part of humankind's cultural heritage that is in need of monitoring and constant care. Its irreplaceable contents must be carefully managed and protected, and the delicate and precarious balance between environmental pressures and economic demands must be controlled if it is to survive for future generations.

The following management plan for KV is the result of nearly a decade of work. It is far from the last word on the subject of site protection, and it does not pretend to offer answers to all the many questions of archaeological conservation and tourist control posed by the site. But it is a start, and we hope it will stimulate discussion and action among the many stakeholders who are responsible for determining KV's future.

The preparation of a KV management plan has always been a part of the TMP's work, but it became a principal concern of the project in 2004. A first edition of the plan appeared in 2007. Additional work has been conducted since then, including continued condition surveys, photographic recording, and updated stakeholder surveys. This book includes

this updated material, but it has not been possible to obtain more up-to-date tourism figures for Luxor and KV than those included in this report. Tourism dropped markedly after the Arab Spring, and we are told that Luxor hotel occupancy in winter 2012 was at 20 percent of pre-2010 levels. This does not bode well for the economy of Egypt, but one hopes that the government can take advantage of the less crowded conditions in KV to reexamine its cultural resource management procedures and implement some of the changes proposed here.

A question that has been frequently asked—we ask it ourselves—is whether this plan will be implemented or simply shelved, as so many proposals for archaeological conservation have been in the past. We are optimistic. Indeed, several parts of the plan—on-site signage, the new Visitors Center, and new parking areas, to name a few—have already been completed, and others—better tomb lighting and traffic management, for example—are ready to implement.

There is a bit of anecdotal evidence that further supports our optimism. In 2011, the TMP opened a library as part of its Luxor West Bank office. It includes a large collection of books in English and Arabic on Egyptology, archaeological methodology, site conservation practices, and management plans around the world. The library is the first such facility in Egypt that makes available works essential to the proper training of archaeological site managers and conservators. In just six months, the library, which is open to all at no charge from 3 to 9 pm, seven days a week, was being used by over two dozen adults daily. These include tour guides, inspectors of antiquities, members of the government's conservation staff, and students—all persons working with Theban monuments, all voluntarily making extensive and enthusiastic use of the library's resources. When asked why they come, the answer most of them give is this: "We know the monuments of Thebes must be protected, and we want to help. We want to learn to do our jobs better." Our library also contains a children's section, with Arabic-language books on Egypt's history and its monuments. Here, too, the collection is being used heavily by primary and secondary school teachers and students, who come voluntarily, individually and in small groups, to learn more about their country's history. That so many Supreme Council of Antiquities (SCA) staff members are using the library bodes well for the future of the Theban monuments; that

so many enthusiastic youth are also coming offers great hope for the long-term survival of one of Egypt's greatest assets.

Chapter 4 ("Stakeholder Surveys") was prepared by Nigel Hetherington and is based upon surveys undertaken by the Social Research Center of the American University in Cairo. Chapter 5 ("KV Condition Surveys") is a summary of reports prepared for the TMP by Dina Bakhoum. Editorial assistance was provided by Lori Lawson and Magdy Abu Hamad Ali. On-site work was supervised by Ahmed Mahmoud Hassan. Many individuals supported the work of the TMP summarized here, but we must give special thanks to Dr. Gaetano Palumno and Ms. Bonnie Burnham of the World Monuments Fund; Mr. Neville Agnew of the Getty Conservation Institute; Mr. Bernard Selz, Ms. Deborah Lehr, Mr. Bruce Ludwig, Mr. and Mrs. Howard Zumstag, Ms. Mary Arce, Janice Jakeway, Richard Flanagan, Bob and Carole Braxton, Ms. Eileen Gutierrez, and Wilderness Travel. The staff of the Supreme Council of Antiquities, now the Ministry, have been very helpful, and we must offer particular thanks to Mr. Mansour Boraik for providing much of the statistical data in chapter 4. Thanks also to Ali Ibrahim Youssef for his help with contemporary data collection.

1 Introduction to the Site

Site Definition

Thebes and Modern Luxor

Thebes is one of the largest, richest, and best-known archaeological sites in the world. It lies about 900 km (560 miles) south of Cairo on the banks of the River Nile. On the East Bank, beneath the modern city of Luxor (fig. 1), lie the remains of an ancient town that from about 1500 to 1000 BC was one of the most spectacular in Egypt, with a population of perhaps fifty thousand. Even in the Middle Kingdom, four centuries earlier, Thebes had earned a reputation as one of the ancient world's greatest cities. Within it, the Egyptians had built huge temple complexes at Karnak and Luxor. These are two of the largest religious structures ever constructed, the homes of priesthoods of great wealth and power. On the West Bank lies the Theban Necropolis—covering about 10 km^2—in which archaeologists have found thousands of tombs, scores of temples, and a multitude of houses, villages, shrines, monasteries, and work stations.

Thebes has been inhabited continuously for the last 250,000 years. The first evidence of the Paleolithic in Africa was found there. However, the most important period in its history was the five-century-long New Kingdom, when what the ancient Egyptians called this 'model for every city' achieved unrivaled religious, political, and architectural stature. Every New Kingdom pharaoh—there were thirty-two of them—and

Fig. 1. West Bank Luxor. © Theban Mapping Project

many before and after that date added to the site's huge architectural inventory. The monuments erected during Dynasties 18, 19, and 20 have ensured that even today, thirty centuries later, Thebes is one of the world's foremost archaeological sites. Not surprisingly, it was one of the first sites listed by UNESCO as a World Heritage Site (in 1979).

The name 'Thebes' was given to the town by early Greek travelers. Some historians believe the Greeks misheard the local name for an area around Medinet Habu, 'Jeme'; others think that it came from 'Tapé,' or *tp*, meaning 'head' in ancient Egyptian. In the Bible, Thebes was called No, from the ancient Egyptian word *niw*, meaning 'city.' The Egyptians also called it Waset, the name of the nome (administrative district) in which it lay, or *niwt 'Imn*, 'city of Amun,' which the Greeks rendered as 'Diospolis,' 'city of Zeus' (the god with whom the Greeks equated Amun). The Egyptians had many epithets for Thebes: "City Victorious," "The Mysterious City," "City of the Lord of Eternity," "Mistress of Temples," "Mistress of Might," and others. The more recent name for Thebes, Luxor, derives from the Arabic 'al-Uqsur,' meaning 'the castles,' which in turn may derive from the Latin word *castrum*, meaning a military garrison.

Between the river and the desert edge, the Nile Valley floodplain consists of a thick layer of nutrient-rich silt deposited by millennia of annual Nile floods. Today, perennial irrigation waters fields of sugar cane, clover, wheat, and vegetables, and makes possible two crops annually. Before the completion of the Aswan High Dam in the 1960s, which ended the annual Nile flood in Egypt, the river rose every year in June, and for the following four months covered the floodplain with 30–50 cm of water. It filled shallow, natural 'basins' that were a product of uneven silt deposition across the floodplain. About six such basins lay on the Theban West Bank, each covering several square kilometers. After the floodwaters receded, these now water-saturated basins were planted and their crops harvested in late autumn and winter. In dynastic times, farmers grew wheat, barley, sorghum, pulses, onions, garlic, and melons. These were vegetables of such quantity and quality, grown with such ease, that European visitors constantly remarked about the wondrous Egyptian soil. Some believed that life generated spontaneously in this rich Nile mud and that simply drinking Nile water could cause a woman to become pregnant. The valley's fabled richness became for Europeans proof of the special place Egypt occupied in the hearts of the gods. Nowhere but in

New Kingdom Pharaohs
Eighteenth Dynasty
Ahmose I 1539 BC–1514 BC
Amenhotep I 1514 BC–1493 BC
Thutmose I 1493 BC–1482 BC
Thutmose II 1482 BC–1479 BC
Thutmose III 1479 BC–1426 BC
Hatshepsut 1479 BC–1458 BC
Amenhotep II 1426 BC–1400 BC
Thutmose IV 1400 BC–1390 BC
Amenhotep III 1390 BC–1353 BC
Akhenaten 1353 BC–1336 BC
Smenkhkare 1336 BC–1333 BC
Tutankhamun 1333 BC–1323 BC
Ay 1323 BC–1319 BC
Horemheb 1319 BC–1292 BC
Nineteenth Dynasty
Ramesses I 1292 BC–1290 BC
Seti I 1290 BC–1279 BC
Ramesses II 1279 BC–1213 BC
Merenptah 1213 BC–1203 BC
Seti II 1203 BC–1196 BC
Amenmesse 1196 BC–1190 BC
Siptah 1196 BC–1190 BC
Tawosret 1190 BC–1188 BC
Twentieth Dynasty
Setnakht 1188 BC–1186 BC
Ramesses III 1186 BC–1155 BC
Ramesses IV 1155 BC–1148 BC
Ramesses V 1148 BC–1143 BC
Ramesses VI 1143 BC–1135 BC
Ramesses VII 1135 BC–1129 BC
Ramesses VIII 1129 BC–1127 BC
Ramesses IX 1127 BC–1108 BC
Ramesses X 1108 BC–1104 BC
Ramesses XI 1104 BC–1075 BC

Table 1. Kings of the New Kingdom

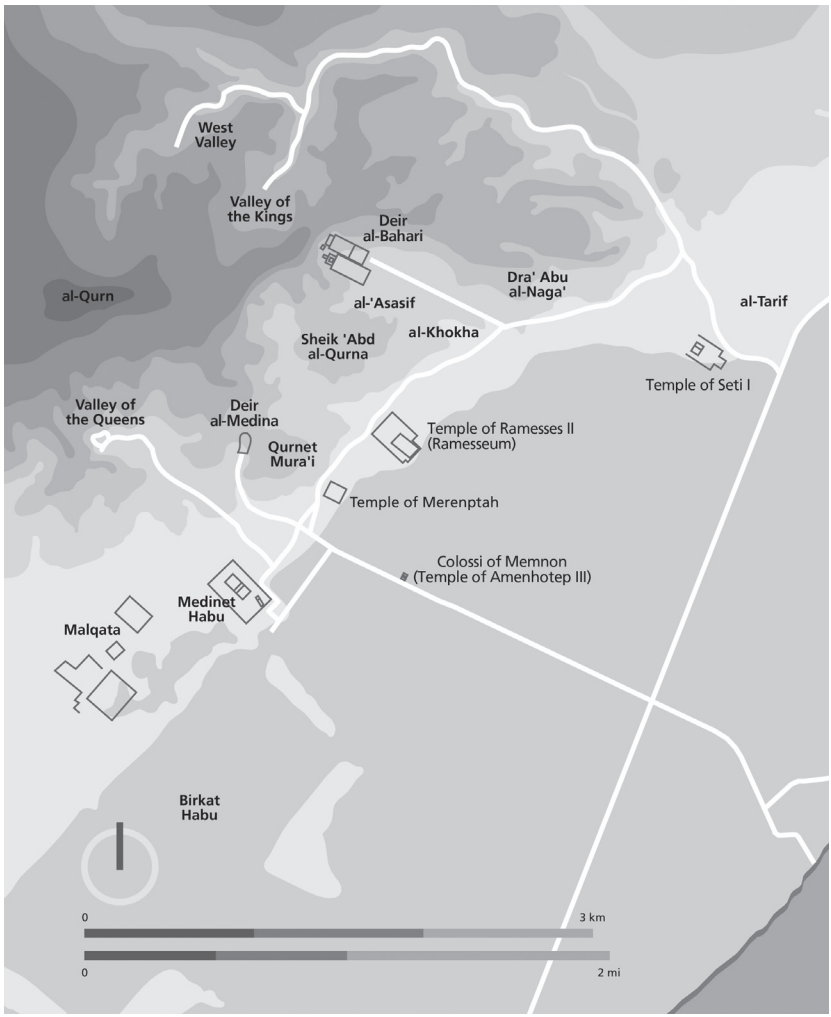

Fig. 2. Location map, Luxor. © Theban Mapping Project

Egypt were the silts so rich, crops so plentiful, fields so easily tended. Even today, the Theban area has a great reputation for agricultural excellence, and tourists who come to admire its monuments often leave equally impressed by its landscape. Azure skies, green fields, blue river, golden hills, crimson sunsets, and fluorescent afterglow give Thebes the appearance of an over-imagined painting. Europeans were certain that here lay the landscape in which God had created the Garden of Eden.

The close proximity of limestone for building and plentiful agricultural land helped maintain the wealth and prestige of ancient Thebes. But the reasons that it grew from a sleepy Old Kingdom hamlet to a substantial Middle Kingdom town and a formidable New Kingdom city were political and religious. The reunification of Egypt after the defeat of the Herakleopolitans at the end of the First Intermediate Period was largely the work of Theban rulers, who appointed Theban officials to high government positions, thereby assuming control of the entire country. During the Second Intermediate Period, Theban rulers again achieved prominence. With the expulsion of the Hyksos in the Seventeenth Dynasty, they again governed Egypt.

But Thebes was inconveniently located too far south to rule a country becoming, in the New Kingdom, increasingly tied economically and politically to western Asia. The town of Pi-Ramese was built in the Nile Delta to ease problems of international communications, and it assumed importance as Egypt's diplomatic and military center. Memphis, at the apex of the Nile Delta, served as the headquarters of Egypt's internal bureaucracy. Inconvenient location notwithstanding, Thebes prospered and was revered. In part, this was due to the religious, political, and economic power wielded by Amun, the principal god of Thebes. Credited with having freed Egypt from its enemies, making it the wealthiest and most powerful country in the ancient world, establishing Thebes as "the queen of cities," Amun, joined with the Heliopolitan solar deity as Amun-Ra, became the "king of the gods," the leader of the Egyptian pantheon. The Theban temples of Amun, with their huge landholdings and large cadres of priests that managed them, ensured that Thebes was Egypt's preeminent religious center. It remained the perceived capital city of Egypt long after actual bureaucratic authority had moved away. This state of affairs continued into the Late Period. Eventually, however, as Egypt's wealth and power declined, so invariably did that of Thebes. There are Late Period, Greek, and Roman references to Thebes, and a large number of Christian monasteries, churches, and hermitages on the West Bank. But from about the eleventh century AD, Thebes virtually disappeared from history. It was not until the coming of European visitors in the eighteenth century that Thebes, by now called Luxor, resumed its place as one of the most famous cities in the world.

The West Bank

The boundaries of the Theban West Bank have changed significantly during the last century. In common local usage, "the West Bank" has referred to the west bank of the Nile directly across from the city of Luxor, and the term implied no specific boundaries (fig. 3). The term 'Theban Necropolis' could also refer to this area, but it was usually limited to the desert lands west of the cultivation into parts of a complex wadi system that contains archaeological remains. Its northern and southern boundaries were not clearly defined.

In ancient times, designations of the West Bank were vague. The area was called "West of Thebes," "the Great West," or "the Beautiful West," but its boundaries were never mentioned. Today, somewhat more precisely, "the West Bank" is defined administratively as the west bank of the Nile lying within the modern boundaries of Luxor City. The northern boundary lies beyond the modern villages of al-Tarif and the complex called New Thebes. The southern boundary is near Armant. The western boundary is not specified, but is meant to extend far enough into the desert to include any archaeological sites. The eastern boundary is the River Nile.

Fig. 3. Location map, KV in West Bank. © Theban Mapping Project

The West Bank area known as "antiquities land," that is, land controlled by the Supreme Council of Antiquities (SCA), was broadly defined and enlarged in a law passed in 1956. Prior to that date, the Colossi of Memnon (but not the mortuary temple of Amenhotep III, of which they are a part) lay on a small 'island' of government-owned land surrounded by private fields. In 1956, several hundred square meters of the temple in private hands were incorporated into antiquities land, creating a single, contiguous archaeological zone. (A very substantial part of the temple compound surrounding the central core, however, still lies beneath privately owned sugar cane fields.)

There are still many irregularities in the "antiquities land" boundaries. Some date back to a decision made in 1926, when the Egyptian government issued a decree declaring the West Bank to be a protected area. The 1926 Survey of Egypt graphically showed the area's eastern boundary on its 1:500 "Theban Necropolis" map sheets. Generally, that boundary was drawn along the edge of the cultivation, regardless of whether antiquities lay east of it or not. This arbitrary (and, frankly, inexplicable) line resulted in some temples lying partly in the protected antiquities zone and partly in unprotected private lands. The memorial temple of Thutmose III is an example: its First Pylon and courtyard lie in private agricultural land (now rented out as a launching point for hot-air balloons) outside the antiquities zone; the part from the Second Pylon westward lies within it. Recent attempts have been made by the SCA to rationalize such boundaries, but this is still very much a work in progress.

Thebes was designated a World Heritage Site by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 1979, but none of UNESCO's documents correctly define its boundaries either. They were said to include the East Bank temples of Karnak and Luxor and the West Bank "necropolis, funerary temples, royal palaces, and a village of craftsmen and artists." SCA officials have been no more precise about its East Bank borders, but they are trying to be more precise about its limits on the West Bank. They argue that the World Heritage Site begins at the Nile, then extends west through agricultural land into the desert beyond the Valley of the Kings. The northern boundary includes the archaeological zone of al-Tarif; the southern includes Malqata and Deir al-Shalwit.

For inexplicable reasons, the coordinates given by the World Heritage Convention for the boundaries of "Ancient Thebes with its Necropolis"—Long 32° 35–40' E, Lat 25° 42–45' N—do not include some of the pertinent monuments, most notably Luxor Temple. In the map below (fig. 4), the coordinates have been corrected by the TMP and the entire protected area is shown within the rectangle, the two longitudinal lines representing 32° 30' E and 32° 40' E and the two latitudinal lines showing 25° 41' N and 25° 45' N. The 2 km buffer zone (see below) would add another two minutes to each boundary.

For economic reasons, some officials and entrepreneurs maintained that the eastern boundary of the archaeological zone is not the Nile but the main Cairo–Aswan highway that runs north to south several kilometers to the river's west. This definition, they believed, could allow new hotels and cruise ship moorages to be built along the river. The SCA,

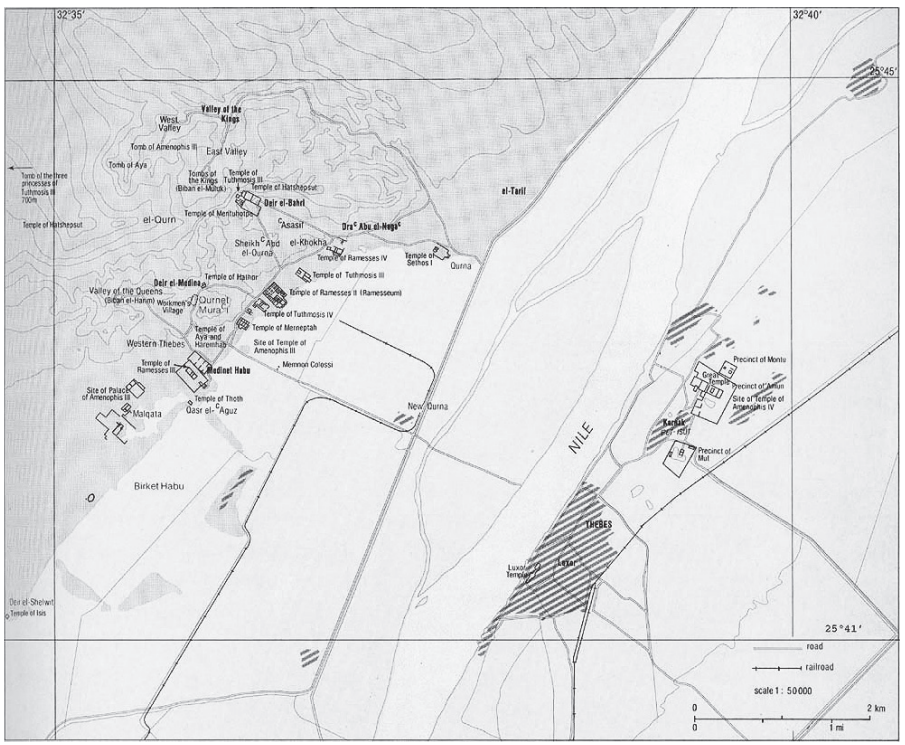

Fig. 4. WHC zone. © Theban Mapping Project based upon various historical sources

however, argues that the World Heritage Site does extend to the Nile, and that the area to be protected must include the cultivated floodplain and the Nile riverbank. Justification of this view is that the panoramic view of the West Bank from Luxor is as much a part of the area's heritage as its individual monuments, and it is clear that UNESCO's intention was to protect that view. Indeed, a law defining the River Nile as the eastern boundary of the site was passed by Egypt's National Assembly in 1983. It was based upon official *amlak* (cadastral) surveys of the area. This was reaffirmed in 2005 by the Luxor City Council when it gave orders to demolish new construction along the banks of the Nile. The reasons cited were that such construction was unsightly, detrimental to the landscape, illegally built on government land, and in violation of antiquities laws.

In 1980, President Sadat decreed the West Bank to be a Cultural Heritage Site, and prohibited any building activity that encroached upon it or altered its character. In 2004, President Mubarak reaffirmed the 1980 decree, and further declared that SCA-owned lands should be surrounded by a 2-km-wide 'buffer zone' in which only limited building activity would be permitted.

The Valley of the Kings

Known today in Arabic as Wadi Biban al-Muluk (the Valley of the Gates of the Kings) and in antiquity as "The Hidden," the Valley of the Kings (KV, for "Kings' Valley") consists of two branches of a complex West Bank wadi system in the desert west of the temples at Deir al-Bahari. It is called in Arabic *wadiayn*, "the Two Valleys," further identified as the East Valley and West Valley (figs. 5 and 6). For purposes of this masterplan, we consider the term 'Valley of the Kings' to include both the East and West Valleys, the entire watershed defined by the hills surrounding them (fig. 7), and the roads and paths that connect them to the Nile Valley.

The East Valley is the better known and the most visited by tourists because of the many royal tombs found there. There are two royal tombs in the West Valley, plus a few small, undecorated tombs of unidentified royal family members. The Valley of the Kings is less than a kilometer as the crow flies from the Nile floodplain, but the modern road leading to it describes a great arc over five kilometers long (fig. 5).

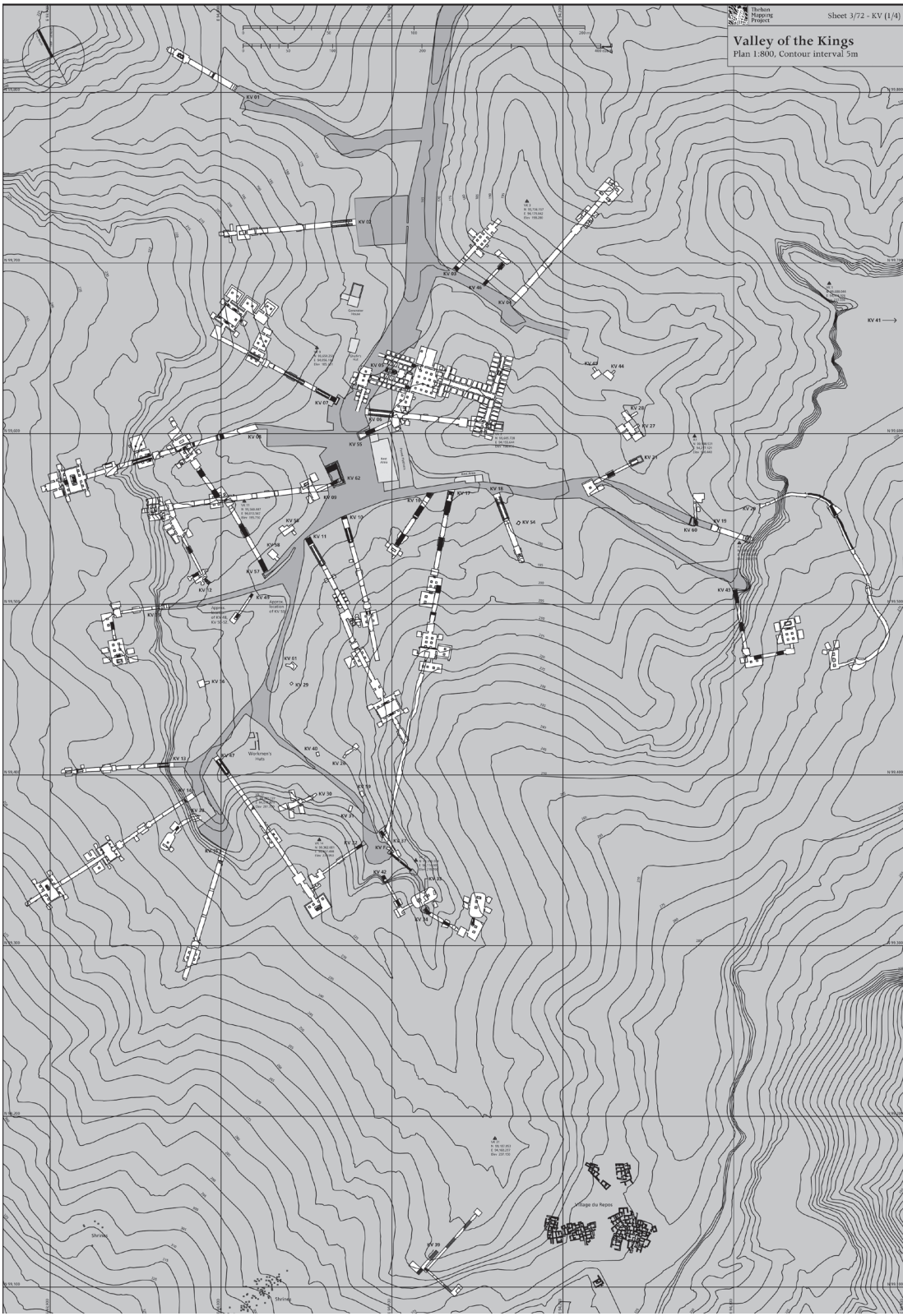

Fig. 5. Map of East Valley. © Theban Mapping Project

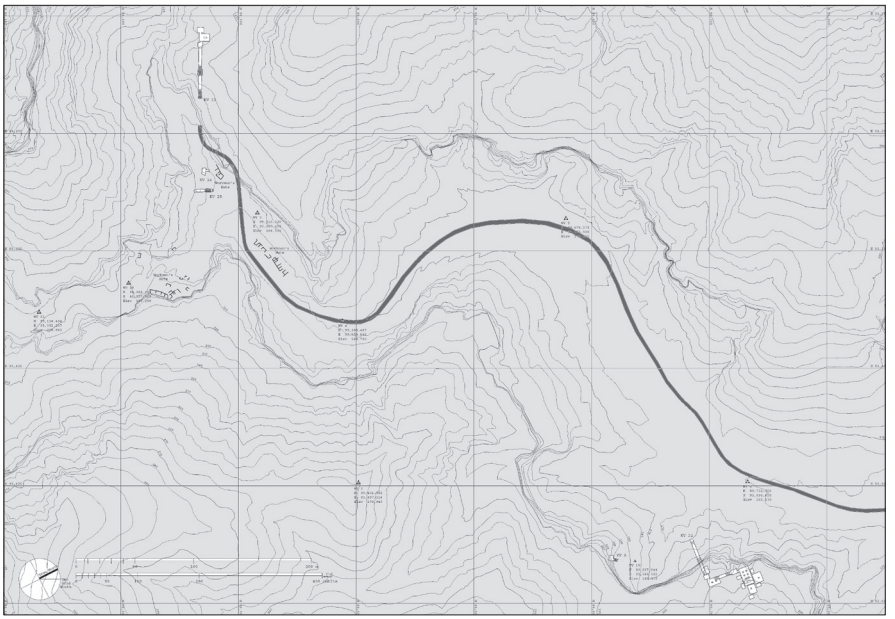

Fig. 6. Map of West Valley. © Theban Mapping Project

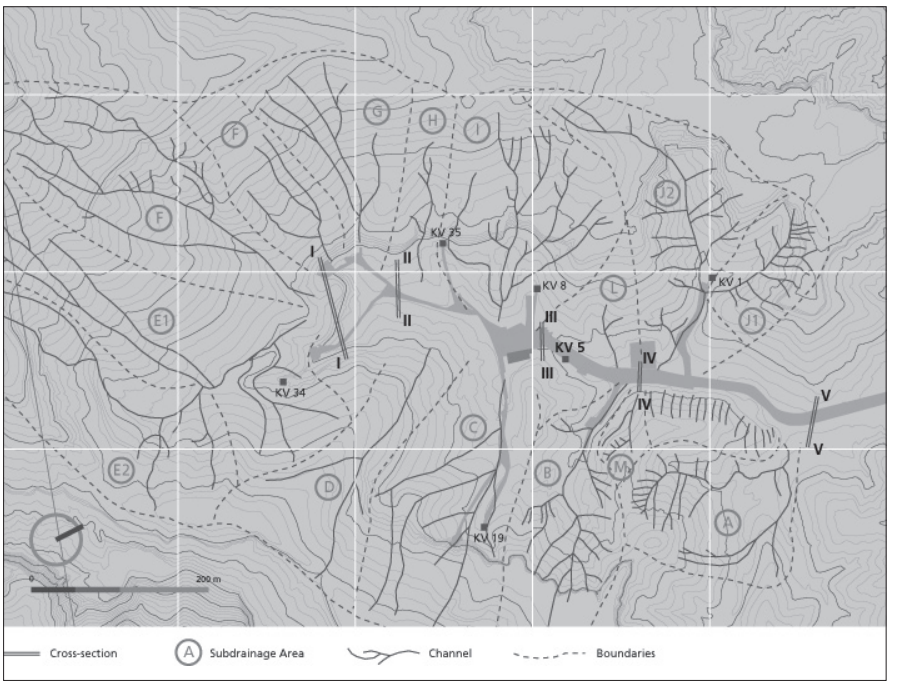

Fig. 7. Hydrological map of the East Valley of the Kings 2000. © Theban Mapping Project

Wadis are small, steeply sided valleys, or arroyos, found throughout the limestone hills of Egypt. They were cut into bedrock millions of years ago by heavy rains that fell almost continuously over the North African landscape, eroding bedrock created millions of years earlier when it lay beneath a great sea called Tethys, the precursor of the Mediterranean. Virtually all exposed bedrock in this part of Egypt is limestone, and it contains small pieces of chert embedded in its several strata (making the bedrock look rather like a bowl of cream and raisins). These chert nodules were used from the Paleolithic through dynastic times as the material of choice for making tools. There is also an underlying, discontinuous strata of montmorillonite, a dangerously unstable stone also called Esna shale (in Arabic *tafla*). Esna shale is known in the Valley of the Kings, and can be seen exposed in several KV hillsides and tombs. When this shale is exposed to water or even high humidity, it expands and can exert tremendous pressure on the limestone strata above it. As it expands, it can seriously damage the tombs that are cut there.

Historical Development of the Valley of the Kings

Introduction

The Valley of the Kings served as the burial place of Egypt's pharaohs during the New Kingdom, from 1550 to 1070 BC. For the first time, Egyptians located royal tombs away from the other component parts of the royal memorial temple. They built the temples along the edge of the West Bank cultivation, where they could be reached by religious processions that traveled from Karnak Temple by boat along canals cut through the fields. The tombs were dug several kilometers away, in the solid, dry bedrock of the isolated and easily guarded Valley of the Kings, called Wadi al-Muluk.

The first ruler to be buried here may have been Thutmose I, the third king of the Eighteenth Dynasty; the last was Ramesses XI, last ruler of the Twentieth Dynasty.

During its five centuries of use, at least sixty-four tombs were dug in KV. Each was assigned a number, 1–22, by John Gardner Wilkinson (1797–1875, early British traveler), who worked in the mid-1800s (fig. 8).

Wilkinson's scheme assigned numbers geographically from the entrance of the Valley southward, and from west to east. Since then, tombs have been numbered in order of their discovery, the most recent being KV 62 (King's Valley tomb 62, the tomb of Tutankhamun, found by Howard

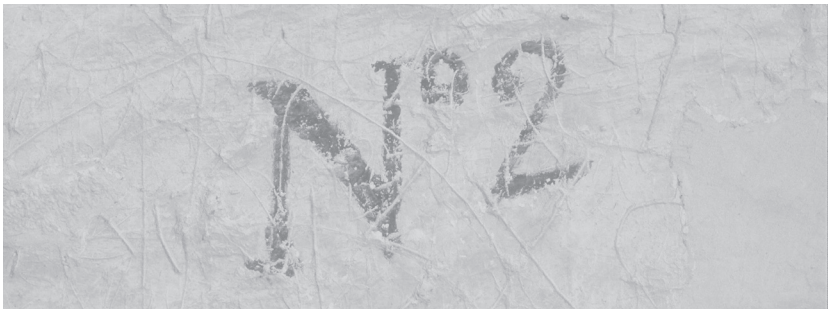

Fig. 8. An example of Wilkinson's KV numbering. © Theban Mapping Project

KV1	The tomb of Ramesses VII	KV33	Unknown
KV2	The tomb of Ramesses IV	KV34	The tomb of Thutmose III
KV3	The tomb of an unnamed son of Ramesses III	KV35	Originally the tomb of Amenhotep II, Cache
KV4	The tomb of Ramesses XI	KV36	The tomb of the noble Maiherperi
KV5	The tomb of some of the sons of Ramesses II	KV37	Unknown
KV6	The tomb of Ramesses IX	KV38	The tomb of Thutmose I
KV7	The tomb of Ramesses II aka Ramesses the Great	KV39	Possibly the tomb of Amenhotep I
KV8	The tomb of Merenptah	KV40	Unknown
KV9	The tomb of Ramesses V and Ramesses VI	KV41	Unknown
KV10	The tomb of Amenmesse	KV42	The tomb of Hatshepsut-Meryet-Ra
KV11	The tomb of Ramesses III	KV43	The tomb of Thutmose IV
KV12	Unknown	KV44	Unknown
KV13	The tomb of Bay	KV45	The tomb of the noble Userhat
KV14	The tomb of Tawosret later reused by Setnakht	KV46	The tomb of the nobles Yuya and Thuyu
KV15	The tomb of Seti II	KV47	The tomb of Siptah
KV16	The tomb of Ramesses I	KV48	The tomb of the noble Amenemipet
KV17	The tomb of Seti I	KV49	Unknown
KV18	The tomb of Ramesses X	KV50	Unknown
KV19	The tomb of Mentuherkhepshef	KV51	Unknown
KV20	The tomb of Hatshepsut and Thutmose I	KV52	Unknown
KV21	Unknown	KV53	Unknown
KV22	The tomb of Amenhotep III	KV54	Tutankhamun Cache
KV23	The tomb of Ay	KV55	The tomb of Tiye (?) or Akhenaten (?)
KV24	Unknown	KV56	Unknown
KV25	Unknown	KV57	The tomb of Horemheb
KV26	Unknown	KV58	Unknown
KV27	Unknown	KV59	Unknown
KV28	Unknown	KV60	The tomb of Sit-Ra (?)
KV29	Unknown	KV61	Unknown
KV30	Unknown	KV62	The Tomb of Tutankhamun
KV31	Unknown	KV63	Cache
KV32	The tomb of Tia'a	KV64	—

Table 2. Tombs in the Valley of the Kings. © Theban Mapping Project

Carter in 1922); KV 63, found by Otto Schaden in 2005; and KV 64, uncovered by a Swiss mission in 2011. The tomb of the sons of Ramesses II (KV 5) was rediscovered in 1995 by the Theban Mapping Project, but its entrance had been seen by Wilkinson a century and a half earlier, and was assigned its number then. In addition, there are about two dozen 'commencements,' tomb shafts that were begun but almost immediately abandoned for unknown reasons. The non-royal tombs in KV belonged to various officials, royal family members, and priests.

The Valley of the Kings lies about one kilometer west of the Nile floodplain at Thebes (modern Luxor). It was cut by torrential rains and erosion during several pluvial periods in the Pleistocene into a thick layer of limestone that lies above a discontinuous stratum of Esna shale. The Valley lies about 70 m (230 feet) above the level of the River Nile, 140 m (460 feet) above mean sea level. The immediately surrounding hills that define the East Valley rise an average of 80 m (265 feet) above the valley floor. It was probably chosen as the burial place of royalty because of its geology, its relatively convenient access from the Nile floodplain, and the pyramid-shaped mountain, 'al-Qurn,' or 'forehead,' that rises about 300 m (985 feet) above its southern end that perhaps was seen as a symbol of solar deities.

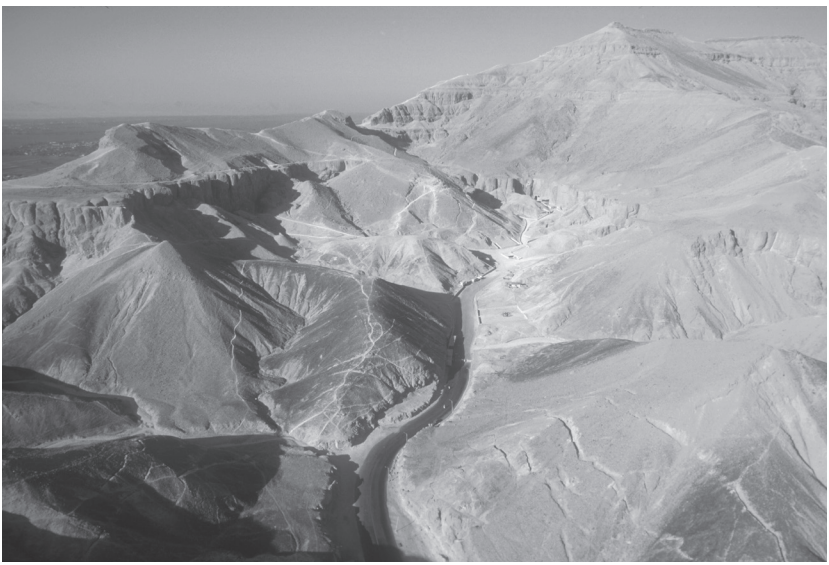

Fig. 9. al-Qurn. © Theban Mapping Project

Tomb Construction

Tombs in the Valley of the Kings did not follow a single plan. Their layout and decorative program were based on notions of the journey taken by the pharaoh and the sun god through the night sky and into the Afterlife, and as priests revised those notions, tomb plans changed. Royal mortuary architecture therefore had theological significance. Tombs in the Eighteenth Dynasty were relatively small, with steep corridors that sometimes curved downward or made several right-angle turns before reaching an oval or rectangular burial chamber. Tombs of the Nineteenth Dynasty had steep corridors leading along a single (or a jogged) axis to a large burial chamber and multiple side rooms. In the Twentieth Dynasty, tombs were again smaller, nearly level, with wider and higher corridors (fig. 10).

The walls of KV tombs were decorated with raised relief cut in the bedrock or, if the bedrock was unsuitable, painted on a layer of plaster applied over it. After a tomb chamber had been dug, its walls were smoothed, a thin layer of mud plaster mixed with wheat chaff was applied, then painted with a white or gray wash. Scenes and hieroglyphic texts were outlined in red ink, then amended, if necessary, by senior scribes and artisans who used black ink to correct spelling errors or the proportions of figures. Raised relief was carved, the figures modeled, and paint applied. The artist's palette consisted of only six colors, each made of natural ingredients, usually mineral: black (made from soot and charcoal), white (gypsum), red (hematite or ochre), yellow (limonite or yellow ochre), blue (ground faience), and green (made from copper, or a mix of yellow and blue pigments).

The selection of a KV site for a royal tomb was made by the vizier and the country's principal architects, and later perhaps affirmed by the pharaoh. Early in the New Kingdom, during the Eighteenth Dynasty, preference was often given to sites in the base of the sheer cliffs that surround KV, ideally below cliffs over which, in the rare event of rain, a temporary waterfall would pour and deposit debris over the tomb's entrance, burying it ever deeper over the centuries. In the late Eighteenth and Nineteenth Dynasties, the preferred location was in lower-lying talus slopes; in the Twentieth Dynasty, it was one of the small spurs of bedrock that extend from the Valley's sides into the center of KV. These changes in preferred location may indicate that Eighteenth Dynasty tombs were intended to be completely and permanently sealed after the burial, while Nineteenth and Twentieth

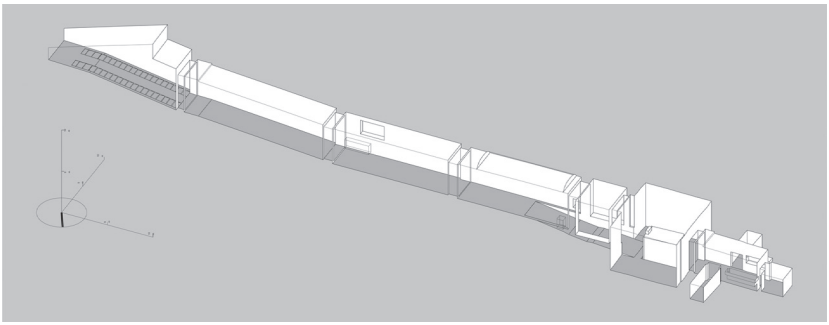

Fig. 10a. Dynasty 20 tomb style. © Theban Mapping Project

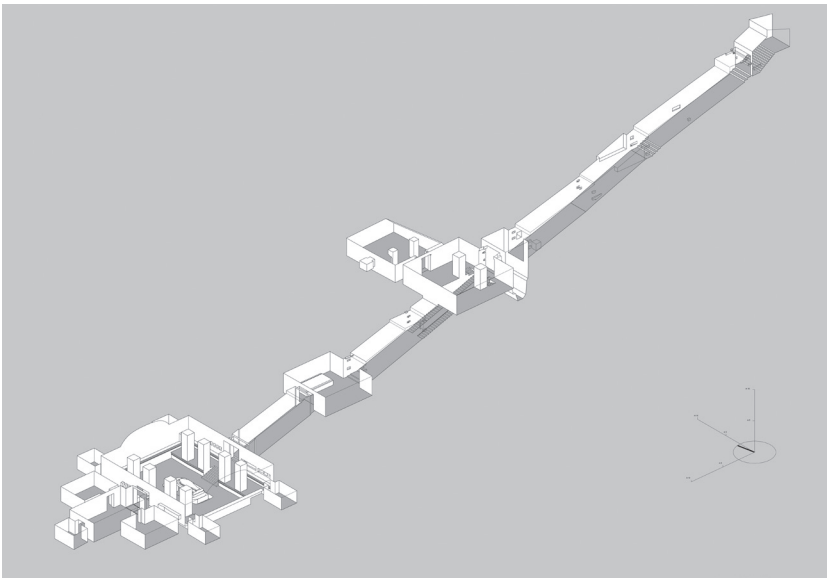

Fig. 10b. Dynasty 19 tomb style. © Theban Mapping Project

Dynasty tombs were to remain partially accessible so that ceremonies could continue to be performed in them long after the pharaoh had been interred. In this latter case, it is likely that only the burial chamber and its storerooms would have been permanently closed. The orientation of the tomb was apparently the result of geological considerations, not a desire to physically align the tomb to any particular cardinal direction: tomb axes run in compass directions ranging from 68° to 357°. In order to place decoration correctly on their walls, artists arbitrarily assumed that a tomb's principal axis ran from east to west, no matter what its actual direction.

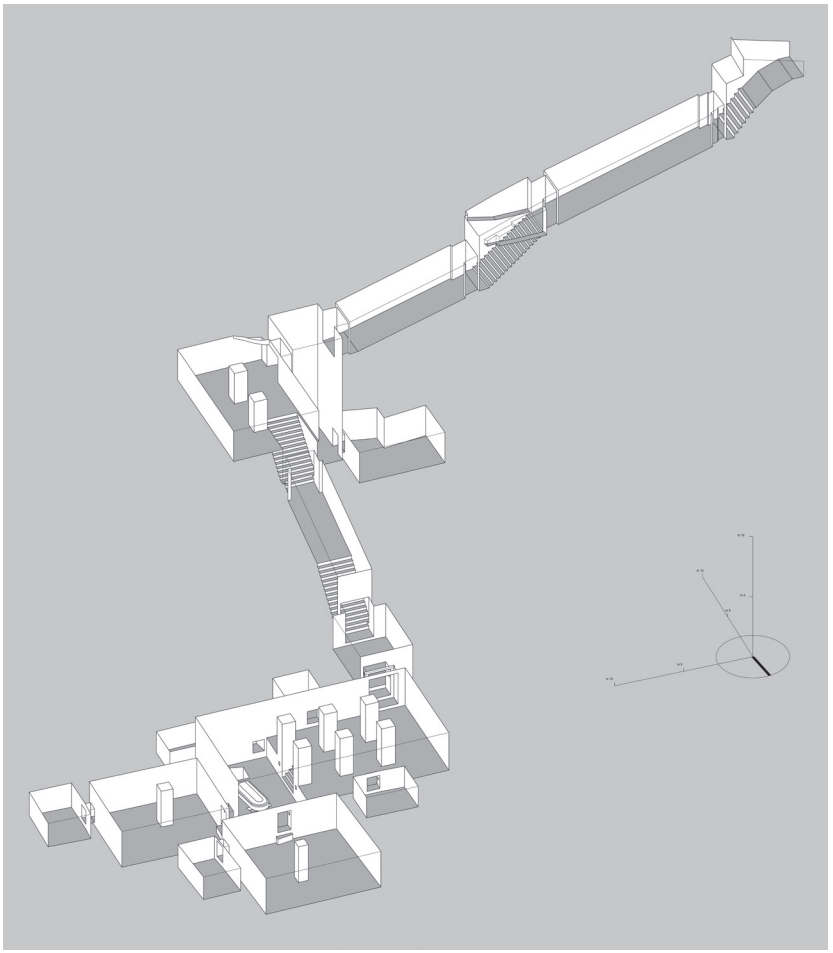

Fig. 10c. Dynasty 18 tomb style. © Theban Mapping Project

By the later New Kingdom, the Valley of the Kings was filled with tombs, and there were fewer sites available in which more could be cut. It is unlikely that ancient architects maintained a masterplan of the valley showing the location of tombs, because we know of three instances in which quarrymen dug a new tomb that collided with an earlier one. When such collisions occurred, the quarrymen presumably had three choices: immediately change the new tomb's axis and veer away from the earlier tomb; abandon the new tomb and dig elsewhere; or incorporate part of the earlier tomb into the new (fig. 11).