

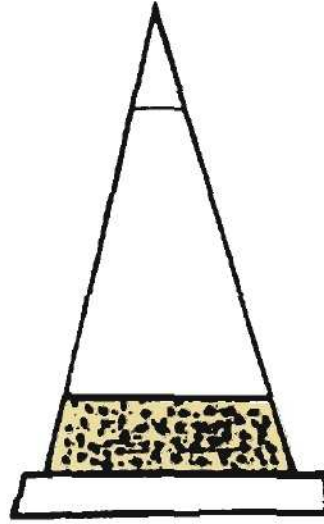
M A R K L E H N E R

# THE COMPLETE PYRAMIDS

Solving the Ancient Mysteries



Thames & Hudson



*mr* 'pyramid'

*'Any gods who shall cause this pyramid and  
this construction of the King to be good and  
sturdy, it is they who will be vital, it is they who  
will be respected, it is they who will be  
impressive, it is they who will be in control...it  
is they who will take possession of the crown.'*

Pyramid Texts 1650





# The Complete Pyramids

MARK LEHNER

556 illustrations, 83 in color



*To Bruce Ludwig, for his steadfast support*

Half-title: *Old Kingdom hieroglyph for 'pyramid' from the Tomb of Ptahhotep I at Saqqara*. Title-pages: *The pyramids of Menkaure, Khafre and Khufu at Giza*. Contents page: *The pyramids of Khafre and Khufu at Giza*.

Any copy of this book issued by the publisher as a paperback is sold subject to the condition that it shall not by way of trade or otherwise be lent, resold, hired out or otherwise circulated without the publisher's prior consent in any form of binding or cover other than that in which it is published and without a similar condition including these words being imposed on a subsequent purchaser.

© 1997 Thames & Hudson Ltd, London

First published in the United States of America in 1997 by  
Thames & Hudson Inc., 500 Fifth Avenue, New York, New York 10110

Reprinted 2001

Library of Congress Catalog Card Number 97-60232  
ISBN 0-500-05084-8

All Rights Reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any other information storage and retrieval system, without prior permission in writing from the publisher.

Printed and bound in Slovenia by Mladinska Knjiga

# CONTENTS

*Pyramids, Land and People* 6

*Chronology* 8

*Map* 10

*Pyramids in the Landscape* 12

*The Giant Pyramids:  
Their Rise and Fall* 14

*The Standard Pyramid Complex* 18

## I

### TOMB AND TEMPLE

*The Ka, the Ba and the Body Embalmed* 20

*Burial Rituals and the Pyramid Complex* 25

*This World and the Netherworld* 28

*The Pyramid Texts* 31

*The Pyramid as Icon* 34

## II

### EXPLORERS AND SCIENTISTS

*Early Legends* 38

*Mythic History of the Copts and Arabs* 40

*The First European Discovery* 42

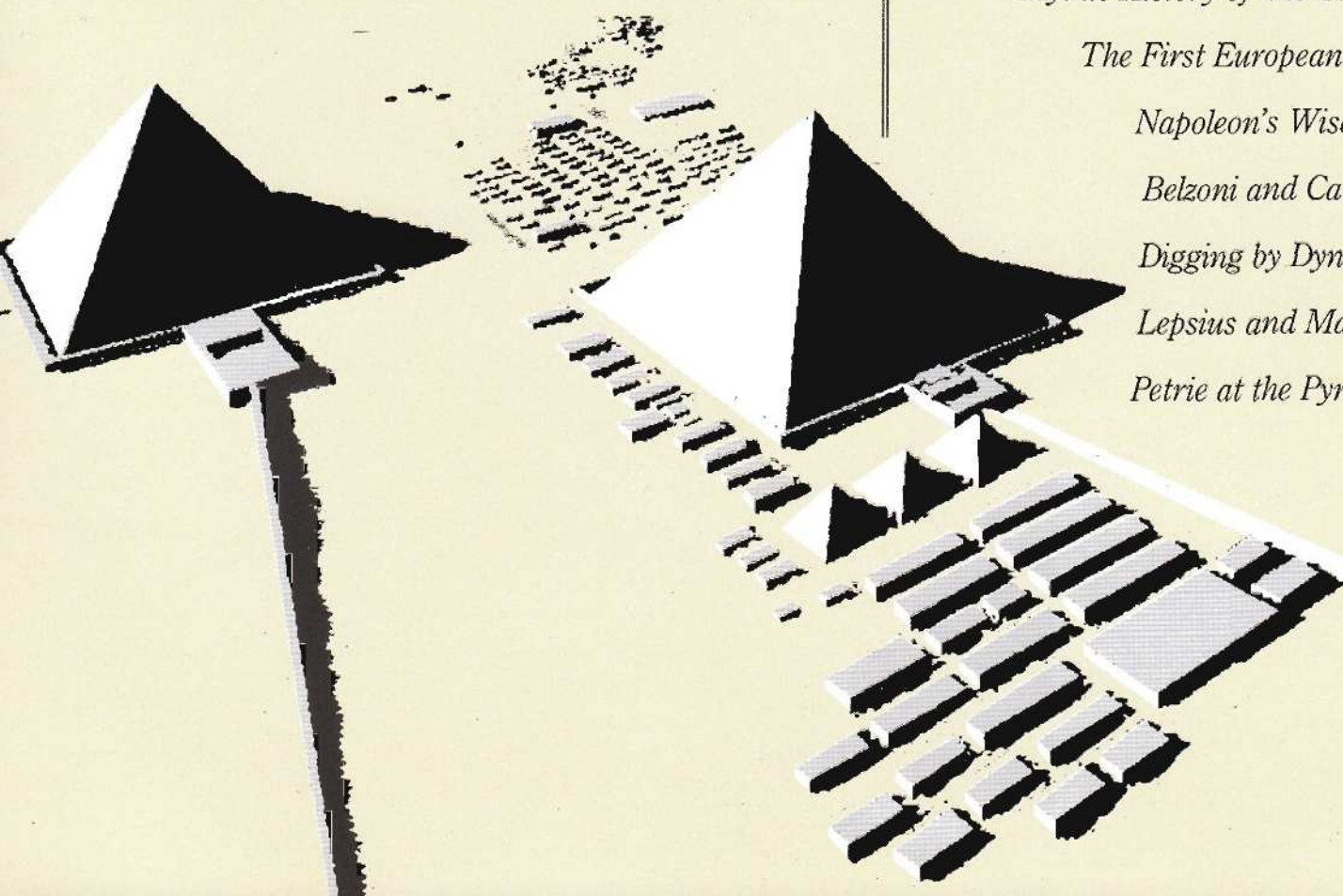
*Napoleon's Wise Men* 46

*Belzoni and Caviglia* 48

*Digging by Dynamite* 50

*Lepsius and Mariette* 54

*Petrie at the Pyramids* 56





*The Great Expeditions* 59

*Recent Discoveries* 66

### III

## THE WHOLE PYRAMID CATALOGUE

*Origins of the Pyramid –  
Hierakonpolis* 72

*Royal Tombs at Abydos* 75

*Archaic Mastabas at Saqqara* 78

*Saqqara: An Overview* 82

*Djoser's Step Pyramid Complex* 84

*The Short Life of Step Pyramids* 94

*The First True Pyramids:  
Meidum and Dahshur* 97

*Giza: An Overview* 106

*The Great Pyramid of Khufu* 108

*Djedefre at Abu Roash* 120

*Return to Giza:  
Khafre's Pyramid and the Great Sphinx* 122

*Menkaure's Pyramid* 134

*The Passing of a Dynasty* 138

*The Pyramid of Userkaf* 140

*The Pyramids of Abusir* 142

*The End of the 5th Dynasty* 153

*Pyramids of the 6th Dynasty* 156

*Pyramids of the  
First Intermediate Period* 164

*Mentuhotep at Deir el-Bahri* 166

*The Pyramids at Lisht* 168

*The Second Phase of  
Middle Kingdom Pyramids* 174

*Mudbrick Pyramids* 175

*Late Middle Kingdom Pyramids* 184

*New Kingdom Pyramids* 188

*Ahmose at Abydos* 190

*'Private' Pyramids* 192

*Pyramids of Late Antiquity* 194

### IV

## THE LIVING PYRAMID

*Supply and Transport* 202

*Quarries* 206

*The NOVA Pyramid-Building Experiment* 208

*Tools, Techniques and Operations* 210

*Survey and Alignment* 212

*Ramps* 215

*Rise and Run* 218

*Trouble at the Top* 222

*The Workforce* 224

*Building a Middle Kingdom Pyramid* 226

*Pyramid as Landlord* 228

*Pyramid Towns* 230

*Those Who Serve:  
Priests and Watchers* 233

*Loaves and Fishes* 236

*The Royal Workshops* 238

*Epilogue:  
The Legacy of the Pyramids* 240

*Visiting the Pyramids* 244

*Further Reading* 246

*Illustration Credits* 252

*Sources of Quotations* 252

*Index* 253

*Acknowledgments* 256



---

# Pyramids, Land and People

---

*First to be lit in the morning and catching the last of the sunlight in the afternoon, the brilliance of the Giza pyramids has been dimmed by the removal of their casing and a patina of age*

The Egyptian pyramids are very human monuments, although their builders may have tried not to emphasize that fact. At dawn, as the sun rose over the eastern cliffs, its rays caught the pyramids, energizing their sacred precincts with heat and light well before the morning mists had lifted from the cool, sleeping valley floor. At high noon forty-five centuries ago, when the pyramids were complete with their freshly smoothed white limestone casings, their brilliance must have been blinding. Only in this light can we appreciate the intensity with which the pyramids symbolized the sun god.

This powerful special effect was extinguished when the outer casing of most pyramids was robbed long ago. Where it remains, for example at the top of Khafre's pyramid at Giza, the weathering of the ages has coated it with a tan patina. And so what we mostly see today are the stripped core bodies of the pyramids, composed of substantially rougher masonry than the outer casing. Even the Great Pyramid of Khufu, the finest of all, has a core formed of cruder blocks, set with gypsum mortar, and sometimes a fill of broken stone. Other pyramids have cores of smaller stones set in desert clay, or a debris fill that slumped into low mounds when the casing was removed, or dark bricks of mud and straw. In places on their exposed cores we can find evidence left by workers who practically lived on the gradually rising pyramids during the years, even decades, that it took to build them.

In 1984 I directed a project with Robert Wenke, of the University of Washington, to collect samples of organic material embedded in the fabric of pyramids for radiocarbon dating. It was an amazing





sensation, climbing over the Great Pyramid looking for minute flecks of charcoal left in the gypsum mortar. Such close encounters with pyramids reveal not the 'footprints of the gods', but rather the 'fingerprints of the people': straw and reed, wood, fragments of rope and stone tools, flecks of copper and sherds of pottery.

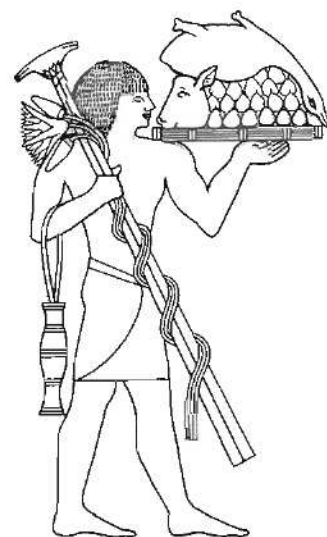
### The geography of the pyramids

Since their lives were governed by rhythmic movements along two cosmic axes, the ancient Egyptians were immediately aware of the cardinal directions. The sun rose and set over the beige desert and bronze cliffs framing them on east and west. The north-south axis was defined by the linearity of the Nile, which channelled the flow of goods, services and the administration of the land. Even in the Delta, travel was easiest up and down the Nile as opposed to straight across.

Approximately 4,000 years before the founding of the modern capital of Cairo, Egypt's first 'capital', Memphis, began as a fortified settlement close

to the apex of the Delta. From here to the entrance to the Fayum was a long, narrow section of the Nile Valley which throughout Egyptian history would be the 'capital zone' and also the pyramid zone. West was the traditional direction of the dead and the high western desert along the northern capital zone became the burial ground for royalty, courtiers, officials and sacred animals. In the Old Kingdom the seat of administration may have been the chief royal residence in the valley below the clusters of pyramids.

Karl Butzer has estimated that the two areas of greatest population density in dynastic times were between Luxor (ancient Thebes) and Aswan (Elephantine) at the 1st cataract, and from Meidum at the Fayum entrance northwards to the apex of the Delta. In between was Middle Egypt, a geographic buffer zone with a lower population density. It is worth bearing in mind that the total population of Egypt at the time the Giza pyramids were built is estimated to have been 1.6 million, compared with 58 million in AD 1995.



*Produce from the lands and people of Egypt was delivered to the pyramids from estates in Middle Egypt and the Delta. This is a drawing of an offering bearer from a relief in the pyramid temple of Senwosret I at Lisht.*

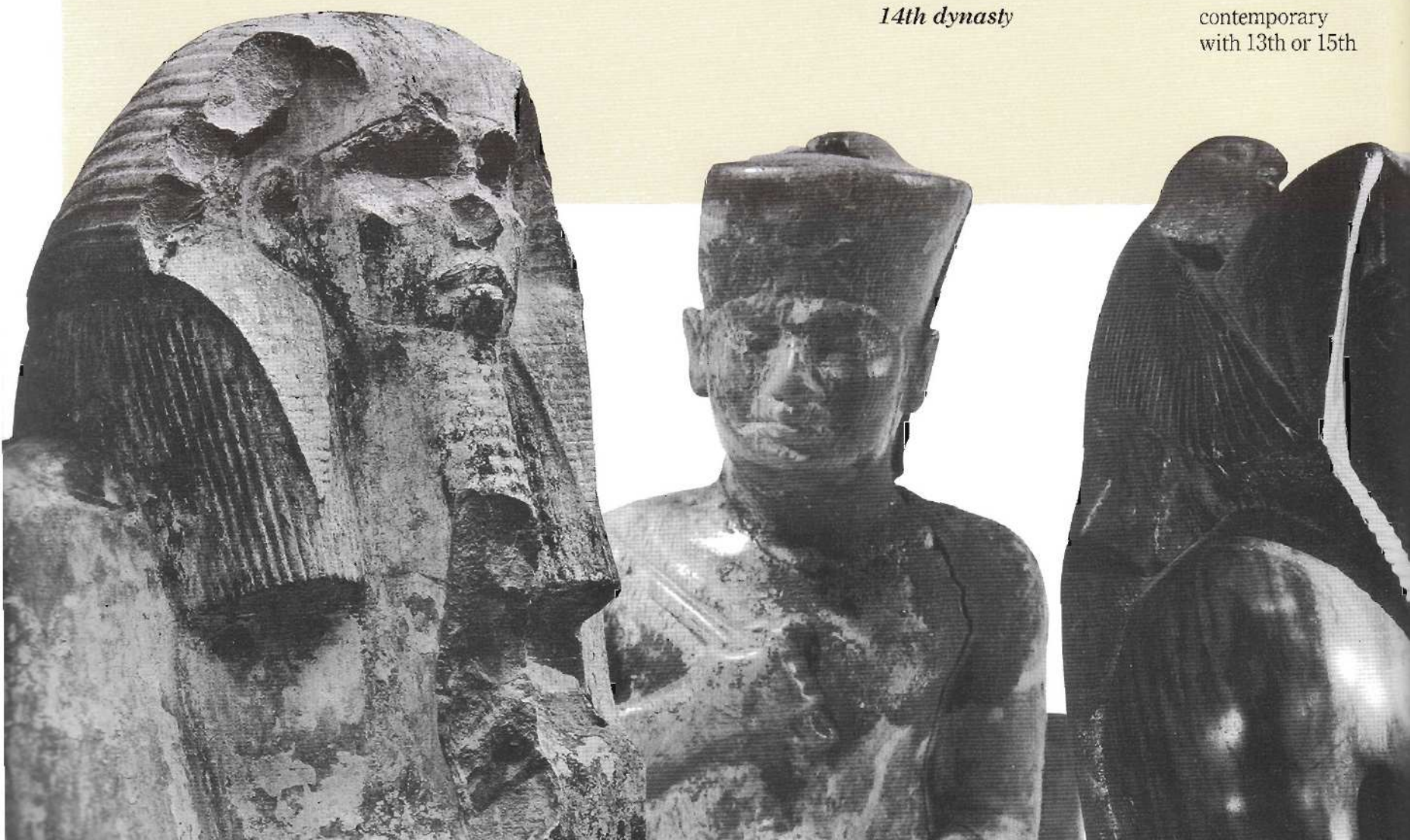




# Chronology of the Pyramid Builders

*Egyptian chronology and the dates of dynasties and pharaohs are still the subject of scholarly debate, with different systems proposed. The dates used here are based on the chronology developed by Professor John Baines and Dr Jaromir Malek and set out in their Atlas of Ancient Egypt. Details of those pharaohs who built pyramids or are featured in the text are given in full, where known.*

<b>Late Predynastic</b>	<b>c. 3000 BC</b>	<b>6th dynasty</b>	<b>2323–2150</b>
<b>Early Dynastic Period</b>		Teti	2323–2291
<b>1st dynasty</b>	<b>2920–2770</b>	Pepi I	2289–2255
Menes (Hor-Aha); Djer, Wadj; Den, Adjib, Semerkhet; Qa'a		Merenre	2255–2246
		Pepi II	2246–2152
<b>2nd dynasty</b>	<b>2770–2649</b>	<b>7th/8th dynasties</b>	<b>2150–2134</b>
Hetepsekhemwy; Raneb; Ninetjer; Peribsen; Khasekhem(wy)		including Ibi	dates uncertain
<b>3rd dynasty</b>	<b>2649–2575</b>	<b>First Intermediate Period</b>	
Nebka	2649–2630	<b>9th/10th dynasties</b>	<b>2134–2040</b>
Djoser (Netjerykhet)	2630–2611	<b>11th dynasty (Theban)</b>	<b>2134–2040</b>
Sekhemkhet	2611–2603	Intef I	2134–2118
Khaba	2603–2599	Intef II	2118–2069
Huni	2599–2575	Intef III	2069–2061
		Mentuhotep	2061–2010
<b>Old Kingdom</b>		<b>Middle Kingdom</b>	
<b>4th dynasty</b>	<b>2575–2465</b>	<b>11th dynasty</b>	<b>2040–1991</b>
Sneferu	2575–2551	Mentuhotep I	2061–2010
Khufu (Cheops)	2551–2528	Mentuhotep II	2010–1998
Djedefre	2528–2520	Mentuhotep III	1998–1991
Khafre (Chephren)	2520–2494	<b>12th dynasty</b>	<b>1991–1783</b>
Menkaure (Mycerinus)	2490–2472	Amenemhet I	1991–1962
Shepseskaf	2472–2467	Senwosret I (Sesostris I)	1971–1926
<b>5th dynasty</b>	<b>2465–2323</b>	Amenemhet II	1929–1892
Userkaf	2465–2458	Senwosret II (Sesostris II)	1897–1878
Sahure	2458–2446	Senwosret III (Sesostris III)	1878–1841?
Neferirkare	2446–2426	Amenemhet III	1844–1797
Shepseskare	2426–2419	Amenemhet IV	1799–1787
Raneferf	2419–2416	Sobekneferu	1787–1783
Niuserre	2416–2388	<b>13th dynasty</b>	<b>1783–1640</b>
Djedkare-Isesi	2388–2356	including	
Unas	2356–2323	Ameny-Qemau	c. 1750
		Khendjer	c. 1745
		<b>14th dynasty</b>	contemporary with 13th or 15th





<b>Second Intermediate Period</b>	
<b>15th–17th dynasties</b>	<b>1640–1532</b>
<b>New Kingdom</b>	
<b>18th–20th dynasties</b>	<b>1550–1070</b>
including	
Ahmose (Amosis)	1550–1525
<b>Third Intermediate Period</b>	
<b>21st–25th dynasties</b>	<b>1070–712</b>
<b>25th dynasty</b>	<b>770–712</b>
(Nubian and Theban Area)	
Kashta	770–750
Piye	750–712
<b>Late Period</b>	
<b>25th dynasty</b>	<b>712–657</b>
Shabako	712–698
Shabatko	698–690
Taharqa	690–664
Tantutamun	664–657
<b>26th dynasty</b>	<b>664–525</b>
including	
Necho I	672–664
Psamtik I	664–610
(Psammetichus I)	
<b>27th dynasty</b>	<b>525–404</b>
<b>28th dynasty</b>	<b>404–399</b>
<b>29th dynasty</b>	<b>399–380</b>
<b>30th dynasty</b>	<b>380–343</b>
<b>2nd Persian Period</b>	
	<b>343–332</b>
<b>Graeco-Roman Period</b>	<b>332 BC–AD 395</b>
<b>Meroitic kingdom</b>	<b>300 BC–AD 350</b>

## The pyramid as temple

It is true that the pyramids are pharaonic tombs, but the tomb of a pharaoh of ancient Egypt was far more than just the grave of a king. One of the hallmarks of the Egyptian state from its very beginning in the 1st dynasty was the tradition centred on the king as an incarnation of the god Horus, whose totem was the falcon. In the world of the ancient Egyptians the falcon soared above all other living creatures. When an incarnation of Horus died, the god passed to the next reigning king. Physically entombed within the pyramid, the dead king became identified with Osiris, the divine father of Horus. The pyramid complex was, in one sense, a temple complex to the Horus-Osiris divinity, merged with the sun god in the central icon of the pyramid.

As a temple complex, the pyramid was also the largest of what have been called 'pious foundations', that is, enormous endowments of people, lands and produce, for the sustenance, upkeep and service of a tomb, temple or pyramid. When the Egyptians built the pyramids, they also founded new farms, ranches and whole new towns in the provinces. The livestock and produce from these estates flowed into the area of the pyramid complex where they would be redistributed to the workforce and to the priests and special classes of people who served the temple complex. So the pyramid was also an economic engine, and, especially during the Old Kingdom, a major catalyst for internal colonization and the development of Egypt as one of the world's first true states.

The complete pyramid played many roles: massive labour project; baker and brewer for hundreds of consumers; colonizer of the Egyptian provinces; employer of farmers, herdsman and craftsmen of all kinds; temple and ritual centre at the core of the Egyptian state; reliquary of a king; embodiment of light and shadow; and the union of heaven and earth, encapsulating the mystery of death and rebirth.

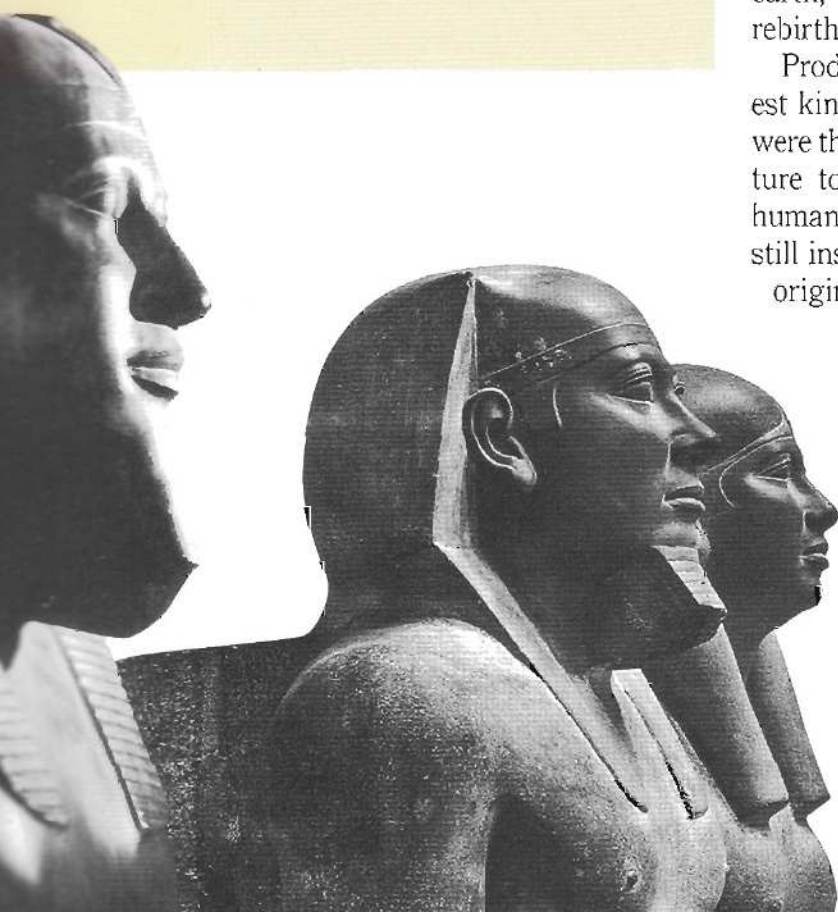
Products of the land and people of Egypt's oldest kingdoms, in their pristine form the pyramids were the closest mankind has ever come in architecture to creating an illusion of transcending the human condition. Their aura of otherworldliness still inspires the popular imagination to seek their origin anywhere other than the people who inhabited the lower Nile Valley between five and three thousand years ago.

## Pyramids, Land and People



Two of the lesser pyramid builders: the 4th-dynasty pharaoh Djedefre (top), who began a pyramid at Abu Roash, north of Giza; and the 5th-dynasty ruler Userkaf (above), who built a pyramid adjacent to Djoser's Step Pyramid at Saqqara and was also the first pharaoh to construct a sun temple in addition to his pyramid, at Abusir.

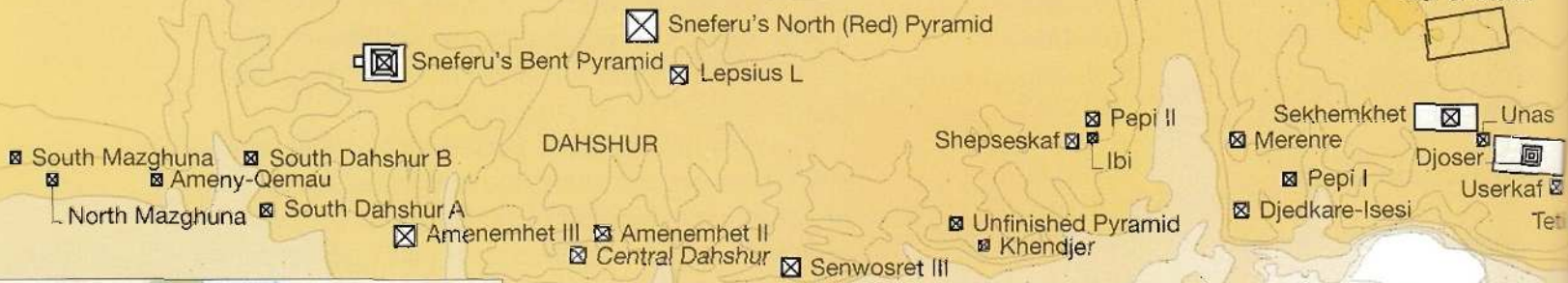
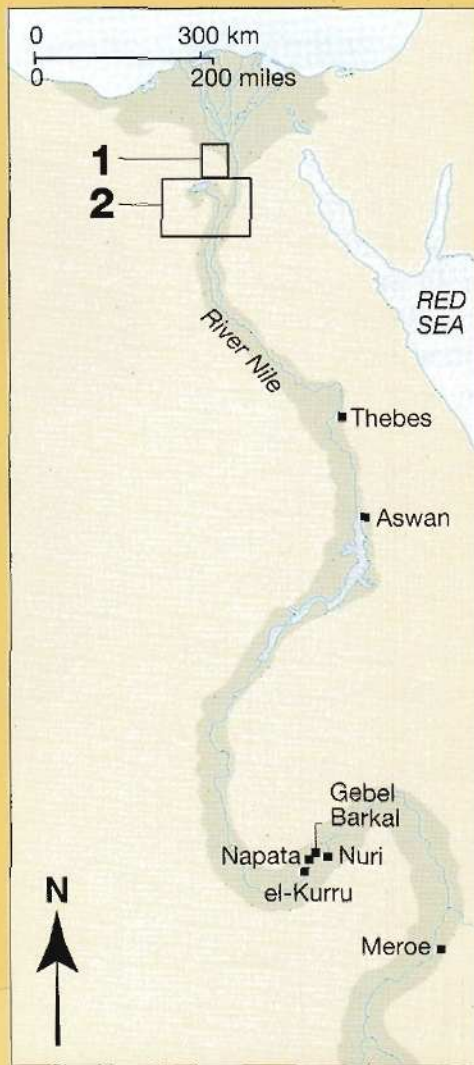
(Left) The great pyramid builders of the Old Kingdom: Djoser (far left), here depicted in a life-size painted statue, built the world's first stone pyramid, the Step Pyramid at Saqqara. Khufu (second left) oversaw the construction of the most magnificent pyramid, the Great Pyramid at Giza, but is preserved only in this tiny ivory figurine, about 5 cm (2 in) high. Khafre (third left) is depicted in this life-size statue, merged in identity with the Horus falcon. Menkaure (near left) is shown standing next to his queen, Khamerernebtet.





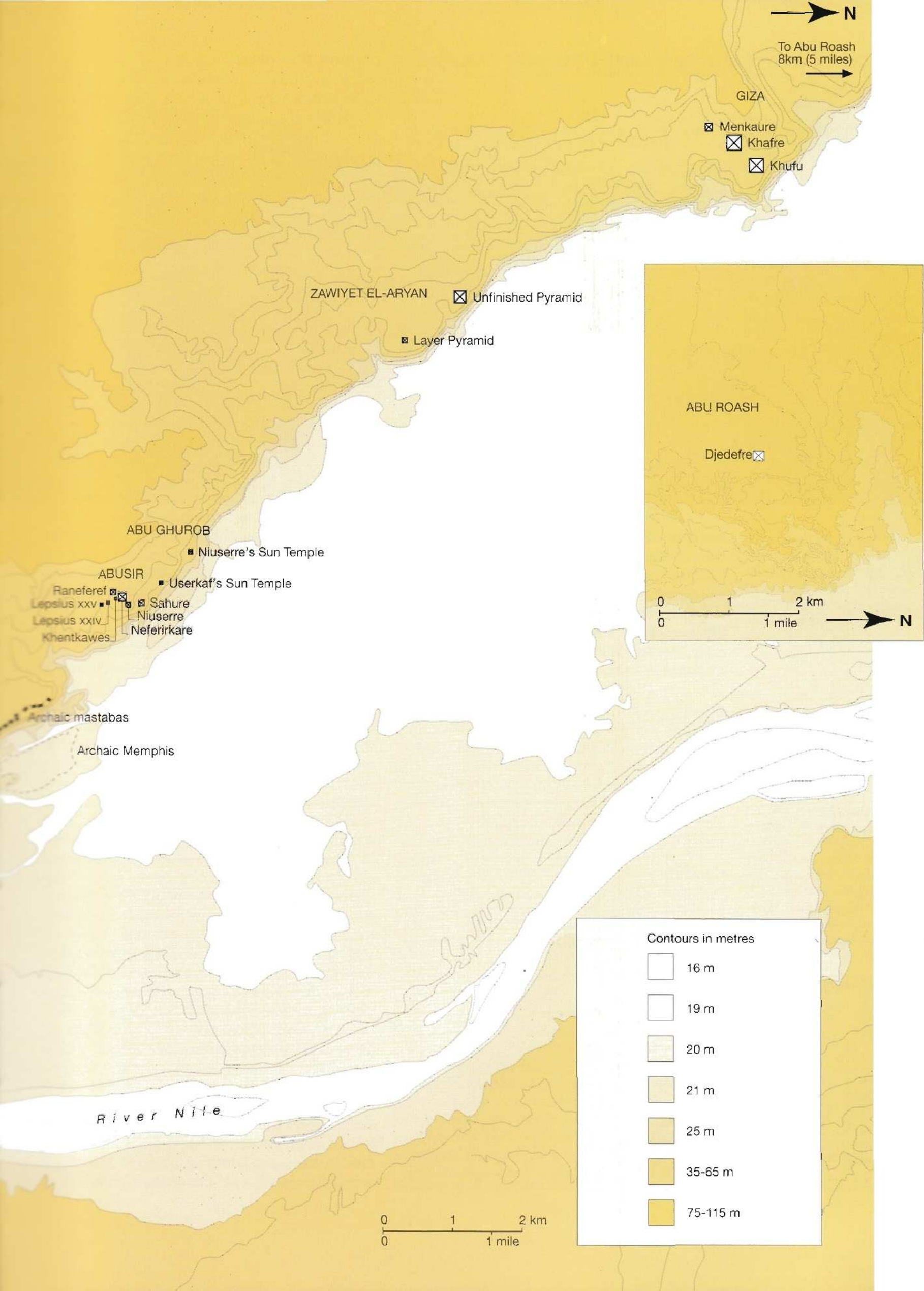
# THE PYRAMIDS OF EGYPT

1



Main Memphis  
ruin field







# Pyramids in the Landscape

Egypt was a cradle of civilization that allowed the same basic language and culture to flourish for nearly 3,000 years. For most of this long history, pharaoh was 'Lord of the Two Lands', a reflection of the natural division of the country into two inhabitable parts: the Nile Valley and the broad Delta. Each pharaoh wore the double crown, combining the Red Crown of Lower (northern) Egypt and the White Crown of Upper (southern) Egypt.

In shape, the Nile and its Y-shaped Delta can be compared to three of the plants that flourish in the valley and which the pyramid builders petrified in stone in carvings and columns: the palm tree, the lotus and the papyrus. Upper Egypt is the trunk or stem; and the Delta is the palm frond, the lotus flower or the head of the papyrus. If the Delta is the lotus blossom, the Fayum is its bud. The Fayum is a large fertile basin, at various times filled by a lake whose remains today are the brackish waters of Lake Qarun. The lake was fed by the only major tributary of the Nile in Egypt, the Bahr Youssef ('River Joseph'), which enters the Fayum by way of the ancient Hawara Channel.

## Nomes and basins

Through processes of erosion and deposition, the Nile created a convex floodplain. That is, the highest land is nearest the river and, perhaps contrary to what we might expect, the lowest land is closer to the desert. In between were natural basins, terraced downstream from south to north. The basins were one of the largest and most basic landscape features of the yearly cycle, forming an immense natural irrigation system that was wiped out by the modern dams at Aswan. Surrounded by dykes and carefully managed, the great cell-like basins held water for six to eight weeks each year during the annual flood. In the last century, from Elephantine to just north of the Fayum there were 136 principal basins.

How did the ancient Egyptians organize this landscape and its peasant farmers to provide the food and labour that supported pyramid building? During the last century such control involved independent systems of basins, consisting of (rarely) one or (usually) several basins watered by a single feeder canal. The head of this canal was a breach in the Nile bank. Beginning in the 18th dynasty, the canals that seasonally channelled flood waters to the basins were named with the hieroglyph of the human arm – they were 'armatures of water'. Each basin system also had a tail-end escape to allow the waters to flow back into the Nile after they had deposited their fertile silty slime. This was breached first, followed by successive openings in each transverse dyke back to the head basin.

Field beds appeared at the bottom of the basins from south to north. The Egyptians planted by broadcast sowing – simply scattering the seed by hand – and this was best done soon after the basin was drained when the beds were still wet. Draining and sowing therefore needed to be closely co-ordinated and the basin administrators must have rapidly surveyed and identified field boundaries.

The southernmost Upper Egyptian basins were usually dry by 5 October, and the northernmost by 30 November. Sowing and growing took place in the season of *peret*, 'coming forth', followed by *shemu*, 'harvest', and, beginning in late summer, *akhet*, 'inundation'. The three seasons each consisted of four months, for a 12-month year.

It was usual for a temple or large household to own, rent or manage an assemblage of fields that may not have been contiguous and were not necessarily near the house. In ancient Egypt as other societies based on flood recession agriculture, an archipelago of land holdings of different quality spread throughout the country may have been an insurance against floods that were too high or too low. The Old Kingdom pyramids were among the earliest developers and owners of such land portfolios. One of the most frequent scenes in the pyramid temples is a long train of offering bearers, each personifying a village, estate or nome (p. 228).

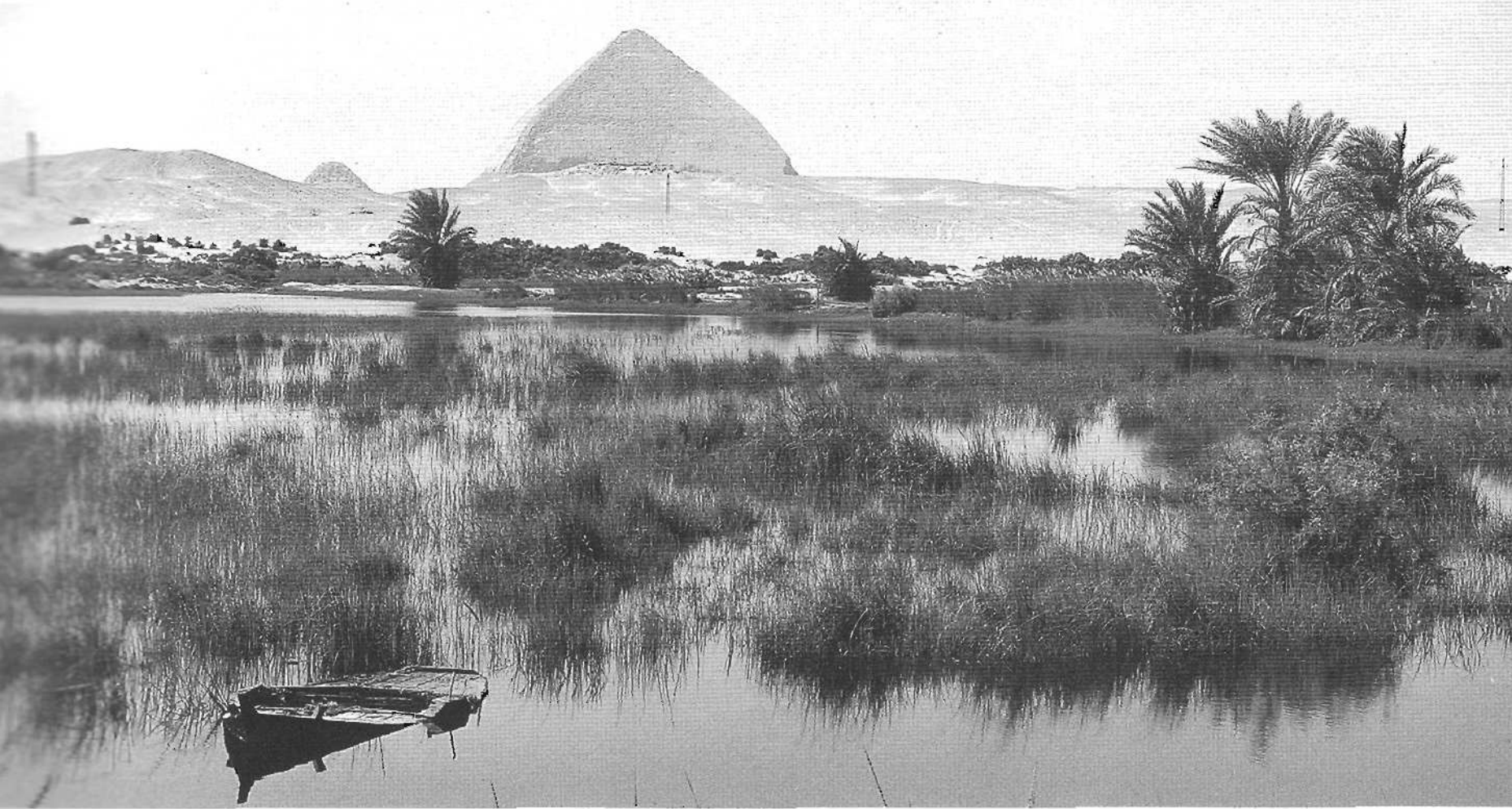
## Stone for Pyramids

The ancient Egyptians favoured various stones for their pyramids and carvings. Over millions of years (primarily the Eocene, 65–35 million years ago) the sea covered much of Egypt, depositing sediments that became the limestone of Egypt's tableland. Limestone was quarried for the cores of pyramids in block sizes often corresponding to the thickness of successive natural layers or beds. Finer limestone for outer pyramid casings came from eastern quarries across the Nile. Farther south, and formed in older geological periods, sandstone was used for the last pyramids in the Nile Valley – at Napata and Meroe.

Granite was important as the second stone for pyramid casings, and often the primary material for sarcophagi and burial chambers. Diorite and greywacke were highly prized for statues. Basalt was long preferred for the pavements of temples. To obtain these materials the Egyptians mounted quarry expeditions to the places where these harder and geologically older igneous rocks lay exposed – the Fayum, the Red Sea Mountains and Aswan and its desert quarries. They also contained the copper needed for tools, as well as gold, silver and iron, the last mostly used only in later periods.







For administrative purposes, the ancient Egyptians divided Upper Egypt into districts called **nomes**, with Nome 1 at Elephantine on the 1st cataract and Nome 22 just north of the Fayum entrance. These nomes, each with a main settlement that developed into a 'capital', were established by the 5th dynasty. The complete set of 20 northern nomes, beginning with Lower Egyptian Nome 1 of Memphis, and taking in the Delta, was established only in late antiquity.

It is tempting to think that the nomes, and the first proto-kingdoms that amalgamated in the late predynastic to become the Egyptian 'state', originated in these basins. Certainly the communication required for the sequential filling and discharge would have been easier across the smaller basin systems such as those of the Qena Bend, from where rulers of Egypt emerged more than once.

## Basins and pyramids

Research on the flood basins and the geography of the Memphite region is now clearing up some old misconceptions. The average depth of the Nile flood waters was not sufficient to float huge limestone casing blocks or granite beams to the foot of the pyramid plateau. Yet there is no evidence that the Old Kingdom Egyptians cut perennially flooded canals transversely across the flood plain.

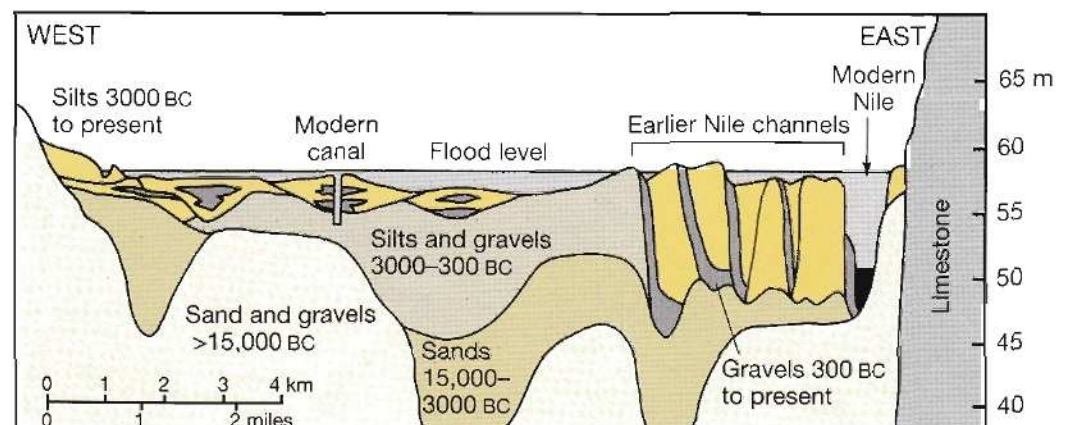
In the northern pyramid zone, from Dahshur to Giza and particularly in the area of Memphis, the Nile flowed closer to the west bank during the early periods of Egypt's history. At intervals along the edge of the desert were lakes that held water after the flood receded. These probably existed in front of pyramid sites such as Abusir, Saqqara, Dahshur

and possibly Giza. Where perennial lakes did not occur, the pyramid builders could have created them by widening and deepening the natural flood basins that would then have served as the harbours that every standard pyramid complex required. It is possible that older canals that still survive near the escarpment at Saqqara and Abusir, particularly the Bahr el-Libeini, are vestiges of ancient channels.

There is a high place on the Mokkatam Hills southeast of Cairo where one can look across the valley and see, silhouetted in the desert haze, the pyramids of Giza, Abusir, Saqqara and Dahshur. In the valley below, the Nile no longer floods the basins. The nome centres and royal communities – with their bakeries, granaries, breweries and multitudinous workshops – have been replaced by the sprawl of Africa's largest city. The pyramids no longer connect with living Egypt and so we have lost sight of their original role in ancient Egyptian lives. But from the Mokkatam Hills, there is still the sense of the pyramid field as one vast Memphite necropolis, the pyramids standing as giant tombstones of distant god-kings.

*Lake Dahshur, the last surviving of the pyramid lakes on the desert edge, gives a haunting impression of pyramid ecology. Sneferu's Bent Pyramid rises to the west.*

*A simplified cross-section of the Nile Valley between Sohag and Asyut, where the river runs next to the east escarpment today, based on Karl Butzer's work. A convex flood plain leaves high land along Nile levees, and low basin land towards the desert. The Nile has migrated eastwards through time.*



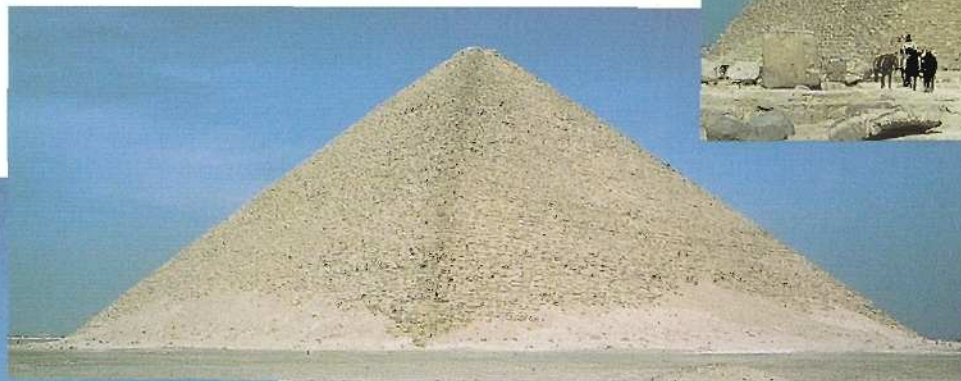


# The Giant Pyramids: Their Rise and Fall

*The march to near pyramid perfection began with the Bent Pyramid of Sneferu at Dahshur (below).*

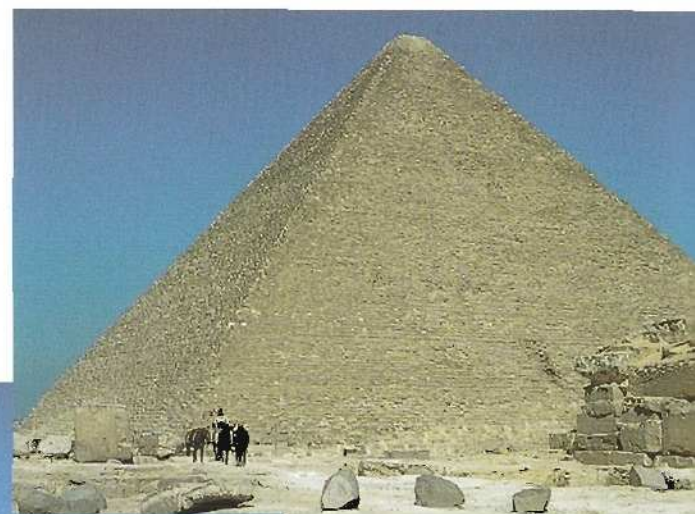


*(Below) The giant pyramid appeared suddenly in the 3rd-dynasty reign of Djoser, who built the first pyramid and mortuary complex in stone, which he surrounded by an enclosure wall more than 1,600 m (5,250 ft) long.*



*Sneferu (2575–2551 BC) also built the North (or Red) Pyramid at Dahshur (above), a true pyramid with a slope of 43°, and the pyramid at Meidum, which he gave the form of a true pyramid with a slope of 52°*

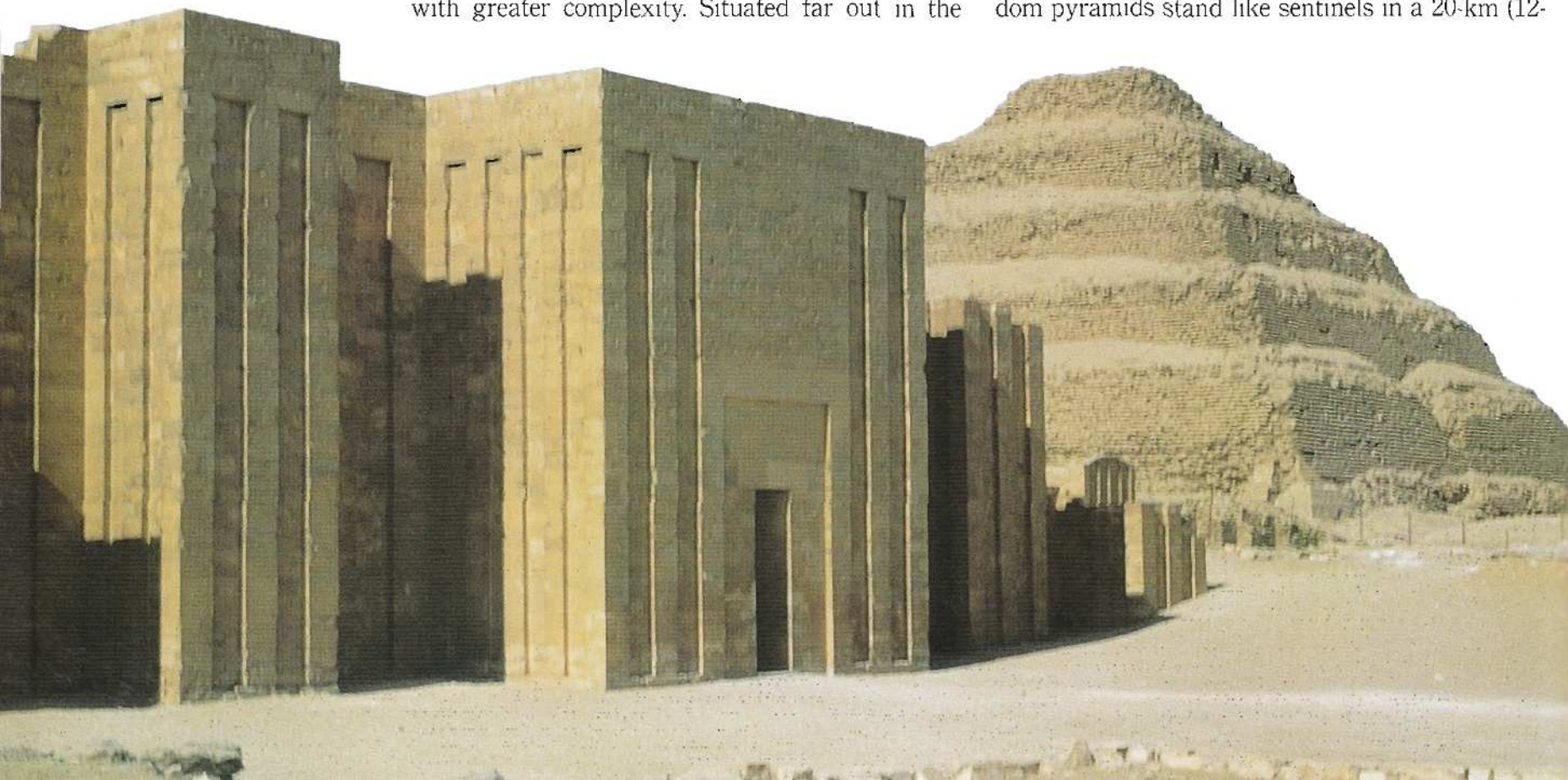
Egyptologists trace the ultimate origins of even the grandest pyramids back to the modest pit graves of the predynastic period, which were covered by simple mounds of sand and gravel. A little later, on the threshold of the 1st dynasty (c. 2900 BC), the graves of the rulers and elite consisted of neat mudbrick boxes, sunk in the desert and divided, like a house, into several chambers. The tombs of the pharaohs of the first two dynasties followed this pattern, but with greater complexity. Situated far out in the



*(Above) Khufu's Great Pyramid at Giza was the largest ever built, covering 5.3 ha (13.1 acres) and rising 146 m (479 ft) at a slope of around 52°*

desert near the high cliffs at Abydos, each would have been marked by a pair of large stelae and covered by a mound. These royal pit and mound graves, together with imitation palaces in the form of open rectangular courts defined by mudbrick walls down in the valley, are the architectural antecedents of the pyramids. While some are certainly monumental in size, they do not approach the scale that emerges suddenly in the 3rd-dynasty reign of Djoser (2630–2611 BC).

The Step Pyramid of Djoser heralded the classic pyramid age, the 4th to 6th dynasties, also known as the Old Kingdom. During these centuries the Egyptians built pyramids for their god-kings in a 72-km (45-mile) span of desert, between Abu Roash, northwest of Giza, to Meidum in the south, near the entrance to the Fayum. Excluding the pyramids of Djedefre at Abu Roash and Sneferu at Meidum as outliers, the 21 other major Old Kingdom pyramids stand like sentinels in a 20-km (12-





mile) stretch west of the capital the 'White Wall', later known as Memphis, clustering at Giza, Zawiyet el-Aryan, Abusir, Saqqara and Dahshur.

The truly gigantic stone pyramids were built over the course of only three generations: Sneferu, Khufu and Khafre. If Sneferu did indeed build the Meidum pyramid as well as his two stone pyramids at Dahshur, his pyramids alone contain more than 35 million cu. m (124 million cu. ft) of stone. All the other pyramids of Egyptian kings combined (excluding queens' and other satellite pyramids) contain only 41 per cent of the total mass of the pyramids of Sneferu, his son Khufu and grandson Khafre. Menkaure still used multi-tonned stone blocks for the third pyramid of Giza, but the total mass was less than that of Djoser.

In the 5th and 6th dynasties each king still built a pyramid, but on a much smaller scale and with smaller stones and a core of stone rubble fill. In one sense this is inferior construction; however, the Egyptians accomplished the same pyramidal form with fine casing and less expense. At the same time the pyramid temples increased in size, complexity and craftsmanship in comparison with those of the early 4th-dynasty pyramids. True standardization was reached in the pyramids of the late 5th dynasty, and particularly those of the 6th. In spite of the difference in length of reigns, the pyramids of Merenre (9 years) and Pepi II (over 90 years) were nearly identical in their outer dimensions.

Pyramid building almost ceased during the First Intermediate Period when unified rule gave way to rival principalities. It was resumed in the Middle Kingdom, when the first pyramids were built with a core of small and broken stone in casemate or retaining walls, and later pyramids were built with a mudbrick core. Sizes were not as standardized as the later Old Kingdom. Entrances no longer opened consistently from the north side of the pyramid, and passages followed a circuitous off-axis route to the burial chamber. The geographic range of pyra-

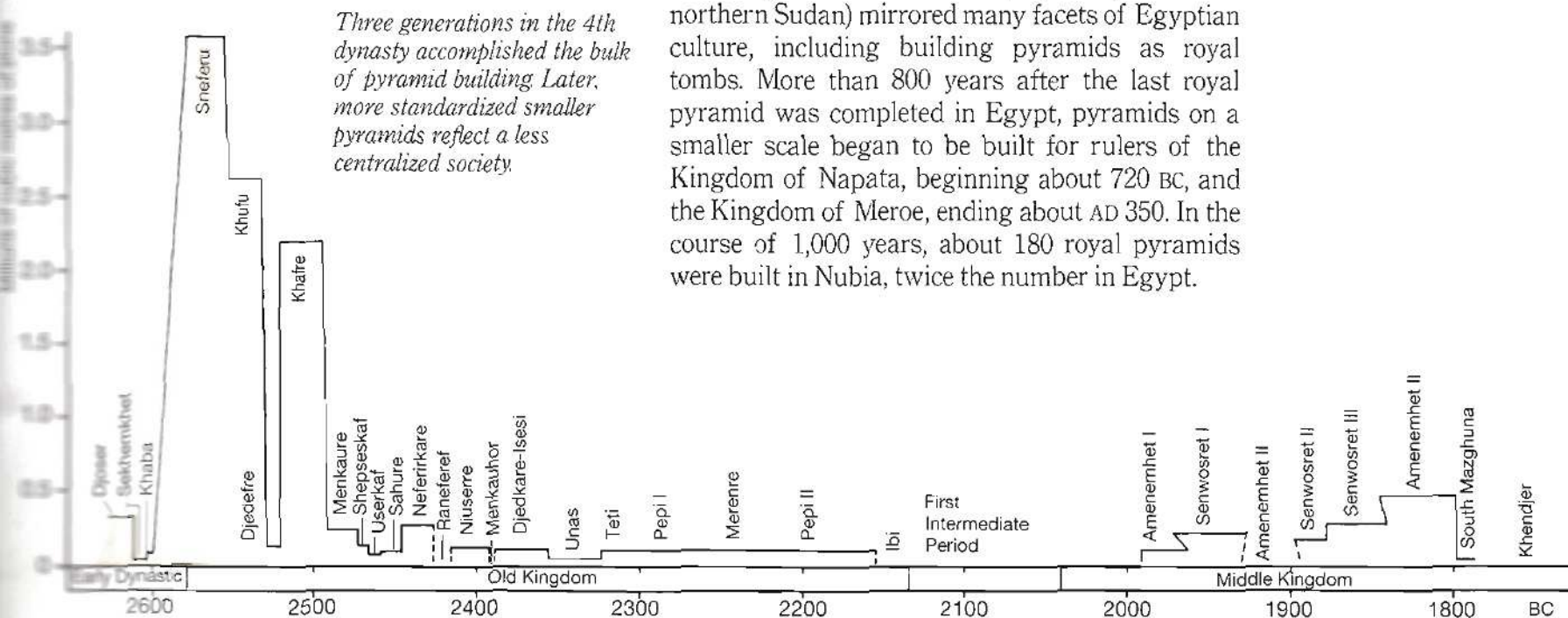


mids was still in the north near the apex of the Delta, but the margins had shifted southwards, from Dahshur in the north, to Illahun and Hawara at the Fayum entrance to the south.

New Kingdom pharaohs built their tombs in a communal royal burial ground, the Valley of the Kings, at Thebes (modern Luxor). Above the valley towers a mountain peak that takes the form of a natural pyramid for the multiple corridors and royal burial chambers cut into the crevasses of its lower slopes. Manmade pyramids were reduced to small superstructures above the rock-cut tombs of the scribes, artisans, craftsmen and officials who served the king and were employed on the construction of the royal tombs.

Throughout ancient times, Nubia (in modern northern Sudan) mirrored many facets of Egyptian culture, including building pyramids as royal tombs. More than 800 years after the last royal pyramid was completed in Egypt, pyramids on a smaller scale began to be built for rulers of the Kingdom of Napata, beginning about 720 BC, and the Kingdom of Meroe, ending about AD 350. In the course of 1,000 years, about 180 royal pyramids were built in Nubia, twice the number in Egypt.

*The Middle Kingdom mudbrick pyramid of Amenemhet III and the Old Kingdom stone North Pyramid of Sneferu, seen across the Dahshur lake, the last remaining pyramid harbour lake.*





# The Shape of Pyramid History

Profiles of the major pyramids, drawn to the same scale, from the earliest stepped mound of the 1st dynasty, through the stepped pyramids of the 3rd dynasty and the massive 4th-dynasty pyramids, to the much smaller monuments of later Egyptian history. According to one chronology only 60 years passed between the completion of the Step Pyramid of Djoser and the beginning of the Great Pyramid of Khufu. If so, someone could have been a small child when Djoser's pyramid was new, and lived to see, in old age, the building of the Great Pyramid, when 'Egyptian masonry rose to a peak of excellence'. The giant pyramids represent an accelerated cultural development, comparable to our modern space programme or computer revolution.

After the end of the 5th dynasty, pyramid entrances are no longer consistently on the north, and the passages and chambers follow circuitous routes, so that the profiles do not show the interiors.

## 1ST DYNASTY



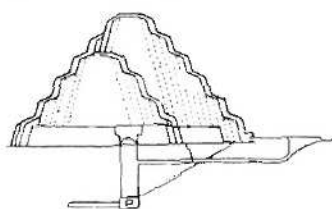
Stepped mastaba, Saqqara

## 2ND DYNASTY

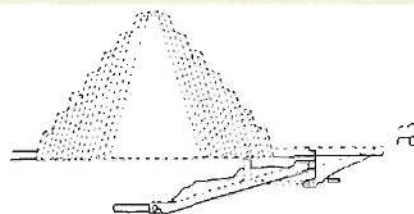


Funerary enclosure of Khasekhemwy, Abydos

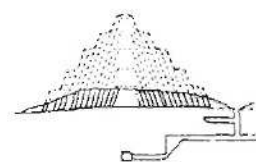
## 3RD DYNASTY



Step Pyramid of Djoser, Saqqara

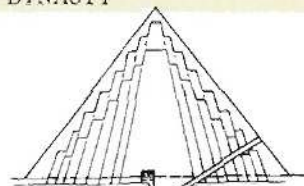


Sekhemkhet, Saqqara

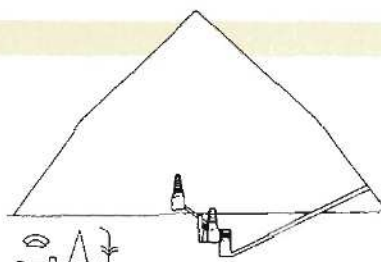


Layer Pyramid, Zawiye el-Aryan

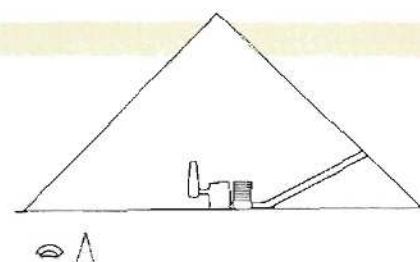
## 4TH DYNASTY



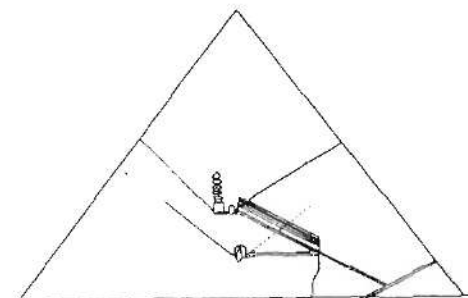
Sneferu, Meidum



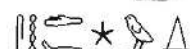
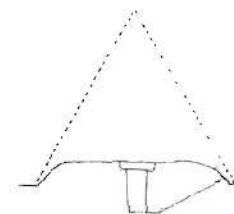
Sneferu, Bent Pyramid, Dahshur



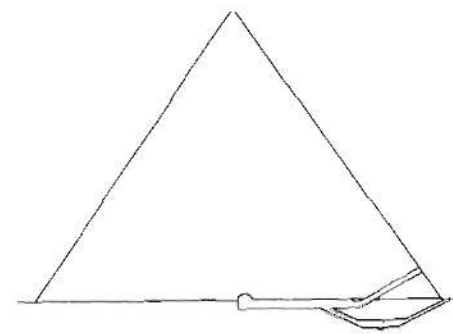
Sneferu, North Pyramid, Dahshur



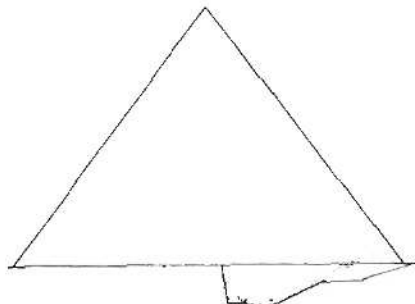
Khufu, Great Pyramid, Giza



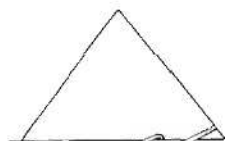
Djedefre, Abu Roash



Khafre, Giza



?Nebka, Unfinished Pyramid, Zawiye el-Aryan



Menkaure, Giza



Shepseskaf, Saqqara

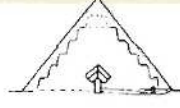


Khentkawes, Giza

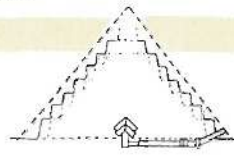
## 5TH DYNASTY



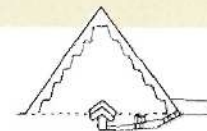
Userkaf, Saqqara



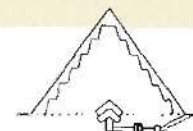
Sahure, Abusir



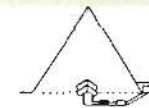
Neferirkare, Abusir



Niuserre, Abusir

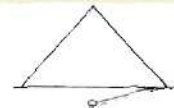


Djedkare-Isesi, Saqqara

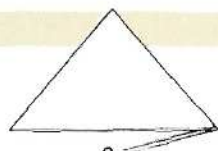


Unas, Saqqara

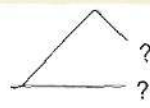
## 12TH DYNASTY



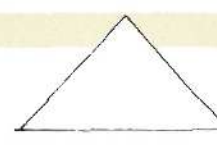
Amenemhet I, Lisht



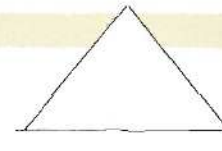
Senwosret I, Lisht



Amenemhet II, Dahshur



Senwosret II, Illahun



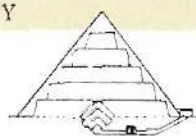
Senwosret III, Dahshur



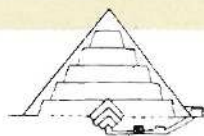
# Major Pyramid Statistics

Pharaoh	Location	Dyn.	Base (m)	Height (m)	Volume (cu. m)	Slope	Satellite	Queens'	Ancient Name
Djoser	Saqqara	3	121x109	60	330,400				
Sekhemkhet	Saqqara	3	120	7 (unfinished)	33,600				
Khaba (?)	Zawiyet el-Aryan	3	84	20 (unfinished)	47,040				
Sneferu (?)	Meidum	4	144	92	638,733	51°50'35"	✓		Sneferu Endures
Sneferu	Dahshur	4	188	105	1,237,040	54°27'44"/ 43°22'	✓		The Southern Shining Pyramid The Shining Pyramid
Sneferu	Dahshur	4	220	105	1,694,000	43°22'			
Khufu	Giza	4	230.33	146.59	2,583,283	51°50'40"	✓	3	Akhet Khufu
Djedefre	Abu Roash	4	106	67	131,043	52°	✓		Djedefre is a <i>Sehed</i> -Star
Khafre	Giza	4	215	143.5	2,211,096	53°10'	✓		Great is Khafre
?Nebka	Z. el-Aryan	4	200	(unfinished)					
Menkaure	Giza	4	102.2x104.6	65	235,183	51°20'25"		3	Menkaure is Divine
Shepseskaf	S. Saqqara	4	99.6x74.4	18	148,271	70°			The Purified Pyramid
Khentkawes	Giza	4	45.5x45.8	17.5	6,372 (upper)	c. 74°			
Userkaf	Saqqara	5	73.3	49	87,906	53°7'48"	✓		Pure are the Places of Userkaf
Sahure	Abusir	5	78.75	47	96,542	50°11'40"	✓		The Rishing of the <i>Ba</i> Spirit
Neferirkare	Abusir	5	105	c. 72	257,250	53°7'48"			Pyramid of the <i>Ba</i> of Neferirkare
Raneferref	Abusir	5	65	(unfinished)					The Pyramid which is Divine of the <i>Ba</i> Spirits
Niuserre	Abusir	5	78.9	51.68	112,632	51°50'35"	✓	2?	The Places of Niuserre Endure
Djedkare-Isesi	S. Saqqara	5	78.75	c. 52.5	c. 107,835	52°	✓	1	Beautiful is Isesi
Unas	Saqqara	5	57.75	43	47,390	56°18'35"	✓		Perfect are the Places of Unas
Teti	Saqqara	6	78.75	52.5	107,835	53°7'48"	✓	2	The Places of Teti Endure
Pepi I	S. Saqqara	6	c. 78.75	c. 52.5	c. 107,835	53°7'48"	✓	5	The Perfection of Pepi is Established
Merenre	S. Saqqara	6	c. 78.75	c. 52.5	c. 107,835	53°7'48"			The Perfection of Merenre Appears
Pepi II	S. Saqqara	6	78.75	52.5	c. 107,835	52°7'48"	✓	3	Pepi is Established and Living
Ibi	S. Saqqara	8	31.5	21?	6,994?				
Khui	Dara	FIP	130						
Amenemhet I	Lisht	12	84	55	129,360	54°27'44"			The Places of the Apearances of Amenemhet
Senwosret I	Lisht	12	105	61.25	225,093	49°23'55"	✓	9	Senwosret Beholds the Two Lands
Amenemhet II	Dahshur	12	c. 50						Amenemhet is Provided
Senwosret II	Illahun	12	106	48.6	185,665	42°35'	✓?	or 1?	Senwosret Appears
Senwosret III	Dahshur	12	105	78	288,488	56°18'35"		7	
Amenemhet III	Dahshur	12	105	75	274,625	57°15'50"			Amenemhet is Beautiful
Amenemhet III	Hawara	12	105	c. 58	200,158	48°45'			Amenemhet Lives
Amenemhet IV or Sobekneferu	S. Mazghuna	13	52.5	(unfinished)	30,316				
Ameny-Qemau Khendjer	S. Saqqara	13	52.5	c. 37.35	44,096	55°			

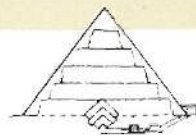
## 6TH DYNASTY



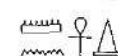
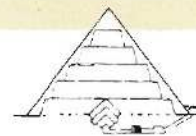
Teti, Saqqara



Pepi I, S. Saqqara



Merenre, S. Saqqara



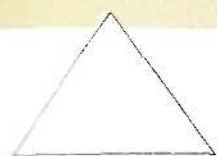
Pepi II, S. Saqqara

## 8TH DYNASTY

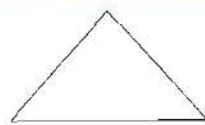


Ibi, S. Saqqara

## 13TH DYNASTY



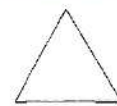
Amenemhet III, Dahshur



Amenemhet III, Hawara



Amenemhet IV or Sobekneferu, S. Mazghuna



Khendjer, S. Saqqara



Unfinished, S. Saqqara



# The Standard Pyramid Complex

The pyramids covered the tombs of divine kings and, late in their history, they marked graves of the aristocracy and high officials. They satisfy a principle that the great Giza excavator George Reisner stated: 'Every substructure [grave] implies a superstructure which marks the site of the grave and provides a place where the offerings to the dead may be presented'. As the tomb superstructure, the pyramid was the central element in an assembly that makes up the 'standard pyramid complex'.

We see the most basic elements in two extreme cases. Tombs in Lower Nubia (A-group), contemporary with the late predynastic in Upper Egypt, consisted of pits sunk into the ground, covered by a ceiling of sandstone slabs, on which was constructed a mound of debris encased in drystone masonry. Pottery was left at the base of the mounds, some of which had specially constructed offering places on the west and south sides. We then turn to the pyramids at Giza, as more complex versions of the same basic scheme – on a gigantic scale. The grave pit is now carved out of bedrock at the end of a long corridor which points the king's soul to the northern circumpolar stars, or, uniquely for Khufu, is moved up into the very body of the masonry. The pyramid is simply the mound transformed to sublime geometry and expanded into a man-made mountain.

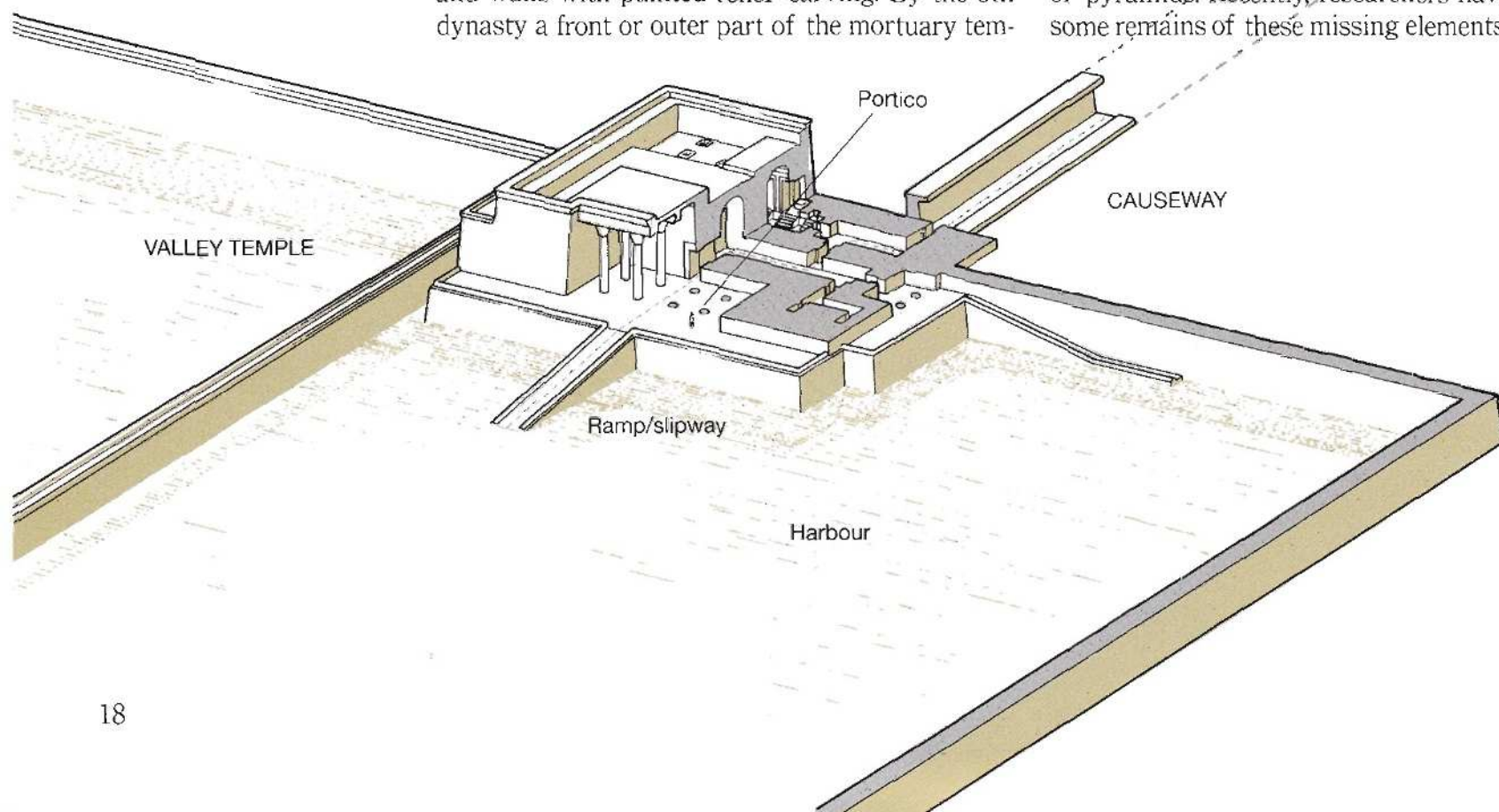
The offering place is now a mortuary (or pyramid) temple on the eastern side, with a colonnaded court with black basalt pavement, granite pillars and walls with painted relief carving. By the 5th dynasty a front or outer part of the mortuary tem-

ple was separated from an inner temple by a transverse hall. Beyond were magazines, and, lastly, an inner sanctuary – the whole route ending in a false door, the symbolic portal of the pyramid complex.

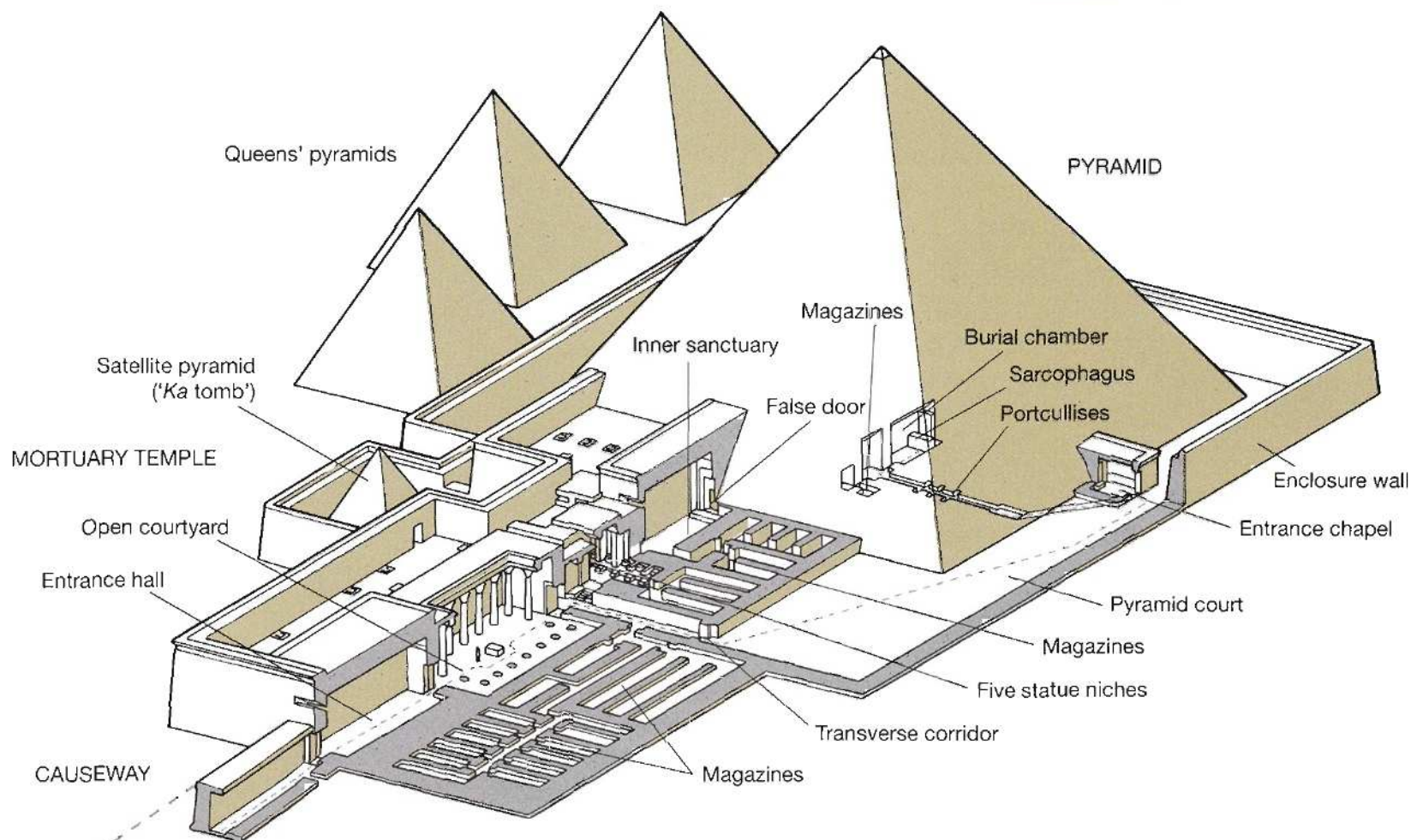
It was long thought that the pharaoh's funeral took place in the mortuary temple, but there are problems with this (p. 25). We are certain at least that it functioned symbolically as a kind of eternal palace for the deceased king, for whom daily rituals were carried out, including processions out and around the pyramid, perpetuating his worship as a god-king. From the mortuary temple a causeway, with walls and usually a roof, ran down to the valley temple, the entrance to the whole complex. The classic complex required that the pyramid be near the valley floor, where it could be reached by a canal, or a channel that held water after the annual Nile flood receded. At the same time the pyramid had to be far enough out in the desert on the plateau to have a dramatic approach. Its base was enclosed by one or two courtyards, defined by walls of stone or mudbrick. Within the inner or outer enclosure was a small satellite pyramid, a miniature double that may have been associated with the king's *ka* or 'spirit' (p. 22). Many complexes include smaller pyramids for queens and several are flanked by pits for the burial of boats, either real or imitation.

These standard elements – pyramid, satellite pyramid, queens' pyramids, mortuary temple, causeway and valley temple – are clear from a survey of the remains of complexes along a stretch of the Nile Valley from Abu Roash to Meidum. For the Egyptians of the pyramid age, other elements on the valley floor might have been equally standard. These structures, concerned with the society and economy of the living pyramid, were mostly built in mudbrick, and have therefore been lost due to the wetter conditions of the floodplain and modern urban expansion. But we read of them in ancient papyri and tomb texts that relate to the functioning of pyramids. Recently, researchers have recovered some remains of these missing elements.

*In the standard pyramid complex access via a harbour or canal was necessary. The valley temple, in essence nothing more than an elaborate portico, formed the entrance to the entire complex. From here the causeway ran up to the mortuary temple and pyramid.*







The standard arrangement, with its east-west axial alignment, of the classic Old Kingdom pyramid complex first appeared in simple form with the Meidum pyramid (p. 97). It was almost immediately and astonishingly amplified and expanded by Khufu's Giza complex (p. 108), and it remained essentially unchanged throughout the Old Kingdom. But the first pyramid of Djoser at Saqqara had a different arrangement (p. 84). A long north-south rectangular enclosure was defined by a niche-decorated wall with a single entrance at the far south end of the east side. The sudden explosion of stone building represented by Djoser's complex had a profound influence on later pyramid builders. In the Middle Kingdom, when the earliest Meidum-type pyramid complexes were already fading into ruin, pyramid builders returned, in a time of experiment and renewal, to some of the basic elements of Djoser's complex.

So it is proper to speak of two basic types of pyramid complex that were separate in conception, but mixed in later monuments. Dieter Arnold has documented the curious switching between the ideal 'Djoser type' and the 'Meidum type'. Already in the 5th dynasty Userkaf returned to elements of the Djoser type. Then in the 12th dynasty Senwos-

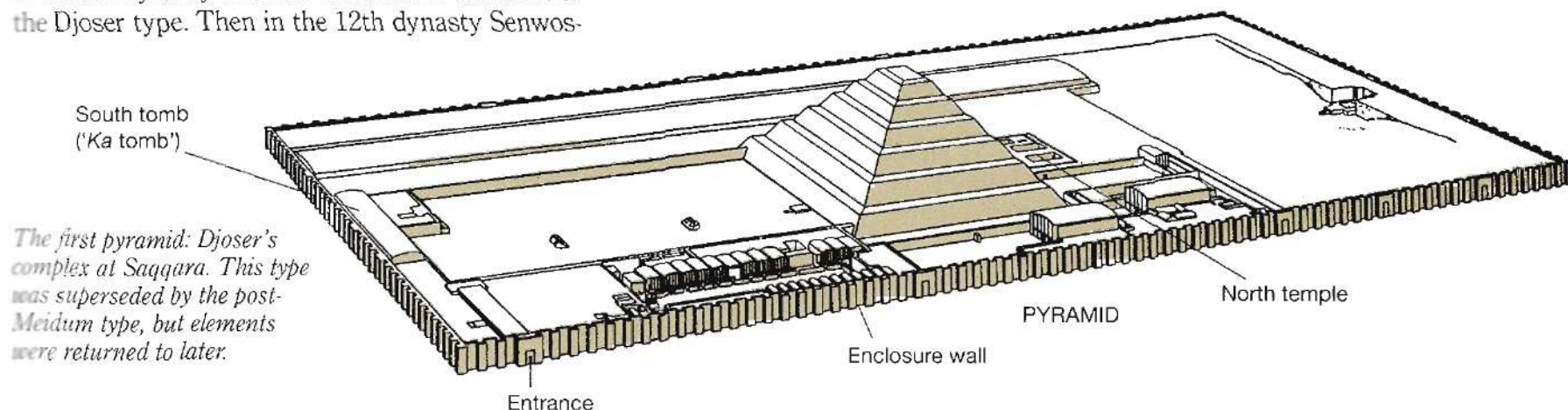
ret III adapted it, as did his son, Amenemhet III for his second pyramid at Hawara. Although one or the other layout is favoured, these later arrangements always include influences from both early types.

At the end of 1,000 years of pyramid history in Egypt, the non-royal 'private' pyramid complexes returned to the basic features of the simple mound-tombs: the pyramid as the symbol of both grave mound and resurrection, the chapel as a place to commune with the dead and leave offerings, and the grave chamber below the hallowed space.

*The standard pyramid complex, based on the pyramid of Unas, but with the addition of three queens pyramids as found at Pepi I's pyramid.*

### The Two Main Pyramid Complex Types

	Djoser Type	Post-Meidum Type
<i>Orientation</i>	North-South	East-West
<i>Entrance</i>	South end of east side	Centre east side
<i>Parts</i>	N-S sequence	E-W axial symmetry
<i>Enclosure wall</i>	Niched, no inner wall	Smooth outer wall, occasionally niched inner wall
<i>'Ka Tomb'</i>	South tomb, no satellite pyramid	Satellite pyramid
<i>Temple</i>	North or south temple, simple or no east chapel	East temple, only north 'entrance chapel'



*The first pyramid: Djoser's complex at Saqqara. This type was superseded by the post-Meidum type, but elements were returned to later.*





Each major pyramid was a tomb for a king of Egypt. Since the king was a god, each pyramid was also the focus of a temple complex maintained by a priesthood long after the pharaoh had been laid to rest. The pyramid complex was an economic engine, too, deploying people and redistributing goods. This was possible only because the pyramid was designed to be a cosmic engine as well; in fact, each pyramid ensured the rule of universal order, the turning of the days and seasons, and the flooding of the Nile. The mechanics of the pyramid as cosmic engine depended on the Egyptian concept of a person and the distinct phases of life and death, called *kheperu*. These 'transformations' continued when the *ka*, the *ba* and the body, which had become separated at death, interacted in the final transformation – becoming an *akh*, a glorified being of light, effective in the Afterlife. The pyramid was an instrument that enabled this alchemy to take place for the pharaoh, who had ruled as the god incarnate, and allowed that incarnation to pass from father to son, from Osiris to Horus. Encapsulating the dangerous interface between cosmic order and the terrible formlessness of time before the beginning, the pyramid is better understood as the meeting point of life and light with death and darkness. Our earliest insight into such ideas comes from the Pyramid Texts, written on the walls of pyramid chambers beginning with Unas in the 5th dynasty. These texts speak to us of what the pyramid meant as an icon and offer glimpses of the burial ceremonies for the god-king and the rituals that were carried out once his mortal remains had been mummified and entombed, setting the cosmic engine in motion.

*The 'opening of the mouth' ceremony from a New Kingdom  
Book of the Dead.*



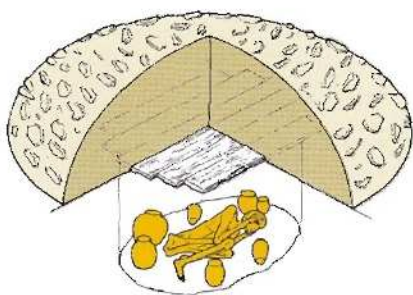




## I TOMB AND TEMPLE



# The Ka, the Ba and the Body Embalmed



(Above) A simple predynastic grave, the body buried in a pit beneath a mound. The body was naturally desiccated by the hot, dry desert sands.

(Above right) Early evidence of mummification: a human arm from the tomb of King Djer at Abydos, with linen wrappings and four bracelets.

'This Unas has come... His two wings having grown as those of a falcon, feathered as those of a hawk, his *ba* having brought him, his magic having equipped him. You shall open your place among the stars in the sky.'

Pyramid Texts, 245, 250-51

When we visit the pyramids we walk on ancient graveyards. The pyramids and their temples, and the burials of kings, nobles and commoners, express the unique ancient Egyptian idea of death. Death is a ritual process for the living and the Egyptians marked their passage into the hereafter perhaps more than other ancient societies. For them death was not the end, but just one of the transformations in life's natural cycle. The final change in status depended on the first duty in the housekeeping of death – the treatment of the corpse.

During life the body was called *khet* or *iru* – 'form', 'appearance'; the corpse was *khat*. Transformed into a mummy, it was *sah*, a word whose root is also used for 'to be noble'. Mummification was not so much the preservation of the body as it had been during life, but the transfiguration of the corpse into a new body 'filled with magic', a simulacrum or statue in wrappings and resin.

## The origins of mummification

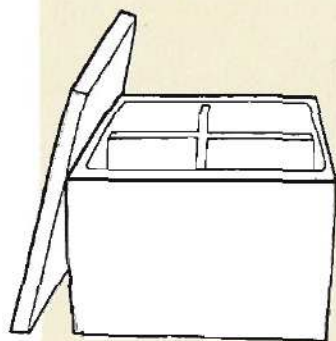
It is often stated that mummification was inspired by simple predynastic pit burials in which the body was naturally desiccated by contact with the desert



sands. As time went on graves became more elaborate, separating the body from the sand. Ironically, these measures promoted decay instead of preservation. The first steps towards mummification – wrapping the body in linen – coincide with the development of tomb superstructures, just after the rise of the Egyptian state. An arm with bandages and wearing four bracelets, dating to the 1st dynasty, was found in the tomb of Djer at Abydos.

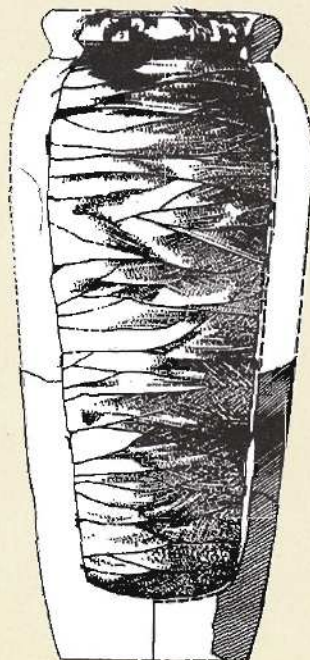
In fact, mummification may have stemmed from a practice diametrically opposite to preventing the body's decay. Petrie found evidence which suggested to him that as early as predynastic times certain people were prepared for death's passage by allowing the body to decompose, with the skeletal parts

## Canopic Vessels



(Left) Alabaster canopic chest of Queen Hetepheres I, from her secret tomb at Giza.

(Right) In Pepi I's pyramid, fragments of canopic jars were found, and one tightly wrapped package of viscera, still retaining the shape of its jar.



In the process of mummification the Egyptians removed the viscera – particularly the liver, lungs, intestines and stomach – from the body in order, as is usually thought, to prevent decay. They were then wrapped up and stored in the tomb separately. At Meidum, the tomb of Rahotep and Ranefer contained

small square recesses for the canopic packages in the south wall of the burial chamber. Ranefer's canopic recess still retained his linen-wrapped organs. The Giza tomb of Hetepheres contained the oldest known canopic chest, carved of alabaster and divided into four compartments. When it was opened it still contained packages, presumed to be the queen's viscera, in a natron solution.

By the time of Meresankh III, Khufu's granddaughter and wife of Khafre, the viscera were placed in four separate jars. Later canopic jars were fitted into the chests. One of Pepi I's canopic bundles was found in his pyramid, mixed with the fragments of alabaster jars that had once contained it and the others.

Canopic is a word derived from a Greek myth about Canopus, a sailor who died and was subsequently worshipped in Egypt in the form of a jar, and associated with Osiris.



then reassembled. Before preparing the mummy, the objective was to remove all body parts that would putrefy. By early dynastic times the skeleton was re-incorporated in a linen-wrapped effigy. Discoveries in elite tombs at Meidum, on the threshold of the pyramid age, show how dismemberment and recomposition of corpses was practised on the bodies of the most important people in the land. Well into the Middle Kingdom, human remains inside mummies are often little more than skeletons.

This observation is all the more intriguing when we realize that dismemberment and decay in death were among the primary fears of the Egyptians. Certain funerary texts from all periods contain, along with such fears, positive allusions to the recomposition of the body. In the Pyramid Texts (p. 31) spells call for the recomposition of the royal body, implying a prior state of dismemberment. All this relates to Egypt's central myth about Osiris who was killed and dismembered by his brother Seth, reconstituted by his sister-wife Isis as the archetypal mummy and avenged by his son Horus, the god incarnate in every king.

Dismemberment renders something dysfunctional. In the tomb precinct, a liminal zone between this world and the Netherworld, the Egyptians seem to have been anxious to dismember things that might be highly charged by contact with the dead. Structures associated with death and burial were sometimes ritually disassembled and carefully buried separate from the body. The southern ships of Khufu are particularly large and wonderfully complete examples (p. 118). Another is the canopy found under Khafre's satellite pyramid. Probably used for transporting a funerary statue, it had been chopped up and the pieces packed in a box, buried in a blind passage under the pyramid (p. 126).

If one goal of mummification was to put away and to incapacitate the dead, the point was also to reassemble the body to gain release in another plane of existence. The paradox of the bound mummy was that it also allowed liberation and continued life – not so the dead could haunt the living, but so they could be reborn in the Afterlife. The two realms did, however, interact. In fact they were mutually dependent. For this reason the Egyptians wanted the spirits of their departed to be bound to the mortal remains – but confined to the other side of the tomb. The reassembled body served as an anchor for a spiritual reassembly on the other side of the false door, a mysterious alchemy of a person's separate parts, the *ka* and the *ba*.

### The *ka*

The *ka* is one of the most important dimensions of the human being in Egyptian thought, yet there is no easy translation. It is written with the sign of upraised arms, bent perpendicular at the elbows. Perhaps the most succinct translation is 'life force'. The *ka* is associated with 'food sustenance', *kau*,

and therefore with the food offerings in the tomb. 'For your *ka*' was an Egyptian toast with food and drink offerings similar to our salute 'to your health'.

While residing discretely in each person the *ka* was characterized by its transferability and commonality. In Egyptian artistic convention the upraised arms of the *ka* hieroglyph represent an embrace. For the Egyptians an embrace transferred vital force between two people, or between gods and king. The *ka* was transferred through the family lineage – it was generic and, in our terms, genetic. For everyone, this life force extended back through countless generations to the creator god who transferred his *ka* to the gods, who, in turn, transferred theirs to the king. The king is the life force, the *ka*, of his people – 'the *ka* of the living'.

At death one's *ka* went to rest, subsumed back into its generic folds. This return to commonality took place while the body was prepared and transformed into the mummy. The *ka* then needed to be reactivated so that the spiritual transformation of rebirth could take place and so that the link to the land of the living, through the tomb, could be established and maintained. For this to happen the deceased had to travel to join their *ka*, but not as the body, bound up in its wrappings. It is the *ba* that makes the journey.

### The *ba*

If the *ka* is the generic life force, the *ba* is a person's individual renown or distinctive manifestation – the impression made on others. The *ba* has often been translated as 'soul' and considered a part of the total human being along with the *ka* and *akh*. But detailed studies indicate that the *ba* and *akh* are entities in their own right. The *ba* seems to have been a fully corporeal mode of existence with the ability, for instance, to eat, drink, travel and copulate. It is represented by the hieroglyph of the ibis; from the 18th dynasty it had a human head.

The *bas* of gods were their manifestation in nature – stars, inanimate objects, even other gods. A *ba* of Shu, god of the air, is wind. Likewise the *bas* of the king are the manifestations of his power – an armed expedition, for example. Cities had *bas*. Even inanimate objects like temple pylons, threshing floors, doors and sacred books had *bas*. During life this power was revealed primarily through the body. With death the body becomes inanimate and so the former personality and status of a person were distilled into a being that could travel to the realms of the Afterlife and then return to the tomb.

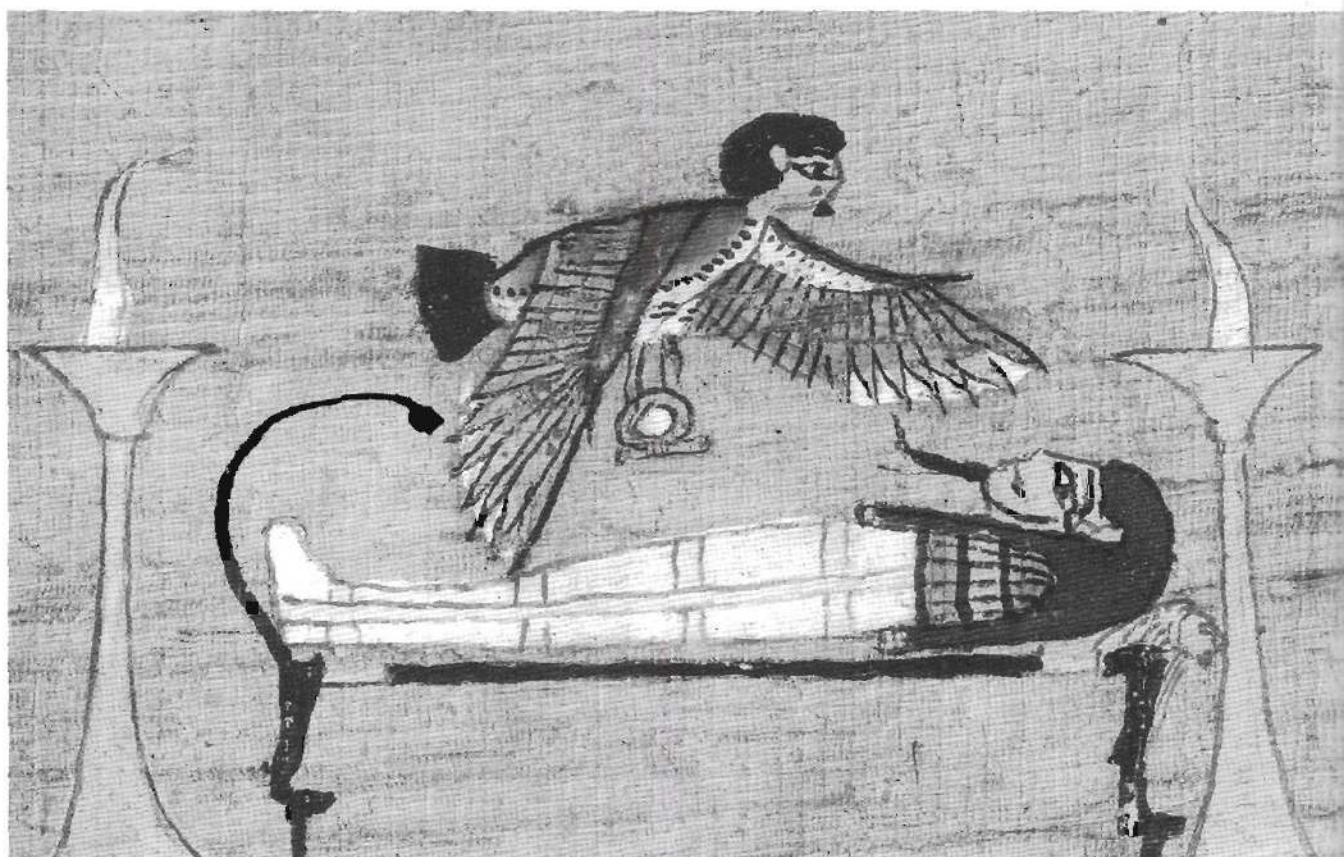
In the Afterlife the *ba* could not function if the corpse was decaying and putrefying – it was for this reason that all potential for decay had to be stripped from the body. The Coffin Texts tell the deceased 'thy *ba* awakest upon thy corpse', but for this to happen the corpse had to be made 'firm', 'established', 'stable', 'enduring', 'whole', 'sound'.

*This wonderfully complete, life-sized wooden ka-statue of the 13th-dynasty king Aibre-Hor was found in his tomb at Dahshur, within the precinct of Amenemhet III's pyramid.*





The ba hovering over a mummy, from a New Kingdom Book of the Dead.



As in rituals around the world, Egyptian rites of death and passage to a higher status involved a stage where the distinguishing features of life were stripped and dissolved. As a collection of excarnated bones, desiccated flesh and hair, the naked body of a king looked like that of anyone else. The burial ritual re-established social status and personality, now realized as the *ba*. The Pyramid Texts speak of the royal insignia, the uraeus and the Eye of Horus, being given to the king. For passing through the doors of heaven, the king puts on a *ba*-garment, the leopard pelt of princely and priestly power.

As miraculous as this new mode of existence may have been, it was still only part of the final transformation. A journey followed to the sky, to sunlight, to the stars. In the celestial realms the deceased hoped to attain higher status, second only to becoming a god – resurrection as an *akh*.

### The *akh*

The Pyramid Texts speak of the king ascending to Nut, the sky goddess, leaving 'a Horus', a new living king, behind him. Joining the stars, the king becomes an *akh*. *Akh* is often translated as 'spirit' or 'spirit state'. It derives from the term for 'radiant light', written with the crested ibis, as though the crest transforms the ordinary ibis bird of the *ba*. The *akh* is the fully resurrected, glorified form of the deceased in the Afterlife. *Akh* is also a word for 'effective', 'profitable', 'useful'. The reunion of the *ba* with the *ka* is effected by the burial ritual, creating the final transformation of the deceased as an *akh*. As a member of the starry sky, called *akh-akh* in the Pyramid Texts and the New Kingdom Book of the Dead, the king is free to move on and over the earth. Like the *ba*, the *akh* was thought of as a com-

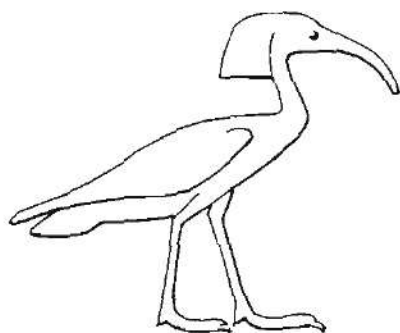
plete entity, co-existing with the *ka* and the *ba*. An 'effective, equipped *akh*' comes close to our concept of a ghost, for it could reach across the liminal zone of the tomb to have positive or negative effects on the realm of earthly life. Being an *akh* had its practical responsibilities in the world of the living.

### Pyramid as place of transformation

The success of an ancient Egyptian in the Afterlife depended on the burial rites and later offering rituals in the tomb. For the king, the pyramid was the place of ascension and transformation. His independent modes of being – particularly his *ka* – stood at the head of all his living and dead subjects. This was particularly true in the Old Kingdom, when only the king's pyramid was inscribed with funerary texts. No wonder, then, that it was so important to take care of his *ka*, for in a sense it contained the life force of all his living subjects.

The names of pyramids show that they were perceived as places of ascension and transformation. Khufu's was *Akhet*, the 'Horizon', of Khufu. Built on the word *akh*, the name signified not just the horizon but the 'radiant place' of glorification. A series of 5th-dynasty pyramid names contain a reference to the *ba*. Six of the 26 known pyramid names refer to the rising of the king, while five refer to his perfection. Five others affirm that the king is 'established' and 'endures', while eight pyramids are named for the king's 'places' or 'thrones' which 'rise', 'flourish' and are 'established', 'pure', 'divine' and 'perfect'. As the kings ascended and re-established their courts in the Afterlife, generations of Egyptians moved as cohorts across death's threshold to live again as a 'community of *kas*', focused on the pyramid and its surrounding necropolis.

The *akh* was represented as the crested ibis. This was the final transformation of the deceased.





'Horus takes him to his fingers, that he may cleanse  
this Unas in the Jackal [Anubis] Basin;  
He will release the *ka* of this Unas in the Morning  
Basin;  
He will wipe off the flesh of the *ka* of his body;  
He conducts the *ka* of this Unas and of his body to the  
Great House.'

Pyramid Texts 268

Burial rituals enacted at the pyramid ensured the transfer of kingship from the dead pharaoh to the living one. These rituals might therefore help us in understanding the function of parts of the pyramid complex. Much of our information for Egyptian funerals comes from scenes in tombs of high officials, since the king's funeral is never shown in any of the pictorial fragments recovered from pyramid temples. On the basis of such scenes the funeral ceremony has been divided into 4, 5 or as many as 16 episodes. In typical Egyptian fashion there were rituals embedded within rituals, for embalming, purification, burial and offering. This sacred theatre was probably seldom complete in all its acts – except, perhaps, for the king.

### The voyage of the dead

Our first glimpse of the opening scenes of the funeral pageant is in reliefs in 6th-dynasty tombs. Women shriek and wail, people fall to the ground, rend their clothing and throw dirt on their heads as the coffin is carried on a bier. Already we see a cast of characters who will remain the principals throughout the funeral. The Old Kingdom procession includes a woman labelled 'the Kite', either a professional mourner or the widow. Later there were two Kites, identified with Isis and Nephthys, mourners of Osiris. They are mentioned in the Pyramid Texts, where the dead king is identified with Osiris. Also present was the 'Embalmer',

whose name, *Wet*, means 'the Wrapper', who was in charge of those who changed the cadaver into the mummy. The 'Lector Priest', 'one who carries the ritual', possessed knowledge which was key to the transformation of the deceased into an *akh*.

Flanked by the two Kites and accompanied by the others, the coffin was loaded on to a boat. Those who had lived some distance from the necropolis probably reached it by old river channels, canals or a harbour-lake for the pyramid complex. For those who had lived in towns at the base of the pyramid plateau, there could have been a voyage on a token canal, perhaps indicated by scenes of the boat towed by rows of men on the banks. The disassembled boats ritually buried in pits outside Khufu's pyramid enclosure (p. 118) may have been used to carry the king's body on this voyage. Docking at the pyramid harbour, the deceased was unloaded before the 'Doors of Heaven', described in the Pyramid Texts as part of the watery celestial world. In tomb scenes of the funeral, the doors were associated with the *Ibu*, the 'Tent of Purification.'

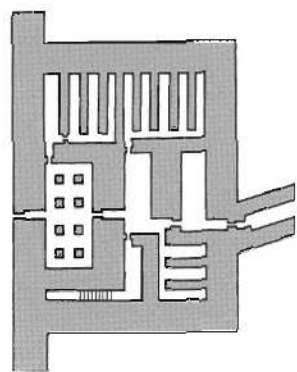
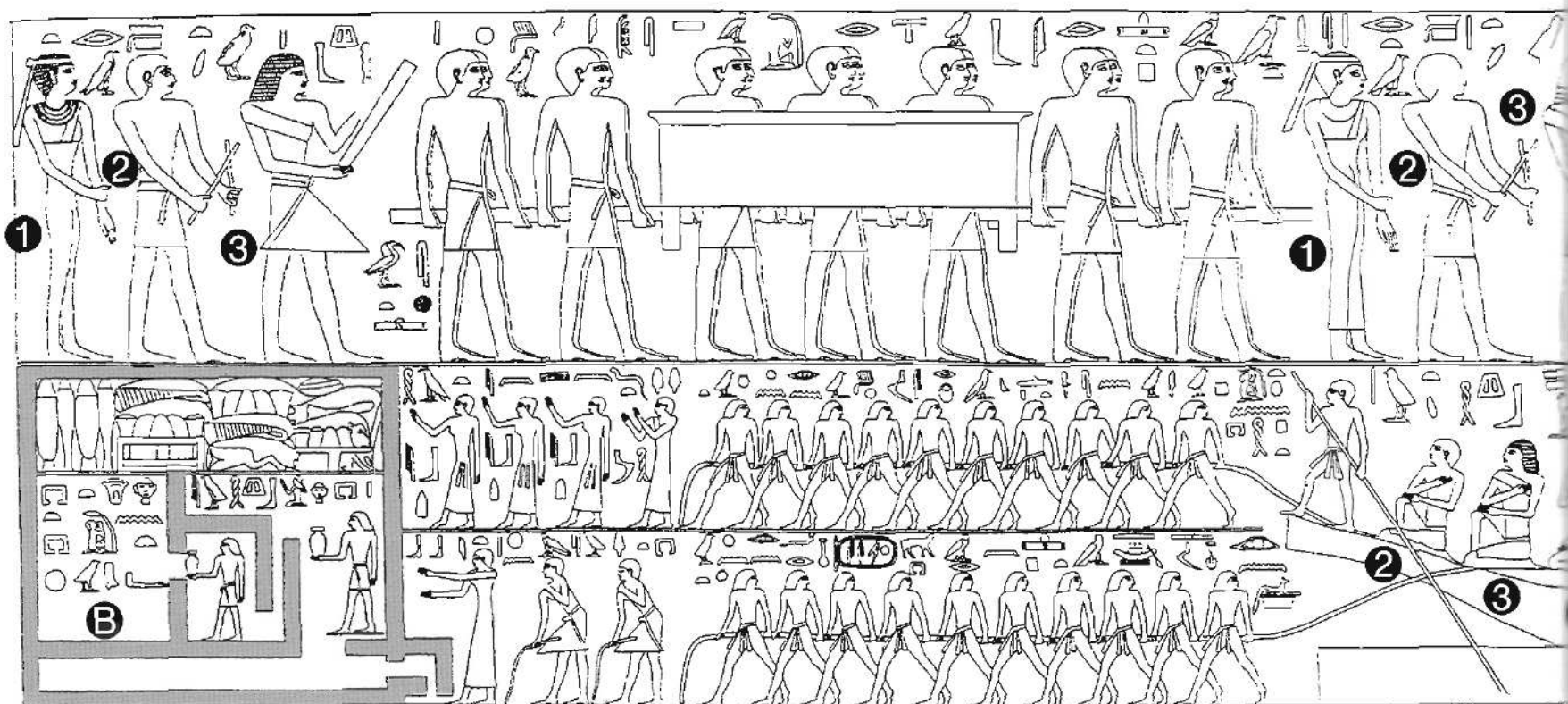
### The *Ibu* and the *Wabet*

So far, the corpse had probably not received any elaborate treatment. But before it could enter the sacred necropolis it had to be purified. As we have seen, the 'cleansing' at some point involved the

*Mourners, dressed in white, precede the coffin hauled along on a long-poled bier in this scene from the New Kingdom Book of the Dead of Ani.*







The plan of Pepi II's valley temple reflects the main features of Qar's wabet, highlighted above: two vestibules or antechambers, a blind corridor or stairway (below), main hall and side magazines (top of plan).

removal of most of the soft tissue. Where did this take place? Tomb scenes give the impression that almost immediately after arriving at the necropolis, the body was taken to the *Ibu*, or the *Ibu en Waab*, the 'Tent of Purification'.

In tomb scenes the *Ibu* is a light construction of wood poles and reed mats shielding a rectangular space, on or near the edge of a waterway, with pathways and doors at either end. Comparisons can be made to known pyramid valley temples, particularly those of Khafre at Giza and Pepi II at South Saqqara. Along the front of Pepi II's temple, ramps ascended from the harbour to a platform, with doorways through small kiosks at each end. Khafre's valley temple is also approached by two stone ramps up to a low terrace along the temple front. In 1996 Zahi Hawass found tunnels in the bedrock beneath the ramps, with mudbrick walls forming a corridor, perhaps a token canal. After crossing this symbolic waterway, ramps lead to the north and south doors of the valley temple. The *Ibu* could therefore have been a temporary wood-frame and reed-mat structure on platforms in front of the valley temple, if not part of the valley temple itself.

From the *Ibu* the body was taken to the *Wabet* – from a word meaning 'pure'. In the tomb of Pepi-ankh this is called the 'Pure Place of Wrapping'. *Wabet* is usually translated 'mortuary workshop' and said to be the place of embalming. It has been suggested that the royal *Wabet* could have been in the mortuary temple. However, texts and pictorial representations hint that the *Wabet* was in the valley – perhaps the valley temple – and near the *Ibu*.

If the process of desiccation and partial dismemberment lasted 70 days, or a major part of 272 days as noted in the tomb of Queen Meresankh, the *Ibu* may not have been secure enough. Perhaps ritual lustration and removal of the viscera and brain

were performed in the *Ibu*, while the long period of desiccation followed in the *Wabet*. Relief scenes in the Giza tomb of Qar show his *Wabet* which is labelled 'Wabet of a period of time' and which has similarities with the valley temple of Pepi II. Both have three main central rooms, a long narrow blind corridor and one side taken over by magazines.

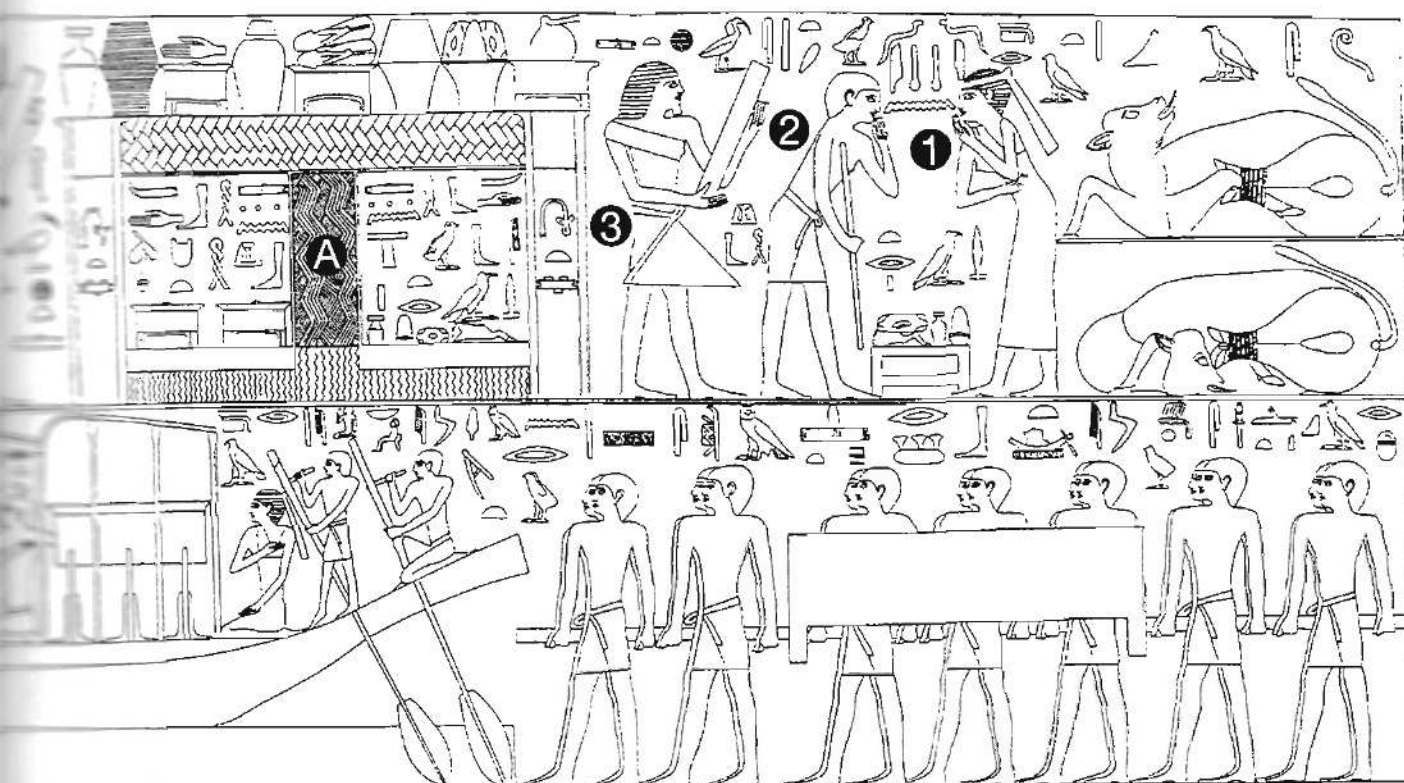
Such individual correspondences between the valley temples of Khafre and Pepi II and features of 6th-dynasty scenes of funeral rituals – the edge of a canal or basin, two pathways, two entrances, a portico, the form of the 'Divine Booth' – have prompted suggestions that the valley temples functioned as the *Ibu*, or the *Ibu* and *Wabet* combined. B. Grdseloff thought that the purification was carried out on the roof of the valley temple and embalming in the vestibule. Herbert Ricke believed the whole process would have taken place in mudbrick buildings elsewhere, then ritually re-enacted in the valley temple. None of the eight excavated valley temples – of 28 that probably existed – contain an obvious place for the processes of mummification.

### Journey to the tomb

The mummified body in its coffin was now pulled by oxen on a sledge to the necropolis. At this stage the coffin procession still involved the Kites and priests. The procession to the tomb also included furnishing for setting up house in the Afterlife: linen, tools, weapons, pottery and metal vessels, ointments, oils and symbols of social status. Unfortunately, no pyramid has been found archaeologically with its burial assemblage intact, so we can only guess at the riches it would have comprised.

An important ritual at the tomb was an invocation called 'coming forth at the voice'. The deceased was summoned to come and partake of the offerings. As time went on, offerings became lengthier





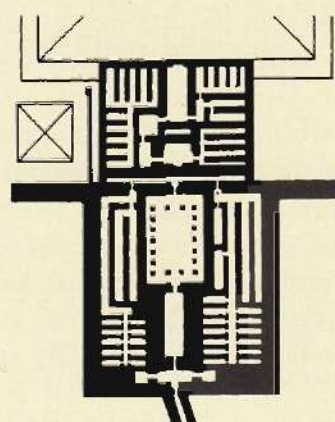
The funeral procession to the Ibu and the Wabet, shown in great detail in the 6th-dynasty tomb of Qar at Giza.

- A Ibu
- B Wabet
- 1 'Kite'
- 2 Embalmer
- 3 Lector Priest

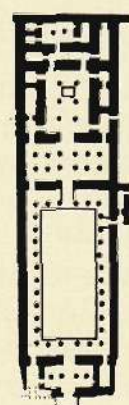
and more complex. Hermann Junker counted 17 different ritual presentations in Old Kingdom tombs which he could relate to those for the king mentioned in the Pyramid Texts, including censings, libations, gifts of cloth, cattle and fowl. With the addition of a second set of utterances and rites for glorifying the dead, or making them effective (*akh*), the ritual grew so complex that a specialist, the Lector Priest, appears in 5th-dynasty scenes. The 'opening of the mouth' was performed to allow the deceased to breathe, eat and speak in the Afterlife. Texts of the 6th dynasty speak of 80 men who helped set the lid on to the stone sarcophagus. This may have been the full complement of workers but they could not all have fitted into the burial chamber. The final rite was 'bringing the foot' – erasing the footprints of the officiants by dragging a brush, along with more censuring and libations.

The focus of any tomb, including the king's, was the offering place and false door – the entrance to the Netherworld. In both large tombs and pyramid complexes, pictorial programmes included scenes of hunting, fowling, fishing and the delivery of offerings. Both pharaoh and nobleman had statues representing the continued existence of the head of the household. In elite tombs the arrival at the sepulchre is labelled 'landing at the *Tjeph*et' ('Cavern') of the Great Palace' and in the Abusir Papyri the five statue chambers in the mortuary temple are called *Tjeph*et. It seems evident that the pyramid complex embodied, at a higher order of magnitude and elaboration, a ritual similar to that depicted in the funeral scenes of late Old Kingdom nobility. The king 'moved' through the pyramid complex in the cycle of rebirth and transformation that the funeral ritual effected, even if the housekeeping of death and burial required real but temporary structures, and side routes or ramps over the enclosure.

## A Stage for the Funeral?



Pepi II's mortuary temple



Merenptah's palace

While there are debates as to the role of pyramid mortuary temples in burial ritual, they do reflect the principal features of royal palaces, like Merenptah's at Memphis, from the New Kingdom.

Dieter Arnold, among others, doubts whether the pyramid temples and causeway were in fact used in the royal funeral ceremony. One argument is architectural: rooms and doorways seem too small for the passage of the funeral. From the mortuary temple the body and grave goods had to be taken into the pyramid court and round to the north side of the pyramid to be carried into the burial chamber. In the standard pyramid temples of the 5th and 6th dynasties the exit to the pyramid court was at one end of the transverse hall separating the front from the inner temple. Its doorways seem too narrow to allow the funeral to pass through. In Djoser's Step Pyramid complex, the route from the entrance hall through the mortuary temple and down to the burial vault is just as narrow. Arnold therefore thinks that the funeral rituals would have been conducted outside the pyramid complex in light structures, and the royal body conveyed into the pyramid court by means of a side entrance.

If the mortuary temple was not the stage for the royal funeral, what did it represent? At least one of its aspects was as the deceased king's eternal residence, its parts corresponding broadly to the palace of his lifetime. Indeed, it has the same basic elements as large houses known from the archaeological record: enclosure wall; vestibule; a central meeting place in the form of a pillared hall or open court; a platform for the head of the house to receive visitors; private rooms. The innermost room, the offering hall, corresponded generally to the royal dining room. Behind the false door where offerings were placed, lay the magazines, antechamber and burial chamber under the pyramid, corresponding to the inner foyer and bedroom. The Pyramid Texts identify the burial chamber as the *Per Duat*, an allusion to the Netherworld but also to the *Per Duat*, 'House of Morning' or 'Toilet House' of the palace, where the pharaoh was bathed, anointed and dressed.



# This World and the Netherworld

'I come forth by day to any place where I may wish to be. I have gained power over my heart, I have gained power over my breast, I have gained power over my hands, I have gained power over my feet, I have gained power over my mouth. I have gained power over all limbs of mine ... I sit down, I stand up.'

The Egyptians did not imagine the Afterlife as an ethereal existence. Each person's hope and expectation was to be reborn fully corporeal, as expressed in Chapter 68 of the New Kingdom Book of the Dead (quotation above). Released from the bondage of the bandages, the deceased had control over all physical and psychic abilities. But the mummy did not return bodily to this world, or walk through the tomb's false door, carved in solid rock. It was plain that offerings left at the base of the door were not eaten. The resurrection of the dead happened in another, parallel world. Food offerings were a token meal shared with the dead, providing sustenance just as stone simulacra of shrines, bodies (statues) and boats gave the dead protection, corporeality and mobility in that world. In the same chapter of the Book of the Dead the deceased control more than their own limbs, they now also control air, water, rivers, floods, shores. The spell begins:

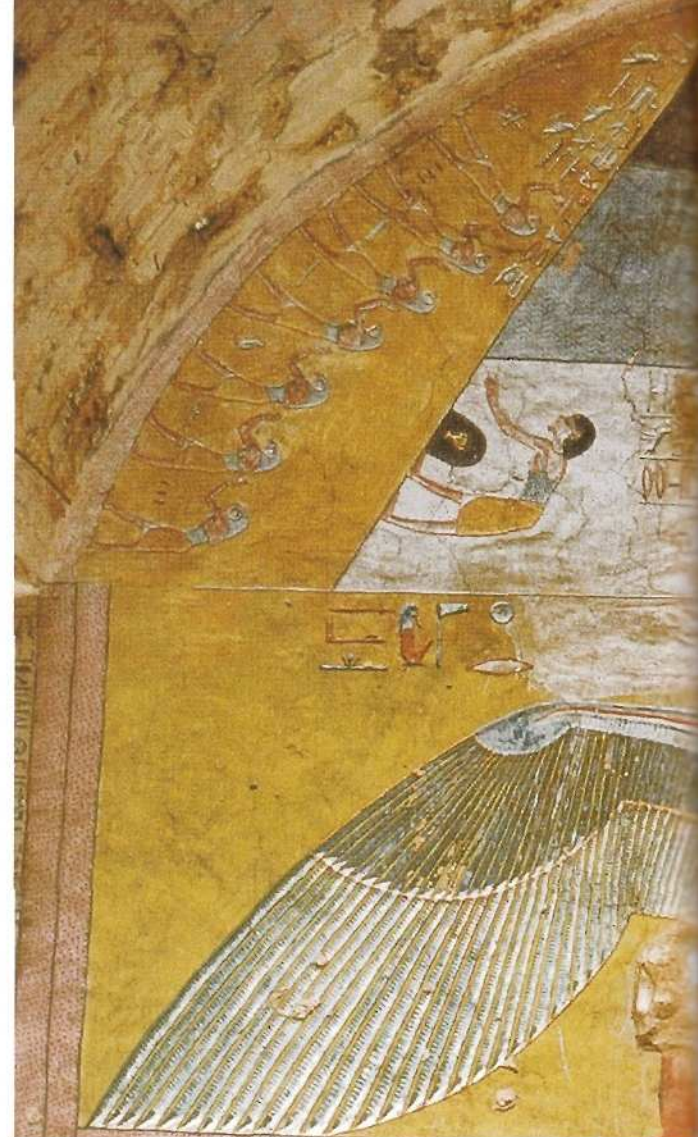
'Opened for me are the double doors of the sky, open for me are the double doors of the earth. Open for me are the bolts of Geb; exposed for me are the roof... And the twin peep-holes..'

On the north side of his Saqqara Step Pyramid, Djoser emerges from his tomb, in statue form, into a statue-box, or *serdab*, which has just such a pair of peep-holes to allow him to see out (p. 90).

## Celestial world and underworld

The oldest literature about the Afterlife, the Pyramid Texts (p. 31), emphasizes the celestial world of the sky more than the earthly underworld. The principal elements of the topography of the Afterlife were the sky, the abyss, the *Duat* ('Netherworld') and the *Akhet* ('horizon'). It was the king's destiny to 'go forth to the sky among the Imperishable Ones' and to 'go around the sky like the sun'.

The sky (*pet*) was inhabited by the *kas*, *bas*, *akhs* and birds as well as gods. The Pyramid Texts mention the sun, the sky-goddess Nut, Osiris, Horus and even Geb, the earth god, as being there. The 'Imperishable Ones' are the circumpolar stars, about 26° to 30° above the northern horizon in the

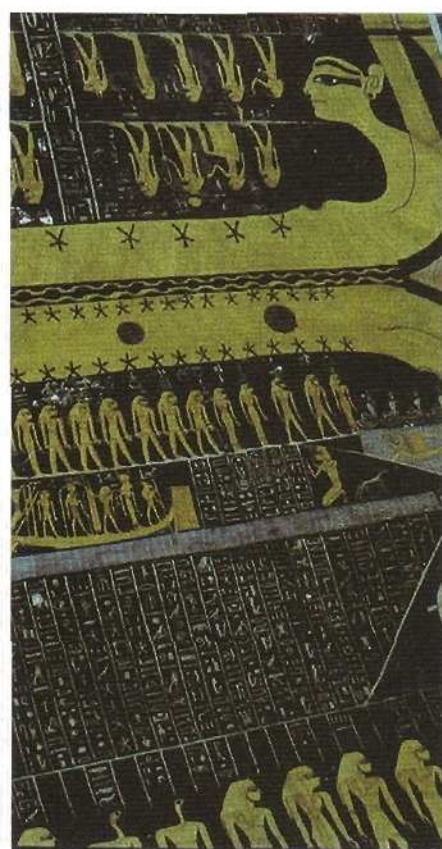


pyramid zone. Since these stars revolve around the celestial north pole and neither rise nor set, the long, narrow passages sloping up from the burial chamber in the northern sides of many pyramids were aimed like a telescope in their direction.

Doorways that opened on each side of the sky allowed gods and kings to pass through but barred commoners and foreigners. Such exclusivity may reflect that of the doors of pyramid temples which may have kept out all but the priests. The expanse of the sky was conceived as the surface of a large body of 'fresh water' that the king and gods crossed on reed floats. Numerous canals and lakes or basins in this image imply the presence of land – indeed, the sky had banks or levees on the west and on the east. The Milky Way was the 'beaten path of stars', although it was also a watery way. Two fields were prominent in the sky, the Field of Reeds, a rather marshy area on the eastern edge, and the Field of Offerings further north, near the Imperishable Ones. In fact, the vision is that of the Nile Valley at inundation.

Nut was the personification of the sky. She was imagined as bending over the earth with her head in the west, where she swallows the setting sun and stars, and her loins in the east, where she gives birth to the rising sun and stars. This image works for sunset if Nut bends under the earth, suggesting that she was conceived as a sky for the Underworld. In the New Kingdom an image of Nut was carved on the bottom of royal sarcophagi, with her

Nut, 'she of a thousand bas' – the stars and sun as her manifestations – from the 19th-dynasty royal tomb of Ramesses VI in the Valley of the Kings.







The most dramatic representation of resurrection from the Duat through the primeval mound was conceived at the end of the 19th dynasty as an embellishment the Book of Caverns, a scene painted in the tombs of the pharaoh Merenptah and the queen Tawosret. Although it is not labelled 'pyramid', the mound has the form of a regular triangle split in half, with the two sides slid apart like a gigantic doorway. The pyramid has a black apex and a blue watery middle band to symbolize the path of the sun through the black darkness and blue waters of the Netherworld. Inside each half a god bends over a black mound enclosing a face, representing the god buried within the Duat. The texts label this, 'the Great God, the Secret of the Duat'. Other texts refer to this motif as 'the Secret Mound, in which there is the interior of the great mystery'. Below the opened pyramid, with wings outstretched for the impending glory of dawn's flight, is the night-form of the sun god with a ram's head. The rising of the sun god takes place in the opening of the pyramid-gate. Other participants total 24, probably representing the 24 hours of the day and night. The birth itself is assisted by gigantic arms that reach down from above to lift out the upside-down figure of a child, a scarab and a sun disk.

Although this scene was composed well over a thousand years after the Pyramid Texts, the same theme of renewal of creation – rebirth – in the depths of the earth is expressed in pictures as it was in stone in the massive pyramids of the Old Kingdom.

arms in the *ka*-like embrace on the sides. The king's tomb was also a cosmic womb, an idea articulated in the Pyramid Texts (616 d–f):

'You are given to your mother, Nut, in her identity of the coffin,  
She has gathered you up, in her identity of the sarcophagus,  
You are ascended to her, in her identity of the tomb.'

This suggests that the sloping pyramid passages descending to the burial chambers were seen in fact as 'ascending' to Nut in the Netherworld. The word for 'Netherworld' was *Duat*, often written with a star in a circle, a reference to Orion, the stellar expression of Osiris, in the Underworld. Osiris was the Lord of the *Duat*, which, like the celestial world (and the real Nile Valley) was both a water world and an earthly realm. In the Pyramid Texts the *Duat* is connected to the earth or to a darker region lying primarily beneath. Aker, the earth god in the form of a double Sphinx, was the entrance – already the Sphinx is a guardian of gateways.

*Akhet* is usually translated as 'horizon', where land and the skies touch, but it meant much more in the Egyptian world concept. Written with the same root as the word *akh*, the *Akhet* was where the dead were transformed into effective inhabitants of the world beyond death. As part of the sky, it was also the place into which the sun, and therefore the king, was reborn from within the *Duat*. It is not hard to imagine the early Egyptians being inspired by the

pre-dawn glow in the eastern horizon, and by the sunset flaming in the west, to see the area just below the horizon as the place of glorification. Khufu's pyramid was *Akhet Khufu*. Here, and in the Pyramid Texts, *Akhet* is written with the crested ibis and elliptical land-sign, not with the hieroglyph of the sun disk between two mountains that was used later to write 'horizon'. As the place where the deceased becomes an *akh*, a suggested translation is 'Spirit' or 'Light Land'.

### The living and the dead

All the cosmic skies and seas, and all the arcane imagery, stem from the uncertainty about the voyage between this world and the Netherworld. At the end of the journey, the Netherworld was a vague reflection of this world – Netherworld celestial geography was similar to the Nile Valley at inundation; Netherworld society lived on in 'That City', where the deceased could be influential if she/he became 'effective' – an *akh*.

To continue an effective life beyond the grave, the dead required living household members to attend to the services of the tomb. In return for this, the living requested that their dead relatives use their influence to maintain the household, of which the tomb was a part. They made their petitions in 'letters to the dead' written on bowls, linen, stelae or even jar stands and deposited in the tomb. Once established in the Netherworld, the deceased was just beyond the veil of the false door. Maintenance



of the household and transfer of the estate were the real motives behind the burial rituals, the tomb and all the weird imagery of the Netherworld. The one who buried the deceased head of the household inherited the estate; the prince who buried the dead king in his pyramid inherited the kingship. The most immense tombs – the pyramids – made the

head of the entire Egyptian household supremely effective (*akh*) in the Netherworld. With the surrounding tombs of members of the court and royal family, the pyramid necropolis was a stone simulacrum of 'That City'. Its role was to carry the king as head of the living *kas*, and therefore the entire community with him, to the new life after death.

## The Netherworld in the New Kingdom

In the New Kingdom, just as the pyramid as the royal burial place was replaced by a natural pyramidal mountain above the subterranean tombs of the Valley of the Kings, new funerary texts emphasized a Netherworld in and under the earth. As opposed to the dead flying up to the celestial light, the sun god comes to the dead with his entourage, journeying down the Nile of the night in his barque. Within this imagined realm are underworld pyramids that elaborate themes hinted at in the Pyramid Texts.

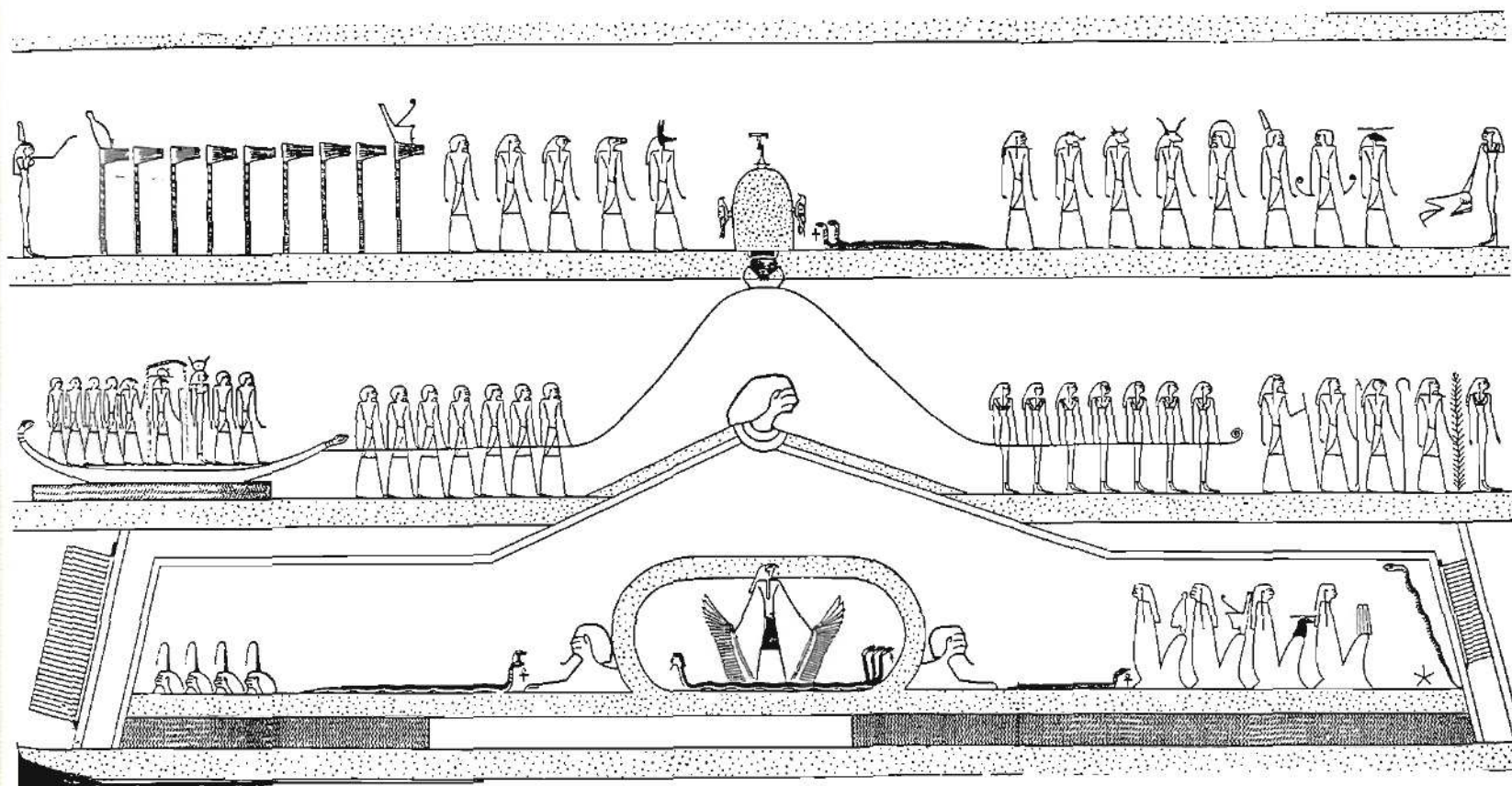
This new genre of funerary composition, at first exclusive to the king's tomb like the older Pyramid Texts, decorated the walls of the royal tombs in the Valley of the Kings. For convenience the texts are called 'Books': the Book of Caverns, Book of Gates, Book of Aker. As with the Pyramid Texts of a thousand years earlier, they contain variations on the creation theme, now played out as a journey systematized into 7 gates, 21 doors, 7 heavenly cows, 14 mounds and 12 caverns. These are illustrated map-guides to the Netherworld. The oldest is *Amduat*, the 'Book of What is in the Underworld', which first appears in the reign of Thutmose I (1504–1492 BC).

The journey of the sun god in his night form of a ram-headed man is depicted in the central register of the walls of descending corridors of tombs. Above

and below, registers show the architecture and denizens of the *Duat* which is divided into 12 hours. In the 5th hour a pyramid-like mound rises to interrupt the three registers. Above the pyramid is a small mound of sand – a stylized grave. Both grave and pyramidal mound are subterranean, as indicated by a stippled band to represent sand.

From the apex of the pyramid a head emerges, in some versions identified as 'the flesh of Isis, who is over the Land of Sokar'. Sokar, the most mysterious form of the god Osiris, Lord of the Netherworld, is the core of the scene, awakening inside his ellipse or 'egg' within the pyramidal mound. The texts state that not even the sun god can penetrate Sokar's chamber, but his passage and his words to Sokar in the sealed chamber set off a reaction within the 'egg'.

The exchange between light – the sun god – and darkness – the cavern of Sokar – allows resurrection to take place at the end of the night journey, when the scarab beetle Khepri pushes the ball of the sun through the gates of the horizon, as the mummiform Osiris slips back into the *Duat*. The renewal of creation in the depths of the earth allows the king's soul to ascend from the tomb just as it allows the sun to rise again.





'As for anyone who shall lay a finger on this pyramid and this temple which belong to me and to my double..., he will be judged by the Ennead and he will be nowhere and his house will be nowhere; he will be one proscribed, one who eats himself.'

Pyramid Texts, 1278–79

The route through a pyramid complex leads finally to the great stone false door at the back of the offering chapel. On the 'other side', behind solid masonry, deep under the pyramid, lay the most intimate rooms of this house of eternity: the burial chamber and antechamber. Beginning with the pyramid of Unas at the end of the 5th dynasty, the walls of these chambers were inscribed with vertical columns of texts from Egypt's – indeed the world's – oldest religious literature. The Pyramid Texts are a tantalizing, yet confusing, literary window on to the meaning of a pyramid complex.

The Brugsch brothers, Emile and Heinrich, made the initial discovery of Pyramid Texts in 1881 in the pyramids of Unas, Teti, Pepi I, Merenre and Pepi II. Kurt Sethe prepared the first definitive edition of the texts, numbering 714 individual sayings or spells. New texts found in 1925 in the pyramids of Pepi II and his queens, Neith, Iput and Wadjes extended the number to 759. French excavations in South Saqqara, under Jean Leclant, have continued to find new texts in the last two decades.

In spite of great repetition of the spells and their sequences, the 'editions' of Pyramid Texts differ from one pyramid to another. The oldest edition, that of Unas, contains only 283 of the known texts and includes ones not found in later editions. The

most recent royal edition, in the small pyramid of Ibi, includes spells unknown in older ones. This suggests a fair degree of fluidity and individual choice of repertoire for each king. On the basis of both archaeological and historical evidence, scholars recognize references to the Old Kingdom state, and therefore date their earliest composition to the period after the unification.

During the First Intermediate Period and Middle Kingdom, Pyramid Texts were also inscribed in the tombs of high officials. They were then subsumed into the Coffin Texts, found inside the coffins of important people. Pyramid Texts were still included in the tombs of officials in the New Kingdom, in the Book of the Dead and in Late Period funerary papyri. The can also be recognized, after radical reworking, in New Kingdom temple ritual. Copies of Pyramid Texts have been found in Late Period tombs and sarcophagi. The fact that such copies, carefully executed in Old Kingdom style, include spells both known and unknown in Old Kingdom editions, hints that the known Old Kingdom texts are a selection from a larger body of texts.

## Categories of Pyramid Texts

*Scholars have recognized five major categories of spells:*

**1 Dramatic Texts** include spells of lament, spells of the offering ritual, and spells relating to the provision of the king's crowns, to the introduction of equipment to the grave, and to the opening of the mouth and other statue rituals. The Dramatic Texts take the form of recited speech and prescribed action: 'raise up before him' (the deceased), 'lay on the ground in front of him'. Some of the texts suggest that the speaker and the recipient take on the roles of gods in the prescribed ritual action. The formulation of the Dramatic Texts may date to the 2nd and 3rd dynasties.

**2 Hymns with Name Formulae** set the cult symbols, actions and ritual objects of the Dramatic Texts in the context of mythical stories or allusions, sometimes by adding, 'in this thy name of' or simply 'as'.

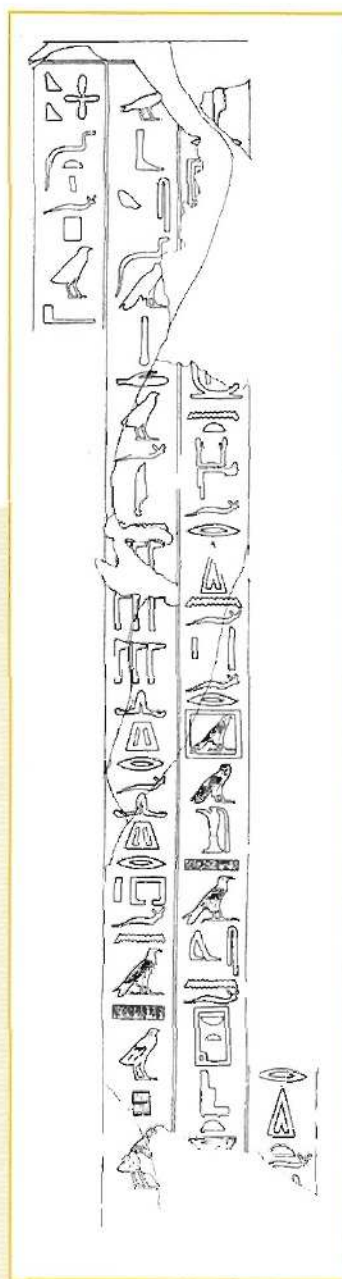
**3 Litanies** are structured as verse and consist of enumerations and sequences of names and name formulae pertaining to particular divine things and

beings. For example, Spell 220 hails the crown as the king takes possession of it: 'He comes to you, O Crown! He comes to you, O Flame; He comes to you, O Great One; He comes to you, O Rich in Magic.' The Hymns and Litanies may have been composed during the 4th dynasty.

**4 The Glorifications** – the *Sakhu*, literally, 'that which makes one into an *Akh*', form the largest part of the Pyramid Texts. The oldest glorification spells, probably carried out at the tomb during the funeral, mention the sand tomb (PT 1877–78) and the mudbrick mastaba (PT 572c–e). Many of the Glorification Texts are, however, the youngest Pyramid Texts, composed during the 5th and even as late as the 6th dynasty.

**5 The Magical Texts** consist of short protection spells for charming snakes and other dangerous beings. From their form of speech, they are judged to be the oldest texts, dating to the early Archaic Period.

# The Pyramid Texts



*Pyramid texts inscribed before the portcullises in Pepi I's pyramid, translated in the opening quote.*





*The pyramid of Unas at Saqqara is the earliest to contain Pyramid Texts. A detail is shown opposite.*

Like the programmes of statues and reliefs in the pyramid temples, the overall theme of the Pyramid Texts was the eternal existence of the king in the Afterlife. However, it has not been easy to recognize a completely coherent treatment. The texts do, however, have a decided emphasis on the sky realm of the sun god, an emphasis which makes scholars suspect Heliopolis as the place where much of the corpus was conceived and formulated. The king joins the extended family of the gods; in fact, his death and resurrection is a homecoming. He boards the ship of the sun god and voyages through the sky and the various fields of the Netherworld. Alternatively, the king flies to the sky as a falcon, kite or goose, or leaps upward as a grasshopper. Or he is assisted in his ascent by the natural forces like wind and hail storms. His destiny is both the day and the night sky, for he joins the northern Imperishable Stars. As they identify the dead king with Osiris, the Pyramid Texts also present a chthonic Underworld dimension of the Afterlife.

### **Fragmented myth and ritual**

The Pyramid Texts make allusions to myths, particularly the central pageant of Osiris and the conflict between Horus and Seth over the inheritance of the kingdom, but never provide a coherent narration of the stories. Instead there are, scattered throughout, fragments of myths, as though the story as a whole is too potent for outright telling.

Opinions differ as to the purpose of this poetic discourse, draped like a curtain of ritual and magic around the innermost chambers of the pyramid. For the Egyptians, word and its effect were perceived as one and the same. Kurt Sethe considered the texts a free-form amalgamation of spells that, inscribed permanently on the walls around the king's body, allowed him to be transformed and resurrected, a view which many agree with. Others, while not disagreeing, also see them as the script of the funeral rituals. The idea that parts of the Pyramid Texts were recited in particular contexts is made compelling by directions like 'words to be





spoken', by the dramatic form of spells comprising the opening of the mouth, by instructions for ritual actions and by the texts which have as their object purifications, censings, presentation of clothes and ointments, and the consecration of the pyramid. It would be perverse to think that the offering ritual would not have been performed in the offering hall of the mortuary temple.

### Text, architecture and cosmos

In James Allen's recent 'reading' he looked at the pyramid of Unas – the oldest and most complete rendition. He examined the placement of the spells on the walls, the direction of their narration and the groups of spells. Two ordering principles emerged. First, the narrative flows away from the direction that birds and animal and human hieroglyphs face – the texts progress from right to left except on the north walls of the burial chamber and antechamber where they are read left to right. This is in order to follow the second rule: the texts move from inside the tomb outwards. Thematically, the texts fall into two broad sets: one for the burial chamber and another for the antechamber.

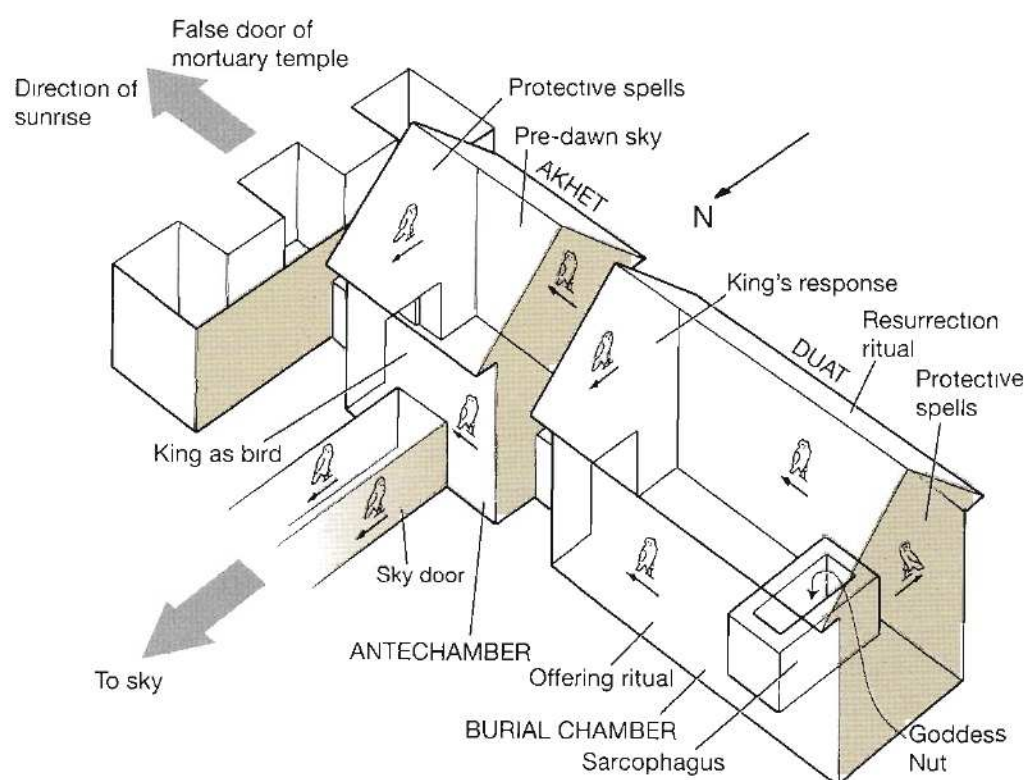
On the western gable of the burial chamber are spells to protect the dead king against snakes, scorpions and other threats. Similar protective spells are found on the east gable of the antechamber. The king's private apartments are thus framed by apotropaic texts, just as outside the pyramid, the causeway and small vestibule contained scenes that protected the passage through the pyramid complex. Parallels between interior text and exterior sign and symbol are evident in the opening spell of the offering ritual on the north wall of the burial chamber, which talks of seizing enemies. The scenes at the lower end of the causeway showed the gods holding ropes binding the enemies of the

king. The rest of the offering ritual speaks of the king being dressed, anointed and fed, as he was in the private rooms of the royal residence during life.

On the east gable of the antechamber is also the famous 'Cannibal Hymn' in which the king flies to heaven through a stormy sky: '...impressive as a god who lives on his fathers and feeds on his mothers...' We should understand this 'cannibalism' in the light of the *ka* as the communicative life force that is passed down from Creator to the gods to the king and from parent to child. We should also not forget that the eastern wall of the antechamber faces the 'virtual' exit from the underground apartments of the pyramid – the false door embedded in the east flank of the pyramid at the culmination of the mortuary temple. Beyond the antechamber are the standard three niches, sometimes referred to as *serdabs* as if for statues. However, they could also have been magazines for storing provisions, symbolically transferred into the pyramid chambers from the offerings presented before the false door.

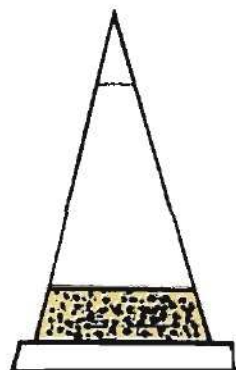
Altogether, the arrangement of Unas's Pyramid Texts reflects the order in which Unas would read them after rising from the sarcophagus, moving through the burial chamber, antechamber and along the corridor. Although Unas's body remains in the burial chamber, just as Osiris remains in the *Duat*, his *ba* awakens, releases itself from the body and proceeds through the *Duat* towards sunrise. The antechamber, east of the burial chamber, the 'Duat', serves as the *Akhet*, that region between the *Duat* and the day sky, just below the horizon. In the pyramids of Teti, Pepi I and Pepi II, the corridor between the burial chamber and antechamber is inscribed with texts about passing through the marshes at the edge of the *Akhet*, the place of transformation where the king becomes an 'effective spirit' (*akh*) who is able to rise at dawn and to function in the Afterlife.

*The flow of Pyramid Texts in the chambers under Unas's pyramid. In the entrance corridor the emphasis is on a rising from the Akhet. The three east recessed magazines are opposite the false door in the offering hall of the pyramid mortuary temple. The goddess Nut was carved into sarcophagi from the New Kingdom onwards.*





# The Pyramid as Icon



The full hieroglyphic determinative for 'pyramid'. Could the red band at the base signify that pyramids were thus painted, as some have thought? Or is it a vestige of the red granite casing at the base of some pyramids, such as Khafre's, Menkaure's and Neferirkare's?

The pyramidion of Amenemhet III's pyramid at Dahshur (p. 179). The eyes are the pharaoh's, gazing up from within his pyramid to the beauty of the sun.

'Atum Scarab!  
When you became high, as the high ground,  
when you rose as the *ben-ben*, in the Phoenix Enclosure,  
in Heliopolis,  
you sneezed Shu,  
you spat Tefnut, and you put your arms around them, as  
the arms of *ka*, that your *ka* might be in them.'

Pyramid Texts

The pyramid was above all an icon, a towering symbol. It has been said that the Egyptians did not distinguish sharply between hieroglyphic writing, two-dimensional art and relief carving, sculpture and monumental architecture. In a sense, the pyramids are gigantic hieroglyphs. But why a pyramid? And how should we read the pyramid glyph?

## Pyramid and pyramidion

The word for pyramid in ancient Egyptian is *mer*. There seems to be no cosmic significance in the term itself. I.E.S. Edwards, the great pyramid authority, attempted to find a derivation from *m*, 'instrument' or 'place', plus *ar*, 'ascension', as 'place of ascension'. Although he himself doubted this derivation, the pyramid was indeed a place or instrument of ascension for the king after death.

Our word 'pyramid' comes from the Greek, *pyramis* (pl. *pyramides*), 'wheat cake'. The Egyptians had a conical bread loaf called *ben-ben*, which was also the word for the capstone of a pyramid or the tip of an obelisk – *ben-benet*, named after the *ben-ben* stone, the sacred icon in the temple of Heliopolis, the oldest centre of the sun cult.

The capstone or pyramidion is the complete pyramid in miniature, bringing the structure to a point at the same angle and with the same proportions as the main body. Stadelmann found the earliest pyramidion at Sneferu's North Pyramid at Dahshur (p. 104), made of the same limestone as the casing and uninscribed.

A number of pyramidions also survive from Middle Kingdom royal pyramids and from the small pyramids of non-royal tombs of New Kingdom and later times (p. 186). Amenemhet III's pyramidion, of hard black stone, from his pyramid at Dahshur, is the most complete royal capstone. On one of

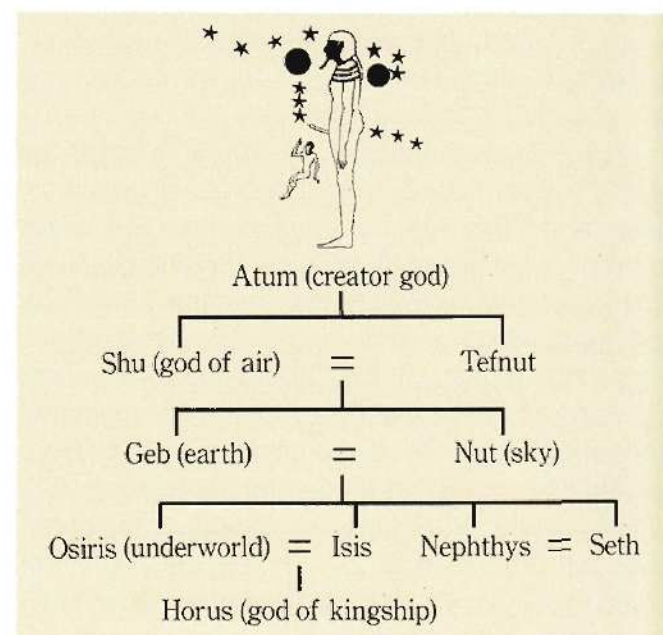
its faces is a winged sun disk in relief. Below are two *wedjat*, sacred eyes, and below them are three *nefer* ('beauty' or 'perfection') signs; below these again we find the hieroglyph for the sun disk, flanked by the name and titles of Amenemhet III. The whole composition can be read as: 'Amenemhet beholds the perfection of Re.' The sacred eyes are those of the king himself. Like the names of the pyramids – 'Sneferu Gleams', 'Great is Khafre' – the eyes tell us that the pyramids were personifications of the dead kings who were buried and revived within them.

## Pyramid and *ben-ben*

The phrase 'beholds the perfection of Re' is one of many indications that the true pyramids were seen as symbols of the sun. The identification of the pyramid with the sacred *ben-ben* stone in the temple of Heliopolis is another sign that the pyramids were sun symbols. To understand the *ben-ben* we must begin with Atum, probably the earliest god worshipped at Heliopolis. An aspect of the sun god, he is the 'old' sun of the evening as opposed to Ra at noon and Khepri – the scarab beetle – the morning sun. Atum was also the oldest creator god; in his most primeval form he was the singularity within the primeval waters of the Abyss. The root, *tm*, in Atum's name means 'complete', 'finish', yet also 'not-be'. In later texts Atum is 'Lord of Totality' and 'the Completed One', and in the Pyramid Texts he is 'self-developing' or 'self-evolving'. Atum is a chthonic god – virtually everything that exists is part of his 'flesh', having evolved as his 'millions of *kas*'. How did this evolution begin? According to Pyramid Text 527,

'Atum is the one who developed, getting an erection in Heliopolis.  
He put his penis in his grasp that he might make orgasm with it,  
and the two siblings were born, Shu and Tefnut.'

Shu, the god of air and atmosphere, and his sister Tefnut are the next generation of primeval gods.





The genealogy leads to Geb (earth) and Nut (sky) who beget Osiris, his sister and wife, Isis, his brother and adversary, Seth, and Seth's counterpart Nephthys. Osiris and Isis beget Horus, the god of kingship. Thus kingship goes back to the Creator. Other texts relate Atum's erection and ejaculation to the *ben-ben* pyramidion through a cosmic pun on the root, *bn*, which is associated with procreation and could mean 'become erect' or 'ejaculate'.

*Bn* could connote the idea of swelling in general. The concept of Atum's masturbation was that he expanded as a mound (*bnnt*) in the abysmal waters of Nun. The Egyptians must have envisaged this as the Nile Valley land emerging from the receding waters of the annual inundation. Within a few lines of this text that speaks of Atum's primeval mound, the theologians are mixing metaphors with impunity, associating Creation with the image of the scarab beetle and the *ben-ben* at Heliopolis. In the same breath, Shu and Tefnut are said to come forth, by onomatopoeia, from Atum's sneezing (*ishesh*) and spitting (*tff*).

As an image of the primeval mound, the pyramid is, therefore, a place of creation and rebirth in the Abyss. The Phoenix, Benu in Egyptian, appears in the tapestry of the Heliopolitan creation myth both by virtue of its sound-similarity with *ben-ben*, and because it returns after long periods to its natural habitat, which the Egyptians pictured as a pyramidal perch of sticks.

## Sunlight and the pyramid

Both *ben-ben* and pyramid may have symbolized the rays of the sun, particularly as they appear shining through a break in clouds – the pyramid is thus the immaterial made material. The Pyramid Texts speak of the sun's rays as a ramp by which the king mounts up to the sun, just as the older step pyramids may have been seen as giant stairs. But the pyramid was much more than a magical device for the king to mount to heaven. It was a place of physical and spiritual transformation that tied the king's ascent to the creation of the world and to the daily rebirth of the sun.

There is evidence that the *ben-ben* stone was actually cone-shaped and the pyramid is the easiest way to mimic this in monumental architecture. Here we have to keep in mind the original appearance of the pyramid when most of its surface was newly covered with smoothed white limestone. The reflected light must have been so brilliant as to be almost blinding.

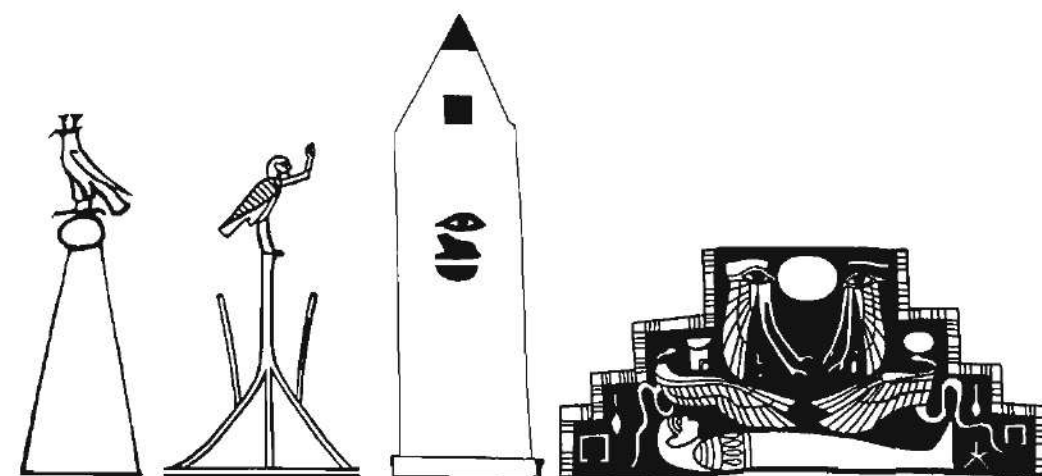
There is a kind of 'picture-window' principle to much of Egyptian art and architecture that might apply to the pyramid as a stone model of immaterial sunlight. In one sense the pyramid may have been a gigantic reflector, a stone simulacrum of sunlight and a window to the sky, as though we were inside the mass of stone looking out at the sunlight, exactly as the eyes of Amenemhet III are

doing on his pyramidion. If we could look through the 'picture-window' of the pyramid, its temples and its underground apartments, we would better appreciate the pyramid complex as a royal house, with its gate house (valley temple), entrance corridor (causeway), vestibule, courtyard, portico and reception room (court and statue chamber), antechamber to the private quarter, dining (offering) hall, and, furthest back, the most intimate apartment where the king sleeps in death only to be reawakened, bathed, and clothed before reappearing in the celestial court.

What makes the arrangement unlike any house is the pyramid itself, towering above the most intimate rooms. It is the pyramid that merges this eternal house with that of the gods – the cosmos. The pyramid is a simulacrum of both the mound of primeval earth and the weightless rays of sunlight, a union of heaven and earth that glorifies and transforms the divine king and ensures the divine rule of the Egyptian household.

*The pyramids magically combined the darkest and most dense primeval earth and the rays of celestial light.*

*Pyramidal icons (from left to right): 2nd-dynasty depiction of the benu (phoenix) bird on the solar disc at the apex of the ben-ben; a New Kingdom benu bird from the tomb of Ramesses VI; an obelisk named as the embodiment of Osiris – this, like the late funerary image of Osiris inside a dark step pyramid, reflects the chthonic aspect of the pyramid as primeval mound.*



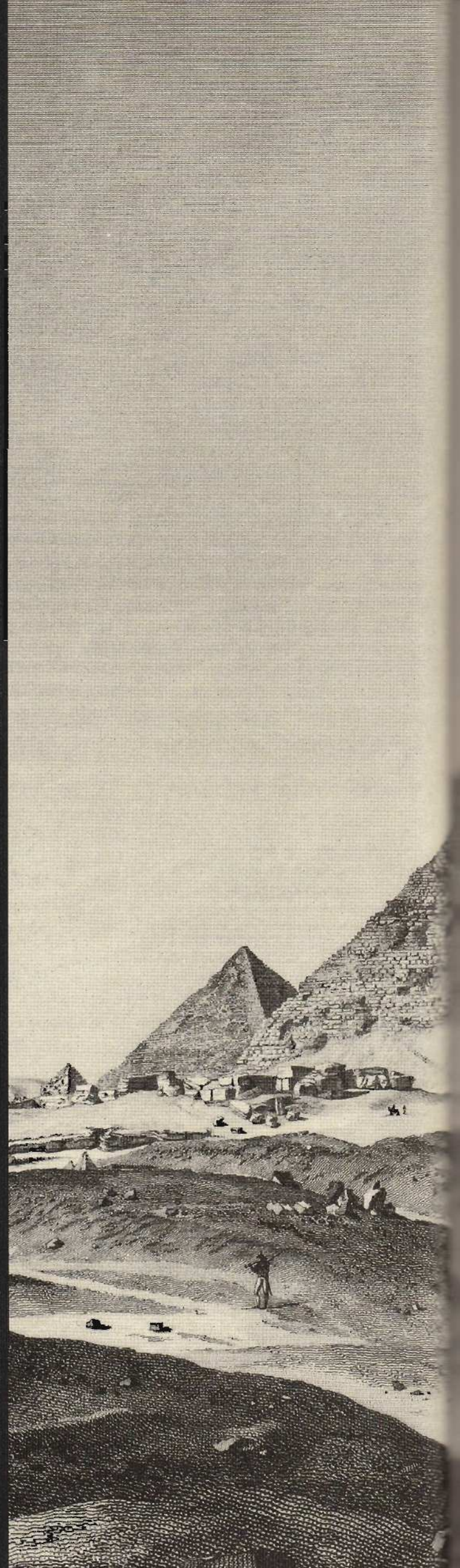




Long after they were abandoned, pyramids, or the stumps of pyramids, protruded above the debris of their own collapse and the drifting sands of the ages. At first they defied enterprising explorers who dared to try to penetrate their secrets – these early attempts were frontal assaults to find a way inside. As the pyramids were entered one after another, their chambers, shafts and passages were cleared and later mapped. Attention also turned to the ground around the towering ruins. By the turn of the 20th century, it became clear that the pyramids had temples attached, and that the upper temples were connected by long causeways to the lower, valley temples. And so scholars came to see the unity of the pyramid complex. The excavation, mapping and theoretical reconstruction of temples and other features of pyramid ensembles continues to this day at most of the pyramid sites: Abu Roash, Giza, Abusir, Saqqara and Dahshur.

Recently, pyramid exploration has moved in a fresh direction. In addition to recovering the art and architecture of the pyramids, archaeologists now excavate to retrieve evidence of the elementary structures of everyday life of the society that built these great monuments. As their ancient builders intended they should, the pyramids appear mysterious and otherworldly deprived of their social and economic context. Questions that now guide the excavator are: how were the builders housed and fed? What was the economic role and significance of the pyramids as labour projects and functioning ritual centres? What did pyramids contribute to the evolution of Egyptian civilization and, ultimately, to human development? Addressing such questions requires a team of scientists – specialists in bone and plant remains and in radiocarbon dating, in addition to those who still probe the pyramids themselves with remote-controlled robots and cosmic rays, always with the suspicion that the pyramids might hold more secrets.

*The pyramids of Giza as depicted by one of Napoleon's artists, from the Description de l'Égypte.*







## II EXPLORERS AND SCIENTISTS



## Early Legends

{Khaemwaset} has inscribed the name of the King of Upper and Lower Egypt, Unas, since it was not found on the face of the pyramid, because the *Setem* Priest...much loved to restore the monuments of the kings of Upper and Lower Egypt.'

Inscription of Khaemwaset (19th dynasty)

### Abandoned in antiquity

By Middle Kingdom times (11th to 13th dynasties), the early Old Kingdom pyramid builders, such as Khufu (Cheops) and Khafre (Chephren), were already characters of legend rather than history. Some 550 years after Khufu, his pyramid temple and those of his successors seem to have been stripped of their reliefs, since blocks and pieces were reused in the core of the 12th-dynasty pyramid of Amenemhet I at Lisht (p. 168). Amenemhet's pyramid was itself abandoned well before the New Kingdom era of Moses and the Exodus.

The pyramids were thus relics of a bygone era, their stone quarried for other buildings and their temples in ruins. But the names and sequence of their builders were known from king lists and there were occasional attempts to restore the revered monuments of the ancestors. In his stela set up at

*By the time of Ramesses II (1290–1224 BC), the Sphinx at Giza had become an object of pilgrimage. Officials, scribes, military leaders, builders and sculptors all made their way there and left behind small commemorative stelae. The scribe Montuher left the oldest depiction of the Giza pyramids on his unique stela.*

the Sphinx, Amenhotep II (c. 1427 BC) acknowledges both Khufu and Khafre. Khaemwaset (c. 1250 BC), son of Ramesses II and High Priest of Memphis, appears to have done some restoration work on 5th- and 6th-dynasty pyramids at Saqqara and Abusir, and other Old Kingdom tombs, including Shepseskaf's Mastabat el-Fara'un.

The New Kingdom rulers did not, however, restore the names of the builders of monuments at Giza. In fact, there is evidence that they removed the fine limestone, alabaster and granite of Khafre's pyramid temples at the same time that they restored the Sphinx in the form of the god Horemakhet. In the Ramessid Turin Canon of kingship, there are hints that the 4th dynasty was undergoing some folkloristic rewriting. For instance, the suspiciously uniform lengths of reign – Huni 24 years, Sneferu 24, Khufu 23 and so on – might well be simple estimates of a generation on the throne.

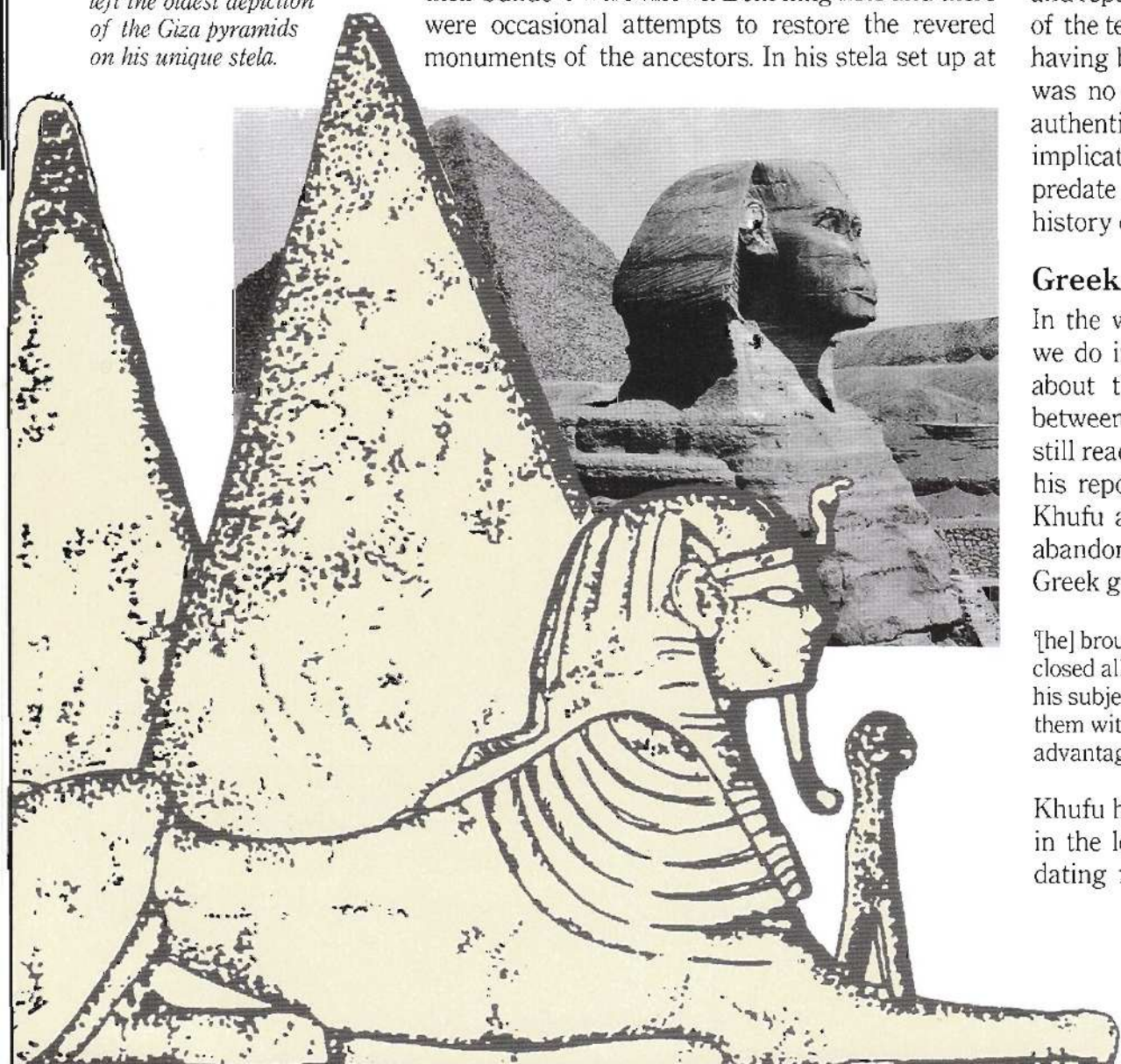
The 26th dynasty saw an attempt to resurrect the glory of the Old Kingdom. At Giza there was an active priesthood of the Sphinx as Horemakhet and there were also people calling themselves priests of Khufu, Khafre and Menkaure. Ironically, the worship of the powerful kings who built the largest structures in Egypt was now carried out in the tiny Temple of Isis, built against the southernmost of the pyramids of Khufu's queens (GI-c) in the 21st dynasty. A small stela there related another story about Khufu, namely that having found the Isis Temple in ruins he restored the images of the gods, and repaired the headdress of the Sphinx. The style of the text and the deities mentioned all point to its having been written in the 26th dynasty; the story was no doubt told to give greater antiquity and authenticity to the fledgling cult. But its erroneous implication that the Sphinx and Isis Temple predate Khufu shows just how far the perceived history of the site was slipping from fact.

### Greek and Roman travellers

In the writings of the Greek historian Herodotus we do indeed find a mixture of fact and folktale about the pyramids. When he came to Egypt between 449 and 430 BC the hieroglyphic script was still read and pharaonic religion still practised, but his report makes us wonder whether the cult of Khufu and his sons in the Isis Temple had been abandoned. The priests who informed the curious Greek gave a decidedly negative account of Khufu:

*'[he] brought the country into all sorts of misery. He closed all the temples, then, not content with excluding his subjects from the practice of their religion, compelled them without exception to labour as slaves for his own advantage'*

Khufu had already appeared in a slightly bad light in the legends of the Westcar Papyrus (probably dating from the Second Intermediate period, but





copying an older document), but it was Herodotus who established the erroneous and now virtually ineradicable association between pyramid building and slave labour. Khufu's pyramid undoubtedly required massive toil, but Herodotus's credibility is strained when he goes on to report that:

'no crime was too great for Cheops: when he was short of money, he sent his daughter to a bawdy-house with instructions to charge a certain sum – they did not tell me how much. This she actually did, adding to it a further transaction of her own; for with the intention of leaving something to be remembered after her death, she asked each of her customers to give her a block of stone, and of these stones [the story goes] was built the middle pyramid of the three which stand in front of the Great Pyramid.'

When Herodotus visited the pyramids Khufu's causeway was intact, with 'polished stone blocks decorated with carvings of animals ... a work ... of hardly less magnitude than the pyramid itself.' It had taken, he was told, 10 years of 'oppressive slave labour' to build; the pyramid took 20 years,

'including the underground sepulchral chambers on the hill where the pyramids stand; a cut was made from the Nile, so that the water turned the site of these into an island.'

Two centuries after Herodotus, the Egyptian priest Manetho compiled his *Aegyptiaca* – possibly to correct the chronology of Herodotus – which we know only through the edited and abridged versions of Josephus (c. AD 70), Africanus (3rd century AD) and Eusebius (4th century AD). Our framework for ancient Egyptian history is still based on Manetho's king list, grouped into 30 dynasties, and he is the first source to organize the kings from Menes to Unas into five dynasties. (The New Kingdom Turin Canon gives the 39 names of this period as a single lineage.) Manetho must have based his grouping on popular tradition and the sequence of the pyramids. He credits Khufu, written 'Suphis', with building the Great Pyramid, and, far from being wicked, with writing the 'Sacred Book'.

Alexander the Great conquered Egypt in 332 BC. For the next 300 years, down to Cleopatra VII, the land was ruled by the Ptolemies, descendants of Ptolemy (I) Soter, the great general who hijacked Alexander's body and took it to Egypt, where he had gained control. In 30 BC Egypt became a Roman province – and a major tourist attraction. On every traveller's itinerary, just as today, were the Giza Pyramids and the Sphinx, Memphis and the Apis house, and – up the Nile Valley at Thebes – the Colossi of Memnon, the Temple of Karnak and the Valley of the Kings. Off the modern tourist trail was the Labyrinth – the temple of Amenemhet III's Hawara pyramid, now levelled.

The Greek author, Diodorus Siculus, in Egypt around 60 BC, reported the Great Pyramid casing as intact, though possibly missing its capstone. In the

1st century AD, Pliny the Elder mentioned the village of Busiris (Abusir) at the foot of the pyramid plateau, whose inhabitants would climb the pyramids for tourists – just like their modern counterparts in the village of Nazlet es-Samman (though it would have been altogether more difficult when the pyramid casing was still largely intact).

Another myth became attached to the pyramids when, towards the end of the 1st century AD, the Jewish historian Josephus included pyramid building among the hardships that the Hebrews had had to endure during their years of labour in Egypt:

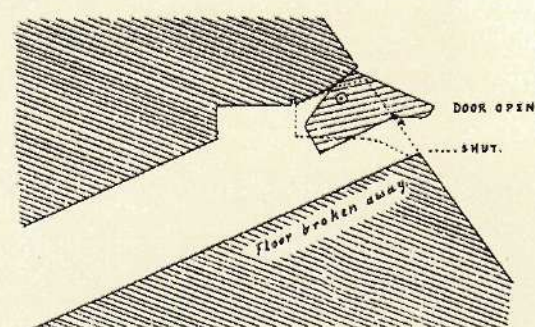
'for [the Egyptians] enjoined them to cut a great number of channels for the river, and to build walls for their cities and ramparts, that they might restrain the river, and hinder its waters from stagnating, upon its running over its own banks: they set them also to build pyramids, and by this wore them out...'

This idea persists in the popular imagination, although we now know that the largest pyramids were constructed over a millennium before the era of the Hebrews.

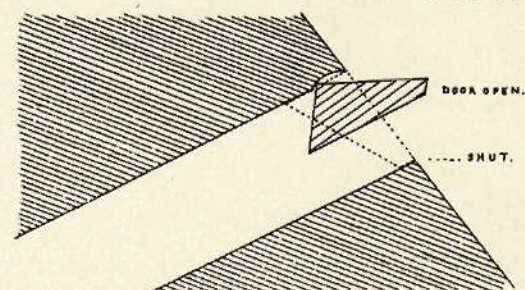
By the Roman period the Egyptian language was written using the Greek script. From the 3rd century AD onwards, the Egyptian language was Coptic. Once Constantine converted to Christianity in AD 312, 3,000 years of pharaonic culture came to an end. The Copts began to destroy the pagan monuments of their ancestors and the last person to read the hieroglyphic script died sometime in the 4th century AD. When the ancient inscriptions became cryptic, real knowledge of the pyramid builders drowned in a sea of myths and legends, and the pyramids fell silent.

About 25 BC, the Roman geographer Strabo reported a movable stone, high up and in the middle of one of the faces of Khufu's pyramid, that allowed access to the Descending Passage. Since any 'trap door' in the original building would have compromised the pyramid's security, this could only have been provided later – perhaps for tourists to reach the subterranean chamber. On the right is a hypothetical reconstruction by the British Egyptologist W.M. Flinders Petrie, based on pivot holes he found at the entrance to the Bent Pyramid at Dahshur.

DOOR OF THE SOUTH PYRAMID OF DAHSHUR.  
AS SHOWN BY THE EXISTING DOORWAY.



DOOR OF THE GREAT PYRAMID OF GIZEH  
RESTORED FROM THE DOORWAY AT DAHSHUR.

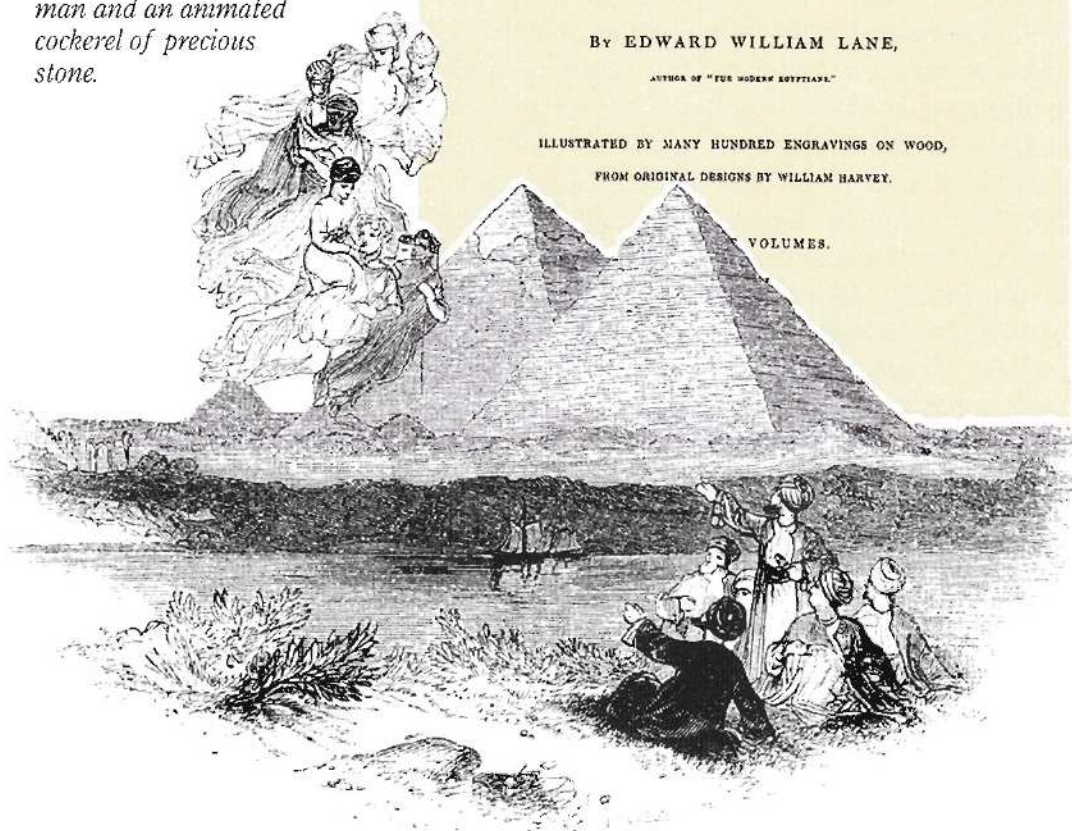


"A stone that may be taken out, which being raised up, there is a sloping passage."  
Strabo



# Mythic History of the Copts and Arabs

Books such as *The Thousand and One Nights* carry tales of hidden treasure in the Great Pyramid. One such legend tells of the Caliph al-Mamun breaking through the north face. Some stories say he found a vase with limitless water, a golden casket with the ruby-studded body of a man and an animated cockerel of precious stone.



'Then Surid ordered the building of the pyramids, had the sciences recorded in them, and had the treasures and pieces of sculpture put into them. Finally, he set an idol to guard each of the three pyramids ... After his death, Surid was buried in the "Eastern" [Khufu's] Pyramid, his brother Hujib in the "Western" [Khafre's] one, and Hujib's son, Karuras in the "Pied" [Menkaure's] Pyramid.'

Coptic legend

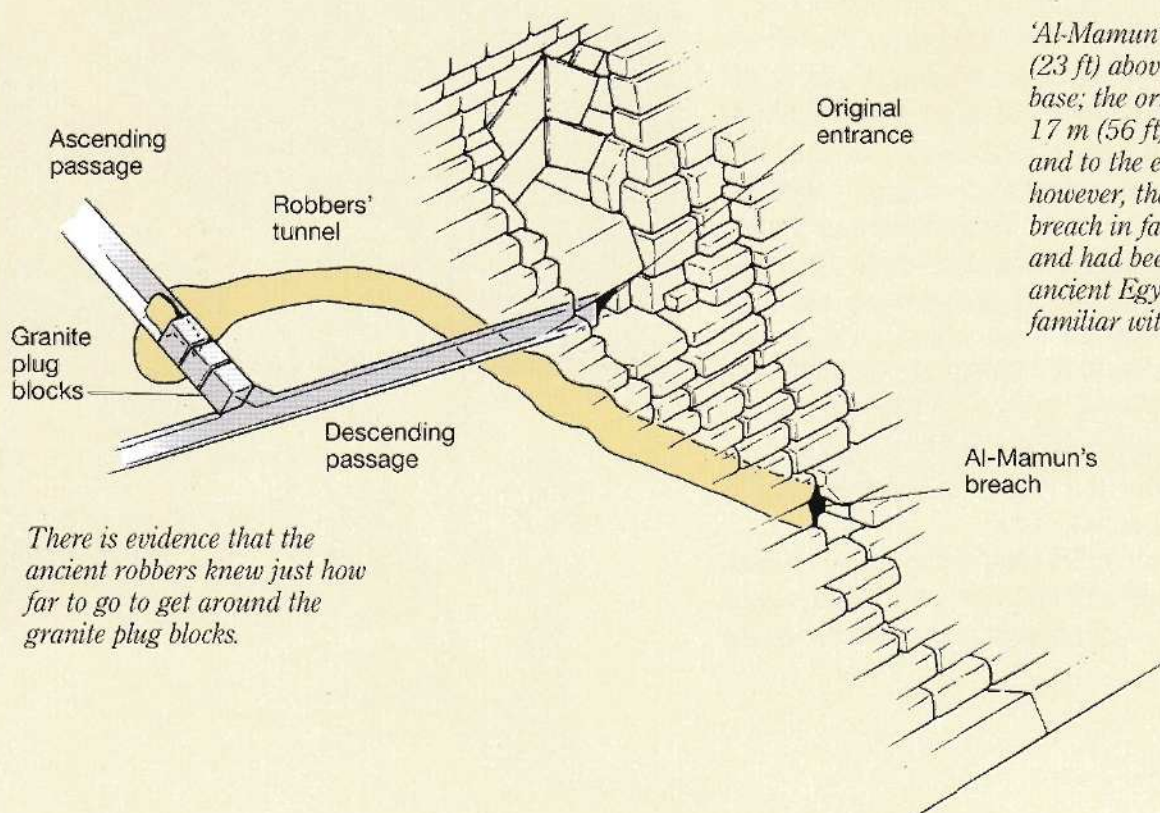
In AD 395, the Roman empire split in two – east and west – with Egypt under Byzantine control. Two-and-a-half centuries later, in AD 642, Egypt was conquered by the Arabs. The pyramids, being of such obvious antiquity, became linked with legendary and fabulous events.

## The pyramids and the Flood

A Coptic legend tells of King Surid who lived three centuries before the flood. His dreams foretold future chaos and only those who joined the Lord of the Boat would escape. The tale is a blend of both the Judaeo-Christian story of the flood and ancient Egyptian themes. Surid may be a corruption of Suphis, a late form of Khufu; his city, Amsus, is Memphis; and the Lord of the Boat is an amalgam of Noah's ark and the barque of the sun god.

One popular Arab legend maintained that the Great Pyramid was the tomb of Hermes – the Greek counterpart of the Egyptian Thoth – who, like Surid, built pyramids to hide literature and science from the uninitiated and preserve them through the flood. The Yemeni Arabs believed the two large pyramids to be the tombs of their ancient kings, one of whom defeated the Egyptians – perhaps a distant memory of the Hyksos invasion in the 2nd millennium BC.

Embellishments of the Arab legends abounded, including of the Surid story. The 15th-century historian al-Maqrizi reported that the king decorated the walls and ceilings of his pyramid chambers with representations of the stars and planets and all the sciences, and placed treasures within such as



'Al-Mamun's breach' is 7 m (23 ft) above the pyramid's base; the original entrance is 17 m (56 ft) above the base and to the east. It is possible, however, that al-Mamun's breach in fact already existed and had been made by the ancient Egyptians, who were familiar with the interior.



iron weapons that did not rust and glass that bent without breaking. Maqrizi also says that, according to the Copts, Surid was buried in the pyramid surrounded by all his possessions. If Surid is a memory of Khufu, this may not be so far from the truth.

### The breach of al-Mamun

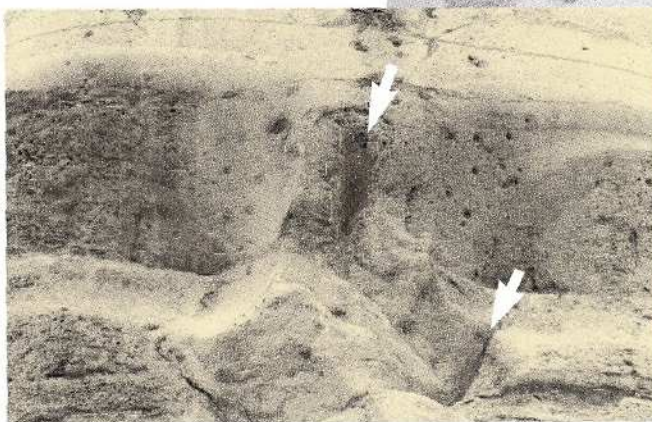
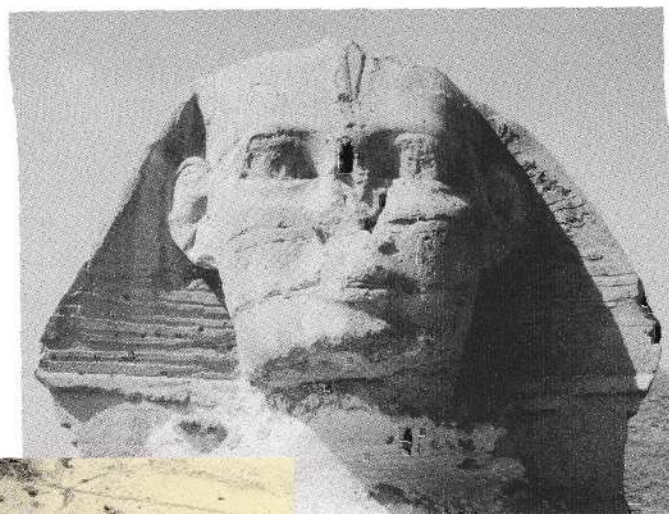
Legends of treasures hidden within Khufu's pyramid persisted. They found their way into the tale of *The Thousand and One Nights*, along with a story that Caliph al-Mamun, son of Haroun al-Rashid, was the first to break into it, around AD 820. With great effort, he forced a passage with iron picks and crowbars, and by pouring cold vinegar on to fire-heated stones. There is indeed a breach – now the tourist entrance – below and to one side of the original entrance. But just when the pyramid was violated remains a puzzle, though it is possible that it was in ancient times. It seems that whoever carried out the operation aimed straight for a point opposite the juncture of the descending and ascending passages before turning east to break through beyond the granite plugs. Saite Period (26th dynasty) priests perhaps made repairs, since at this time there was an attempt to restore Old Kingdom monuments. If the passage was forced in pharaonic times, however, it must have been gaping open in AD 820 – and presumably any repairs would have been detectable. Mamun's men may have enlarged the passage made by ancient robbers.

These confusions do not inspire confidence in the historicity of the story of al-Mamun. Accounts of wild events and fabulous discoveries inside the pyramid increase our doubts. A more sober, and perhaps more trustworthy, version is that of Abu Sza'it of Spain. He tells of Mamun's men uncovering an ascending passage. At its end was a quadrangular chamber containing a sarcophagus. 'The lid was forced open, but nothing was discovered excepting some bones completely decayed by time.' But doubt is cast again by Denys of Telmahre, the Jacobite Patriarch of Antioch. He accompanied Mamun's party and states that the Great Pyramid was already opened at the time of their visit.

### Quarrying the pyramids

The 12th-century scholar, Abd al-Latif, describes the pyramids as covered with indecipherable writing – probably the graffiti of visitors, some perhaps from pharaonic times. His observation implies that much of the casing at Giza was still intact when he visited. By that time, nevertheless, the pyramids were being systematically quarried for building stone. Abd al-Latif reports the destruction of a number of small pyramids by the Emir Karakoush during Saladin's reign (AD 1138–93). It must have been Karakoush who removed the satellite pyramid south of Khafre's pyramid, and who began dismantling Khufu's subsidiary pyramids. Other stones, probably from the two larger pyra-

Although it is not known when or by whom the Sphinx's nose was broken away, careful examination of the face shows clear evidence of how it was done. Someone hammered long rods or chisels into the nose, one down from the bridge and the other under the nostril. Once in place, the implements were used to pry the nose off to the right (south).



mids, were used for walls in the growing city of Cairo. The plunder of casing stone from the Great Pyramid continued during succeeding generations until the outer mantle was finally stripped bare.

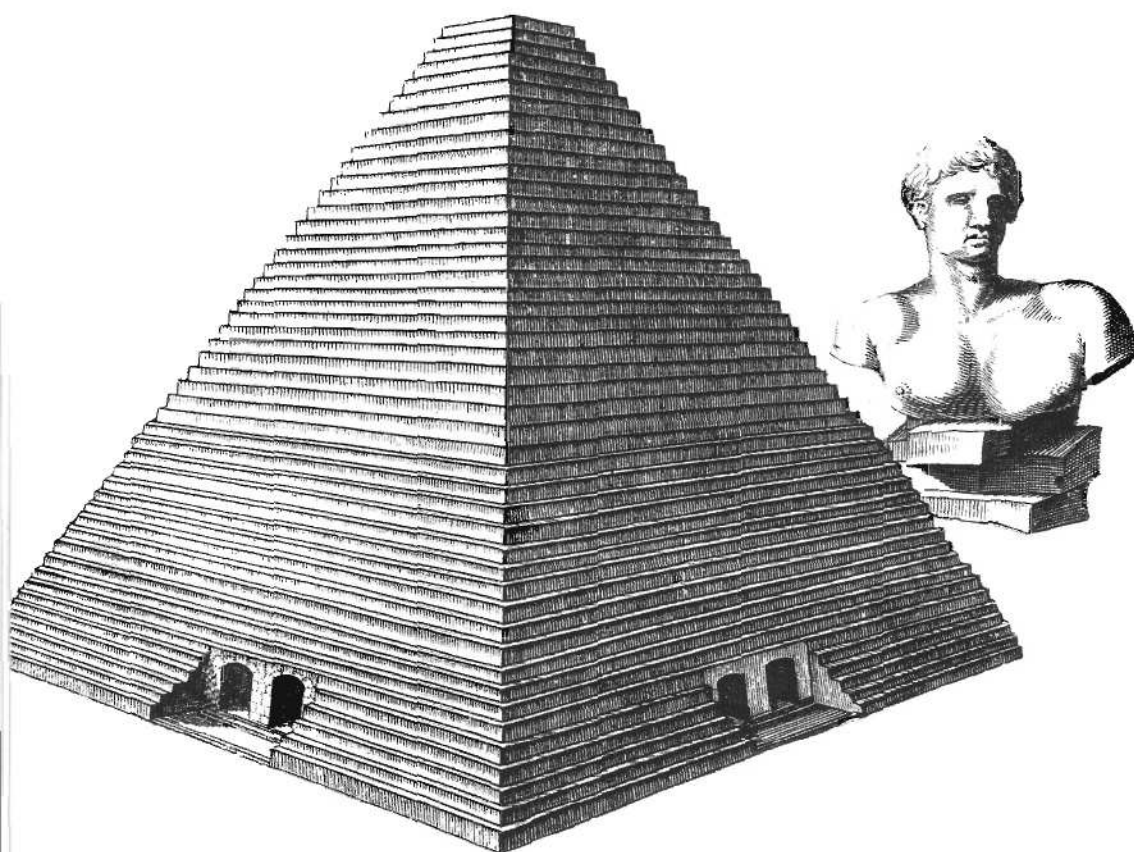
Abd al-Latif also enthused about the Sphinx, already known by its modern Arabic name, *Abu Hol*, 'Father of Terror'. He described its handsome face, 'covered with a reddish tint, and a red varnish as bright as if freshly painted'. He specifically mentions the nose, which leads us to think that it was still intact, contrary to indications that it may have been missing as early as the 10th century. It is certain that someone removed it before the early 15th century when another Arab historian, al-Maqrizi, wrote about it. The nose was long gone, at any rate, by the time Napoleon visited Giza in 1798, although he is often blamed for its removal.

(Below) In AD 1196, Malek Abd al-Aziz Othman ben Yusuf, son of Saladin, mounted a concerted attack on the pyramid of Menkaure to dismantle it and remove its stone. Eight months' work merely damaged the pyramid's northern face. Such enormous – and unsuccessful – efforts increase our admiration for the skill of the ancient builders in creating such durable monuments.





# The First European Discovery



(Above) For those who had never been to Egypt, imagination was the only means by which they could picture the Sphinx and pyramids. The renowned 17th-century Jesuit scholar and polymath Athanasius Kircher, for instance, drew the pyramids in 1674 with huge double-door entrances, no doubt since he saw the pyramid as a mausoleum. Kircher had read that the Sphinx was a large bust projecting from the sands, so he illustrated it as a classical bust, with the rounded breasts of the female Sphinx of the Oedipus legend.

(Above right) The pyramids depicted as granaries in a mosaic in St Mark's cathedral, Venice.

'And some men say that they be sepultures of great lords, that were sometime, but that is not true, for all the common rumour and speech is of all the people there, both far and near, that they be the garnerers of Joseph.'

*Voyage and Travaile of Sir John Maundeville*

Around the time that Abd al-Latif recorded his experiences, the Crusaders were returning to Europe with intriguing tales of what they had seen in the Near East. A trickle of pilgrims soon became a stream of travellers who wished to amaze and astound when writing their travel memoirs.

## Telling tales

One of the domes of St Mark's in Venice has a 12th-century mosaic of the pyramids as Joseph's granaries, an idea first suggested by the 5th-century AD Latin writers Julius Honorius and Rufinus. This image was repeated by many early visitors, even though direct observation should have convinced them otherwise. Likewise, Mandeville's *Voyage* (quoted above), supposedly an informed guide, was concocted in the 14th century by a certain Jean d'Outremeuse, who had never made the journey.

The Renaissance saw renewed interest in the pagan past. It was known that behind the great-



ness of Rome was that of Greece. With the travel reports came the realization that behind the greatness of Greece lay that of the Near Eastern civilizations, including Egypt. Travel became safer when Egypt came under Turkish rule in 1517 and Sultan Selim I confirmed protection for French traders and pilgrims. The invention of the printing press in the mid-15th century allowed the details and images of such travellers' voyages to the pyramids to be more widely disseminated.

Travellers eventually became 'antiquaries' who, in the 16th century, began to retrieve artifacts and ancient manuscripts for the growing number of European collectors and for libraries and museums. A thriving trade in antiquities grew, which included mummies, the embalmed bodies of ancient Egyptians. These had already been a marketed commodity for 400 years; the 'mummy pits' of Saqqara were a major attraction.

## Seeing and imagining

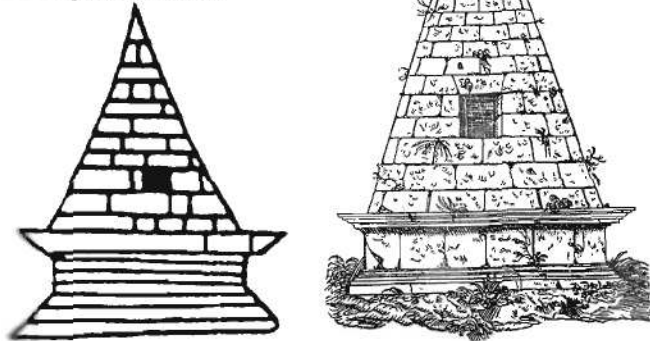
Those who could not visit Egypt themselves had to depend on their imaginations. A case in point is Athanasius Kircher (1602–80), considered by some 'the Father of Egyptology'. The drawings of the pyramids and Sphinx in his *Turris Babel*, published in 1674, reflect his ability to conceptualize rather than to depict accurately.

We also have to wonder about the illustrations of some of the 15th- and 16th-century voyagers who did make their way to Egypt. It is clear that many of these illustrations could not have been based on sketches made at the site. Having covered a great deal of ground and seen many things, these writers must have had to rely on memory when they recorded their travels, and their vision of the monuments would have been conditioned as much by what was familiar to them as by the exotic structures they had all too briefly beheld. So when they drew the pyramids, they based their images on more familiar steeply angled classical monuments.

Kircher promoted the idea, still potent today, that the pyramids contain some mystic significance.



Europeans tended to represent the pyramids in ways that reflected their own attitudes and cultural values, rather than as they actually appeared. The angles of the sides were often inaccurate and impossibly steep.



While such fanciful notions about the pyramids were still current, some of the early visitors, such as George Sandys who visited the pyramids in 1610, accepted the idea that the pyramids were the tombs of kings.

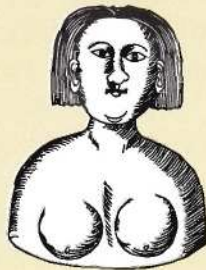
Early travelogues also contain ambiguous hints about when the pyramids were stripped of their outer casing. In 1546, Pierre Belon observed that the third Giza pyramid was in perfect condition, as if it had just been built. But what about the attack of Othman in 1196, as reported by al-Latif (p. 41)?

Jean Chesneau mentioned that the other two pyramids at Giza were not 'made in degrees'. Did this mean that their inner, stepped cores were not exposed? Prosper Alpinus, one of the first Europeans to attempt an accurate measurement of the pyramids, wrote in 1591 that the viceroy of Egypt, Ibrahim Pasha, enlarged the entrance to the Great Pyramid 'so that a man could stand upright in it'. This must indicate a widening of the passage of al-Mamun. Those who entered next brought a new approach to the study of the pyramids.

This woodcut (above) is from *Relation of a Journey Begun in 1610* and shows the poet and traveller George Sandys and his party visiting the Giza pyramids. Sandys agreed with the classical authors that the pyramids were not built by Hebrew slaves, nor were they the granaries of Joseph, but were in fact the tombs of Egyptian kings.



1556  
Thevet



1579  
Helferich



1647  
de Monconys



1650  
Boullaye-le-Gouz



1743  
Pococke



1755  
Norden

## The Image of the Sphinx through the Centuries

It took Europeans some time to focus accurately on the image of the Sphinx. In André Thevet's *Cosmographie de Levant*, published in 1556, seven years after visiting Giza, the author related that the Sphinx was 'the head of a colossus, caused to be made by Isis, daughter of Inachus, then so beloved of Jupiter'. He pictures it as a very European curly-haired monster with a grassy dog collar. Johannes Helferich, another much-quoted visitor to Giza, tells in his travelogue of a secret passage by which the ancient priests could enter the Sphinx and pretend to be its voice. Helferich's Sphinx is a pinched-face, round-breasted woman with straight hair. The only edge his rendering has over Thevet's is that the hair suggests the flaring lappets of the headdress.

George Sandys stated flatly that the Egyptians represented the Sphinx as a harlot. Balthasar de Monconys interprets the headdress of the Sphinx as a kind of hairnet, while Boullaye-le-Gouz's Sphinx is

once again a European with rounded hairdo and bulky collar (perhaps the way travellers remembered the protruding and weathered layers of the neck). All these authors render the Sphinx with its nose complete, though it had been missing for centuries.

Richard Pococke's illustration in his *Travels* is closer to the Sphinx's actual appearance than anything previously published, except the illustration, 'Bau der Pyramide', by Cornelius de Bruyn. Indeed, it seems as if Pococke extracted his Sphinx bust from de Bruyn's drawing, down to the gentleman gesturing with his left arm under the Sphinx's headdress. Again, both drawings render the nose more or less complete. Frederick Norden's depiction is more accurate and includes the broken nose. The Sphinx of Casas, though painted slightly later, shows the nose once more complete. It was with artists of Napoleon's Expedition, such as Dutertre, that the Sphinx began to be faithfully rendered.

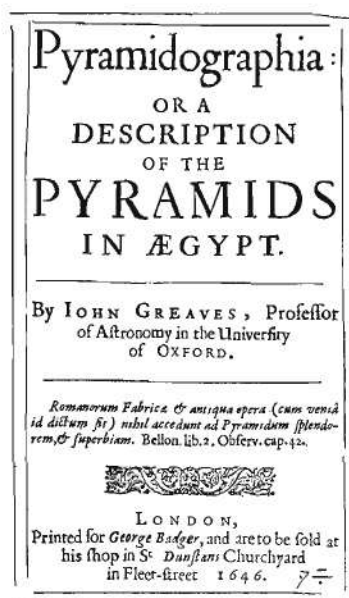


1799  
Casas



1822  
Dutertre





In the midst of the quirky illustrations and odd ideas of the 17th century came the first scientific reports about the Great Pyramid of Giza.

### The scholars enter

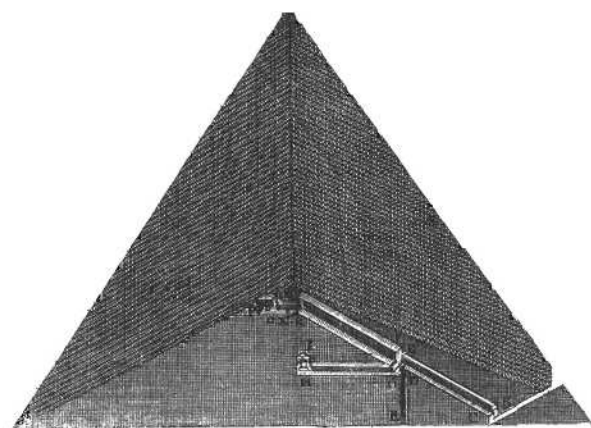
John Greaves (1602–52), Professor of Astronomy at the University of Oxford, first reviewed the existing literature and then went to Egypt to study the pyramids for himself. He dismissed all the accounts of the Giza pyramids having been built by biblical figures or legendary kings. From the classical sources, he concluded that these monuments were erected by Cheops (Khufu), Chephren (Khafre) and Mycerinus (Menkaure), as tombs for the security of the body because of an ancient Egyptian conviction that this would ensure the endurance of the soul. Greaves set out to produce detailed measurements of Khufu's pyramid with the best available instruments and a rigorously scientific approach. He calculated that the Great Pyramid had a perpendicular height of 499 ft (152 m, it is in fact 146.5 m tall), a slope height of 693 ft (211 m) and a base of

480,249 sq. ft (44,615 sq. m). Greaves counted the steps (207 or 208) as he climbed the pyramid. He described climbing a mound of rubbish to the original entrance, in the 16th course of masonry, open since the pyramid had been stripped of its outer casing. Following the Descending Passage, he worked out its slope as 26 degrees. He marvelled at the Antechamber with its portcullis slab and the smooth granite walls of the King's Chamber, giving the dimensions and position of the sarcophagus. This early scholar even noted the basalt pavement east of the pyramid that hinted at the existence of the mortuary temple.

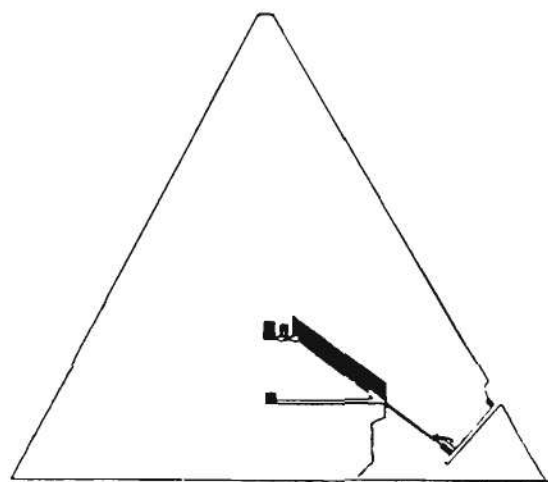
Another clue in the murky history of pyramid destruction was added when Greaves wrote that, while the stones of Khafre's pyramid were not as large or as regularly laid as in the Great Pyramid, the surface was smooth and even and free of inequalities or breaches, except on the south. Today casing remains only on the upper third of the second pyramid.

Benoît de Maillet was the French Consul-General in Egypt from 1692 until 1708, during which period he visited Khufu's pyramid over forty times. His plan and section of the superstructure are not as good as those of Greaves, but his drawing of the passages and chambers is more accurate. The lengths and proportions of the Ascending Passage and Grand Gallery are nearly correct, as are the different parts of the well shaft. The Descending Passage was still unknown beyond its juncture with the Ascending Passage.

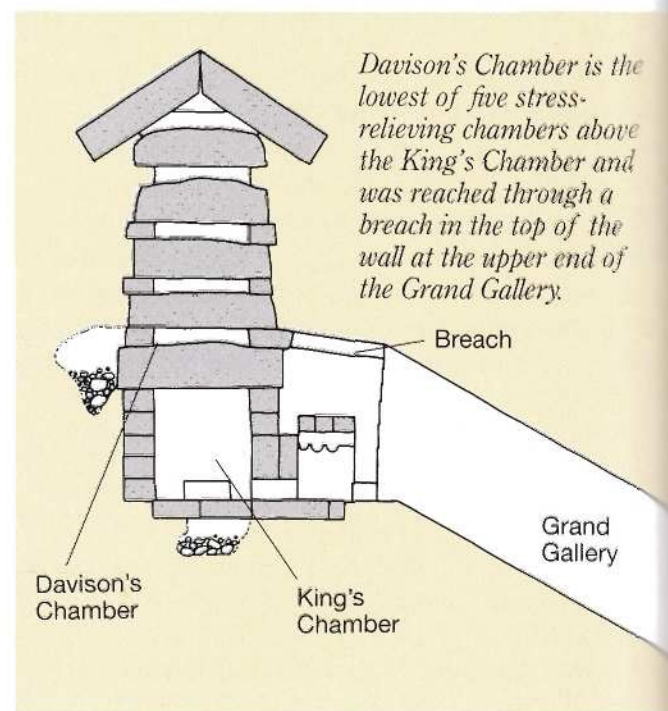
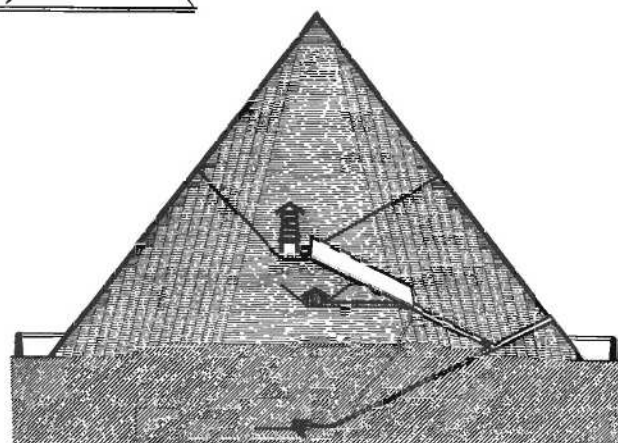
Between 1639, when Greaves was at Giza, and 1692, the second pyramid must have been stripped to its present condition, because de Maillet mentions that the casing stones remained only at the top. He also called for a survey to produce an accurate map and documentation of all the ancient Egyptian sites – a plan to be executed a century later by the Napoleonic Expedition (p. 46).



*Greaves's Pyramidographia of 1646 included the first measured cross-section of the pyramid and its internal passages (left). The Ascending Passage is not in correct proportion and the Descending Passage ends abruptly at the pyramid base, for it had yet to be cleared to the Subterranean Chamber. He also gave the dimensions of all known passages and chambers. De Maillet's 1735 publication includes a cross-section with details more accurate than Greaves's (centre), although the proportions of his pyramid are too tall and steep.*

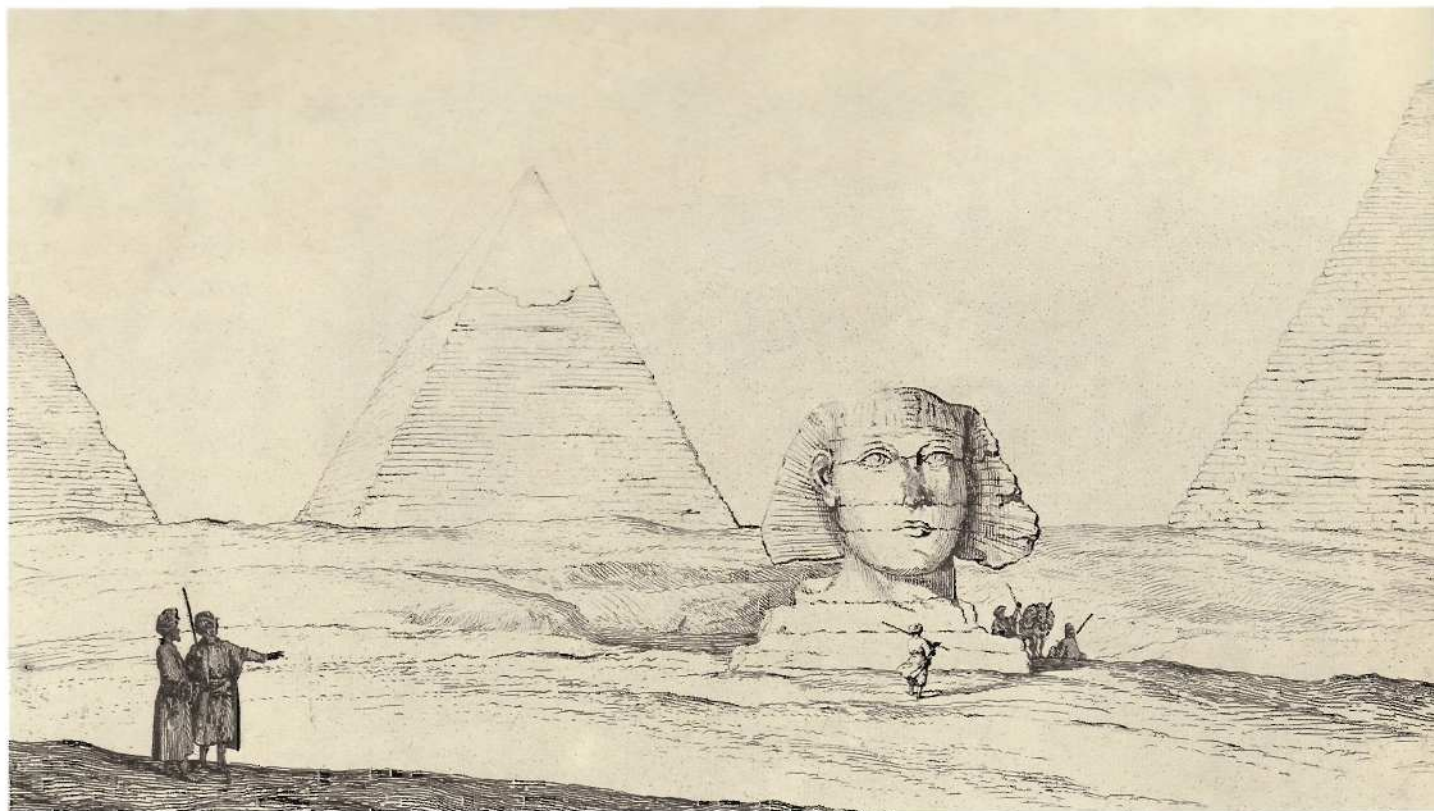
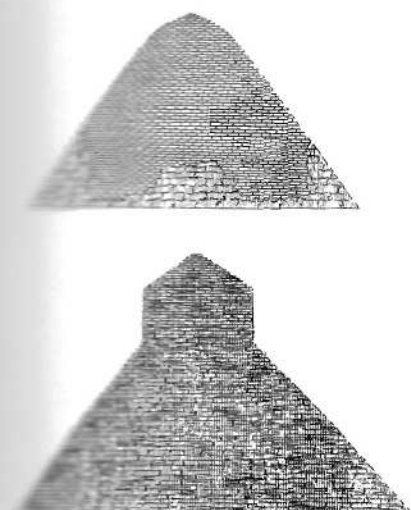


*The full plan and precise dimensions of the interior of Khufu's pyramid were only revealed over time (seen here in Borchardt's profile of 1922). In 1765, Davison entered the lowest of the five stress-relieving chambers built directly over the King's Chamber. The four chambers above were then still to be discovered.*





Pococke's 'pyramids of Dahshur' (below) seem to reflect the Bent Pyramid of Sneferu and the mudbrick tower that remains of the pyramid of Amenemhet III, both at Dahshur.



## From travellers to antiquaries

Throughout the 18th century travellers took up the call, and came to Egypt not only to describe what they saw but also to make accurate records. Travelogues evolved into geographical catalogues, and included the ancient sites and monuments. One antiquary was the Jesuit Claude Sicard, who travelled in Egypt between 1707 and 1726. He documented 20 of the major pyramids, 24 complete temples and over 50 decorated tombs.

Foremost among the 18th-century antiquaries are the Englishman Richard Pococke and the Dane Friderik Norden, both in Egypt in 1737. Pococke's map of Giza is extremely schematic and his profile of the Great Pyramid is borrowed from de Maillet. His report is curious in other ways and includes a description supposedly of Khufu's causeway. He describes it as being 20 ft (7 m) wide, 1,000 yds (914 m) long, built of stone, and reinforced by 61 circular buttresses, 14 ft (4.3 m) in diameter and spaced at 30 ft (9 m). This in no way fits the causeway foundation that runs to the east from the pyramid. The enigma clears, however, when we realize that Pococke was describing the arches in the floodplain north of Khufu's pyramid. Built under Saladin from blocks taken from the Giza pyramid, the arches ran westward and then south towards the pyramid plateau.

Pococke's idea that the pyramids were made by encasing natural mounds of rock calls to mind the assertion of another 18th-century traveller, the Scot James Bruce: 'anyone who will take the pains to remove the sand will find the solid rock there hewn into steps'. Bruce must have noticed that at the northeast corner of Khufu's and the northwest corner of Khafre's pyramids the bedrock is left in the cores of the pyramids, and fashioned into steps.

Norden's *Travels*, published in 1755, marks a great advance in documentation, no doubt owing to his profession as an artist and naval marine architect. Sent by King Christian VI of Denmark to explore Egypt, Norden travelled all the way to Derr in Nubia.

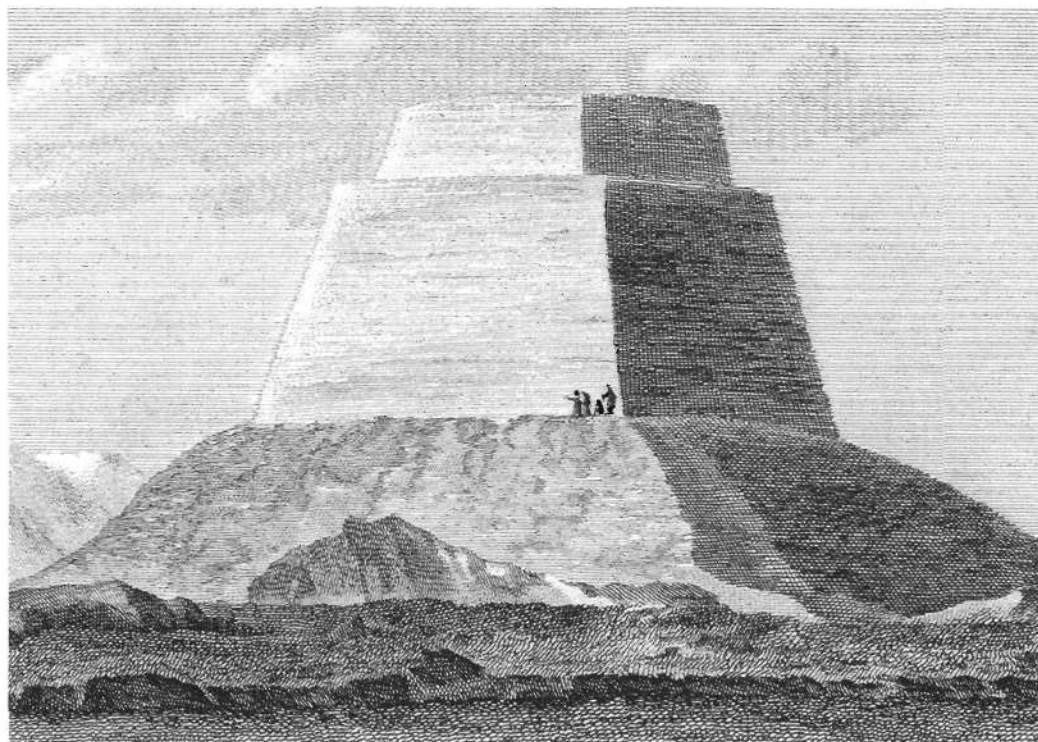
The English diplomat and traveller Nathaniel Davison (d. 1808) is credited with being the first to enter the lowest of five stress-relieving chambers above the King's Chamber in Khufu's pyramid. The German orientalist Karsten Niebuhr had searched for it in vain, apparently after hearing about it from a French merchant named Meynard. Since Niebuhr describes the chamber as being directly above the King's Chamber, albeit of a lower height, it seems that someone must have entered before Davison. Davison was accompanied by Meynard when he entered the pyramid on 8 July 1765, although Davison alone crawled through dirt and bat dung to enter the chamber that would henceforth carry his name. Its floor consisted of the same nine granite blocks that roofed the King's Chamber below, although in Davison's Chamber the surfaces were unfinished. The chamber was roofed by eight large granite beams smoothed on the undersides.

When Davison entered the pyramid, recent rains had washed away some of the sand and debris choking the Descending Passage. He saw that the passage sloped away into the bedrock beneath the pyramid, and followed it into the darkness for 130 ft (39.6 m), where he encountered debris that sealed it off. Davison also investigated the well shaft. He descended from the bottom of the Grand Gallery to a depth of 155 ft (47.2 m) where the well, too, was closed off with rubble. It was to take more than 50 years to discover a link between the two choked passages (p. 48).

Norden's drawing of 'The Sphinx and pyramids of Giza' from his *Travels* published in 1755. Norden produced the first good map of the Giza pyramids, showing the ruins of the mortuary temples of Khafre and Menkaure, as well as the causeways of Khufu and Menkaure. Unlike most other illustrators of the time, Norden's profile and full-face drawings of the Sphinx show the break of the nose and weathered outlines that are essentially correct.



# Napoleon's Wise Men



Depicted by the draughtsmen of the Napoleonic expedition, the pyramid of Meidum seemingly rises from the mound of rubble that surrounds it. This rubble includes the remains of the casing, possibly destroyed as long ago as the New Kingdom.

A panoramic and picturesque view of the pyramid field of Saqqara, from the *Description de l'Égypte*.

'On approaching these colossal monuments, their angular and inclined form diminishes the appearance of their height and deceives the eye...but as soon as he begins to measure by a known scale these gigantic productions of art, they recover all their immensity..'

Vivant Denon, *Travels in Upper and Lower Egypt*

A major threshold in the study of ancient Egypt was crossed with the great expedition led by Napoleon Bonaparte to Egypt in 1798. France's revolutionary government wanted to strike a blow at their foremost enemy, England. Rather than attempt a full-scale invasion across the channel, however, Napoleon decided to take control of Egypt, dredge the canal linking the Red Sea and the Mediterranean, and thereby short-circuit England's trade with India. Napoleon had in mind the precedents of Alexander's and Caesar's Egyptian enterprises. This was not to be just a military and political conquest, however, but a revival, through

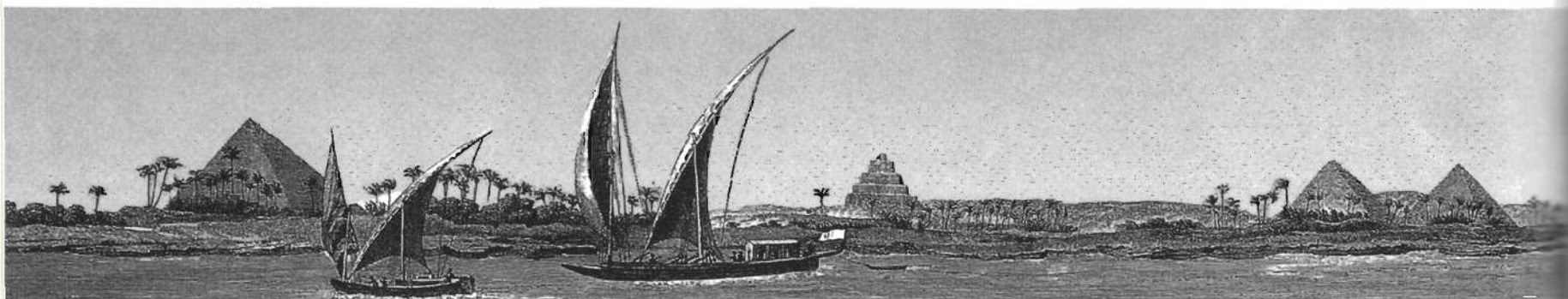
French enlightenment, of an ancient seat of knowledge. The military campaign would ultimately fail, but the reconnaissance of an ancient civilisation stands as the real achievement of the expedition.

## Bringing Egypt to Europe

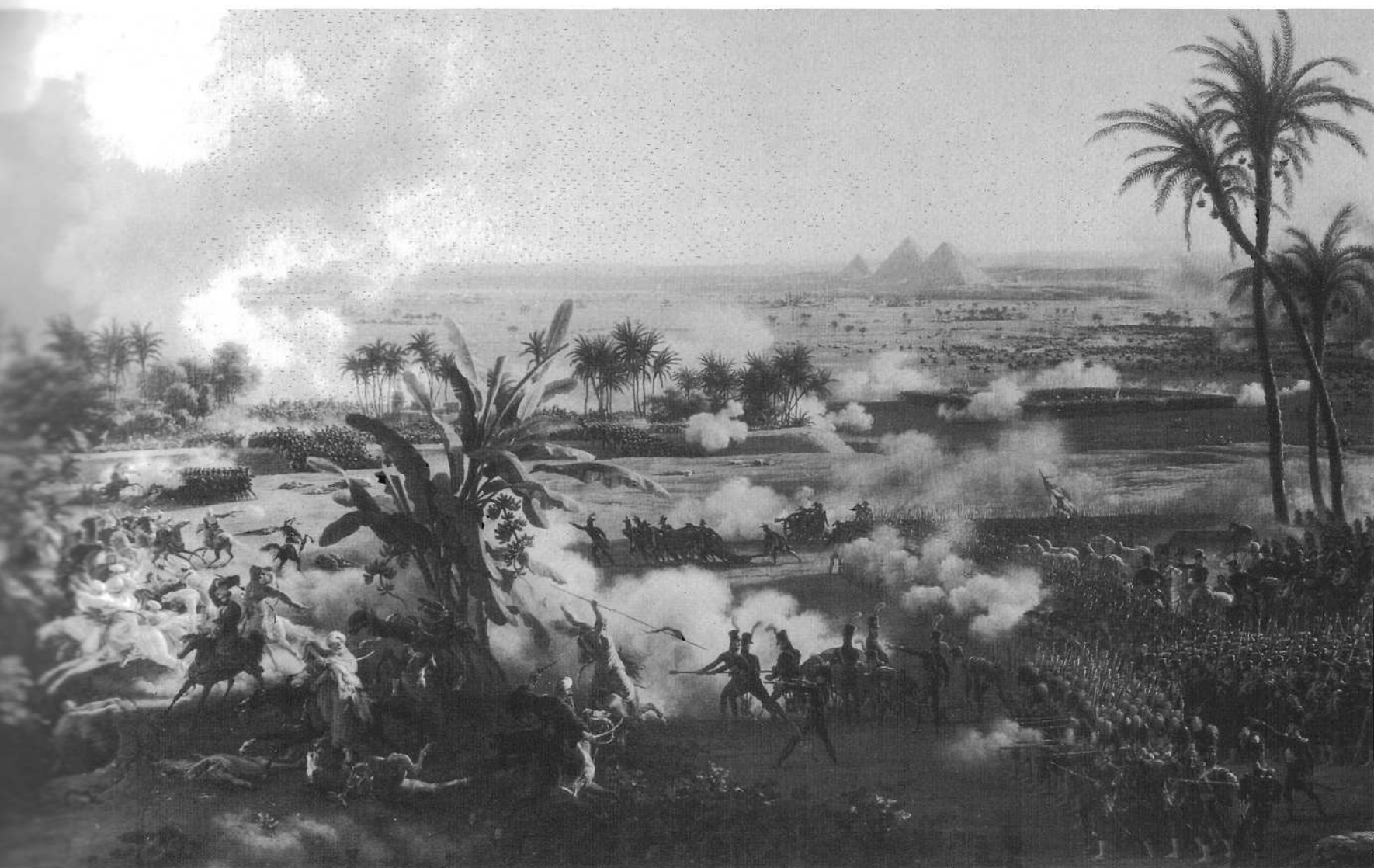
Napoleon ordered leading French scholars to assemble a team of savants and surveyors for the survey of all Egypt that de Maillet had proposed and which Norden began. Over 150 non-military personnel were assembled as the Commission of Arts and Sciences. One could not have hoped for a better team to document the sites and monuments of ancient Egypt – just before the major onslaught of plunder and destruction that would begin on the heels of the Expedition. There were surveyors, civil and mining engineers; mathematicians, chemists, botanists and astronomers; archaeologists, architects, artists and printers. There were also students from the military engineering school and recent graduates of the civil engineering school. Most only learned of their final intended destination after the fleet had passed Malta.

Opposing Bonaparte, after he marched across the desert to seize Cairo, were the ruling Mamelukes, descended from Georgian and Armenian slaves who were trained as a military elite. Five hundred years earlier they had taken Egypt for themselves, heavily taxing the native Egyptians with whom they had little affinity. When Napoleon met the Mameluke army at Imbaba, west of Cairo, he is reputed to have pointed to the distant pyramids of Giza, proclaiming, 'Soldiers, forty centuries look down upon you from these pyramids'.

The Mamelukes were easily defeated in this 'Battle of the Pyramids', and scattered into Upper Egypt, where Napoleon's General Desaix pursued them for ten months. The French took over Cairo, but shortly thereafter, in early August, the English destroyed their fleet in Abukir Bay. The stranded expedition gave birth to the Institut d'Égypte, composed of the savants of the Commission on Arts and Sciences and military and administrative officials. Over the three years that the French remained in Egypt, commission members spread throughout Egypt, collecting artifacts and specimens, mapping the entire country, documenting archaeological sites, and recording individual monuments, irrigation systems, and the flora, fauna and culture of contemporary Egypt.







The French scholars had to forfeit much of their material, including the famed Rosetta Stone, during the complications of the commission's departure from Egypt along with the French retreat in 1801. They managed to keep hold of a good deal of their material and carry it to France, however, by threatening to throw it in the sea or burn it rather than turn it over to the British.

### The fruits of labour

Back in Paris, the material was gathered together in the series of volumes named the *Description de l'Égypte*, itself a veritable monument. The principal books covered antiquities, modern Egypt, natural history and a topographical map. Those on antiquities appeared between 1809 and 1818 (the final volume of antiquities plates in 1822). The complete *Description* required 837 copper engravings for 3,000 illustrations. An engraving machine was developed by Nicolas Jacques Conté which resulted in reproductions of an exceptionally high standard. It was estimated that the machine could complete in three days work that would have taken an artist six months by hand – no small consideration with a work of this magnitude.

The *Description* was a window for Europe into 3,000 years of ancient Egyptian civilization. Nevertheless, it was hardly something that every family could afford – a complete custom-designed cabinet

was required to hold the entire set. Instead, a reduced popular account of the Expedition and the monuments of Egypt was out by 1802. Entitled *Voyage dans la Basse et la Haute Égypte*, it was the work of Vivant Denon.

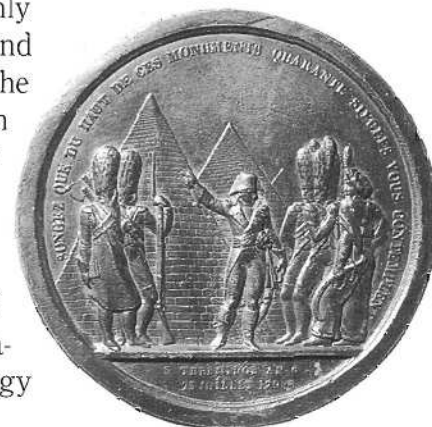
### Napoleon's men at the pyramids

The artists of the commission created precise views of many of the pyramids. Colonel Coutelle and the architect J.M. Lepère undertook a detailed study of the interior of Khufu's pyramid while the surveyor E.F Jomard and engineer and artist Cécile re-measured the superstructure, including the height of each course of stones. The views of the Sphinx and pyramids they produced are impressionistic but accurate. The next step in scientific graphic imaging – large true-to-scale contoured maps of the Giza Plateau and Sphinx – was only achieved in the late 1970s. In 1801, Coutelle and Lepère began to dismantle Pyramid GIII-c, the westernmost queen's pyramid of Menkaure, in the hope of finding an undisturbed burial. They abandoned their efforts after removing the upper north quarter of the pyramid.

It is ironic that with the massive French effort at accurate documentation began the era of plunder and destructive, non-systematic excavation that was a hallmark of Egyptian archaeology and pyramid exploration in the 19th century.

Louis François Lejeune's 1806 painting of The Battle of the Pyramids. In this decisive encounter of 21 July 1798, French troops under the command of Napoleon, defeated the Mameluke rulers of Egypt and drove them from their Cairo power base. The three Giza Pyramids can be seen in the background; Napoleon himself is on horseback at the far right of the picture.

'Soldiers, forty centuries look down upon you from these pyramids' The message on this bronze medal.





# Belzoni and Caviglia

Belzoni's main contribution to pyramid studies was his opening of the unknown upper entrance of Khafre's pyramid (below) at Giza in 1818. When he reached the burial chamber, he found an Arabic inscription. 'the master Mohammed Ahmed, quarryman, has opened them, and the Master Othman attended this opening, and the King Alij Mohammed' This suggests that the pyramid may have been entered six to eight centuries earlier. Bones found in the sarcophagus later proved to be those of a bull.

'I reached the door at the centre of a large chamber. I walked slowly two or three paces, and then stood still to contemplate the place where I was. Whatever it might be, I certainly considered myself in the centre of that pyramid, which from time immemorial had been the subject of the obscure conjectures of many hundred travellers, both ancient and modern.'

Giovanni Belzoni, *Narrative*

Even after the departure of Napoleon's fleet, Egypt remained a battleground for Anglo-French rivalry. But the 'campaign' now took the form of a bitter competition to see who could obtain the best antiquities. French efforts were led by Bernardino Drovetti (1776–1852), an Italian-born diplomat who had fought with Napoleon's forces. He was French Consul-General in Egypt from 1802 to 1814, regaining the post in 1820. In 1816 Henry Salt was appointed Consul-General representing British interests. He had been trained as an artist and travelled extensively in the East and Egypt. Both men

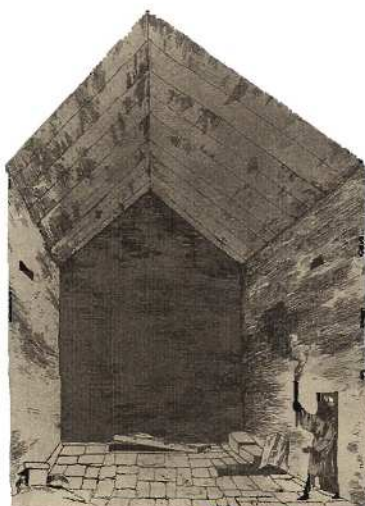
financed excavations and amassed collections, which they then sold, obtaining funds for further work in Egypt. Drovetti's treasures include the collection that forms the foundation of the Egyptian Museum in Turin. One of Salt's best-known finds is the colossal head of Ramesses II, now in the British Museum. The rivalry between Drovetti and Salt found fertile ground at Giza, the setting also for some of Egyptology's most remarkable characters.

## The sailor and the strongman

In the late 18th century Italy produced two unlikely heroes of Egyptology. They shared first names and a passion for the antiquities of the Nile; and both were also possessed of adventurous, fearless spirits. Giovanni Battista Caviglia (1770–1845), born in Genoa, spent his early life sailing a merchant ship around the Mediterranean. But this uneducated temperamental seaman's real vocation turned out to be Egyptology. Caviglia was employed by several European collectors to find objects. His own obsessive interest in religion led to a conviction that chambers within the Great Pyramid held mystic secrets. From 1816 to 1819 he therefore explored the pyramids and tombs of Giza and he was the first to carry out major excavation on the Giza Plateau.

Caviglia explored Davison's Chamber in the Great Pyramid (p. 45) hoping to find a secret room, but found instead solid rock. In 1817, he descended into the vertical shaft known as the 'well'. Breathing difficulties halted him, in spite of attempts to clear the air by burning sulphur. Caviglia then decided to work down through the Descending Passage. After clearance allowed him to pass about 60 m (200 ft), he smelled sulphur and realized he had found an opening to the 'well'. Thus Caviglia was able to demonstrate that the well was probably a shaft linked to the Descending Passage for the

(Below right) A lithograph of a drawing by M. Gauci shows Belzoni in Turkish dress, and appeared as the frontispiece to his *Narrative*. This important book appeared in December 1820 and was the record of Belzoni's work at the pyramids, temples, tombs, other excavations in Egypt and Nubia, and elsewhere. The book appeared in two volumes, one a quarto and the other a folio with 44 colour plates.





ancient workmen to escape after the Ascending Passage had been sealed. Caviglia also found the unfinished Subterranean Chamber.

Henry Salt later paid Caviglia to excavate the Sphinx. In the course of this work, the Italian found a small open-air chapel between the monument's forepaws, with the famous Stela of Thutmose IV. Caviglia also found fragments of the beard of the Sphinx; one piece is now in the British Museum.

The promising career of this dedicated, hard-working amateur ended after a brief collaboration with Colonel Howard Vyse who came to Egypt in 1835 (p. 50). Vyse had employed Caviglia to assist him in his explorations of the pyramids and was vexed when the Italian spent all his time looking for 'mummy pits' instead. In 1837, Caviglia settled in Paris where he became a protégé of Lord Elgin.

The second Italian was Giovanni Battista Belzoni (1778–1823), born in Padua. Half-facts abound about the life and exploits of this ambitious and eccentric man. Some say he planned to become a monk, and it seems that he studied hydraulics. In any event he spent several years travelling, eventually becoming a circus strongman in London – a calling eminently suited to the great strength of this giant of a man, 2 m (6 ft 6 in) tall. Belzoni's restless nature soon saw him on his travels again, this time accompanied by his Irish wife, Sarah. In 1814, a contact in Malta directed him to the Egyptian court of Mohammed Ali, in an ill-starred attempt to capitalize on his knowledge of hydraulics. Fate brought him into the circle of Europeans interested in antiquities. In 1816 Belzoni began collecting objects for Salt. The consul suggested that he work with Caviglia, but collaboration with a rival did not appeal – in fact, he even took offence when Caviglia's clearance of the Sphinx was mistakenly credited to him in an 1818 British publication.

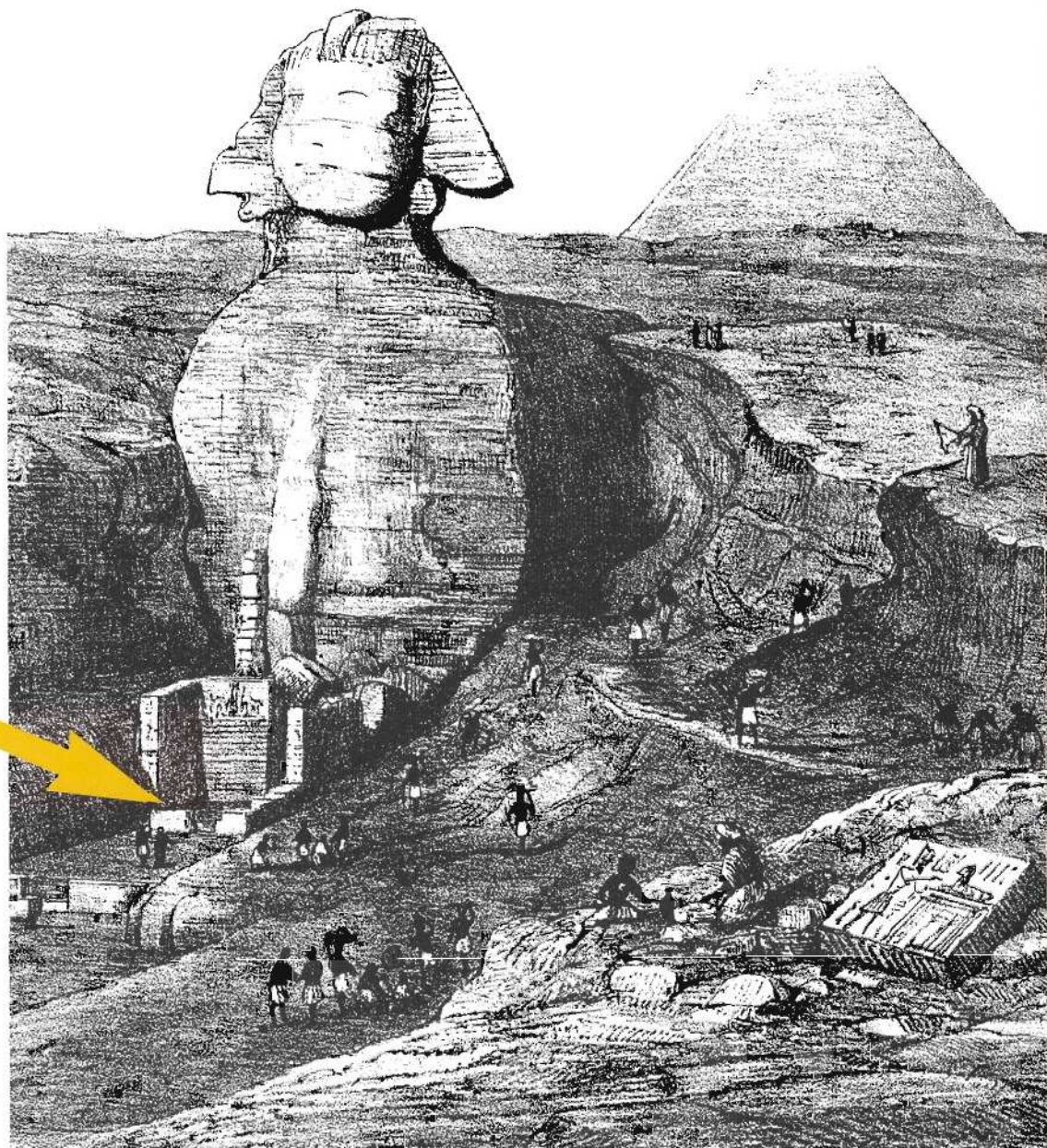
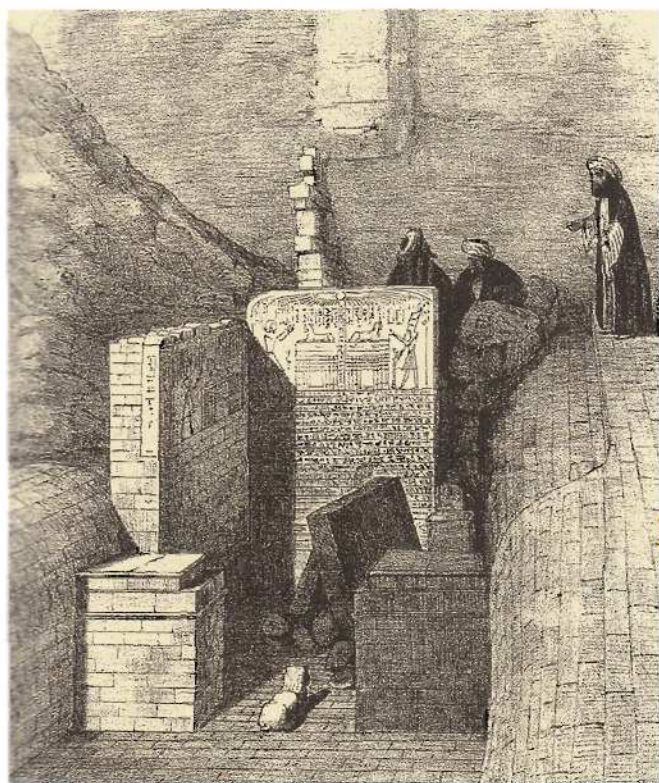
## Belzoni and Giza

After his arrival in Egypt, Belzoni went to Giza and explored the Great Pyramid – at one point having to be extricated from a passage in which he became wedged. He also visited the pyramids of Saqqara and Dahshur, but his greatest contribution to the study of the Giza pyramids was opening the previously unknown upper entrance of Khafre's pyramid. Meticulous observation led him, after one false start, to the true entrance. Belzoni was anxious to enter before Drovetti, who was rumoured to be about to blast the pyramid open using dynamite. He hired local villagers to clear the rubble blocking the opening. He then made his way through the upper passage to the horizontal passage, where with great effort he raised a portcullis slab, and finally, after almost a month, he reached the burial chamber itself. Any hopes of finding an intact burial chamber were soon dashed by the sight of the half-open sarcophagus. Its fine granite lid lay in two pieces. An Arabic inscription on the wall revealed that the chamber had already been entered, probably in the 13th century.

While exploring Khafre's monument, Belzoni had a team working at the third Giza pyramid. But a disagreement with Salt put an end to this work. Although Belzoni's instincts were leading him in the direction of the entrance, it was Howard Vyse who would use gunpowder to blast his way into Menkaure's pyramid 19 years later.

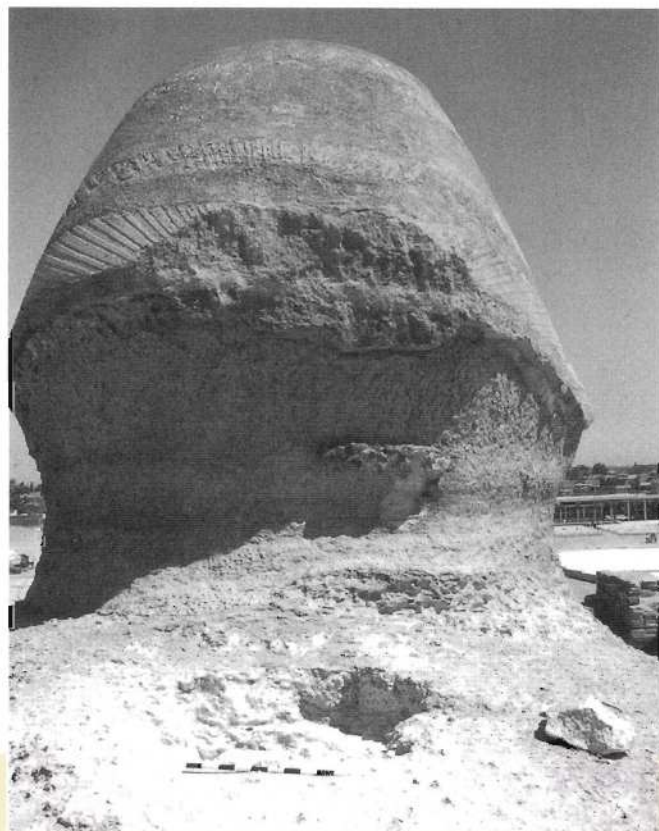
## Belzoni and Caviglia

*The first major excavation on the Giza Plateau was by Caviglia, whose commission allowed him to roam the monuments at will with his excavation workers. In his major exterior project, he cleared the front of the Great Sphinx, and found an open-air chapel between the forepaws, where rulers from New Kingdom to Roman times worshipped the colossal bedrock statue. The altar at the outer gateway of the chapel still had the ashes of the last sacrificial fire burned to the Sphinx, probably in late Roman times.*





# Digging by Dynamite



When the cavity created in the back of the Sphinx by Vyse's gunpowder was cleared in 1978 under the direction of Zahi Hawass, it was found to contain not only Vyse's drill hole but also a large chunk of the Sphinx's headdress with its relief-carved pleating.

## All in a Day's Work...

24 February 1837



Reis, 7      Men, 99.      Children, 66.

Great Pyramid.  
Excavation on southern front.  
King's Chamber  
Davison's Chamber  
Northern Air-channel.

Second Pyramid.  
Lower Entrance.  
Excavation for base at north-western angle.  
Quarries.

Third Pyramid.  
Interior.  
Excavation for base at north-eastern angle.

Bridge in the southern dyke.

Sphinx.      Boring.

One day's work from Howard Vyse's *Operations Carried on at the Pyramids of Gizeh in 1837*. Vyse (left) records that on this day the clearing of the Northern Air-channel proved impossible and that the boring of the Sphinx had reached a depth so far of 9 ft 8 in (2.95 m). He notes that the Maltese, Turks and Arabs were afraid to go out at night – unlike his English assistant who spent every night for five months in Menkaure's pyramid.

'Towards the end of this work gunpowder was used with great effect..'

R. Howard Vyse and J. Perring, *Operations...*

Richard William Howard Vyse (1784–1853) was an English army officer who first visited Egypt in 1835. Like many of his time, his interest in the pyramids stemmed from strongly held religious beliefs. He met Caviglia in Alexandria in 1836 and began excavating with him at Giza the same year. Vyse soon found the Genoese mariner unproductive, however, and in 1837, the year Vyse was promoted to Colonel, he began a collaboration with the engineer John Shae Perring (1813–69) with the aim of exploring and documenting the pyramids. Together they established a camp in the tombs of the eastern cliff at Giza. Work went on night and day, with shifts of workers on several sites at once. Confident in Perring's ability and trustworthiness, Vyse returned to England later in 1837, leaving his new assistant to carry on the work with his financial backing. Perring drew maps, plans and profiles of many of the pyramids – from Abu Roash to Giza, Abusir, Saqqara and Dahshur – that he published in three folio volumes, *The Pyramids of Gizeh*. Vyse reproduced Perring's drawings at a smaller scale in his own three-part *Operations Carried on at the Pyramids of Gizeh in 1837*.

Another contributor to Vyse's publication was the Sinologist and Egyptologist Samuel Birch of the British Museum. Vyse investigated the pyramids a mere 15 years after the brilliant decipherment of Egyptian hieroglyphs by Jean François Champollion, but Birch was able to supply notes to the text and give a rough translation of the inscriptions that the team was finding in and on the mastaba tombs that surround the Giza pyramids. Birch's crude transcriptions of the glyphic words include their Coptic equivalents. Written largely with the Greek alphabet, Coptic had been readable long before Egyptian hieroglyphs; indeed an understanding of Coptic was invaluable in Champollion's decipherment of hieroglyphs.

## Excavation by force

At Giza, Vyse cleared the lower entrance of the pyramid of Khafre by blasting apart the granite plugs that blocked it. Belzoni had entered the pyramid from the upper entrance and suspected the existence of the lower entrance when he saw the descending passage, closed with debris, from inside the pyramid.

Although Perring and Vyse carried out valuable documentation of the pyramids, Vyse, despite his evident admiration for the monuments, had no qualms about dismantling parts of the pyramids using boring rods in the search for hidden chambers or blasting his way through obstacles with dynamite. Opposite his view of Menkaure's queens' pyramids, Vyse wrote of the middle pyra-



mid (GIII-b) that it 'was prepared for boring by removing the stones from the top of it, as I expected to find the sepulchral chamber by penetrating through it.' Vyse ploughed straight through the centre of the superstructure without finding an addition to the passage to the subterranean burial chamber, which contained a granite sarcophagus holding a young female skeleton. Written in red on the roof of the burial chamber is the name of Menkaure, confirming the ancient sources that the third Giza pyramid was the tomb of that king.

Wondering if a chamber existed in the body of the Sphinx, Vyse ordered his men to drill straight down from the top of the back. When his boring rods became stuck at a depth of 8.2 m (27 ft), Vyse ordered the use of gunpowder to free the rod, but,

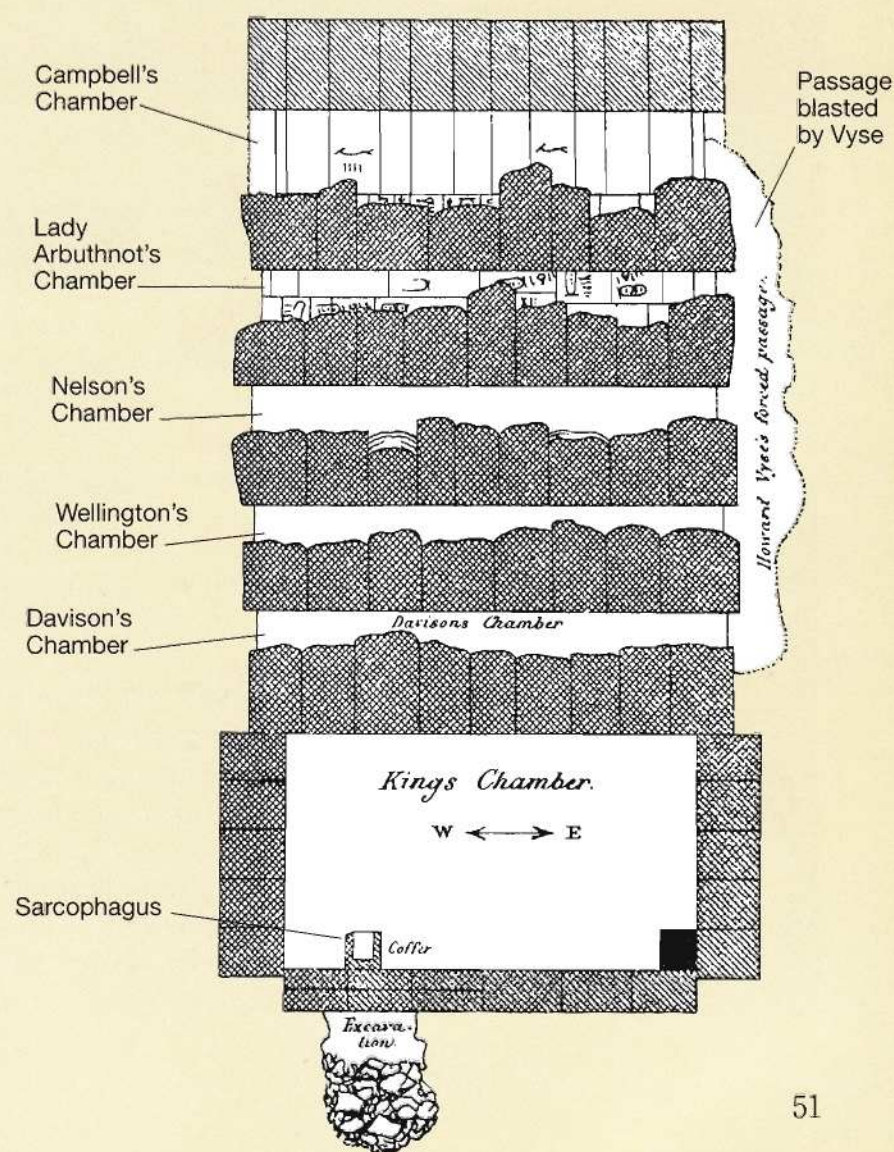
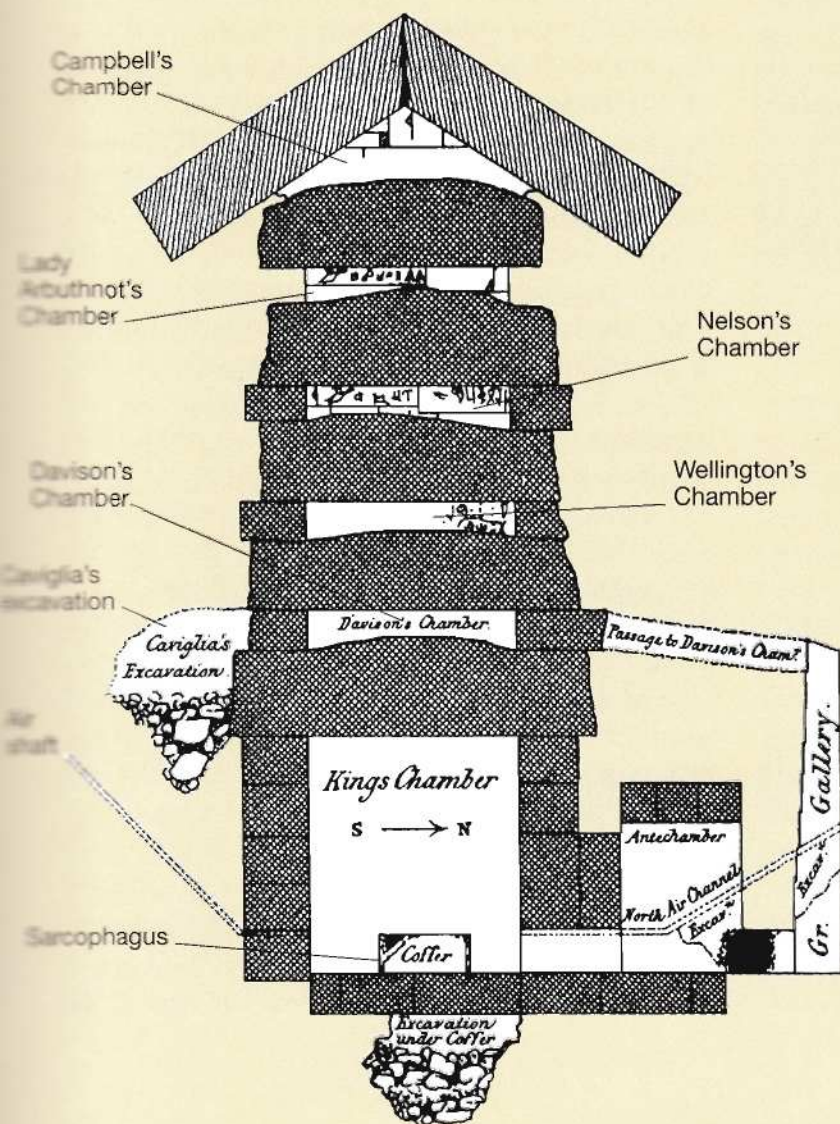
he said, rather contradictorily, 'being unwilling to disfigure this venerable monument, the excavation was given up and several feet of boring rods were left in it.'

## The pyramid of Menkaure

Vyse also burrowed straight into the core of the pyramid of Menkaure, beginning from the chasm that Saladin's son had made in AD 1196. Just off the central axis of the pyramid Vyse turned his tunnel downwards and forced it to the base of the pyramid, requiring his workers to come up out of the pyramid every time a new blast took place. But he found no new passages or chambers in the superstructure. Eventually Vyse located the entrance, instructed his men to clear it and, having paid



*Campbell's Chamber (left), topmost of the five stress-relieving chambers of Khufu's pyramid, was reached after Vyse dynamited upward from Davison's Chamber. It contained graffiti which included the name of the pharaoh Khufu (right). The other chambers were named after prominent people (sections below: left, looking west; right, looking north).*







Menkaure's pyramid, with its three queens' pyramids in the foreground. The middle pyramid (GIII-b) was built of limestone, but like the westernmost of the three pyramids it appears not to have been cased.

them, made his way into the interior and the burial chamber with the artist Edward Andrews who prepared many of the plans and sections illustrating the works of Vyse and Perring. As with Belzoni in Khafre's pyramid, the Arabic graffiti on the walls immediately declared that they had been preceded. In the granite-lined burial chamber they found the original stone sarcophagus but the lid was missing and the sarcophagus lay empty. Pieces of the lid were found in the bedrock-hewn 'Upper Apartment' above the burial chamber, from which Perring and

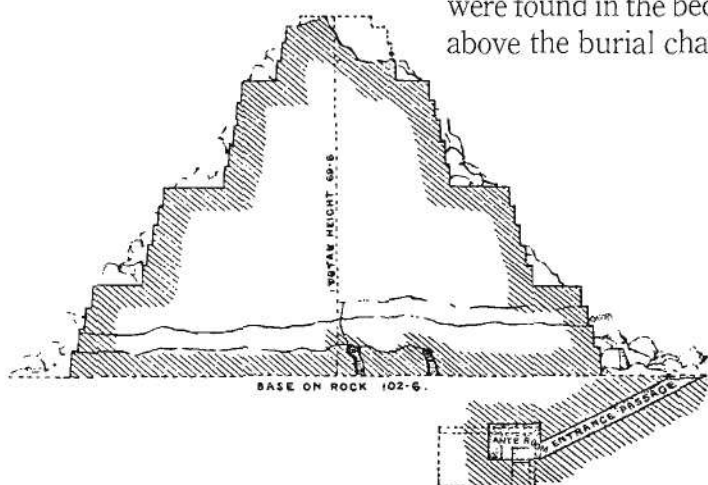
Vyse were able to reconstruct it. With great difficulty Vyse's men removed the sarcophagus for transport to England, but it sank to the bottom of the Mediterranean during a storm, along with the ship transporting it, the *Beatrice*.

With the fragments of the sarcophagus lid, the excavators also found human bones, linen wrappings, and parts of a wooden coffin. An inscription on the front of the coffin identifies its occupant as the 'Osiris [deceased] Menkaure, given life for ever, born of the sky, the sky goddess Nut above you... Curiously, the style of the coffin shows that it is of Saite (26th-dynasty) date, and radiocarbon analysis of the bones points to the Christian period. Both coffin and bones are now in the British Museum.

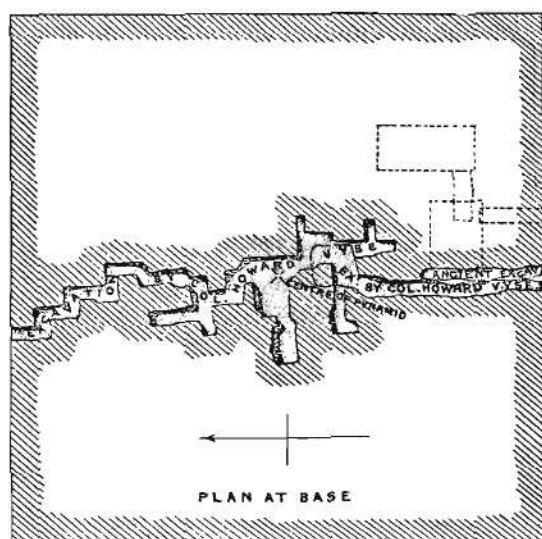
This apparent 'burial' of Menkaure some 2,000 years after he lived and died must, in fact, be a reburial and may relate to an inscription on the granite casing just below the entrance to the pyramid. Diodorus Siculus had noted this inscription but it was only found in 1968 when debris was cleared from the pyramid's base. It gives the year (unfortunately damaged), month and day that Menkaure was buried in the pyramid, and states that the king was given a rich burial. One theory is that the inscription may date to the time of Khaemwaset, son of Ramesses II, who carried out a lot of restoration work at Giza. These mysterious facts, like the bones of a bull found in the sarcophagus of Khafre, hint that the history of the pyramids is not always as straightforward as Egyptologists may think.

### The pyramid of Khufu

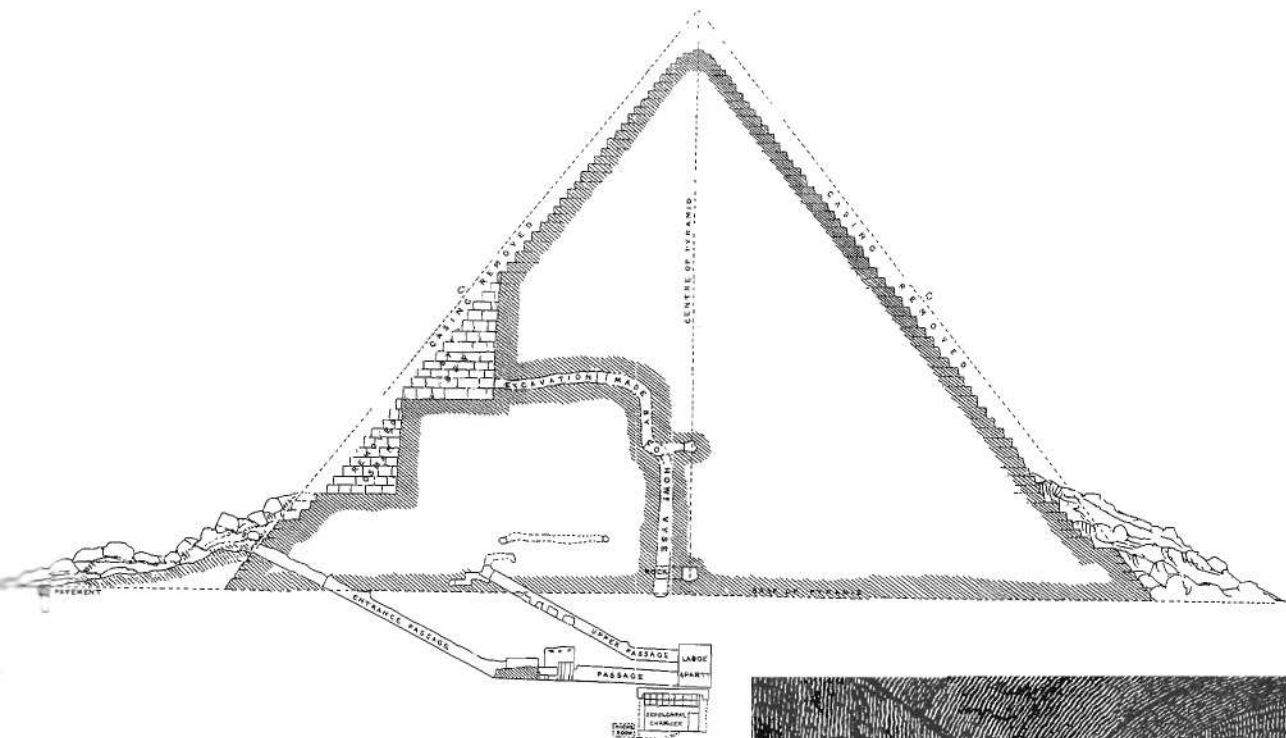
Vyse initially directed his dynamite operations at the pyramid of Khufu to its south side, where he thought he might blast open a second entrance at about the same level as the northern entrance. He



Perring's detailed plan and profile of the middle queen's pyramid. Vyse removed stones from the top of the middle pyramid and forced his way down through the centre of it without reaching the burial chamber as he expected. The fact that Perring so accurately mapped his intrusion through the 4,600-year-old monument indicates that Vyse saw no harm in what he called 'excavations in the pyramids'. We should at least acknowledge that this may be the beginning of documenting archaeological excavation in Egypt.





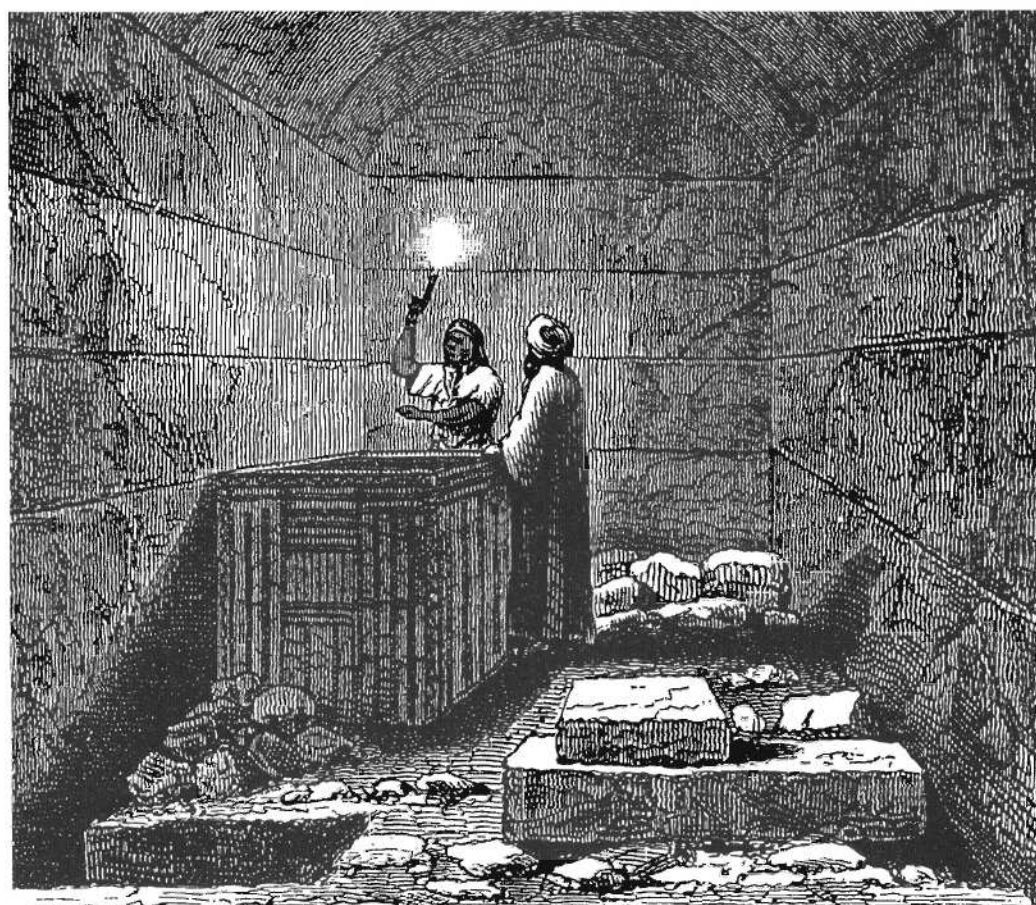


*Perring's cross-section of Menkaure's pyramid (left) is a meticulous record of his excavation of the site. He found the true entrance and reached the vaulted burial chamber. Within its red granite walls was the royal sarcophagus, made of basalt and in typical Old Kingdom palace façade style. When clearing the chamber before the burial chamber (below), he discovered human remains and a fragment of coffin lid, with Menkaure's name, but in a style not in use until many centuries after his death.*

gave up only after creating a large hole in the core masonry. Excavating down to the bedrock, Vyse did, however, uncover some of the original polished casing blocks of the pyramid, together with a pavement that extended out from the base.

Vyse's gunpowder-blasting archaeology did make one highly notable discovery in the Great Pyramid. Caviglia had begun to dynamite his way along the south side of the stress-relieving chamber that Davison found in 1765, hoping to find a communication with the southern air channel that would lead him to a secret room. After falling out with Caviglia, Vyse came to suspect that there was another chamber directly above Davison's since he could thrust a yard-long reed through a crack and up into a cavity at its northeastern corner. He therefore directed his dynamiting straight upward, whereupon he found, over three and a half months, the four additional stress-relieving chambers, all roofed, floored and walled with granite except for the topmost, which was gabled with limestone blocks so that the weight of the pyramid did not press down on the chambers below. Vyse named these chambers after important friends and colleagues: the Duke of Wellington, under whom he had served; Admiral Nelson, hero of Trafalgar; Lady Ann Arbuthnot, wife of Lieutenant-General Sir Robert Arbuthnot, who visited the pyramid just after the discovery of the chamber on 9 May 1837; and Colonel Campbell, the British Consul in Cairo.

Just as significant as the amazing architecture of the Relieving Chambers was Vyse's discovery of numerous graffiti in red paint dating from the time the pyramid was being constructed. Along with levelling lines, axis markers and directional notations were the names of the workgangs compounded with one form of Khufu's name, such as 'Khnum-Khuf' ('the creator god Khnum protects

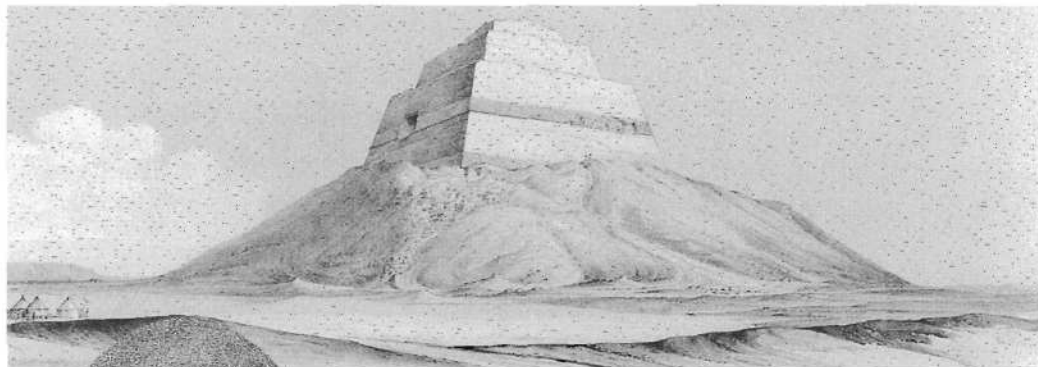


him'). One of the gangs might have been called something like, 'how powerful is the great White Crown of Khnum-Khuf!' In spite of the extreme difficulty of getting up into the Relieving Chambers, a fair number of visitors have followed Vyse since the 1837 opening. They have, unfortunately, freely added their graffiti to that left by the workgangs 4,600 years ago.

The single instance of the king's name as simply 'Khufu', again as part of a workgang name, is found on the south ceiling towards the west end of the topmost chamber (Campbell's Chamber). Since nobody had entered this from the time Khufu's workmen sealed it until Vyse blasted his way in, the gang names clinch the attribution of this pyramid to the 4th-dynasty pharaoh, Khufu. Workers' graffiti in red paint have since been found in other Old Kingdom pyramids, temples and mastabas.



# Lepsius and Mariette



Karl Richard Lepsius (above) recorded and documented many of Egypt's pyramids in his massive work, the *Denkmäler*. Most of the plates were based on the drawings of Ernst Weidenbach, such as the one of Meidum shown above. Lepsius's map of the pyramid field of Saqqara (detail right) was a model of detail.

'From the Labyrinth these lines come to you... We have also made excavations on the north side of the pyramid, because we may expect to discover the entrance there; that is, however, not yet done.'

Karl Richard Lepsius, *Discoveries in Egypt*

Fortunately, disciplined scholarship and the recognition of the importance of preserving and recording the legacy of ancient Egypt gradually took precedence over the more brutal excavation methods of the early 19th century.

Karl Richard Lepsius (1810–84) was a formidable scholar and is widely held to be the greatest Egyptologist after Champollion. Having first studied classical archaeology in Germany, he went on to study Egyptology in Paris. In the 1830s he published several papers on hieroglyphs, including a famous letter to Professor Ippolito Rosellini at the University of Pisa that transformed the study of the subject. Lepsius's contributions to Egyptology are numerous, but undoubtedly his greatest is the 12-volume *Denkmäler*, the massive work on the monuments of Egypt, containing 894 folio plates and published after his death. Five volumes of text were prepared from his notes and appeared between 1897 and 1913.

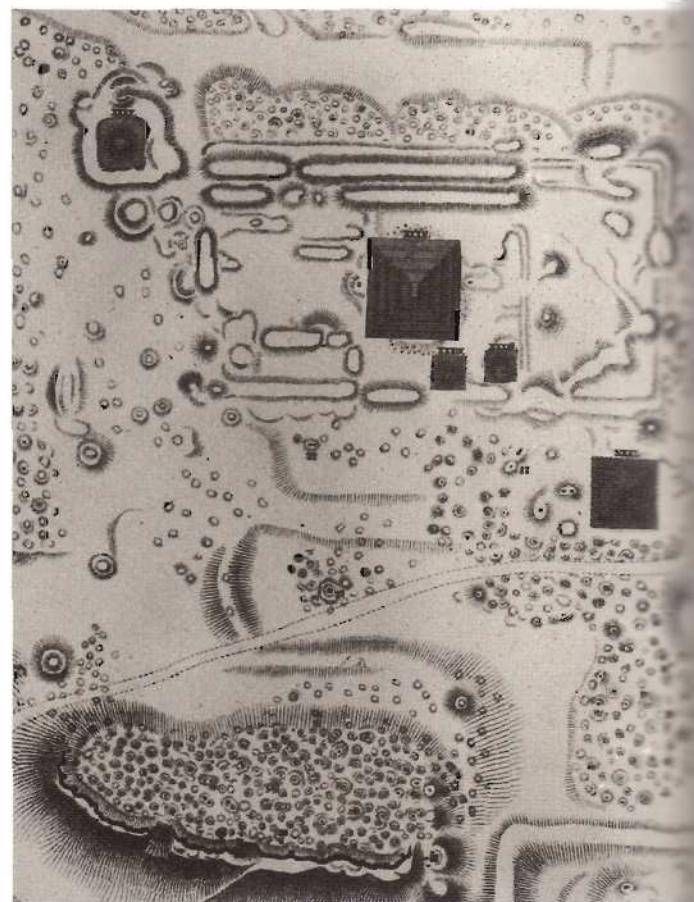
## The expedition of Lepsius

Lepsius's massive work was the result of a survey of Egypt and Nubia ordered by King Frederick William IV of Prussia. As leader he appointed Lepsius, then lecturer in philology and comparative languages at Berlin. In preparation, Lepsius spent four years touring the collections of Europe, recording details of artifacts and copying inscriptions; he not only studied the Egyptian language, but also the practical skills of lithography and copperplate engraving. In 1842, Lepsius and his team set out for Egypt. Their three highly productive years were characterized by careful, methodical

analysis, meticulous recording of detail and outstanding finds. As well as the *Denkmäler*, Lepsius also published a personal account, *Discoveries in Egypt*. The 15,000 casts and antiquities Lepsius brought back form the core of the Berlin Museum collection.

Among the many pyramids Lepsius investigated was the Step Pyramid at Saqqara. He removed from the southeast part of the substructure a door lintel and frame inscribed with the name of the king, together with some of the blue faience tiles from the wall. In 1843, the team excavated at Hawara in the Fayum, at the so-called Labyrinth. The site had been described by Herodotus and Strabo; the former regarded it as a wonder of the world even greater than the Giza pyramids. This vast complex was, in fact, the mortuary temple of the 12th-dynasty ruler Amenemhet III – the largest of all mortuary temples – which lay adjacent to his pyramid. Much of the structure of the Labyrinth had been destroyed over the centuries as it was quarried for its lime. Lepsius also began excavations on the north face of the pyramid but failed to find an entrance.

While studying the pyramids, Lepsius formulated his 'accretion theory', which held that the size of a pyramid was dictated by the length of reign of its builder. Others have since questioned this and the theory is now discredited. Subsequent research has shown that some pyramids, such as those of Djoser and Sneferu at Meidum, were indeed enlarged over the course of successive building stages. It seems the sizes of most were predetermined, and a large pyramid like Khufu's may signify that it was begun by a king in the prime of youth, as opposed to one





who came to the throne in his later years, and who possessed the confidence, and longevity, to take such a colossal enterprise to its summit.

## The birth of the Antiquities Service

Auguste Mariette (1821–81) was a bright young man with varied interests and an inquiring mind. In 1842, he read the papers of one of his relations, Nestor l'Hôte, who had been a draughtsman on the Egyptian expedition of Champollion and Ippolito Rosellini. Mariette's fate was sealed. He studied ancient Egyptian language, art and history, and Coptic; he wrote articles and papers and finally secured a post with the Louvre. In 1850, that institution sent him to Egypt to buy Coptic manuscripts, but he began excavating instead. At Saqqara he found and excavated the Serapeum where the sacred Apis bulls had been buried in a great catacomb.

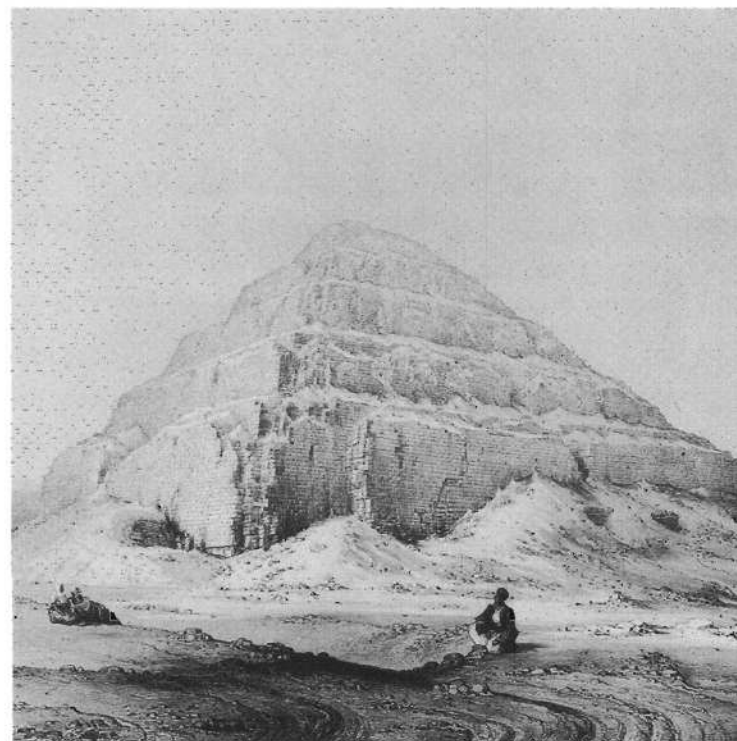
Then, in 1858, Ferdinand de Lesseps, in charge of the Suez Canal project, pressured the ruler Said Pasha to place Mariette in charge of all Egyptian antiquities. This he did, naming Mariette *mamûr* of a new national Antiquities Service, a position that would be held by a Frenchman until 1952. With the founding of the Egyptian Museum at Boulaq (later moved to Giza, and finally to Qasr el-Nil), to gather and display ancient works of art, the 'reign of Mariette' began. For the next two decades he carried out field archaeology at 35 sites throughout the country. His work practices and methods were criticized by some of the next generation of Egyptologists, but they were advanced for his time and his output has never been equalled.

Also at Saqqara Mariette dug huge trenches, revealing tombs of all periods in what had been a national cemetery of pharaonic Egypt (pp. 62–3), including many dating to the pyramid age. Unfortunately, however, he never produced a proper map of the tombs, and many were covered by the shifting sands and lost again.

Mariette's second major discovery, after the Serapeum, was Khafre's valley temple which was visible above the debris of the ages only as a series of pits and stones. He partially excavated the interior of the valley temple in 1853 and completed its clearance in 1858 by removing a shallow layer of sand that still covered the floor. In the course of this work Mariette blew apart some collapsed structural elements and other major pieces to remove them from the temple. Frustratingly, he published almost nothing about what he found inside the temple. However, one of the finest masterpieces of ancient Egyptian art was found by Mariette in the valley temple – the diorite statue of Khafre himself.

During 1880, the last year of Mariette's life, the foreman of the Antiquities Service, Mohammed Chahin, opened the pyramid of Pepi I at Saqqara. This was the first in which Pyramid Texts were

*The Step Pyramid at Saqqara from Lepsius's Denkmäler. The artist of this particular plate was J. Frey.*



found, which were rapidly copied by Emile Brugsch and, unofficially, by Flinders Petrie. The pyramid of Merenre was entered just before Mariette's death, and more were penetrated by his successor, Gaston Maspero. As Maspero explained:

'The discovery of the Pyramids of Pepi I and of Merenre at the place where the theory affirmed that they would be found, decided me to direct the attack on the entire front of the Memphite Necropolis, from Abu Roash to Lisht. Rapid success followed. Unas was opened on the 28th February, Pepi II, Neferirkera [Neferirkare] on April 13th, and that of Teti on the 29th May. In less than a year, five of the so-called "dumb" pyramids of Saqqara had spoken..'

*This rare photograph (below) was taken before Mariette finished clearing the valley temple. It shows a granite beam fallen between the pillars. This and other pieces in the temple were blown apart to remove them.*





# Petrie at the Pyramids

*This photograph taken in 1880 shows Petrie outside the rock tomb in which he lived during the two winter seasons of his pyramid survey. These quarters were three small tombs broken into one room. Petrie managed a comfortable co-existence with the dogs who inhabited the area, controlled the rats and mice with traps, and coped with the heat and the tourists by working in his underwear 'if pink, they kept the tourist at bay, as the creature seemed to him too queer for inspection.'*

William Matthew Flinders Petrie (1853–1942), the 'Father of Egyptian archaeology', was a bright child. When not yet six, he learned the hieroglyphic alphabet and, encouraged by his father, he later combined interests in mathematics and measurement with archaeology. Between 1875 and 1880 he surveyed a number of British sites, including Stonehenge. Then, in 1866, Petrie read Charles Piazzi Smyth's *Our Inheritance in the Great Pyramid* and became excited by the possibility of reconciling science with religion. Although he did not believe in Smyth's extreme religious notions and the concept of Britain as a lost tribe of Israel, he fully adhered to the idea of the pyramid as a gigantic scale model of the Earth's circumference.

In 1880, having become convinced of the need for another survey of the Great Pyramid, young Petrie arrived in Egypt. Petrie's meticulous survey of the pyramid in fact proved the death knell for Piazzi

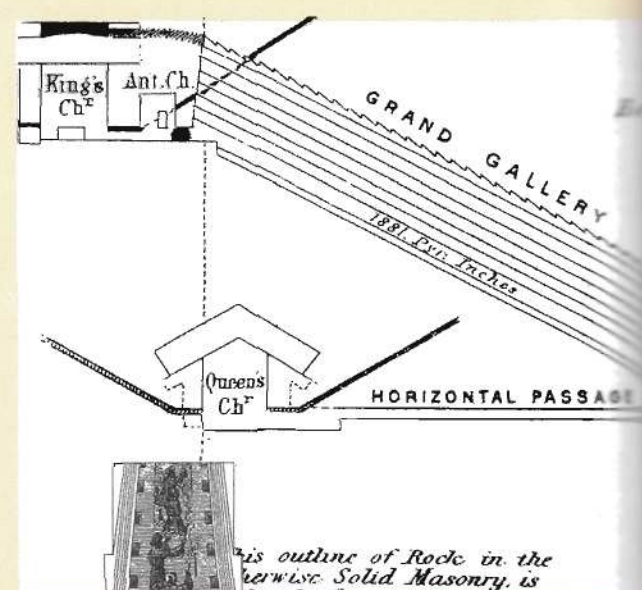
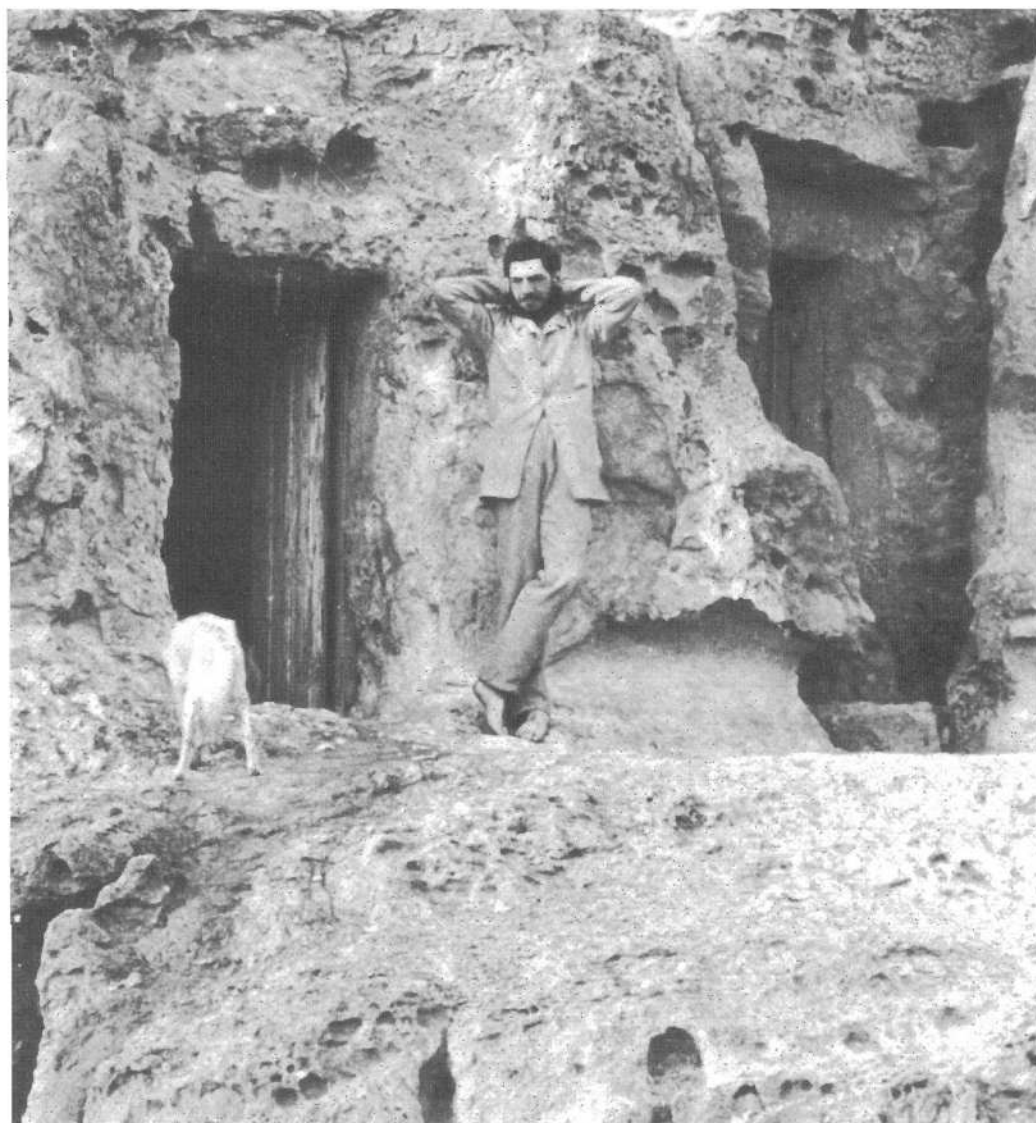
Smyth's so-called pyramid inch (see box). The theories of pyramidologists like Piazzi Smyth rested on measurements that claimed to be accurate to a matter of fractions of inches. But all this was argued at a time when massive mounds of debris still covered the base of the pyramid.

With the debris banked against the sides of the Great Pyramid, Petrie measured its exterior through an elaborate set of triangulations that encompassed all three Giza pyramids. He resolved the positions of the corners and the lengths of the sides trigonometrically. By this method he also established the positions of many other points, including on the pyramids of Khafre and Menkaure. Unfortunately, Petrie's triangulated map was never published on a scale larger than the page of a paperback.

Some continued to believe in Piazzi Smyth, regardless of Petrie's measurements. Earlier this century, the structural engineer David Davidson actually used Petrie's figures in creative ways to 'prove' the theories of Piazzi Smyth, and even far more ambitious claims.

## Petrie after Giza

During 1888 and 1889, Petrie followed up Lepsius's work of 1843 by investigating the site of Hawara. He excavated what remained of Labyrinth and the adjacent pyramid of Amenemhet III, where he



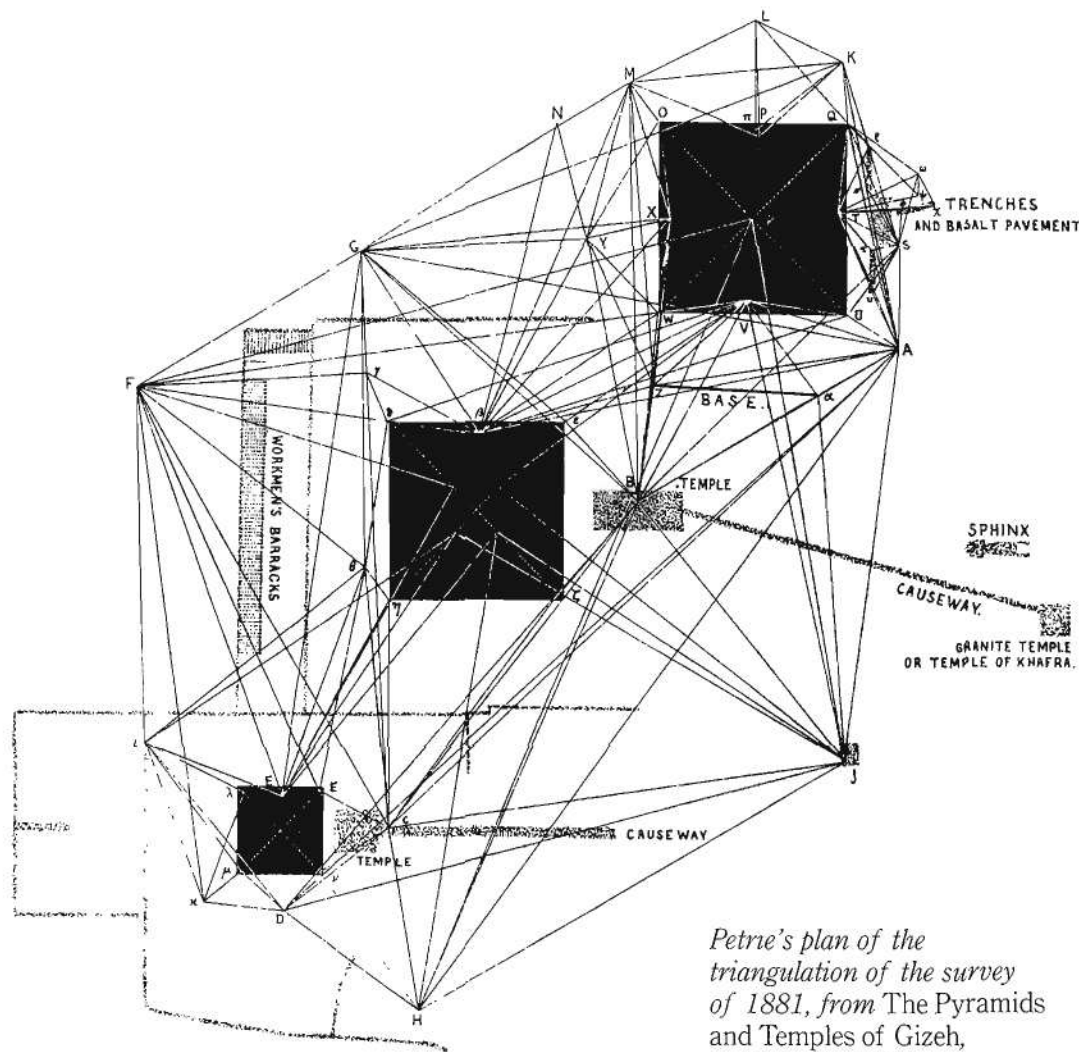
*The Grand Gallery as recorded by Piazzi Smyth. His aim was to measure accurately every surface and aspect of the Great Pyramid. He brought equipment to measure the dimensions of the stones, the precise angle of sections such as the Descending Passage, and a specially designed camera to photograph both interior and exterior. Other instruments enabled him to make astronomical calculations.*



entered the flooded burial chamber and found two sarcophagi and burnt human remains.

Petrie excavated the pyramid of Senwosret II at Illahun in 1887–8, but failed to find the entrance and passage to the burial chamber, with its red granite sarcophagus, until the following year. In one of the shaft tombs just outside the pyramid, he, together with Guy Brunton, found the exquisite jewellery of Princess Sit-Hathor-Iunet, now in the Cairo Museum and New York's Metropolitan Museum of Art. He also searched unsuccessfully for a passage or chamber underneath the subsidiary 'Queen's Pyramid' of Senwosret II, even though he carved out two criss-crossing tunnel systems, and a deep vertical shaft, directly under the pyramid. It is strange that there are apparently no passages or chambers under this small pyramid considering that Petrie did find the remains of a chapel at its north side, where someone must have been worshipped.

Petrie continued his pyramid investigations at Meidum, where he uncovered the small limestone temple next to the pyramid of Sneferu, with its two uninscribed stelae. He also examined the two anonymous pyramids of Mazghuna, south of Dahshur. They date to the 13th dynasty and closely resemble a number of other pyramids of that period discovered at South Saqqara and Dahshur by Gustave Jéquier and Sami Farag respectively.



*Petrie's plan of the triangulation of the survey of 1881, from The Pyramids and Temples of Gizeh, published in 1883.*



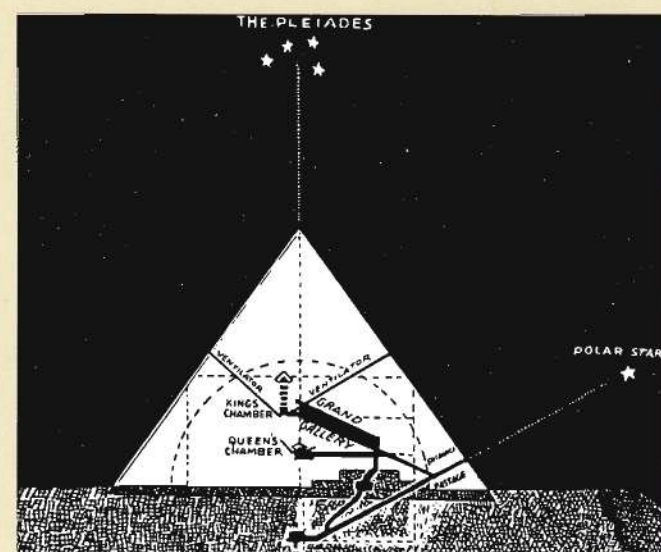
*determine the pyramid's latitude. He produced drawings of the pyramid, such as that shown above, using his 'pyramid inch'. In recognition of his work the Royal Society of Edinburgh awarded Piazzi Smyth a gold medal. He was not the only 'pyramidiot', however, as many others were also producing theories and drawings linking the pyramids with the stars or the Bible, among other things.*

## Piazzi Smyth and the Pyramid Inch

Charles Piazzi Smyth (1819–1900) was Astronomer Royal of Scotland and Professor of Astronomy at Edinburgh University. He surveyed Khufu's pyramid in 1865, armed with the theories of John Taylor, author of *The Great Pyramid: Why Was It Built? & Who Built It?*, published in 1859. Taylor, who based his ideas on the records of travellers, took a number of mathematical coincidences and declared that the Great Pyramid was built 'to make a record of the measure of the Earth' – similar assertions are still being made today by alternative pyramid theorists such as Robert Bauval and Graham Hancock. One of Taylor's claims was that the Egyptians knew the value of  $\pi$  and that they used an inch close to the British inch to form their cubit of 25 inches. Taylor presented a paper on the subject to the Royal Academy, but it was rejected.

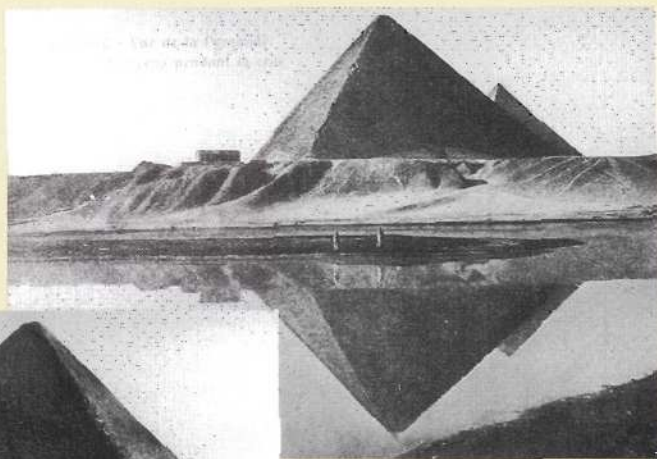
Heavily influenced by Taylor, with whom he corresponded, and by his own religious views, Piazzi Smyth set out for Egypt – having been refused a grant to defray his expenses. He too had come to believe that the Great Pyramid of Khufu was built with just enough 'pyramid inches' to make it a scale model of the circumference of the Earth, and that its perimeter measurement corresponded exactly to the number of days in the solar year. These ideas were tied to his belief that the British inch was derived from an ancient 'pyramid inch', and that the cubit used to build both Noah's Ark and the tabernacle of

Moses was also based on this inch. Piazzi Smyth further believed that the British were descended from the lost tribe of Israel, and that the chambers and passages of the pyramid were a God-inspired record, a prophecy in stone of the great events in world history, made by scientifically advanced ancestors of the British. His theories are contained in *Our Inheritance in the Great Pyramid* (1864), and the three-volume *Life and Work at the Great Pyramid* (1867). In 1874 the Royal Society rejected his paper on the design of Khufu's pyramid, as they had Taylor's, and Piazzi Smyth resigned in protest.





# Postcards, Pyramids and



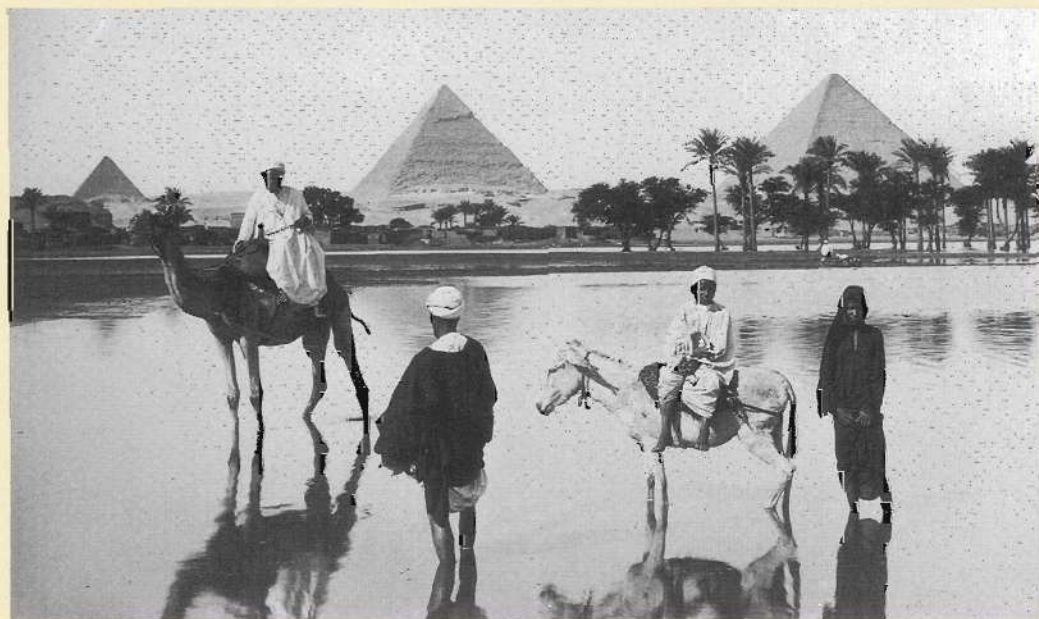
*The sight of tourists travelling by camel to the pyramids (above) was a common one in the 19th-century. The road to the plateau was flanked by a canal and, eventually, by a trolley line that could transport the ever-increasing numbers of tourists.*

*For about six to eight weeks, when the flood waters were calm (top and below), the ancient Egyptians could see the inverse of the pyramid reflected in the inundation waters. It is interesting to speculate whether they saw in this image the union of the sky and Duat (Netherworld).*

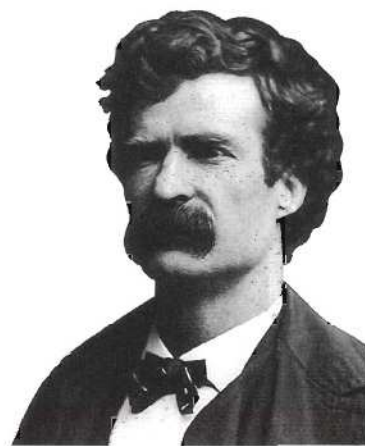
The first pyramid postcards began to appear around the end of the 19th century. Perhaps surprisingly they are a valuable source of information from a period when there was a lack of documentation of important excavations by Mariette and Maspero at the Sphinx, and just before the massive clearing operations of the Great Expeditions.

Some of the postcards show the pyramids during full flood of the Nile, a sight lost since modern control of the river level, but a potent, annually recurring image in ancient times. Postcards showing partial inundation reveal the catchment patterns of the valley floor at the base of the pyramid plateau, possible clues for ancient canals, harbours and settlements.

A year before the opening of the Suez canal in 1869 an elevated road was built from Giza to the pyramid plateau to facilitate visits by attending royalty, most notably the Empress Eugenie. At the same time, the Mena House Hotel was built at the base of the plateau, below Khufu's pyramid. A roadway led from the hotel to the foot of the pyramid, just below its entrance. Modern tourism was now in full swing.



## Mark Twain, Early Tourist



‘ A laborious walk in the flaming sun brought us to the foot of the great Pyramid of Cheops. It was a fairy vision no longer. It was a corrugated, unsightly mountain of stone. Each of its monstrous sides was a wide stairway which rose upward, step above step, narrowing as it went, till it tapered to a point far aloft in the air. Insect men and women...were creeping about its dizzy perches...we were besieged by a rabble of muscular Egyptians and Arabs who wanted the contract of dragging us to the top...Each step being full as high as a dinner-table; there being very, very many of the steps; an Arab having hold of each of our arms and springing upward from step to step and snatching us with them...till we were ready to faint, who shall say it is not a lively, exhilarating, lacerating, muscle-straining, bone-wrenching and perfectly excruciating and exhausting pastime, climbing the Pyramids? ...Twice, for one minute, they let me rest...and then continued their manic flight up the Pyramid. ’

