Norman Lockyer and the Controversial Beginnings of Archaeoastronomy

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Abstract:
It has long been acknowledged that Norman Lockyer played a central role in the foundation of archaeoastronomy in the late nineteenth and early twentieth centuries. His interest in what was then referred to as "orientation" flourished on a visit to Egypt, where he became convinced that rigorous scientific methods could be used to prove archaeological theories concerning ancient religions.

However, despite the prospect of a well-known intellectual entering the sparse discourse around archaeoastronomy, little happened to promote the discipline after the Egyptian expedition.

Whilst Lockyer is often framed as a lonely figure working at the dawn of the field, newly digitised lantern slides from the Norman Lockyer Observatory archives reveal his extensive interactions with a dedicated network of British archaeoastronomical researchers. Lockyer's work, along with that of his new community, came at a very unfortunate time. This paper seeks to explain why his archaeoastronomic work was not well-received by prominent archaeologists, and why the discourse around archaeoastronomy up until his time smothered Lockyer's attempts to legitimize orientation.

Keywords: Norman Lockyer, archaeoastronomy, Edfu, Stonehenge, Boscawen-Un, Avebury

Introduction

Norman Lockyer (Figure 1) was one of the most famous Victorian amateur astronomers. He was a co-discoverer of helium in the solar corona in 1868, along with the French astronomer Pierre Janssen. He founded the science journal *Nature* a year later, and later became the director of the Solar Physics Observatory in South Kensington. In the early 1890s, he became interested in archaeoastronomy and would devote much of his remaining career to this subject. Lockyer was a constant promoter of public education in the sciences and was knighted in 1897. The Solar Physics Observatory moved to Cambridge, and Lockyer went to spend his retirement in Sidmouth. There he built his own observatory, originally known as the Hill Observatory. After his death, the observatory became the Norman Lockyer Observatory (NLO). The Lockyer family ran the NLO, and once their tenure came to an end, the observatory eventually came to be acquired by East Devon District Council, who leased it to the Norman Lockyer Observatory Society.

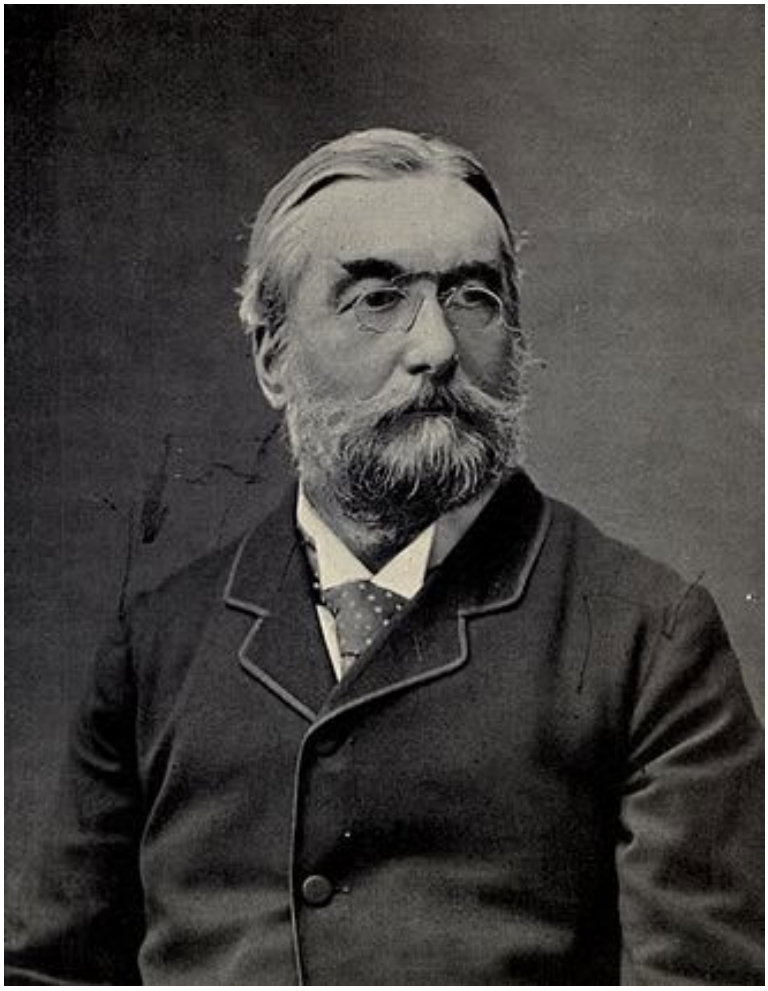


Figure 1. Photograph of Norman Lockyer, 1897 (Notables, 1897, p. 156).

Today, the NLO archives contain roughly one hundred and twenty lantern slides depicting different aspects of Lockyer's archaeoastronomical studies. The majority of these pertain to his studies in Britain and showcase the period from 1892 to 1906. Most of the slides were donated to the NLO and come from three main sources: the Lockyer family, private lantern slide collectors, and the former Solar Physics Observatory (now Institute of Astronomy) in Cambridge.

The objective of this paper is to track and explain, using the NLO image archives and personal correspondence, how a Lockyer-oriented archaeoastronomical coterie was formed. From this we can assess how its methodology impacted the field and chart the tension between Lockyer's archaeoastronomical legacy and the controversy his work elicited. There is considerably less documentation of his earlier studies in Egypt, but *The Dawn of Astronomy* (1894) contains photographs and accounts of the people Lockyer met there. The completeness of the NLO archives on British antiquities allows for some interesting insights, providing us a window into what Lockyer selected for inclusion in *Stonehenge and Other British Stone Monuments Astronomically Considered* (1906a) and what the reasoning behind these choices might have been.

Both *Dawn of Astronomy* and *Stonehenge* were backed by major publishing houses, such as Cassell & Co. and Macmillan. Alexander Macmillan believed in Lockyer as a communicator of science. Macmillan had previously chosen Lockyer to be the editor of the influential periodical *Nature*, and had published his popular educational books, an early example being 1868's *Elementary Lessons in Astronomy.* Lockyer's reputation was a good one, and weathered earlier controversies in his career, such as his heated public debates with William Huggins over the Meteoritic Hypothesis and the turbulent disintegration of his professional relationship with Richard Proctor. He managed to emerge from these incidents relatively unscathed due to the enormous respect he had gained as a pioneer in electromagnetic spectroscopy and his subsequent landmark discovery of helium. At the turn of the century, Lockyer's reputation would be tested by the might of the British archaeological establishment, but in the long term he would be vindicated.

Lockyer's method of investigation went as follows: he took photographs in the field and paired these with detailed ground plans and sky charts and diagrams. Among other things, he used these to work out which stars were the likely focal points for different temples. He also gathered local knowledge and folklore to assist this process.

In this paper I use Lockyer's lantern slide photographs, ordinance survey maps, proposed alignment charts and other materials in the NLO archive in an effort to trace Lockyer's archaeoastronomical connections. These connections were mostly with other English-speaking archaeoastronomers. As a result, the concerns of this paper are limited to the development of archaeoastronomy in the Anglosphere. There are very few records of Lockyer's Egyptian expedition in the NLO archives. The lantern slides mainly document his British expeditions. The collection has no formal accession numbers, but interested researchers will easily be able to locate the relevant boxes of material at the NLO. While there may be lost Egyptian lantern slides that I am at present unaware of, the careful preservation of the British slides implies that a small and close-knit community existed around British antiquities. Indeed, it is Britain that Lockyer devoted the greater part of his career to, but an examination of his initial activities in Egypt is required to gain the full picture. The theories he developed there laid the groundwork for many of his assertions about the early religions of Neolithic and Bronze Age Britons. For purposes here, I have rendered the lantern slides in the best detail I could. In order to correctly identify personages in the photographs and present an uncluttered, clear image, I occasionally removed borders of the lantern slides and zoomed in on relevant features.

There are numerous factors that come into play when examining why Lockyer's foray into archaeoastronomy was not widely applauded. I do not mean to place the blame squarely on the shoulders of prominent archaeologists of the time. However, Lockyer set out with some pre-conceptions about what his findings would reveal about the societies he wished to study, and these set into motion a series of events which would lead to his blacklisting. Firstly, he desired to elevate the lowly status of British antiquities, and this ambition would dictate the course of his studies.

Secondly, he drew extensively upon folklore and esotericism to support his analyses of sites such as Stonehenge. Thirdly, these sources led to Lockyer making some eccentric new connections, and he found himself rather awkwardly associated with the shady world of Edwardian esotericism. Yet, none of these developments would prove fatal to the longevity of his innovations, and whilst many of his theories regarding the Celts and Druids have been discounted, we can learn much from the ways in which he went about designing a new methodology. In the words of Gingerich (1984), "*the prime duty of the historian of astronomy is to illuminate his science as a creative human activity of the astronomical community of the time*" (p. x).

The development of the study of archaeoastronomy at the end of the nineteenth century is a fascinating story for a historian of astronomy because it interacts with all of the aforementioned social and temporal elements in surprising ways. Indeed, the story of the early rejection of archaeoastronomy is ultimately one that challenges the positivist assumptions we make about the furthering of knowledge and progress in general. The hierarchies that Lockyer found himself up against, first as an amateur astronomer, and then as a scientist seen to be meddling in the business of archaeologists, are undoubtedly characterised by their historical context. Many who resented Lockyer's intervention were religious and academic elites. Lacking the expertise and superlative achievement that had distinguished him to the gentlemen scientists of the astronomical world, he began again as a plucky amateur in the field of archaeology at the age of fifty-five.

Initial Years in Greece and Egypt

Lockyer has been branded the "father of Archaeoastronomy" (Polcaro & Polcaro, 2009, p. 224), but this is not especially due to the originality of his ideas concerning stars and stones. Ideas about orientation first struck him in 1890, when he accompanied a friend on a trip to Greece, visiting the Parthenon (Figure 2), Propylaea (Figure 3), the Temple of Concord (Figure 4), and other antiquities.

Figure 2. Photograph of the east front of the Parthenon by Norman Lockyer, 1890 (image courtesy of the Norman Lockyer Observatory).

Figure 3. Photograph of Propylaea, taken from the southwest by Norman Lockyer, 1890 (image courtesy of the Norman Lockyer Observatory).

Figure 4. Photograph of the Temple of Concord, Girgenti, by Norman Lockyer, 1890 (image courtesy of the Norman Lockyer Observatory).

He noticed that the temples were built in what he saw as bizarre and inconvenient directions for the landscapes they inhabited (Meadows, 2008, p. 236). *Orientation,* as it was called, was the then somewhat fringe theory that ancient manmade structures may have been built to be aligned with or oriented toward celestial phenomena, seemed a very likely explanation for this. Lockyer thought that this would represent an advance for archaeologists by potentially providing a new way of accurately dating ruins. He wrote to a friend of his, W. M. Flinders Petrie, a leading Egyptologist, and whilst Petrie was intrigued, he urged caution. In a letter dated the 10th of October 1890, Petrie warns Lockyer not to get too carried away with astronomical explanations, writing that “Another serious consideration is how far local consideration influenced the positions. In some cases the hills were such that no other arrangement… could be made”. Not to be dissuaded, Lockyer organised a series of lectures on orientation at the end of 1890. In *The Dawn of Astronomy,* he recalls that one of the audience members at these lectures let him know that he was not the first to have considered orientation. A German professor called Heinrich Nissen published on the subject in the 1880s. Lockyer’s friend, the architect Francis C. Penrose, takes the credit for making Lockyer aware of Nissen in his paper, “On the Results of an Examination of the Orientations of a Number of Greek Temples” (1893). Nissen approached the subject as a philologist rather than an archaeologist or astronomer. Whatever the case may be, and whether Penrose had been an

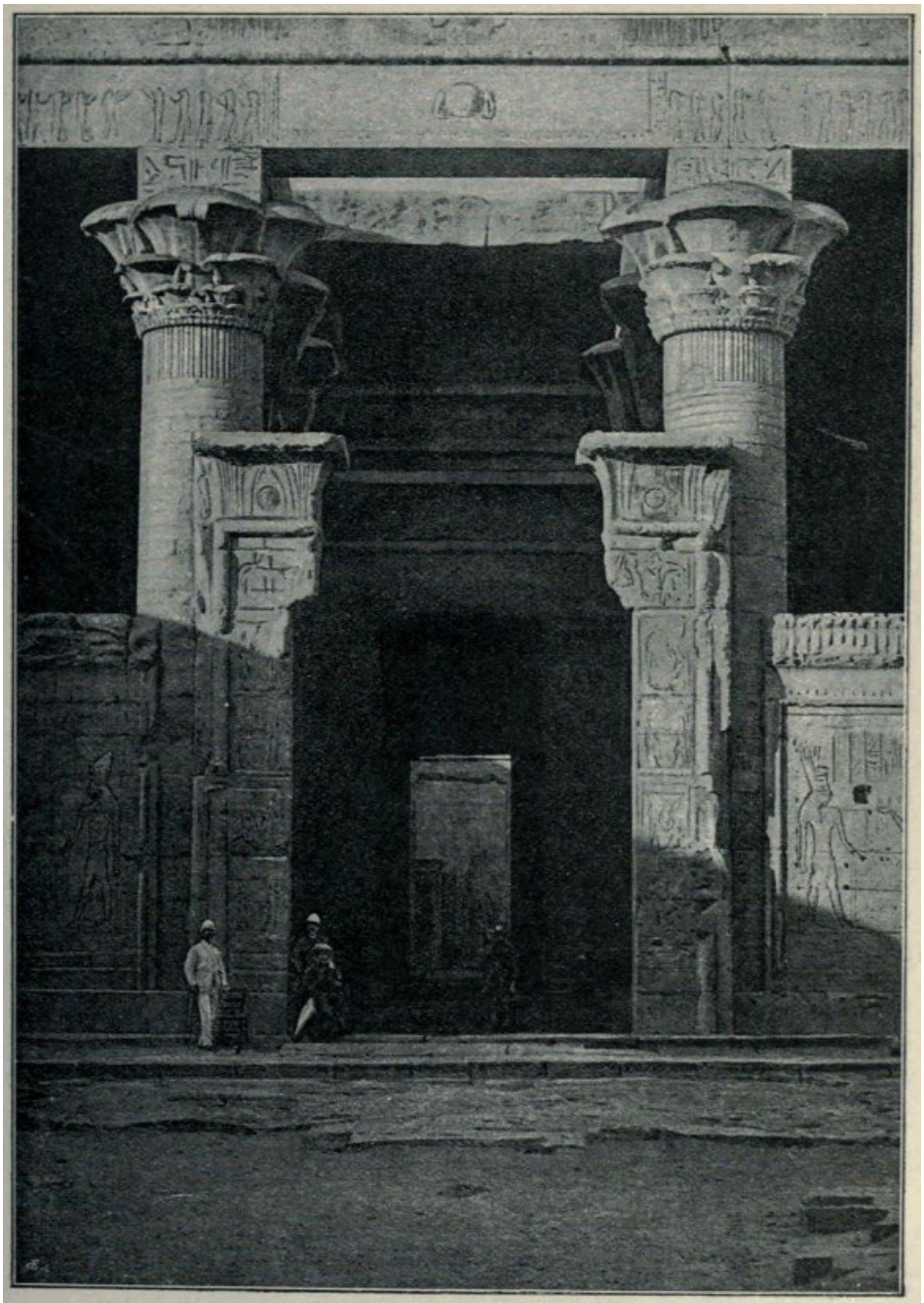
audience member or not, he helpfully spied a few inconsistences in Nissen's measurements of monuments that he thought could be righted by Lockyer's scientific precision. Penrose would go on to be a major collaborator with Lockyer in all archaeoastronomical matters. The next year, Lockyer went to Egypt to make new measurements and see if he could add to Nissen's scholarship.

The Dawn of Astronomy is the result of Lockyer's expedition. The book makes an argument for astronomical calculation as a way of dating monuments, offering a firm solution to the issues surrounding the exact dates of the Pharaohs' reigns. Lockyer was persuaded that "It is fundamental to orientation theory that the cult shall follow the star" (p. 213), and armed with this dictum, he set out to collect his measurements. However, the problem of whether any alignments could be solidly backed by written records was yet to be resolved when Lockyer set foot in Egypt. Initially, none of the resident experts seemed able to help him. He remarks in *The Dawn of Astronomy* that "In Cairo also I worried my archæological friends. I was told that the question had not been discussed; that, so far as they knew, the idea was new; and I also gathered a suspicion that they did not think much of it" (p. ix). This comment betrays a little of Lockyer's insecurity about the reactions to his theory, and the concern shown for Lockyer by other members of the archaeological community is a fascinating aspect, as is the complete unawareness of previous work by seasoned Egyptologists.

It is worth noting that, at this stage, the concept of orientation was not totally rejected or received with bemusement. As Meadows documents in *Science and Controversy: A Biography of Norman Lockyer* (2008), one archaeologist acquaintance of Lockyer's decided to look further into his theory, and produced what seemed to be evidence of orientation. He introduced Lockyer to Edfu's astronomical significance through an inscription on the foundations of the temple, which refers to "the constellation of the Great Bear" being used to "establish the four corners of thy temple" (Lockyer, 1894, p. ix). In *The Dawn of Astronomy* this individual is named as "Brugsch Bey" (p. ix). Presumably, Lockyer means Henry Brugsch-Bey, the relatively forgotten author of *A History of Egypt Under the Pharaohs* (1881). Brugsch-Bey, Penrose, and the small community of archaeologists who did take Lockyer seriously, were instrumental to his studies. They provided vital insight into ancient monuments, previous scholarship, and even facilitated Lockyer's personal transport up and down the Nile (Meadows 2008).

The photographs Lockyer took in Egypt are very similar to those taken by commercial travel photographers. Francis Firth is the photographer perhaps most responsible for familiarising the British public with scenes of Palestine, Sinai, and Egypt. According to James Ryan in *Picturing Empire: Photography and the Visualization of the British Empire* (1997), "Frith saw himself as an artist and scientist" (p. 45). Lockyer's activities in Egypt bear the mark of these artist-scientist-photographers. *The Dawn of Astronomy* makes the assertion that the problems of chronology that have always been faced by Egyptologists are best solved by science, but also it showcases the tendency that Lockyer has to engage in the romanticisation of the ancient era. If the temples were pointed according to certain

stars, then they could be dated much more accurately than otherwise. The aforementioned Ptolemaic temple of Edfu was extremely important as it had a stated astronomical significance (see Figures 5 and 6). It is an excellent example of how Lockyer could present the magnificent nature of these monuments alongside the scientific facts. Unlike many of the other illustrations in *The Dawn of Astronomy*, this photograph (Figure 5) includes Lockyer's contemporaries, placing the picture firmly in a modern context. Such a photograph would not go amiss if it was included in a holiday photo album, but it is not among the NLO lantern slides. The exact personalities present are not identified in *The Dawn of Astronomy* or the NLO archives, but they are probably archaeologists, many of whom Lockyer met with in Egypt. It has the effect of a tableau, depicting the European colonials outside Edfu as the rightful inheritors of imperial splendour. This particular belief about civilisational inheritance was not an uncommon one when colonials confronted "fabulous antiquity" (Ryan, 1997, p. 138), and it had previously seeped into the work of archaeoastronomers. Lockyer believed in, and often wrote of, the exceptionalism of the English mind in matters of art and science (see Lockyer, 1893). The impact of these impressive monuments perhaps prompted him to give some credence to the belief that the colonials had sprung from the same branch as the temple-builders of Egypt.



INNER COURT AND SANCTUARY AT EDFÛ.
(*From a Photograph by the Author.*)

Figure 5. Photograph of Inner Court and Sanctuary at Edfu by Norman Lockyer, 1891 (reproduced from *The Dawn of Astronomy*, 1894, p. 107).

Figure 6. Lantern slide showing an etching of Edfu, n. d. (Panckoucke, 1820; image courtesy of the Norman Lockyer Observatory).

Other Englishmen in Egypt shared in this enthusiasm for linking science with archaeology. Before the publication of *The Dawn of Astronomy*, Lockyer was writing in *Nature* about his archaeoastronomical exploits. A letter of support published in *Nature* from a Capt. H. G. Lyons, later to become Director of the Science Museum, confirms the survival of astronomical calendars in modern Egypt. Lyons (1892) draws on Lockyer's links between the orientation of Egyptian temples and "the heliacal rising of certain stars" to comment on the corresponding custom of the Nuba people, who "foretell the first rise of the Nile by the heliacal rising of the Pleiades" (p. 101). Lyons was in his twenties when he wrote this letter to Lockyer, and was recruited by him as a kind of remote assistant, surveying ruins. Lyons had spent much of his time in the Egyptian Army writing about the physiography and geology of the Nile Basin. With the excitement of a young tourist, he set out on expeditions and boat trips to relevant destinations. In his correspondence with Lockyer, he reveals that he had a good time doing his work, and liked being occupied with the analysis of inscriptions and azimuths, a task which was far more intellectually enaging for him than his titular career (Meadows, 2008, p. 240). The consternation of the archaeologists at Lockyer's propositions was not shared by all, and the readers of *Nature* were bound to be slightly awed by the exoticism of the work.

At this time, Lockyer felt far from isolated when he considered the provenance of his views. He defends some of the more controversial Egyptologists of the past in his book, but he does not choose to discuss one of the most famous artist-scientist-photographers in Egypt, Charles Piazzi Smyth. Figure 7 is a reproduction of one of

Smyth's star-maps in *The Dawn of Astronomy*, but no other comment ever appears (p. 127). As Figure 8 shows, Lockyer was also very interested in the Egyptian interpretation of the stars, but Smyth would draw much out of this cosmology, not all of it strictly scientific.

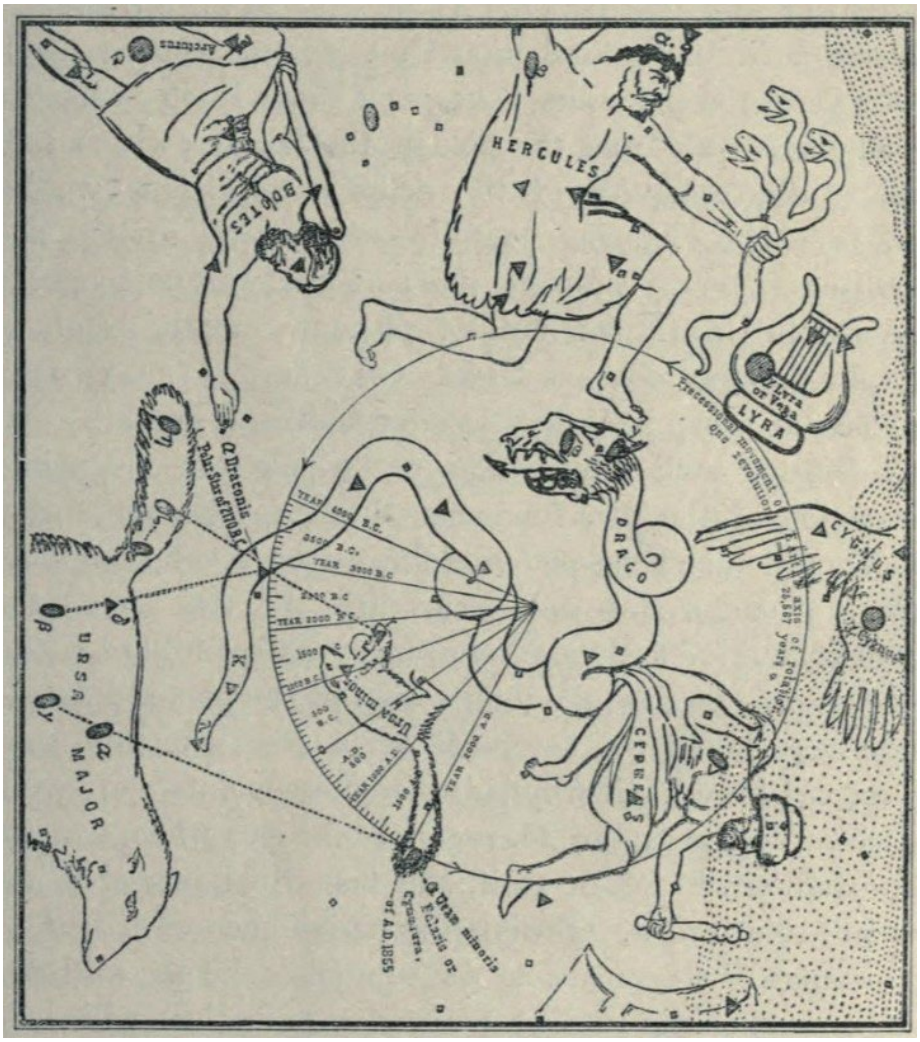


Figure 7. "STAR-MAP. REPRESENTING THE PRECESSIONAL MOVEMENT OF THE CELESTIAL POLE FROM THE YEAR 4000 B.C. TO THE YEAR 2000 A.D. (From Piazzi Smyth.) Symbols adapted to represent the magnitudes or brightnesses of the stars, 1st. ⊙, 2nd. ⬭, 3rd. ∆, 4th. ⊡." (Lockyer, 1894, p. 127).

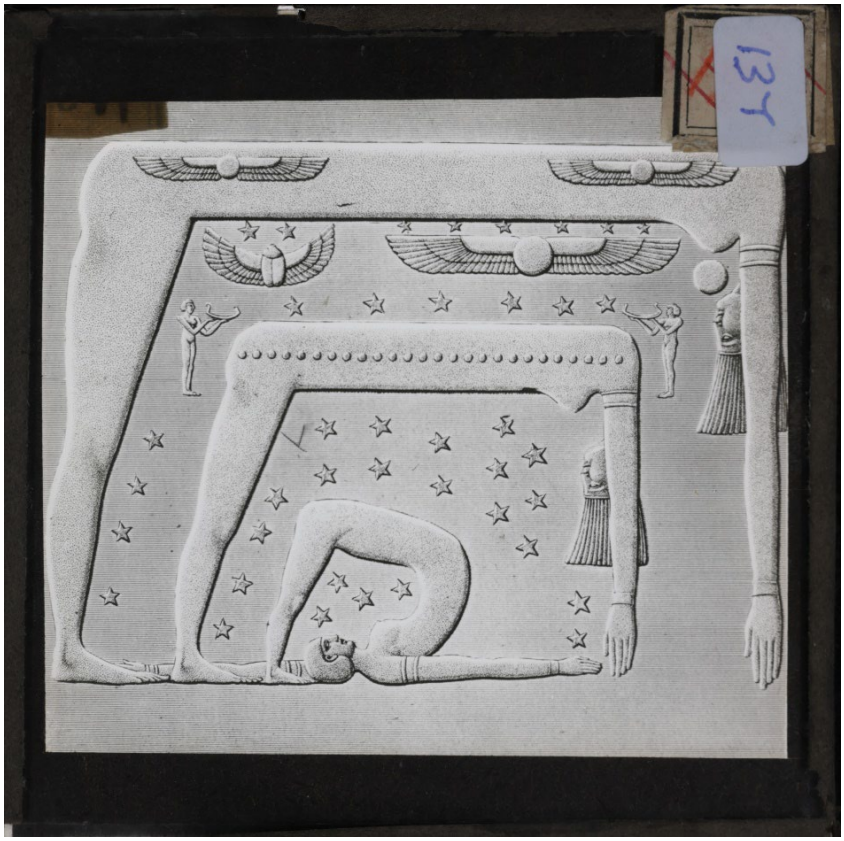


Figure 8. Lantern slide showing an engraving of the sky goddess Nut, n. d. (image courtesy of the Norman Lockyer Observatory).

Smyth and Lockyer had much in common. Smyth was an astronomer with an interest in spectroscopy, and a Fellow of the Royal Society. He had devoted much of his later career to theories about the Pyramids of Giza, publishing the divisive *Our Inheritance in the Great Pyramid* (1864). He believed that the pyramids were the work of the Israelites, and that passages in the Old Testament concerning a "sacred cubit" could be proven to be related to the imperial units of measurement (Piazzi, 1864, p. x). This was not all; he predicted that the end of the world would come in 1881 on the basis of evidence he had gathered from the pyramids, a sensational claim which caused no end of debate in the years afterwards (as cited in Finnegan, 2021, p. 121). One cornerstone of Smyth's thought was British Israelism. This, in short, is the belief that the lost tribes of Israel had travelled to Britain, and this theory was popular among Christian Evangelicals. Officially, it was a disagreement with James Clerk Maxwell that led to Smyth's resignation from the Royal Society, but it is hard to believe that his odd new beliefs played no part in his fall from grace. In 1880, Petrie had also undermined Smyth, venturing to Egypt to find that his measurements had all been inaccurate (Petrie, 2013, p. 189). Smyth was perhaps thinking of the ruin of former reputations when he gently tried to steer Lockyer away from archaeoastronomy.

Despite all of this, Smyth and Lockyer kept a warm and cordial correspondence. In his initial letters to Lockyer in the 1870s and 1880s, Smyth wishes him luck with his eclipse expedition in Spain and discusses gyroscopy. Even in these fairly affable

exchanges, flashes of bitterness are detectable on Smyth's side. He complains of the low public education in matters of science and warns Lockyer of the "anti-British French" element when sharing his research internationally (see Smyth letter dated January 25, 1882). The full extent of Smyth's alienation becomes clearer in the last two letters of their correspondence, written on the 23rd and 24th of April 1890. In the first, he responds to Lockyer's enquiry as to the declination of Sirius at the Great Pyramid with a slight ambivalence. Yet, he writes of the "astonishment and interest" with which he followed the thoughts of younger astronomers on the subject of archaeoastronomy during the last quarter-century. He signs off as "exploited of all useful means". In the next epistle, sent a day later, he clarifies his stance on Sirius, and ends with "yours in reitrement & penury". The impression given is that of a man who has accepted the end of his career, but remains unsatisfied at the lack of recognition his work has received. Lockyer would certainly have taken notice of the lasting consequences of this censure on a man who had once been a prominent public scientist. A reluctance to drag Smyth back into the fray is perhaps why he is not mentioned at length in *The Dawn of Astronomy*, despite him being one of the forerunners of cultural astronomy.

Another conspicuous absence is John Greaves, a seventeenth-century astronomer who was responsible for the first scientific survey of the pyramids. It seems that early on in his archaeoastronomical career, Lockyer was looking to draw some significant theistic revelations out of his alignments. Therefore he chose instead to devote time to a more obscure figure, the eighteenth-century savant Charles François Dupuis. Dupuis is best remembered for his mythical Christ theory, also advocated by fellow philosopher Constantin François de Chassebœuf. This proposed that Jesus was a mythological figure rather than an actual historical personage, based on tradition around previous ancient gods, often solar deities. Two of Dupuis' major works, *Origine de tous les Cultes, ou la Réligion Universelle* (1795) and *Mémoire explicatif du Zodiaque, chronologique et mythologique* (1806) particularly influenced Lockyer's outlook on ancient civilisations. The first book explicitly put forward the idea of a commonality of cultures. Dupuis became convinced in the second book that the strongest evidence for this lay in similar beliefs about astrology and orientation between ancient civilisations and argued that Upper Egypt was the cradle of these beliefs. In *The Dawn of Astronomy,* Lockyer characterises Dupuis' opponents as men who believed "that his imagination had run away with his learning" (p. 138), which certainly prefigures the type of criticism that Lockyer himself would receive in the years to come.

One can easily observe the influence that Dupuis had on Lockyer's theories about the origins of religious society. Indeed, much of Lockyer's archaeological work was built on the research conducted by the French expedition to Egypt led by Napoleon, and a lot was done in the interim by successive generations of French Egyptologists. In *The Dawn of Astronomy,* Lockyer leans heavily on Auguste Mariette's temple plans and conclusions, but he uses astronomy to fill in the gaps in some "crucial cases" that Mariette studied (p. 190). Lockyer's application of a scientific apparatus to previous research is innovative, but he remained strongly indebted to some of the

ideas that accompanied such incredible archaeological work by the French. Dupuis's theory about the root of all western civilisation is typical of the *siècle des Lumières* obsession with human monogenesis (see Curran, 2014). As Jarsaillon (2018) demonstrates, Mariette's own method was to exploit "an Egyptomaniacal agenda as a way to attract his potential audience's attention; he then directed it towards a more scientific discourse" (p. 360). The main argument of her article is that Romanticism and Orientalism inevitably influenced Mariette's work, despite his wish to retain an objective scientific focus. We must appreciate the impact of ideologies that held sway over photographic, scientific, and archaeological coteries before they even arrived in Egypt, and how these may have filtered into the new theories proposed by those such as Lockyer.

The Dawn of Astronomy is a relatively subdued archaeoastronomical work by Lockyer, and undoubtedly the one which involved fewer family and friends than his later efforts. His ideas were that all Egyptian mythology is related to the stars, and that the Egyptians were a race of "kings, workers, priests, and astronomers" ("Sir Norman Lockyer at Penzance," 1906). These conjectures in particular were subject to criticism (Meadows, 2008, p. 244), and were beliefs which he held long after the publication of *The Dawn of Astronomy*. At times, his attitude could even be charactertised as inflexible. His work on the solar alignment of the Karnak complex is one example of this. As the generally held viewpoint on Egyptian chronology changed during the early twentieth century, and the Sothic cycle became more widely adopted, Lockyer did not change his attitude of skepticism regarding "the so-called Sothic cycle" (1894*,* p. 266). In his book, he describes a number of problems with the proposed timeline. These include inconsistencies between inscriptions made on temples devoted to certain kings and where the Sothic cycles place the age of each temple in relation to the reigns of these kings (pp. 261–2). Solutions to these specific issues had not been found and presented conclusively before Lockyer became relatively inactive in the archaeoastronomical world in the mid-1910s. One letter to *Nature* written by Howard Payn in 1911 directly referenced Lockyer's work on Karnak. This author visited the temple in order to test his theories. However, he found himself impeded in his line measurements by problems at the site. As Payn (1911) writes:

> The sanctuary itself is completely filled up with the huge stones of the fallen roof, and the last columns of the Great Hall at the other end are at present built round with stones and bags of sand on account of the repairs being carried out to the neighbouring pylon, while the pylon itself is timbered up to prevent its falling… the two important points for a survey of this part of the axis cannot be used at present. (p. 515)

Part of the axis is visible in Figure 9, and the fallen stones Payn mentions are easily observable in Figure 10. It is evident that, twenty years after Lockyer's visit, the conditions in some places at the site were still difficult to negotiate. It is possible that complete clarity on the Karnak question was seen by Lockyer as unachieveable, at

least in his lifetime. At any rate, before his retirement, he had refocused his powers to study other monuments.

Figure 9. Lantern slide showing the axis of the Temple of Amen-Rā at Karnak, photograph by Norman Lockyer, 1891 (image courtesy of the Norman Lockyer Observatory).

Figure 10. Lantern slide showing an obelisk at Karnak, photograph by Norman Lockyer, 1891 (image courtesy of the Norman Lockyer Observatory).

None of the claims Lockyer makes about solar cults in Egypt seem particularly outlandish to a modern reader, but the looming question of the relevance of this research for Britain is constantly observable in the background. Lockyer had laid the groundwork for orientation, and from this point onward he would begin to apply the concept to the much more obscure artefacts of the United Kingdom. His reputation was not impacted to the same extent as pyramidologists, but his attempts to guard against the baldly esoteric would give way to a stronger desire to affirm the place of Britain in the canon of the world's great ancient civilisations. The NLO lantern slides become a useful medium through which to view this stage of his career. They show us that a small and close-knit community of proto-archaeoastronomers helped inform Lockyer's views, and this new atmosphere of private and unbridled enthusiasm was quite different to what he had found in Egypt. He had unwittingly entered the world of the modern Druids.

Britain and Stonehenge

All of the slides depicting British antiquities were taken between 1900 and 1908, but no exact dates are given. Figure 11 depicts Norman Lockyer setting up his tripod at the Boscawen-Un stone circle, Cornwall. He is with an unidentified male companion, who appears to be leaning on a stone and writing. The famous pointed central menhir, or large freestanding stone, is observable in the centre of the granite circle. In *Stonehenge and Other British Stone Monuments* (henceforth referred to as *Stonehenge*) Lockyer (1906a) viewed his scientific expeditions as part of a "holiday task" (p. 294), but pouring rain on this visit to Boscawen-Un prevented him from doing any astronomical observations. Lockyer (1907a) documents how he undertook many expeditions after 1906, prompted by the deluge of information he received after the publication of *Stonehenge* (p. 56). These investigations were documented in a series of articles in *Nature* entited "Notes on Ancient British Monuments" (1906a-1907c). The undeniably social aspect of this period of enquiry is captured by Lockyer's second wife, Lady Mary Lockyer, who took most of the photographs in this collection. She often travelled with him and documented the visits to archaeological sites, and her photographs provide an invaluable insight into the people and working processes present when Lockyer was conducting his investigations. As Figure 12 shows, on his trip to the stone circle at Boscawen-Un, he was accompanied by local peer Horton Bolitho, and "the tenant of Boscawen-noon" (1906a, p. 287), Hannibal Rowe. Either of these men may be the figure on the left. This photograph of Lockyer's visit to Boscawen-Un is unique in the archive because of its sharp image of archaeoastronomers working in a break from the rain. The other photographs taken at Boscawen-Un are hazy and indistinct, but convey the determination of a small group of archaeological researchers who braved all weather conditions to reach the most obscure of ancient artefacts.

Figure 11. Lockyer (left) preparing his tripod at Boscawen-Un, Cornwall. Photograph by Lady Mary Lockyer, n.d. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Figure 12. Lockyer (left) standing at Boscawen-Un with Horton Bolitho and Hannibal Rowe. Photograph by Lady Mary Lockyer, n.d. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Despite the lack of public interest or knowledge about sites such as Boscawen-Un, British intellectuals had been attempting to link them with Biblical scripture for hundreds of years. Lockyer was the first to make a serious attempt to examine them with the help of astronomy (see Figure 13).

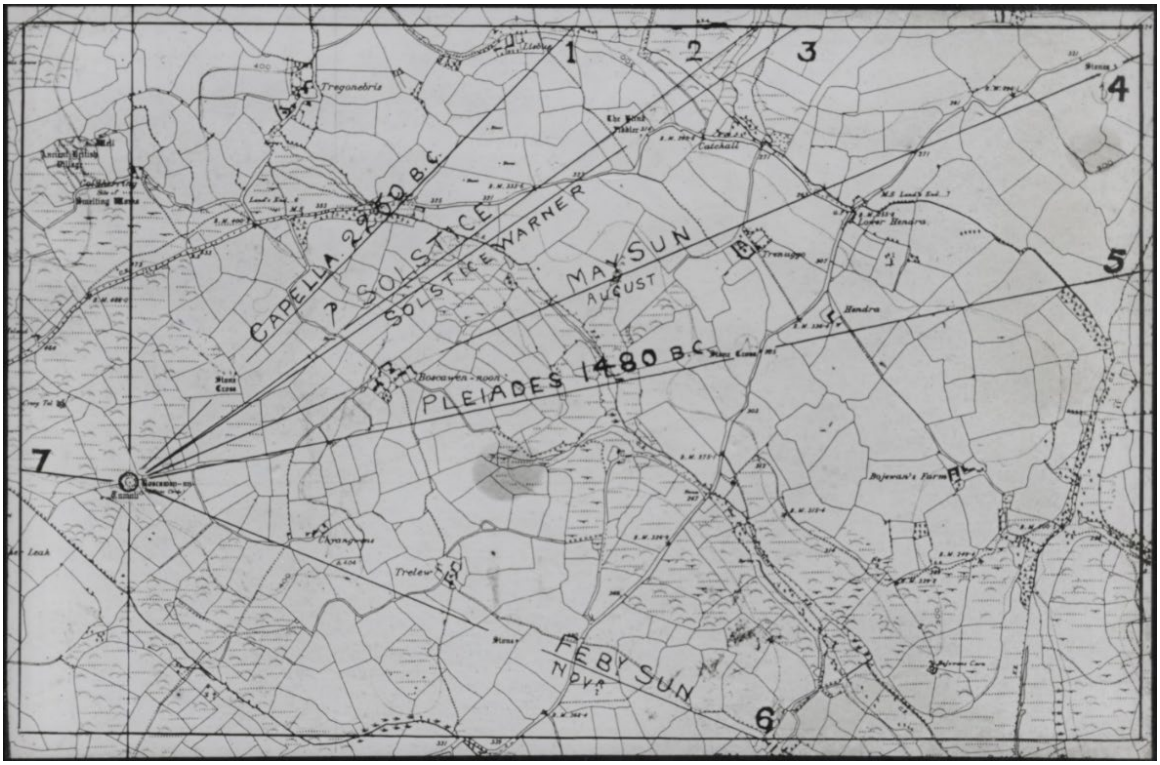


Figure 13. Lantern slide showing solstitial lines of Boscawen-Un drawn on an ordinance survey map, n.d. (image courtesy of the Norman Lockyer Observatory).

Often, this interest centred on the more famous monuments. As Morrison uncovers in her article “Solomon’s Temple, Stonehenge, and Divine Architecture in the English Enlightenment” (2012), Isaac Newton possessed unpublished manuscripts relating to what he thought were the similarities between The Temple of Solomon and Stonehenge. William Stukeley, often regarded as the first real archaeologist, joined Newton in his belief “that both the Temple and Stonehenge represented the plan of the celestial universe, which was ‘written’ into the architecture and embodied by the very stones of the structures” (Morrison, 2012, p. 137). Much of this Enlightenment interest in antiquities attempted to place Neolithic and Bronze Age stone circles and pagan practices into a more dignified narrative of classical learning or Christian philosophy. The supposition that these structures contained anything of note, let alone a mathematical precision that reflects the knowledge of truths far in advance of the period, was considered preposterous. In fact, some of the sites Lockyer would eventually document were objects of the young church’s ire. The “Devil’s Den” in Avebury is one such example, a Neolithic tomb given its name by early Christians to stop Britons from persisting in their pagan beliefs (Figures 14a and 14b).

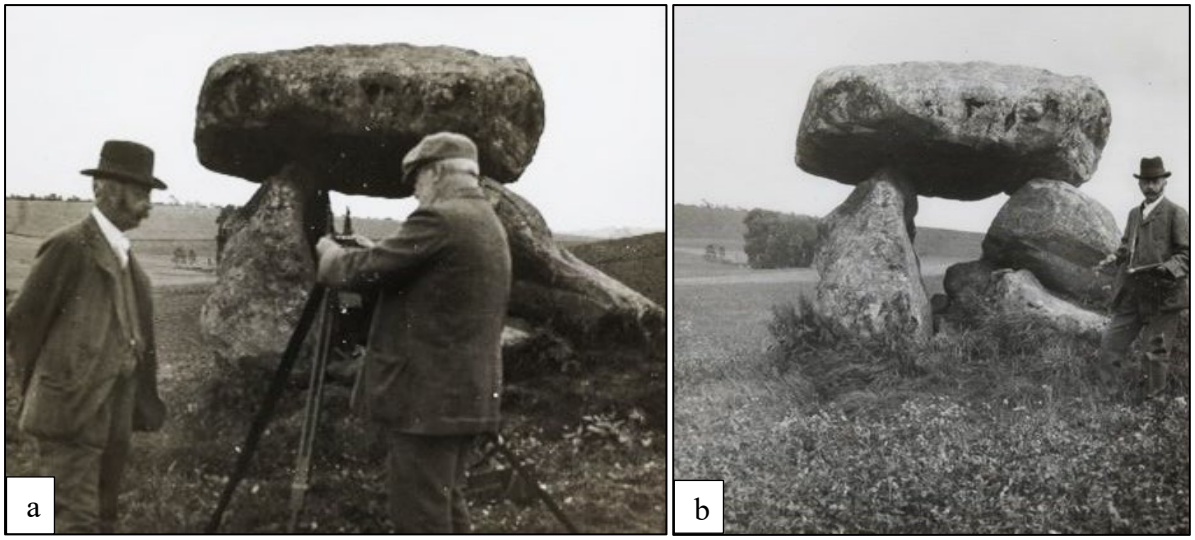


Figure 14a. Photograph of Lockyer (right) and R. H. Caird (left) at the Devil's Den in Avebury. Photograph by Lady Mary Lockyer, 1908. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).
Figure 14b. Photograph of R. H. Caird at the Devil's Den by Norman Lockyer, 1908. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Due to the past stigma surrounding these monuments, as well as the greater interest in classical civilisations rather than the Anglo-Saxon and Celtic cultures, the sites were unknown even to most who lived in Britain. However, Lockyer knew that the home front would present deeper challenges than the lack of interest in these monuments. In *Stonehenge*, Lockyer notes that one key motivation for his writing the book was "that in consequence of the supineness of successive Governments, and the neglect and wanton destruction by individuals, the British monuments are rapidly disappearing" (p. v). He had a strong desire to preserve and restore these ancient monuments, but he would have to find a good reason for the public to care as much about them as he did. This assertion of the importance of these monuments in the canon of British prehistory would come to define Lockyer's engagement with these antiquities.

Along with his astronomy-centred methodology, the fact that Lockyer moved his focus to British antiquities appears to be a further step outside the boundaries of what had been the archaeological norm. As Henty (2022) notes, Lockyer was one of "few practictioners" of British orientation, joined by "Penrose, Lewis and Somerville" (p. 60). These men had picked up the thread left behind by Stukeley and his fellow antiquarians. Yet, Lockyer's willingness to draw close connections between the Neolithic star cults in Britian and Egyptian astronomical religions showcases just how much eighteenth-century antiqurianism affected his understanding of anthropology. His assertion that British stone monuments were Druidic temples was the controversial crux of his argument. When putting together the image archives, this was evidently not far from Lockyer's mind. Figure 15 is listed as "Druid's Altar", and is a feature from a photograph publised in *Nature* (Lockyer, 1907b, p. 83). Lockyer also visited some of the more famous prehistoric burial chambers, such as Bryn Celli Ddu in Anglesey, Wales (Figure 16).

Figure 15. Photograph of the Druid's Altar, Pawton, by Lady Lockyer, 1907. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

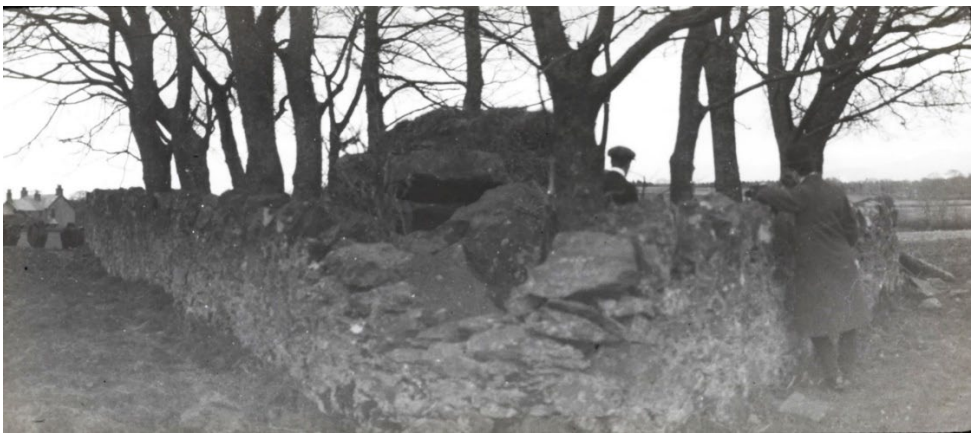


Figure 16. Photograph of men at Brynn Celli Ddu, photographer unknown, n.d. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Lockyer's selection of photographs, clearly intended to signal connections between the Druids, star cults, and these monuments, is not altogether surprising. Lockyer would have known that he was making a statement with these choices. As documented in Williams' book *The Antiquary: John Aubrey's Historical Scholarship* (2016), the reluctance to attribute sites such as Stonehenge and Avebury to the Druids can be dated back to the late seventeenth century. This past reluctance often hinged upon the unwillingness of religious and cultural authorities to grant that Druids were responsible for any important British heritage, as this undercut the dominant societal investment in Christian and Classical learning. Williams (2016) notes that some, such as John Selden, attempted to argue that Druids were an appropriate ancient civilisation to credit with impressive stone monuments, as

elements of their practice betrayed a monotheism that came closer to Christianity than contemporary Greek or Roman worship (p. 35).

The archaeological opposition to Lockyer mainly focused on the eccentricity of views that linked star cults, pyramids, and Druids. His theory about stone avenues in Dartmoor being originally built for Druid worship caused what Lockyer (1906a) referred to in *Stonehenge* as a "war" among interested parties:

> It will be seen from the above that I have not tackled a question full of pitfalls without due caution, and this care was all the more necessary as the avenues have for long been the meeting ground of the friends and foes of what Rowe calls "Druidical speculations"; even yet the war rages, and my writing and Lieut. Devoir's observing touching the similar but grander avenues of Brittany have so far been all in vain…. (p. 152)

Lockyer believed that he was being very diligent about his use of evidence. Yet the language here indicates a slightly more tentative approach than usual, one we might not automatically expect from what Barton (2007) presents as Lockyer's indomitable character. Indeed, Lockyer had stoked the fires of debate in the pages of *Nature* since its inception. Barton (2007) indicates that he did not believe in a strict scientific hierarchy, as evidenced by his willingness to give room in his periodical to other voices aside from "the powerful network around Darwin" (para. 7). Interestingly, as Michell points out in his book *A Little History of Astro-Archaeology: Stages in the Transformation of a Heresy* (1989), the strongest resistance to Lockyer's ideas came from a British archaeological establishment that was "totally conditioned by Darwinian historical theory" (p. 45). Such a doctrine of progress rejected the notion that the ancients could have been interested in something as existential as astronomy. Lockyer was different from archaeoastronomers who "focused solely on alignments" (Henty, 2022, p. 217) because both *The Dawn of Astronomy* and *Stonehenge* attempt to make inferences about star cults from his orientation studies. Even this more cultural focus did not appear to interest many archaeologists. Instead, Lockyer was advised on the work by anthropologists such as J. G. Frazer, and his influence is clear in *Stonehenge*. Frazer even suggested a friendly meeting at Stonehenge and professed to defer to Lockyer on matters of stone monuments (see Frazer letter dated 19 March, 1905). Nevertheless, an audience was building, and Lockyer rarely ventured to any of these sites alone or solely accompanied by his wife. He had made some auspcious connections, such as Lord Boston in Wales, Horton Bolitho, Lord Avebury, and the Right Hon. Viscount of Falmouth. The social network around archaeoastronomy was perhaps no more varied in terms of class than it had been in the days of the antiquarians. It was also not by any means egalitarian in terms of gender. The only woman who appears in any of the lantern slides is Lady Lockyer. Usually though, she remains behind the camera. She makes a few sporadic and candid appearances in the lantern slide collection, but she did not pose for photographs like the men (see Figures 20 and 21). Figures 17 and 18 appeared in *Nature* (Lockyer, 1907c, p. 150; Lockyer, 1906b, p. 151), but Figures 19,

20, and 21 are previously unpublished as far as the author is aware. Among these scientific male coteries, wives had a similar role to lab assistants, as they often made contributions to their husband's work, but were rarely acknowledged for their efforts and ideas. However, Lockyer always gave credit to Mary for her photographs.

Figure 17. Photograph of Col. Morgan, Rev. J. Griffith, and others at Arthur's Stone, Gower, by Norman Lockyer, 1907. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Figure 18. Photograph of Lockyer and Dr. Milne at Easter Aquhorthies in Aberdeenshire, by Lady Lockyer, 1906. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Figure 19. Photograph of Norman Lockyer (left) with Dr. Milne (right) at Whitehill Stone Circle, Aberdeenshire, by Lady Lockyer, 1906. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Figure 20. Photograph of Lady Lockyer (centre) and Dr. Milne (right) at Easter Aquhorthies by Norman Lockyer (shadow in the foreground), 1906. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Figure 21. Photograph of Lady Lockyer (right) and R. H. Caird (left) at the Devil's Den by Norman Lockyer, 1908. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Lockyer certainly met with opposition, but it is worth clarifying that the "war" he refers to above was not characterised by spirited debate in the pages of *Nature*, or even reasoned discourse around the evidence. Hutton comments in "The Strange History of British Archaeoastronomy" (2013), that "archaeologists… did not know what to make of any of his suggestions", mostly ignoring his work or dismissing archaeoastronomy "in general and contemptuous terms" (p. 379). Conversely, in *Surverying for Archaeologists* (1909), Lockyer wrote of the necessity of a guide for the "many archaeologists who are now taking up the study of orientation" (p. v). Even if the mainstream archaeologists scorned his ideas, he evidently believed that he was making headway with some in the archaeological community. Michell (1989) argues that the silence Lockyer met with from prestigious academics was a common form of opposition to ideas that upset the group consensus, but some responses were vociferous. The most astonishing of these were written after Lockyer's death, and despite the eventual disproving of his Druidic theories, it is clear that respected figures were willing to dismiss the entire field of archaeoastronomy without evaluating its evidence. Michell (1989) cites various works by archaeologists such as R. A. S. MacAlister, Gordon Childe, and Sir Mortimer Wheeler, all of whom verged on the derisive when discussing the possibility of solar orientation.

The medium of the lantern slide becomes relevant when we consider Lockyer's wish to promote British antiquities, in this context of national ambivalence and academic dismissal. The utilisations of the lantern slide differed widely over the decades in which it was a mass medium. Kember (2019) points out its roles in "spectral entertainments", "the popularisation of science, or other educational fields", and "public persuasion" in matters of politics or morality (p. 1). In light of this, it does not seem like a coincidence that more slides of Britain than Egypt have been preserved. Lockyer's slides of British monuments represent a congruence of these different purposes. He did have some slides of Egypt, as evidenced by records of lectures he gave during his archaeoastronomical period, but these are mostly used to provide a basis for talking about the British monuments. His best received lectures were given in Wales and Cornwall. One particular lecture given in the April of 1905 at Penzance met Lockyer with rapturous applause, although it was noticed by the unnamed news reporter covering the lecture that Lockyer's tone was one of slight caution. This reporter, working for *The Cornishman*, highlights that the famous archaeoastronomer was not eager to draw a direct line between the Egyptians and the Cornish ancients, or "allude directly to the great intelligence of these Cornish astronomers" ("Sir Norman Lockyer at Penzance," 1906). A couple of years later, when Lockyer spoke in Swansea, he asked if Wales had as rich an archaeoastronomical heritage as Cornwall, and was greeted with "Cries of "Yes." (The Royal Institution of South Wales, 1908, p. 5). It cannot be understated that the enthusiasm with which Lockyer was greeted in the Celtic Nations is very much

connected with the pride the locals took in elevating the scientific status of their ancestors, hence the popularity of Lockyer's endeavours. The fact that Lockyer received a lot of information following the publication of *Stonehenge* means that many read and reacted positively to the book, hoping to contribute to Lockyer's knowledge of their area. Figure 22 demonstrates that the family sometimes accompanied Lockyer on these trips. They all undoubtedly received a warm reception.

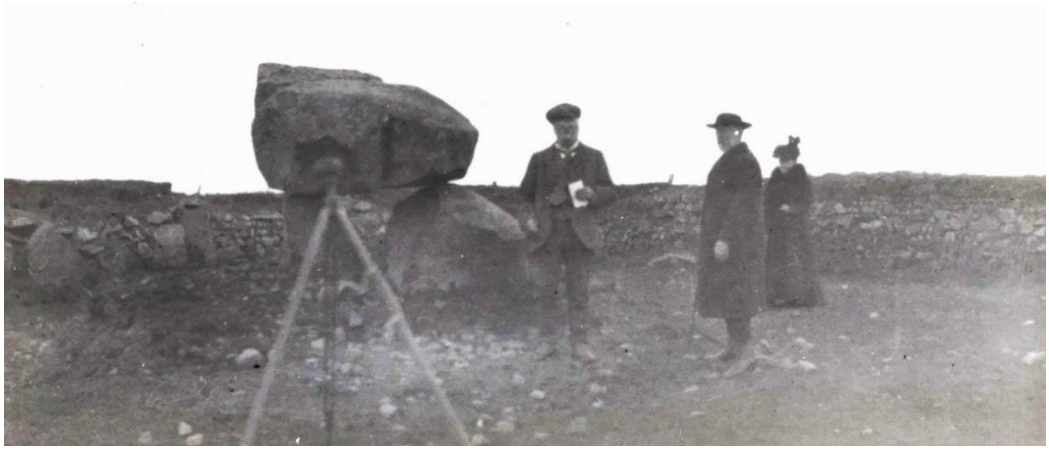


Figure 22. Photograph of the Lockyer family at the Ty Newydd Cromlech in Anglesey, Wales. From left to right: Jim Lockyer (Norman's son), Norman, and Mary. Contrast enhanced by the present author. Photographer unknown, n.d. (image courtesy of the Norman Lockyer Observatory).

The promotion of scientific literacy was always instrumental to Lockyer's career, and the medium of the lantern slide itself was often used for educational purposes. Lockyer had less persuasive work to do when working in areas with people who already wished to learn more about their astronomical heritage. Yet, the task of reconciling the wider British public and the archaeological establishment to the astronomical significance of their own monuments was vast in comparison to exploiting the fascination with Egyptian and Greek antiquities, and required a bigger toolkit to carry it out. Among other experts, Lockyer could not be bouyed along by nationalistic sentiment or the enthusiasm of amateur hobbyists, and his evidence would have to be airtight.

The contributions of people who were already investigating archaeoastronomy in Britain were vital to Lockyer's studies, not only in terms of showing him sites and allowing him access to them, but in relaying folklore that might provide some clues. Lockyer's correspondents and companions on his visits offered him snippets of modern local tradition which supported his hypothesis about star cults being a dominant force in the prehistoric world of Britain. One intriguing piece of evidence concerning the influence and longevity of these beliefs was offered by Rev. John Griffith (1928). The Welsh fairytale of "three-mornings-in-one" goes as follows:

> One of the most curious bits of folk-lore connected with a fairy "cave"… A man found the entrance into the cave, a sleeping warrior awoke, and asked the

> visitor: “A ddaeth y tri bore’n un?” (Have the three mornings in one come?)… “They are all gone into the world of light”. (p. 423)

The scholars that Griffith wrote to for explanation of this were perplexed, but the unusual turn of phrase was more than satisfactorily explained by Lockyer. Lockyer wrote back that the solstice could be what is referred to as the three mornings. Griffith (1928) recalled that Lockyer helped to solved the riddle by informing him that, during the solstice, “the sun appears to rise at the same place”, creating the illusion of three identical mornings or nights (p. 424). Griffith (1928) was keen to add that this resonates with the tradition of the three-day festivals, such as those of the Gorsedd (Figure 23) and church fairs.

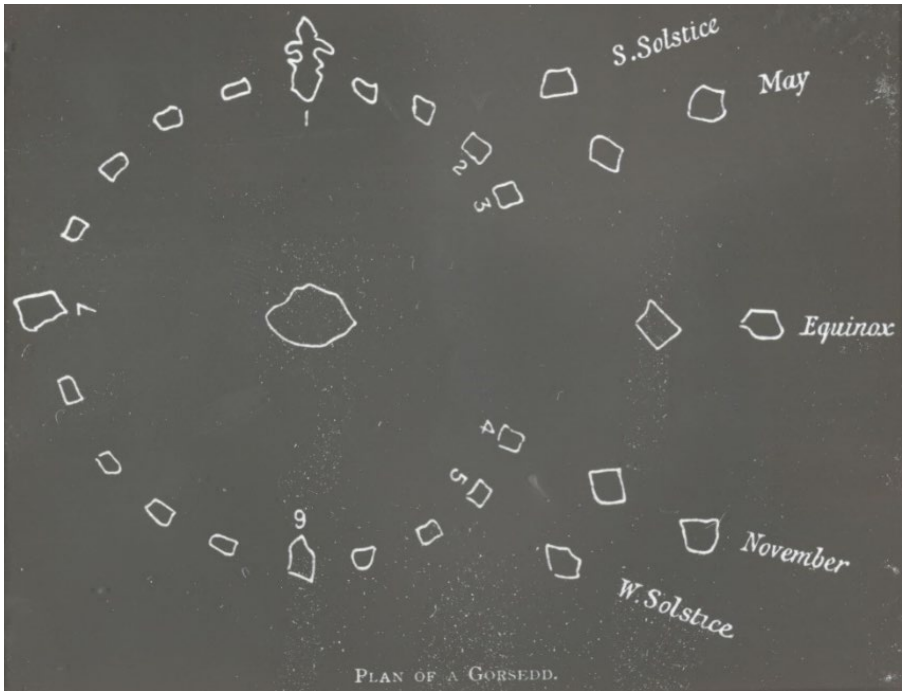


Figure 23. Lantern slide showing a plan of a Gorsedd (labelled “from Griffith”), n. d. (image courtesy of the Norman Lockyer Observatory).

At Boscawen-Un, Lockyer had discovered a connection between the site and the contemporary bardic festival in Wales. Michell (1989) uses this as a particularly ergregious example of the extent of the erasure of Lockyer’s work:

> As an illustration of the vendetta that has been so long sustained against Lockyer, neither Piggott nor any other literate archaeologist ever refers to his discovery of the correspondence between the plan of the Neolithic Gorsedd circle at Boscawen-un and the pattern of the traditional Gorsedd used by the Modern Welsh bards; and so an important and rare piece of evidence is omitted from the modern record. (p. 47)

Archaeologists ignored Lockyer's work due to the inability to prove many of his archaeoastronomical hypotheses conclusively. And while proof for some of Lockyer's ideas may be lacking, Michell's comment aptly summarized the situation. Indeed, Michell's characterisation of the resistance to Lockyer as a "vendetta" does not appear to be hyperbolic in the least. The point-blank refusal to acknowledge Lockyer's ideas, even if they were incorrect, functions in essentially the same manner as censorship, excising orientation from the academic discussion completely.

References to the most famous and exalted object of archaeoastronomical study in Britain – i.e, Stonehenge, are peppered throughout Lockyer's book. As recorded by Meadows (2008), Lockyer fostered a productive friendship with Stonehenge's owner, Sir Edmund Antrobus. Antrobus, unlike his late father, wanted to invest in the preservation of Stonehenge, but his change of approach was to end in protracted public argument. Eventually, Antrobus went to court to defend his decision to fence off the site and charge visitors for entry. The court ruled in his favour. In light of the damage being done to the monument, and the cost of repairs, one can understand why Antrobus took the action he did. The majority of the wanton damage and littering had been done by sightseers, exaggerating the effects of natural decay occasioned by weather events and the passage of time. Lockyer, while presenting British monuments as a matter of national interest, agreed with Antrobus that Stonehenge was his private property, and indeed, all the large-scale repairs had been carried out at Antrobus' personal expense. *Stonehenge* includes a long account of the delicate operations performed in 1901, including winching the heavy leaning stones, packing them with protective felt, and excavating the soil to allow for new placement. The manpower required to undertake this was significant, as well as the equipment that needed to be contructed for the moving of the stones. Professor William Gowland, an engineer appointed by the Society of Antiquaries of London, oversaw the work (Lockyer, 1906a, p. 47).

Precession

One problem that had been established by Penrose and Lockyer in Greece and Egypt was that of the changing position of the stars. In *Stonehenge*, Lockyer provides a concise explanation of the issue in his chapter "Conditions and Traditions at Stonehenge" (pp. 34–55). A temple built to point to a certain star may end up pointing at another completely different star after hundreds of years. Stonehenge was widely believed to be a solar temple primarily used at midsummer. Lockyer believed that, as a result of slight changes in the position of the sun over time, the change in the angle between the ecliptic and equatorial planes could be used to calculate the age of Stonehenge (1906a, p. 43, see Figure 24).

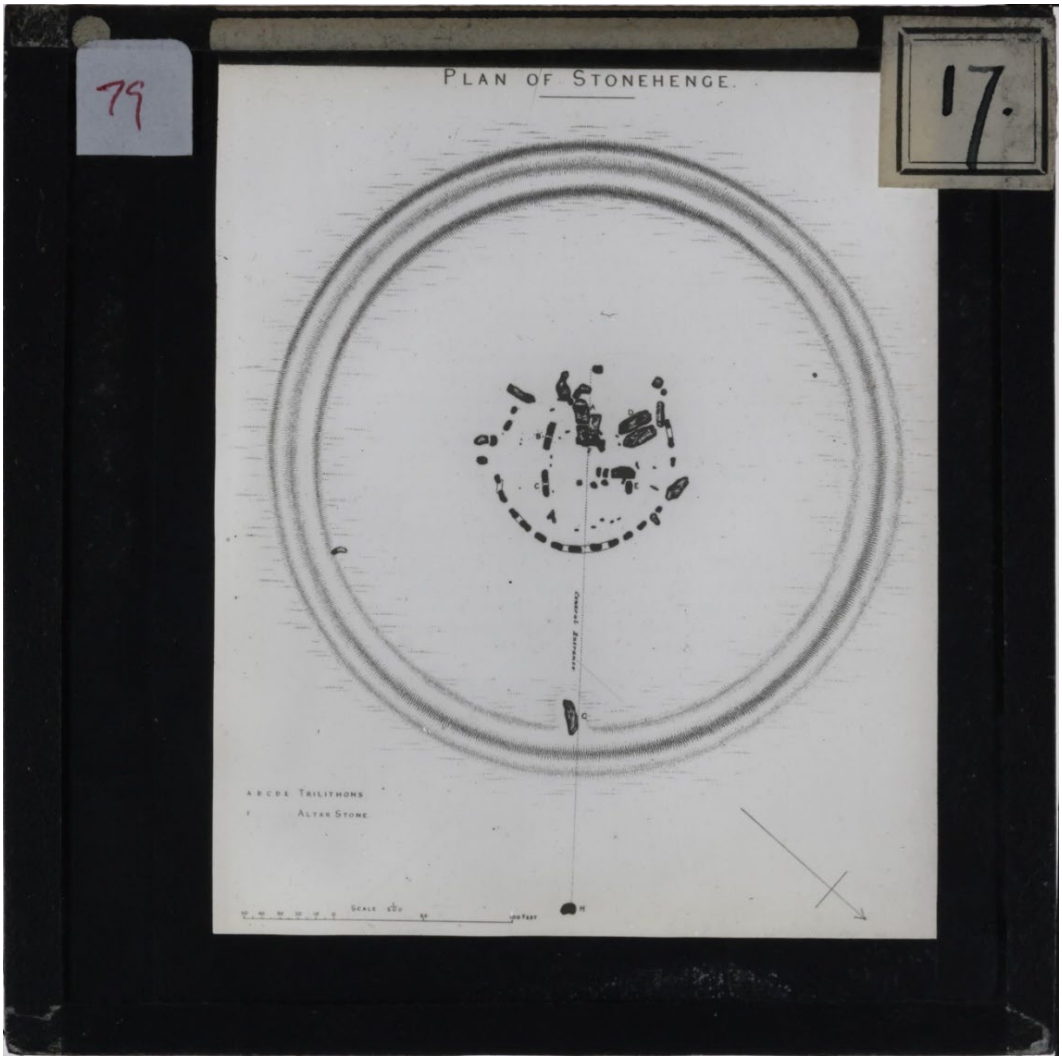


Figure 24. Lantern slide showing plan of Stonehenge, n.d. (image courtesy of the Norman Lockyer Observatory).

Lockyer writes that he and Penrose wanted to study Stonehenge because it was the most convenient place to observe this change in angle, and therefore an attempt to date the site could be made. Despite the ease of observation at Stonehenge, Lockyer (1906a) referred to “the ruined state” (p. 45) of the heritage site as the biggest obstacle faced by an astronomer. The state of the stones at the time is clearly visible in Figure 25.

Figure 25. Photograph of rod placed on the recumbent stone, used to measure the common axis, by Norman Lockyer, 1901 (image courtesy of the Norman Lockyer Observatory).

Lockyer viewed members of the heritage societies who demanded free access to the site while lobbying for its preservation as wanting a contradictory arrangement, one which Antrobus could not possibly deliver without upsetting one group or another. Antrobus must have been distressed by the presentation of his motives by his opponents, but he does present himself as a victim of unfair and unfounded opinion in the many letters he exchanged with Lockyer on the subject (see Antrobus letter dated May 5, 1905). Rather than a mercenary type attempting to make money off of such a famous relic, Antrobus saw himself as following the advice of societies, unintentionally incurring a court case which so defined his public life that it was mentioned at length in his obituary in *The Times* ("Death of Sir E. Antrobus: Owner and Guardian of Stonehenge," 1915, p. 27). Lockyer made a public statement in favour of Antrobus, and some archaeoastronomers agreed that the site should be protected in some way. A constant correspondent, Penrose wrote to Lockyer in support of this back in 1902. Penrose advises him to focus on the damage visitors have done to Stonehenge in his statement to the court, rather than expounding upon the character of the unruly visitors and the side opposing the action (see Penrose letter dated April 30, 1902). Petrie took a much dimmer view of what Antrobus was attempting to do, protesting that the public should have a voice in the matter, and this

view infuriated Antrobus (as cited in Meadows, 2008, p. 251). Lockyer seems to acknowledge the unecessarily difficult position his friend was put into by making a political comment in *Stonehenge*: “If Stonehenge had been built in Italy, or France, or Germany, it would have been in charge of the State long ago” (p. 50).

Lockyer was, for once, not at the centre of this dispute, and Meadows does not go into detail about the part that esotericism played in the midst of this particular argument. In 1905, the same year as his court case, Antrobus hosted a mass initiation ceremony of the Ancient Order of Druids at Stonehenge (Hutton, 2009, p. 321). He himself was one of the inductees, and there is certainly a probability that he hosted such a contentious gathering in deliberate defiance of those who said that Stonehenge was every Briton’s property. Lockyer’s own association with the Welsh Gorsedd would have cast him in a similar light to Antrobus. As Hutton notes in *Blood and Mistletoe: The History of the Druids in Britain* (2009), the Gorsedd had been founded on “the forgeries of Iolo Morganwg” (p. 313), a Welsh antiquarian who began the bardic order. The calling into question of these occult societies in the twentieth century was also accompanied by a fair portion of derision, much of which attended Antrobus’ gathering of the Druids (Hutton, 2009, p. 322). Lockyer’s association with the Gorsedd and eccentric figures like Antrobus may not have disqualified his work in the eyes of F. C. Penrose, Capt. Lyons, Boyle Somerville and others who were influenced by him. However, it is reasonable to assume that many others would have looked on silently with considerable suspicion of his beliefs and motives. And, rather than increasing scientific interest in Stonehenge, the media chose to focus on the more sensational debates and occultist gatherings that dogged the site, perhaps resulting in even more archaeological restraint when it came to the discussion of star cults. The 1905 gathering was covered by *The Bristol Times and Mirror*, *Daily News*, *Weekly Dispatch*, *The Globe* and many other regional and national newspapers. The reaction in the press was not positive. As the *Gloucester Journal* put it, “the London Press has united in condemnation of the gathering of Druids at Stonehenge” (“The Druids at Stonehenge,” 1905, p. 8).

Aside from these liaisons with the Gorsedd and modern Druidical sects, *Stonehenge* itself skirts dangerously close to the theory of British Israelism that had condemned Smyth in the eyes of serious scientists. Native Britons (those present before what Lockyer terms the “Celtic intrusion”) were “representatives of the highest civilisation of the East” (Lockyer, 1906a, p. 324), as proven by the presence of astronomer-priests with advanced scientific knowledge. The religious significance of this to the modern era is downplayed in Lockyer’s work, and he would certainly been aware of the kind of attention he could attract if he leaned too heavily on the Judeo-Christian element. A few decades before, Richard Proctor, an astronomer famous for his popular lecture tours, got into some controversy in the United States by rolling back his seeming support of Smyth’s pyramidological theories. Proctor and Lockyer were bitter rivals, and their mutual dislike of each other erupted into public mud-flinging in the 1870s. Ironically, they would both suffer similar maladies when it came to the tricky question of stone monuments and the stars. Finnegan (2021) makes a strong case for the media misinterpreting Proctor’s “live utterances” (p. 129), and

even the absence of Smyth in abridged reprints of his lectures was taken by some to be a betrayal. Finnegan (2021) uses the example of Reverend Joseph Wild, a popular Methodist preacher in Brooklyn, who launched an attack on Proctor from the pulpit, taking issue with his more skeptical approach to the great pyramid (p. 125). Proctor ultimately emerged from these debates with an intact reputation, but outside of the world of science, Finnegan is careful to note that the idea was being entertained. The *New York Herald* article reporting on this extraordinary rebuff is very much on the side of Wild, and the author uses a literalist interpretation of the Bible as evidence of Wild's moral and factual correctness ("Professor Proctor criticsed," 1879), but not all supporters of British Israelism were interested in the proposition for religious reasons. Some of the most famous examples of British Israelism are to be found in the work of George Eliot, who pays the idea considerable attention in *Daniel Deronda* (1876) and *Impressions of Theophrastus Such* (1879). Eliot is more interested in the concept from a political point of view than an anthropological one, but still cannot resist quoting a passage by Heinrich Heine that figures the achievements of the Egyptians and the Israelites in terms of obelisks and pyramids (1876, p. 626, see Figure 26).

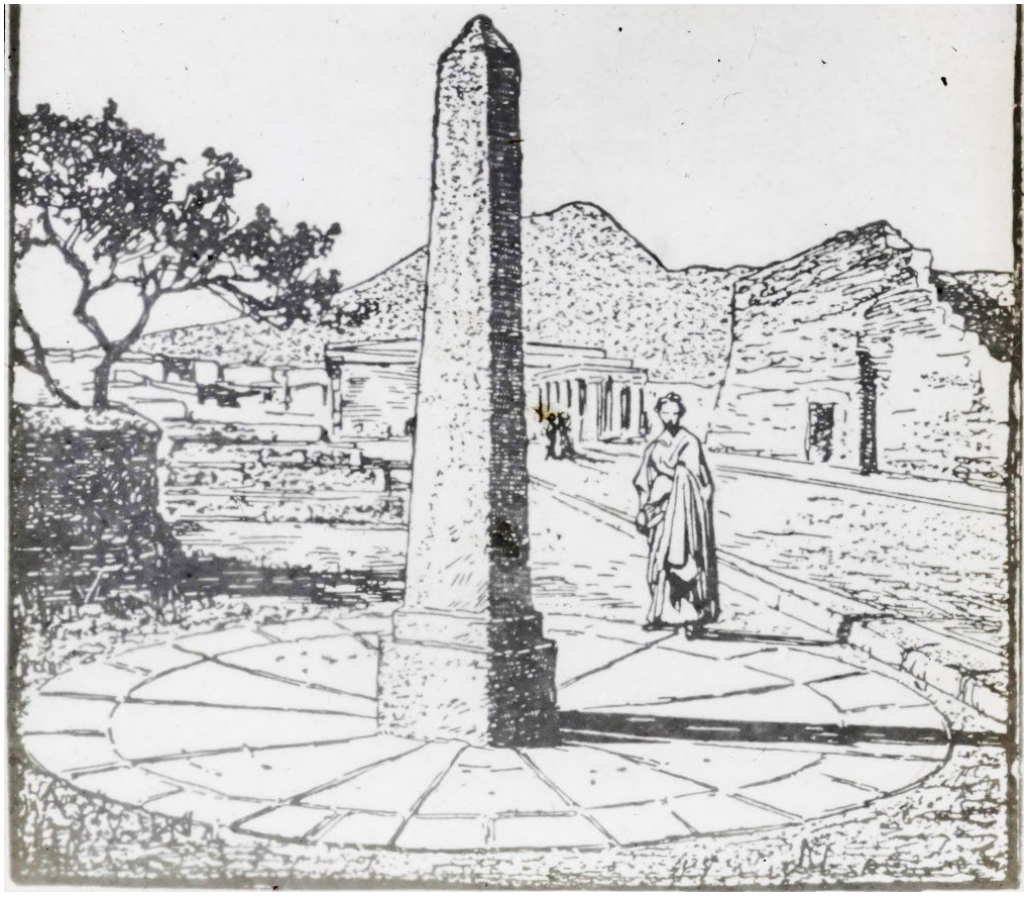


Figure 26. Lantern slide showing an illustration of an obelisk, n.d. Contrast enhanced by the present author (image courtesy of the Norman Lockyer Observatory).

Lockyer was careful not to evoke anything remotely millenarian in his text, but he does mention Bible passages and makes much of the Semite-Egyptian connection.

The scholar he cites in relation to this, Prof. William Robertson Smith, was also not free from religious controversy. He had been put on trial for heresy at the Free Church General Assembly in 1878, and after three years of deliberation was cleared of all charges but was also advised not to openly question the veracity of Bible stories. He continued to do so, and was dismissed from his post at the Free Church College of Aberdeen. A new freedom allowed him to travel extensively in Egypt and the Middle East, collecting records of ancient religions and languages. Smith's scientific view of the Bible must have appealed to Lockyer, and Smith's *Lectures on the Religion of the Semites* (1889) is now considered a seminal work in social anthropology. Yet, much like *Stonehenge,* it could hardly have been written without the support of fellow scholars who believed that the Bible should be open to interpretation and critique in the same way as any other historical document. Smith and Lockyer had both undergone a baptism of fire and it is perhaps this which rendered them able to be push further than others for a holistic view of the past, one which drew upon current knowledge in science and linguistics. Their attempts to align Britain with other civilisations and find points of contact in the stories of early religions is more of a gesture towards monogenesis rather than a result of national exceptionalism.

Unfortunately, the ambition of Smith to track and compare the development of religions would not have been the first parallel drawn with Lockyer's archaeoastronomical theories. A different and more sensational Smyth is a case in point. Smyth's spectre had haunted the work of Proctor, but did it compromise the work of a respected scientist forty years after the publication of *Our Inheritance in the Great Pyramid*? The fact of this divisiveness in the recent past meant that informed readers could not possibly peruse orientation theory without unhelpful echoes reverberating in their minds. Despite this, the first impact in the modern history of archaeoastronomy had been made, and Lockyer's wide circle of friends and correspondents remained invested in his ideas and deferred to his opinion.

Lockyer's Archaeoastronomical Legacy

Penrose, who sadly died before the publication of *Stonehenge*, was Lockyer's primary supporter and collaborator in starting a new chapter for archaeoastronomy in the 1890s. His son, Frank Penrose, wrote to Lockyer after his father's death, "No one could have held your powers in higher estimation than our father did" (see Penrose letter dated February 10, 1903). The chief editor of Cassell & Co. Publishers, James Walter Smith, was of the same opinion, and wrote to Lockyer in 1910 to propose a new edition of *The Dawn of Astronomy*. Some years before, it had been allowed to go out of the publishers' catalogue due to the loss it had made. The editor had read the book and thought that it had an important part to play in educating the public, and should be made available to new researchers in archaeoastronomy.

The response from Lockyer is missing. We can reasonably infer that in this reply to Smith, he indicated that there would be some impediments to overcome before the new edition, including significant revisions which would have to be completed. In a letter dated six days after his initial epistle, Smith promises to "go further into the

matter and write… later", asks him how long the revision would take, and proposes meeting to talk about terms (see Smith letter dated October 27, 1910). Despite this correspondence, it does not seem this new edition ever materialised. However, Macmillan had released a second edition of *Stonehenge* in 1909. The recognition of Lockyer's extraordinary abilities helped to preserve a sense of the importance of his research in the face of rejection from greater entities in archaeology than himself. The lantern slides housed at the NLO also have an invaluable part to play in the ongoing process of preserving not only Lockyer's legacy, but in informing us of the instrumental nature of his coterie.

Many of Lockyer's suppositions about Druids and their connection to sites such as Stonehenge are now known to be incorrect. However, this is of little consequence when one considers how he galvanised and combined the disparate aspects of a subject that had suffered many blows to its confidence. Lockyer was the most accomplished scientist who had approached the subject, his abilities far outstripping those of Proctor, Smyth, Penrose, or any other archaeoastronomer of the time. His most impactful legacy was his interdisciplinary methodology. He knew that archaeoastronomy was a deeply social subject as well as a battleground fraught with political questions and ideologies. Even when treating it with due care, he could not avoid some dubious notoriety.

The lantern slides and his correspondence show a man who, over his long career, had become adept at creating community from people with very diffuse aims and interests. The most effective way in which he did this was by getting his audience and collaborators to interact with him and the monuments in person. He documented these visits in the lantern slides, and they inform us to a much greater extent than the use of correspondence or lecture notes that a tight-knit archaeoastronomical coterie was central to defining the subject which was to gradually emerge over the twentieth century. The visual archives are not merely supplements to the correspondence and writings of Lockyer, they are important primary sources in themselves, and without them we would have far less of an idea as to the importance of personal relationships in the making of Lockyer's archaeoastronomical progress.

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