SAMPLE

History of Astronomy: Ancient Astronomy

Stonehenge to Babylon

Aira Astralis

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Conclusion

This free sample contains the Introduction and Chapter 1. The complete book contains the full contents above.

Introduction

Long before the first written word, people were watching the sky. The oldest surviving sky-related artifacts, carved notations on bone from the Ice Age, are older than the first cities by twenty thousand years; the oldest surviving building whose purpose seems to have been to catch a beam of solstice sunlight, a tomb in Ireland, is older than the pyramids of Egypt by centuries; and the oldest known picture of the cosmos, a bronze disk buried in Germany, is as old as the Trojan War. Ancient astronomy, the subject of this book, is the astronomy of this deep past: the sky knowledge of the pre-literate and the early literate world, practiced from the Stone Age to the first civilizations, and recovered in our own time by the science called archaeoastronomy.

The subject has a double nature, and the book honors both. It is, first, a history: the story of what our ancestors saw and did about it, the sunrise alignments of megalithic monuments, the lunar tallies of Ice Age carvings, the calendars of pits and stones, the sky's myths that named the constellations. It is, second, a detective story: the modern discovery of that ancient knowledge, the antiquarians and the engineers who noticed that old stones point at the sky, the controversies that shook the field when some claims outran the evidence, and the mature discipline that emerged, careful now, reading the sky from the ground with statistics and humility in equal measure.

The chapters ahead follow the discovery first, then the understanding: what ancient astronomy was and what it was for; the celestial cycles it worked with and the naked-eye science behind them; the observation methods of the ancients and the measurement methods of the moderns who study them; the great sites and artifacts from Stonehenge to the Nebra disk; the cultural context and the series of sibling civilizations, each with its own volume; the modern understanding and the open research; the significant discoveries, the challenges and mysteries, the future directions, and the trivia of a subject rich in strange facts. The book's thread, running through all of it, is the one the whole history argues: the sky was humanity's first science, watched carefully for thousands of years before anyone could write a word of it down, and the evidence of that watching is still in the ground, still readable by anyone patient enough to learn its language.

Chapter 1: The Discovery of Ancient Astronomy

The discovery of ancient astronomy is a modern story, roughly two centuries old, in which the present slowly noticed that the deep past had been looking up.

The noticing began with the monuments. The antiquarians who first studied

Stonehenge, from the seventeenth century onward, recorded its shape and speculated about its builders, and the sun's behavior at the site was remarked early: the midsummer sunrise appears over the Heel Stone when viewed from the center of the circle, a fact observable by anyone who stands there on the right morning. For a long time this was trivia rather than evidence, a curiosity of a monument assumed to be a temple or a Druidic court, and the sky knowledge of the ancient world, when thought of at all, was credited only to the literate civilizations, the Greeks and the Babylonians, whose texts had survived. The idea that pre-literate peoples, the megalith builders and the peoples before them, had practiced a sophisticated astronomy of their own was available to no one, because the very possibility had not been posed.

The antiquarian era deserves one more paragraph, the accumulating noticing. William Stukeley, the eighteenth century's pioneering antiquarian, remarked the solstice's geometry at Stonehenge and its avenue's orientation; the nineteenth century's surveyors and the twentieth century's excavators fixed the monument's sequence and its faces, the collateral knowledge that any later theory would need; and the age's own monuments elsewhere, the great passage tombs and the stone rows, were being mapped and dug with the same growing care. The era's limit was conceptual rather than observational: everything was in place for the ancient-astronomical reading except the idea of it, and the idea, when it came, came from outside the archaeological establishment, as the next section's engineer demonstrates.

The posing came in the twentieth century, and it came from an engineer. Alexander Thom, a professor of engineering at Oxford by way of a Scottish industrial career, spent his vacations from the 1930s onward surveying the megalithic monuments of Britain with a precision no antiquarian had attempted; over four decades he measured hundreds of stone circles and rows, and in the data he found patterns. The circles, he claimed, were laid out with a standard unit, the megalithic yard of about 0.83 meters; the alignments, he claimed, included careful horizon marks for the solstices, and even for the extreme risings of the moon at its eighteen-year standstill.

Thom's surveys were impeccable and his conclusions were revolutionary: the prehistoric farmers of Britain, centuries before Pythagoras, had possessed a

geometry, a metrology, and an astronomy of serious ambition. The claims were contested then and remain contested now, this chapter returns to the controversy, but the effect was permanent: the possibility had been posed, and the deep past's sky was suddenly a research frontier.

Thom's own claim deserves the discovery's fuller telling, the engineer's arithmetic. His method was the survey's discipline itself: each site measured to centimeter tolerance, the geometry reduced to numbers, and the numbers compared, hundreds of circles against each other, the pattern sought in the aggregate. The findings, stated in his books from the 1960s and 1970s, were the metrology and the astronomy: the standard units, the yard of about 0.83 meters and its double; the geometric layouts, the circles' flattened and egg-shaped forms built by construction; and the long alignments, the distant horizon foresights, the moon's standstills among the targets.

The reception was the era's own: the archaeological establishment was skeptical, the statisticians argued the units, and the field that grew up around the controversy inherited both the data and the argument, Thom's surveys remaining, whatever the conclusions' fate, the subject's measurement foundation. The public turning point came in the 1960s, at Stonehenge again. Gerald Hawkins, an astronomer working with the new electronic computers, published in 1963 an analysis arguing that Stonehenge's stones encoded alignments to the sun and the moon, and a book, Stonehenge Decoded, followed in 1965 claiming more: that the monument was a neolithic computer, its sightlines arranged to predict eclipses.

The book was a sensation and a scandal; the solstice alignments stood, but the eclipse-prediction claims were criticized as statistical overreach, and the field's hardest lesson was learned in public, that the sky offers so many notable rising points that alignments can be found by accident in almost any arrangement of stones. From the controversy, though, came the discipline: the debate's participants and successors formalized the study of alignments in the ancient world, and archaeoastronomy, the field's modern name, was established by the 1970s with its own conferences, its own journals, and its own rules of evidence, a science of the ancient sky built on the ruins of a bestseller.

The discovery's full arc can be told in the sites themselves, and the chapters ahead tell it so: the Ice Age bones and cave walls whose notations were proposed as lunar calendars by Alexander Marshack in the 1960s; the Egyptian desert basin of Nabta Playa, whose stone complex was mapped by archaeoastronomers in the 1990s; the German enclosure of Goseck, whose solstice gates were recognized in 2003; the Scottish field of Warren Field,

whose twelve pits were revealed by aerial survey as the world's earliest known calendar, in 2004; and the Irish tomb of Newgrange, whose solstice beam was seen by the modern excavator in 1967, the first winter sunrise in four thousand years to reach the chamber's floor. The discovery of ancient astronomy is thus still in progress, and its method is the book's method: to read the sky from the ground, taking the ancients seriously enough to check their work.

A paragraph on the archaeology of the knowledge itself, because ancient astronomy had to be discovered twice. What the modern world knows of the old sky-watchers was assembled slowly and from fragments: tablets dug from city mounds and slowly deciphered, inscriptions read off temple walls, alignments measured at stone circles whose builders left no written word at all; each generation of scholars added a few more pieces, and the picture of ancient astronomy as a working, quantitative science is itself barely a few centuries old. The origin note for the file: the ancients observed the sky for millennia, but the recovery of their observing is a modern science with its own instruments, its own literature, and its own patient milestones, and the file's confidence about what the ancients knew should be calibrated to the evidence, which arrived broken.

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ABOUT THE AUTHOR

Aira Astralis is a science writer specializing in astronomy and space exploration. Her work spans the full breadth of humanity's relationship with the cosmos -- from the earliest naked-eye observations to the engineering marvels of modern space missions.

Her books are built on a foundation of primary sources: peer-reviewed research, mission archives, and direct engagement with the scientific community. She writes for readers who want to understand not just what we know about the universe, but how we came to know it.

She believes that the most important frontier is not out there but in the gap between what scientists discover and what the public understands. Her books exist to close that gap.