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The Royal Astronomer and the Astronomer Royal: Tar-Meneldur and Sir Harold Spencer Jones

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In a 12 September 1965 letter to Dick Plotz, Tolkien explained that the history of Númenor was likely to remain in "Annal form… except for one long Númenórean tale: *The Mariner's Wife*: now nearly complete" (*Letters* 504). This "story of Aldarion… and his tragic relations with his father and his wife" was deemed to have been "preserved in the Downfall, when most of Númenórean lore was lost except that that dealt with the First Age, because it tells how Númenor became involved in the politics of Middle-earth" (*Ibid*.). Aldarion's father – unnamed in this letter – was Tar-Meneldur. According to "The Line of Elros," he was born Írimon but "took his title Meneldur from his love of star-lore" (*UT* 219). Also known as "Elentirmo 'star-watcher'" (*UT* 433), this "wise, but gentle and patient" man (*UT* 219) was "without pride, whose exercise was rather in thought than in deeds of the body." Unlike many of his countrymen (including his son), he

> gave no heed to the Sea that lay all about it; for his mind looked further than Middle-earth …. he was enamoured of the stars and the heavens. All that he could gather of the lore of the Eldar and Edain concerning Eä and the deeps that lay about the Kingdom of Arda he studied, and his chief delight was in the watching of the stars. He built a tower in the Forostar (the northernmost region of the island) where the airs were clearest, from which by night he would survey the heavens and observe all the movements of the lights of the firmament. (*UT* 173)

Despite his love of star-gazing, upon the traditional abdication of his father while still strong of mind and body, he left his beloved observatory and with his wife and three children (two daughters and his son, Aldarion) settled in the government seat of Armenelos. Although he was said to have been a "good and wise king," his heart "never ceased to yearn for days in which he might enrich his knowledge of the heavens" (*UT* 173).

The works in which Meneldur's astronomical exploits are mentioned were penned relatively late (as noted in the aforementioned letter, dating to the 1960s [*UT* 7-8]); a 1967 letter directly gives us the Elvish word for astronomer, *Meneldil,* literally 'heavens-lover' (*Letters* 543). However, other brief references to astronomical observing (and even observatories) appear much earlier in Tolkien's writings. For example, before its decline under Saruman, Isengard had been "A strong place and wonderful" once used by "wise men that watched the stars" (*TT* 160). At the Council of Elrond Gandalf recounts that he had been held "on the pinnacle of Orthanc, in the place where Saruman was accustomed to watch the stars," apparently carrying on the tradition (*FOTR* 273). Other characters casually

stargaze, for example Frodo and Bilbo in *The Fellowship of the Ring* (187; 251). As the use of telescopes is nowhere described in Tolkien's legendarium, it appears that all astronomical observations in Middle-earth were conducted with the unaided eye, which makes sense for Elves and the "far-sighted" Númenóreans (*Sil* 262). While I have elsewhere argued (Larsen 2022) that Tolkien's details concerning Tar-Meneldur's observatory – including its location on the island – make astronomical sense, there are two mysteries that have continued to pique my interest: (1) why was Tar-Meneldur so specifically described as an active astronomer (rather than a casual star-gazer) and (2) why was this detail added in the 1960s (during the time of the writing of "Aldarion and Erendis")?

One might be tempted to argue that Tar-Meneldur was meant to be an astronomer from earlier in Tolkien's writing, as his name is mentioned in the "Rulers of Númenor" in Appendix A of *The Lord of the Rings* (*ROTK* 315). However, there are a number of rulers with names that reference the heavens, including Vardamir (referencing the Vala responsible for kindling the stars and setting the motions of the Sun and Moon) and Tar-Anarion (named after the Sun), neither of whom are said to be astronomers. While it is clear that Tolkien wished to contrast the interests and personalities of the homebody and scholarly Tar-Meneldur and his restless mariner son, there are any number of other avocations one might have selected for the elder king (for example, historian, geologist, botanist, ornithologist, etc.) that might have set up the same dichotomy. Indeed, Elros's son, Vardamir, is said to have been called Nólimon – derived from the "Quenya *nólë* 'long study, lore, knowledge'" (*Sil* 359) – because "his chief love was for ancient lore, which he gathered from Elves and Men" (*UT* 218). Vardamir's grandson, Tar-Elendil, was also named Parmaitë ('book-handed,' [*UT* 460]) because "with his own hand he made many books and legends of the lore gathered by his grandfather" (*UT* 219).

In contrast, Meneldur both collected astronomical lore in particular, and actively observed, said to "survey the heavens and observe all the movements of the lights of the firmament" (*UT* 173), especially "the motions of the stars" (*UT* 167). Such observations probably included the periodic motions of the moon and the planet Venus, both those with periods on the order of one to several months and longer-term ones that require more than a decade of careful observation to document, such as the Saros cycle, a 18.6-year cycle in the orientation of the moon's orbit around the earth relative to the earth's orbit around the sun. Tolkien notes in late writings from around this same time that the apparent motions of the planets or "wayward stars = our planets" were known to the Elves (*NOME* 281-2), and by extension could easily have been included in the star lore collected by Tar-Meneldur; but the king is also specifically said to especially observe the motion of the "stars" (as opposed to the "lights of the firmament" more broadly). This insinuates the motions of the so-called 'fixed stars.' Tolkien was aware of the

seasonal motions of the bright stars and constellations, as described in such disparate works as the early poem "Kortirion Among the Trees" (in particular the Big Dipper and Pleiades [Larsen 2018]) and the strikingly accurate description of the orderly rising of the Pleiades (Remmirath), Aldebaran (Borgil), and Orion (Menelvagor) found in *The Fellowship of the Ring* (*FOTR* 91). The apparent motion of the stars provides a natural system of timekeeping, based on careful observation of the patterns. Conversely, the apparent motions of the stars (and the sun and moon) make possible celestial navigation, a necessary skill for sailors. Putting aside the important issue of the differences in celestial navigation on a flat versus round world[1], Tar-Meneldur's observations might have provided important information to mariners like his son (in the form of ephemeris and latitudinal charts).

The most practical applications of astronomical observations prior to the 1800s were the construction of calendars and the precise measurement of relative positions (the coordinates) of the stars (Schrimpf and Verbunt 6; Wolfschmidt 231). Elsewhere I argued that there are parallels between Tar-Meneldur and the lives of several pre-20th century astronomer-nobles (Ulugh Beg, Johannes Hevelius, Wilhelm IV, Tycho Brahe, and James Ludovic Lindsay) and noted several real-world astronomical events that may have informed/motivated Tolkien's development of Tar-Meneldur's avocation, including political controversies concerning the Radcliffe Observatory at Oxford and the Royal Observatories at Greenwich and Edinburgh (Larsen 2022). Since that publication I have continued to ponder Tolkien's depiction of Tar-Meneldur as an astronomer (and king), and offer another possible source of inspiration for the royal astronomer in the form of the tenth Astronomer Royal, Sir Harold Spencer Jones.

The office of Astronomer Royal (a member of the Royal Household) was founded by King Charles II alongside the founding of the Royal Observatory, Greenwich, in 1675. The first office holder, John Flamsteed, was charged with "rectifying of the tables of the motions of the heavens, and the places of the fixed stars, so as to find out the so much desired longitude of places for the perfecting of the art of navigation" (*Royal Museums Greenwich*, n.d.). The extremely practical nature of the observatory's work is important to note; as Lee T. Macdonald describes,

> The Royal Observatory's traditional role was to provide accurate tables and other services to the Royal Navy and merchant marine, and also to provide a timekeeping service to the nation. Most of the astronomical work done was strictly positional, centred around timing the meridian passage of the stars. The only astrophysical work carried out at Greenwich before the late nineteenth century was that which had a direct practical value, such as

[1] See Jonathan Crowe (2018) for an excellent discussion of this problem.

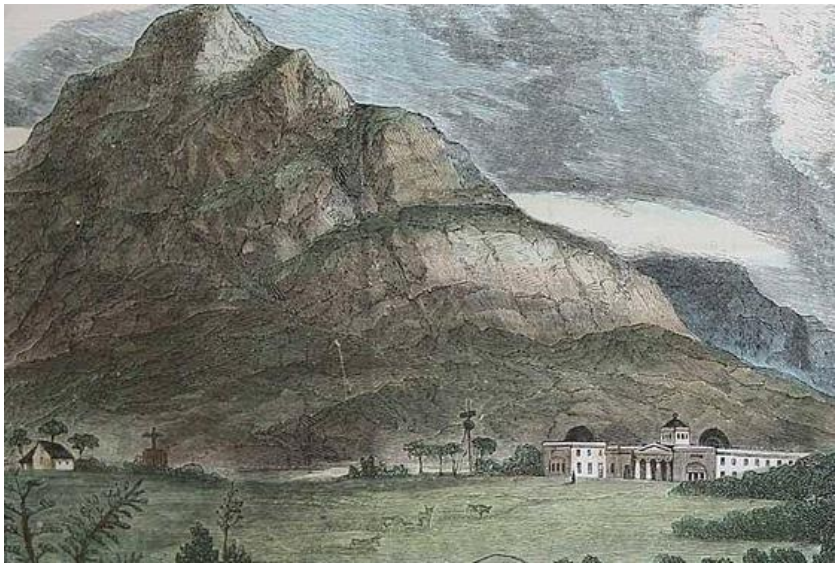
> monitoring solar activity and the earth's magnetic field, which were believed to affect the climate and navigation. Basic research – defined as research 'to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view' – was not seen as part of the observatory's role. (Macdonald 2010, 74)

This intentional eschewing of astrophysical work set the Royal Observatory into increasing contrast with the development of modern astronomy in the late nineteenth and early twentieth centuries (Clerke 2003, 2-3). The study of positional astronomy therefore became seen as 'old school;' however, it would have seemed quite at home in Númenor. Macdonald describes Spencer Jones as "the last Astronomer Royal of the old school, in that he was primarily concerned with positional astronomy and timekeeping" (2010, 75). He is best known today for two pieces of astronomical work, spearheading an international campaign to more precisely measure the average distance between the Earth and Sun (the 'astronomical unit') using observations of a close-approach of the asteroid Eros (Spencer Jones 1944) and demonstrating that variations in the Earth's rotation cause irregular fluctuations in the observed longitudes of the Sun, Mercury, and Venus (meaning that the Earth's rotation is an unreliable clock) (Spencer Jones 1939a).

Born to accountant Henry Charles Jones and his former schoolmistress wife Sarah Ryland in Kensington on 29 March 1890, like Aldarion, Harold Spencer Jones was the third child and eldest son. His innate interest in and talent for mathematics resulted in a scholarship to Jesus College, Cambridge, where he excelled in mathematics and physics (including the designation of Isaac Newton Student in 1912) (Woolley 1961, 137). He was elected to a Fellowship in Jesus College in 1913 but instead served as Chief Assistant at the Royal Observatory, Greenwich, a role he fulfilled for a decade (with the exception of wartime service at the Ministry of Munitions (Smart 1961, 117). In July 1923, at the relatively young age of 33, he was appointed His Majesty's Astronomer at the Cape of Good Hope Observatory outside Cape Town, South Africa, following the death of S.S. Hough. This prestigious institution was founded in 1820 by King George IV to expand the work of the Royal Observatory, Greenwich, into the southern hemisphere, where, in Tolkien's words, "the stars are strange" – i.e., not visible from the latitude of England (*FOTR* 261). Spencer Jones and his wife of five years, Gladys Mary Owens, arrived in South Africa in December of that year (Sadler 1963, 115).

While Tolkien does not describe the living arrangements of the then Crown Prince and his beautiful wife, Almarien, on the remote northern coast of the Forostar, it is said that before reaching his majority (25th birthday) his son Aldarion "had little liking for the north country, and spent all the time that his father would grant by the shores of the sea" with his grandfather (*UT* 174). One might understand

if Mrs. Spencer Jones was less than enthralled with the conditions she and her husband originally encountered at the Cape; as noted by the eleventh Astronomer Royal, the observatory staff itself was "discontent" at the "official houses on the site, which had been built in Victorian times and were in need of improvement. Spencer Jones introduced electric light and water-borne sanitation, and secured properly made tarred roads which kept down the dust," improvements that earned him "the undivided loyalty and admiration of the entire staff" (Woolley 1961, 137).

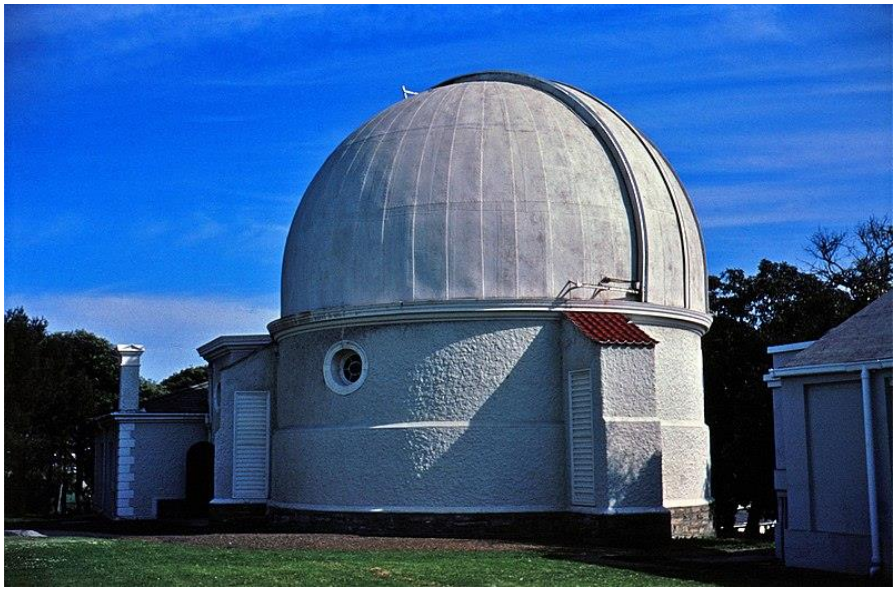


Royal Observatory, Cape of Good Hope, 1857. Public domain.

Spencer Jones was an active advocate for South African astronomy overall and became an active member of the Astronomical Society of South Africa (founded 1922), serving as president in 1926-7 and 1932-33; he was later elected an Honorary Member of the organization ("Sir Harold Spencer Jones" 1960, 147-8). His nearly ten years in South Africa were professionally productive and, by all accounts, socially enjoyable. Despite the Observatory's proximity to Cape Town (about four miles from city center), light pollution was relatively minor, as Spencer Jones reported in a 1930 article; in fact, improvements to street lighting after 1927 were found to correlate with a *decrease* in sky brightness at the Observatory (Rayleigh and Spencer Jones 1930, 53), the calm before the light pollution storm he would ultimately face back home in England. In a 25 May 1944 letter to his son Christopher, then serving in South Africa in World War II, Tolkien noted that he "was disposed, at last, to envy you a little; or rather to wish I could be with you 'in the hills'. There is something in nativity, and though I have few pictorial memories, there is always a curious sense of reminiscence about any stories of Africa, which

always move me deeply" (*Letters* 118). While the locations of Christopher's flight training and his father's birthplace are admittedly far to the northeast of Cape Town (and nowhere near the coast, in contrast with both the Forostar and Cape Town), the romantic/nostalgic juxtaposition of South Africa with England in both cases gave me reason to pause.

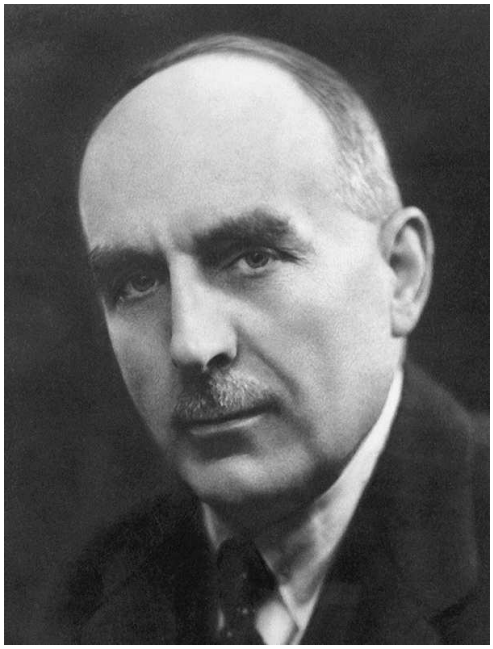
While the Observatory had engaged in both spectroscopic ('astrophysical') and positional work under the previous director, Spencer Jones steered the facility back towards its old-school roots after the retirement of staff astronomer Joseph Lunt in 1926. Instead, he utilized the Victoria telescope (actually four instruments mounted in tandem) to develop a program of using photographs to determine the distances to stars via the methodology of trigonometric parallax (Woolley 1961, 138).[2] At the start of Spencer Jones' term there were reliable parallaxes (and hence reliable distances) to only about 100 southern stars; this number was more than quadrupled by the end of his tenure (Sadler 1963, 115-6).



The Victoria/McClean Observatory, which housed four co-mounted telescopes, including 18-inch and 24-inch instruments. Credit: Janek Szymanowski (CC-BY-SA-3.0), courtesy of Wikimedia Commons.

[2] For a quick and non-technical explanation of this technique, which uses the annual motion of the Earth around the Sun to determine star distances, see https://youtu.be/iwlMmJs1f5o?si=jK-HHuPwtihUxVtm.

Spencer Jones also initiated a program to use a variety of photographic methods alongside transit observations (similar to Meneldur's assumed observations, measuring the movement of a star across a reference line in the eyepiece) to measure the positions of stars to great position. Changes in these positions over time are caused by the individual motions of stars through space (rather than the Earth's orbit around the Sun) and are termed proper motion.[3] The result was determinations of positions, brightnesses, and proper motions for some 40,000 southern stars, an impressive body of work ("Sir Harold Spencer Jones" 148; Sadler 115-6). The retirement of Sir Frank Dyson, nineth Astronomer Royal, in 1933 marked the return of Spencer Jones to Greenwich, and British skies.



Harold Spencer Jones. Courtesy of Sonoma State University (https://phys-astro.sonoma.edu/brucemedalists/harold-spencer-jones)

As Astronomer Royal Spencer Jones wielded political power within the astronomical community and was seen as a public figurehead who spoke to the nation about all things astronomical. His books, including *General Astronomy*

[3] Proper motion very slowly changes the shapes of the constellations over time. The evolution of the Big Dipper over long timescales is modelled here: https://youtu.be/txJH8RlIoXQ?si=3S90HJ9_50BNemlR.

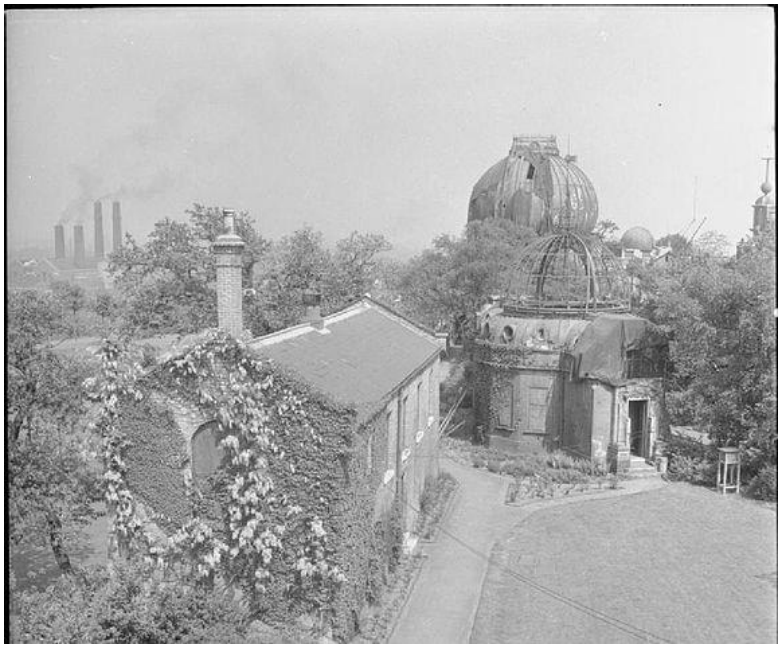
(1922), *Worlds without End* (1935), and *Life on Other Worlds* (1940) enjoyed numerous reprintings and revised editions. He was noted for speaking "widely, in all media, on the subject of time and many will recall the enthusiasm with which he presented his material" (Macdonald 2010, 75). He modernized the timekeeping facilities of the Royal Observatory, and became President of the British Horological Institute, as well as Master of the Clockmaker's Company in 1949 and 1954 ((Woolley 1961, 141). He delivered the prestigious Halley lecture at Oxford for 1939 on "The Earth as a Clock," explaining his technical paper of that year on the Earth's variations in rotation for a more general audience. As was normal for Halley lectures, his was published by the Clarendon Press at Oxford, increasing its reach among the public (Spencer Jones 1939b). His related interest in navigation (again, a practical reason for astronomical observations in Númenor) was furthered when His Majesty's Nautical Almanac Office was placed under his direction in 1936 (previously an independent office). As he had in many other aspects of his professional life, he took on additional leadership roles, serving as chairman of the official Air Navigation Committee for many years, which "advised on all aspects of navigational research and development" (Sadler 1963, 119). In addition to his knighthood in 1943 and K.B.E. 1955, Spencer Jones received numerous scientific awards, including a Royal medal from the Royal Society and the Bruce medal of the Astronomical Society of the Pacific.

While this discussion has teased out some interesting parallels between the lives of Meneldur and Spencer Jones, perhaps the most interesting is the latter's central role in the building of the largest observatory in Great Britain (aligning him with Meneldur in yet another way), and the movement of the Royal Observatory (and along with it the Astronomer Royal) not from the north coast to the royal capital in Armenelos, but from Greenwich to a castle in Sussex.

Recall that Spencer Jones had enjoyed relatively good sky conditions in South Africa. Not only did he have to deal with British weather upon ascending to the 'throne' of Astronomer Royal, but the well-known deteriorating observing conditions due to air and light pollution. Indeed, nearly a decade before he had first joined the Greenwich staff as Chief Assistant, the soot and vibration from a coal-powered energy station less than a mile away were already taking their toll on the Observatory's seeing conditions (L.T. Macdonald 2020, 273-74). In August 1905 an anonymous column in *The Daily Mail* openly asked if it was time to move the "Greenwich Observatory to some spot where there would be a better chance of making observations in a clear sky?" (Macdonald 2020, 278-9). The brightness of the Greenwich skies deteriorated further after 1930 when electric streetlights were introduced. While Spencer Jones began considering the possibility that the Observatory might have to be moved as early as 1938, the 1939 report of a special committee convened by the Observatory's governing Board of Visitors warned that air pollution had already made it impossible to measure the transits of stars that

were low in the sky because they simply could not be seen, and air pollution and related bothersome air currents were hampering other observations. In addition, the pollution was causing damage to some of the instruments. The basic problem was obvious to anyone who cared to look skyward, as the Milky Way was no longer visible to the unaided eye from Greenwich (Macdonald 2020, 272-3).

During World War II the Time Department was moved from Greenwich to a magnetic station at Abinger, while most of the astronomical instruments were mothballed for their own protection, a shrewd move given that the Observatory grounds suffered damage by bombs in 1940 and 1944 (*Imperial War Museums* n.d.). Official discussion to move the entire Observatory operation began as early as 1944 (Woolley 1961, 140), and by the war's end the decision had been made to move the astronomical facilities to the grounds of Herstmonceux Castle in Sussex. The official announcement came on 11 April 1946, although the sale was not complete until the following year. Spencer Jones calmed the angst of those who worried about the historical legacy of the Observatory by announcing that the crown had approved the name "The Royal Greenwich Observatory, Herstmonceux" for the new facility (Sadler 1963, 119-20). The astronomical instruments were moved from storage to Herstmonceux Castle over the next few years, resulting in a lengthy hiatus in astronomical observations that must have been as frustrating for Spencer Jones as it had been for Meneldur (although thankfully not nearly as long).



World War II bomb damage to the Royal Observatory, Greenwich. Public Domain. Courtesy Imperial War Museums.

Herstmonceux Castle, 1965. Credit: Peter Jeffery, CC-BY-SA-2.0, courtesy of Wikimedia Commons.

But Spencer Jones had not been completely idle in terms of astronomical business during this time period. The c. 1965 typescript from which Christopher Tolkien took some of the material that appeared as "A Description of the Island of Númenor" in *Unfinished Tales* notes that Tar-Meneldur's royal observatory in the Forostar was "the first and greatest of the observatories of the Númenóreans" (*NoME* 332-3). Similarly, the Astronomer Royal was planning to install a great telescope in the British Isles. By the end of World War II the United States had won the battle of the behemoths in terms of building the world's largest – and hence most powerful – telescopes. The 100-inch Hooker telescope outside Los Angeles at Mount Wilson came online in 1917, and the 200-inch Hale telescope (outside San Diego at Mount Palomar) was set to open in 1949. The historic Radcliffe Observatory at Oxford (completed in 1794) may have significantly framed Tolkien's description of Tar-Meneldur's observatory tower, especially as it was clearly visible from St. Aloysius Catholic Church (and decades ago probably from the street outside the Eagle and Child as well). It was, however, a fossil from an earlier era, as early as Tolkien's return to Oxford as a faculty member in 1925.

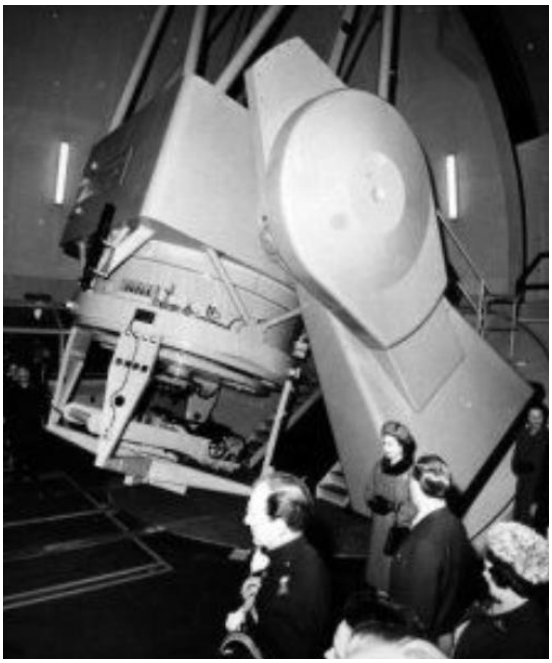
Radcliffe Observatory, Oxford. Photograph by the author.

In spite of political disputes roiling within the university, the Trustees sold the Observatory and associated grounds to the University Infirmary in 1929, with the majority of the £100,000 price tag earmarked for the construction of a 74-inch aperture telescope in Pretoria, South Africa (Thackeray 1972, 314). Plagued by delays caused by the war and problems with manufacturing such a large telescope mirror, the facility finally opened in 1948 (Smith and Dudley 1982, 2). The dual connections to both his home university and his country of birth (along with the drawn out process itself) should have put the project on Tolkien's internal radar. The well-known problems with the British weather and increasing threat from light pollution did little to deter increasing voices calling for the installation of a large, world-class telescope on British soil – especially as part of the newly moved Royal Observatory. Savilian Professor of Astronomy at Oxford and President of the Royal Astronomical Society H.H. Plaskett turned his 1946 presidential address into an appeal for the building of an instrument of at least 72 inches in aperture. Spencer Jones, Chairman of the Royal Society's Committee to determine the needs of British astronomy in the post-war era, quickly recommended the creation of a large instrument – dubbed the Isaac Newton Telescope – and only five months after Plaskett's plea used his considerable influence to successfully convince the Treasury to fund an impressive 100-inch instrument (Woolley 1961, 141; Sadler 1963, 121). Although an unused 98-inch mirror blank was offered by the University

of Michigan only three years later, arguments about optical design and the state of the British economy led to delay after delay (Sadler 1963, 121; Macdonald 2010, 80).

Spencer Jones retired on December 31, 1955, during the last stage of the official transition from Greenwich to Herstmonceux. While in a note to a typescript on the lives of the Númenóreans Tolkien mentions that after passing the sceptre to his son Aldarion, Meneldur "lived on in retirement (engaged in his favourite pursuit of astronomy)" for an additional 59 years (*NoME* 321), Spencer Jones passed away in 1960, four years before the construction of the Isaac Newton Telescope observatory building began. The instrument was completed in August 1967 and Queen Elizabeth II officially opened the facility in December (Macdonald 2010, 83). The telescope was operational for the remainder of Tolkien's life, but was closed in 1979, and the instrument was moved to the Canary Islands in search of better observing conditions, reopening in its new location in 1984 (Smith and Dudley 1982, 1). The well-read Tolkien would have undoubtedly been aware of the ongoing saga of the Greenwich Royal Observatory, even peripherally.

Observatory Science Centre, Herstmonceux Castle Grounds, 2011. The dome that once housed the Isaac Newton Telescope is on the right. Credit: Leiven Smits, CC-BY-SA-3.0, courtesy Wikimedia Commons



Queen Elizabeth II at the dedication of the Isaac Newton Telescope, December 1, 1967. Posted to Pinterest by Lora McNutt.
https://www.pinterest.com/pin/511651207671470855/

In conclusion, I offer a few words about Spencer Jones the man. Like Tolkien he had varied interests, including science and the arts, and collected rare editions of books (Sadler 1963, 125). He was described as a

> tall, upright, dignified figure who brought an air of distinction to any gathering. He had a fine presence, with a clear delivery and a ready command of language; he was certainly, in appearance, the most dignified astronomer of his era. In his dealings with his staff and, with his many committees, he possessed a rare gift for finding the right way to lead, and for choosing the right phrase, or the right compromise, to obtain agreement. (Sadler 1963, 124-5).

The same biographer summarized him as

> a simple and kindly man, with high ideals and complete integrity of purpose, which he brought to all his many activities. As such he preferred logical and temperate argument to passionate advocacy; his beliefs were pursued and

> generally achieved, with a quiet unspectacular persistence and with a fitting dignity, enhanced by his fine presence and his clear delivery…. Although deeply immersed in so many activities, he was never hurried and treated all with kindness, consideration and unfailing courtesy; his helpful advice was always available. (Sadler 1963, 113-4)

Might we see some semblance of the "good and wise king" Meneldur, a man "without pride, whose exercise was rather in thought than in deeds of the body" whose "chief delight was in the watching of the stars"?

Two final anecdotes also caught my interest; firstly, Spencer Jones delivered the 1944-45 Royal Institution Christmas Lectures, a series of lectures "given for young people by a distinguished scientist. Sir Harold lectured to a large and enthusiastic audience of 'children' of all ages" ("Sir Harold Spencer Jones F.R.S., F.R.A.S." 1945, 505-6). Lastly, Sir and Dame Spencer Jones were known for their "keenest interest in all members of the staff of the Observatory, and especially in their children," no doubt aided by their devotion to their own sons, David and John. Interestingly, to the staff's children he was known as "Father Christmas" (Sadler 1963, 125). But perhaps that is a rabbit hole (or black hole) too deep, even for this astronomer.

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