CHAPTER 12

Considerations on the Two Passageways of Khafre's Pyramid

1. The Two Passageways

The passage extending from point C to point D in Fig. 11-6 was likely constructed progressively as the pyramid's masonry rose. In other words, access between the ground level and point C must have been maintained throughout construction, meaning that movement to and from C would have posed no difficulty

At this point, however, I encountered a new question: For what purpose was the ascending passage from B to the horizontal passage at C constructed?

Although many researchers have noted the existence of the two passageways and have proposed explanations for their apparent inconsistency, none of these arguments seemed sufficiently convincing to me. Khafre's pyramid exhibits rational design choices in many respects, making the seeming irrationality of the dual-passage system particularly striking.

While surveying various sources, I came across the account of Giovanni Battista Belzoni, the first explorer to reach Khafre's burial chamber.

By 1818, when Belzoni began searching for the entrance to Khafre's pyramid, both the official and the robber's entrances of Khufu's pyramid were already known. Belzoni therefore examined the central axis of the northern face of Khafre's pyramid, and—knowing that Khufu's entrance lies slightly east of the axis—he also investigated that area. He removed the debris covering the pyramid's face until much of the masonry was

exposed. After more than two weeks, he discovered a robber's tunnel, but it was dangerously unstable, and he abandoned excavation. He failed to locate the true entrance.

Belzoni wrote that "recent disappointments had made me obstinate," and he resolved to continue. Eventually, he discovered the entrance to the descending passage (A). He notes that the workers assisting him had begun calling him a "madman."

Removing large granite blocks and debris from the passage, and lifting a fallen portcullis stone just enough to crawl beneath it, Belzoni finally reached the burial chamber (C) on 2 March 1818. The chamber, however, was empty.

Belzoni had noticed the upper passage while traveling from the descending passage toward the burial chamber, but his priority was to reach the chamber itself. Only afterward did he begin clearing debris from the ascending passage from within the pyramid. The passage had a slope of 26 degrees. Through this work, he discovered that a second passageway existed above the descending one.

Belzoni's account states that after excavating the upper passage from the inside, he reached what he identified as the second entrance (D). It is unclear whether he broke through to the exterior solely from within, or whether he and his team also excavated from the outside based on predicted alignment. Belzoni was conducting measurements and calculations during excavation, so he likely understood where the upper passage would emerge on the pyramid's face.

In summary: Belzoni initially failed to locate D. After various attempts, he discovered A. He then reached the burial chamber at C, identified the ascending passage, cleared it from within, and eventually reached the northern face at D—realizing only then that this was the original entrance. The fact that D was discovered from the inside is crucial.

Another point of interest is the condition of the masonry near D in Petrie's sectional drawing. The area above the passage is heavily hollowed out, and the lower portion is filled with debris.

In Fig.12-1, the area around the entrance (the vertical opening at F) is

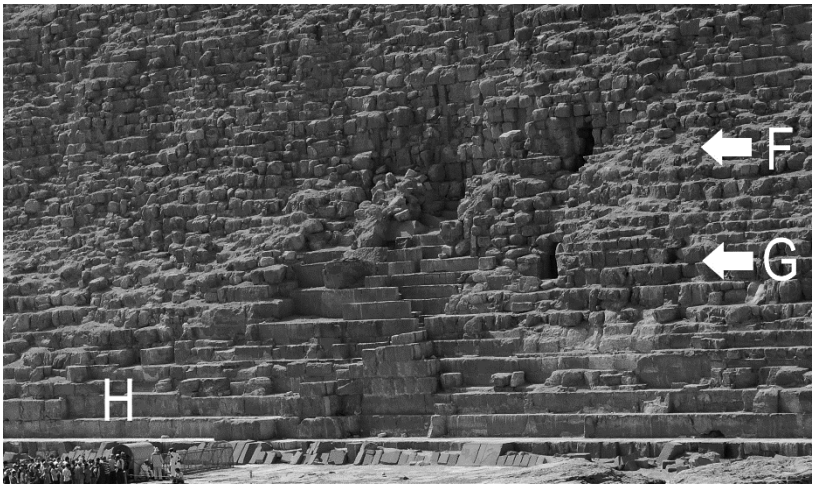

Fig. 12-1. Collapsed area near the entrance of Khafre's pyramid.

significantly hollowed out. Such damage is often attributed to tomb robbers, but I questioned this assumption. Robbers excavated from below (point G), so it is difficult to attribute the upper hollowed-out area to their activity.

The group of tourists visible at H marks the entrance to the descending passage.

Comparing Fig. 12-1 with Belzoni's account led me to a hypothesis: The original entrance at D in Fig. 11-6 may have collapsed during Khafre's lifetime, sustaining irreparable damage. To ensure the king's burial, the builders may have excavated the passage from B to C, thereby restoring access from A to C.

This may seem speculative, but it provides a clear rationale for the otherwise puzzling ascending passage from B to C.

2. Examining the Possibility of Collapse in the Upper Passage

The possibility that the northern entrance passage collapsed is not discussed in mainstream scholarship. Yet I found no source that explicitly rejects the possibility either. It appears that the question has simply not

been considered.

Belzoni wrote that the upper passage was completely blocked with stones when viewed from the inside. The floor may have remained intact, allowing him to follow it outward.

Belzoni clearly states that the descending passage (A) had a granite portcullis, which he broke through. In contrast, the upper passage contained only stones of various sizes; he notes that the portcullis stone had been removed.

If the entrance at D had been intentionally sealed after completion and concealed, one would expect Belzoni to have encountered a granite portcullis. The absence of such a feature suggests a different security design—or perhaps that the entrance had collapsed naturally.

In Khufu's pyramid, the passages leading to the burial chamber—excluding the Grand Gallery—are 1.05 m wide and 1–1.2 m high, with flat ceilings. Khafre's passages follow essentially the same construction method.

However, the entrances differ dramatically. Khufu's entrance is protected by two massive gabled ceiling blocks, still intact today.

Khafre's entrance, by contrast, is severely damaged and resembles a

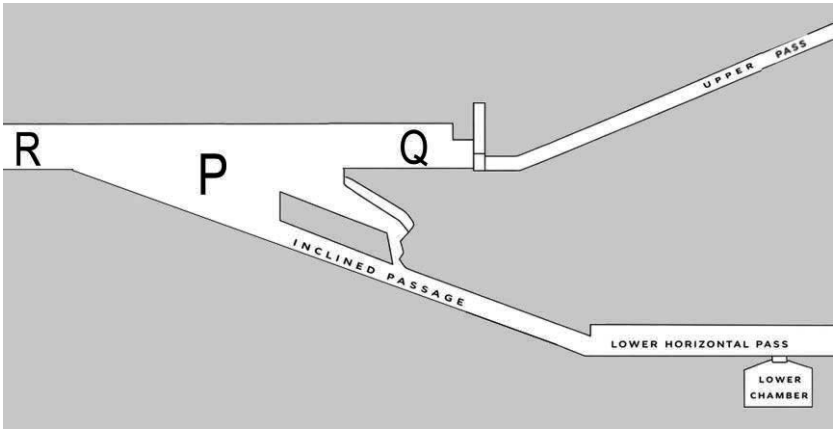

Fig. 12-2. Enlarged diagram of the two passageways of the Pyramid of King Khafre (traced from Perring's structural drawing).

robber's tunnel. No gabled structure is visible. I examined the literature for evidence of a gabled entrance in Khafre's pyramid. If such a structure—comparable to Khufu's—had existed, it would almost certainly have been documented. No such record exists. This suggests that even if a gabled structure once existed, it was far less substantial than that of Khufu's pyramid.

Next, I re-examined the junction between the descending passage and the upper passage using the diagrams. The explanation here follows Perring's original drawing.

Fig. 12-2 is a traced version of Perring's diagram, representing the conditions at the time of his survey (the robber's tunnel is omitted). One point that requires particular attention is the space marked P in Fig. 12-2. Although P appears to be a wide area in the sectional drawing, its actual width is only slightly more than one meter. In other words, it is not a space where ascending and descending traffic could run parallel to each other, like the up-and-down escalators in a department store. Even though the two passages meet at this point, the space could function as only one passage at a time.

This point strongly contradicts the idea that the upper passage connecting Q and R was still in use when the builders excavated

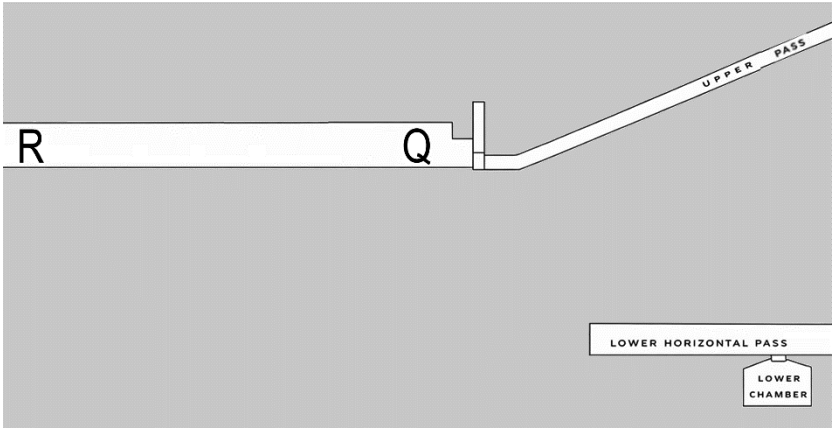

Fig. 12-3. Reconstruction illustrating the upper passageway as it may have appeared when it served as the primary entrance.

downward at P in order to link it with the descending passage.

The moment the area at P was cut downward, the passage at Q would have ceased to function entirely. In other words, the geometry of the junction makes it impossible for both passages to have operated simultaneously during such an excavation.

Fig. 12-3 presents a reconstruction of the situation when the upper passage served as the formal, primary route to the burial chamber. The fact that the ceiling height of the passage at points Q and R is identical strongly suggests that this corridor originally formed a single, continuous passage. In contrast, the descending passage was abandoned after only a short extension beyond the subterranean chamber, once the design of the burial chamber was altered to a location near the bedrock surface. As a result, the descending passage became a dead end and construction was halted.

Fig. 12-4 illustrates the situation after the upper passage had become blocked, prompting the initiation of an emergency excavation of an upward-sloping shaft. From the ceiling of this shaft, a vertical probe was then cut upward, apparently to verify the positional relationship between the shaft and the horizontal passage connecting Q and R. Maragioglio and Rinaldi note that this vertical shaft is finished in a very rough manner,

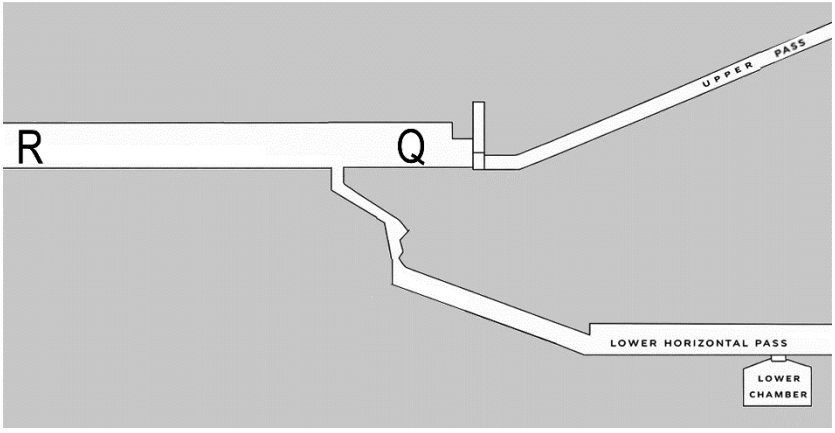

Fig. 12-4. Reconstruction illustrating the beginning of the extension work on the descending passage.

and its form clearly indicates that it was never intended as a formal passage. It is difficult to interpret it as anything other than a test shaft excavated to determine whether reconnection with the upper passage was possible.

Once the test excavation confirmed that the horizontal passage lay directly above the descending passage, the probe shaft was likely enlarged. Fig. 12-5 shows the state of this upward-cut opening after expansion. At this stage, I believe the enlargement was intended to create sufficient working space for clearing the collapsed upper passage from the inside, much as Belzoni later excavated it from within. Such an operation would have required bringing a considerable number of workers and tools into the area around point Q, and the expansion of the opening appears to have been designed to accommodate that need.

However, this attempt at restoration appears to have failed. Once the effort to reopen the upper passage was abandoned, the area marked S in Fig. 12-5 was excavated, and the descending passage was extended toward the burial chamber. This work ultimately produced the present configuration shown in Fig. 12-2.

Thus, although it is reasonable to explain the situation by assuming that the upper passage was constructed first and later became unusable—

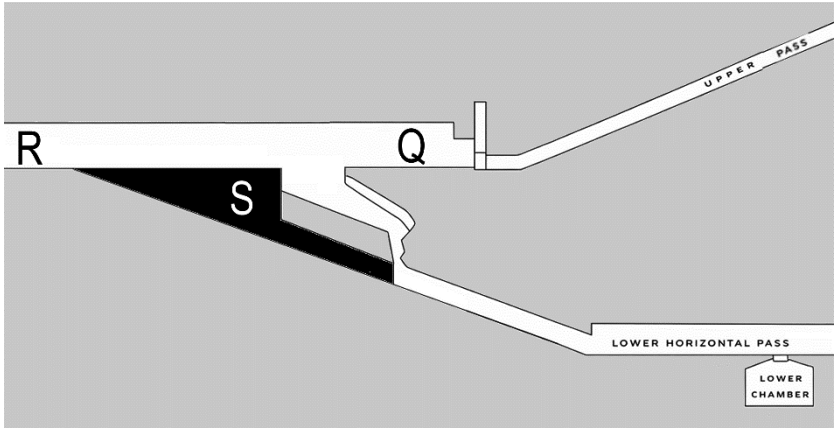

Fig. 12-5. Expansion of the opening connecting the descending passage to the upper passage.

necessitating the extension of the descending passage to reach the burial chamber—it is far more difficult to imagine the opposite sequence: that the descending passage originally reached the chamber and that the upper passage was subsequently connected to it.

Considering the manner in which the two passages join, the apparent lack of a robust gabled entrance structure comparable to that of Khufu's pyramid, and Belzoni's descriptions of the blocked upper passage, it is most plausible that the original entrance collapsed, rendering the upper passage unusable.

3. Considerations on the Impact of the Entrance Collapse

The differences in design philosophy between the internal structures of Khufu's pyramid and Khafre's pyramid have been noted several times already. The seemingly excessive measures taken in Khufu's pyramid to manage vertical and lateral loads were, in Khafre's pyramid, reduced to a far more rational and economical system. The superior precision of Khufu's masonry is one example of this contrast: Khufu's project appears to have implemented every conceivable safety measure, not through selective reasoning but by executing all possible precautions.

For the engineering team that had constructed the Red Pyramid with its extremely safe 43-degree slope, the specifications demanded for Khufu's pyramid—52 degrees and a design height of 146 meters—must have seemed extraordinarily severe. Their response included relocating the project to Giza, conducting extensive bedrock surveys, and developing multiple load-distribution systems, while also insisting on high precision in stone cutting.

In Khafre's pyramid, by contrast, the design philosophy rested on confidence in the strength and stability of the bedrock. Structural simplicity was regarded as the optimal solution. The builders appear to have judged, with sober realism, that certain theoretically beneficial measures—such as extreme precision in stone cutting—were not essential, and that practical, on-site adjustments would suffice. In modern

terms, this could be described as rationalization through the elimination of over-quality. However, no surviving evidence confirms how simplified the entrance structure of Khafre's pyramid actually was, nor can we determine the precise cause of its collapse. What is clear is that the entrance was the only part of the pyramid that appears structurally vulnerable.

If the entrance collapsed, preventing access to the interior, the king could not be buried—a catastrophic situation during Khafre's reign. Such an accident would have made it impossible to continue construction as planned. Consequently, the builders likely undertook excavation from the already obsolete descending passage, extending it until it connected with the burial chamber.

For the engineering team, the accident must have been a highly visible and dramatic failure, one that damaged their authority and credibility. I wish to emphasize that this failure was not the result of negligence or complacency, but rather the unintended consequence of a rationalized design—one that had eliminated certain redundancies and thus exposed a critical weakness.

From a modern perspective, such an event might be expected to undermine royal authority and become a political issue. However, I believe this was unlikely in Khafre's time. The king possessed transcendent authority as a divine figure, and the notion of political accountability is difficult to apply within an absolutist system.

The timing of this "entrance-collapse accident" remains uncertain. If it occurred during the middle phase of pyramid construction—while the masonry was still being laid—the work would have been temporarily halted. However, the extension of the descending passage and the resumption of construction could have proceeded in parallel, and the pyramid would ultimately have been completed. This is because the excavation of the descending passage and the continuation of masonry work could be carried out simultaneously.

By contrast, if the accident occurred near the end of construction—during the final stages of dressing the casing stones, when the removal of

the construction ramps was nearly complete—the consequences may have been far more serious. At such a late stage, the collapse of the entrance would have disrupted not only access to the interior but also the final operations required to finish the pyramid, potentially imposing severe delays and forcing major revisions to the burial arrangements.