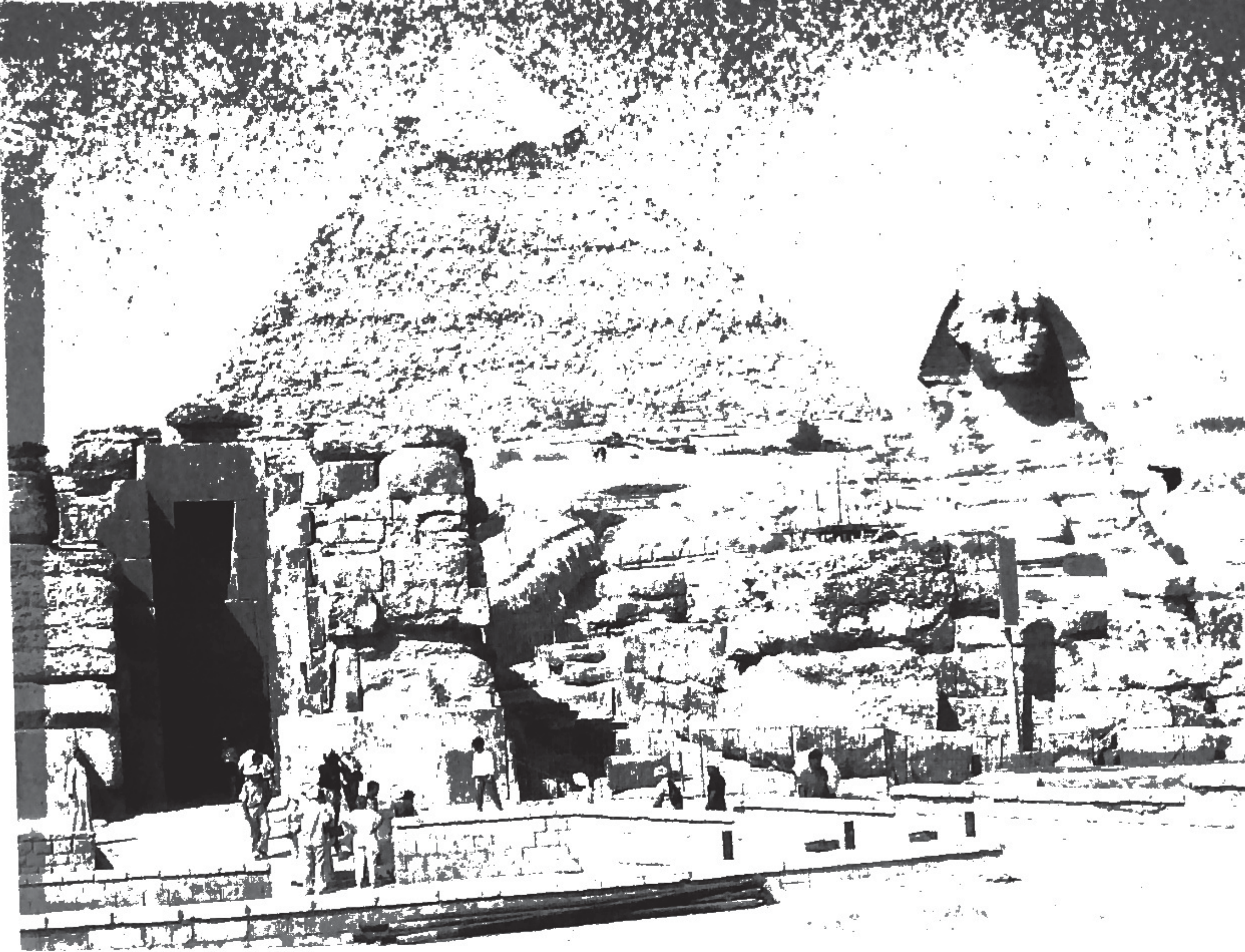


around the edges of the wall. Two levels of narrow storage rooms extended into the solid wall mass. Today the temple stands without a roof or its outer stone facing beside the Sphinx, a man-headed lion 187 feet long and sixty-six feet high, carved in situ out of a natural rock ledge (Fig. 1.26). (It has long been presumed that the head on the Sphinx was a likeness of Khafre, but this cannot be proven. Recent speculation that the **Sphinx** may be significantly older than the pyramids is not generally accepted by Egyptologists.) Khafre's mortuary temple at the base of the pyramid is connected to the valley temple by a causeway running at an oblique angle to the river. The mortuary temple is rectangular in plan, with a series of axially disposed interior spaces. Its limestone structure was probably cased with a finer material, and the floor was alabaster. At the center of the temple was a large courtyard surrounded by enormous pillars, in front of which stood twelve large statues of the pharaoh.

Pyramids, especially the impressive Giza group, have long provoked two questions: How could ancient peoples, working with simple technologies, have built such enormous structures, and why would they have built them? The answer to the first question can be reasonably surmised, although this is still an area of study. Even though the Egyptians lacked metals harder than copper and made no use of the wheel for transport, they were not primitive. Their knowledge of surveying, necessary for reestablishing field boundaries after the annual flood, enabled them to lay out the pyramid's base accurately and to orient the square plan to the cardinal directions. Khufu's pyramid deviates only $5\frac{1}{2}$ minutes of arc from true north; its summit is only one foot off the center of the base; and there is only an eight-inch error in the length of one side of the base. The absence of wheeled vehicles was not a serious handicap, as much of the stone transport would have been made over water or across sand, where wheels would have provided no real advantage over the boats and sledges actually used. Quarrying was accomplished with metal saws for the softer limestones or sandstones, and by repeatedly pounding balls of very hard rock (dolerite) along seams in the harder stones such as granite. The finishing of cut surfaces could be accomplished with stone hammers, chisels, axes, and sand or grindstones. By any method, quarry work was tedious, and it was probably assigned to prisoners or conscripts. Much of the limestone in the core of the Giza pyramids was quarried on-site. Finer display stone and granite was transported from more distant locations.

Construction of the pyramids was probably done by large teams of laborers during the flood season when agricultural work was impossible. The muscles of men supplied the force to haul blocks into place. Studies of ruined or incomplete pyramids have revealed that there was no single construction method used; least of all is known about the most complete monuments, the Giza trio, because their interiors cannot be inspected closely. In some cases, ramps were erected along with the rising

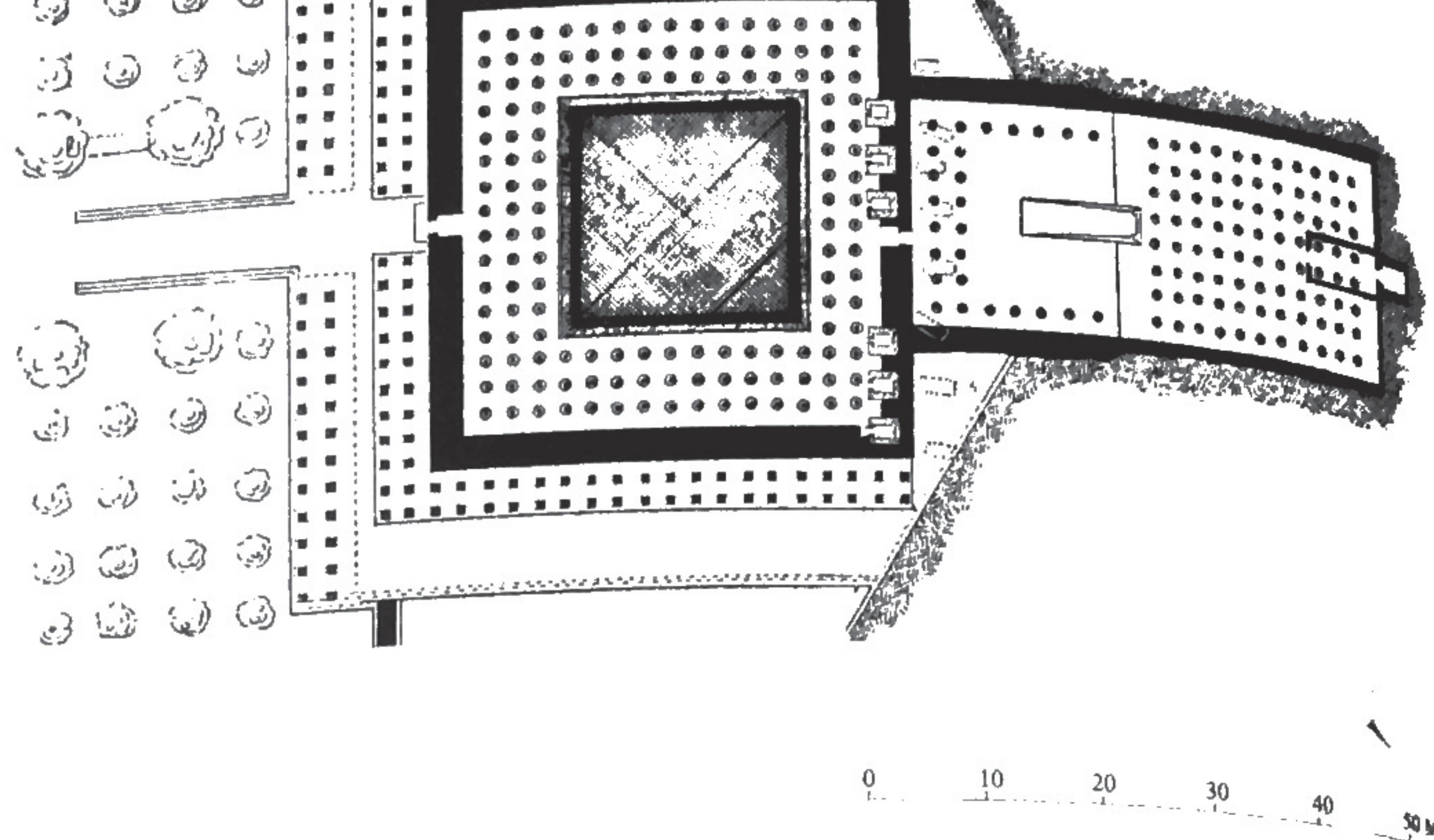
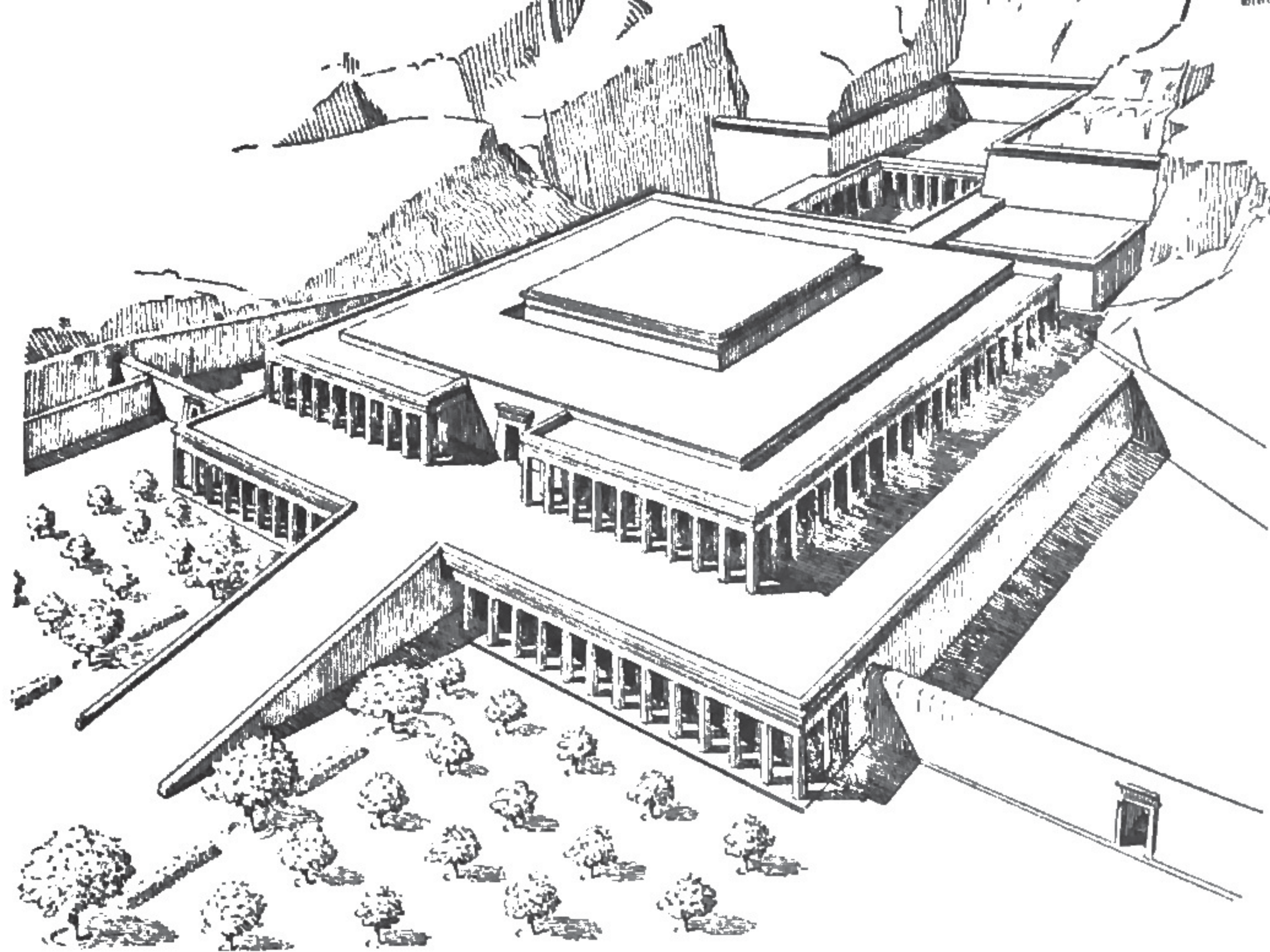


1.26 Khafre's pyramid and the Sphinx, Giza, Egypt, ca. 2550–2460 BCE.

Remains of the entrance to Khafre's valley temple are visible to the left.

masonry mountain to provide an inclined plane for dragging stone on sledges. It is also possible that the rising stepped core of the Giza pyramids served as a construction staircase for workers pulling and leveraging the blocks onto the upper levels, as the volume of material needed for additional ramps on these enormous buildings and the difficulty of hauling stone around corners would make inclined planes impractical. While the number of men and length of time required to see a major pyramid through to completion are still subject to debate, the Egyptians' ability to organize labor forces and quarrymen in seasonal building campaigns remains a fact and a tribute to the abilities of their engineers.

The question of why the pyramids were built has inspired both serious inquiry and speculative nonsense. Theories ranging from embodiments of standard measures (as defined in English units) to apocalyptic predictions of the end of the world have been offered to explain the dimensional configuration of Khufu's pyramid, but Egyptologists are convinced that the pyramids were first and foremost tombs for the pharaohs. Why people should devote so much effort to what we might regard as a fundamentally useless project is answerable only within the context of the Egyptian world view. Perhaps no other society before or since has invested so much time and labor to ensure survival after death for its most important personages. Virtually all Egyptian art and architecture was very practical, intended to assist one's passage to the next world and ensure comfort and pleasant living upon arrival. While the greatest attention was lavished on the setting for the pharaoh's afterlife, all Egyptians believed in their particular view of eternal life and so all had a stake in the creation of an architecture of death and rebirth, from the modest tombs of the poor to the monumental edifices of the rulers.



1.27 Reconstruction and plan of Mentuhotep's mortuary temple, Deir-el-Bahari, Egypt, ca. 2061–2010 BCE.

This Middle-Kingdom temple represents an interesting synthesis of an axial temple, hypostyle hall, and burial chamber into a single composition. Its ramps and stepped terraces would be echoed in the New-Kingdom temple of Hatshepsut built about 400 years later on an adjoining site.

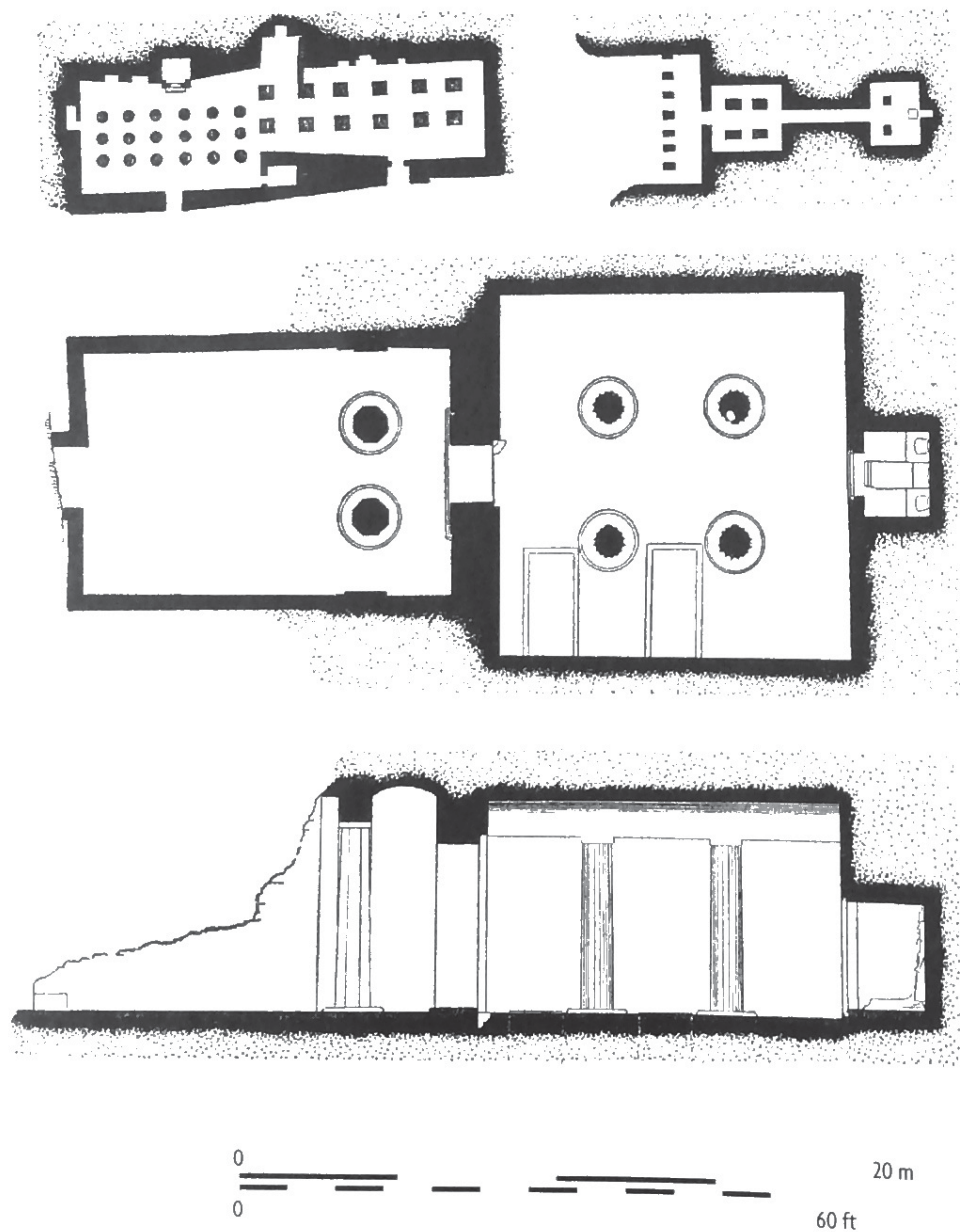
THE MIDDLE KINGDOM (ELEVENTH–THIRTEENTH DYNASTIES, ca. 2040–1640 BCE)

The first eight Egyptian dynasties gave way to a period of upheaval when local feudal lords upset the unity achieved by Menes. This era of inter-regional strife is designated the First Intermediate period, and it was followed by a second phase of centralized government called the Middle Kingdom. During this period, the royal capital was relo-

cated from Memphis to Thebes, and the pharaoh's position was more that of a feudal lord over local vassals than an absolute and divine ruler in the Old-Kingdom tradition. Royal tombs were still of major architectural importance, but Middle-Kingdom tombs generally neither endured nor intimidated grave robbers.

The tomb of Mentuhotep II at Deir-el-Bahari (ca. 2061–2010 BCE) (Fig. 1.27) is an exceptional work of architectural innovation, combining temple and tomb chamber in a single composition. The complex, approached by an axial route from the Nile, had two levels of colonnaded terraces surrounding a masonry mass, long thought to have been a pyramid but more recently interpreted as a flat-roofed hall. (The building is a ruin today, so one cannot be sure of the initial design. The case for a flat-roofed hall is based on there being insufficient foundations to support even a modest pyramid.) The central axis continues through layers of square columns, through the flat-roofed hall, through a courtyard, and through a forest of columns until reaching Mentuhotep's actual burial vault carved in the rock cliff. The two levels of columns seen upon approach are dramatized by the contrast of their sunlit shafts with the shadowed recesses behind and anticipate Greek temples with their surrounding colonnades. Mentuhotep's tomb would serve as a prototype for the more elaborate adjoining funerary complex built by the New-Kingdom pharaoh Hatshepsut.

More typical of Middle-Kingdom tombs are those at Beni Hasan, which are cut into rock cliffs and provided with sheltering porticoes (Fig. 1.28). Reflecting the political importance of their builders, these tombs were constructed for minor nobles and court officials, who evidently enjoyed considerable influence and wealth. Most of the architectural character was created by excavation, and the builders replicated spaces and details associated with ordinary dwellings, that is, wooden and plastered reed structures with slightly arched roofs composed of mats laid on a frame.



1.28 Plan and section of rock-cut tombs, Beni-Hasan, Egypt, ca. 2000–1900 BCE.

Even when working amorphous rock, the builders chose to replicate rectangular geometries and to carve details reflecting the wooden and plastered reed construction that doubtless characterized houses. The lower of the two plans corresponds to the section.

THE NEW KINGDOM (EIGHTEENTH–TWENTIETH DYNASTIES, ca. 1550–1070 BCE)

The Middle Kingdom was terminated by the arrival of the Hyksos, shepherd-kings who may have come from Asia. Whatever their origins, the Hyksos were the first successful invaders of Egypt in centuries, and they ruled for about 100 years in what is known as the Second Intermediate period. They introduced metallurgy, the two-person chariot, new deities, and new weapons to Egyptian culture, but their rule produced no lasting artistic innovations. With the expulsion of the Hyksos came the New Kingdom, which was characterized by an invigorated dynastic line of pharaohs and an increasingly powerful hereditary priesthood who brought Egypt to new heights of political and cultural brilliance.

The Eighteenth Dynasty, the first of the New Kingdom, continued the Middle-Kingdom tradition of burial in rock-cut tombs, going a stage further by eliminating all

suggestions of monumentality. It had escaped no one's notice that all the dynastic tombs had been successfully penetrated by grave robbers. The Giza pyramids were probably plundered during the First Intermediate period. To preserve the worldly remains of the pharaoh and thwart the thieves, Eighteenth-Dynasty builders relied on concealment and improved policing of the royal necropolis. New-Kingdom pharaohs were interred secretly in the desert wilderness beyond Deir-el-Bahari, a region known as the Valley of the Kings, where very modest chambers were hewn out of the cliffs, and the entrances were hidden by dirt and sand. Spiritual nourishment for the deceased

1.29 Mortuary temple of Queen Hatshepsut, Deir-el-Bahari, Egypt, ca. 1473–1458 BCE.

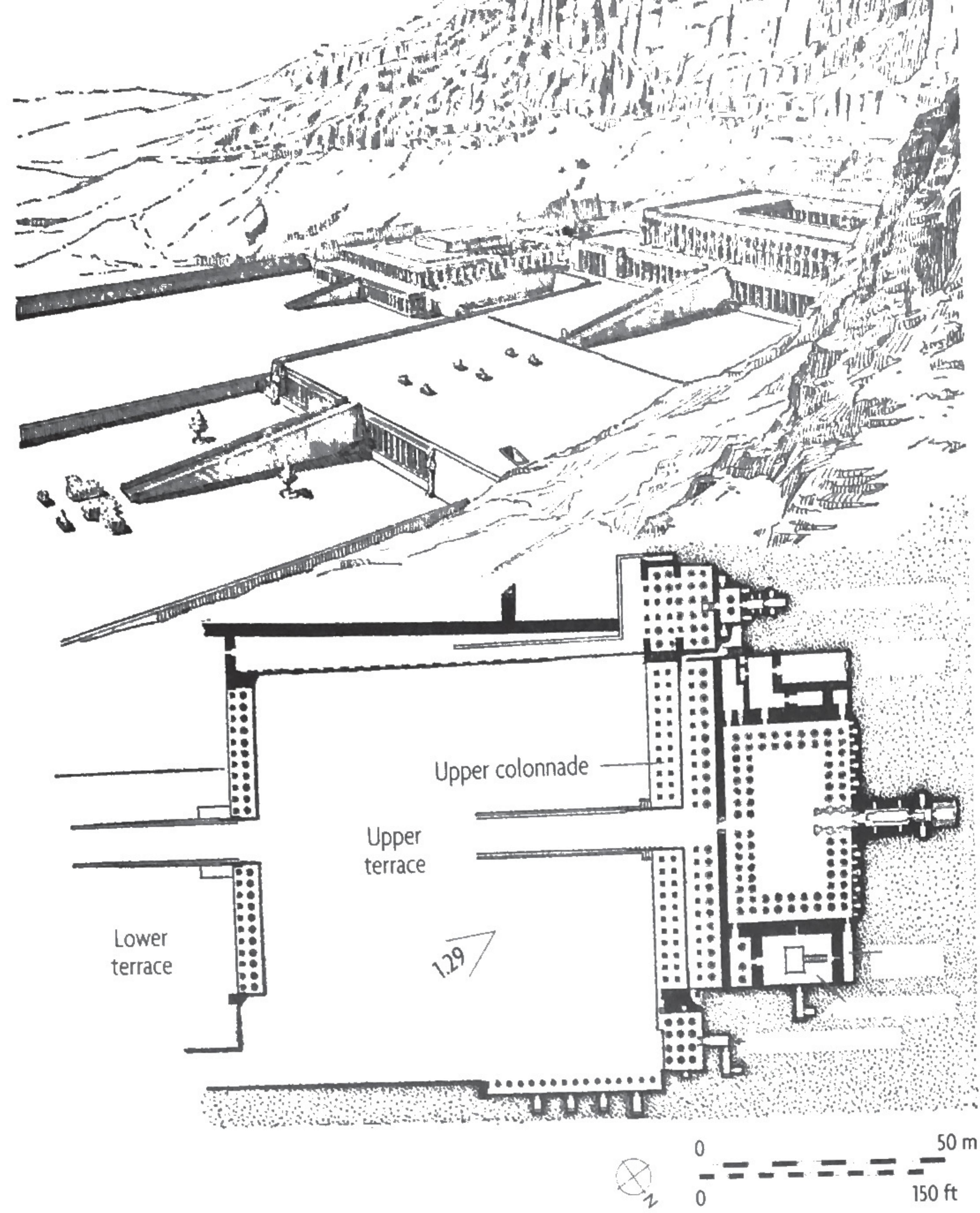
In its day, this great temple, with planted terraces and dignified carved colonnades framed by the cliff face, must have been a restful oasis in the dry landscape, a fitting monument to the peaceful reign of Hatshepsut, one of the rare woman rulers in antiquity.



was provided at increasingly elaborate separately erected funerary temples.

Among the most splendid of the Eighteenth-Dynasty temples is the funerary complex of Queen Hatshepsut (1473–1458 BCE) at Deir-el-Bahari (Fig. 1.29), notable both for its architecture and for the fact that its patron was a woman. Succession to the throne passed through the female line, but the pharaoh was almost always male. Hatshepsut was the daughter of Thutmose I, and she married her half-brother, who became Pharaoh Thutmose II. During his reign she relegated him to a subsidiary role, and after his death she ruled independently, though ostensibly as regent for Thutmose II's son by a concubine, Thutmose III. Her court favorite was a commoner, Senmut, who was also responsible (perhaps as architect) for her funerary temple. Hatshepsut was buried on the other side of the mountain range in the Valley of the Kings, so the temple complex was a mortuary chapel dedicated to the god Amun, the sun god with whom the pharaoh was associated. Ramps lead up from the valley to three broad terraces, each defined by colonnades, which also serve as retaining walls for the next level (Fig. 1.30). The overall design was doubtless inspired by the neighboring temple of Mentuhotep, although Hatshepsut's temple is considerably larger and grander. Columns in the north colonnade of the second terrace are faceted in a manner suggesting the flutes of later Doric columns (Fig. 1.31). Relief carvings and wall paintings within the sanctuary spaces and in the great hall depict Hatshepsut's divine birth as the child of Amun and the activities of her peaceful reign, including trading expeditions to Punt (perhaps the Somali coast) bearing gold, ivory, baboons, and botanical specimens. Hatshepsut herself is usually depicted as a man, sometimes as the god Osiris, wearing the apron and headdress of a pharaoh.

Today they are sand-covered and barren, but in the Eighteenth Dynasty the terraces of Hatshepsut's temple were embellished with incense trees planted in earth-filled pits to create a garden for Amun's promenades. Buried irrigation pipes supplied water to sustain the plants, and priests placed tributes to the god in the shade beneath the branches. The entire setting of the temple, from the axial-ramp approach to the termination of the processional way at a false door painted on the wall of the final rock-hewn sanctuary, is a masterly blending of architecture into a dramatic landscape including rugged cliff faces. Although Hatshepsut reigned and died peacefully, her successors did



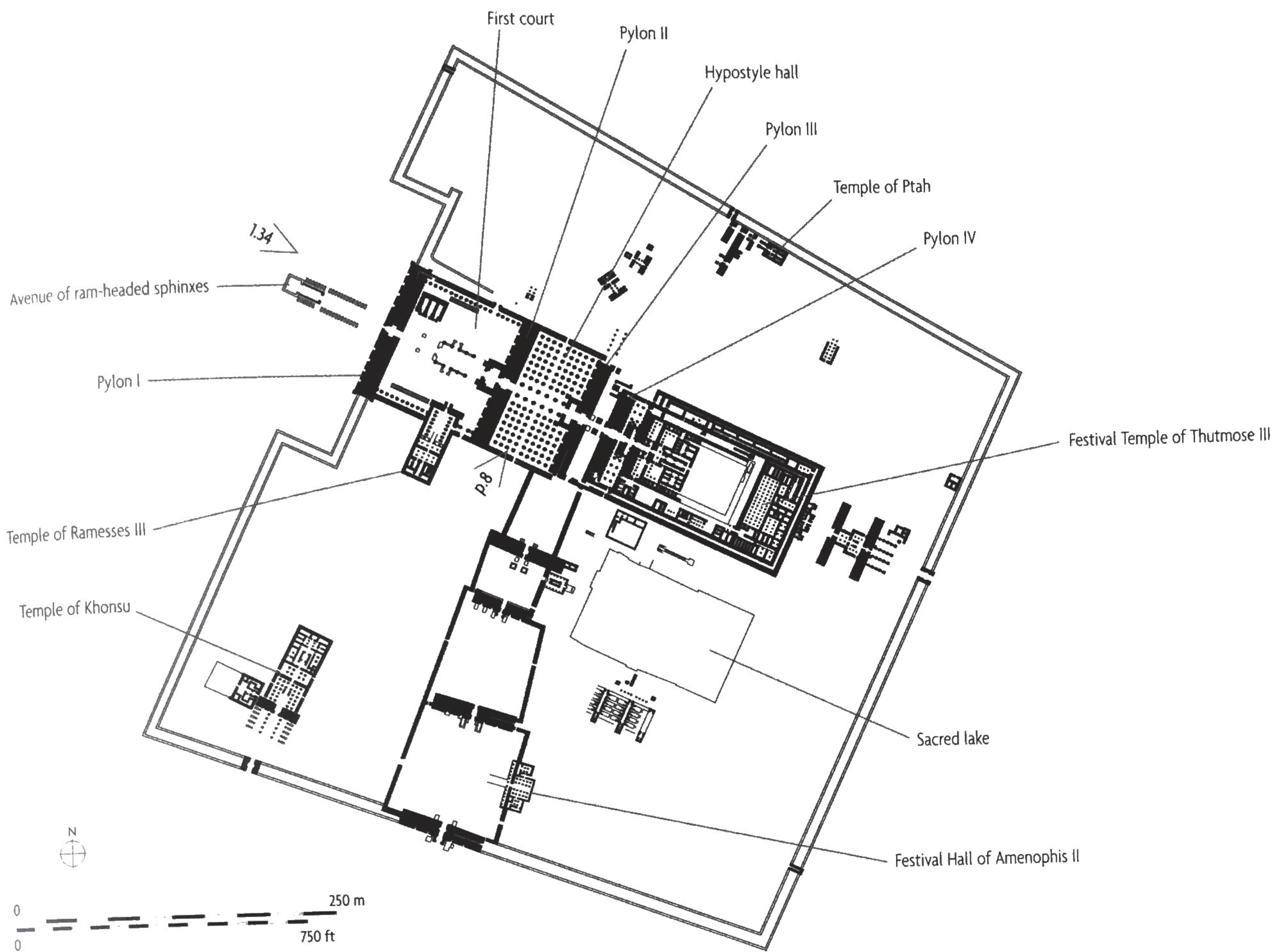
1.30 View and plan of Hatshepsut's mortuary temple, Deir-el-Bahari, Egypt, ca. 1473–1458 BCE.

To thwart thieves, New-Kingdom pharaohs arranged for their bodies to be buried in concealed tombs in the Valley of the Kings (behind these cliffs), where priests guarded against robbers. Mentuhotep's earlier tomb is seen just beyond Hatshepsut's monument.



1.31 Upper colonnade (detail), Hatshepsut's mortuary temple, Deir-el-Bahari, Egypt, ca. 1473–1458 BCE.

Behind the rectangular piers are cylindrical columns with fluting that has led to their being called proto-Doric. Certainly they are evidence of Egyptian precedent for what in Greek hands would become an aspect of the orders of architecture.



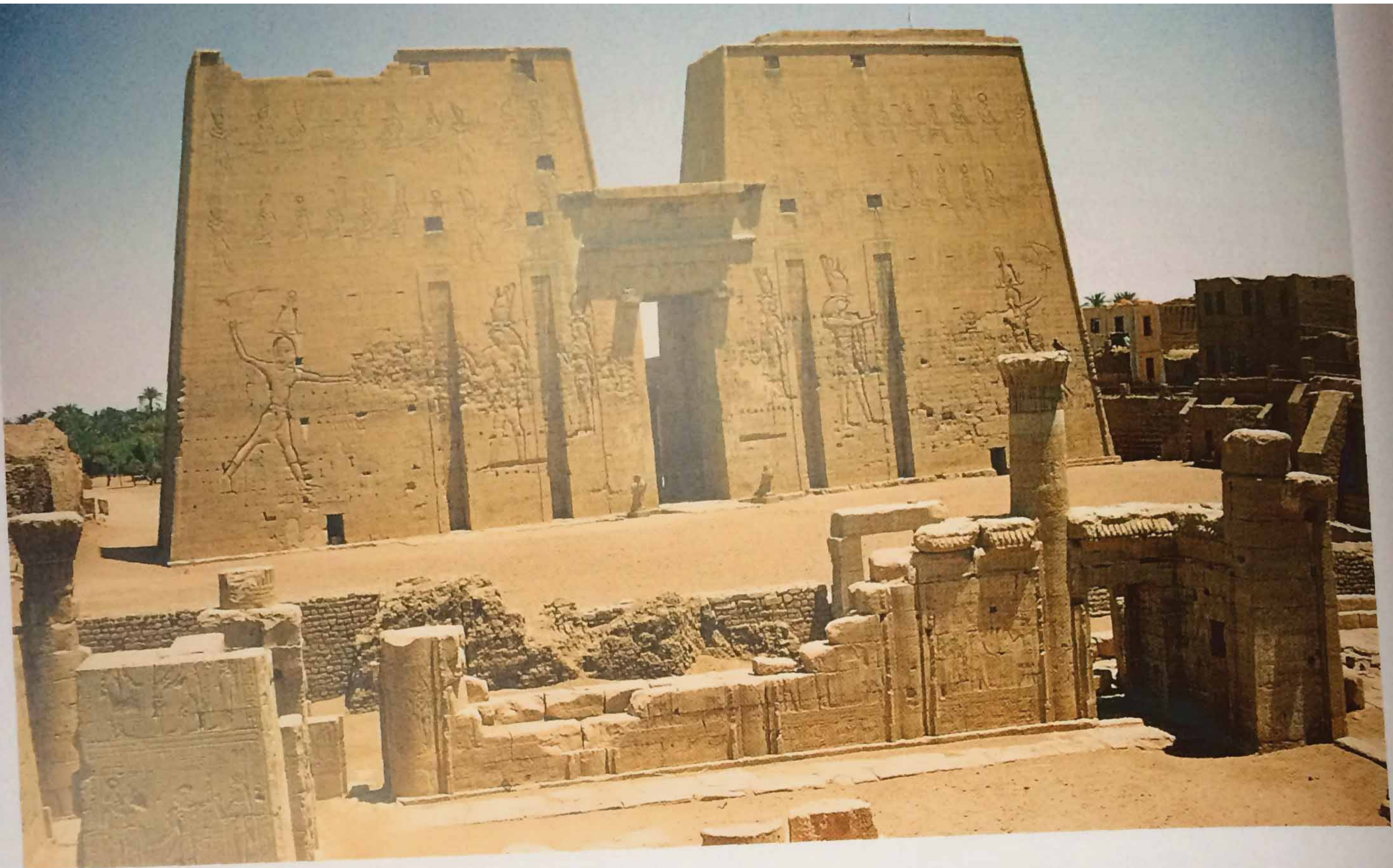
1.32 Plan of the Great Temple of Amun, Karnak, Egypt, begun ca. 1550 BCE.

This temple is celebrated more for its sheer size than for its architectural coherence. Dedicated to the sun god Amun, whose priesthood was powerful during the New Kingdom, the temple maintained a strong sense of axiality and monumental procession through all its additions.

everything possible to eradicate her memory, erasing her name from inscriptions, smashing almost all of her sculptural representations, and desecrating the burial site of Senmut.

In the course of the Eighteenth Dynasty, temple complexes built to honor both gods and pharaohs became more extensive and elaborate, aided by the establishment of Amun as the main "state" god and the increased power and influence of his priesthood. Successive rulers would add new portions or renovate older temples, creating designs whose chief attribute was overbearing grandeur, not coherence or esthetic delight. The temple at Karnak, across the Nile from Deir-el-Bahari, is an example of this process (Fig. 1.32). Begun about 1550 BCE, it was enlarged by Thutmose I, enriched by obelisks given by his daughter, Hatshepsut, and again expanded with a hypostyle jubilee festival hall constructed by Thutmose III for his own glorification. Yet another hypostyle hall, the largest of all, was built by Ramesses II.

Hypostyle halls are sizeable chambers created by rows of large columns placed closely together. The tight spacing was necessary to support the stone lintels of the roof, while the large column diameter reflected the substantial height of the stone cylinders. The net effect was a dimly lit interior without a sense of spatial expanse. Daylight admitted through slits in the stone clerestory grilles filtered through the incense smoke and the upper volume of the hypostyle columns to create a sense of mystery, the desired effect for religious ritual (see page 8). The temple was the habitation of the god, who was sheltered, clothed, and fed by the priests, by now a powerful and largely hereditary group. Each day the priests performed purification rites in the sacred lake within the temple precinct, dressed the statue of the deity in rich garments, and presented it offerings at the evening ritual. They carried small statues in processions, and placed others in the sun for rejuvenation in special festivals, such as those marking the beginning of the New Year. Monumental masonry entrance gates or pylons (Fig. 1.33) lined processional routes to represent the eastern mountains of Egypt through which the divine early-morning sunlight emanated. Despite their rambling plans and numerous additions, New-Kingdom temples maintained axial circulation spaces for the penetration of solar rays and



1.33 Pylon gateway, Temple of Edfu, Egypt, 237–57 BCE.

While this pylon dates from the Ptolemaic period after Alexander the Great conquered Egypt, it is similar in form and purpose to those at Karnak. Such a spatial threshold signified the increasing sacredness of the space beyond. The four vertical slots once held obelisks.

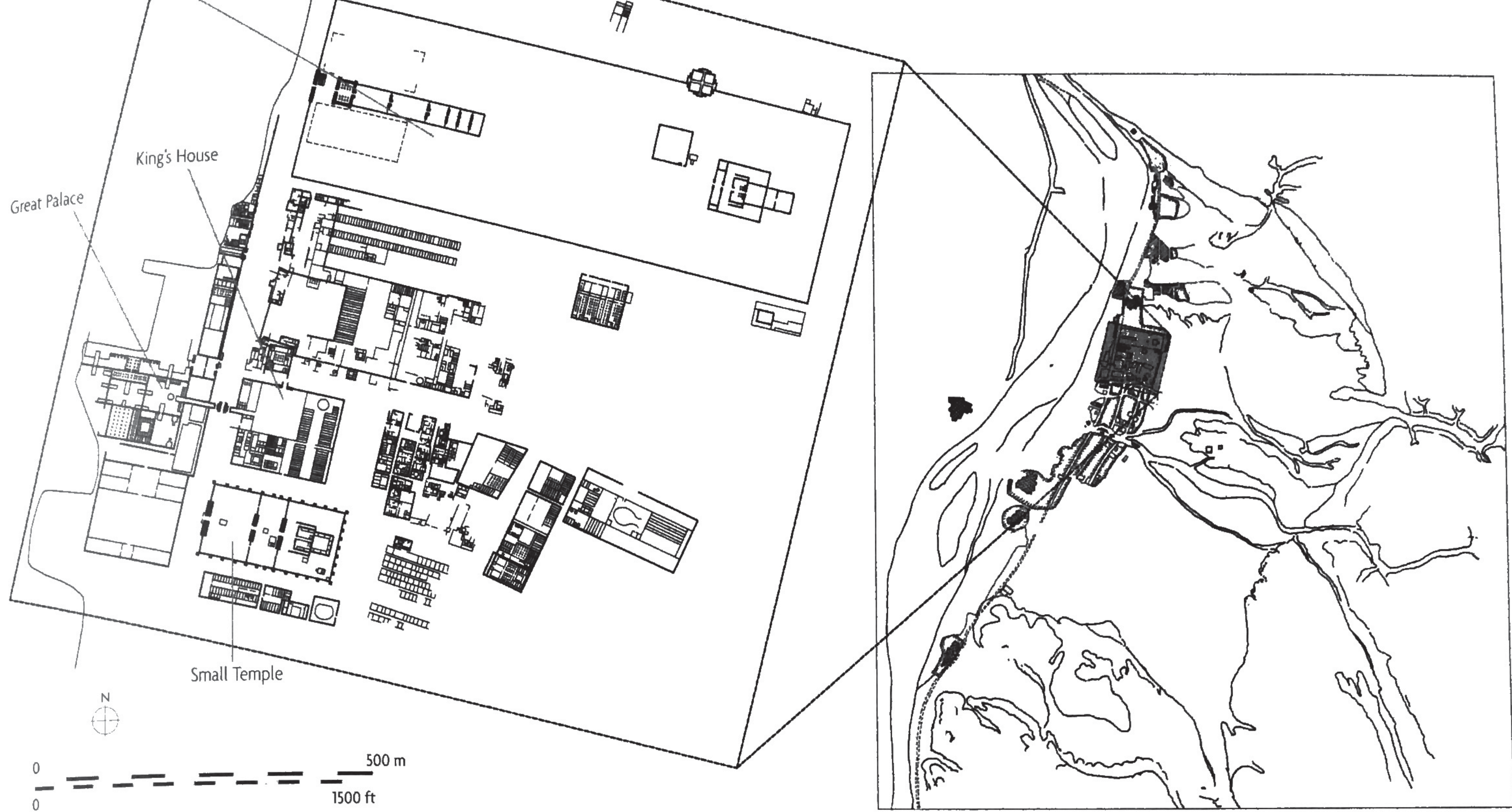
1.34 First court, Great Temple of Amun, Karnak, Egypt, begun ca. 1550 BCE.

Massive columns and colossal statues of Ramesses II define the axial path to the second pylon gate, built by Sethos I (1306–1290). Beyond is the Hypostyle Hall illustrated on page 8.



the movement of priestly processions (Fig. 1.34). The pylon gates were not only symbols of the entrance through which the sun was reborn each day, but also of the gates to the underworld through which the eternal spirit must pass.

Five generations after Hatshepsut, the pharaoh Amenophis IV (1353–1335 BCE) made a major break with Egyptian religious tradition by disavowing the multitudes of deities and instituting a monotheistic religion devoted to the sun disc Aten. Changing his name to Akhenaten, which means “all is well with Aten,” Amenophis abandoned the old capital at Thebes about 1350 BCE to establish a new capital 300 miles to the north at Akhetaten (the modern Tell-el-Amarna). Judging from incomplete excavations of its ruins, Akhetaten was a linear town nearly seven miles long, bounded on the west by the Nile and on the east by mountains, and lacking a consistent overall plan. Transportation was facilitated by the



1.35 Plan of the central section, Akhetaten (Tell-el-Amarna), Egypt, ca. 1350 BCE.

This was the new capital city of the pharaoh Akhenaten, located away from traditional religious centers in an effort to break the power of the established Egyptian priesthood. Rites for the sun disc Aten were celebrated in temples containing large open courtyards, lit directly by the sun's beneficent rays.

waterway, and a river road linked the various residential sections (Fig. 1.35). Temples had altars set in open courtyards, and there were no segregated areas for the priest-class. Private houses of the wealthy were commodious, walled off from public view, with rooms grouped around open courts with tree-planted gardens. Thick mud-brick walls moderated the extremes of heat and cold. No wall surrounded the city, protection being provided by free-standing guardhouses.

CONCLUSIONS ABOUT ARCHITECTURAL IDEAS

Throughout this chapter, you have seen certain fundamental architectural ideas appear that will be consistently used during every era in every geographical location covered by this text. These ideas have to do with such issues as demarcation, orientation, sequential movement, and surface articulation. A site like Newgrange encompasses all of these, as it marks a significant spot, is aligned

with cosmic events, involves a path (in this case from profane to sacred space), and includes ornament. The ziggurats and pyramid complexes exploited open terrain where the horizon was inescapable. Stepped, then true pyramids became manmade vertical foils for the natural horizontal, and in Egypt the pyramids were eventually superseded as vertical markers by the obelisk. Within both the ziggurat and pyramid environments, participants moved along an axis, toward a terminus, with architectural incidents like gateways providing a rhythm and signaling changes in spatial significance. The principles remained the same at both Middle and New Kingdom funerary complexes, where giant columns emerged as interior architectural features. While the pyramids exhibit a monolithic skin, the surfaces of ziggurats were articulated by means of brick bands and polychromatic glazes. At the funerary temple complexes of Mentuhotep and Hatshepsut, wall articulation evolved to the level of proto-columns, and columns will be the principal elements in the classical architectural language of the ancient Greeks and Romans discussed in coming chapters.