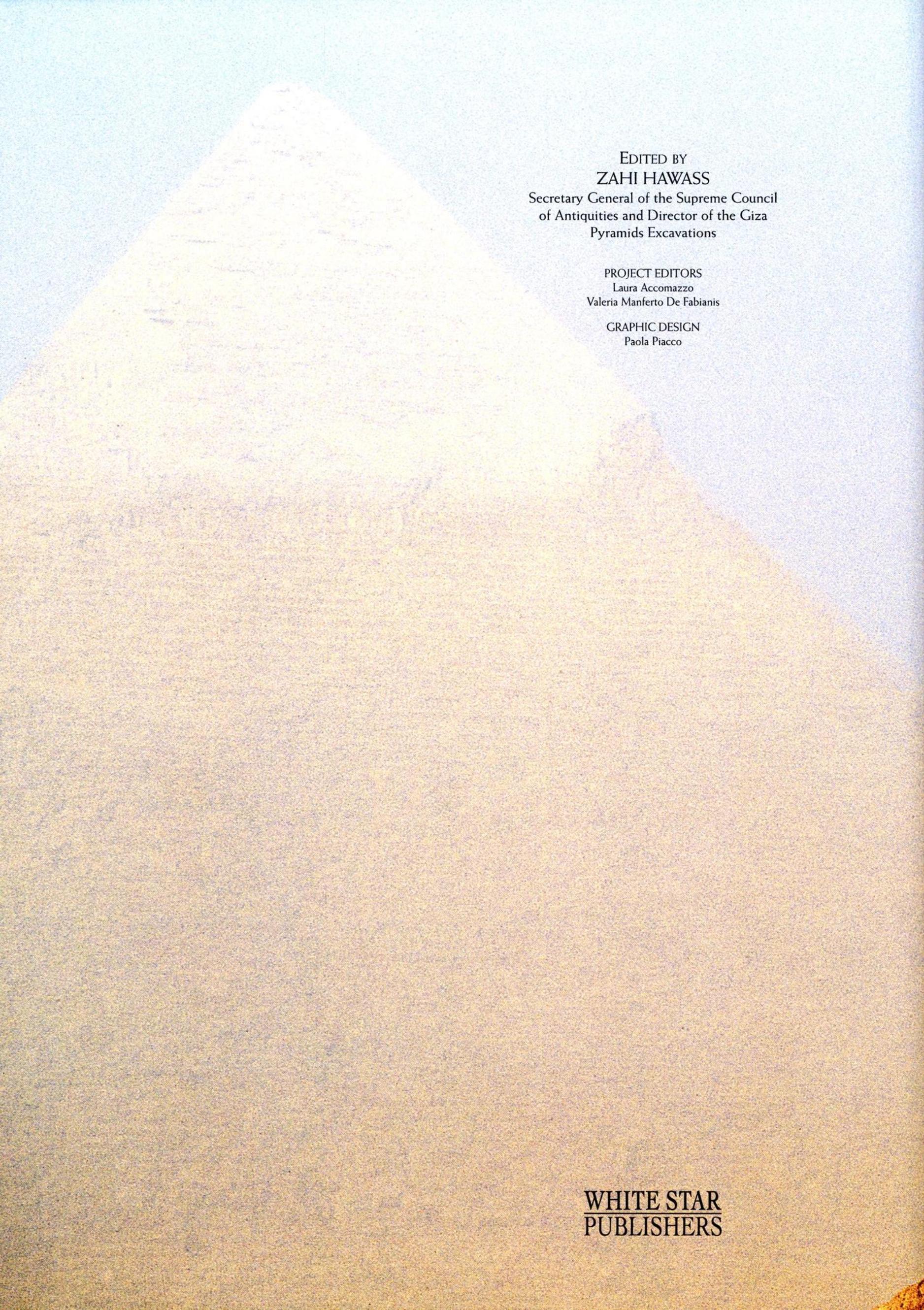


ZAHÍ HAWASS

# THE TREASURES OF THE PYRAMIDS



EDITED BY  
**ZAHİ HAWASS**  
Secretary General of the Supreme Council  
of Antiquities and Director of the Giza  
Pyramids Excavations

PROJECT EDITORS  
Laura Accomazzo  
Valeria Manfredi De Fabianis

GRAPHIC DESIGN  
Paola Piacco

**WHITE STAR  
PUBLISHERS**

# THE TREASURES OF THE PYRAMIDS







<b>CHAPTER 18</b>	
THE TOMBS OF THE HIGH OFFICIALS AT GIZA by Peter Der Manuelian	Page 190
<b>CHAPTER 19</b>	
THE 'UNFINISHED' PYRAMIDS OF THE FOURTH DYNASTY by Michel Valloggia	Pag. 224
<b>CHAPTER 20</b>	
THE PYRAMIDS OF THE FIFTH DYNASTY by Miroslav Verner	Pag. 236
<b>CHAPTER 21</b>	
THE SURPRISING ABUSIR BLOCKS by Zahi Hawass and Miroslav Verner	Page 260
<b>CHAPTER 22</b>	
THE PYRAMIDS OF THE SIXTH DYNASTY by Audran Labrousse	Page 264
<b>CHAPTER 23</b>	
THE DECORATIVE PROGRAM OF THE OLD KINGDOM PYRAMID COMPLEXES by Zahi Hawass	Page 282
<b>CHAPTER 24</b>	
THE TOMBS OF THE FIFTH AND SIXTH DYNASTIES AT SAQQARA by Karol Mysliwiec	Page 286
<b>CHAPTER 25</b>	
THE PYRAMIDS OF THE MIDDLE KINGDOM by Dieter Arnold	Page 326
<b>CHAPTER 26</b>	
THE TOMBS OF THE NOBLES IN THE MIDDLE KINGDOM by David P. Silverman	Page 348
<b>CHAPTER 27</b>	
ROYAL AND PRIVATE STATUES OF THE OLD AND MIDDLE KINGDOMS by Hourig Sourouzian	Page 366
INDEX AND BIBLIOGRAPHY	Page 392

The Publisher would like to thank:  
H.E. Farouk Hosny - The Egyptian Minister of Culture,  
Nabil Osman - President of the Egyptian Information Center,  
Attiya Shakran - General Director of the Cairo Press Center,  
M. El-Damaty - Director of the Egyptian Museum, Cairo,  
Mena House Oberoi Hotel, Cairo,  
Gamal Shafik of the Cairo Press Center,  
The curators and assistants of the Egyptian Museum, Cairo,  
Rajiv Kaul,  
Guido Paradisi and Fabio Calamante - photographers' assistants.

The Editor would like to thank Mark Linz and Neil Hewison of the American University in Cairo Press. He also wants to thank Essam Shehab of the Giza Inspectorate, and Mohamed Ismail, Mohamed Megahed, Brook Myers, and Sabar Mabrouk from the Technical Office of the Supreme Council of Antiquities.

10-11  
Scene showing the 'Meidum geese',  
Egyptian Museum Cairo, Old  
Kingdom.

© 2003 White Star S.r.l.  
Via C. Sassone, 22/24  
13100 Vercelli, Italy  
www.whitestar.it

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without written permission from the publisher.

ISBN 88-8095-233-1

Reprints:  
1 2 3 4 5 6 07 06 05 04 03

Printed in Italy by Officine Grafiche De Agostini  
Color separation by Fotomec, Turin

# The Pyramids of the Fourth Dynasty

by Rainer Stadelmann



With the long reign of Sneferu, the first king of the Fourth Dynasty, the 'Pyramid Age'—the time of the great pyramid builders—begins. This was one of the most magnificent and glorious periods of Egyptian culture. In addition to architecture, the arts of sculpture, relief, and painting reach their culmination. In the natural sciences and medicine, the foundations of knowledge and practice were laid that would remain valid for centuries, right into the Greek era. The belief in the almighty sun god Re, creator of all things, dominated Egyptian religion, ethics, state, and society, which became open and receptive to those with the skills to work on great projects. These individuals formed the new class of 'scribes,' academics who were trained in the practical and theoretical management of the state. This group admitted princes alongside those who had risen by their merits. As guarantor of this system, the sun god Re gave power to the king, whose divinity consisted of not himself, but in his capacity as ruler. He was the 'benign god,' the god of the necropolis, of which it was his task to construct. Sneferu's Horus-name means 'Lord of the world order,' a title that later applies only to the sun god Re. Sneferu's son Khufu identified himself with the sun god to such an extent in his pyramid complex and tomb that his sons and successors referred to themselves by the new royal title, 'Son of Re.'

Contemporary sources about the ancestry of Sneferu are rare. His mother Meresankh was probably a secondary queen of Huni, last king of the Third Dynasty, but the royal ancestors of kings of the Old Kingdom are never mentioned directly because the king was by nature of divine parentage. Besides his large pyramid structures, the principal achievements of the reign of Sneferu were the campaigns in Nubia and Libya that brought substantial booty in both cattle and men. These were settled in thirty-five new royal estates in the

Fayum and in the Delta. Additional achievements that can be linked to this period include the construction of a new royal palace, possibly near Dahshur, with large gateways of cedar wood, intensive ship building, the manufacture of life-sized royal statues in copper and gold, and an extremely large and precious wooden harp.

It is astonishing that the building of the pyramids is never mentioned in inscriptions of contemporaries, kings, or high functionaries, although it must have been the main event that took place during the reign of any king. However, the building of a pyramid is like the performance of daily rituals in the temples, the ceremonies that guaranteed the rising and setting of the sun, the passage of the seasons, and the arrival of the Nile floods; all these are a fundamental part of the king's natural lifetime assignments that they hardly needed mentioning. Sneferu was without doubt the most outstanding builder of the ancient world, having constructed three large and two smaller pyramids in his long reign using more than 3.6 million cubic meters of stone: one million more than his son Khufu used in his Great Pyramid at Giza. Nonetheless, he is known in Egyptian tradition as the good king par excellence who addressed, according to folk tales, his subordinates as 'friend' or even 'brother.' The shape of the pyramid complex changed under the influence of the sun god and his worship, from a north-south-oriented rectangle into a square east-west complex, following the course of the rising sun. The east-west orientation emphasizes a new element in the layout of the pyramid complex: the long causeway, which leads from the east, the land of the living, up the pyramid tomb, finally ending at the mortuary temple that from this time forward lies on the east side of the pyramid. The entrance gate to the causeway develops into a valley temple, the cult center of the pyramid town, in which the goddess Hathor and the king were worshipped as local deities.

112

*The stela of Sneferu from the cult pyramid at Dahshur South, now in the court of the Egyptian Museum, Cairo, represents the king as Lord of the Two Lands and Lord of the Divine World Order.*

113

*This life-size statue of Sneferu with the white crown of Upper Egypt once was inserted in the niche of one of the six chapels of his valley temple at Dahshur. Now restored and in the Egyptian Museum, Cairo.*



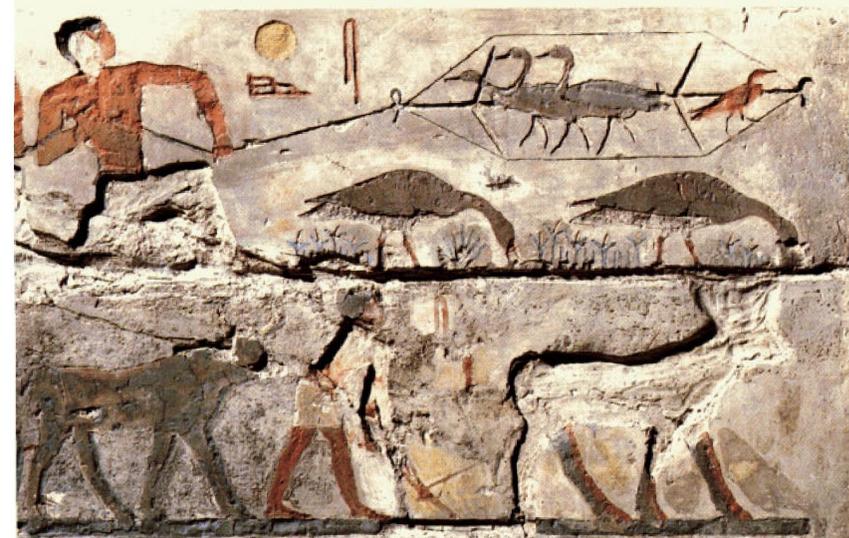
114-115

The pyramid of Sneferu at Meidum was originally built as a towering step pyramid but it was 'modernized' into a true pyramid at the end of Sneferu's reign. The picturesque form of the pyramid is due to stone quarrying from Greco-Roman to modern times.



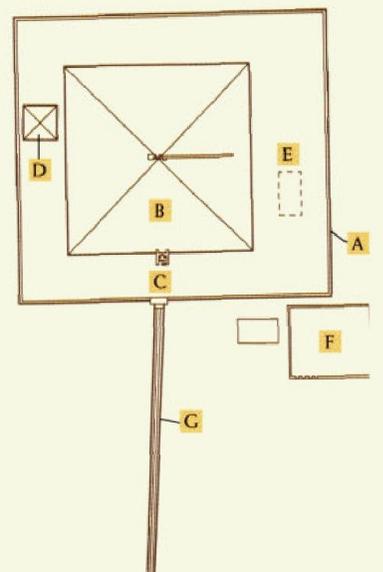
114 bottom

This wall fragment from Mastaba M 16 of Prince Nefermaat and his wife Atet shows the catching of birds with the clap net, two pecking geese, and farmers plowing with oxen. For this relief, a technique of inlaid color pastes was used, but the inlays fell out when they dried. Now in the Egyptian Museum, Cairo.

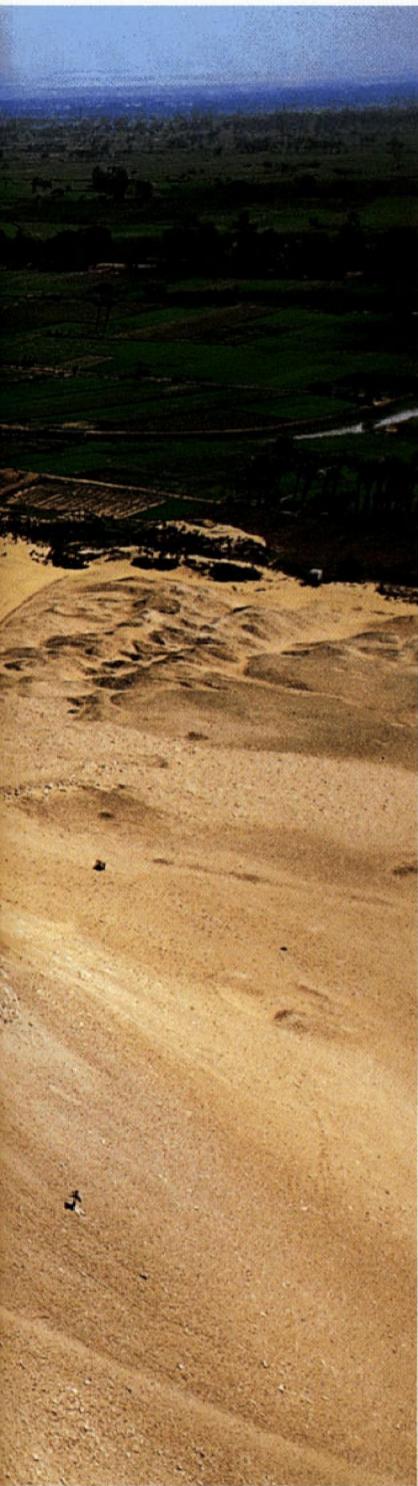


MEIDUM PYRAMID PRECINCT

- A ENCLOSURE WALL
- B PYRAMID WITH CORRIDOR AND BURIAL APARTMENTS
- C OFFERING TEMPLE WITH ROYAL STELAE
- D SOUTH OR CULT PYRAMID
- E TOMB SHAFT, PERHAPS THE TOMB OF THE KING'S MOTHER MERESANKH (?)
- F MASTABA M 17 TOMB OF A CROWN PRINCE WHO DIED YOUNG
- G CEREMONIAL CAUSEWAY WITH THE REMAINS OF A VALLEY TEMPLE



In this view from the pyramid of Meidum, the offering temple with the two stelae and the ceremonial causeway leading to the valley temple in the east can be observed.



Sneferu built his first two pyramids, still in the form of step pyramids, at Meidum. A small, solid step pyramid formed a towering landmark above the royal palace at Seila, on the eastern edge of the Fayum. His first pyramid complex, 10 kilometers to the east, overlooking the Nile valley, includes a huge step pyramid, which was enlarged in a second building phase to the tremendous height of 85 meters. It still dominates the view of the Nile Valley today. Toward the end of his long reign Sneferu 'modernized' this step pyramid, changing its form into that of a true pyramid.

The form of the step pyramid had its roots in the preceding Third Dynasty; there were now, however, important innovations influenced by the orientation of the pyramid complex following the course of the sun, mentioned above, and also in the system of tomb chambers. From the older cult buildings of the Third Dynasty complexes only the mortuary temple and the south tomb remained in the new pyramid complex of the Fourth Dynasty. The south tomb was adapted to the king's tomb as a small step pyramid directly to the south of the main pyramid. At Meidum the mortuary temple was a small sanctuary to the east of the pyramid with two large, high stelae which replaced and physically represented the king who was not buried at Meidum. The tomb-chamber system in the pyramid also differs from those of the Third Dynasty. The burial chamber was no longer situated deep in a shaft in the subterranean rock, but was constructed above ground in

the center of the pyramid. During the Old Kingdom, the entrance into or exit out of the pyramid was always situated on the north flank. Through the tomb corridor leading up from the burial chamber, the king would ascend to the everlasting stars in the northern sky, in order to meet the sun god in his barque there. The beginnings of a three-chamber system can already be recognized in the tombs of the First Dynasty: the tomb chamber proper, as well as two subsidiary chambers, which initially served to store the most important offerings for the deceased king. In the pyramid of Djoser, the ante- and side-chambers were already conceived as having religious functions. Thus, the ascent to the stars begins from the antechamber, and it is for this reason that the portcullis stones there were decorated with stars. The eastern corridors and the so-called 'Blue Chambers' are the model palace for the king's afterlife. In the Fourth Dynasty, the horizontal arrangement of the chambers is replaced by a vertical system, of which the Pyramid of Khufu provides the ultimate example. At Meidum a trend was set by laying out a royal cemetery in regular rows to the northeast of the pyramids with the double *mastabas* of Sneferu's sons and their wives. A huge single *mastaba* stands right by the northeast corner of the pyramid complex and thus in an important position. This was apparently built in a hurry and contains the burial of a nameless prince, probably a crown prince who died young in the early years of Sneferu's reign.

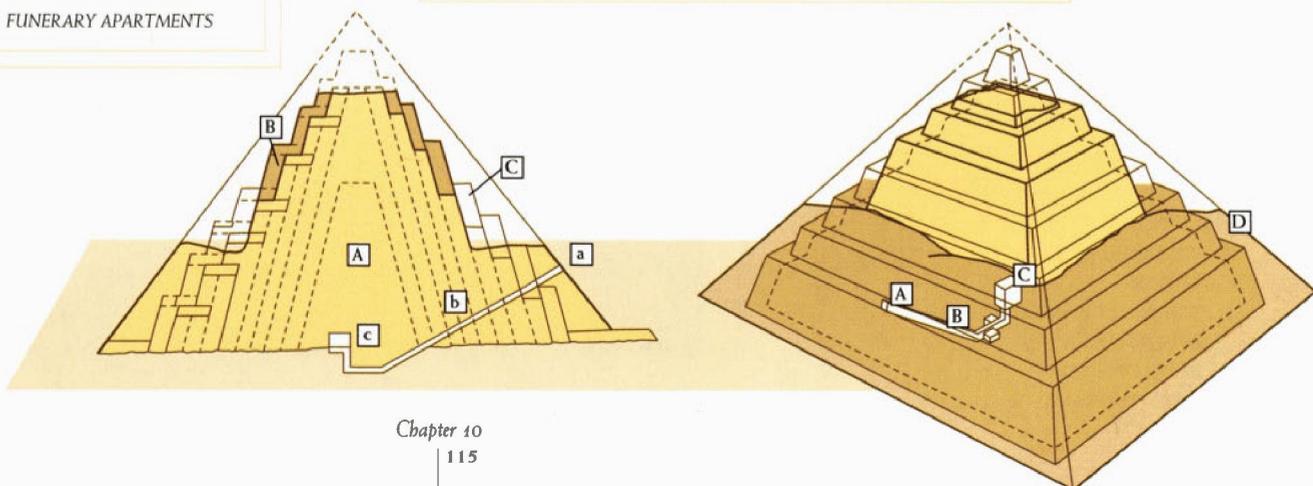
Meidum Pyramid

MEIDUM PYRAMID: THE CONSTRUCTION PHASES

- |   |  |                            |
|---|--|----------------------------|
| A | FIRST STEP PYRAMID OF SEVEN STEPS            | APPARENTLY NEVER COMPLETED |
| B | SECOND PHASE, WITH EIGHT STEPS REACHING 85 M | a ENTRANCE                 |
| C | THIRD PHASE, TRUE PYRAMID                    | b DESCENDING CORRIDOR      |
|   |  | c FUNERARY APARTMENTS      |

MEIDUM STEP PYRAMID

- |   |                     |   |  |
|---|---------------------|---|--|
| A | ENTRANCE            | D | RUBBLE FROM ANCIENT AND MODERN STONE QUARRYING |
| B | DESCENDING CORRIDOR |   |  |
| C | FUNERARY APARTMENTS |   |  |

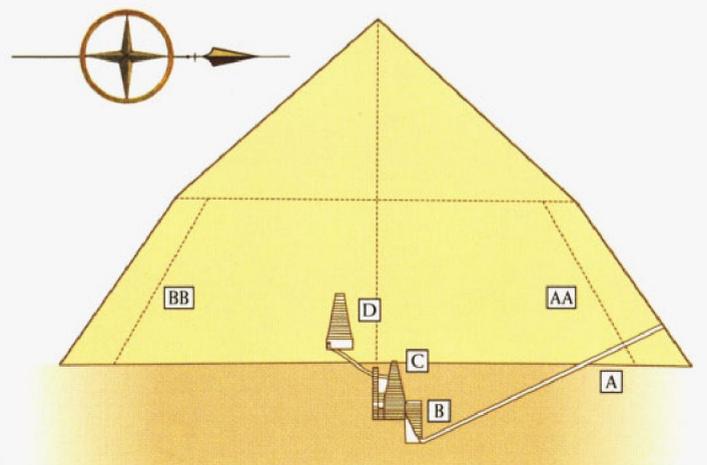
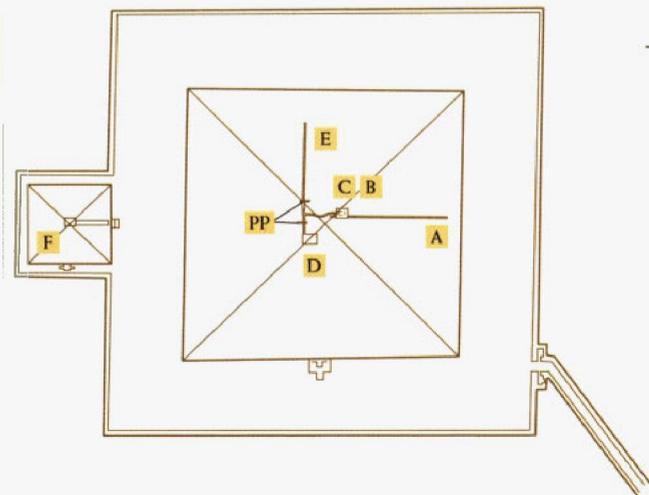


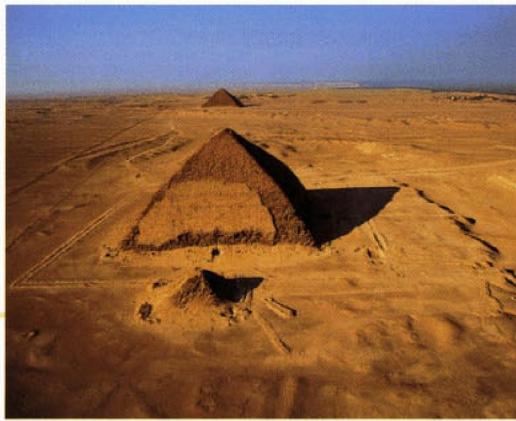
# Bent Pyramid



## PLAN OF THE BENT PYRAMID

- A NORTHERN ENTRANCE AND CORRIDOR
- B LOWER CHAMBER
- C ANTECHAMBER
- D UPPER BURIAL CHAMBER
- PP PORTICULLI = BLOCKING STONES
- E WESTERN CORRIDOR AND ENTRANCE ABOUT 40 M HIGH IN THE WEST SIDE
- F SATELLITE PYRAMID





We can only speculate as to the reasons why in the fifteenth year of his reign Sneferu should have abandoned his palace and the nearly complete pyramid at Meidum, and begun again nearly fifty kilometers north, constructing a new residence with a royal palace and a pyramid near Dahshur. Possibly it proved difficult to control the colonization of the Nile Delta and the trade routes from far away in Middle Egypt. The new site near Dahshur, on the other hand, was very convenient. A natural basin for the harbor ensured the development of the region. To the east, a trade route led to Sinai, and a wadi led to the western oases and the Fayum. Conveniently sited limestone quarries for building material lay on both sides of the Nile. There, a new opportunity was found for the now idle workers and specialists, in a bold undertaking that was to build a towering pyramid without steps, and with an inclination almost as steep as that of the step pyramids, which should have reached the extraordinary height of about 150 meters.

It needs emphasizing that the development from a step pyramid to the pure geometrical form of the pyramid proper was certainly not inevitable. None of the other ancient cultures that built step pyramids made this advance. The progression from assembling step-shaped masses to form an artificial hill to the abstract geometrical form of the pyramid is a remarkable intellectual achievement that was the result of an extraordinary and unique venture in the time of Sneferu. Bold improvements were also made in the tomb chambers in the new pyramid, which, because of its present form is known as the 'Bent Pyramid.' These were to have corbeled vaults, conceived at Meidum but perfected here, up to a height of 15 meters. The ensuing alterations necessitated by subsidence and damage during construction resulted in a chamber system in this

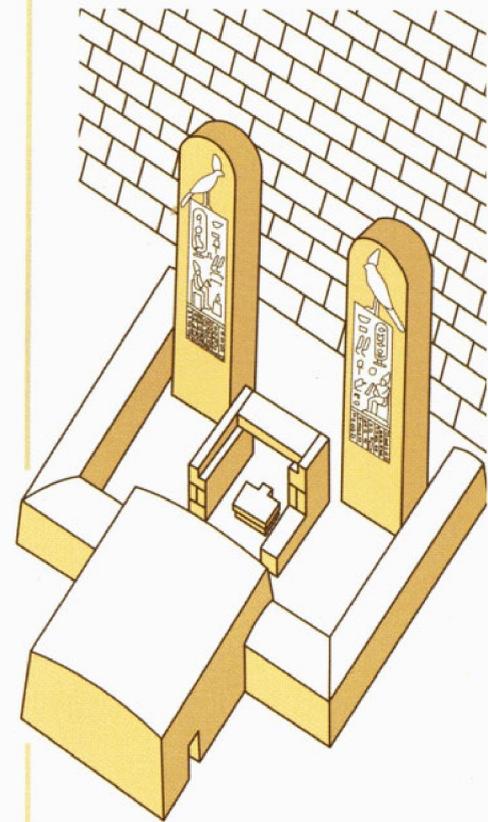
pyramid that is extraordinarily complicated and difficult to follow.

According to earlier religious descriptions of the royal hereafter, this mystical place was situated deep in the underworld. For this reason, the lowest of the three tomb chambers had to lie deep in the rock, as in the tomb of Djoser. The upward slope of the tomb corridor is also determined by the requirement for an undeviating passage up to the circumpolar stars. It therefore needed to begin deep in the rock below ground in order to lead to the desired exit, a short distance up the north face of the pyramid. The middle chamber is connected with the king's ascent to heaven, which is in turn represented by the tomb chamber above, although the ascent also actually lies in the direction followed by the tomb corridor.

In order to facilitate the excavation of a shaft of about 7 x 7 m and 22.5 m deep, an underground layer constituted of mixed layers of marl and slate as at Saqqara was chosen; this was not, however, adequate to support the weight of the stone masses. As the pyramid grew upwards, sizeable cracks appeared in the three chambers and in the corridor; initially it was thought sufficient to repair these by fillings. However, soon it became evident that both the lower chambers and the entrance corridor were seriously damaged and could not be saved by any further reparations. Eventually all attempts to save the project—even giving up the lower chamber and reducing the pyramid's angle of slope—proved to be in vain. After fifteen years of construction work, the boldest of all pyramid projects had to be abandoned. Sneferu began work on building a third pyramid. At the same time, the step pyramid at Meidum was modernized and altered into a true pyramid; this was surely in order to secure a burial place for the king if he should die before having completed the new pyramid.

116-117  
The Bent Pyramid at Dahshur with its cult constructions. To the east, a small offering temple with two stelae, and to the south, the cult pyramid with the remains of two stelae of Sneferu.

117 top  
In the pyramid field of Dahshur, the Bent Pyramid is in the center with its enclosure wall and the small south or cult pyramid. About two kilometers farther to the north the Northern or 'Red Pyramid' is visible.



117 center right  
The small offering chapel with two royal stelae and an offering table under a massive limestone shelter is surrounded by brick walls.

117 bottom  
This isometric reconstruction shows the offering chapel with a vestibule, the offering plate in form of the hieroglyph Hetep, which means 'offering,' and two 9 meter-high rounded stelae with the name of Sneferu.

#### CROSS SECTION OF THE BENT PYRAMID

- A NORTHERN ENTRANCE AND CORRIDOR
- B LOWER CHAMBER WITH STAIRCASE
- C ANTECHAMBER WITH 'CHIMNEY'
- D UPPER BURIAL CHAMBER
- AA, BB INNER CORE

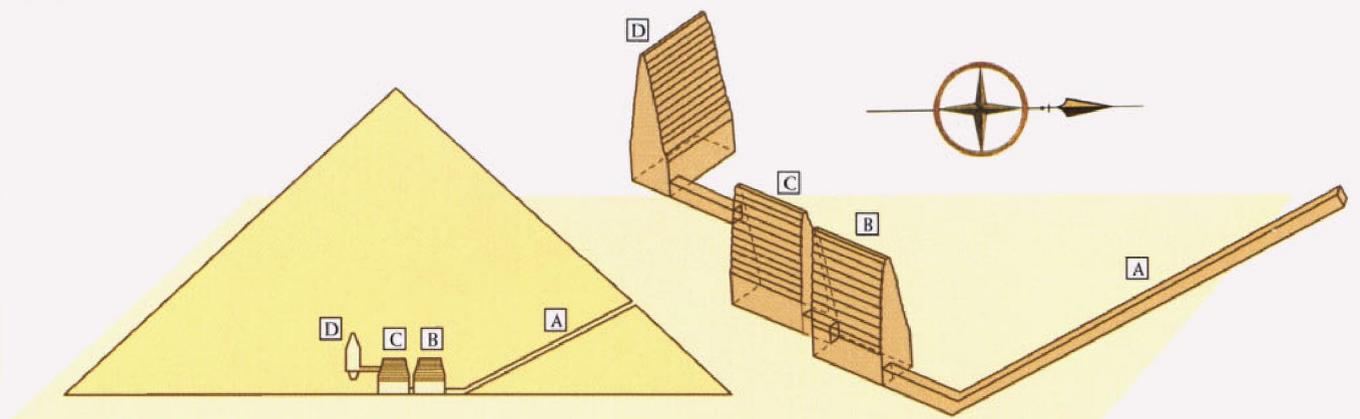


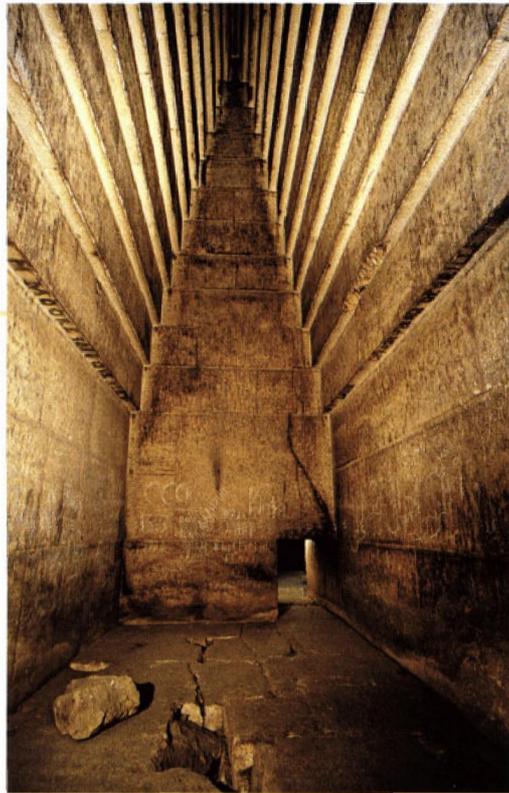
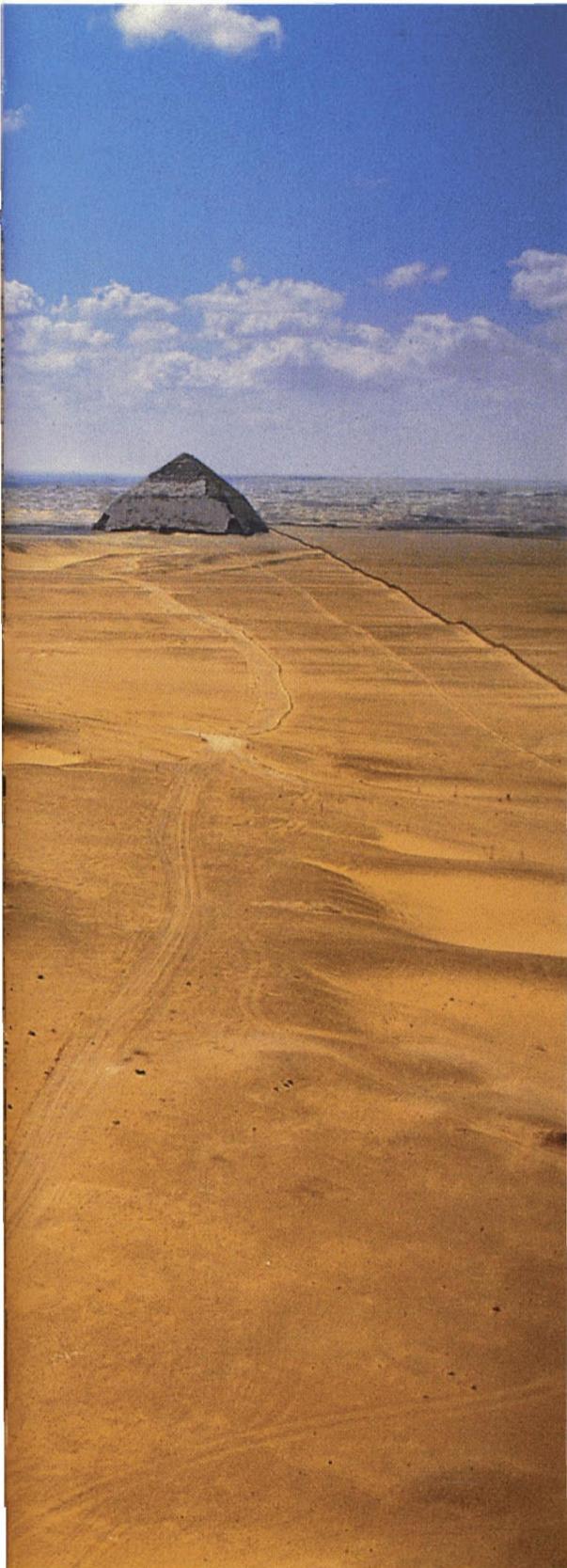
# Red Pyramid



CROSS SECTION OF THE  
NORTHERN PYRAMID OF SNEFERU

- A CORRIDOR
- B, C FIRST AND SECOND ANTECHAMBERS
- D BURIAL CHAMBER





For the third of Sneferu's great pyramids, the 'Red Pyramid' at north Dahshur, the underground layers were properly tested; the base of the pyramid was

increased to 220 meters along all sides, and it was decided to lower the angle of inclination to 45°. The method of constructing in layers which was in use for the step pyramids was now abandoned. It proved to bring no saving of labor in building steeper pyramids, and it was therefore replaced by laying horizontal courses of stone.

With a height of 105 meters, the 'Red Pyramid' is the third largest and highest after the pyramids of Khufu and Khafre. Everything about this building contributes to a harmonious and majestic effect. The system of chambers is harmonious and congruent because they are laid out one behind the other. They are set only just below ground, and reached by an exit in the north side of the pyramid nearly 30 meters above ground, something that must have been greatly inconvenient for the introduction of the royal mummy during the funeral ceremony and the final blocking off of the corridor.

The foundations of a hastily completed mortuary temple in front of the east side of the pyramid, and the sad remains of a mummified corpse that were found in the burial chamber, suggest that Sneferu was eventually buried in this pyramid. The princes and princesses of the later years of Sneferu's reign at Dahshur are buried in

great stone *mastabas* in the eastern area in front of the two pyramids at Dahshur. These are massive rectangles of stone with a smooth casing. Only the east side originally had

two niches, the southern one bore the names of the deceased and perhaps a false door panel. In a small court to the front were possibly displayed two stelae with names and titles of the princes. Even the principal queen of this period, probably the famous queen Hetepheres, had only a modest undecorated *mastaba*. She was, however, not buried in Dahshur but later in Giza in the cemetery of her son Khufu.

Nearly fifty years of continuous construction work under Sneferu brought about remarkable advances in building techniques: in masonry, tunneling, the transport of stone, and in structural engineering. The bitter experience of a catastrophic collapse due to an unstable underground led to extreme caution in the choice of sites. The organization and logistics of a building site profited from the experience of twice relocating the pyramid-building towns.

The need for building materials, special types of stone, wood, and copper for tools and equipment stimulated expeditions and trade with countries to the north and the east. This brought a greater awareness of the world around the Nile Valley.

The officials also gained experience through their varied tasks and became an efficient instrument of central government.

118-119

*The Northern or 'Red Pyramid' of Sneferu at Dahshur can be observed in this spectacular aerial view from north. The entrance, nearly 30 meters high, is on the north side. It is the red color of the core stones which gave the name 'red' to the pyramid. The shining white-limestone casing of the pyramid was quarried off in the Middle Ages.*

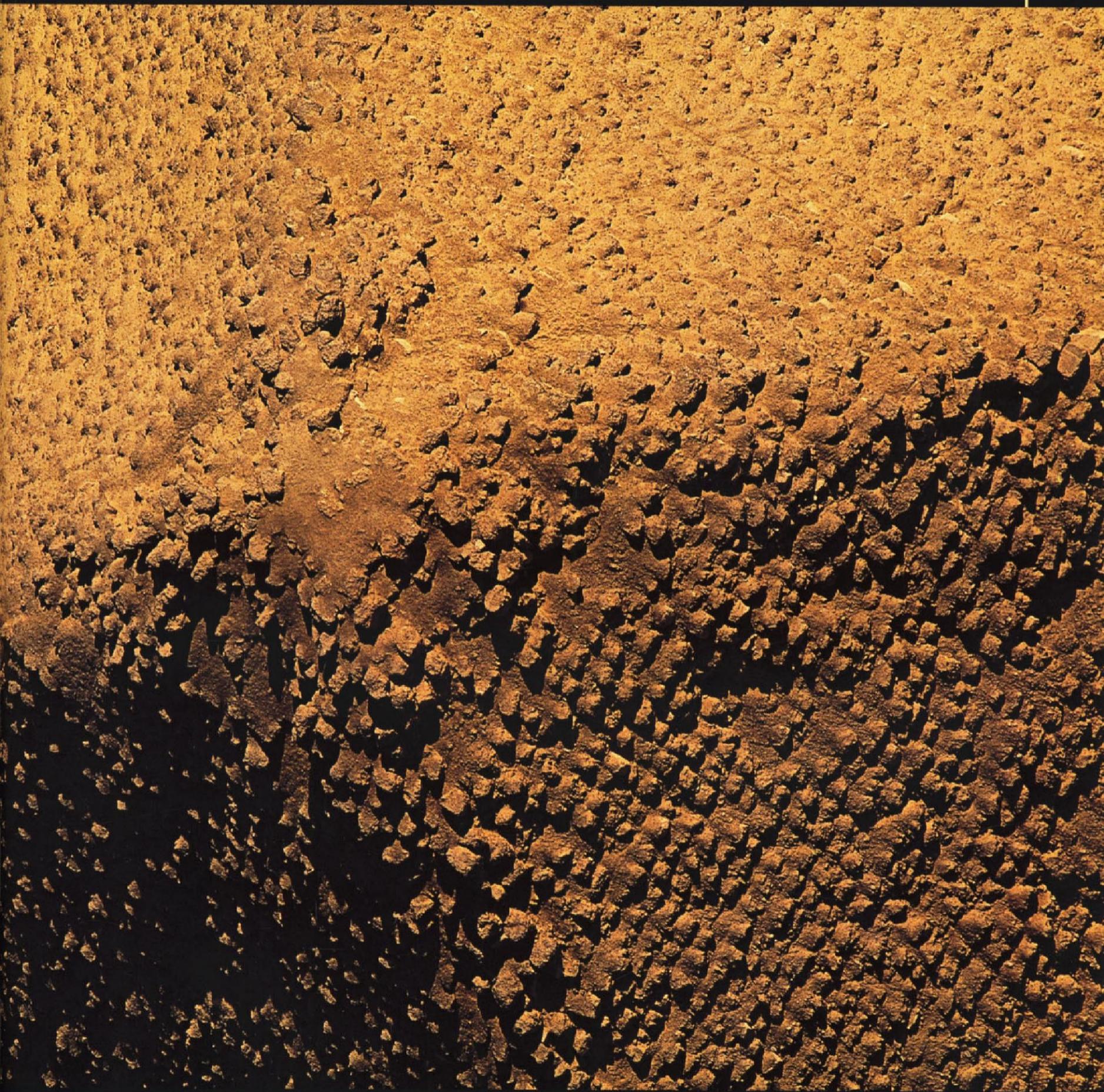
119 top

*The first antechamber of the Northern Pyramid of Sneferu presents, as is easily seen here, a perfectly corbelled roof 12.30 meters high.*

120 and 121

*The Northern Pyramid of Sneferu was originally 105 meters high. Today, the top is flattened by the work of stone robbers of the Middle Ages and the pyramid is now only about 92 meters high.*







122-123

*The Giza Plateau seen from northwest with the Great Pyramid of Khufu, the large Western Cemetery, Khafre's pyramid, and the pyramid of Menkaure with two of its satellite pyramids.*

122 bottom

*In this view of the Giza Plateau, the northeast corner of Khafre's pyramid and Khufu's pyramid can be observed.*

123 top

*The ivory statue of Khufu wearing the crown of Lower Egypt was found at Abydos. This small figure, only 7.6 cm tall, is the only complete effigy of the great king who built the largest monument and 'Wonder of the World.'*



Sneferu's son and successor thus benefited from the best examples he could have in order to plan an even more ambitious pyramid for his own tomb. In order to avoid another ruined building, he settled on a solid rock foundation, which he found in a commanding position on the ridge above what is now Giza.

Since the time of the step pyramids, the alignment of the pyramids to the cardinal points was a substantial concern. Khufu's pyramid is oriented almost exactly to true north, with a minor deviation of five degrees only. The pyramids of Khafre and Menkaure are seemingly aligned by a diagonal which touches, in each case, the corners of Khufu, Khafre, and Menkaure's pyramids. Most other alignments between the three pyramids and temples are only inspired by the fantasy of pyramid enthusiasts. This is undoubtedly the case concerning the theories of a celestial origin of the layout of the Giza pyramids which would reproduce the constellation of the stars of the Orion belt which in the Pyramid Texts is identified with Osiris on earth.

The technical perfection of Khufu's pyramid demands maximum admiration: the accurate orientation toward the north, the leveling of the corners, which do not differ more than 2.1 cm, the minute difference in length of the sides of 4.4 cm only, and the variation of the angles of only  $2'48''$ ; all this seems incredible, considering the simple tools available at the time. In contrast to the low  $45^\circ$  angle

of slope of Sneferu's last pyramid, the builders dared to construct Khufu's pyramid at  $51^\circ50'40''$ . With a side of 440 cubits, 230.37 m, it originally attained a height of 280

cubits, 146.59 m, close to the ideal height of 300 cubits. Today the pyramid is still 138.75 m high.

The perfection of the proportions and construction of the superstructure exactly matches the planning of the system of corridors and chambers inside.

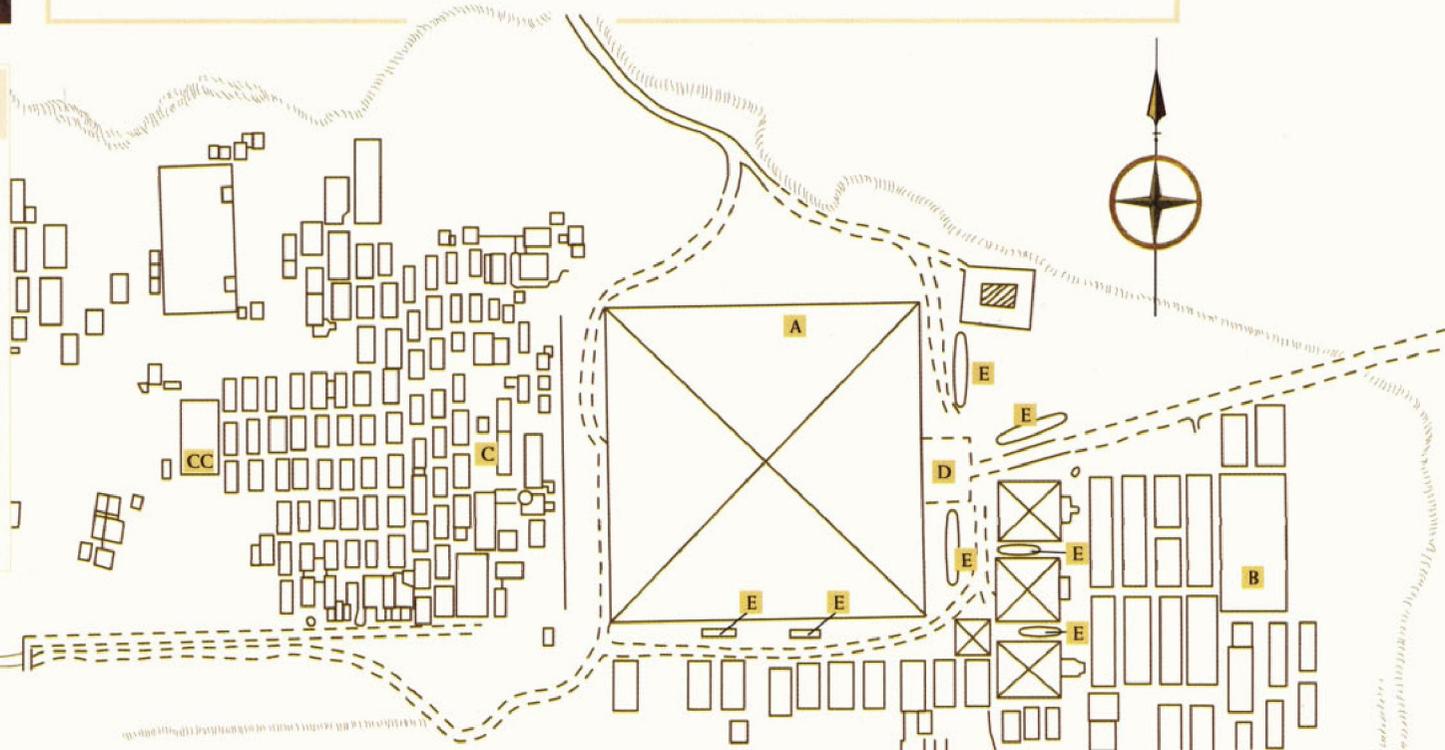
To the present day, scholars have tried in a broadly positive spirit to attribute the pyramid's three chambers to three successive changes in the design, but it does not do justice to the architects who designed and executed this unique building so perfectly to suggest that in the essential element of the pyramid's construction, that is the system of tomb chambers, they had proceeded without concept or design. Against this view is a conclusive argument in that the exterior construction and the layout of the chamber system work in perfect accord, and that neither inside nor out is there any suggestion of a change of plan. Recent research has shown that since the Thinite era, royal tombs have had not just a single burial chamber but a series of three rooms or spaces, whose function has so far been only partially understood.

Recently, this realization has also provided evidence against pyramid mysticism, an epidemic of which is breaking out again, which suggests that hidden secrets, or even further treasure chambers, the 'chambers of knowledge,' were built into the chamber system of the pyramid of Khufu.

*Khufu*

MAP OF KHUFU'S PRECINCT  
'HORIZON OF KHUFU'

- A GREAT PYRAMID
- B EASTERN CEMETERY WITH THE QUEENS' PYRAMIDS AND THE MASTABA TOMBS OF KHUFU'S SONS AND DAUGHTERS
- C WESTERN CEMETERY
- CC MASTABA OF HEMIUNU, MASTER BUILDER OF THE PYRAMID
- D MORTUARY TEMPLE AND CAUSEWAY
- E BOAT PITS



The upper granite burial chamber stands more or less isolated in the interior of the pyramid. Five relief chambers with granite beams weighing up to forty tons serve to relieve the pressure. The uppermost relieving chamber has a gabled roof of magnificent limestone blocks that rest on the stones of the core construction. In the upper relieving chambers, graffiti written by the ancient construction workers can be found that name Khufu as builder of the pyramid. This is the only authentic evidence of Khufu found in his pyramid. From the middle of the south and north walls of the burial chamber—and in the same way from the middle chamber—narrow model corridors with a diameter of 20 x 20 cm lead toward the southern and northern skies. They

provide a direct route up to heaven for the deceased king's soul. Previously these had been seen as ventilation shafts or telescopes for observing the skies; but it is certain that these corridors were originally sealed off and could only have served for the ascent to heaven of the deceased king's soul. During recent examinations of the southern shaft in the middle chamber, a small limestone block obstructing the end of the shaft was discovered that shows two copper fittings on its well-polished surface. These fittings were most probably hieroglyphic signs, symbols of magic power which enable the soul of the king to pass through the blockage. In the newest investigations, an opening was drilled through this small limestone block and

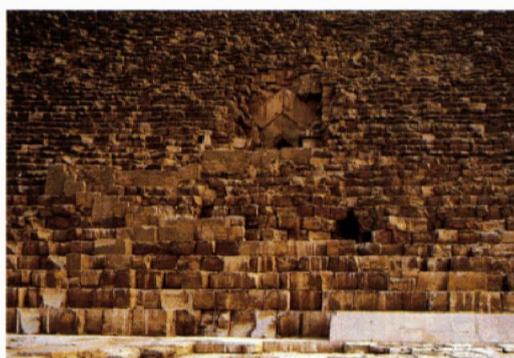
an endoscopic camera inserted. The first pictures show a narrow empty space behind the first blocking and another less smoothed limestone that shows faint quarry marks on its surface, which means that this stone is from the core of the pyramid. This would definitely confirm the theory developed after our first examination in 1992 that these shafts are model corridors sealed with model blocking stones. The first well-polished stone might well be a model portcullis stone. The examination of the model corridor leading out from the north side of the chamber presented more or less the same results. The corridor ends in front of a white limestone block. On its smoothed surface, the traces of two copper fittings of the same kind as those on the

124 top

*The original entrance in the north side of the pyramid of Khufu. Below it is the entrance cut by the ancient tomb robbers.*

124 bottom left

*The Great Gallery of the pyramid of Khufu is 47 meters long and 8.50 meters high with a perfectly corbelled roof.*



124 bottom center

*The antechamber of Khufu's pyramid, the so-called Queen's Chamber, has a statue niche in the east wall.*

124 bottom right

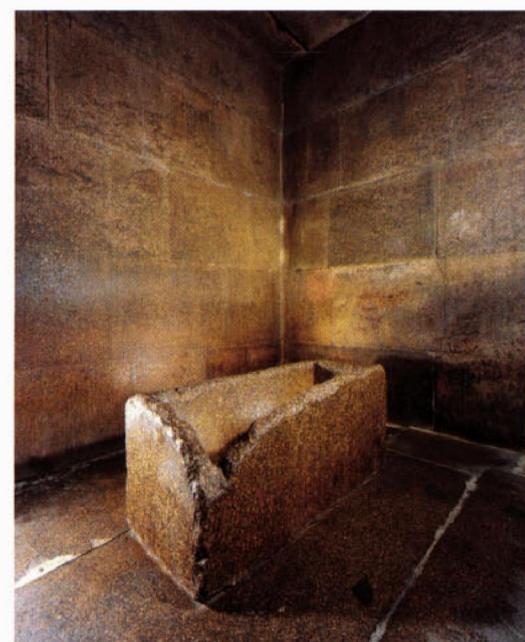
*The king's burial chamber, with the red granite sarcophagus, is completely built of granite, the roof consists of nine enormous granite beams, weighing each about 40 tons.*



125 left  
*Giza, Khufu's pyramid: cross section through the burial apartment with the King's Chamber (J), a corridor chamber (I) with the room for the*



*portcullis blocking stones, and five stress-relieving chambers (K). A roughly hewn corridor connects the top of the Great Gallery with the first of the relieving chamber.*



126-127  
*The pyramid of Khufu with the Great Sphinx.*

southern blocking or porticulis stone are visible. These are surely not handles, but magic hieroglyphic signs for the soul of the king. On the surface faint traces of quarry marks are detectable, the sign of the work-gang *wadj* ('the green one'), and probably the hieroglyph *prjj*, 'to come out' (of the tomb). One can be absolutely sure that these corridors served only the ascent of the soul of the dead king to the northern and southern sky and that there were definitely no hidden chambers behind these blocks.

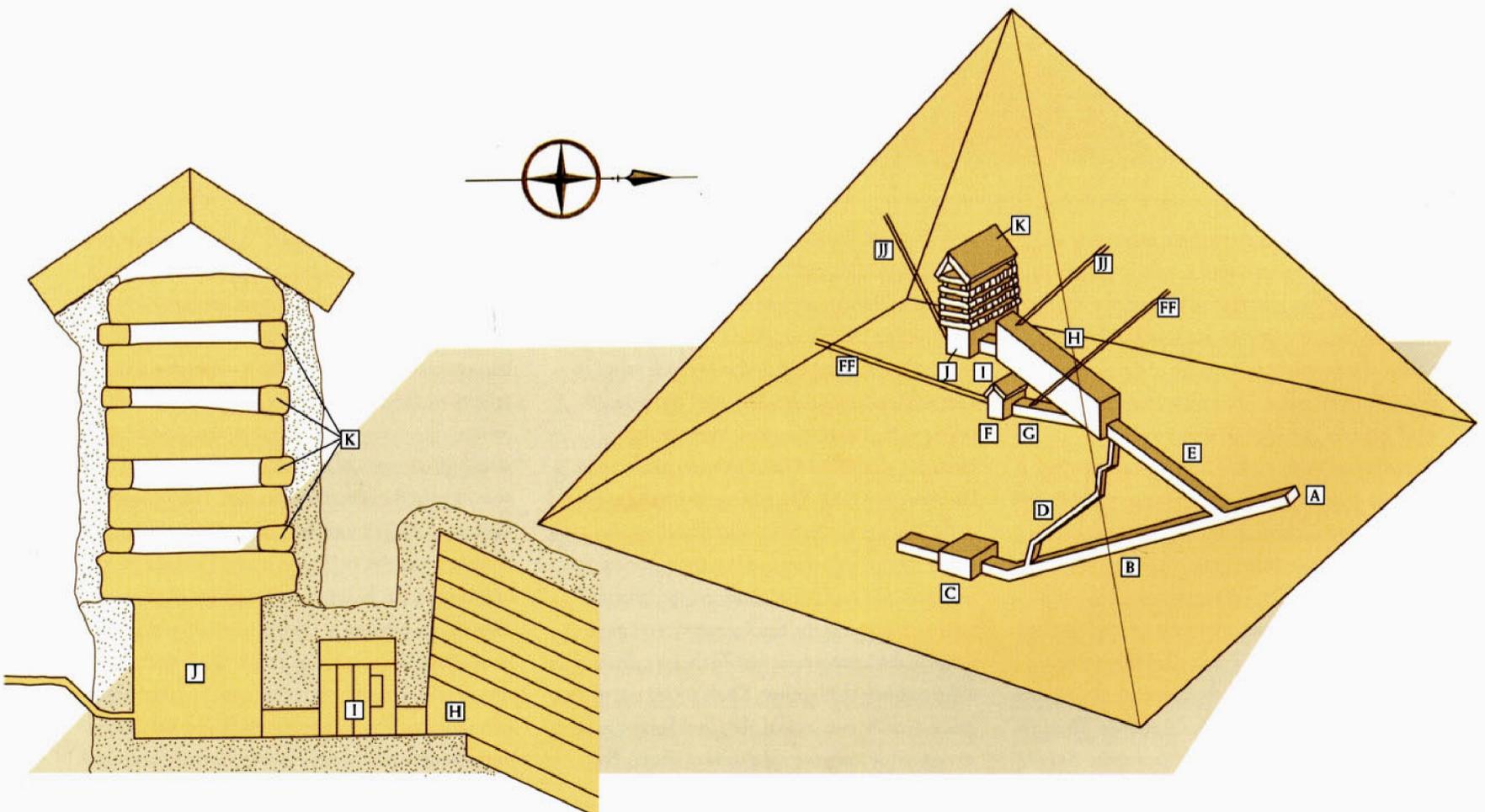
It is characteristic of the conservative beliefs and traditions of the ancient Egyptians that alongside the predominant theology centered on worship of the sun, older ideas about an underworld afterlife in the depths of the earth were tolerated. This 'chthonic' or

netherworld aspect is manifested in the rock chamber cut thirty meters deep into the solid ground underneath. The corridor on the east side of the rock chamber, which might have led to a southern tomb underneath the pyramid, was never completed, perhaps the workmen did not have enough air to breathe at this extreme depth. Khufu later built a small southern pyramid on the southeast corner of his pyramid enclosure, only discovered and excavated a few years ago. The middle chamber has a statue niche on the east side for a *ka* statue of the king and, like the granite chamber, has model corridors leading to heaven. This chamber cannot ever have served as an actual burial chamber since it was not provided with a stone sarcophagus or a

sealing by porticullises (stone plugs released from above in the entrance corridors). Through the inclusion of a closed cult area in the body of the pyramid, the precinct outside was reduced to the mortuary temple of which only the basalt paving remains today. From the pattern of markings in the paving it is evident that the temple once consisted of a broad court surrounded by columns and a chapel for mortuary offerings. Also added later, and only after the south tomb in the rock beneath the pyramid had been abandoned, was a small cult pyramid in the southeast corner of the complex. Fragments of statues made of limestone and other materials are evidence of the rich decoration of the mortuary temple.

AXONOMETRIC VIEW OF THE PYRAMID OF KHUFU

- |    |                           |    |                                    |
|----|---------------------------|----|------------------------------------|
| A  | ENTRANCE                  | G  | HORIZONTAL CORRIDOR                |
| B  | DESCENDING CORRIDOR       | H  | GREAT GALLERY                      |
| C  | SUBTERRANEAN ROCK CHAMBER | I  | CORRIDOR CHAMBER WITH PORTCULLISES |
| D  | SERVICE CORRIDOR          | J  | KING'S CHAMBER                     |
| E  | ASCENDING CORRIDOR        | JJ | AIR SHAFTS                         |
| F  | ANTECHAMBER               | K  | STRESS RELIEVING CHAMBERS          |
| FF | AIR SHAFTS                |    |                                    |



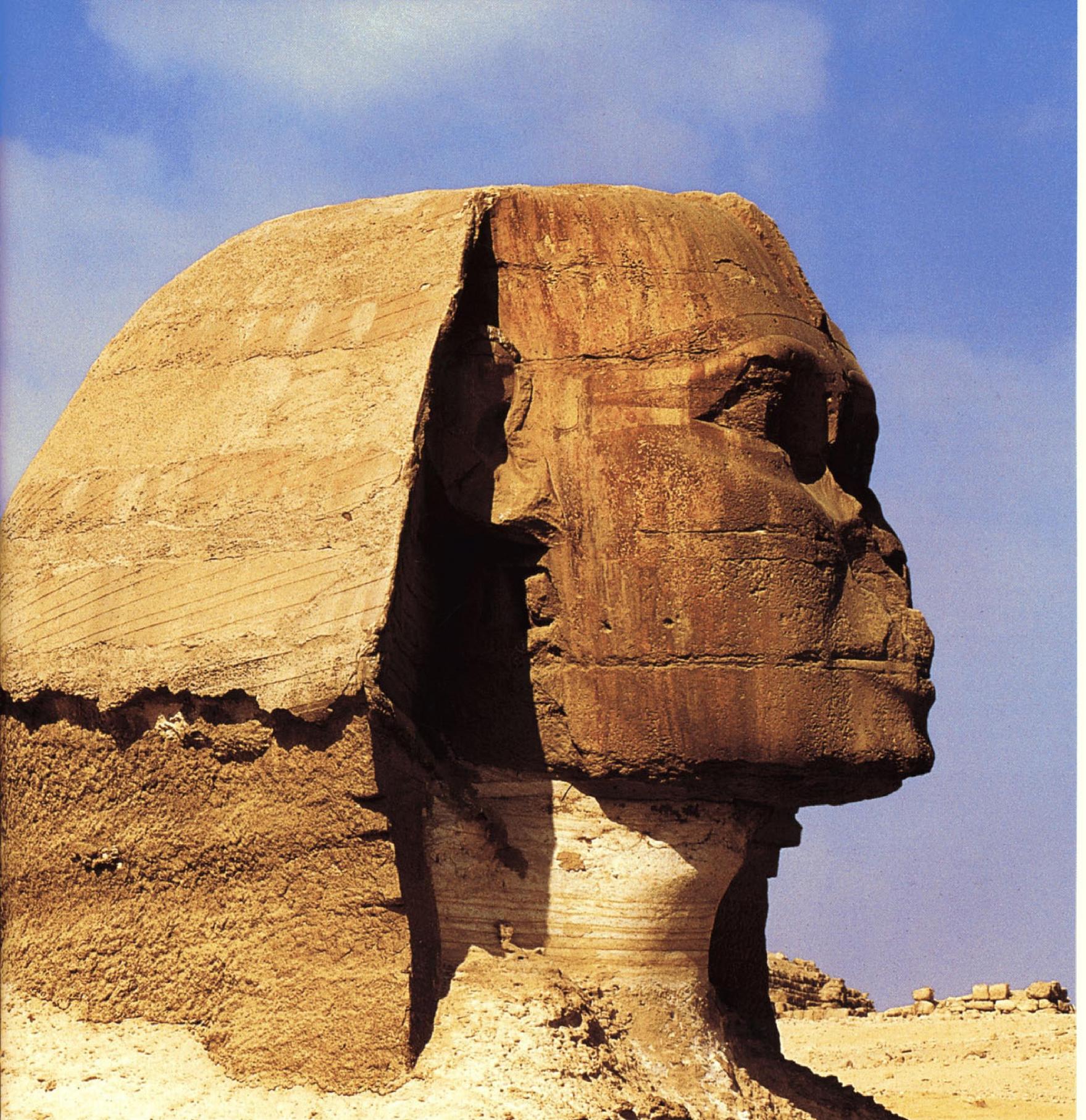


Khufu

The necropolis was planned just as precisely and carefully as the pyramid complex itself. Five shafts in the rock to the east and south of the pyramid once contained funerary barques—not solar barques—for Khufu. The two shafts to the south of the pyramid were originally found sealed. The eastern shaft contained a royal ship complete with all its oars and cords, dismantled into over 1,200 pieces. Now reassembled, it measures 43.40 m long. The other barque burial has not yet been opened, although recent video images taken through a drill hole showed that the ship it contains has been badly damaged by the environmental impact of the underground rock and the construction of the Boat Museum above the eastern shaft. Undoubtedly both ships provided transport for the king while he was alive and were to be at his disposal in the afterlife. These are not the only ships found in a royal necropolis. As early

as the First and Second Dynasties, kings were provided with ships for the afterlife. To the east of the Great Pyramid lie three small pyramids. One belongs to the king's mother Hetepheres, main consort of Sneferu, who outlived her 'husband' and died in her son's palace at Giza and was buried there. The other two pyramids belong to the two chief queens, Meretites and Henutsen, mothers of Khufu's sons and successors, Djedefre and Khafre. The genuine sons and daughters of the king were given huge, solid double *mastabas* to the east of the queens' pyramids. High court officials, the architects, and even prince Hemiunu, the influential building manager of the king's pyramid, were given tombs in the western cemetery. To the east, down in the valley and near to his palace, Khufu carved one of the greatest statues ever created, the Great Sphinx, now recognized as a genuine *chef-d'oeuvre* of Khufu. The

traditional assignment of the Great Sphinx to Khafre has no archaeological, epigraphic, or stylistic basis, on the contrary all pieces of evidence point firmly to Khufu. The sphinx is hewn out of a large rock formation inside the quarries of Khufu. The stylistic and iconographic features are those of Khufu. The overall form of the Sphinx's face is broad, almost square, with a broad chin, whereas the features of Khafre are long, noticeably narrower and the chin almost pointed. The Sphinx has the earlier, old fashioned, fully-pleated type of *nemes* headcloth, like that of Djoser's statue. The same *nemes*, fully pleated, can be seen on the fragment of a statue of Khufu in the Museum of Fine Arts, Boston, which comes from Khufu's pyramid temple. It is remarkable that the *nemes* has no band in the form of a raised hem over the brow. This is again the older type, like Djoser's. From Djedefre and Khafre onward, the raised hem band



over the brows becomes the norm. Under Khafre, only the lappets of the *nemes* headcloth are pleated but never the *nemes* head or the *nemes* wings. The side wings of the *nemes* headcloth of the Sphinx are deeply hollowed; but with Khafre hardly at all. With Khafre the headcloth corners curl up, but they do not do so with the Sphinx. The Sphinx has a uraeus cobra placed on the lower edge of the headcloth. In contrast to those of Khafre and Menkaure it shows high relief with naturalistic detailing of the serpent's neck and the scales of its hood. The eyebrows of the Sphinx bulge powerfully forward, and they are pitched high and slope down toward the temples. The eyes are deep-set, but strongly modeled. They are large and wide open, to which perhaps the monumentality of the head owes something. These wide-open eyes are absolutely typical of sculptured reserve heads from the time of Khufu. The ears are

fundamentally different from those of the statue of Khafre. The ears of the Sphinx are very broad and folded forward, those of Khafre elongated and situated closer to the temples. A decisive criterion is the absence of a beard. The sphinx has no indications of hair on its chin. There is also no trace of a break under the chin. Consequently, there would not have been a beard on the Sphinx in the Old Kingdom. The fragments of a plaited god's beard which are now in the British Museum in London and in the Cairo Museum are certainly of New Kingdom origin, and were added to the Sphinx when it was identified with and adored as god Harmachis. Certainly, the rounded god's beard is an innovation of the New Kingdom and did not exist in the Old Kingdom or the Middle Kingdom. When this beard was added, a small platform was carved out of the Sphinx's chest on which the beard and a royal statue

rested. The beard is a royal attribute. Some kings wear a beard, others do not. In the Old Kingdom it is an absolute and strict rule; if a king wears the beard, it appears in all representations, sculpture and relief, in Upper Egypt and in Lower Egypt—there is no exception. In the Fourth Dynasty one can observe that Sneferu never has a beard, nor does Khufu, neither on his small ivory statue nor on the Brooklyn Museum or the Munich Museum heads. From Djedefre on, however, all kings, including Khafre and Menkaure wear the ceremonial beard in relief and in sculpture. Userkaf, the first king of the Fifth Dynasty, however, abandons the beard again, but has a moustache. In the recent excavations of a Japanese mission, a small sphinx was discovered. It bears the name of Khufu and Pepy I. This proves that in the Sixth Dynasty, the awareness was still alive that it was Khufu who created the Great Sphinx.

King Khufu himself influenced the form of the tomb chapels and their decoration, which is limited only to scenes of the most important offerings. In this way, state and society were included in a unique and monumental way in the strict hierarchy of the royal necropolis and in the imaginary world of the king's afterlife, in order that they might serve him forever. They also became recipients of royal donations and offerings from the central royal mortuary temple.

We know as little about the person of Khufu as we do of other kings of the Old Kingdom. The critique of his reign and achievements handed down by Herodotus is a purely Greek reaction to the superb architecture that towers above everything on a human scale, which for a Greek could only signal human hubris. That Khufu was Sneferu's son we know only from the chance find of the tomb equipment of his mother Hetepheres in a shaft burial at Giza. When Queen Hetepheres died, she was initially buried in this shaft tomb, until her pyramid, the northernmost of the queens' pyramids, was completed to the east of the pyramid of Khufu. Khufu must have been one of the younger sons of Sneferu,

probably born at Dahshur, in about the twentieth year of Sneferu's reign, which would mean that Khufu came to the throne when he was about twenty-five to thirty years old. By this time, his older brothers, the princes Nefermaat and Rahotep, who were the architects of the pyramids at Meidum and Dahshur, had already died. Never before or ever again in Egyptian history are the claims of divine kingship so powerfully expressed. That this could be completed in the twenty-three to twenty-six, or more likely thirty, years of his reign, is the result of the remarkable training of the managers, architects, and workers engaged in undertakings that had now continued for half a century. This enabled the participants to accomplish astonishing achievements: the hollowing out of a 100 m shaft into a deep and solid rock bed; the preparation and storage of incredibly heavy stones to provide a constant supply for the teams of workmen; the design of ramps and transport routes that cost a minimum in time and materials and which still did not hinder the continuing process of surveying as the pyramids rose upward. The details of how this was done are still largely unknown.

Recent research into pyramid building by architects, construction engineers, and archaeologists of the German Institute of Archaeology in Cairo examining different models has resulted in proposing a new theory for the transport of the stones by initially using a number of small ramps on all sides of the pyramid. When reaching a height of about 20 to 25 meters—by this time nearly 40 percent of the stone had been laid—the small ramps had to be abandoned, as the inclination of these ramps would have become too steep. Therefore, another method of transport had to be used. A single direct ramp sloping up against one side of the pyramid must be excluded; it would have been about 1,500 m long and would enclose more than seven times the material of the pyramid. Similarly, a double spiral ramp, starting at two or even all four corners of the pyramid and spiraling upward while resting on the unfinished casing of the pyramid, would have posed enormous difficulties during construction as it would have been nearly impossible to constantly control the correct inclination by means of beams. It is therefore proposed that an inclining ramp was built on one side



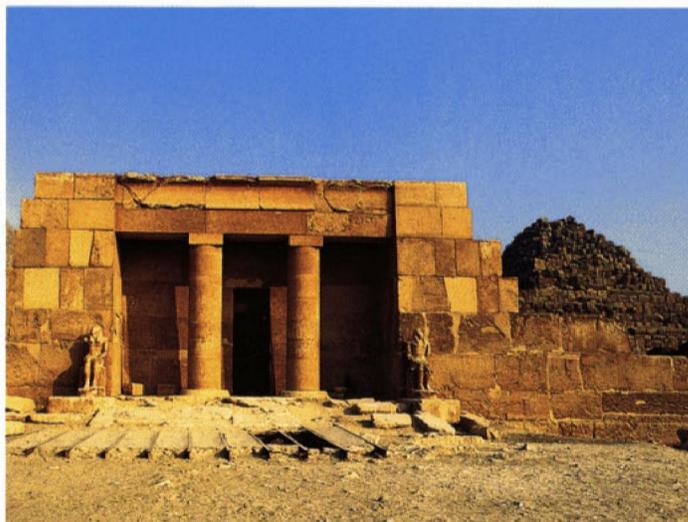


# Khufu

of the pyramid. This inclining ramp could have used first the material of the small ramps. After reaching a height of about 100 meters—then already 97 percent of all building material was put in place—even the inclining ramp would have become too steep to still be useful. For the last 40 meters, stepped ramps and combined mechanics, levers, and even pulleys might have been used. The top stone of the pyramid, the pyramidion, might have been brought up already in an earlier stage via the ramp and constantly raised from level to level during construction until it could be placed on the top. At a much later time, Egyptian priests reported strange stories on pyramid construction to the Greek historian Herodotus. They told him about a workforce of hundreds of thousands of workers, slaves, and bonded laborers working during the inundation season using wooden levers and machines to lift the stones. These fanciful stories are still repeated in our time. It is, however, evident, that the narrow building sites did not leave sufficient room for such large numbers of people. According to quarry marks which were found and registered during the excavations

at the northern pyramid of Sneferu at Dahshur, a highly specialized troop of workmen, a kind of pioneer army, did work all year round, not only during one season. Our calculations suggest a number of workers not exceeding 20–25,000: quarrymen and stonemasons, sappers and carriers, bricklayers and plasterers, suppliers and servers of food, and then many engineers and architects. With the estimated total population of Egypt at around two million people, their numbers would have lain just below one percent of the total population of the country. They were hardly affected by the pyramid-building program. Even the costs and material assets for the building and its teams of workers remain within reason with this percentage. A new class of men and their families, professional members of the court, administrators, and craftsmen, occupied the towns that surrounded the palace and pyramids. They were employed as priests and officers of the mortuary temple. It is these people who shaped the state, and enabled it to achieve ever greater accomplishments. For a better understanding of the Pyramid Age we must distance ourselves once and for all from the positivist

viewpoint of the nineteenth and early twentieth centuries, and remember that the construction of the pyramids, the layout of the tomb chambers, and the form and size of the mortuary temple were not only an architectural achievement and a technical progress, but they are determined by religious ceremonies and the needs of the cult. These are the real motives and nothing else. The burial chamber system inside the pyramid and the form of the mortuary temple outside are interrelated. A sophisticated arrangement of the burial chambers corresponds to simple architecture in the mortuary temple and vice versa. The size of a pyramid is in no way a measure of the power and position of its builder. For example, Djedefre, the son and successor of Khufu, began building his pyramid on a much smaller scale, but in such a commanding position at Abu Rawash (north of Giza) that it dominates the landscape because of its location in just the same way that Khufu's pyramid does at Giza. Although unfinished, the mortuary temple of Djedefre was nevertheless adorned with many statues of the king of the highest quality.



128–129

*The pyramid of Khufu with boat pits, the Solar Boat Museum, the satellite pyramid in the southeast corner, the mortuary temple, and the cemeteries of the queens and high officials.*

129 top

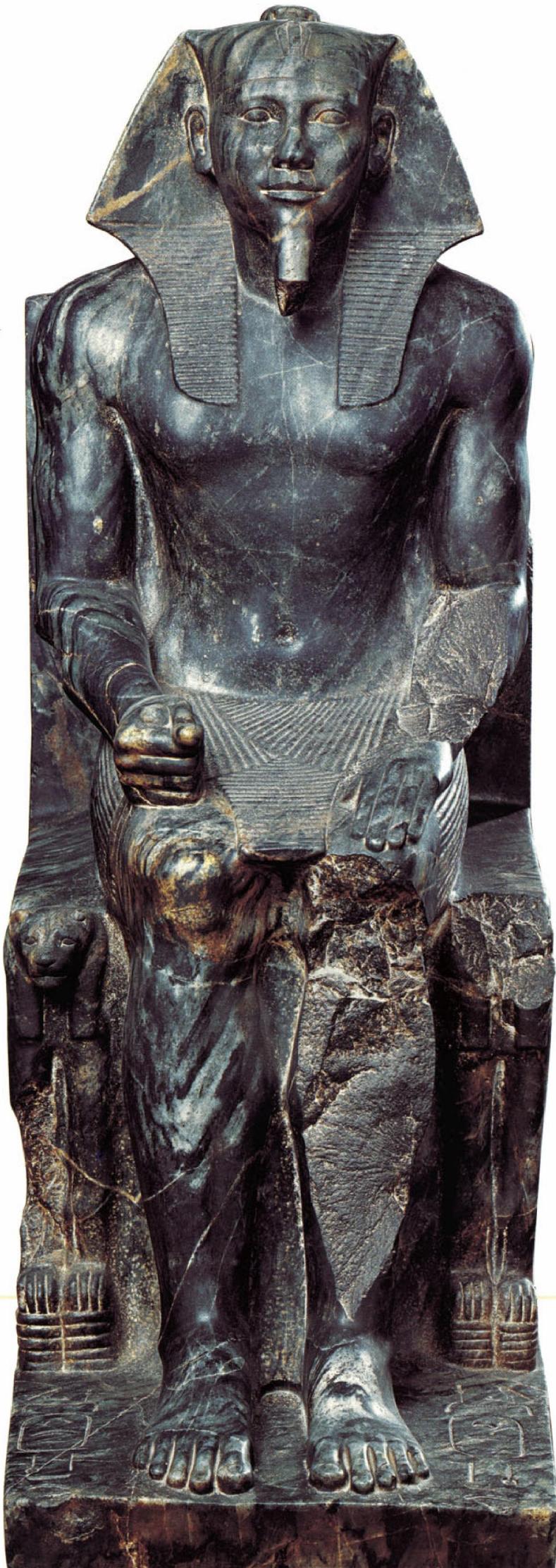
*The portico of the mastaba tomb of the Seshemnefer family, high officials of the Fifth Dynasty and residents of Khufu's pyramid town.*

129 bottom

*The Giza Plateau seen from the east with the Eastern Cemetery and the small pyramids of Khufu's queens and the large double mastabas of Khufu's sons and daughters.*



## Khafre



This can be demonstrated more clearly by example of the complexes of Khafre and Menkaure. Khafre was one of Khufu's younger sons. He came to the throne unexpectedly after the sudden and early death of his brother Djedefre. Khafre's pyramid was intended to equal the height of that of his father, which he achieved in fact, through the choice of a slightly higher site and a steeper angle of slope. He therefore named his pyramid "Khafre is the Greatest." For the first time the base of the pyramid was cased with blocks of beautiful red granite. At the top of the pyramid the original casing is still preserved. On the other hand, the system of chambers is so simple that in the 1960s serious attempts were made by a team of prominent American scientists using the most modern technical equipment to locate additional rooms in the pyramid, without success. The burial chamber is quite large and impressive with its high gabled roof, and a marvelous sarcophagus was discovered only in 1818 by Giovanni Battista Belzoni, but of course it was already ravaged in antiquity. The funeral temple and the valley temple of Khafre are very lavishly constructed using enormous blocks for the core masonry and granite for the casing. They, too, were cased with smoothly polished red granite blocks, as were the huge square pillars of the valley temple. The rooms of the valley temple are surrounded by massive cyclopean stone walls, creating the impression either that the temple was enclosed in a solid cliff, or that it was carved from the heart of the pyramid and set down outside it. More than seventy majestic hard-stone statues that once decorated the funerary and valley temples contribute to this effect by depicting the king as the visible image of the gods, among them the famous seated statue of Khafre protected by the falcon god Horus. Recent excavations in front of the valley temple brought important cult installations to light, connected with the cult of Sokaris. This was certainly part of Rosetau, perhaps the first stage of this famous cult location which is reported from the Fourth Dynasty to the Roman Period. To the south of the main pyramid, the outline and some casing blocks of the south pyramid are still in place. In a separate shaft slightly to the west of this pyramid, a wooden box was hidden that contained an enigmatic scaffolding, probably a carrying shrine for the *ka* statue buried in the south pyramid.

130

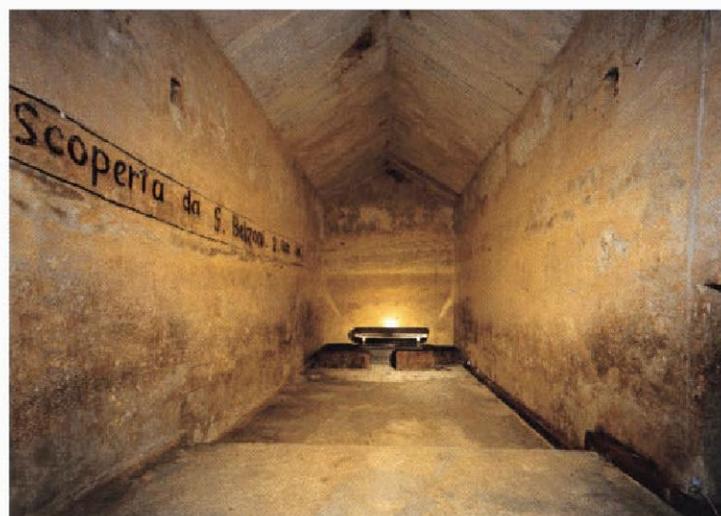
*This diorite statue of Khafre, 168 cm high, with the falcon god Horus protecting the king, was found in the valley temple. It is now in the Egyptian Museum, Cairo.*

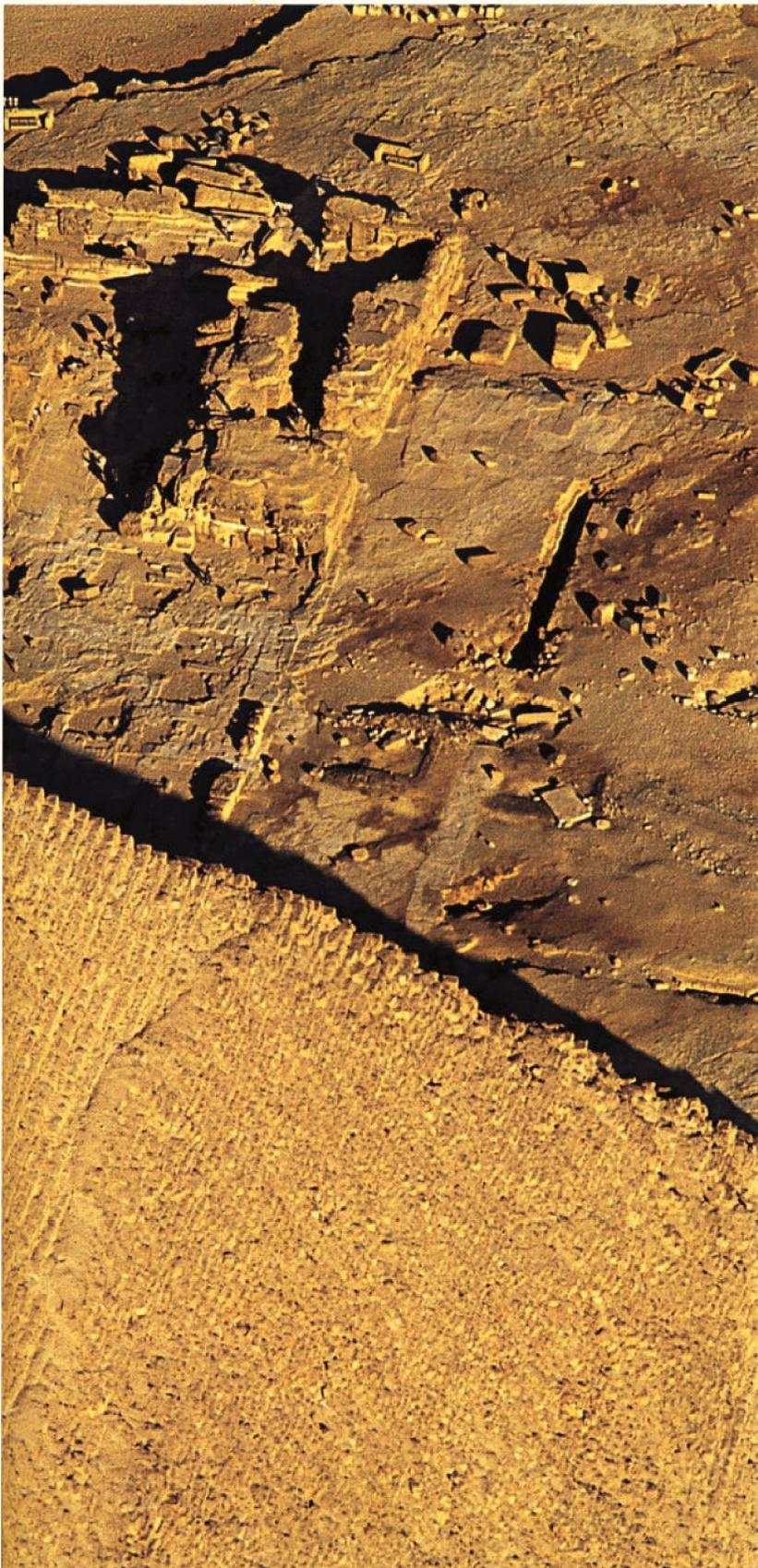
131

*Aerial view of the complex of surrounding the pyramid of Khafre.*



 *Khafre*



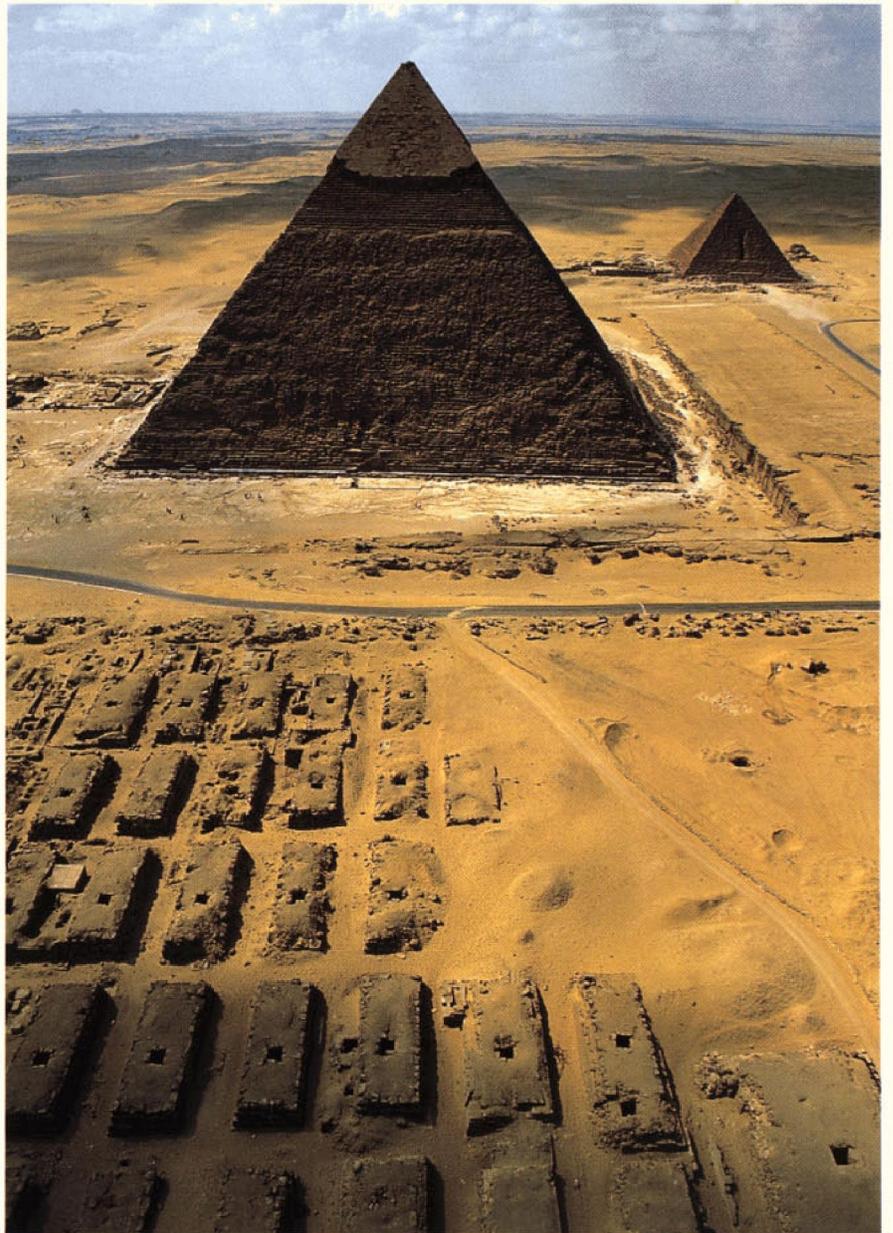


132-133  
The top of the pyramid of Khafre presents well-preserved casing stones. To the right are the remains of Khafre's mortuary temple.

132 bottom left  
The valley temple of Khafre was completely built in shining red granite.

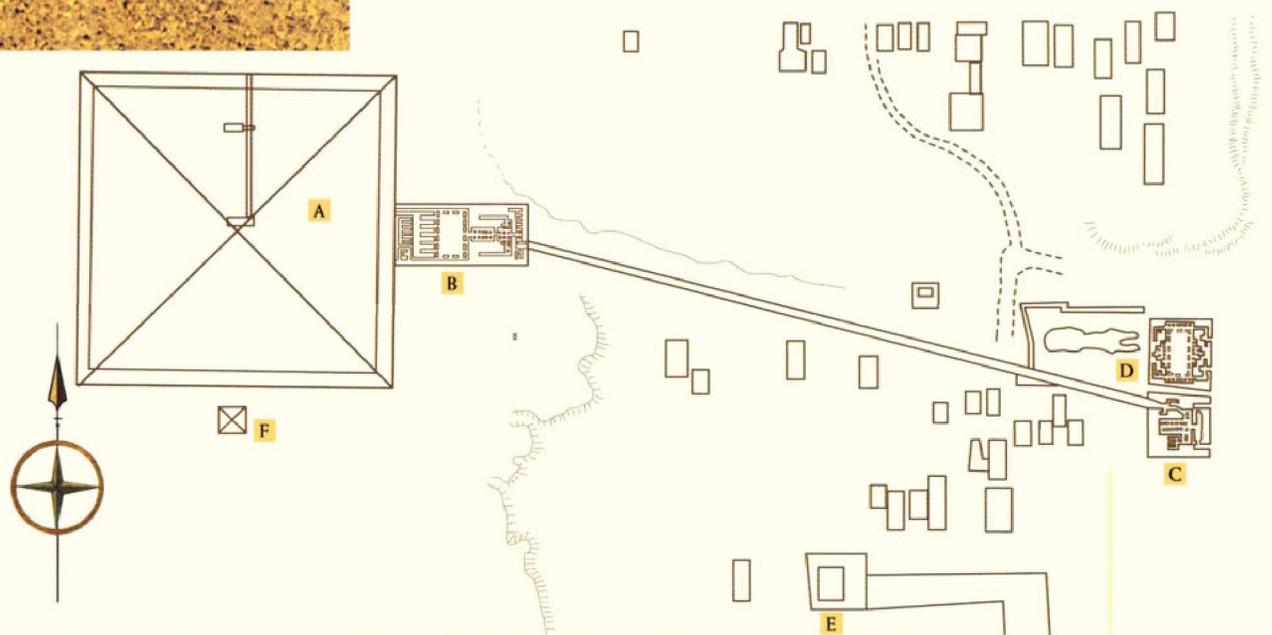
132 bottom right  
The burial chamber of the pyramid of Khafre presents a magnificent black granite sarcophagus, which is embedded in the floor of the chamber.

133  
This view from north shows the Western Cemetery looking toward the pyramids of Khafre and Menkaure.



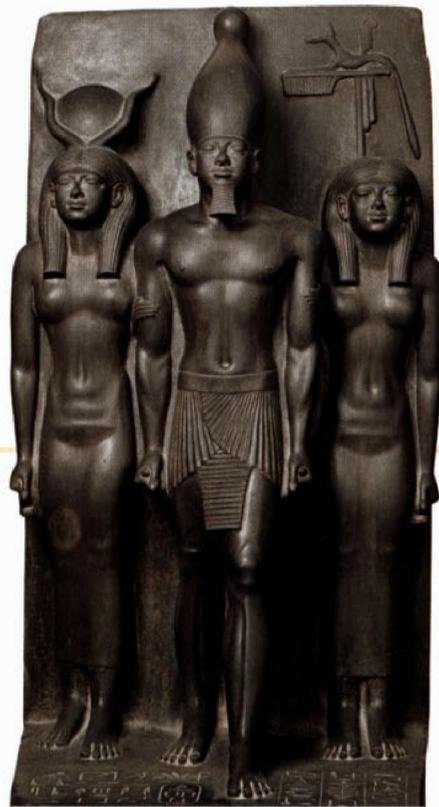
MAP OF KHAFRE'S PYRAMID PRECINCT

- A PYRAMID
- B MORTUARY TEMPLE
- C VALLEY TEMPLE
- D SPHINX DITCH
- E TOMB OF QUEEN KHENTKAWES
- F SATELLITE PYRAMID





# Menkaure



The third pyramid at Giza, the pyramid of Menkaure, is remarkably small. It had, however, a casing of sixteen courses of wonderful red Aswan granite. Menkaure had a long and peaceful reign of twenty-eight years, therefore there is no reason to assign the reduction of the height and mass of his pyramid to an economic crisis.

The explanation must be sought elsewhere.

We must differentiate our understanding of the pyramids as royal monuments, as a representation of power only, toward an understanding of a religious monument comparable to the cathedrals of the European Middle Ages and the Renaissance.

It is in no way the size only, but the religious significance that determines the form and style. In contrast, the system of the corridors and funerary apartments in the pyramid of Menkaure is characterized by an extraordinary succession of rooms comparable only with those of Khufu's pyramid, except that those of Menkaure lead down into the rock whereas those of Khufu are ascending.

Certainly this different design was not the result of secondary architectural corrections; it may already attest to the new concept of the underworld god Osiris. His funerary temple is, however, more like that of Khufu consisting of a broad, open courtyard with a large and deep offering chapel.

Within the temple itself and in the valley temple, a large number of statuary of different materials—limestone, alabaster, and granite—were discovered. With the three pyramids in Giza, the development of the pyramid complexes reached its apogee. Already the kings of the Eighteenth Dynasty showed a deep respect for the pyramids, the monuments of their ancestors at Giza. Greek travelers from the sixth century onward admired these enormous monuments even if they did not understand their religious meaning.

A Greek poet of the second century BC included the pyramids of Giza within the 'Seven Wonders of the World.' They are now the only ones that have survived.



134

*This triad of Menkaure in green-grey schist, 95.5 cm high, with the goddess Hathor and Bat, the goddess of the 7th Upper-Egyptian nome, belongs to a group of statues, numbering at least eight, which at one time were standing in the valley temple of Menkaure. Now in Egyptian Museum, Cairo.*

135

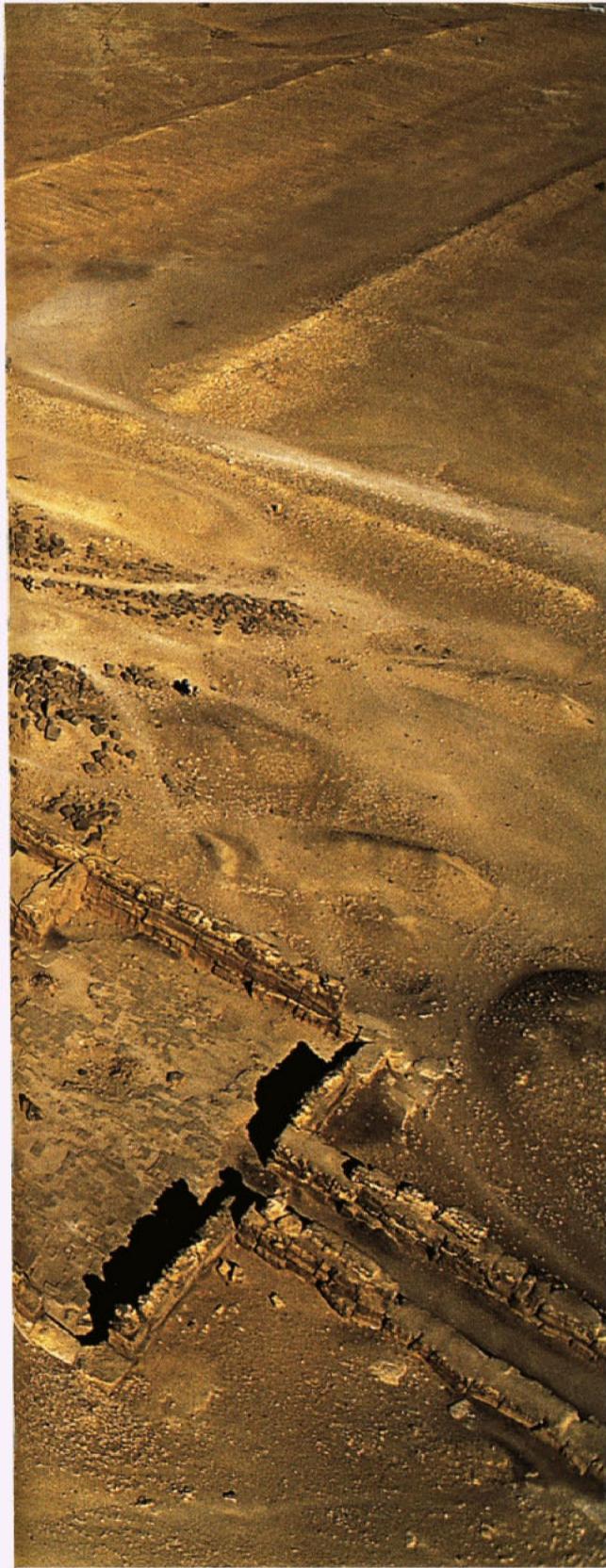
*This head from a seated statue, found in the valley temple of Menkaure, is now conserved in the Egyptian Museum in Cairo. The statue, which is made of alabaster and is 161 cm high, portrays a pharaoh in all his majesty.*







# Menkaure



136-137

This aerial photograph clearly shows the pyramid of Menkaure with the remains of his mortuary temple.

136 bottom left

The corridor chamber of the pyramid of Menkaure still presents fine, panelled decoration.

136 bottom right

Inside the pyramid of Menkaure is a rock chamber with six niches, perhaps for storage of offerings.

137

The pyramid of Menkaure seen from the north with part of its granite casing, the entrance, and a great gash reportedly made by Caliph Othman in the 12th century.

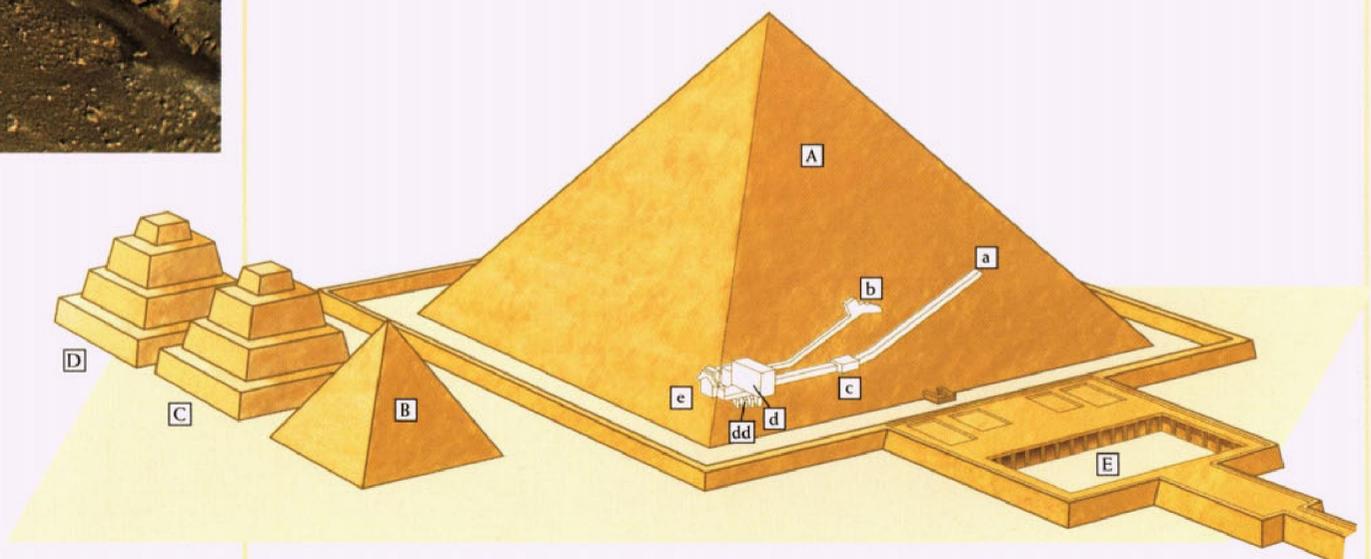


## AXONOMETRIC PLAN OF THE PYRAMID OF MENKAURE

- A MAIN PYRAMID
- B CULT PYRAMID
- C, D QUEENS' PYRAMIDS
- E MORTUARY TEMPLE
- a ENTRANCE AND DESCENDING CORRIDOR
- b SHAFT USED TO PULL IN THE GRANITE BLOCKS

- FOR THE CASEMENT OF THE BURIAL CHAMBER
- c CORRIDOR CHAMBER AND HORIZONTAL CORRIDOR
- d ANTECHAMBER
- dd STATUE NICHE
- e BURIAL CHAMBER CASED WITH DARK GRANITE, IT

ONCE IT CONTAINED A BEAUTIFULLY DECORATED SARCOPHAGUS OF DARK GRANITE REMOVED BY VYSE AND LOST IN A SHIP WRECK OFF THE COAST OF SPAIN



Krejci, J., "The Origins and Development of the Royal Necropolis at Abusir during the Old Kingdom," in M. Bárta and J. Krejci (eds.), *Abusir and Saqqara in the Year 2000*, Praha, 2000, pp. 477, figs. 2 and 4.

Lauer, J.-Ph., *La Pyramide à Degrés, I-III*, Cairo, 1936-1939.

---, "Histoire Monumentale des Pyramides d'Égypte I: Les Pyramides à Degrés (IIIe Dynastie)," *BdÉ* 39 (1962).

---, "Les petites pyramides à degrés de la IIIe dynastie," *Rev. archéologique* (1962), pp. 5-15.

---, "Recherche et découverte de tombeau sud de L'Horus Sekhem-Khet san son complexe funéraire à Saqqarah," *BIF* 48/49 (1969), pp. 121-131.

---, *Saqqara: The Royal Cemetery of Memphis*, London, 1976.

Leclant, J. and G. Clerc, "Fouilles et travaux en Égypte et au Soudan," *Orientalia* 57, no. 3 (1988), pp. 336, figs. 40, 41.

Lehner, M., "Z 500 and the Layer Pyramid of Zawiyet el-Aryan," in P. der Manuelian (ed.), *Studies in Honor of W.K. Simpson II*, Boston, 1996, pp. 507-522.

---, *The Complete Pyramids*, London, Cairo, 1997.

Lesko, L. H., "Seila 1981," *JARCE* 25 (1988), pp. 215-235.

Müller, H. W., "Lowenskulpturen," *MJbK* XVI (München 1965), pp. 20.

---, "Gedanken zur Entstehung, Interpretation und Rekonstruktion ältester ägyptischer Monumentalarchitektur," in *Ägypten-Dauer und Wandel*, in DAIK, Sonderschrift 18, Mainz 1985, pp. 7-33.

O'Connor, D., "New Funerary Enclosures (Talbezirke) of the Early Dynastic Period at Abydos," *JARCE* 26 (1989), pp. 51-86.

Otto, E., "Die Religion der Alten Ägypter," in *Handbuch der Orientalistik*, Abt 1, Bd VIII, 1, Leiden 1964, p. 55.

Parra Ortiz, J. M., "Houni et Snérou: Les Pyramides de Meïdout et Dahschour," *GM* 154 (1996), pp. 77-91.

Radwan, A., "Recent Excavations of the Cairo University at Abusir: A Cemetery of the 1st Dynasty," in D. Kessler and R. Schultz (eds.), *Gedenkschrift für Winfried Barta*, in *MÄU* 4 (1995), pp. 312, n.11.

---, "Mastaba XVII at Abusir (First Dynasty): Preliminary Results and General Remarks," in M. Bárta and J. Krejci (eds.), *Abusir and Saqqara in the Year 2000*, Praha, 2000, pp. 509-514, fig. 2.

---, "Some Remarks Concerning the Superstructure of Some Mastabas at Abusir," in Z. Hawass (ed.), *Egyptology at the Dawn of the Twenty-First Century. Proceedings of the Eighth International Congress of Egyptologists*, Cairo 2000, Cairo, 2002.

Ricke, H., "Bemerkungen zur ägyptischen Baukunst des Alten Reiches I," *Beiträge*, Bf 4 (1944).

Ritner, R. K., O. "Gardiner 363: A Spell Against Night Terrors," *JARCE* 27 (1990), pp. 37f., fig. 5

Schraff, A., "Die Ausbreitung des Osiriskultes in der Frühzeit und während des Alten Reiches," *SBAW* Heft 4, (1948).

Seidel, M., and D. Wildung, in C. Vandersleyen (ed.), *Das alte Ägypten* (Propyläen Kunstgeschichte 15), Berlin, 1975, pp. 218-220.

Seidel, M., "Die königlichen Statuengruppen I," *HAB* 42, 1996, pp. 5-9.

Sourouzian, H., "Inventaire iconographique des Statues en Manteau Jubilaire," in *Hommages à J. Leclant*, *BdÉ* 106, vol. 1 (1994), pp. 50ff.

---, "L'Iconographie du roi dans la statuaire des trois premières dynasties," in *Kunst des Alten Reiches*, *DAIK*, Sonderschrift 28 (1995), pp. 133ff.

---, "Concordances et Écarts entre Statuaire et Représentations à deux dimensions des Particuliers de L'Époque Archaïque," in N. Cimal (ed.), *Les Critères de Datation Stylistiques*, *BdÉ* 120 (1998), pp. 305ff.

Stadelmann, R., "Pyramiden," *LÄ* IV (1982), pp. 1205ff.

---, "Das vermeintliche Sonnenheiligtum im Norden des Djoserbezirkes," *ASAE* 69 (1983), pp. 373-378.

---, "Die Oberbauten der Königsgräben der 2. Dynastie in Sakkara," *Mélanges G. E. Mokhtar II*, *BdÉ* 97/2 (1985), pp. 295-307.

---, *Die ägyptischen Pyramiden - vom Ziegelbau zum Weltwunder*, Mainz, 1985.

---, *Die großen Pyramiden von Giza*, Graz, 1990.

---, "Zur Baugeschichte des Djoserbezirkes, Grabschacht und Grabkammer der Stufenmastaba," *MDAIK* 52 (1996), pp. 295-305.

---, "Origins and Development of the Funerary Complex of Djoser," in P. der Manuelian (ed.), *Studies in Honor of W.K. Simpson*, Boston, 1996, pp. 787-800.

---, "Représentations de la famille royale à l'Ancien Empire," in Chr. Ziegler (ed.), *L'Art de l'Ancien Empire*, Paris: Musée du Louvre, 1999, p. 174, fig. 5.

Sténou, J., "El-Kolah," *Chronicle d'Égypte* 59 (1950), pp. 43-45.

Swelim, N., "Additional Views Concerning the Monument Called Sinki," *MDAIK* 38 (1982), pp. 94f.

---, *Some Problems on the History of the Third Dynasty*, Alexandria, 1983.

---, *The Brick Pyramid at Abu Roash, Numbered I by Lepsius*, Alexandria, 1983.

---, "Some Remarks on the Great Rectangular Monuments of Middle Saqqara," *MDAIK* 47 (1991), pp. 389-402.

Tray, L., *Patterns of Queenship in Ancient Egyptian Myth and History*, Uppsala, 1986, pp. 56ff.

Verner, M., *The Pyramids: The Mystery, Culture and Science of Egypt's Great Monuments*, Cairo, New York, 2002.

Westendorf, W., *Das Alte Ägypten*, Baden-Baden, 1968, p. 30.

Wildung, D., "Die Rolle ägyptischer Könige im Bewusstsein ihrer Nachwelt," *MÄS* 17 (1969).

---, "Imhotep" *LA* III (1980), pp. 145-148.

---, "Two Representations of Gods from the Early Old Kingdom," *Miscellanea Wobouiana I* (1972), pp. 145ff.

Wilson, J. A., "Buto and Hierakonpolis in the Geography of Egypt," *JNES* 14 (1955), pp. 209-236.

Ziegler (ed.), Chr., *L'Art égyptien au temps des Pyramides*, Cat. Paris, 1999, pp. 34-51, 148-165.

#### Photo credits:

86 Oriental Institute of The University of Chicago

87, 88, 89, 90, 91, 92, 93 Araldo De Luca/Archivio White Star

94-95 Marcello Bertinetti/Archivio White Star

95 top Giulio Veggi/Archivio White Star

96 Marcello Bertinetti/Archivio White Star

98, 99 Araldo De Luca/Archivio White Star

100, 101 Giulio Veggi/Archivio White Star

102, 102-103, 103 bottom left Marcello Bertinetti/Archivio White Star

103 bottom right Giulio Veggi/Archivio White Star

104 top Marcello Bertinetti/Archivio White Star

104-105, 106-107, 107 bottom Marcello Bertinetti/Archivio White Star

107 top, 108 top, 109 bottom right Giulio Veggi/Archivio White Star

108-109, 109 bottom left Marcello Bertinetti/Archivio White Star

110 top Araldo De Luca/Archivio White Star

110 center and bottom Giulio Veggi/Archivio White Star

111 Miroslav Verner

#### THE PYRAMIDS OF THE FOURTH DYNASTY

Text by Rainer Stadelmann

Born October 24, 1933 in Oettingen/Bavaria as son of a professor of classical languages, he studied Egyptology at the Universities of Munich and Heidelberg. He first visited Egypt between December 1955 and April 1956 and participate in excavations at the Sun Temple of Userkaf at Abusir. Completed his PhD in spring 1960 with a thesis on "Syrisch-Palästinensische Gottheiten in Ägypten" and became Assistant Lecturer of Egyptology at the University of Heidelberg. In 1967 he completed a second Ph.D., Habilitation, in Heidelberg with a thesis on: "Altägyptische Bauinschriften und Namen von Bauteilen" and became Assistant Professor. In April 1968 he became Scientific Director of the German Institute of Archaeology in Cairo and Honorary Professor at the University of Heidelberg. In 1989 he became First Director of the German Institute of Archaeology in Cairo. He has at Elephantine Island and the Mortuary temple of Sety I at Gurna and the Pyramids of Sneferu at Dahshur. Newest excavation and conservation work at the Temple of Amenhotep III and the Colossi of Memnon. He has published several books about the pyramids and ca. 100 scholarly articles in German, English, and French in international periodicals.

#### Bibliography:

Edwards, I. E. S., *The Pyramids of Egypt*, London, 1985.

Fakhry, A., *The Monuments of Sneferu at Dahshur, vol. I-II*, Cairo, 1959.

Hawass, Z., *The funerary establishment of Khufu, Khaefra and Menkaura*

Lauer, J. Ph., *Le Mystère des Pyramides*, 1988.

during the Old Kingdom, Pennsylvania, 1987.

Lehner, M., *The Complete Pyramids*, 1997.

Stadelmann, R., *Die Großen Pyramiden von Giza*, ADEVA, 1990.

---, *Die Ägyptischen Pyramiden*, Mainz, 1997.

Vercoutter, J., *L'Égypte et la vallée du Nil, NOUVELLE CLIO Tome I, Des Origines à la Fin de l'Ancien Empire*, Paris, 1992.

#### Photo credits:

112 Araldo De Luca/Archivio White Star

113 Private collection

114-115 Marcello Bertinetti/Archivio White Star

114 bottom Araldo De Luca/Archivio White Star

115 Giulio Veggi/Archivio White Star

116-117, 117 top Marcello Bertinetti/Archivio White Star

117 bottom Giulio Veggi/Archivio White Star

118, 119, 120-121 Marcello Bertinetti/Archivio White Star

121 Marcello Bertinetti/Archivio White Star

122-123 Marcello Bertinetti/Archivio White Star

122 bottom Giulio Veggi/Archivio White Star

123 top Araldo De Luca/Archivio White Star

124 top Giulio Veggi/Archivio White Star

124 bottom Araldo De Luca/Archivio White Star

126-127 Giulio Veggi/Archivio White Star

128-129, 129 bottom Marcello Bertinetti/Archivio White Star

129 top Giulio Veggi/Archivio White Star

130 Araldo De Luca/Archivio White Star

131, 132-133, 133 Marcello Bertinetti/Archivio White Star

132 bottom left Giulio Veggi/Archivio White Star

132 bottom right, 134, 135, 136 bottom left and right Araldo De Luca/Archivio White Star

136-137, 137 Marcello Bertinetti/Archivio White Star

#### THE QUEENS' PYRAMIDS OF THE FOURTH DYNASTY AT GIZA

Text by Zahi Hawass

#### Bibliography:

Badawy A., *History of Egyptian Architecture I*, Giza, 1954.

Borchardt, L., *Das Grabdenkmal des Königs Sabu-Re II*, Leipzig, 1913.

Edwards, I. E. S., *The Pyramids of Egypt, rev. ed.*, New York, 1985.

Fakhry, A., *The Pyramids*, Chicago and London, 1969.

Hawass, Z., *The Funerary Establishments of Khufu, Khaefra, and Menkaura During the Old Kingdom*, Ph.D. Dissertation, University of Pennsylvania microfilm, Ann Arbor, MI, 1987.

---, update in W. M. F. Petrie, *The Pyramid and Temples of Gizah*, London: Histories & Mysteries of Man, 1990.

Lehner, M., *The Pyramid Tomb of Hetep-heres and the Satellite Pyramid of Khufu*, Mainz am Rhein, 1985.

Maragioglio, V. and C. Rinaldi, *L'Architettura della piramidi menfite*, Vols. 2-8, Turin and Rapello: Tip. Artale, 1963-77.

Reisner, G. A., *A History of the Giza Necropolis, vol. II: The Tomb of Hetepheres, Mother of Cheops*, Cambridge, MA, 1955.

Riser, E., *Der Königliche Harim im alten Ägypten und seine Verwaltung*, Vienna, 1972.

Simpson, W. K., *The Mastabas of Kawab, Khaefkhu I, II, and III*, Boston, 1978.

Stadelmann, R., *Die ägyptischen Pyramiden*, Mainz, 1985.

Vyse, H., *Operation carried on at the Pyramids of Giza 2*, London, 1841.

#### Photo credits:

132 bottom left Giulio Veggi/Archivio White Star

132 bottom right, 134, 135, 136 bottom left and right Araldo De Luca/Archivio White Star

136-137, 137 Marcello Bertinetti/Archivio White Star

138, 139 Giulio Veggi/Archivio White Star

140, 141 Marcello Bertinetti/Archivio White Star

142, 143, 144, 145 right Giulio Veggi/Archivio White Star

145 left Marcello Bertinetti/Archivio White Star

146, 148-149, 149 bottom Giulio Veggi/Archivio White Star

149 top Marcello Bertinetti/Archivio White Star

#### THE SATELLITE PYRAMID OF KHUFU

Text by Zahi Hawass

#### Bibliography:

Hassan, S., *Excavations at Giza 10. The Great Pyramid of Khufu and its Mortuary Chapel*, Cairo, 1960.

Hawass, Z., "The discovery of the Satellite Pyramid

of Khufu, GID" in P. Der Manuelian (ed.), *Studies in Honor of William Kelly Simpson*, Boston: Museum of Fine Arts, 1996.

---, *The Funerary Establishments of Khufu, Khaefra, and Menkaura During the Old Kingdom*, Ph.D. Dissertation, University of Pennsylvania microfilm, Ann Arbor, MI, 1987.

---, update in W. M. F. Petrie, *The Pyramid and Temples of Gizah*, London: Histories & Mysteries of Man, 1990.

---, "The Discovery of the Pyramidion of the Satellite Pyramid of Khufu (GID)," *Iubilaeum Conlegae. Studies Memory of Abd Aziz Sadek, Part I, Varia Aegyptiaca*, Vol. 10, (1997).

Lauer, J. P., *Pyramide à degrés I*, Cairo 1935.

Lehner, M., *The Pyramid Tomb of Hetep-heres and the Satellite Pyramid of Khufu*, Mainz am Rhein, 1985.

Maragioglio, V. and C. Rinaldi, *L'Architettura della piramidi menfite*, vols. 2-8, Turin and Rapello: Tip. Artale, 1963-77.

Reisner, G. A. A., *History of the Giza Necropolis, vol. II: The Tomb of Hetepheres, Mother of Cheops*, Cambridge, MA, 1955.

Reisner, G. A., *Mycerinus: The Temples of the Third Pyramid at Giza*, Cambridge, MA, 1931.

Smith, W. S., *The Art and Architecture of Ancient Egypt*, Harmondsworth, 1981.

Stadelmann, R., "Die Pyramiden des Sneferu in Dahschur: Erster Bericht über die Grabungen an den nördlichen Steinpyramide," *MDAIK* 38, 1982.

---, *Die ägyptischen Pyramiden*, Mainz, 1985.

Vyse, H., *Operation carried on at the Pyramids of Giza 2*, London, 1841.

#### Photo credits:

151 Giulio Veggi/Archivio White Star

#### THE MYSTERY OF HETEPHERES

Text by Zahi Hawass

#### Bibliography:

Lehner, M., "The Development of the Giza Necropolis: the Khufu project," *MDAIK* 41 (1985).

Hawass, Z., *The Funerary Establishments of Khufu, Khaefra, and Menkaura During the Old Kingdom*, Ph.D. Dissertation, University of Pennsylvania microfilm, Ann Arbor, MI, 1987.

#### Photo credits:

153, 154, 155 Araldo De Luca/Archivio White Star

#### THE SECRET DOORS INSIDE THE GREAT PYRAMID

Text by Zahi Hawass

#### Bibliography:

Hawass, Z., M. Waters, and C. Sandreal, "The Recent Investigation of the so-called doors inside the great pyramid"

Stadelmann, R. with the contribution of R. Cantenbrink, "Die Sogenanntem Luftkanle der kheopspyramide. Modellkorridore für den Aufstieg des Kings Zum Himmel," *MDAIK* 50 (1994), pp. 285-294.

#### Photo credits:

157, 158 Kenneth Garrett

#### THE PYRAMIDION

Text by Zahi Hawass

#### Bibliography:

Arnold, D., "Rituale und Pyramidentempel," *MDAIK* 33 (1977).

Badawy A., *A History of Architecture*, Berkeley: University of California, 1966.

Edwards, I. E. S., *The Pyramids of Egypt, rev. ed.*, New York, 1985.

Fakhry, A., *The Pyramids, 2nd ed.*, Chicago: University of Chicago Press, 1974.

Hawass, Z., "The discovery of the Satellite Pyramid of Khufu, GID" in Peter Der Manuelian (ed.) *Studies in Honor of William Kelly Simpson*, Boston: Museum of Fine Arts, 1996.

---, *The Funerary Establishments of Khufu, Khaefra, and Menkaura During the Old Kingdom*, Ph.D. Dissertation, University of Pennsylvania microfilm, Ann Arbor, MI, 1987.