

Prologue The Valley of the Kings

No man knows the meaning of ANYTHING in any paper until he knows what interests control it. Curiosity in this domain is limited to an élite. It is almost un-english to mention any such topic.

*Ezra Pound's Guide to Kulchur*¹

So, Mr Pound. Thirty years ago, I was living in Egyptian Thebes and entirely captivated by the Valley of the Kings. What had so fascinated me was that most of its great tombs had been made by a few families of craftsmen working side by side for centuries, yet every one was different. You could see ancient people making living choices. Walking through the tombs that they had made was like taking a trip back into part of the ancient mind.

One windy evening as the branches of the palm trees rattled in the darkness outside the windows of my studio, I drew out the plans of some of those royal tombs on slips of tracing paper so that, by placing them one over the other, I could compare the changes in their architecture. Even as I watched the shapes of various tomb plans twist this way and that down through the centuries, something unexpected happened. Despite their differences, I could see an underlying constancy in their design, a strict set of rules that had been most carefully applied from one tomb to the next. It was profoundly moving. I

had rediscovered something of the essence of those tombs, and for a while I alone in all the living world shared that information with the ancient people who had planned and made them. Later, I discovered that the application of those rules had developed and expanded, tomb by tomb, in a way that was so regular, so logical, that I could predict the arrangement and shapes of parts of the later tombs by measuring up the plans of earlier ones and making some simple calculations.² So although at first those ancient monuments had seemed so full of individuality, in reality each one was a subtle variation on its predecessor; the Royal Valley, a great fugue.

And once again, within these last few years, as I worked with the plans of ancient Egypt's early pyramids, I have experienced the same thrill of discovery many times. That same eerie dialogue as, once again, I stumbled through the thoughts of ancient tomb designers. This time, however, I was working with the product of the geniuses who had planned and built one of the greatest monuments on our planet: the Great Pyramid of Giza.

I'd started my pyramidological perambulations innocently enough, with a ruler, a pair of compasses and a plan, trying to work out how on earth the ancient Egyptians had managed to set a mysterious block of limestone that lies in one of the Great Pyramid's interior corridors exactly at the height at which the area of the base of the pyramid above the block is precisely half of the area of the base of the entire pyramid (see fig. 0, and ch. 4 below). And then perhaps, once I had solved that strange conundrum, I would discover why these ancient people had set such specific mathematics within the tomb of pharaoh.

The first thing that I discovered was that, unlike the royal tombs of Thebes, the combination of the Great Pyramid's colossal size and extraordinary precision – for the accuracy of its architecture can be measured on occasion within fractions of an inch – easily defeats the efforts of a modern draftsman. That the width of a line upon a scale plan of the Great Pyramid will cover several feet of solid stone at the Pyramid itself so that any such plan printed on the pages of a book cannot prove that the Great Pyramid's architecture is related to the passage of the sun and stars, to Pythagoras' Theorem or a map of the Cairo subway system or a ticket to the moon. And so I turned to other methods. From the beginning and in common with many other people through the ages, I sensed that, like the royal tombs of Thebes, the architecture of this Pyramid, both its dark interior and its celebrated silhouette, was held in a cat's-cradle of geometric harmonies and contained a kind of hidden logic.

Three years and several pyramids later, I discovered what that logic was. And in those ancient patterns, I rediscovered something of the pyramid-makers' purposes and ambition, and something of their wisdom, too.

Now I am well aware that my claim to have uncovered some of the Great Pyramid's innermost secrets after four and half millennia appears to verge on the bizarre. From the first day I started working on the Great Pyramid, whose measurements alone induce a sense of unreality, my investigations took on a somewhat Quixotic air. If only then, to reassure my readers and myself, my first task when I set out to write this book was to discover why no one else had done this work before me; why the archaeological study of ancient Egypt's most celebrated monument, and most especially its interior, had been neglected for so long. And why, despite all the books and articles – amazon dot com presently lists two hundred works upon the pyramids – the most accurate descriptions of Egypt's most celebrated monument are more than a century old. How such a failure of scholarship and imagination had occurred and why, as a scholar-reviewer recently observed: 'Modern Egyptologists have largely given up on the pyramids.'³

My story is founded on three main premises. First, that the builders of the Great Pyramid worked from a single construction plan, a plan whose existence has long been doubted and even denied by many scholars, but one that I have now recovered; a plan whose ambitions for the body and the spirit of the dead king had been developed from those of earlier royal tombs. Second, that the daily effort involved in building the Great Pyramid was similar to that which has been recently calculated for the construction of the so-called Red Pyramid, which was built a few decades before it. Third, that the processes of the Great Pyramid's construction were integral to its design; that, at the time that this Pyramid was built, the modern processes of architectural construction and design had not yet been placed into their separate compartments, and that subtle harmonies held within its architecture are the product of the methods of its manufacture; of its craftsmen and their specific use of their materials.

This then, for the first time, is an account of the design and construction of the Great Pyramid of Giza based upon its rediscovered ancient plan and a near-contemporary timetable of pyramid construction.

Nor is this account based upon yet another theory of pyramid construction and design. As well as being the most accurately surveyed building in the modern world, the Great Pyramid is also one of the

most accurate the human race has ever made; some of the elements of its architecture are yet precise to within fractions of an inch. The ancient symmetries and patterns that it contains exist in cold hard blocks of stone, in tens of tons. The real challenge, then, was not simply to expose a plan within the Great Pyramid's architecture, but to establish how and why the plan was made.

To rediscover the how and why of the Great Pyramid, a product of a pre-literary age,⁴ we must attempt to feel inside its craftsmen's finger tips, to move inside their minds, to understand their largest and most mysterious creation. It is a voyage back into the shapes and forms and textures of early ancient Egypt, a voyage in which mathematics, geometry and modern plans are but the means to an end, to be employed as one would a modern grammar book to penetrate the purposes and meanings of processes that have been lost and whose sole surviving traces are held within the Pyramid itself and the landscapes in which it was created.

Part One, 'Visions of the Pyramid', introduces the Great Pyramid and describes how our present knowledge of it was built up; an egyptological misadventure in which the simultaneous establishment of both academic egyptology and pyramidology prompted a rivalry that has served to stifle pyramid studies and at the same time create the best part of the Great Pyramid's so-called 'mysteries'. It also introduces the two new sources of information that are the motors of the book: a reconstruction of the Great Pyramid's building timetable and an outline account of a previously unobserved underlying plan within its architecture, the traces of an elegant and sophisticated system by which the Great Pyramid, the largest stone block building in the world, was built by a nation of Bronze Age farmers with a population of the size of Manchester or San Francisco.

Part Two concerns the people who made the Great Pyramid and is divided into two sections. 'The ghosts in the cemetery' discusses the vulgar representations of ancient Egyptians that have come to haunt the Giza Plateau and defers discussion of how and why such great pyramids were made. It is therefore as much concerned with present misconceptions of the king for whom the Pyramid was made, with his subjects and their titles and professions, as it is with the Pyramid itself. The second section, 'The people on the Plateau', considers the surviving traces of the pyramid-makers themselves. It deals in epitaphs and portraits, in quarrymen and chisel-cuts. Here then, the book's substance echoes its subtitle. For the creation of this unique Pyramid cannot be explained by recourse to that woolly entity now known collectively as 'ancient Egypt'.

Part Three, 'The land and the Pyramid', describes the exploitation and the mobilisation of the ancient land of Egypt in the drive to build the Pyramid. Information gained in recent surveys right across the ancient kingdom offers a fresh understanding of how the materials of the Great Pyramid were obtained and moved.

Part Three also deals with the physical and metaphysical impact of Egypt's landscapes upon the culture of the pyramid-makers: the river and the rocks, the minerals and the earth that sustained the Pyramid's makers and their state and informed their sensibilities.

Part Four, 'Drawing in the air', describes the historical origins of the Great Pyramid's design and specifications and the traditional arrangements for the burial of the king. It shows how the materials extracted and transported from the length and breadth of Egypt were manipulated in a series of aesthetic and technical developments, a process more akin to craft work than Western processes of architectural design, that culminated in the Great Pyramid's construction.

It is often said that the establishment of ancient Egypt, the world's first nation state, was based on the development of writing and of national government, a progress said to have been 'accompanied by advances' in Egyptian art and architecture.⁵ The evidence of the early pyramids, however, is that a great part of this revolution was played out in their construction and design. In this respect, the Great Pyramid was not just a building project, an architectural display, but is the physical residue of the process of the creation of the Egyptian state, a process set underway in previous centuries, as the royal tomb and stone block architecture had been developed.

Part Five, 'Planning the Pyramid', describes how the Great Pyramid was sited, located and designed. In this, I have derived much fresh material both from modern surveys and from little-known features on the Giza Plateau whose ancient purposes came to light during my analysis of the Great Pyramid's plan.

Part Six, 'Building the Pyramid', outlines the processes of the Pyramid's construction, year on year. Based upon a time frame derived from the imperatives of the Great Pyramid's construction, this method brings enormous dividends to an understanding of how the Pyramid was built.

The climax of this epic labour, the entombment of the king, was the last act in the national ritual of making this Great Pyramid. It was also the moment where stone and time and royal destiny became as one. Not only then had the Great Pyramid's unique geometry served it as its own theodolite during the long years of its construction, but in the final stages of its ancient functions that same geometry had

also served quite literally as a definition of the route to royal burial: the royal destiny.

'After Khufu', a two-part coda, briefly outlines the huge effect of the Great Pyramid on later periods: this pyramid, it would appear, not only defined the fate of the king for whom it had been built but also holds the novel notion of a resurrection in its stones.

Apparatus

A great deal in this book is new and I am well aware that without the appropriate facts and footnotes to back up its arguments it will register inconsequentially, as yet more pyramidological speculation. At the same time I have tried to make my text accessible to all who are interested in the Great Pyramid, rather than just to that narrow circle of professionals, the archaeologists and egyptologists, who for the most part are not interested in it at all.

Primary references to specific antiquities and excavations are usually given in the endnotes to the text. Many of my observations, however, cover swathes of scholarly material and full citations are impracticable. In these instances, the general references that I have cited are of recent publications and have been chosen because their bibliographies will serve to lead the curious back through the main lines of previous research. I might add that I wrote with a handful of excellent general reference books by my side, including Mark Lehner's *The Complete Pyramids*, Rainer Stadelmann's *Die ägyptischen Pyramiden* and the Highway Code of ancient Egyptian building books from which one departs at one's peril, Dieter Arnold's *Building in Egypt*.⁶

My prime reference, however, was Petrie's *Pyramids and Temples of Gizeh*, the classic nineteenth-century tome that holds the results of the last full survey of the Great Pyramid. Whenever that survey has been tested, its measurements have been found quite accurate, and Petrie after all was but checking and correcting a mass of earlier data that had itself been gathered with unusual, not to say fanatic, care.⁷ For reasons of consistency therefore, I have usually preferred Petrie's measurements as given in that work rather than mixing those figures with the results of later but more partial surveys.⁸ I have also on occasion mined the recent exhibition catalogue *Egyptian Art in the Age of the Pyramids*, a splendid example of what Glyn Daniel has called 'haute vulgarisation', as a sort of 'Gombrich' of contemporary academic opinion concerning the period in which the Great Pyramid was built; it also has the added advantages of splendid maps and pho-

tographs, lavish references and up-to-date bibliographies.⁹ It is for these specific reasons that I refer so frequently to it in my text, and I hope that the catalogue's numerous contributors will not take offence at my occasional re-examination of their words.

Those familiar with Mark Lehner's fine book upon aspects of the monuments and topography of the eastern side of the Great Pyramid, *The Pyramid Tomb* etc, may detect both similarities and divergences in our two treatments of this area.¹⁰ Although I came to the detail of his survey after I had already formed the outline of my understanding of the geometry underlying the Great Pyramid's plan, several of Lehner's observations allowed me to expand my results. And for that I am extremely grateful.

Finally, a few paragraphs concerning specific aspects of the text.

All distances have been calculated using latitude and longitude as given in Baines and Málek's *Atlas of Ancient Egypt*, with shipping distances given at an extra 10 per cent, excepting those which necessitated a passage around the so-called Kena Bend in Upper Egypt, to which 40 per cent has been added.¹¹ As no one can be entirely sure of the ancient course of the Nile, closer calculation seems hardly practical. Employing data gathered from the work of Jeffreys and Tavares, however, I have estimated that, at the time of the Great Pyramid's construction (c. 80 BC), the Nile's stream at the latitude of Giza ran about 1½ miles (2½ km) west of its present course.¹²

In similar fashion, the year dates that are presently accepted for the reigns in which the Great Pyramid and the other early pyramids were built are provisional and will almost certainly remain so; fortunately, the arguments of this book are not dependent upon chronological exactitude. For the lengths of the reigns of the early kings of Egypt, I have generally followed von Beckerath's *Chronologie des pharaonischen Ägypten*, although I have modified some of those figures, using more recent information.¹³ I have also extended the length of the reign of Khufu's father Sneferu by six years as Rainer Stadelmann the excavator of his Red Pyramid has proposed and, following the new date for the Great Pyramid's foundation proposed in Kate Spence's elegant paper upon its stellar orientation,¹⁴ I have reset von Beckerath's absolute chronology (see Appendix 1).¹⁵ At the risk of disappointing devotees of chronology, I have not chased the consequences of these date-shifts throughout the following half-millennium; a reluctance founded, I admit, on the desire to keep less-impassioned readers awake and reading, and fortified by the belief that my readjustment does not question currently accepted patterns of chronology.¹⁶

For like reasons, all ancient names have been given in a single form

of common usage.¹⁷ So, King Khufu's name appears here only in that form and not in its variants. Once again, this simplification has been made in the interests of narrative; neither would the themes of my book be enhanced by its further discussion.¹⁸ Place names too are given in a single form of common usage, the majority taken from Baines and Málek's *Egyptian Atlas*.¹⁹

For reasons of style, I have capitalised the word pyramid where it is used as an abbreviation of the Great Pyramid. All other uses of the word, except where it is employed as a proper noun, are given in lower case. I have also employed the modern term 'Giza Plateau' for the rocky outcrop on which the Great Pyramid sits, and I have capitalised the common names of the architectural elements inside the Great Pyramid: the Grand Gallery, the Queen's Chamber, etc., whose locations are indicated in figure 11 – although to avoid confusion I have described the uppermost room, which its early explorers dubbed the 'King's Chamber', as the burial chamber.²⁰ By themselves, of course, none of these modern labels define the ancient purposes of the architecture they describe.

Similarly, although I am well aware that the royal title 'pharaoh' was first employed in ancient Egyptian literature in later dynasties than Khufu's, I have occasionally dubbed King Khufu as a 'pharaoh'. The word after all has a millennial history of its own within the English language – Piers Plowman's 'Pharaones tyme' denoting all the days of ancient Egypt – and it seemed a shame to sacrifice such a splendid biblical term to academia.²¹ Its use here may also serve to remind the reader that the word 'king' which is more generally used to denote ancient rulers such as Khufu is loaded with equally unwonted connotations, as many ludicrous 'reconstructions' of ancient Egypt in the modern media unwittingly demonstrate.

I have also employed the word 'spirit' – a broad term, though not at all ambiguous – to denote the non-physical aspects of the Egyptian dead. No texts from Khufu's time or that of earlier reigns provide an ancient alternative, whilst the Oxford Dictionary's definition of spirit as 'the animating or vital principle in man (and animals); that which gives life to the physical organism, in contrast to its purely material elements' provides an apposite alternative to such common egyptological terms as 'ba' and 'ka' which are only to be found in texts of a far later date than the Great Pyramid, and are not in general English usage.

The use of such jargon, moreover, often serves to create another of those endless circular discussions – the egyptological equivalent of claiming the writings of Bernard Berenson to have been the inspira-

tion of the Renaissance – where there is never anything new under the Egyptian sun and everything is ‘explained’ by reference to something else. To do that would be to deprive the Great Pyramid of its originality, and its makers of their humanity. I have therefore avoided general discussion on ‘how the pyramids were made’ and dealt principally in facts found upon the Giza Plateau and other early sites with direct connection to the Great Pyramid itself.

For similar reasons, I have confined discussion of ancient Egyptian mathematics and geometry to endnotes. The Great Pyramid, after all, was built in what can now be described as a ‘pre-literary Age’, and such mathematical texts as have survived from later periods of Egypt’s history – basically school books – do not begin to approach the sophistication of the Great Pyramid’s design. Neither could the accurate physical replication of such subtle maths as the Great Pyramid contains have been accomplished at the time of its construction: such an extraordinary labour would have required the employment of equipment that has only been available in the last few centuries. And in that conundrum lies a great part of this Pyramid’s fascination.