
The Strange History of British Archaeoastronomy

Ronald Hutton

University of Bristol,
School of Humanities, Department of History,
11 Woodland Road, Bristol BS8 1TB, UK
R.Hutton@bristol.ac.uk

Abstract

Between 1965 and 1985, British archaeologists found themselves obliged to study the skies as well as the evidence beneath the earth. The sciences of astronomy, mathematics, and statistics bore down on the study of prehistoric monuments as never before, and a series of impressive books and conferences explored the alignments and proportions of ancient ceremonial sites. A quarter of a century later, all this excitement has arguably evaporated. The four different disciplines have largely separated again, and prehistory has been handed back to the excavators. These developments can be characterised as the result of a series of complex relationships between established experts in British prehistory, academic scholars from other disciplines, and members of a radical counter-culture. Archaeoastronomy became presented as a challenge to the credentials of the established experts, and the apparent lack of absolute proof to its conclusions enabled them to reject it wholesale. In Britain it has effectively been handed over to the counter-culture in which it is retained as a tradition.

Keywords

archaeoastronomy, anthropology, megalithic, alignments, pagan Britain, orientation, ethnoastronomy, Oxford conferences, methodology, astronomical heritage, British history

The subject matter of this paper is designed to represent a parallel study to the history of astrology. It does so in that it similarly considers ways of looking at the cosmos, focused on the patterns of heavenly bodies,

which raise questions about the relationship between orthodoxy and unorthodoxy in modern professional scholarship. Its intention is to examine two specific problems. The first is what has happened in Britain to the discipline of archaeoastronomy, or astro-archaeology, the study of ancient responses to the heavens. The subject was established in the 1970s and 1980s on a wave of excitement created by pioneering works of the 1960s. It was confidently expected then to become an integral and important component of the investigation of prehistory. Instead it has shrunk into a small sub-discipline, isolated both from most archaeologists and from an enthusiastic movement existing largely outside the academy, which focuses on alignments between prehistoric monuments and the sky. The second question is why current archaeologists should be so uninterested in the sky, even though the two movements that have dominated the development of their discipline since the 1990s should have enhanced their consciousness of it. However, in the case of O'Connell (2013), the role of archaeoastronomy in formulating a likely interpretation for the monument at Lismullin, County Meath, Ireland, has been significant. One of those movements has been landscape archaeology, and the sky is not only a major component of any landscape but the only one that remains much as it was during prehistory. The other has been cognitive archaeology, the study of the way in which ancient people perceived and experienced their world, and the sky, again, must have formed a major aspect of both processes. Instead it usually plays at most a minor part in the interpretation of archaeological sites.

To set about providing some answers, it is necessary to explain the fortunes of archaeoastronomy itself. In order to do that, attention should be paid to the context in which it appeared and had to operate, and there were four significant features to that.¹ The first was the admiration for big science that has pervaded modern Western society and peaked at certain moments, such as the late nineteenth and the mid-twentieth century. A widespread belief, which had commenced under Queen Victoria, was that scientists would eventually find remedies for virtually all human ills and limitations and reveal all of the workings of the universe. As people almost invariably search for kindred spirits in the past, this created a disposition to detect and praise anybody in history or prehistory who seemed capable of anticipating or matching modern scientific achievements. The second relevant development was the professionalisation of the discipline of archaeology between the 1920s

1. All four have been investigated in more detail, with regard to parallel issues, in Hutton 2009a: 210-417 and 2009b: 313-32.

and the 1950s. Until then it had been carried on mostly by amateurs. Now it became rooted in university courses and the qualifications that they gave, and its prime tool, excavation, was reserved for those equipped with these. The higher the academic status of archaeologists, the more dominant they were in the discipline (Stout 2008). For those with a passionate interest in prehistory who were unable or unwilling to join this exclusive club, only two aspects of the subject remained which were not under the latter's control. One was the relation of prehistoric monuments to other landscape features; the other was their relation to heavenly bodies.

Built into the development of professional archaeology was a third contextual feature: the belief in evolution as the motor force of natural development, which had appeared under Victoria. It was coupled with another major feature of Victorian thought: a cult of moral and technological progress as an admirable, and perhaps divinely inspired, phenomenon. This created a tendency to regard ages that were technologically primitive as debased in their social and moral characteristics as well. The twin words habitually employed for more traditional societies—savages and barbarians—summed up this attitude. It was embodied in the works of some of the most prominent archaeologists of the early twentieth century. It was also, and perhaps more influentially for the general public, personified in the illustrations provided for works on prehistory. The ubiquitous drawings of Alan Sorrell (1980), for example, provided for the readers of the 1950s and 1960s a succession of prehistoric Britons with unkempt hair and beards, dressed in animal skins.² This last, intellectually dominant view of the remote past ran counter to an older one, which remained significant in twentieth-century Britain, especially outside the academy. It was ultimately derived from the Bible, which had remained the basis for a general understanding of history and prehistory until the 1860s. Even among people who had themselves ceased to be Christian, it was a potent instinctual position a hundred years later: a belief that in the remote past humanity had shared a single, primal, good religion, perhaps based on divine revelation or a deep instinctual knowledge of the truths of the cosmos. In this view, the religion and the knowledge concerned had been fractured and mostly forgotten in the course of the millennia. Many people who held it brought with it a desire, to a greater or lesser degree, to recover this lost wisdom and revive this good primal religion in the modern age. Some felt, echoing the Christian apocalyptic tradition, that the survival of humanity depended on this achievement.

2. See also Sorrell's illustrations to Atkinson 1959.

The professional archaeologists of the early twentieth century were certainly aware that some of Britain's prehistoric monuments—and some elsewhere—had important alignments with the sky. The most famous of all was Stonehenge's orientation on the midsummer sunrise, but there were others. Scotland's greatest single Neolithic monument, the passage grave of Maes Howe, was aligned with the midwinter sunset. None of these leaders of the new profession, however, were much interested in astronomy, mathematics, or engineering. This was partly because those are simply different disciplines but also because the elements of all those in prehistoric structures seemed simple enough to require no special study. Occasionally an outsider had taken an interest in them, and this sometimes had spectacular effects. The most distinguished was the great research scientist Sir Norman Lockyer, who was, among other achievements, the discoverer of helium, and who published a series of works on the astronomical significance of ancient monuments between 1894 and 1907. In the process he fixed the date of Stonehenge at around 1680 BCE and informed the leaders of the Welsh national cultural institution, the Eisteddfod, that the ceremony that opened it was proven by its orientations to be about 4000 years old. By studying the layout of ancient buildings, he declared his discovery of a universal ancient religion of sun-worship, carried across Europe by the Phoenicians. These had brought it to Britain and founded the religious tradition that entered history as the Druids (Lockyer 1906).³

All of this was eventually proved completely wrong. The earliest phase of Stonehenge is about a thousand years older, and the ceremony that opens the Eisteddfod was invented by an eighteenth-century forger. The Phoenicians never got near Britain, and the buildings which Lockyer linked together in his universal sun-worship are completely unrelated. It took, however, until the late twentieth century for each suggestion to be decisively disproved, and, in addition, Lockyer found a number of apparent alignments between specific monuments and different annual movements of the sun that are more difficult firmly to refute. The archaeologists of the first three decades did not know what to make of any of his suggestions. Most decided to ignore them, while a few dismissed them and indeed went a great deal further to reject all attempts to characterise ancient monuments regarding astronomical orientation in general and contemptuous terms (Michell 1977: 45-47). This approach seemed effective: as the century wore on, such ideas slipped from public

3. Lockyer's work is considered with full references in Hutton 2009a: 314-15, 333, 366, 404. Much of the latter two-thirds of that book are concerned with the context in which these ideas of Lockyer's came to be refuted.

view. Initially Lockyer had inspired a number of other individuals with an interest in astronomy and surveying to turn their attention to ancient sites. The most significant of these was Rear-Admiral Boyle Somerville (1924 and 1927), who claimed solar, lunar, and stellar alignments from several Irish and Scottish sites.

Somerville identified a problem for archaeoastronomy which had appeared as soon as it took shape, and which was to shadow it ever since (Somerville 1924, 1927). He noted that 'discredit and derision' had already been brought on it

...through the visionary ideas of some enthusiasts, who have tried to import into the subject far more than the cold facts of science can sustain; so that with them, we become confronted by numbers of [Neolithic] 'astronomer priests' sacrificing to the Sun, singing psalms to the Moon, and saluting the Stars. Even the number of stones compassing a Circle, and the 'cubits' that are comprised in its dimensions, have been called upon to provide mystical figures and proportions—an entire prehistoric arithmetic and astrology. It is no wonder, then, that the unmathematical, but otherwise scientific, archaeologist has repelled any suggestion of orientation in these ancient structures (Somerville 1924: 193).

Somerville published in the main journals of archaeology, but after his death this momentum was not continued; by the mid-twentieth century a few people, notably Alexander Thom and C.A. ('Peter') Newham were still publishing articles on the subject in learned journals and local newspapers but creating no controversy and receiving little attention.

This situation ended dramatically in the years between 1963 and 1965, when a professor of astronomy at an American university, Gerald Hawkins, published a series of works leading up to a book, written with some assistance from his friend John White, called *Stonehenge Decoded*.⁴ It became a rapid best-seller on both sides of the Atlantic and continued to be one, in paperback, into the 1970s. Deliberately pitched to a popular market, its selling point was that it was the first attempt to apply computer technology systematically to an archaeological problem. In this case the problem was the purpose of Stonehenge, which Hawkins declared to have been built with extraordinary skill and precision and aligned with the movements of sun and moon. He thought that it had certainly been a calendar, and perhaps a kind of computer, designed among other things to predict eclipses. Hawkins was respectful to archaeologists and used their work, but clearly believed that he had

4. The most celebrated of his early publications was also called 'Stonehenge Decoded', and appeared in *Nature*, the science magazine founded by Lockyer, issue 200 (Hawkins 1963). The book was first published in New York by Doubleday. An English edition followed in 1966, and a Fontana paperback in 1970.

surpassed them in determining at last why the monument was built. He also implicitly challenged their depiction of prehistoric people as savages when the latter had apparently possessed scientific knowledge and ability only equalled again in modern times. The result was a division of expert opinion. One of the most respected of British astronomers, Sir Fred Hoyle of Cambridge University, disagreed with Hawkins's calculations. Hoyle made some of his own calculations, however, and concluded that Stonehenge had indeed been a major scientific instrument, arranged to test new theoretical ideas in a way not known again until modern times (Hoyle 1966a, 1966b). Some prominent writers on archaeology, including the established authority on Stonehenge, Richard Atkinson, condemned Hawkins for making constant mistakes in his use of archaeology and basing his data on inaccurate plans of the monument. Hawkins's critics could not, however, refute the mathematical and astronomical reasoning itself, arguing only that it was possible but not certain, and that different scientists seemed to be reaching different conclusions based on individual selections of data and reconstructions of Stonehenge (Atkinson 1966: 212-16; Hawkes 1967; Hoyle 1967).

Moreover, the archaeologists concerned failed to express their ideas in populist works to rival *Stonehenge Decoded*, leaving a large general public to assume that it had been proven. In addition, and almost immediately, they had a yet more formidable challenger with whom to reckon in the same field: a retired academic Alexander Thom (Thom 1988: 3-13; 1995).⁵ Thom was a very distinguished scholar, having been the Professor of Engineering Science at Oxford University, where a building is named after him. Ever since the 1930s he had been interested in the astronomical and mathematical properties of prehistoric monuments and had devoted many holidays to surveying them, especially in his native Scotland. In 1954 he began to publish his ideas regarding prehistory, but in journals only read by astronomers and statisticians. It was probably the example of Hawkins that made Thom turn to books, releasing in 1967 the first of a series which brought his theories before a large public: indeed, Hawkins had actually cited Thom's earlier work and called for more of it (Hawkins 1963).⁶ These books were the first to support the

5. Biographical sketches of Thom with a bibliography of his works are provided by his son Archie Thom, 'A Personal Note about my Late Father' (1988) and Hans Metz, 'A Personal Appreciation of Professor Alexander Thom' (1988). Archie Thom later published a biography, *Walking in All of the Squares* (1995), and there are further valuable details in Heath 2007: 1-24.

6. The best known were *Megalithic Sites in Britain* (Thom 1967), *Megalithic Lunar Observatories* (Thom 1971), and (with Archibald S. Thom) *Megalithic Remains in Britain and Brittany* (Thom and Thom 1978).

hypothesis that prehistoric monuments were aligned with the heavens using statistical evidence from many sites, produced by extensive field-work of high quality. What Thom argued from this was that the stone circles and rows of Neolithic and Bronze Age Britain had primarily been observatories for studying the night sky in particular with considerable sophistication and precision. He also believed that these observations were used to construct and maintain a general prehistoric calendar of eight annual festivals. Furthermore, he contended that the monuments had been laid out with marvellous mathematical ability, using a standard unit of measurement that he termed the 'megalithic yard'.

Thom did not mock archaeologists for failing to perceive all this, nor did he make any attempt to integrate it with their own findings and their reconstructions of prehistoric culture and society. Instead, he left it to his readers to decide whether the two could be reconciled, and many concluded that he had rendered those reconstructions redundant. As a result his work was immediately and enthusiastically taken up, together with that of Hawkins, by the Earth Mysteries movement that appeared in Britain at the end of the 1960s. It was explicitly opposed to scholarly orthodoxies, being closely allied with the hippy counter-culture of the period and largely inspired by the writings of John Michell, especially his book *The View over Atlantis*, which was published in 1969. This introduced a wide public to the concept of leys—straight lines of mysterious natural energy covering the surface of the earth along which ancient monuments had been aligned. Three points should be emphasised about this concept and the movement with which it was associated in the present context. The first is that it was initially bound up with a post-Christian religiosity and in particular with the biblical concept of a single, primordial true religion from which humanity had deviated at great cost. Michell set the tone for subsequent writers by avoiding any definition of the nature of this religion while employing terms to describe it taken from Christianity. He used apocalyptic language, declaring that acceptance of his ideas represented 'the rediscovery of access to the divine will' and 'the restoration of the Holy Spirit' (Michell 1973 [1969]: 185). The second pertinent point was that it was explicitly hostile to orthodox prehistory as part of a general condemnation of established ideas and institutions. Michell sneered at professional archaeologists as treasure-hunters and grave-robbers who had to be thrown from power (Michell 1973 [1969]: vi, 64).

The third point is that it is most unlikely that Michell and those like him would have written with such enthusiasm had it not been for the apparent discoveries of Alexander Thom. To them, Thom provided a classic example of an outsider who had shown the whole of orthodox

prehistory to be flawed. As such, he was taken up as a hero by Michell and other authors such as Screeton (1974: 22-26), Graves (1976), Hitching (1976: 1-24), and Pennick (1979: 31-34), who followed him in the Earth Mysteries tradition (or as many practitioners called it, 'alternative archaeology') through the 1970s and produced classic works of the genre. Thom's own relationship with this movement was complex. He lacked its mysticism and its contempt for most academics. On the other hand, his ideas, consciously or not, sometimes drew on those of the counter-culture or reinforced them. For example, he proclaimed that Neolithic Britain had observed a ritual calendar of eight festivals, composed by blending the solstices and equinoxes with the quarter days, which started the seasons. He found apparent indications of this in the alignments of megalithic monuments. Lockyer (1906) had drawn attention to such alignments but suggested that the quarter days, solstices, and equinoxes formed not one sacred calendar but two, used by successive prehistoric ages. The only religions known definitely to have observed such an eight-point system are those that constitute modern Paganism. Although claimed by Pagans to be prehistoric, this cycle of feasts had actually been adopted by the first of those traditions to appear, Wicca, in 1958 (Hutton 2008). Thom (1971: 9) also gave support to the idea of ley lines by declaring in 1971 that Neolithic engineers could survey straight paths between mutually invisible points.

Thom's claims were, of course, a great deal less convenient to professional archaeologists, especially as the latter had no skills with which to test them. To do that would require an expertise in astronomy, mathematics, and statistics, and these were all separate sciences. In 1975 Richard Atkinson became the first leading member of his discipline to declare an acceptance of Thom's basic principle that megalithic monuments were bound up intrinsically with astronomical observations. In a book in which he exulted over what he called Atkinson's 'public confession of his former errors' and termed him the first to abandon the 'sinking ship' of conventional archaeology, Michell (1977: 85) swiftly took full advantage of this opportunity. Michell made archaeoastronomy his key example of an apparent heresy that had turned out to prove established scholarship completely wrong and that had become an orthodoxy itself. The lesson was that other unorthodox theorists, like Michell himself, would become the acclaimed experts of the future. By the late 1970s, therefore, two things had become very clear. One was that Thom's claims needed to be examined properly by experts in all of the necessary branches of knowledge. Thom himself was now leaving the field, for by the mid-1970s he had become too old to engage in further research. The other lesson was that established experts in prehistory now

had the strongest possible reason to hope for a disproof of Thom's ideas. As the latter had been set up, especially by Earth Mysteries authors, as the test case of the value of professional archaeology, archaeologists needed to face up to that test and vindicate themselves and their discipline. Nonetheless, two further elements in the situation weighed against any simple need, desire, or ability on the part of practitioners of archaeology to defend their traditional attitudes against Thom's ideas. One was that, contrary to the assertions of some of their non-academic critics, they could actually adapt to fundamental challenges to their received views both speedily and effectively. In exactly the same period during which Thom published his findings, the method of dating upon which they relied, based on radiocarbon analysis, was revealed to be faulty, and the resulting revision altered the whole conventional interpretation of European prehistory. This was also a change brought about by external, scientific research, and it was rapidly and effectively assimilated by archaeologists. The second point to be emphasised is that the decision regarding the worth of Thom's theories could not be made by archaeologists themselves. The span of scientific expertise required for the task required a coalition of practitioners, most of them trained in disciplines other than archaeology.

It was this requirement that engendered the new academic discipline or 'interdiscipline' of archaeoastronomy. This secured something like official recognition in 1979, when the *Journal for the History of Astronomy* created a supplement for it. The first full-scale conference officially devoted to the subject was held at Oxford in 1981, and in the course of the 1980s a coalition of experts emerged within it. Some, like Douglas Heggie, were respected scientists, and some, such as Aubrey Burl, had an existing fame in archaeology. Others, such as John Barnatt, Gordon Moir, and Clive Ruggles, were scholars who were in the process of establishing careers. None of them could have been considered to belong to any existing 'establishment' of experts in prehistory: the nearest to such a figure in the list was Burl, who held a post at what was then a polytechnic and not a university. By contrast, Lockyer, Hawkins, Hoyle, and Thom were all, or had been, prominent members of the 'establishment' of academic pure or applied science.⁷ A few of the new group of archaeoastronomers had personal connections with Thom: indeed, Burl had collated his plans for publication and added approving comments (Thom, Thom, and Burl 1980, 1990). Their investigations had been anticipated during the 1970s by a series of scholars who had accepted Thom's

7. Archaeology is sometimes called a science, but in practice the discipline is almost always classed among the arts and humanities subjects of universities.

ideas and built upon them, and a few of these continued to do so in later decades (Critchlow 1973; MacKie 1977, 2000, 2002; Wood 1978; Thom, Ker, and Burrows 1988).⁸

Nonetheless, the cluster of experts described above came to outnumber these earlier workers in the field and to outrank them, and in the first half of the 1980s, these experts seemed to reach a consensual and negative verdict on Thom's theories, including his mathematical theorising (Burl 1980; Heggie 1981, 1982; Ruggles and Whittle 1981; Barnatt and Moir 1984; Ruggles 1984). Stone circles that he claimed to have been laid out with marvellous precision could, it seemed, have been built without it; nor was good evidence found for a common system of geometry or for a common system of measurement. Their verdict on his astronomical arguments was more mixed. Many stone circles and rows appeared to have no proven alignments with any heavenly bodies, which in itself seemed to overturn Thom's central thesis. The associations between megaliths and stars could not be tested adequately because the latter move so frequently and swiftly that any correlation could not be established without knowing a more precise date for the construction of the monument than present techniques permitted. On the other hand, a significant number of structures did seem to be built to correspond to the movements of the sun or moon, and some to both. This, however, fitted perfectly well the traditional model for prehistoric society that had been assembled by archaeologists. That model had always accepted that certain monuments, including some of the greatest, such as Stonehenge, had clear alignments with bodies in the sky. It had accepted these as significant components of the religion or religions, in most respects mysterious, which had partially inspired the construction of those monuments. Thom's argument had been that the same structures had primarily been astronomical observatories, erected by people with a shared scientific knowledge that had been marvellous even by the standards of the modern age. It was this that had appealed so much to the Earth Mysteries movement, seeming as it did to prove the existence of an impressive and universal ancient wisdom.

A close examination of these critiques suggests that Thom's conclusions were not, in fact, clearly refuted. What they revealed instead was that, at each point, Thom's suggestions were susceptible to challenge and alternative readings: they were not 'hard' science of the kind represented by the correction of the radiocarbon dating process. For virtually all professional archaeologists, this was sufficient to make it permissible to

8. Some of these authors also contributed notable work to the edited collections listed below.

discard them as a contribution to the study of prehistory, justifying their desire to get back to business as usual. By the end of the 1980s, the coalition of experts who had investigated Thom's ideas more or less dispersed, and only one of them continued to make a reputation in the field. This was Ruggles, who emerged during the 1990s as the most respected archaeoastronomer in Britain. As well as being, in the long term, the most dedicated academic scholar of the subject, he had also been the most inclined to emphasise the difficulties and subtleties in it. He had emphasised, for example, that there are actually two different kinds of basic theoretical approaches to statistics, which get significantly different results. He had recognised that apparent scientific results may not always match up to cultural realities. When he investigated the stone rows and aligned pairs of North Mull and the Kilmartin Valley in Scotland, he found that all had a similar orientation. The only celestial event that matched it was the major southerly lunar standstill. What worried him about this was that there are no traditional peoples on earth in recorded history that have shown an interest in movements of the moon along the horizon. A conclusion from this that the Neolithic British were somehow cleverer and more scientifically minded than any other such people seems counter-intuitive. Ruggles got around it by suggesting that in Scotland's latitude alone the moon might seem to move along the horizon at major standstills. He was still plainly unhappy, however, and admitted what he called 'the fundamental problem...that evidence acceptable to a numerate scientist is of a very different nature from that acceptable to his counterpart trained in the humanities' (Ruggles 1988a).

By the end of the 1990s, Ruggles had effectively summed up archaeoastronomy in Britain for his academic peers (see in particular Ruggles 1999). He ruled decisively against any high-precision alignments with heavenly bodies in British or Irish prehistoric monuments. Instead, he found evidence for rough and symbolic alignments with either the sun or the moon among regional traditions that inclined to one or the other. These were fairly clear expressions of a belief system focused upon ritual and cosmic truths rather than observation for its own sake. He also pointed out a logical flaw at the heart of Thom's labelling of megalithic monuments as observatories: that prehistoric farmers could determine the time of year quite easily by watching the horizon. They had no need for any markers to do so, let alone massive stone structures requiring huge efforts to build. In addition, Ruggles had acquired the knowledge of anthropology needed to raise one further concern: that many modern indigenous peoples have taboos against pointing directly at sacred things, so all of the alignments may be deceptive. Equipped with these arguments, he opened the new century by becoming Britain's only

professor of archaeoastronomy, a fitting symbol of his pre-eminence in the field.

It seems that for many archaeologists Ruggles's conclusions represented not just the end of the debate but the end of the subject, an effect neatly illustrated by the most high-profile British prehistoric site of all: Stonehenge. In 1996 a respected academic historian of astronomy, John North, published a book in which he suggested that most Neolithic monuments were aligned with precision on heavenly bodies. Those from the earlier part of the period were targeted on stars, while the large enclosures of the later part, including Stonehenge, to which he devoted most attention, were more oriented with the movements of sun and moon. North (1996) emphasised that the essential purpose of the structures was religious but still insisted that they represented a scientific knowledge extraordinary for the time. The next year, a compilation of essays on the subject of *Science and Stonehenge* appeared under the auspices of the Royal Academy, and Ruggles was invited to write for it on astronomy. Without concentrating on North's book, he managed nonetheless to answer all its arguments, holding that they were hard to prove and suggesting that Stonehenge had only a single undoubted axis based on the solstices and a possible lunar component, neither requiring much grasp of science (Ruggles 1997). In 2007 Julian Richards, at that time probably the leading archaeological authority on the site, produced a book aimed at a large readership and entitled *Stonehenge: The Story So Far*. This did not mention North at all: he was clearly not part of 'the story'. Instead, it summed up Lockyer, Hawkins, and Thom as misguided, and introduced Ruggles as 'the voice of reason' before quoting his views at length (Richards 2007: 217-19). Two years before, Richards had rewritten the official guidebook to the monument, and briefly summarised Ruggles's ideas as all that was needed to be said about the astronomical aspects (Richards 2005: 17). In 2009 the Royal Astronomical Society issued a booklet to the general public which summed up those aspects in a few pages, compiled by a group of members led by Ruggles and once more repeating his views (Ruggles et al. 2009).

To his credit, Clive Ruggles himself was clearly uneasy about the situation that had developed, especially concerning the lack of interest in astronomy that British archaeologists had displayed since 1990. Many had ceased, in fact, to give any special consideration to possible heavenly alignments at the sites that they investigated (Ruggles 2001; Ruggles et al. 2009: 6-11). Ruggles suggested three reasons for this. One was that archaeologists had a new enthusiasm for setting prehistoric sites in their landscapes, which had distracted their focus. Another was that archaeoastronomers drew their language from modern Western science,

and so much of the earlier discourse grated on the ears of archaeologists as both ethnocentric and anachronistic. The third reason, in the eyes of professional archaeologists, was that academic archaeoastronomy had been contaminated by confusion with what Ruggles termed a booming 'popular archaeoastronomy' that had blended indissolubly with paganism and New Age ideas (Ruggles 2001; Ruggles et al. 2009: 6-11).

It may be suggested here that there is truth in all three reasons, but, nevertheless, each can bear further consideration. Ruggles himself noted the logical flaw in the first: that the sky is part of the landscape which archaeologists claimed to be studying. The language of archaeoastronomy may well grate on the ears of professional archaeology. What is possibly more significant, however, is that so many aspects of archaeoastronomy now seem so conjectural and inconclusive that British archaeologists in general now shy away from it.

The major exception to this rule in the years around 1990 was probably the interpretation of a Bronze Age enclosure with wooden posts at Godmanchester near Huntingdon. The excavators proposed alignments from several of the posts upon movements of the sky, only to have their suggestions slammed by Ruggles himself as 'ill-advised', 'dangerous', and 'unconvincing', thus providing an example potent enough to deter others (Ruggles 1999: 128). In this situation, it is all too easy for archaeologists to leave the whole problem to archaeoastronomers, even forgetting in the process to supply the latter with any data. If they take any notice of archaeoastronomy, then the default position is more obviously to repeat the views of Ruggles, not because he is seen as occupying an extreme, sceptical end of a spectrum, but because he is regarded as the opposite: as the main representative of a cautious and consensual position with which virtually all archaeoastronomers should agree, even if some would like to go much further.

The terms which Ruggles has used for the more unorthodox and unofficial forms of archaeoastronomy may also need some refinement. To call them 'popular' is perhaps questionable, in both senses of the word: there is no sign that they attract more public interest or enthusiasm than mainstream archaeology, that they are representative of the populace as a whole, or that they arose from mainstream popular culture. Rather, they are generated by a relatively well-defined minority interest and sub-culture within the UK, which overlaps with the Pagan and New Age movements, shares their opposition to traditional social and cultural norms, but is distinct from the mainstreams of both. The obvious source of it is in neither of the two movements named by Ruggles, but in the former Earth Mysteries, of which in many ways it is a continuation: now that ley lines drawn straight between ancient

monuments on the earth have largely fallen out of fashion, the interest has shifted to straight lines in the air, drawn between monuments and heavenly bodies. This interest is propelled by the same impulse that gave rise to a new interest in archaeoastronomy itself in the 1960s: surveying the sky is one apparent way of coming up with new ideas about the prehistoric past which requires no excavation and no acquaintance with current thinking about prehistory. The force that has recently given it fresh vigour is the microchip revolution, which has provided exciting new tools, including software, that represent the configuration of the night sky during different eras of prehistory, as well as satellite pictures of sites. The simplest name for it, which accurately reflects its most obvious characteristic while being value-free, is 'Thomite'.⁹ To give some sense of the range of approaches at present existing within it, three different bodies of work will now be considered as examples.

The first is that of Robin Heath, who has emerged as the most prominent and prolific recent figure in the field, with a series of books issued since the late 1990s and his own web site (1998, 1999, 2002, 2009, and www.skyscript.co.uk). He is an engineer who has taught at various colleges and recently held an honorary research fellowship at the University of Wales, Lampeter—a reminder that the boundary between mainstream archaeoastronomers and Thomites is not straightforwardly one between academics and non-academics. Heath's heroes are Hawkins, Michell, and Thom, and in his earlier work he restated their claim to have proved the existence of a worldwide, ancient, awe-inspiring scientific wisdom. From the geometrical and mathematical properties of stone circles, especially Stonehenge, he concluded that the builders used them to predict eclipses, calendar dates, tides, and phases of the moon. Heath has also asserted, in partnership with Michell, that Neolithic people accurately calculated the dimensions of the planet. In that earlier work he made no attempt to integrate any of this information with the findings of archaeologists, and indeed he had no time for the latter, dismissing them collectively as characterised by 'ignorance and prejudice' (Heath 1998: xiii). Instead, the supporting evidence that he employed for his interpretations of measurements and calculations was taken from a personal reinterpretation of medieval Christian legends and of selected parts of the Bible and Apocrypha. In many ways his work has been firmly in the older Earth Mysteries tradition, arguing both for an equal validity of the insights of 'dowsers, ley hunters, sacred geometers, psychics, and shamans' with those of archaeology, and for the valuable

9. 'Thomist' is more elegant, but is already current among intellectual historians for the followers and thought of the medieval theologian Thomas Aquinas.

lessons to be drawn today about 'living on the earth' from a true understanding of ancient wisdom (Heath 1998: 138, 183). His most substantial recent book has been an extended defence of the work of Alexander Thom (Heath 2007).¹⁰ Although this book is much more respectful to archaeologists than before, it is still only interested in them and their publications inasmuch as they relate directly to Thom's ideas. Yet Heath still clearly regards a rejection of those ideas as moral failings rather than simply a difference of scholarly opinion. The principal villain of his story, predictably, is Ruggles.¹¹

Heath is, in my opinion, the most typical as well as the most prominent of my three case-studies. The other two, in different ways, buck the normal trend. One is a recent arrival on the scene, a computer programmer named Thomas William Flowers Junior, who has published two booklets and more information on a web site since 2008 (Flowers 2008, 2009).¹² His starting point is also the work of Thom, but he has attacked the latter as inadequate and set out to demonstrate his own surveys of Stonehenge and other major Neolithic sites to be superior. In particular, he has sought to establish a theory that the monuments concerned were designed to bring the sun and moon together to produce a baby sun. He in turn has shown no real interest in the recent findings of archaeology. Instead, Flowers has announced that, on sending his conclusions to English Heritage, the administrative body that cares for Stonehenge, he received a polite acknowledgment but it did not adopt his views. He has therefore condemned archaeologists in general as 'stuck in the past'. He

10. My efforts to obtain this text illustrate well the difficulties experienced by mainstream scholars in trying to engage with such alternative viewpoints. The text did not exist in the copyright library nearest to me, at Oxford, and when I put in an order through the inter-library loan system, I was informed that none was held by any lending institution in the UK. A confined copy existed in the British Library in London, and there was one in a local branch library in Somerset, neither place easily reached from my home. The only other way to read the book was to locate, order, and purchase it on the Internet. I myself thought the effort and expense worth the trouble, in this case, but it would probably deter many mainstream scholars with doubts about the value of the exercise.

11. I am Heath's principal example of a collaborator with the forces of darkness, rather flatteringly in view of my position as an outsider to the field. My experience in this respect is part of a pattern: scholars who ignore the work of Thomites and other counter-cultural writers are only denounced by them in general and anonymous terms. Those who try to engage with their work, while disagreeing, are attacked by them in a direct and personal fashion. This acts as a further, powerful disincentive to any recognition of their existence.

12. In this case there was no difficulty in obtaining the booklets because the author sent copies himself to a string of prominent prehistorians.

has advanced various reasons for a neglect of Thomite work by archaeologists since the 1980s. A further one is that Thomites seem to disagree with each other, while being in general equally hostile towards orthodox scholarship.

The third example is a different sort of exception to the current Thomite rule. It is a lengthy study of the Neolithic monuments of the Boyne Valley, the most famous in Ireland, which appeared in 2006 (Murphy and Moore 2006).¹³ Anthony Murphy and Richard Moore are, respectively, a journalist and an artist from that district. In many ways the book is absolutely typical of the Thomite canon. Its inspiring figure is (again) Thom himself, and it proposes, after his manner, a large number of alignments between the different monuments and the sun, moon, and stars. It is also rooted firmly in the Earth Mysteries tradition, drawing straight lines on the ground between the various sites and finding a giant figure picked out in the landscape. Both are classic phenomena that Earth Mysteries researchers claim to have detected elsewhere, and the book likewise treats the ancient world as having wisdom to teach the present. It also, like Heath, places an emphasis on medieval legends as supporting evidence for these claims. What is so distinctive about it is that the authors have made every effort to understand archaeologists, to incorporate their findings, and to show respect for them. They never, in fact, abuse any opponents and their work is proportionately free of evangelical rhetoric. They admit that their arguments are speculative and offer them as a contribution to a general debate. Nothing quite like their work seems to have appeared in Britain. The difference is not a national one, because relations between archaeologists and Thomites in Ireland seem to have been as strained as those in Britain.¹⁴ It seems to be simply one of personality.

To broaden and balance the argument, on the other side of the Atlantic a different story about archaeoastronomy was emerging, one that shall be touched on only briefly here. Archaeoastronomy in the New World was spawned in an environment investigating the astronomies and the role of cosmology of native North, Meso-, and South American cultures. The two most prominent researchers working within this Mesoamerican material were Anthony Aveni and Edwin Krupp, both highly regarded

13. This would have passed me by completely had I not met Anthony Murphy at a conference of Earth Mysteries enthusiasts at which we were both invited to speak, found him as charming in person as in print, and promptly bought his book.

14. For example, the archaeologist Muiris O'Sullivan spoke bitterly of the 'pseudo-scientific literature' of Earth Mysteries and Thomite writers about Irish Neolithic monuments, and accused them of being 'almost paranoid about archaeologists' (O'Sullivan 1993: 36).

scholars throughout the Americas and significant in founding the discipline of archaeoastronomy during the 1970s (Aveni 1975; Krupp 1977). Aveni, an astronomer researching the astronomical history of the Maya Indians of ancient Mexico, recognised a complex and fundamental difference between astronomical systems developed by indigenous civilisations of the tropical latitudes versus those based in temperate latitudes. This difference was based on distinctly different visible skies as caused by significant latitudinal difference, which his research indicated gave rise to different cosmologies (Aveni 1981). Furthermore, having access to resources such as ethnographies and the historical records of the early colonisers, unavailable to their European counterparts, meant New World archaeoastronomers were able to make claims for the motives behind the construction of monuments and building orientations that were underpinned by anthropological enquiry (Aveni 2008: 8). Such assertions in the Old World would have been considered mere speculation. In 1982 Aveni was made Russell Colgate Distinguished University Professor of Astronomy and Anthropology and Native American Studies at Colgate University in Hamilton, New York, and still holds that position. Krupp is an astronomer whose early research sought both a commonality in the use of sky myths from a diverse set of cultures, including the indigenous peoples of the American plains, northwest and southwest, and a synthesis of the study of the heavens with archaeology (Krupp 1977, 1984). Since 1974 Krupp has been Director of the Griffith Observatory in Los Angeles, which is owned and operated by the City of Los Angeles Department of Recreation and Parks.

The first large-scale meeting of scholars interested in Pre-Columbian Archaeoastronomy, defined as 'the study of the extent of the astronomical knowledge and practice of the ancient people of Mesoamerica' (Aveni 1975: xii) was convened in Mexico City in June 1973, organised jointly by Mexico's Consejo Nacional de Ciencia y Tecnología (CONACYT) and the American Association for the Advancement of Science (AAAS). The meeting was designed to investigate whether Mesoamerican archaeoastronomy as a bona fide interdisciplinary field that had relevance to the understanding of development of civilisation and culture existed, and the overwhelming response was that it did.

In 1981 Michael Hoskin, then President of the history section of the International Astronomical Union (IAU), organised a conference in Oxford to bring together scholars conducting research in archaeoastronomy in both the Old and New Worlds. The result was electric. Those studying Mesoamerican cultures were 'scandalized at the gulf between Thom and his sympathizers on the one hand and European archaeologists on the other' (Hoskin 2001: 2). The only evidence Old World

Thomites could bring to bear on ancient sites was the precise measurement of stones. This contrasted with those in the New World using a range of ethnographical evidence. To quote Ignacio Bernal: 'Astronomy and the calendar are aspects of mathematics and function on the basis of numbers. Whence the dangerous fascination of playing with figures. By moving them from here to there or giving them different meanings, they apparently can be used to prove any hypothesis' (in Aveni 1975: x-xi). The methodologies and research questions of the participants were considered so different that the conference proceedings were published as two volumes (Aveni 1982; Heggie 1982), giving rise to Old World (green-coloured volume) or green archaeoastronomy, based primarily on alignment-orientated statistics, versus New World (brown-coloured volume) or brown archaeoastronomy, which drew on historical and ethnographic records to enrich its understanding of early astronomies and their relationships to calendars and ritual (Aveni 1980). Yet from this grating mix arose a continuing series of Oxford International Conferences on Archaeoastronomy, held every four to five years, designed to share methodologies and processes. As a result, more interdisciplinary approaches that include archaeologists, ethnographers, anthropologists, and historians have underpinned and informed the current discipline of archaeoastronomy (Aveni 1989: xi-xiii). Rather than merely establishing the existence of ancient astronomies, contemporary archaeoastronomers are more open to seeking explanations within a broader cultural context of why ancient peoples would have harboured an interest in the sky. Published proceedings from the 2011 Oxford IX conference held in Lima, Peru (Ruggles 2011) offered a far more global collection of scholarly papers on the development of archaeoastronomy.

In conclusion, this contribution to the subject does not itself attempt to make any intervention in the debates over archaeoastronomy; the author lacks any of the scientific qualifications needed to become a participant in them. They are viewed here instead as an exercise in cultural history, focusing on what they tell us about modern British people and perhaps even about the processes of history themselves. One suggestion is that the various arguments provide powerful support for the concept of great personalities as motive forces in human development. Without the towering figure of Alexander Thom, neither academic nor popular interest in the field would have taken off as it did, and it may be that the Earth Mysteries would not have developed into a coherent movement at all. The same story also reveals some interesting differences between approaches to data on the part of scientists and of scholars in the humanities. It throws into high relief the basic problem of how truth can be established in scholarship and especially in the study of the remote

past. Perhaps, however, it is most revealing as a lesson in the power politics of knowledge, expressed here in the relationships between different kinds of professional scholar, between popular and academic culture, between secularism and Christianity in the modern age, and between mainstream society and a counter-culture. One of the lessons of postmodernity is that academics should look more at the way in which their own perceptions are affected by the times and places in which they live. In this particular case, the interaction between academic and counter-cultural attitudes to the past, and between those engendered by different academic disciplines, seems to have been more important than has generally been acknowledged.

Acknowledgments

I am very grateful to Professor Clive Ruggles for reading through this piece of work in draft form and for making several invaluable suggestions for improvement.

References

- Atkinson, R.J.C. 1959. *Stonehenge and Avebury and Neighbouring Monuments* (London: Her Majesty's Stationery Office).
- Atkinson, J.C. 1966. 'Moonshine on Stonehenge', *Antiquity* 40: 212-16.
- . 1975. 'Megalithic Astronomy: A Prehistorian's Comments', *Journal of the History of Astronomy* 6: 51.
- Aveni, A.F. 1980. *Skywatchers of Ancient Mexico* (Austin, TX: University of Texas Press).
- . 1981. 'Tropical Archaeoastronomy', *Science* 213.4504: 161-71. Doi: <http://dx.doi.org/10.1126/science.213.4504.161>.
- . 1982. *Archaeoastronomy in the New World: American Primitive Astronomy: Proceedings of an International Conference held at Oxford University, September 1981* (Cambridge: Cambridge University Press).
- . 1988. *New Directions in American Archaeoastronomy: Proceedings [of the] 46[th] International Congress of Americanists: Amsterdam, Netherlands 1988* (Oxford: B.A.R.).
- . 1989. *World Archaeoastronomy: Selected Papers from the 2nd Oxford International Conference on Archaeoastronomy Held at Merida, Yucatan, Mexico, 13-17 January 1986* (Cambridge: Cambridge University Press).
- Aveni, A.F. (ed.). 1975. *Archaeoastronomy in Pre-Columbian America* (Austin, TX: University of Texas Press).
- Barnatt, John, and Gordon Moir. 1984. 'Stone Circles and Megalithic Mathematics', *Proceedings of the Prehistoric Society* 50: 197-216.
- Burl, Aubrey. 1980. 'Science or Symbolism', *Antiquity* 54: 191-200.
- Critchlow, Keith. 1973. *Time Stands Still: New Light on Megalithic Science* (London: Gordon Fraser Gallery).
- Flowers, Thomas William. 2008. *Woodhenge Embryology* (private publication).

- . 2009. *Alexander Thom's Megalithic Yard* (private publication). Online: <http://www.definitivestonehenge.com>.
- Graves, Tom. 1976. *Dowsing* (Penzance, UK: Turnstone).
- Hawkes, Jacquetta. 1967. 'God in the Machine', *Antiquity* 41: 174-80.
- Hawkins, Gerald S. 1963. 'Stonehenge Decoded', *Nature* 200: 306-8. Doi: <http://dx.doi.org/10.1038/200306a0>.
- Heath, Robin. 1998. *Sun, Moon and Stonehenge* (Cardigan, Wales: Bluestone Press).
- . 1999. *Sun, Moon and Earth* (Glastonbury, UK: Wooden Books).
- . 2002. *Stonehenge* (Glastonbury, UK: Wooden Books).
- . 2007. *Alexander Thom* (Cardigan, Wales: Bluestone Press).
- . 2009. *The Moon and Ancient Calendars* (Cardigan, Wales: Bluestone Press). Online: <http://www.skyscript.co.uk>.
- Heggie, Douglas C. 1981. *Megalithic Science* (London: Thames & Hudson).
- Heggie, Douglas C. (ed.). 1982. *Archaeoastronomy in the Old World* (Cambridge: Cambridge University Press). Doi: <http://dx.doi.org/10.1017/CBO9780511898310>.
- Hitching, Francis. 1976. *Earth Magic* (London: Cassell).
- Hoskin, Michael. 2001. *Tombs, Temples and Their Orientations: A New Perspective on Mediterranean Prehistory* (Bognor Regis, UK: Ocarina Books).
- Hoyle, F. 1966a. 'Speculations on Stonehenge', *Antiquity* 40: 262-76.
- . 1966b. 'Stonehenge: An Eclipse Predictor', *Nature* 211: 454-56. Doi: <http://dx.doi.org/10.1038/211454a0>.
- . 1967. 'Hoyle on Stonehenge: Some Comments', *Antiquity* 41: 92-95.
- Hutton, Ronald. 2008. 'Modern Pagan Festivals: A Study in the Nature of Tradition', *Folklore* 119: 251-73. Doi: <http://dx.doi.org/10.1080/00155870802352178>.
- . 2009a. *Blood and Mistletoe: The History of the Druids in Britain* (New Haven, CT: Yale University Press).
- . 2009b. 'Modern Druidry and Earth Mysteries', *Time and Mind* 2.3: 313-32. Doi: <http://dx.doi.org/10.2752/175169609X12464529903137>.
- Krupp, E.C. 1977. *Skywatchers, Shamans, and Kings: Astronomy and the Archaeology of Power* (New York: Wiley).
- . 1984. *Archaeoastronomy and the Roots of Science* (Epping, UK: Bowker).
- Lockyer, Sir J.N. 1906. *Stonehenge and Other British Stone Monuments Astronomically Considered* (London: Macmillan).
- MacKie, Euan. 1977. *Science and Society in Prehistoric Britain* (London: Paul Elek).
- . 2000. 'Maeshowe and the Winter Solstice', *Antiquity* 74: 62-74.
- . 2002. 'The Structure and Skills of British Neolithic Society', *Antiquity* 76: 666-68.
- Metz, Hans. 1988. 'A Personal Appreciation of Professor Alexander Thom', in Ruggles 1988b: 14-30.
- Michell, John. 1973 [1969]. *The View Over Atlantis* (London: Sphere Books).
- . 1977. *A Little History of Astro-Archaeology* (London: Thames & Hudson).
- Murphy, Anthony, and Richard Moore. 2006. *Island of the Setting Sun* (Dublin: Liffey Press).
- North, John. 1996. *Stonehenge: Neolithic Man and the Cosmos* (London: HarperCollins).
- O'Connell, Aidan. 2013. *Harvesting the Stars: A Pagan Temple at Lismullin, Co. Meath* (NRA Scheme Monographs, H; Dublin: National Roads Authority).
- O'Sullivan, Muiris. 1993. *Megalithic Art in Ireland* (Dublin, UK: Town House & Country House).

- Pennick, Nigel. 1979. *The Ancient Science of Geomancy* (London: Thames & Hudson).
- Richards, Julian. 2005. *Stonehenge* (London: English Heritage).
- . 2007. *Stonehenge: The Story So Far* (London: English Heritage).
- Ruggles, Clive. 1984. *Megalithic Astronomy: A New Archaeological and Statistical Study of 300 Western Scottish Sites* (British Archaeological Reports, 123; Oxford: B.A.R.).
- . 1988a. 'The Stone Alignments of Argyll and Mull', in Ruggles 1988b: 232-50.
- . 1997. 'Astronomy and Stonehenge', in B. Cunliffe and C. Renfrew (eds.), *Science and Stonehenge* (Oxford: Oxford University Press): 203-29.
- . 1999. *Astronomy in Prehistoric Britain and Ireland* (New Haven, CT: Yale University Press).
- . 2001. 'Astronomy, Cosmology, Monuments and the Landscape in Prehistoric Ireland', in C. Ruggles, E. Prendergast, and T. Ray (eds.), *Astronomy, Cosmology and Landscape* (Bognor Regis, UK: Ocarina): 51-52.
- . 2011. 'Pushing Back the Frontiers or Still Running around the Same Circles? "Interpretative Archaeoastronomy" Thirty Years on', *Proceedings of the International Astronomical Union 7* (Symposium S278): 1-18.
- Ruggles, Clive (ed.). 1988b. *Records in Stone: Papers in Memory of Alexander Thom* (Cambridge, UK: Cambridge University Press).
- . 2011. *Archaeoastronomy and Ethnoastronomy: Building Bridges between Cultures: Proceedings of the 278th Symposium of the International Astronomical Union and 'Oxford IX' International Symposium on Archaeoastronomy Held in Lima, Peru, January 5-14, 2011*. (Cambridge: Cambridge University Press).
- Ruggles, Clive, and Alisdair Whittle (eds.). 1981. *Astronomy and Society in Britain during the Period 4000-1500 BC* (British Archaeological Reports, 88; Oxford: B.A.R.).
- Ruggles, Clive, Bill Burton, David Hughes, Andrew Lawson, and Derek McNally. 2009. *Stonehenge and Ancient Astronomy* (London: Royal Astronomical Society).
- Screepton, Paul. 1974. *Quicksilver Heritage* (Wellingborough, UK: Thorsons).
- Somerville, H. Boyle. 1924. 'Orientation in Prehistoric Monuments in the British Isles', *Archaeologia* 73:193-224. Doi: <http://dx.doi.org/10.1017/S026134090001033X>.
- . 1927. 'Orientation', *Antiquity* 1: 31-41.
- Sorrell, Alan. 1980. *Early Wales Recreated* (Cardiff: National Museum of Wales).
- Stout, Adam. 2008. *Creating Prehistory* (London: Blackwell). Doi: <http://dx.doi.org/10.1002/9781444302912>.
- Thom, Alexander. 1967. *Megalithic Sites in Britain* (Oxford: Oxford University Press).
- . 1971. *Megalithic Lunar Observatories* (Oxford: Oxford University Press).
- Thom, Alexander, and Archibald S. Thom. 1978. *Megalithic Remains in Britain and Brittany* (Oxford: Oxford University Press).
- Thom, Alexander, Archibald S. Thom, and Aubrey Burl. 1980. *Megalithic Rings* (Oxford, UK: British Archaeological Reports).
- . 1990. *Stone Rows and Standing Stones* (Oxford: British Archaeological Reports).
- Thom, Archibald S. 1988. 'A Personal Note about My Late Father', in Ruggles 1988b: 3-13.
- . 1995. *Walking in All of the Squares: Alexander Thom, Engineer and Archaeoastronomer* (Glendaruel, Scotland: Argyll Publishing).
- Thom, Archibald S., J.M.D. Ker, and T.R. Burrows. 1988. 'The Bush Barrow Gold Lozenge', *Antiquity* 62: 108-19.
- Wood, John Edwin. 1978. *Sun, Moon and Standing Stones* (Oxford: Oxford University Press).



Copyright and Use:

As an ATLAS user, you may print, download, or send articles for individual use according to fair use as defined by U.S. and international copyright law and as otherwise authorized under your respective ATLAS subscriber agreement.

No content may be copied or emailed to multiple sites or publicly posted without the copyright holder(s)' express written permission. Any use, decompiling, reproduction, or distribution of this journal in excess of fair use provisions may be a violation of copyright law.

This journal is made available to you through the ATLAS collection with permission from the copyright holder(s). The copyright holder for an entire issue of a journal typically is the journal owner, who also may own the copyright in each article. However, for certain articles, the author of the article may maintain the copyright in the article. Please contact the copyright holder(s) to request permission to use an article or specific work for any use not covered by the fair use provisions of the copyright laws or covered by your respective ATLAS subscriber agreement. For information regarding the copyright holder(s), please refer to the copyright information in the journal, if available, or contact ATLA to request contact information for the copyright holder(s).

About ATLAS:

The ATLA Serials (ATLAS®) collection contains electronic versions of previously published religion and theology journals reproduced with permission. The ATLAS collection is owned and managed by the American Theological Library Association (ATLA) and received initial funding from Lilly Endowment Inc.

The design and final form of this electronic document is the property of the American Theological Library Association.