

I

THE HISTORICAL RELATIONS OF THE GIZA NECROPOLIS

THE Giza Necropolis stands on a limestone plateau overlooking the Nile valley, and visible from the house-tops of Cairo, now a modern city with over a million inhabitants. In the Old Kingdom its pyramids were visible from the walls of Memphis, then the capital of Egypt, probably with a population of less than a hundred thousand. All the pyramids of the Old Kingdom, from Abu Roash on the north to Medum on the south, are to be reckoned as belonging to Memphis, but the special necropolis of Memphis is at Saqqarah, near the old capital built by Menes. As far as we now know, that necropolis began with a great private mastaba built in the reign of Menes, first king of Dyn. I, and was continued by other mastabas of Dyns. I–IV (the Archaic Cemetery). It finally merged into the field of well-known stone mastabas of Dyns. V–VI. The first royal tomb built in the Saqqarah Necropolis appears to have been the Step Pyramid, the beautiful tomb of Zoser, first king of Dyn. III. No other royal pyramids were constructed there until after Dyn. IV, when certain kings of Dyns. V and VI selected sites around the tomb of Zoser.

The tomb of Zoser was placed not in the Archaic Cemetery, but apart from it to the south on a plateau of rather bad limestone. The other kings of Dyns. III and IV whose pyramids have been identified selected sites farther away from the capital city, sometimes building close to older cemeteries and sometimes selecting entirely new sites. In most cases the quality of the stone available for quarrying and that under the projected site had some influence in the selection of the place. In addition to the quality of the rock and the existence of older cemeteries, the proximity of royal estates, the summer residence, or the birthplace of the king may have been factors in the selection of the site. The Giza Necropolis is one of these Memphite royal cemeteries, and contains the burial-places of three kings of Dyn. IV, Cheops, Chephren, and Mycerinus, who resided at Memphis.

Memphis, however, was not the first capital of united Egypt. By later tradition the kings of Dyns. I and II resided at Thinis in Upper Egypt, and near that capital, at Abydos, the tombs have been found of eight kings of Dyn. I and two of Dyn. II. The development of the royal tomb and the divergence of its form from those of contemporary private tombs has been traced in detail in *Tomb Development*. Here I give a summary list of the royal tombs from Menes to Sneferuw:

Dyn. I: at Abydos: Menes, Narmer, Zer, Zet, Wedymuw, Az-ib, Semerkhet, and Qay-a.

Dyn. II: at Abydos: Peribsen and Khasekhemuwy.

Dyn. II or III: at Zawiyet-el-Aryan: the stepped layer-mastaba.

Dyn. III: at Saqqarah: Zoser, first king of the dynasty.

at Zawiyet-el-Aryan: the unfinished pyramid, Nefer-ka-ra (?).

Immediately preceding in time the pyramid of Cheops we have three royal tombs, two of which cannot be certainly identified:

Dyns. III–IV: at Medum: a stepped layer-mastaba converted into a true pyramid and often identified with the name of Sneferuw.

at Dahshur: the Bent Pyramid, associated with private graves containing references to Sneferuw.

Dyn. IV: at Dahshur: the North Stone Pyramid, the burial-place of Sneferuw, first king of Dyn. IV.

These royal tombs show the development of the substructure from a brick-lined open pit to the type used in the pyramid of Sneferuw, and the development of the superstructure from a steep high mastaba of solid brick-work, through the stepped layer-mastaba of the same material, to a similar structure of stone, and finally to the true pyramid.

1. CHEOPS AND HIS PLACE IN THE LIST OF KINGS

The family relationship of Cheops was definitely established by the tomb of his mother, Hetep-heres I, the secret tomb found in 1925 in front of the first Giza pyramid. Cheops was a son of Sneferuw by Queen Hetep-heres I, a princess of the blood royal and therefore probably a daughter of Huni, the predecessor of Sneferuw. Thus our king was descended from the older royal line of Dyn. III. His descendants who came to the throne were his two sons Radedef and Chephren, his grandson Mycerinus, and his great-grandson Shepseskaf. The history of this family will be taken up in detail in a later chapter. For the present purpose it is sufficient to mark him as the second king of Dyn. IV, and his pyramid as one built in direct succession to the pyramid of Sneferuw at Dahshur.

2. THE PYRAMID OF CHEOPS AND ITS RELATION TO OTHER PYRAMIDS

We know that Sneferuw, the father of Cheops, was buried in the North Stone Pyramid at Dahshur. Unfortunately the inscriptions of later date found in his Valley Temple and in private tombs prove that there were two pyramids named 'Kha-Sneferuw', a southern and a northern pyramid. Ordinarily it is assumed that the pyramid at Medum is the southern pyramid of Sneferuw, but its owner is not certainly identified. The southern pyramid of Sneferuw might, however, be the Bent Pyramid at Dahshur, also not identified with the name of a king. All these three royal tombs have substructures which present a modification of the royal type of Dyn. III (RT V), with corbel-roofed chambers, and in their final form present the true pyramid type only slightly modified in the Bent Pyramid. In any case it is the North Stone Pyramid at Dahshur, the pyramid of Sneferuw, with which the pyramid of Cheops is to be compared.

The pyramid of Sneferuw is a true pyramid with a total area of about 48,400 sq. m. The Valley Temple was identified by Professor Borchardt from a decree of Pepy II found accidentally (see Borchardt, *AZ.*, XLII, p. 1, 'Ein Königserlass aus Dahshur'), but has never been excavated. A pyramid temple, an enclosing wall, the subsidiary tomb or tombs, and the causeway may be presumed but have never been excavated. I have placed the original tomb of Queen Hetep-heres I beside this pyramid and have reconstructed the burial-chamber as a single large room about 3 × 5 m. and 3-4 m. high, approached by a sloping passage or a stairway with rounded roof. The mastabas attached to this pyramid lie to the east in groups north and south of the causeway.

The substructure of the Sneferuw pyramid consists of a sloping passage descending through the masonry to the rock, a horizontal passage leading to a corbel-roofed anteroom, and then by another short passage to a second anteroom, all of which are built on an emplacement in the surface of the rock, and finally a passage high up in the south wall of the second anteroom leading to the main chamber constructed in the masonry of the pyramid. This substructure has similarities to those of the Medum pyramid and the Bent Pyramid, but is at no place sunk in the rock.

The pyramid of Cheops is also a true pyramid, but presents three periods of construction, each of which had a substructure of its own. The original substructure was approached by a sloping passage descending through the masonry of the pyramid until it reached the rock in which it continued its

sloping passage to the floor-level of the burial-chamber. Here followed a high, horizontal corridor connected by a low, horizontal passage with a very high anteroom. From the southern wall of this antechamber a passage had been cut intended to reach the main burial-chamber, but the main burial-chamber was never excavated, and this whole substructure was abandoned unfinished.

The superstructure of this substructure had reached a height of about 13 m. (Borchardt) when the design was altered, and a second burial-chamber constructed in the masonry of an enlarged superstructure at a height of about 20 m. above the base of the pyramid. This chamber was reached by a new passage sloping upwards, which, beginning in the first masonry passage near the rock, was cut through the masonry of the first superstructure and continued upwards to the level of the new chamber. There it entered a horizontal passage 38·0 m. long and reached the burial-chamber, which was constructed of white limestone with a pent roof. No coffin was found in this chamber, and whatever the material of the coffin projected, I do not believe it could have been the granite coffin finally placed in the last chamber. The last chamber was a great room of red granite with slab roof and superimposed relieving slabs also of granite. The floor of this chamber was 40·4 m. above the base of the pyramid. It was reached by the great corbel-roofed gallery which began at the top of the sloping upward passage of construction No. 2, and continued the slope of that passage upwards for 48·75 m. At the upper end it gave access to a horizontal passage with a portcullis room and entered the main chamber at the eastern end of the north wall. Borchardt reconstructed the grand gallery with a heavy wooden scaffolding which carried suspended and concealed from view the granite stoppers which were finally used to stop the sloping passage of the second construction. There is one further point to be noted. In order to permit the withdrawal of the workmen after they had lowered the granite stoppers into place in the sloping passage, a shaft had been prepared through the masonry of the pyramid which led down irregularly to the lowest passage, that of the first substructure, which it entered near the lower end. With each change in the design the original sloping corridor, leading downwards from the north, had been prolonged through the accretions of masonry until it opened in the casing of the final pyramid. After the burial, and the withdrawal of workmen, this whole sloping passage from the opening to its lower end in the rock was undoubtedly filled with great stopper blocks of limestone or granite, and the opening closed with a finely fitted casing-stone.

The original design of the substructure of the Cheops pyramid introduces a new type of royal substructure. This differs essentially from the old royal type V used for the Step Pyramid of Saqqarah and the unfinished pyramid of Zawiyet-el-Aryan and, in a modified form, for the pyramids of Medum and Dahshur. The entrance passage was a long, sloping corridor excavated in the rock, a tunnel, not an open trench, and the burial-chamber was excavated in the rock, lined or unlined, not built in an open pit. This type of substructure was used not only in the original design of the Cheops pyramid, but also in that of the three small pyramids of his queens, in the original design of the Chephren pyramid, and in the small pyramid of his queen, in both designs of the Mycerinus substructure, and in the three small pyramids of his queens. The small Cheops pyramid G I-a gives a clear idea of the manner of preparation of this type of substructure. Its substructure was first begun 28·15 m. east of the present substructure, and this unfinished cutting proves that the descending passage in the rock was being cut out and the floor of the passage being constructed above the rock simultaneously. The site of this pyramid was shifted westwards to avoid contact with the secret tomb of Hetep-heres I, and the finished pyramid shows that when the substructure was completed the part above the rock formed a nucleus of masonry which carried the sloping passage out to the face of the core. Over and around this nucleus of masonry the pyramid itself was built and cased. The core structures of all the Giza pyramids were apparently

built in stages with nearly vertical faces in the manner illustrated by the two small unfinished pyramids G III-b and III-c.

The pyramid of Radedef at Abu Roash does not follow the Cheops type, but reverts to the old simple open-pit and trench form (type V). The same type was followed in the tomb of Shepseskaf, the last legitimate king of the dynasty (see Jéquier, *Le Mastabat Faraoun*). The Mastabat el Faraon was not of true pyramidal form, but built in the form of the *qrst* coffin.

The second and third designs of the Cheops pyramid were of special forms forced on the builders by the changes in the plan. They may be reckoned, however, as modifications of type RT V as represented by the three pyramids at Medum and Dahshur. The second design of the Chephren pyramid approximates more closely to the modified type, although its horizontal passage is in a tunnel in the rock. Mycerinus followed the new type introduced by Cheops. Radedef and Shepseskaf reverted to the old type RT V. The order of these pyramids is now fixed beyond doubt, and it is clear that as a group they are in logical succession to the older pyramids and layer-mastabas, both in superstructure and in substructure. The Giza group may be characterized structurally by the use of much larger blocks of limestone and the introduction of hard stone, chiefly granite, in the burial-chambers and in the casing of the temple walls, and to some extent in the pyramids themselves.

3. THE DEVELOPMENT OF THE PRIVATE MASTABA IN THE REIGN OF CHEOPS

a. The Stage Reached by the Crude-brick Mastaba at the Accession of Cheops

When Cheops came to the throne and had begun to build his pyramid and the field of mastabas west of that pyramid, the c.b. mastaba was still the prevailing type. It had nearly vertical faces and took two closely related forms given by the offering-places. One of these forms had two plain compound niches on the valley side, of which the southern, the chief niche, was the larger. The other had the chief niche withdrawn within the mastaba to form an interior chapel of cruciform type. The cruciform chapel generally had the entrance doorway in the middle, directly opposite the chief offering-niche, and its west wall represented a section of the façade of the mastaba, or in other words the chief southern niche. During the reign of Sneferuw the cruciform chapel was of two types, the true cruciform chapel with a plain compound niche, in the middle of the western wall, and the cruciform chapel of palace-façade type with a single section of palace-façade panelling on the west wall. Probably in the early part of the reign of Cheops both these chapels had already appeared in the later derived form which I call 'the modified cruciform chapel', characterized by the shallowness of the niche-work on the western wall. The faces of these mastabas were in some cases provided with additional *ka*-doors, palace-façade or simplified panelling on the façade or on all four sides. Almost all of them also had exterior chapels of several different forms, generally roofed (see *Tomb Development*, Chapter X).

It is of importance to note that the c.b. mastaba presented two types of construction: (1) the c.b. filled mastaba consisting of a retaining wall filled with gravel or rubble, and (2) the solid mastaba built entirely of c.b. In both forms the niches and the interior chapels were constructed in the brick-work by methods of bonding long practised by the masons. In the reign of Cheops himself, or not long before, the construction of the interior chapel was modified in order to facilitate the use of stone lining, to be afterwards carved in relief. This modification consisted in leaving a deep rectangular recess in the brick-work of the mastaba and constructing the cruciform chapel in this recess.

By the accession of Cheops the substructure of the mastaba presented only the shaft type, a rectangular shaft, usually square, descending with cased sides through the mastaba and deep into the

rock to a single rock-cut chamber underground. This shaft type presented, however, several variations: (1) chamber and shaft constructed in a large open pit, (2) chamber built of stone in a cavity in the rock and roofed with stone corbel or stone slabs, and (3) with a chamber merely hollowed in the rock.

b. Evidence of Stone Mastabas Previous to Cheops

The earliest private mastabas of stone which are clearly recorded and certainly fixed in date are those built in the great cemetery west of the Cheops pyramid, and undoubtedly constructed during the building of that pyramid. No stone mastabas which can be dated previous to the reign of Cheops have been found in the Archaic Cemetery at Saqqarah. Nevertheless, there is some evidence of earlier mastabas of stone. De Morgan in *Dahshur*, I, p. 8, reports a group of stone mastabas in the northern end of the group of tombs which lie north of the causeway of the Sneferuw pyramid, but whether these are cores or mastabas he does not inform us and their date is entirely problematical.¹ Much more important is a group of small tombs excavated by M. Montet at Abu Roash on the hill east of that on which stands the pyramid of Radedef. On a visit in the company of Professor Foucart to the excavations being conducted by M. Bisson de la Roque in that cemetery, a number of small tombs were pointed out which were said to be of Dyn. I. The substructures were rectangular open pits cut in the rock and unlined, and two of them had a rock-cut chamber hollowed in the west wall at the north end. This is a type which closely resembles in form the old type I B as used in large mastabas of Dyn. I at Saqqarah. Without any information as to the contents, it seemed to me then that the graves were a larger form of the open-pit graves of Dyn. II of Zawiyet-el-Aryan, with the addition of a small rock-cut magazine, but they can hardly be dated later than Dyn. II. These small tombs were surmounted by low walls of small yellow limestone blocks preserved only to the height of one or two courses. There was no offering-niche visible, nor at the time of my visit any trace of the chapel. Thus these early stone mastabas appear not to have differed in outward appearance from the earliest of the much larger stone mastabas erected by Cheops. The cemetery begun by these primitive stone mastabas continued westwards and northwards, then eastwards and northwards through the area excavated by Bisson de la Roque, and the whole appears to form the cemetery of one rather small community from the time of the early stone mastabas to Dyn. VI.

At Memphis the quarrying of stone was well advanced in the second part of Dyn. I (see *Tomb Development*, p. 122), and the tombs of that period had substructures excavated in the rock. In Dyn. II the Memphite Necropolis workers introduced the deep underground stairway with chambers excavated in the rock. The simple superstructures of the Abu Roash tombs were certainly within the technical skill of the masons at any time from the second half of Dyn. I to the accession of Cheops. The fact that the contemporary mastabas at Saqqarah were of c.b. may perhaps be due to the availability of deposits of Nile mud larger and more easily obtainable than at Abu Roash. The use of stone for superstructures is certified by the Palermo Stone for royal constructions previous to the end of Dyn. II, and the layer-stepped mastaba (pyramid) of Zawiyet-el-Aryan is perhaps an example of such a building. The Step Pyramid at Saqqarah, the tomb of Zoser with its enceinte, presents the translation into limestone of the older mud-brick architecture of Dyns. I-II. Their walls were constructed of small blocks, much after the manner of the bonding of the earlier brick-work, and masses of core-work, solid in the pyramid itself and built of rubble in the subsidiary tombs, were cased with fine white limestone. Yet the superstructures of the private mastabas continued to be built exclusively of c.b.

¹ A field of mastabas in regularly laid-out lines and rows is visible SE of the Sneferuw pyramid at Dahshur, but at present the material, type, and date have not yet been determined.

down to the accession of Cheops, and frequently even after the introduction of the stone mastabas. The increased use of stone as accessory to the brick-work in the c.b. mastabas of Dyn. III and the reign of Sneferuw was based on the desire to utilize the sculptor's craft to improve the functional value of the *ka*-door and can hardly be cited as evidence of a gradual change in the material and construction of the mastaba itself.

c. Introduction of the Stone Mastaba by Cheops

Whatever may have happened previously, Cheops built west of his pyramid at least three groups of stone mastabas, and later one group east of his pyramid. This cemetery of stone mastabas was increased by additions which covered the rest of the Old Kingdom down to the end of Dyn. VI, and present a clear line of development from the early mastaba-cores to the characteristic forms of Dyn. VI, which will be set forth in detail in a later chapter. As far as our evidence now goes, no other stone mastabas were built anywhere previous to the end of the reign of Cheops, and none in the Old Kingdom except in the neighbourhood of Memphis, Giza, Saqqarah, Dahshur, Abu Roash, and Heliopolis.

The earliest stone mastabas built by Cheops consisted of a stone retaining wall filled with stone, gravel, and rubbish, or in better examples filled with solid masonry of small blocks set in plaster. In this regard they followed the c.b. mastaba, which was also either filled with rubbish or built of solid brick-work. The c.b. mastaba down to this time had had nearly vertical faces, and the slight regression of the courses to form an inclination of 5 degrees or less was covered by the thick layer of mud-plaster which coated the face. The bonding of the brick-work and the use of mud-plaster in laying the bricks produced a stable facing-wall of considerable strength. The earliest stone mastabas were built of small stones in correspondingly low courses, each of which had a nearly vertical face. If this retaining wall had been built with the slight regression of the courses of brick-work, it could not have borne the pressure of the filling and would most certainly have collapsed. For this reason the stone courses were set back each from the face of the course below 5–12 cm., generally proportioned to the size and height of the mastaba. The resulting stepped wall, which in the known examples has often decayed but never given way, had an inclination of 15 degrees or over, and gives us the origin of the mastaba slope of Dyns. IV–VI. The majority of these early stone mastabas were used uncased, with an exterior c.b. chapel of one or more rooms, built against the southern part of the eastern face. The stone retaining wall had no offering-niche nor any recess constructed in its masonry, and the only offering-niche was a simple recess in the western wall of the inner room of the exterior chapel, in which the stepped face of the mastaba was exposed with a beautifully carved slab-stela (tablet stone) set in an emplacement in the masonry. Some of them, however, had been cased in fine white limestone, the sloping surfaces of which showed an even greater angle of inclination than the core. The cased small-stepped cores had, or were designed to have, two plain compound niches of ordinary *ka*-door form, with an exterior stone chapel around the southern or chief niche. It was in these examples that the two-niche form of the c.b. mastaba with exterior chapel first appears in the stone mastaba. These niches were cut, as a rule, in the thickened casing wall and for some time not constructed after the manner of the brick-work.

The small-stepped core was succeeded very quickly by the massive stone core in which the retaining wall was built of great rough blocks of nummulitic limestone in stepped courses in which the width of the steps was increased. Four of the older stepped cores were enlarged by blocks of masonry of the new massive type, and in their new form had been wholly or partially cased in white stone with interior white stone chapels. In general, however, the massive-type core, like the small-stepped core, showed no niches or recesses for an interior chapel. Two of the new cores had been faced with small-stepped

masonry and looked externally exactly like the older cores. The cores of the new type were treated like the small-stepped cores, used uncased with exterior c.b. chapels and slab-stelae, or cased in white limestone with two compound niches and an exterior stone chapel around the southern niche. Later, still in the reign of Cheops, and in the reign of Chephren, the massive core was constructed with a chapel recess at the southern end of the eastern face and cased in fine white limestone with an interior chapel of the same material. It was from this latter form that the later stone mastabas at Giza were developed.

The early stone mastabas and the great majority of those built by Cheops had only one burial-shaft with a major and a minor offering-place. This had been the practice from the earliest times, modified only by the introduction in Dyn. III of the twin-mastaba with two burial-places and two sets of offering-niches. The burial-place used in the early Cheops mastabas was of the shaft-and-chamber type introduced in the reign of Sneferuw. In other words, the burial-places of the early stone mastabas are in type and even in their variations entirely in harmony with the burial-places of the c.b. mastaba of the preceding reign.

Functionally the stone mastaba continued on the lines of the c.b. mastaba with burial-place and offering-place structurally separate. The long proportions of the older mastaba were maintained although quite unnecessarily after the disuse of the long stairway. Even the two kinds of structure, the filled and the solid, appear in mastabas of both materials. The exterior c.b. chapel used with so many of these early mastabas was not a new form except that the rooms were roofed with leaning-course c.b. vaults. Yet the new stone mastaba appears to introduce a new type, characterized by the absence of any niche in the façade of the mastaba, and the abandonment, for a time at least, of the interior chapel.

The absence of *ka*-doors in the early cores constructed by Cheops may be interpreted as due to the fact that they were intended to be cased. It seems certain that the massive cores were intended to be faced or cased. The early cores with retaining walls of small-stepped courses and the massive cores faced in the same way presented, however, a finished appearance, and the absence of niches may be ascribed to the difficulty of constructing a *ka*-door in stepped masonry. This difficulty was solved later in Dyn. IV by the insertion of a monolithic framed *ka*-door in the face of the stepped masonry. All cores with stepped faces, and the massive cores as well which were used uncased, were conceived as two-niched mastabas, as is shown by the position of the slab-stela near the southern end of the eastern façade. Those cores which were cased with white limestone had two niches in the casing or an interior chapel and a subsidiary northern niche.

The mastabas themselves, or mastaba cores, are really cheap constructions, quite as cheap as would have been c.b. mastabas of the same size. The use of stone was facilitated by the great quarrying operations of the king, which probably produced an abundance of small blocks not needed for the king's tomb. In any case, the quarrymen of Cheops could have produced the stone of a stepped mastaba quite as cheaply as the brick-makers could have provided an equivalent amount of c.b. Even the large blocks used in the massive cores would have meant no great cost to the quarrymen, and once the handling of large blocks had been acquired, the construction of the massive cores was probably not materially more costly than that of the small stone cores. It is to be noted that in a majority of the early cores the place of the offering-niche was marked by a finely carved slab-stela, fixed in the retaining wall. These slab-stelae bear the table scene with titles and name of the owner, and offering-lists which are characteristic of the tablet of the ordinary *ka*-door and related to the primitive niche-stones. In fact I take them to be intermediate in the development between the primitive niche-stones and the tablets of the stone *ka*-door of traditional form. In those cores which were finished with an exterior c.b. chapel, the slab-stela

is left visible in a plain niche constructed in the west wall of the c.b. chapel. In the stone-cased mastabas (three examples), and those with additions containing an interior chapel (four examples), the slab-stela was left in place, and in one case (G 1201) was covered with a slab of limestone to protect it from damage during the reconstruction. The slab-stelae are obviously the work of the finest craftsmen and were, no doubt, presented by the king and affixed to the mastabas as marks of their assignment by him. So I come to the conclusion that these early stone mastabas were originally intended to be used as built with exterior c.b. chapels, and that the casing of these cores was a modification of the original idea.

I attribute the absence of niches in the body of the mastaba to ineptitude on the part of the masons attempting to reproduce an old form in a new material. The abandonment of the interior chapel, developed so fully in the c.b. mastabas of Saqqarah, may be attributed to the same cause. It has been shown in *Tomb Development* that the interior cruciform chapel amounted to a withdrawal of the chief niche within the mass of the c.b. mastaba in order, originally, to protect the painted decoration of the niche. This withdrawal, which first appears in the reign of Khasekhemuwy, was only a practical device which made no alteration in the function of the niche itself. Nor were all mastabas between Khasekhemuwy and Cheops so constructed, for a large number were still of the ordinary two-niche type with exterior chapels of various forms, usually roofed but sometimes open to the sky. The roofed exterior chapel was quite as early as the interior chapel and served the same purpose. With these antecedents the stone mastaba might have been expected to have from the beginning either an exterior chapel or an interior chapel. The fact that the Giza masons selected the exterior chapel, quite apart from the ineptitude of the masons, seems to indicate a break with the traditional forms of Saqqarah, and the existence of such a break is supported by the form of interior chapel introduced in the latter part of the reign of Cheops.

The older interior chapel, the cruciform chapel, amounted to a withdrawal of the chief niche within the mastaba, and its most characteristic feature is the niche in the middle of the west wall directly opposite the entrance doorway and thus visible from outside the chapel. This type of chapel, invented at Saqqarah and found in scattered examples all through Egypt, continued in use chiefly at Saqqarah in a modified form into Dyn. VI. In an altered form the cruciform type was used in the outer sanctuary of the Mycerinus Pyramid Temple, in the Valley Temple, and in the temple of the small pyramid G III-a. The exterior and interior stone chapels of the reign of Cheops were of an essentially different form, which I call the L-shaped chapel. This form has the entrance at one end, usually the north end, of the eastern wall, and the single offering-niche at the other end, usually the south end, of the west wall. Thus the offering-niche is not visible from the outside. In the later two-niche chapel the only difference was that the secondary northern niche was visible from the doorway. The exterior stone chapels of the early Cheops mastabas were of this L-shaped type, and the interior chapels seem to amount to the withdrawal of the exterior L-shaped chapel within the mass of the mastaba.

The masons of Cheops were not the first to use the L-shaped offering-chapel. The chapels of the subsidiary tombs of the Zoser enceinte had offering-rooms of this form which were in fact interior chapels. Some of them had an anteroom which also blocked the view from the outside by having the entrance in one end of the external wall and the doorway into the inner room at the opposite end of the interior wall. This type of bent entrance was also used in the two anterooms of the pyramid temple of Medum, which is an exterior chapel. The earliest of all known chapels, the small exterior chapels found by Sir Flinders Petrie at Tarkhan, partook also of the character of the L-shaped chapel, but with bent entrance of different type. These were open-air chapels, and almost all the open-air chapels of Dyns. I and II had the entrance so placed as to prevent a direct view of the chief offering-place from the

outside. The roofed exterior chapels of the reign of Khasekhemuwy and Dyn. III also present this same principle of bent entrance. It is therefore only natural that the c.b. chapels of the early stone mastabas of Cheops followed this principle in the inner offering-room. These c.b. chapels were multiple-roomed chapels and present various ground-plans suited to the space available. The early exterior stone chapels reproduced the bent entrance in a more rigid form, the same L-shaped form used in the first interior chapels.

The interior L-shaped chapel was introduced near the end of the reign of Cheops in core-work of the massive type. At Saqqarah, when the stone-lined cruciform chapel was introduced, the general method adopted was to leave a rectangular recess in the masonry of the mastaba and to build in this recess the stone walls backed with c.b. masonry. Some of these chapels I have dated to the reign of Cheops himself, but it is probable that most of them are earlier than the interior stone chapels at Giza. The massive cores were constructed without any chapel-recess down to the last five years of the reign, and in those afterwards provided with interior chapels the chapel-recess was a reconstruction made by breaking away the massive retaining wall for the desired length, and rebuilding it in recess form (see Cem. G 7000, the eight twin-mastabas). In one case, G 2130, an interior chapel was inserted in a solid core of small-stepped masonry by breaking a hole in the masonry without the construction of a recess. There are five other mastabas, all of the small-stepped type, which had received additions of massive core-work in which space had been left for an interior chapel. Thereafter a number of large cores were built with chapel-recesses in the original structure. All the cores built by Cheops probably from the introduction of the massive core were obviously intended to be cased in fine white limestone.

All the mastaba cores erected by Cheops down to the latter part of his reign, whether cased or uncased, had been designed for exterior chapels. These exterior chapels afforded an adequate protection against the weather, and the stone chapels can be reckoned as permanent structures to be damaged only by the wilful removal of stone. Apparently the interior chapel was first introduced in the four finished twin-mastabas in Cem. G 7000 which belonged to the most favoured children of Cheops. These chapels seem to have been planned with exterior stone rooms, and it is possible that the offering-room was built inside the mastaba to gain space in the street for the very elaborate exterior chapel. On the other hand, it may be that the introduction of the interior L-shaped chapel was merely a reversion to the older interior chapel which had been in use since the reign of Khasekhemuwy.

In conclusion, the stone mastaba introduced by Cheops followed in general form and structure the c.b. mastabas of the reign of Sneferuw. The builders did not, however, follow in detail the forms worked out by the brick-masons, but were forced by the new material to a modification of the older mastaba, the omission of offering-niches or chapel-recesses in the retaining wall. As the structure of the mastaba was improved by white stone casing, the forms of the c.b. mastaba reappeared, the two-niche form with exterior chapel and the form with interior chapel and subsidiary northern niche. In the form of the offering-room the stone mastabas at Giza broke with the old cruciform chapel of Dyn. III and Sneferuw, and reverted to an older type, the L-shaped chapel of the Zoser enceinte.