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ABSTRACT

Careful examination of the "Pit" in the Great Pyramid of Khufu on the Giza plateau reveals that this subterranean chamber is not unfinished or abandoned as has been suggested by many observers. The walls and ceiling are smooth, and the floor, which at a glance looks rough and unstructured, actually is carved into a very pronounced and certainly meaningful form. A survey of the historical literature shows that only a few scholars, primarily those interested in esoteric material, have regarded the underground room as important and potentially revealing. Based on this literature and on direct observation, a speculative interpretation is developed to suggest that the sculpted floor may be a symbolic map of the Egyptian world of 4500 years ago. A FieldREG recording of the sort that is often correlated with anomalous effects of consciousness displays a significant response in this chamber, adding to the factors that should stimulate an incisive, expert assessment of the subterranean chamber and its probable function for the ancient Egyptians who built it.

Introduction

The legacy of the ancient Egyptians is tremendous in scope and richness, but the millennia separating their works from our appreciation of them have brought both the ravages of time and shifts of consciousness to obscure the meaning of even the best known of their monuments, the major pyramids. Among the tantalizing mysteries associated with the awesome buildings of the early dynasties are the striking variations in the degree of local finish in the chambers and passages within a given structure, such as the Great Pyramid of Khufu. For example, although traditional archaeology and current guide books give short shrift to the great subterranean chamber in Khufu as "unfinished," (1-6) this interpretation is an impression drawn by early investigators, confronting difficult conditions, that may have been accepted too readily by their successors. It seems unlikely that there would be an incomplete chamber left in the fundament of a building that probably absorbed the labors of 100,000 people over a period of 20 years or more (1). A better understanding of the character and function of this unique room, usually referred to as the "Pit," may contribute to a fuller and more representative interpretation of the functions of Khufu's pyramid.

The room was visited as one of a number of sites, including the interior chambers of the Khufu, Khafre, and other pyramids, designated for "FieldREG" recordings in a study of anomalous correlations between the output of random event generators and certain environmental conditions. This project is detailed in a separate report (7), and the general topic is examined in Nelson, et al (8). We will return to a short discussion of the FieldREG recordings made in the Pit after a fuller description of the archaeological context. The primary purpose of this report is to suggest that a re-examination of this interesting room may be of considerable value for interpretation of the Khufu pyramid and its contemporaries.

Specifically, there are consistent indications that the subterranean chamber, whose uneven "floor" is in some places less than a meter from the smooth, level ceiling, is not incomplete, but instead may be a carefully designed and constructed space containing a symbolic map of the world of the ancient Egyptians. The descending shaft that some regard as a purposefully designed and exquisitely finished instrument for precise alignment of the building on the north pole (9) leads directly from the pyramid's main entrance to the great underground chamber deep in the bedrock. The care and precision evident in the whole length of the descending corridor suggests that the room to which it gives access was indeed functional and supremely important to the people who built it.

The Historical Record

The exploration and interpretation of the Great Pyramid has an interesting history, as Tompkins documents in his thorough treatment (6). Until recently, the dominant impression among scholars was that the pyramids were built as tombs. This interpretation continues to be widely held, but in addition to challenges from esoteric sources, there is an increasingly well-supported academic and scientific case for purposes that include religious ritual as well as proto-scientific applications. Bindel says (10, pg 68), "We should not place too strong and one-sided an emphasis on the concept of the grave in our interpretation of the pyramids. The influence of these buildings was indeed also intended for the living, ..."

A broad range of scholarly documents as well as modern surveys and tour guides regard the Pit as simply an unfinished chamber (1-6, 9). More exotic purposes are described only in the esoteric literature. For example, Palmer gives an account of rites of passage comprising three days of fasting in the dark and increasingly airless Pit prior to initiatory ceremonies in the king's chamber (11, pg 138). On the mundane level, there are only occasional suggestions that there might have been a purpose for the Pit, as in Tompkins' report of a theory that the descending passage was left open and the Pit unfinished to lead grave robbers to the conclusion that no king had been buried in the pyramid (6, pg 242).

Unfortunately, there is almost nothing other than the structure itself to indicate directly the designers' intentions. We have fragmentary reports from early visitors such as Herodotus and Strabo, but they were already separated by two thousand years from the ancient Egyptians who built the pyramids. And later writers dispute their accuracy: Baedeker calls Herodotus' report that the subterranean chamber was built on an island surrounded by a canal from the Nile "erroneous, as the chamber lies above the highest level of the overflow of the river, and ... no channel from the river leads in this direction" (2, pg 358).

Extensive, progressively more scientific and accurate descriptions of the pyramids appeared early in the last century, but little attention was given to the Khufu Pit. The descending shaft was cleared by Caviglia in the 1830's, but filled up with debris again until Petrie opened it 50 years later. Neither of these investigators was much impressed by the Pit. The eminent scholar Petrie wrote, "... the great subterranean chamber in the rock was abandoned before it was cut out" (4, pg 41). In the much more recent Knopf Guide to Egypt, we still find the same message: "A descending gallery leads from the entrance of the pyramid to an unfinished underground chamber hewn out of the living rock of the plateau" (3, pg 336). This same guide states rather vehemently that "an Egyptian pyramid is nothing more than a tomb, in spite of what

may have been or may be said by these lovers of false mysteries, the so-called 'pyramidologists' and the adherents of a similar bogus form of Egyptology" (3, pg 335).

The 1895 Baedeker guide to Lower Egypt has an extensive description of the dimensions and measurements, even though the guide says the subterranean chambers were not accessible at that time. A more professional description can be found in a book on the pyramids by I.E.S. Edwards, Keeper of Egyptian Antiquities of the British Museum until retirement in 1974 (1). It is not clear that Edwards actually visited the subterranean chamber himself. His description differs from Baedeker's in detail, and again concerns itself primarily with measurements. Edwards notes that, "The chamber also is unfinished, its trenched floor and rough walls resembling a quarry. A square pit sunk in the floor may represent the first stage in an unfulfilled project for deepening the chamber." Edwards also mentions an opening in the south wall of the chamber to a roughly hewn blind passage, and suggests that there might have been a planned second chamber beyond the first, in an arrangement paralleling the northern stone pyramid at Dahshur, constructed by Khufu's predecessor Sneferu. He says that the subterranean chamber is situated south of a point directly under the apex of the pyramid. Figure 1 is an artistic rendering of the room, including a figure to provide a sense of scale, adapted from Edwards, who attributes the original sketch to E. W. Lane.

Perhaps the most authoritative description, in most respects parallel to Edwards', is by the current head of the German Archaeological Institute in Cairo, Rainer Stadelmann (5), who is somewhat equivocal in his interpretation of the chamber's status: "The bedrock chamber clearly remains in an unfinished condition, but this does not indicate with absolute certainty that it was abandoned. It measures 27' 5" in the north-south width, 46' 2" in the east-west length, and is a maximum of 16' 6" high, whereby the ceiling is smooth, but the substratum on the other hand has been left very uneven and progressively higher toward the west."

Figure 2 is adapted from Stadelmann, who attributes it to Maragioglio and Rinaldi. It shows the position and relationship of the various interior chambers of the Khufu pyramid, and visualizes, roughly, the shape he describes for the underground chamber. The sketch at "a" indicates the location of the Pit, labeled "F," relative to the whole pyramid. At "b" and "c" the Pit is shown from the east and the south sides, respectively. Stadelmann goes on to say, "The bedrock chamber cannot have been intended as a tomb since a) there are no security measures at its entrance, b) the planned tunnel toward the south indicates it was a sort of vestibule c) no sarcophagus could have been brought in through the corridor." Stadelmann also gives dimensions

for the descending passage and other features associated with the Pit that are in general agreement with Edwards: The entrance is 23' 10" east of the center on the north side, and the shaft is 3' 7" wide, 3' 11" high and slopes downward at an angle of 26 °, 34' 23". It passes 111' 6" through the masonry pyramid, then 229' 3" through bedrock for a total length of 345' 7" with the last, level part a corridor 29' 3" in length. The bedrock chamber lies 98' 5" beneath the level of the plateau. There is a blind corridor continuing southward from the southeast corner for a distance of 53' 10", and a hole in the eastern floor that was originally 6' 7" deep but made deeper by Perring to 36' (sic). Stadelmann believes the first part of this hole also was dug by relatively recent (spätzeitlicher) treasure hunters.

Direct Observation

The author's visit to the chamber was unconditioned by extensive academic research or expectations. It was only about an hour long, and was originally not intended as an academic investigation of the physical aspects of the room, although it was included among the "sacred sites" defined for an investigation of anomalous influences on random event generators (7, 8). However, the visit came to be dominated by the impression that the room had been built to serve an important purpose, because there is well-defined structure apparent in this "unfinished" room. All the dimensions given in the following description, written shortly after the visit, are estimates, since no measuring tools were at hand.

The entrance to the chamber is through the short horizontal part of the descending corridor. This is slightly smaller than the main shaft, and has smooth walls and ceiling but a floor carved into a cobblestone-like pattern; it is so low that it cannot be traversed except by crawling on hands and knees. In the large, main chamber, both the walls and the ceiling are also smooth and planar; only the floor is rough and could be interpreted as unfinished or abandoned. Near the entrance, at the eastern end, the ceiling is approximately 12' above the floor, but this height extends only about 15' toward the west, while in the rest of the room the floor is raised to differing levels. At the western end in the middle, the ceiling is slightly less than 6' above the rough floor, and to the sides the irregularly raised floor comes to within 2' or 3' of the ceiling. It is mystifying but instructive that a small antechamber off the entrance corridor has a smooth floor and a rough-cut ceiling, in distinct contrast to the relationship in the main chamber. Figure 3 is a sketch from memory of the floor plan of the great subterranean chamber as it appeared to the author. The legend gives the author's speculative interpretations of various features.

Figures 4a and 4b are adapted from Lemesurier (12), who attributes them to Adam Rutherford (13). While the details differ from Figure 3, there is considerable correspondence in the general layout of the floor in the perspective (4a) and plan views (4b, bottom). The elevation view (4b, top) also represents the author's direct observations reasonably well. Figure 5 is a photograph by Charles Overby, taken in 1993, but not intended as documentation. Although it includes only a small part of the room, it clearly shows the structured carving of the "throne" adjacent to the "Nile," consistent with the hypothesized mapping of the ancient Egyptian world, and lending credence to the thesis that the Pit is not an unfinished, abandoned room.

The following is a personalized description of the author's experience, based on notes written shortly after the visit. It may help to convey the rather direct impression of purpose and function that is suggested by the structure of the sculpted floor:

> In our second visit to the Khufu pyramid, while the rest of the group went to the Queen's and King's chambers, I went by myself to the "Pit." I definitely wanted to see the room, and wanted also to fulfill my plan to record FieldREG data in all the interior chambers. I first looked around the entrance end of the room, and explored the deep hole and the rough tunnel opposite the entrance. I spent some time in a meditation that rather naturally was colored by thoughts of possible rituals that might have been performed here thousands of years earlier. Then I climbed up into the rougher area toward the western part of the room, following what appeared to be a path down the middle, and, still in a quiet, meditative state, I took some time to survey the whole domain.
>
> Standing at the center of the the back wall, where the finished ceiling was just inches above my head, I suddenly discovered myself at the edge of the known world, near the unknown, unexplored sources of the Nile. What had appeared to be a rough path hacked crudely down the middle of the room, I could now see as the great river, symbolized by channels a handbreadth wide on either side of rounded, symbolic islands. Extending perhaps two meters to each side, slightly roughened flat areas represented the land of the people, watered and fertilized by the Nile in its annual floods. Beyond these livable plains, I could see the symbolic land rising a meter or more, with protrusions and notches representing the low mountains bounding the green earth and separating it from the arid deserts of sunrise and sunset.
>
> From this perspective I could see the symbolic Nile drop lower as it flowed toward the delta and the sea. On the the left side (the "west bank") of the sculptured delta there were curious steps and structures, and on the right

> side, located appropriately to correspond with the seat of the pharaohs in Memphis, I could see a throne with a footrest, oriented to look out across and beyond the delta. Finally, the Nile and the complex, roughly patterned land on either side gave way to the flat expanse of the Mediterranean Sea.

Within the space representing the "sea" is a deeper, terraced hole, whose meaning within this map of the world is completely obscure. Conceivably it might also be symbolic, representing, for example, the mystery of the sea with its unplumbed depths, but its lack of clear function within this generally consistent interpretation of the room should be taken as a spur to further investigation. As noted earlier, Stadelmann suggests that some or all of this hole may have been dug at a later time by treasure seekers.

FieldREG Results

The principal reason for visiting the Pit was to record data for a study of the influence of special environments on the output of a random event generator (REG). For such experiments a miniaturized, electronic source providing a sequence of truly random numbers is connected to a palmtop computer that records and indexes the sequence. Whereas the expectation for such a system is a random walk exhibiting complete unpredictability and independence of the data points, previous work has suggested that the data may take on a trend in the presence of groups of people engaged in meaningful common purposes, especially in environments that are supportive of or conducive to their effort (7, 8). In particular, deep involvement in activities with a high level of intersubjectivity (shared emotional and cognitive experience) such as ceremonies and rituals, appears to be correlated with significant departures from expectation in the REG data. The effect is apparently enhanced by an appropriate environment, including such places as the temples and pyramid chambers of the ancient Egyptian culture, leading to the question whether data taken in a special site might exhibit anomalous deviations even without the group activity.

The technology for measurement of these hypothesized effects is new, and the experimental protocols are still evolving. However, they already provide a rigorous, objective indicator for certain otherwise ineffable interactions of human consciousness. The FieldREG system may similarly provide an objective measure of the influence of a special place such as a temple, either indirectly via effects on human consciousness or directly on the device. For example, very large numbers of people, in all world cultures, regard certain sites as literally sacred. They believe that such places have intrinsic special qualities and that they retain residues of worship and ritual investment.

Other than descriptive and taxonomic records, there is no scientific work attempting to determine whether there is any substance to these ideas, but given their generality and longevity, a scientific assessment is justified.

The data generated during the visit to the Subterranean Chamber are quite interesting in this context. Table 1 shows the data, which were taken in five distinct segments, identified in the onsite notes and in the index of the computer database. The table includes the date and the beginning and ending times for the segment, a short description of the author's activity, the number of 200-bit trials, and the Z-score for that segment.

Table 1: FieldREG Data from the Khufu Subterranean Chamber

Date	Begin	End	Description	No.Trials	Z	Z^2
Oct 18	22:05	22:15	Entrance, Descending Passage	671	2.555	6.528
Oct 18	22:15	22:47	Pit Meditation Rituals	2308	-1.460	2.132
Oct 18	22:47	23:00	Pit General Exploration	1015	-0.821	0.674
Oct 18	23:00	23:08	Pit Nile and World Map	638	1.943	3.775
Oct 18	23:08	23:25	Back to Ancient Entrance	1251	-1.180	1.392

The last column of the table shows the squared Z-score, a χ^2 distributed quantity, for each segment. Summing these, we have a result which can be tested against the expectation for χ^2, yielding an estimate of the likelihood that the deviations are chance fluctuations. The result is $\chi_2 = 14.501$, with 5 degrees of freedom, and a corresponding probability of $p = 0.013$. Thus, the REG data show an anomalous deviation with a chance likelihood of about one part in 100, correlated with the visit to the Subterranean Chamber. Though it is unlikely to be a chance fluctuation, especially given the background of related research (7, 8), it is not possible at this point to determine whether the apparent effect is due to the environment or some influence of the author, or from a combination of these sources. In any case, it is an indication, via an objective measurement, that the Khufu Pit is an extraordinary site. In the context of FieldREG research with similar results, conducted in other places that are acknowledged to be ancient "sacred sites," we can argue reasonably that the Pit may also have been built for similar purposes.

Discussion

The Subterranean Chamber of Khufu certainly deserves further expert scrutiny. From the simple perspective of historical archaeology, there is good reason to believe that the long-held idea that the chamber was unfinished and abandoned is wrong. A better understanding of its purpose and function can be achieved through specific investigations that should be revealing, whether or not they sustain the suggestion of this paper that the room was built as a ritual site and contains a representation of the builders' world.

The existence or purpose of such a symbolic map of Egypt is not described in the ancient records as currently interpreted, but scholars of the original texts might well discover relevant references given an assessment oriented to this question. The gulf of time separating us from the pyramid builders makes interpretation difficult and subjective, and vulnerable to shaping by personal notions and theories. It is nevertheless of some value to reconsider conventional descriptions and interpretations of the limited evidence, such as an example drawn from Herodotus' *Histories*, written in the middle of the fifth century B. C. (14).

In an interesting passage, Baedeker quotes Herodotus as saying "the subterranean chamber planned by Cheops for the reception of his body lay on a kind of island, surrounded by a canal which was conducted hither from the Nile." (Baedeker, pg 358. He mentions "page 344" in Herodotus, but does not supply a full reference.) Stadelmann (7) calls this material an invention of the people of Herodotus' era based on their impression of the Osirian tombs of then relatively recent times, which he says were unrelated to the pyramid tombs. His rendition, in German, of the same passage (pg 114), translates to a slightly different description: "This [report] tells us, namely, that deep beneath the Pyramid a vault was erected that was encircled by an underground Nile channel. Thereupon lay the corpse of Cheops." When we examine directly *The Histories* as translated by de Sélincourt (14), there are two relevant passages: "To build [the causeway] took, as I said, ten years -- including the underground sepulchral chambers on the hill where the pyramids stand; a cut was made from the Nile, so that the water from it turned the site of these into an island" (pg 179). "[Chephren's pyramid] has no underground chambers, and no channel was dug, as in the case of Cheops' pyramid, to bring to it the water from the Nile. The cutting of this canal, as I have already said, makes the site of the pyramid of Cheops into an island, and there his body is supposed to be" (pg 180).

Given the numerous translations and retransmissions in the 2000 years leading up to Herodotus' sources (who presumably spoke Greek, for Herodotus appears not to have been multilingual) and thence to contemporary readings of *The Histories*, it is not

unreasonable to suspect that the original meaning may have been distorted. It is, to give a convenient hypothetical example, entirely possible that Herodotus was told by his Egyptian hosts that the subterranean chamber had a sculpted floor with model islands surrounded by symbolic channels intended to bring the spirit of the Nile into the chamber. Of course, any reinterpretation, however reasonable and well-suited to present purposes, is at this juncture merely speculation, but it is clearly possible to construct a more persuasive interpretation than that attributed to Herodotus by more recent authors.

Conclusion

If it is possible to establish its credibility, the "ritual map" interpretation can help to understand the great investment of the pyramid builders in the subterranean Pit. This chamber, whether or not we accept the hypothesis that it contains an abstraction of the Nile and the world, is certain to have been of tremendous importance, for it was created with huge effort deep in the living stone of the Giza plateau, directly centered under the great pyramid at the end of a long, precisely built sighting shaft used to align this extraordinary monument in relation to the cosmos. The evidence developed in this paper is intended as a stimulus to experts who can undertake a disciplined and thorough investigation of the Khufu Pit.

In speculation, this room can be seen as a ritual chamber in which a high priest, possibly the pharaoh, would pray for and ritually generate the future of the world for which he was responsible. Again taking literary license to envision a possible ancient scene, we see the priest entering the room on hands and knees. Traversing the bumpy floor of the constricted, level part of the descending shaft, he would come in humility to ask for help from the gods. If he was the pharaoh or represented him, he would know that the gods give birth to the morning sun and take it again in the evening death, and he would know that they pour out the waters of the Nile in floods that deposit the living and life-giving black earth. He would understand that his role was to act as a god, and in ritual practices fostered by this symbolic domain, he would raise the sun, deliver the flood, and accept the death that is the beginning of new life.

The physical evidence embodied in the sculpted floor of the room, and the separate evidence based on the random event generator technology, both indicate that scholarly attention to the Subterranean Chamber is justified. The return from an investment in such research is likely to be an improved understanding of the pyramids in general, and a deeper insight into the culture of the ancient Egyptians.

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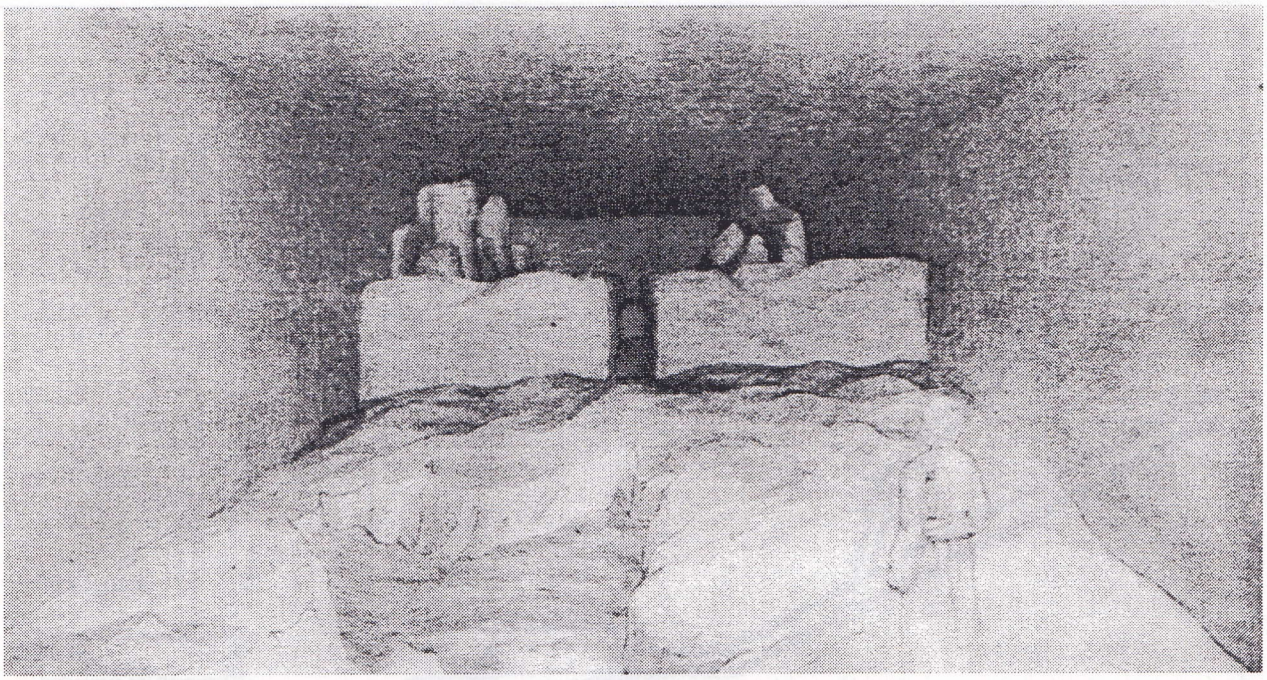


Figure 1: Drawing of the subterranean chamber of Khufu's pyramid, showing the throne on the left side of the central channel and indicating various other structures. E. W. Lane.

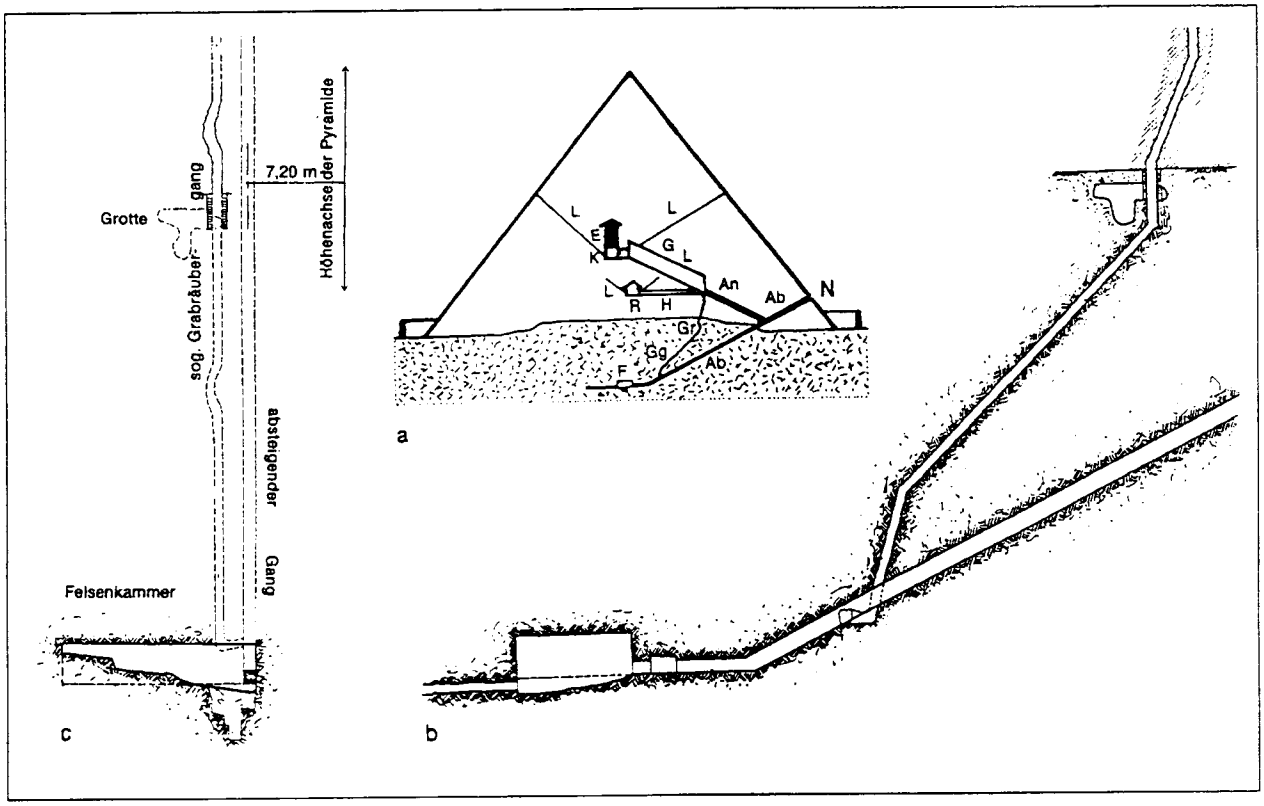


Figure 2: Diagram of (a) the Great Pyramid of Khufu, showing the interior passages and chambers. Details show the end view (b) and side view (c) of the subterranean chamber, with part of the descending passage. Maragioglio and Rinaldi.

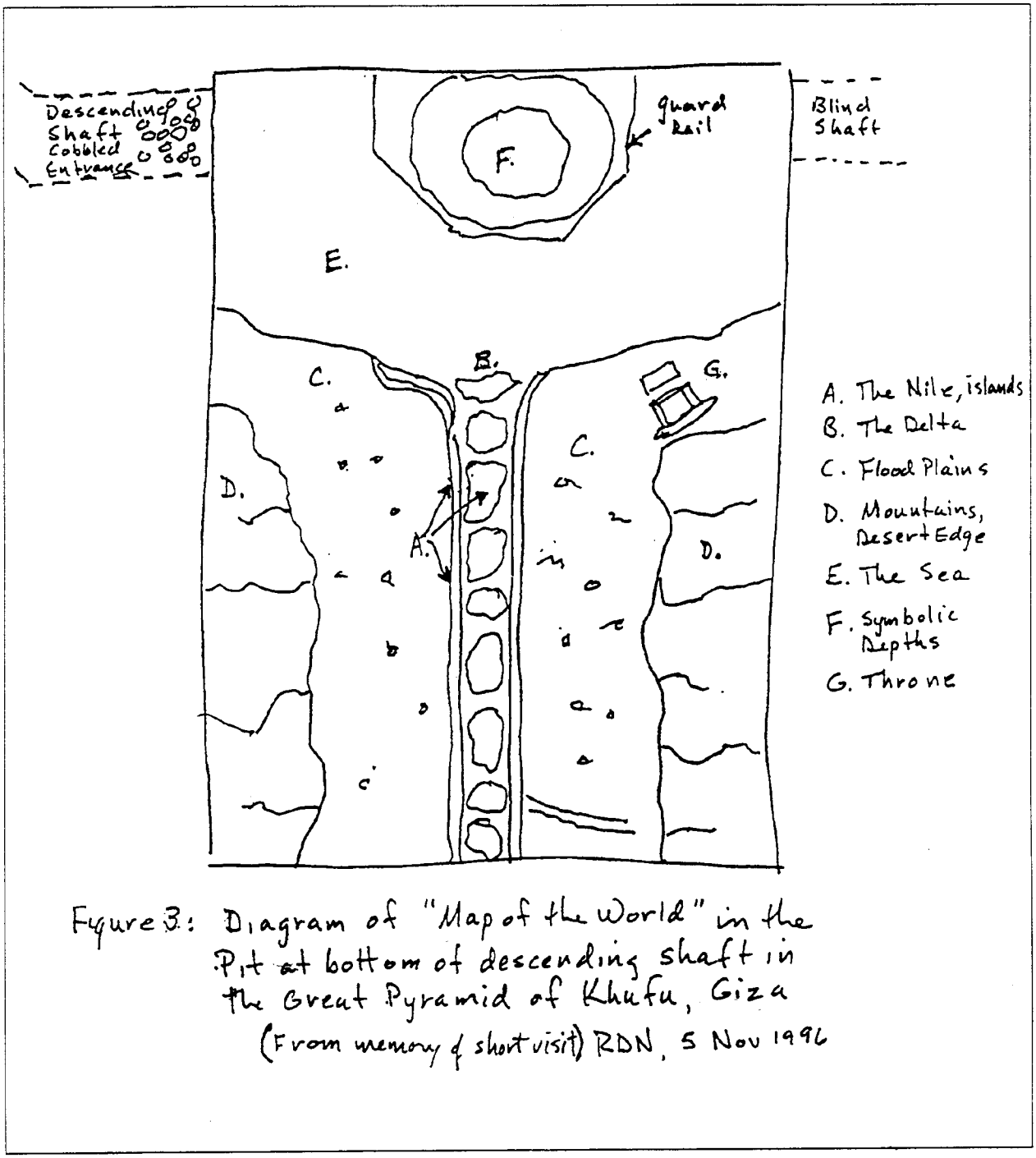
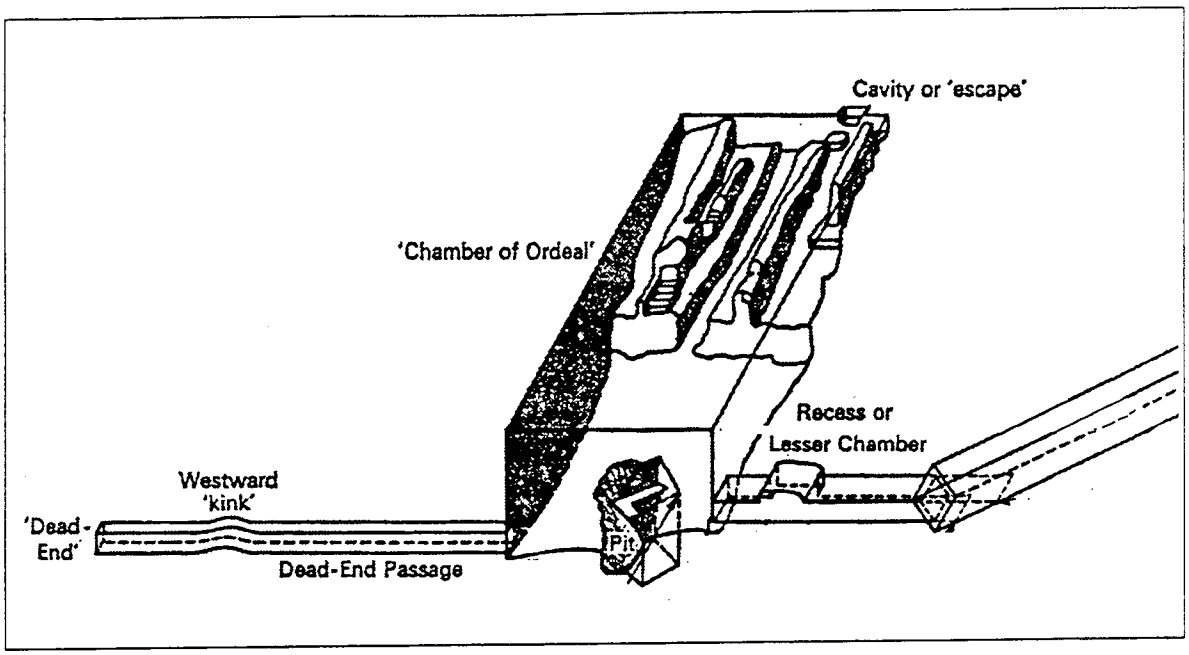


Figure 3: Diagram of "Map of the World" in the Pit at bottom of descending shaft in the Great Pyramid of Khufu, Giza (From memory of short visit) RDN, 5 Nov 1996

Figure 3: Sketch of the floor of the subterranean chamber, with legends describing the hypothesized symbolic representation of ancient Egypt. R. D. Nelson.



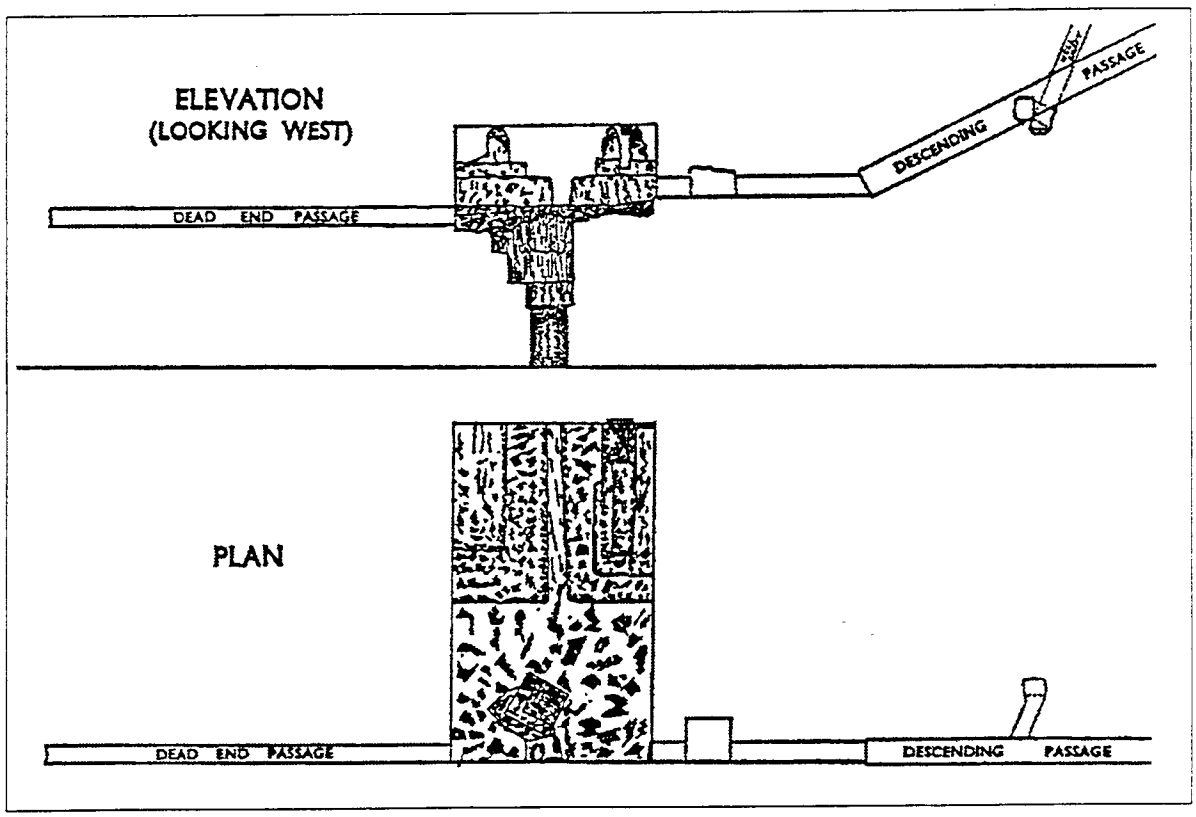


Figure 4: (a) Perspective of the subterranean chamber, showing the structured floor and smooth walls. (b) Elevation and plan views of the chamber and passages. Adam Rutherford.

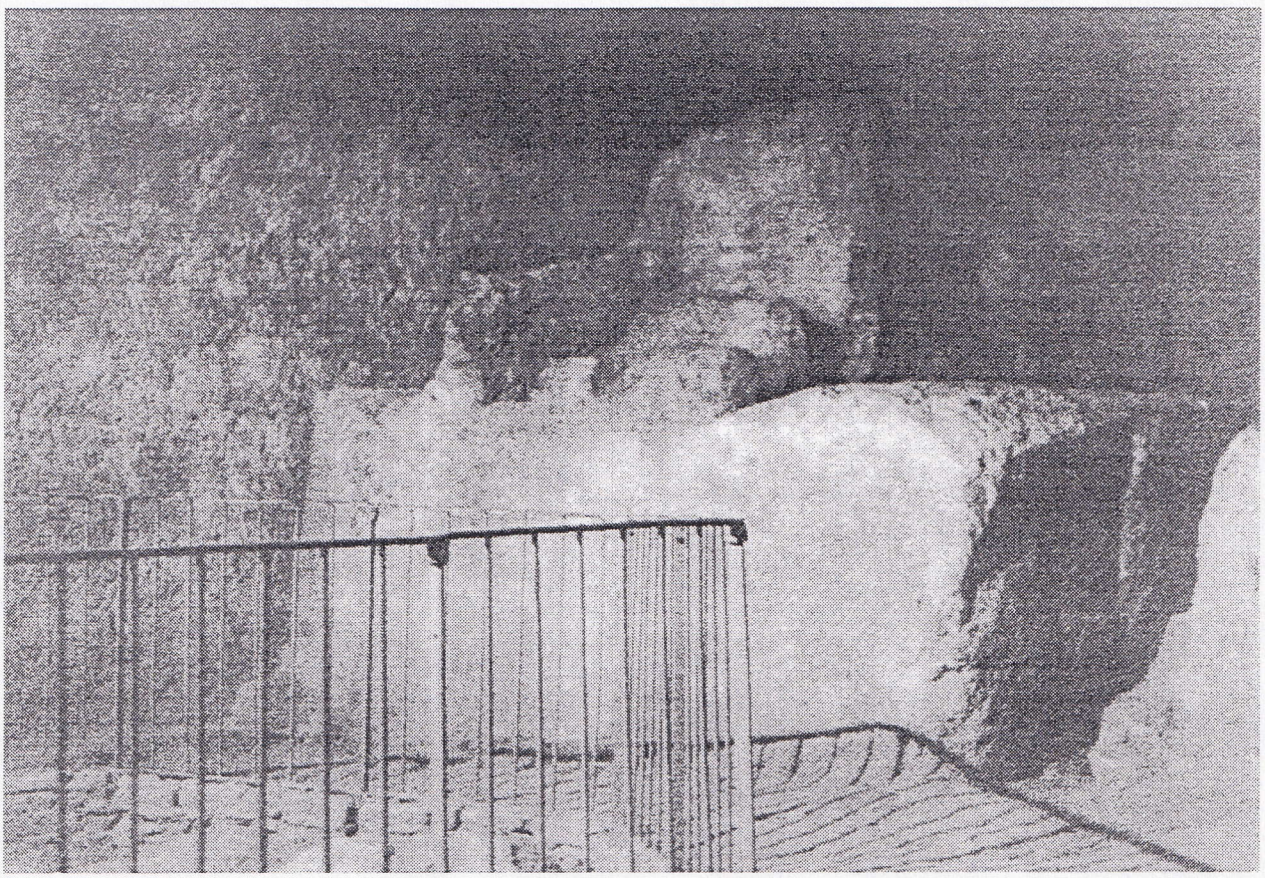


Figure 5: Photograph of the throne and a small part of the carved central channel in the western part of the floor of the subterranean chamber. Charles Overby.