CHAPTER 13

The End of the Large Pyramid Construction

1. The Pyramid of King Menkaure

The successor to King Khafre was his son, King Menkaure.

Menkaure also built his pyramid at Giza. The photograph was taken near the so-called "Panorama Point," beside the queen's pyramids associated with Menkaure. Behind the three subsidiary pyramids, one can see—from left to right—the pyramids of Menkaure, Khafre, and Khufu.

This location is known as "Panorama Point" because it offers a distant view of all three pyramids.

Another reason is that, since the photograph is taken from the side of Menkaure's pyramid, Menkaure's pyramid appears visually larger than it actually is.



Fig. 13-1. The Pyramid of King Menkaure (center), photographed in September 2017

In reality, the pyramid of King Menkaure has a base length of 104.6 meters, a height of 61 meters (estimated at 65.5 meters), and an inclination angle of 51 degrees. Compared with the pyramid of King Khufu, its height is less than half, and its volume amounts to only 9 percent of Khufu's pyramid.

Menkaure was not the first to adopt a smaller pyramid after a large one. A similar reduction in scale had already occurred during the reign of King Djedefre, who succeeded Khufu.

There are several similarities between the pyramids of Djedefre and Menkaure—similarities that can hardly be dismissed as mere coincidence. Djedefre's pyramid has a base length of 106 meters, and its inclination angle is thought to have been between 48 and 52 degrees, giving an estimated height of 57 to 67 meters. Moreover, about twenty courses of granite blocks remain at the base of Djedefre's pyramid. In comparison, the lower sixteen courses of Menkaure's pyramid are faced with red granite. Thus, the two pyramids share not only similar dimensions but also the distinctive use of red granite.

The most important point is that, although Djedefre's pyramid has now lost almost all of its original form, if it had been completed, it would still have stood—only about twenty years old—when Menkaure ascended the throne. Since it lies merely 8 kilometers from Giza, its appearance would have been easily visible from the plateau.

Therefore, it seems reasonable to assume that Menkaure did not intentionally choose a uniquely small pyramid; rather, he may have taken Djedefre's pyramid as a model.

However, despite Menkaure's reign being estimated at 18 to 29 years, and thus not particularly short, the red-granite casing at the base of his pyramid remains in an unfinished state, with no cutting or polishing completed.

If one looks only at the prolonged construction process of Menkaure's pyramid, it may suggest a decline in national capacity or project management. Yet, in fact, traces of other large-scale construction works from the late Fourth Dynasty still remain.



Fig. 13-2. The Mastaba of King Shepseskaf (Lepsius, Denkmäler aus Aegypten und Aethiopien, Band I, University of Tokyo General Library, CC BY)

2. The Mastaba of King Shepseskaf

King Shepseskaf, who succeeded Menkaure, is thought to have reigned for only five years.

Yet at Saqqara there stands an enormous mastaba measuring 90 meters in length and 74 meters in width. In Lepsius's nineteenth-century sketch, most of the lower portion is still buried in sand, but today the structure has been excavated: the lowest course retains its red-granite casing, while the upper courses are believed originally to have been faced with limestone.

This two-tone combination of red granite and white limestone appears related to the color scheme of Djedefre's pyramid, a design concept that was later inherited by Menkaure's pyramid.

The question naturally arises whether a monument of this scale could truly have been built within Shepseskaf's five-year reign, and—more fundamentally—why Shepseskaf built a mastaba rather than a pyramid. These questions prompted my own reconsideration of the circumstances.

A plausible interpretation is that Shepseskaf began constructing his mastaba while Menkaure was still alive, having obtained the king's authorization to do so. If Menkaure's reign indeed extended to twenty-nine years, as maintained by the British school, then it would not

be surprising for Shepseskaf—considering his own life expectancy—to wish to begin preparing his tomb. Nor is there any compelling reason to assume that Menkaure would have refused such a request.

Why, then, did Shepseskaf choose a mastaba?

One possibility is that, although Shepseskaf was a son of Menkaure, he was a half-brother of Khuenre, and that Khuenre, as the eldest son of Queen Khamerernebty II, was regarded as the more legitimate heir.

Khuenre's name itself contains the solar deity Ra (☉), placing him in direct succession after Djedefre, Khafre, and Menkaure.

He held the titles "secretary of his father" and "father's sole companion" (Digital Giza, "Khuenre (MQ 1)," Giza Archives, Harvard University–Museum of Fine Arts Expedition). These titles are unlikely to have been given to a mere child; rather, they suggest a high-ranking prince closely involved in the king's personal and administrative affairs. Furthermore, the statue of Khuenre in the Museum of Fine Arts, Boston depicts him in the pose of a scribe, reinforcing the impression that he was not simply a young prince but a figure already entrusted with significant duties and status.

Shepseskaf, at least at the time he planned his tomb, does not appear to have considered the possibility that he might succeed Menkaure as king. Rather, he seems to have been pursuing the path of a loyal vizier serving Menkaure. Conversely, the very fact that Menkaure permitted Shepseskaf to construct a mastaba indicates that, at that moment, Menkaure himself did not regard Shepseskaf as his future successor.

Viewed in this light, Shepseskaf's choice of a mastaba is entirely reasonable. It offers a far more natural explanation than the traditional religious interpretation that sees his choice as a rejection of the solar god Ra.

What, then, of Khuenre?

If Shepseskaf was granted permission to build his large mastaba, it would not be unreasonable to assume that Khuenre was likewise granted permission to build a pyramid. Although no direct evidence survives to confirm that such authorization was given, there exists a massive

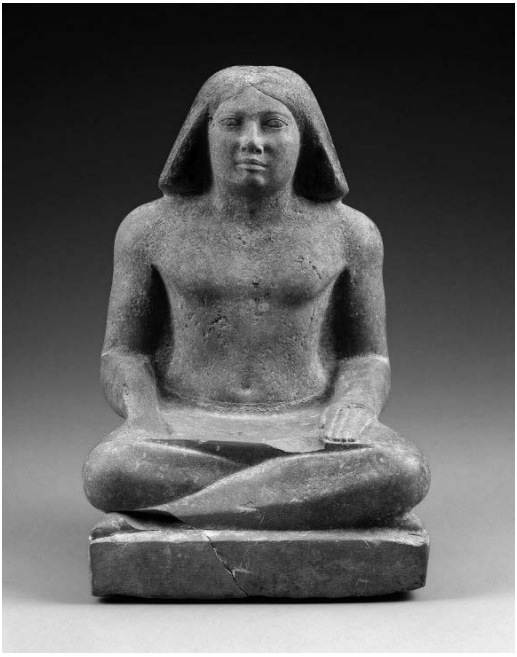

Fig. 13-3. Statue of Prince Khuenre (*Photograph © 2026 Museum of Fine Arts, Boston.)*

unfinished pyramid complex that appears to date to the very end of the Fourth Dynasty.

3. The Unfinished Pyramid at Zawiyet el-Aryan

Approximately 4 kilometers south-southeast of Khufu's pyramid at Giza lies an unfinished structure. Since 1964, the site has been enclosed within an Egyptian military zone, and entry has been prohibited; consequently, no modern archaeological investigations have been carried out.

Despite this, the monument is of extraordinary scale, and it remains enigmatic—particularly with regard to why such a structure was built at Zawiyet el-Aryan, a location that otherwise shows no clear reason for royal construction. Because recent research has been impossible, the site

is seldom discussed in detail today; yet it is a unique and indispensable monument for understanding the pyramid building tradition of the Fourth Dynasty.

The unfinished pyramid was excavated extensively between 1905 and 1912 by the Italian Egyptologist Alessandro Barsanti, then affiliated with the Cairo Museum. After his work, the site was largely abandoned. In the 1950s, however, it was used as a filming location for the American movie The Land of the Pharaohs (directed by Howard Hawks), specifically for the scene depicting the transport of a large stone sarcophagus into the burial chamber.

(As an aside, The Land of the Pharaohs is available online today. From an engineering perspective, several depictions of construction techniques in the film are questionable, yet certain elements—such as the massive mud-brick ramps and papyrus boats—are visually intriguing and worth viewing.)

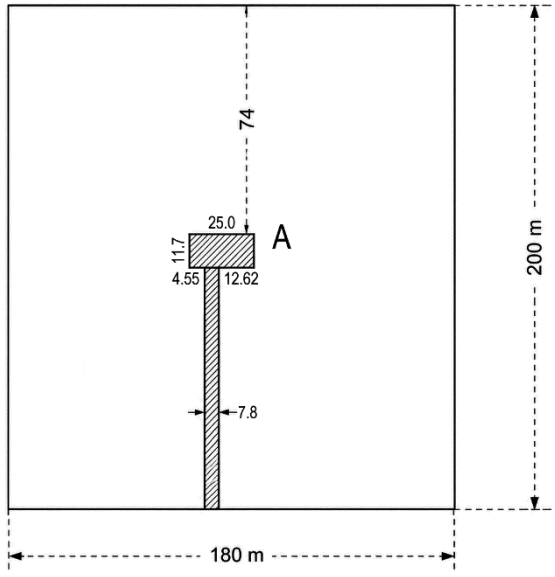

Fig. 13-4. Dimensions of the Unfinished Pyramid at Zawiyet el-Aryan (after Barsanti's plan)(Barsanti, M. Alexandre, "Fouilles de Zaouiet El-Aryan," Annales du Service des Antiquités de l'Égypte, Vol. 7, Cairo, 1906)



Fig. 13-5. Photograph of the structure viewed from direction A in Fig. 13-4 (Barsanti, M. Alexandre, "Fouilles de Zaouiet El-Aryan," Annales du Service des Antiquités de l'Égypte, Vol. 7, Cairo, 1906)

Barsanti regarded the structure as the lowest course of a gigantic pyramid measuring 200 meters north–south and 180 meters east–west, but what draws my particular attention is the enormous subterranean installation that remains.

Descending a 7.8-meter-wide sloping passage, one reaches a massive trench cut into the bedrock, measuring 21 meters in depth, 25 meters in width, and 11.7 meters in length.

This enormous trench had been backfilled with limestone blocks quarried from the site itself, and Barsanti undertook the laborious task of removing these blocks using cranes. Fig. 13-5 is likely a photograph taken during that operation.

The object shown in Fig. 13-6 is an elongated oval basin carved from granite, discovered after the removal of the limestone blocks. Although



Fig. 13-6. Photograph of the bottom of the large trench (Barsanti, M. Alexandre, "Fouilles de Zaouiet El-Aryan," Annales du Service des Antiquités de l'Égypte, Vol. 12, Cairo, 1912)

some have proposed that it functioned as a sarcophagus, there are no parallels for such a form elsewhere, and there is insufficient evidence to identify it definitively as a sarcophagus.

The shape of the enormous trench itself resembles an enlarged version of the rock-cut chamber found in Djedefre's pyramid. It is difficult to imagine that such a vast trench was intended to serve directly as a burial chamber, covered at ground level by long beams and massive ceiling stones. If the structure was meant to function as a chamber, it is more reasonable to assume that the actual chamber was smaller and that the surrounding space was backfilled. In Djedefre's pyramid, no sarcophagus has been found, nor any remains that clearly indicate a burial chamber; this suggests that the large trench there was likewise backfilled before the masonry was laid above it. Whether a subterranean chamber ever existed must therefore be considered with caution.

The trench at Djedefre's pyramid and the trench at Zawiyet el-Aryan appear to share a similar conceptual design, yet because no comparable features exist in other pyramids, their precise function remains impossible to determine.

Nevertheless, the size, form, and two-tone color scheme of Djedefre's pyramid—red granite combined with limestone—were inherited by Menkaure's pyramid. In light of this, it seems plausible that the other distinctive feature of Djedefre's monument, namely its large-scale trench structure, may also have influenced the design of the unfinished pyramid at Zawiyet el-Aryan.

Barsanti recorded the state of the trench when it was still backfilled with limestone blocks, and his drawing clearly illustrates this condition. Judging from the illustration, the larger blocks appear to measure roughly 1 meter in width, 1 meter in depth, and 4 meters in length. Their arrangement suggests that they had been dumped in later, rather than carefully placed. Yet these blocks seem originally to have been quarried from the trench itself.

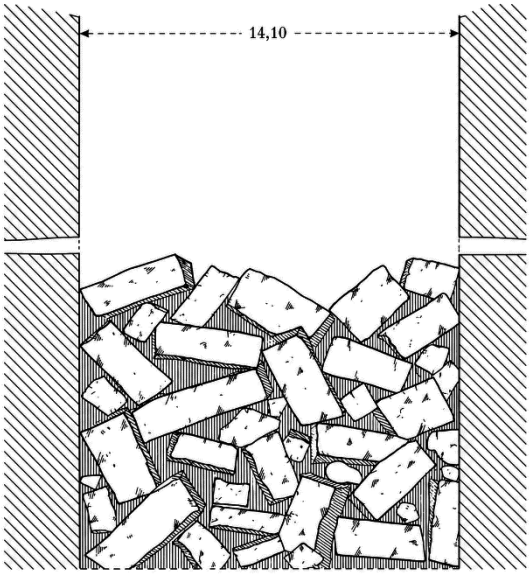

Fig. 13-7. Diagram of the trench backfilled with limestone blocks

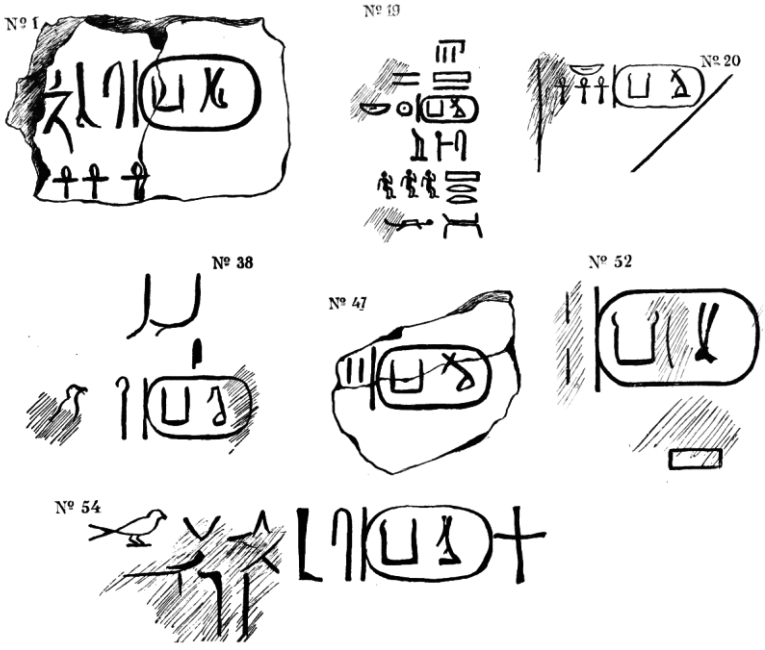

Fig. 13-8. Inscriptions found on the limestone blocks at Zawiyet el-Aryan (Barsanti, M. Alexandre, "Fouilles de Zaouiet El-Aryan," Annales du Service des Antiquités de l'Égypte, Vol. 7, Cairo, 1906)

At Zawiyet el-Aryan, several limestone blocks bearing hieratic inscriptions were found within the subterranean structure, and these were recorded by Barsanti. Although the sign 𓎛 (ka) appears consistently, the second sign varies in form, making definitive identification impossible.

However, similar inscriptions found on blocks within the stress-relieving chambers of Khufu's pyramid are not royal names per se but crew names. As I noted in Column 5 on page 150, such names may be abbreviated, and therefore not all elements of the original designation are necessarily preserved. Moreover, as seen in the two attested forms of Khufu's birth name—𓏏𓅱𓈖𓅱 and 𓄿𓆑𓏏𓅱𓈖—royal or princely birth names are not always uniform. If an abbreviated form was used, it

would be difficult to infer the full name. It is also entirely possible that ordinary crew names did not contain the sign at all.

4. Structural Transformations in the Late Fourth Dynasty

What is crucial here is that the reduction in scale during the reign of Menkaure cannot be explained simply as a "decline in national power." However, if multiple large-scale construction projects were underway simultaneously, it is entirely plausible that labor, building materials, and the bureaucratic apparatus responsible for coordinating them became dispersed. Such dispersion could easily have affected the progress of Menkaure's pyramid and mortuary temple.

Indeed, it may be more appropriate to assume that, even under Menkaure, a strong "inertial momentum" persisted within the Fourth Dynasty toward maintaining the tradition of constructing giant pyramids. This dynamic resembles the earlier "rebound" in which, after Djedefre pursued an independent architectural program at Abu Rawash, Khafre returned to Giza and revived the giant-pyramid tradition.

Even if the concept of a giant pyramid originated with Khafre himself, such a monument could not have been realized without a bureaucratic organization willing and able to support and execute it. A similar "rebound" may well have occurred during Menkaure's reign, and I propose that the enormous platform at Zawiyet el-Aryan may have been the product of this renewed momentum.

If Prince Khuenre—like his grandfather Khafre—expressed an ambition to build a large pyramid, then the bureaucratic group that had previously constructed giant pyramids would naturally have rallied around him, especially if he was regarded as the likely successor. I therefore suggest that Menkaure, at roughly the same time he permitted Shepseskaf to build a large mastaba, also granted Khuenre permission to begin constructing a pyramid. The officials experienced in giant-pyramid construction may then have mobilized for the project at Zawiyet el-Aryan.

Under such circumstances, laborers, quarrymen, stonecutters,

polishers, and overseers would have been divided among three major projects:
Menkaure's pyramid and mortuary temple,
Shepseskaf's large mastaba, and
the construction at Zawiyet el-Aryan.

For the bureaucratic elite, the project associated with Khuenre—who appeared to embody the future—may have seemed the most attractive.

As a side effect, the pace of construction on Menkaure's pyramid and mortuary temple likely slowed noticeably.

It is plausible that, during Menkaure's lifetime, Shepseskaf—concerned about the delays—took steps, with Menkaure's approval, to accelerate completion:
1. To regard the pyramid as "complete" even without polishing the red-granite casing, focusing instead on finishing the burial chamber and essential internal structures.
2. To dismantle the mud-brick ramps surrounding the pyramid and redirect those resources toward the partially built mortuary temple.

Previously, I accepted the conventional view that Shepseskaf completed the mortuary temple only after Menkaure's death. However, I now consider it more likely that Shepseskaf began this work before Menkaure's death, enabling the complex to be formally handed over to the priesthood and allowing Menkaure's funeral to be conducted properly.

Yet no trace survives of Khuenre contributing to the construction of Menkaure's pyramid or mortuary temple.

From the perspective of Menkaure and Shepseskaf, it must have been evident that one cause of the delays was the diversion of labor and resources to Zawiyet el-Aryan, where many officials had aligned themselves with Khuenre's project.

I do not claim that Khuenre fell from power as a result of conflict with the Menkaure–Shepseskaf faction. But one plausible hypothesis is that Khuenre died suddenly for unknown reasons. If so, construction at Zawiyet el-Aryan would have ceased, the administrative structure centered around him would have rapidly collapsed, and the enormous

trench may have been backfilled with limestone. Notably, Khuenre's tomb in the family cemetery of Menkaure has unfinished wall reliefs, and no sarcophagus is present.

There is no direct evidence to prove this hypothesis. Nevertheless, I believe it offers a coherent explanatory model for understanding three interconnected facts:
Shepseskaf's enormous mastaba,
the unfinished state of the Menkaure complex, and
the massive platform at Zawiyet el-Aryan.

What I emphasize here is not whether Khuenre was truly the owner of the Zawiyet el-Aryan monument. Rather, the key point is that, in the final years of Menkaure's reign, the giant-pyramid construction system that had persisted since the time of Sneferu may have undergone a profound transformation.

The bureaucratic and technical organizations that built the large pyramids of Khufu and Khafre were not mere executors of royal commands; they possessed their own institutional inertia. I propose that this inertia propelled them toward the next giant project at Zawiyet el-Aryan—only for that project to lose its purpose abruptly for reasons unknown.

As a result, during the reign of Shepseskaf, the giant-pyramid system that had existed since Sneferu was dismantled, and by the Fifth Dynasty the underlying values had fundamentally changed. When I look at the unfinished pyramid and mortuary temple of Menkaure, the great mastaba of Shepseskaf, and the immense trench at Zawiyet el-Aryan, it is hard not to feel that the end of the Fourth Dynasty marked a major turning point.

Column 6. Were the Casing Stones Truly Installed All the Way to the Summit?

The Bent Pyramid and the pyramid of King Khafre were clearly covered with casing stones up to their summits, as their present appearance demonstrates. In contrast, most other pyramids—aside from the lower courses where casing stones remain—are almost entirely bare. The six satellite pyramids at Giza are completely stripped, with no fragments of casing stones visible around them. At Dahshur, the Red Pyramid retains casing stones only near its base; according to Stadelmann's study, no upper casing stones have been found.

Pyramids are often described as having been "originally covered to the top with fine white limestone casing, later stripped and reused as building material in Cairo." Certainly, the presence of casing stones at the base of Khufu's pyramid and other large pyramids at Giza confirms that casing work was performed at least on the lower levels. Khafre's pyramid, with casing stones surviving at the summit but largely missing below, is a clear example of substantial removal.

However, I question whether this explanation can be applied uniformly to all pyramids.

First, the presence of casing stones at the base proves only that casing work began—it does not prove that it was completed to the summit. Since casing work proceeds upward from the bottom, surviving lower casing stones indicate the start of the process, not its completion. Even in modern architecture, it is common to finish only the ground level or façade with expensive stone while leaving upper levels or rear sides in simpler finishes. We should therefore be cautious about assuming that lower casing stones imply full casing to the top.

From this perspective, the casing stones of the Bent Pyramid and Khafre's pyramid appear to have served not merely as decorative cladding but as structural elements that restrained the rough core masonry and formed the outer shell of the slope. The exposed core masonry today is



Fig. C6-1. Scattered red granite blocks around the Pyramid of Menkaure (photographed in 2008)

coarse, with uneven faces (Fig. 11-3). In these pyramids, casing stones were indispensable structural components.

By contrast, the Red Pyramid and Khufu's pyramid exhibit a different construction philosophy: relatively well-shaped outer core blocks laid in horizontal courses. In this type, the core masonry itself may have formed much of the pyramid's external geometry. Although lower casing stones were certainly installed, the upper casing stones may not have been structurally essential in the same way as those of the Bent Pyramid or Khafre's pyramid.

The pyramid of King Menkaure is particularly intriguing in this context. Numerous large red-granite blocks—clearly worked stones rather than natural boulders—remain scattered around its base. The use of red-granite casing stones on the lower courses is physically evident.

Yet this raises a question: if later stone-collecting was simply motivated by the desire to obtain valuable building material, why were so many Aswan granite blocks left behind? Granite is hard and difficult to rework or transport, but its rarity and visual prominence make the large quantity

remaining puzzling—especially when contrasted with the near-absence of limestone casing stones supposedly taken from the upper levels. This disparity is difficult to explain through a simple "stone-robbery" hypothesis.

Moreover, even if Cairo required limestone, it seems more rational to quarry fresh stone at Tura and transport it overland than to strip casing stones from the Giza pyramids, haul them down the plateau, and ferry them across the Nile.

By the medieval period, the pyramids were already ancient monuments more than three thousand years old. Their casing stones would have been weathered, sand-covered, and cut to the pyramid's slope—hardly ideal for reuse. Freshly quarried limestone, unweathered and cut to required dimensions, would have been far more practical. Thus, the necessity of removing old casing stones from Giza for construction purposes is questionable.

Of course, we need not deny that some casing stones were reused. Stones that had already collapsed, stones near the base that were easy to remove, and stones from temples, causeways, pavements, and enclosure walls were likely taken. These architectural elements were close to ground level and already shaped for walls or floors, making them far easier to reuse than the sloped casing stones of the pyramid itself.

The explanation that "Cairo's buildings used pyramid casing stones" also faces a quantitative problem. The combined casing stones of the pyramids of Khufu, Khafre, and Menkaure number in the hundreds of thousands. If such a vast quantity had been removed, there must have been a correspondingly massive demand. Yet Cairo today does not contain structures that visibly incorporate such an enormous volume of pyramid limestone. If we adopt the stone-robbery hypothesis, we must ask specifically: where, how much, and in what manner were these stones consumed?

One of the reasons I proposed in Chapter 11 the hypothesis that Khafre's builders may have dismantled and reused portions of Khufu's casing stones—together with the mudbrick ramps surrounding the

monument—was my longstanding doubt that the enormous quantity of Khufu's casing stones can be adequately explained by the conventional view that they were simply reused in Cairo during the medieval period.

The real issue is whether the absence of casing stones today should be immediately interpreted as "the completed casing was later stripped." If casing stones were removed on a large scale, it would have constituted a major demolition project. We would expect to find traces of removal: detachment scars, impact marks, re-cutting traces, accumulations of debris, temporary stockpiles, and transport routes. If large quantities of casing stones had collapsed, unusable fragments and chips should also remain.

In fact, for the Red Pyramid at Dahshur, it seems more plausible that casing stones were reused in nearby Fifth-Dynasty pyramid complexes rather than transported all the way to Cairo. Existing temples, causeways, pavements, and enclosure walls—or collapsed casing stones—would have been convenient sources of material for later construction in the vicinity.

Thus, the question is not "whether reuse occurred," but "what was reused, from where, to where, and in what quantity." Before assuming that upper casing stones were removed wholesale from the pyramid body, we must distinguish between reuse of nearby architectural materials and reuse in distant construction.

I am not asserting here that "the upper casing stones were never installed." Old observation records, surviving stones, scattered fragments, and the condition of the outer core masonry must be examined individually. However, the traditional explanation—that all pyramids were fully cased to the summit and that the missing casing stones were uniformly stripped in later periods—deserves careful reconsideration.

At minimum, discussions of casing-stone loss must examine not only the presence or absence of casing stones but also the physical traces of their removal. The Bent Pyramid and Khafre's pyramid, where casing stones formed a structural outer shell, differ fundamentally from the Red Pyramid and Khufu's pyramid, where shaped outer core blocks were laid horizontally. The meaning of upper casing stones may have varied

between these types.

In the future, if possible, I hope that detailed on-site investigations will be conducted for each pyramid to determine how high the casing stones were actually installed and what evidence exists—if any—of large-scale stone-removal operations.