

Origins of an Odyssey

Television is not all bad. In the winter of 1970, as editor of the newly-founded *Journal for the history of astronomy*, I found myself watching a fascinating programme in which an elderly Scots engineer named Alexander Thom¹ discussed the purpose of the great rows of menhirs that march across the countryside of Carnac in Brittany. They were, it seemed, astronomically motivated, part of a complex of stones which the prehistoric builders could have used for high precision observations of the moon. In particular, a huge stone some 20 metres in height and weighing over 340 tons had been erected as a sort of universal foresight, related to a number of backsights located in various directions many kilometres distant. Megalithic Man, according to Thom, had stood at one of these backsights at a critical time of the lunar cycle, and watched the moon as it rose or set behind the great foresight. Backsight and foresight together formed an observing instrument built on a vast scale and therefore offering great accuracy, and this (he claimed) had enabled the constructors to monitor the cycles in sufficient detail for them to predict lunar eclipses.

This reminded me vividly of a suggestion of Galileo's.² Around a solstice the sun sets in almost the same position night after night, so that the actual day of the solstice is difficult to determine; but on one particular occasion, around midsummer, Galileo had noticed that the sun had set that evening behind a distant mountain in a position that was noticeably different from its setting point the night before. The mountain was in effect the foresight of an observing instrument whose length was so great that even the tiny movement of sunset around the solstice could be detected. Thom, though unaware of Galileo's suggestion, believed that Megalithic Man had done exactly the same thing.

The claim that there had been a prehistoric science of astronomy was clearly relevant to my journal. I wrote to Thom and invited him to submit an article on Carnac, and there began a partnership that resulted in the publication of no fewer than twenty articles. It was a partnership because Thom was an engineer unused to literary argumentation and no longer young, and he would send me a draft which I would then work up into publishable form. Now Thom was not only a great fact-gatherer, a meticulous and indefatigable surveyor of sites, but he was also an uninhibited theorizer, and his claims aroused immense interest among historians of astronomy and no less alarm among archaeologists.

A decade passed, and I found myself President of the history section of the International Astronomical Union, and so expected to organize a conference in the middle of my term of

office. What better topic than this contentious subject of ‘archaeoastronomy’? — for I was now receiving so many articles on prehistory that I had been forced to dedicate whole issues to the theme. Oxford seemed a suitable location, for the colleges were well used to hosting conferences and the city was near enough to great monuments like Stonehenge and Avebury for us to visit them on the final day. And so, in September 1981, astronomers, historians, ethnographers and even one or two archaeologists converged on Queen’s College for what was to prove a lively meeting. The students of the Maya and other Mesoamerican cultures had ample evidence of the obsession with astronomical cycles on the part of the peoples they studied. They possessed written documents, admittedly few in number; they could decipher carvings on the walls of buildings; they could question descendants now living; and they could measure the alignments of structures. There was a multidisciplinary approach, and they were scandalized at the gulf between Thom and his sympathizers on the one hand and European archaeologists on the other.

The reason for the gulf was clear: most Old World archaeologists found Thom’s conclusions repellent and his astronomical and statistical arguments incomprehensible. But at least the Thomists, having little other than the stones to work with, measured these stones with care and precision. Their New World counterparts, blessed with a variety of evidence, were much more cavalier. And so each party had much to teach, and much to learn.³ The New World participants agreed to host a return match in the Yucatan which they named ‘Oxford 2’, and to date six ‘Oxford’ meetings have been held and there is a standing international committee to perpetuate the series.

At the time of Oxford 1 I was an editor struggling to assess articles offered for publication in a field largely alien to me. This was about to change. I enjoyed holidays in Menorca and spent much time in a cove with numerous large caves in the cliffs. From an archaeological map for tourists I learned that these included ancient burial caves. My interest aroused, I eventually made contact with William Waldren, an American who had excavated an important site on Menorca and who enjoyed an attractive lifestyle whereby he wintered in Oxford and summered on Mallorca where he had been excavating for many years. We formed a firm friendship, and under his guidance I had my first experiences of practical archaeology. Then, in 1987, Waldren took me to visit an excavation directed by Antonio Arribas Palau, professor of archaeology in the University of the Balearics. Arribas, hearing of my background in astronomy, suggested that I investigate the orientations of the Bronze Age sanctuaries of Menorca. This in turn led to an invitation from the University of Granada to measure the orientations of the tombs at the great site of Los Millares in Almería; and so one thing led to another, and the result is this book.

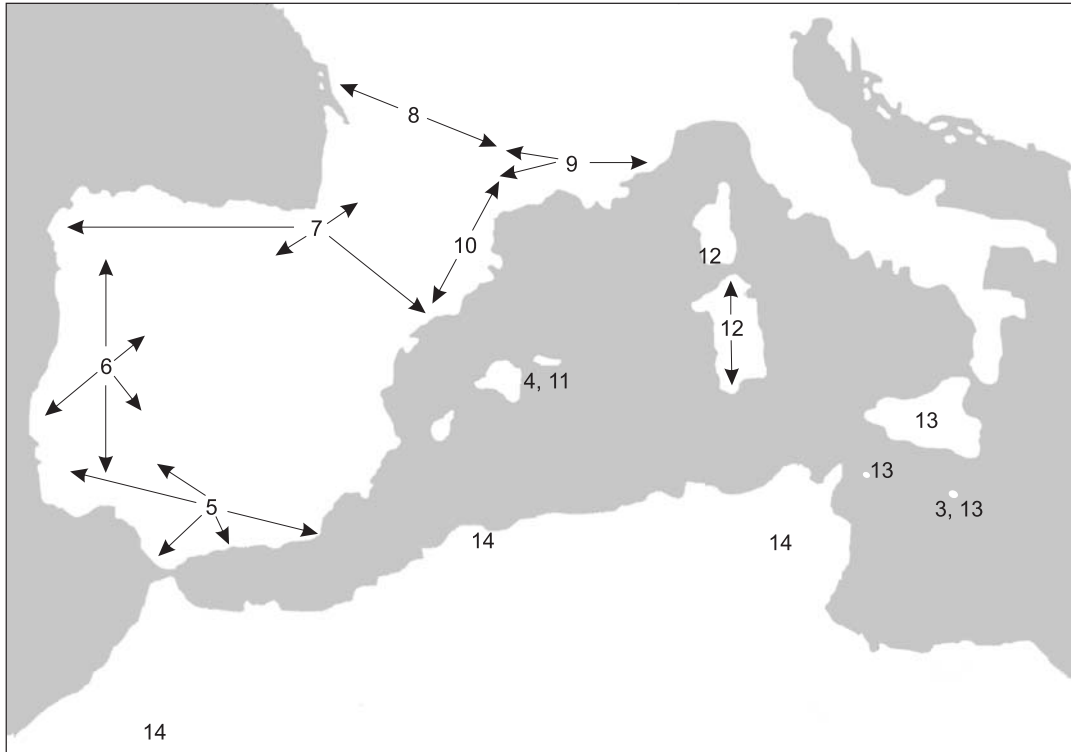
My primary purpose is to make available to prehistorians of the Mediterranean the many hundreds of orientations I have measured (what a friend has generously termed “un espectacular corpus de información”, “una mina de oro”⁴), so that they may take orientations into consideration along with all the other evidence. For it has never been my belief that the ‘archaeoastronomer’ can go it alone; I do not see the student of orientations as a *deus ex machina*, able single-handedly to resolve confusion. However, I believe that every archaeological team not only should have experts in flint and pottery and bones and radiocarbon dating and so forth, but that,

where appropriate, it should include someone who knows how to measure orientations and interpret them. For it is now indisputable that around the Mediterranean most of the prehistoric tomb and temple builders were following customs in the orientation as well as in the structure and location of their monuments; and the modern investigator needlessly impoverishes his enquiry if he ignores these customs of orientation.

The most that could be claimed for this book is that, like the proverbial curate's egg, it is good in parts. Today I normally work and publish in collaboration with archaeologists, but even so the archaeological context I offer for my measurements will inevitably be sketchy and inadequate — the range of cultures whose orientation customs it has been my privilege to investigate is so great that to ensure that the purely archaeological content was always of professional standard would have delayed publication by years. I took retirement from my university post nine years before the normal age partly in order to have unrestricted time for fieldwork. Typically, to locate three or four tombs will occupy a complete day (at an average cost of perhaps £25 per tomb). An archaeologist in university or other professional employment is unlikely to be able to spend so long in the field, even if his research interests made it appropriate for him to range so widely and yet to focus on so limited an aspect of prehistoric cultures. In any case, as I point out in the next chapter, tombs are being destroyed on a vast scale, and in all-too-many cases my measures can no longer be repeated. It therefore seems preferable to assemble my measures — hitherto scattered across numerous journal articles — between the covers of a single book, and to attempt an overview of the results, even if the archaeological context leaves much to be desired. I cite archaeological publications which the interested reader may care to pursue, and meanwhile beg indulgence for any shortcomings.

The focus of this book is on the islands and European mainland of the central and western Mediterranean. After an introduction to motives and methods we discuss in Chapter 3 the great temples of Malta and Gozo, which were at their peak around 3000 BC. They seem to be among the secrets of archaeology, for they predate the pyramids of Egypt and were in their time the greatest buildings on the face of the earth. I offer a tentative explanation for their orientations, but much more interesting is the discussion of the tally stones on the entrance pillars of one of the temples. This, according to my colleagues and me, represents the numbers of days in the intervals between one notable heliacal rising (that is, a star's appearance in the dawn sky after weeks of absence lost in the glare of the sun) and the next; if we are right, then the traditional calendars based on heliacal events, used by farmers to the present day and which we first find expressed in written form in Hesiod's *Works and days* in about the eighth century BC, go back a further two millennia.

In Chapter 4 we investigate the Bronze Age sanctuaries of Menorca, which were at their height around 1000 BC, and also those of Mallorca, which are Iron Age, from the middle of the first millennium. I propose a theory that provides an explanation for a number of hitherto puzzling facts established by excavators working on Menorca, and which parallels our tentative explanation for the orientations of the Maltese temples. As a result, I offer a consistent explanation of the orientations of the temples and sanctuaries of the Maltese and Balearic islands, even though construction



A schematic representation of our coverage of the central and western Mediterranean, with the numbers of the relevant chapters.

of the buildings was spread over three millennia.

Temples and sanctuaries dedicated to cult are rare in Mediterranean prehistory, whereas communal tombs, multipurpose structures that must often have been used for ritual, are very numerous. In Chapter 5 we begin, in Almería and the Costa del Sol, a clockwise progress around three-quarters of Iberia (the remaining quarter being devoid of monuments), during which we shall measure approaching one thousand tombs. The final stage of our journey, in Chapter 7, takes us across northern Spain and along both sides of the Pyrenees, until we are almost within sight of the Mediterranean coast again. We find that almost every one of the tombs faces the eastern half of the horizon, and to the south of midsummer sunrise.

In Chapter 8, we cross into France, and in imagination follow the great band of limestone plateaux or *Causses* that stretches from the Bay of Biscay southeastwards towards the Mediterranean. “In imagination” for myself as well as for the reader, because to visit many hundreds of these mostly inconspicuous tombs, in a country where the cost of living is higher than elsewhere, would have been extremely expensive in both time and money; and in any case many of the tombs have been destroyed in recent years.

A major gap in my coverage of the western Mediterranean threatened. However, it was clear

from the published thesis of a French archaeologist, Yves Chevalier, that he had already carried out much of the necessary fieldwork; but only a handful of the orientations were explicitly cited in his book. It took some time to track down his address, but when contact was made he gladly agreed to publish his data in full. Most unfortunately, Chevalier had by now fallen ill, and before he could fulfil his undertaking he met an early death. However, in implementation of his wishes his family made his manuscripts freely available to me, and from these and from two magnificent inventories published by the French archaeologist Jean Clottes it proved possible to assemble a paper listing in all the orientations of nearly one thousand French dolmens. From the dense concentrations of tombs in the central Causses we have six hundred measures, and again almost all faced the eastern half of the horizon.

In Chapter 9, however, in Provence and east Languedoc, not far from the Mediterranean coast, we encounter for the first time westerly-facing tombs, and then in Chapter 10 we are faced with a confusion of easterly and westerly customs as we investigate southwest France and the neighbouring region of Cataluña. After this it is a relief, on revisiting the Balearic Islands in Chapter 11, to find that all the tombs face westerly.

In Chapter 12 we pass to Corsica and Sardinia. There we once more find easterly customs: the early dolmens on both islands, and (on Sardinia) the *corridoi dolmenici* that succeeded them as well as the hundreds of later *tombe di giganti*, almost all faced eastwards and south of midsummer sunrise. The rare exceptions are almost exclusively to be found in the south of Sardinia.

In Chapter 13 we discuss briefly the modest tombs of various types that are to be found on the islands of Malta, Sicily and Pantelleria, and then, to complete our coverage of the west Mediterranean basin, we turn in Chapter 14 to north Africa, and specifically to Tunisia, Algeria and Morocco. There had seemed every reason to expect to find on these southern shores of the Mediterranean, prehistoric tombs whose builders were following customs similar to those familiar to us from the islands and European mainland; and in Tunisia we did indeed find many hundreds of dolmens. But these are mostly very late, from the last centuries before Christ, and many of them are Punic or Roman. Furthermore, in my opinion their orientations were usually chosen to suit the lie of the land rather than in response to what was to be seen in the sky. Algeria we could not visit because of the present unrest, and what we can say about its tombs is based on the publications from a generation ago. Finally, Morocco has been investigated by intrepid colleagues and we report on their work, although the monuments they have visited prove to be culturally remote from the Iberian tombs across the water.

So far in this book the eastern Mediterranean has not been mentioned, though there are many areas there that offer the archaeoastronomer the prospect of rich harvests. As an encouragement to other investigators, we conclude this volume with a study of the Minoan cemetery at Armenoi in Crete, where we had the privilege of measuring over two hundred tombs excavated out of the bedrock, still in excellent condition and with orientations measurable to an accuracy of minutes rather than degrees.

Notes and references

- 1 His principal writings are: *Megalithic sites in Britain* (Oxford, 1967); *Megalithic lunar observatories* (Oxford, 1971); and *Megalithic remains in Britain and Brittany* (with A. S. Thom, Oxford, 1978). In addition he published many articles, some twenty of them in *Journal for the history of astronomy* (hereafter *JHA*) and its supplement, *Archaeoastronomy* (hereafter *AA*).
- 2 Galileo, *Dialogue on the great world systems*, transl. and ed. by G. de Santillana (Chicago, 1953), 398.
- 3 The proceedings appeared in two volumes: *Archaeoastronomy in the Old World*, ed. by D. C. Heggie (Cambridge, 1982), and *Archaeoastronomy in the New World*, ed. by A. F. Aveni (Cambridge, 1982).
- 4 J. A. Belmonte, *Las leyes del cielo: Astronomía y civilizaciones antiguas* (Madrid, 1999), 75.