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1

axioms in comparative mythology

The more one learns about the myths, legends, and religions of the human race, the more imperative is the demand that one somehow make sense of them as a whole.

– Joscelyn Godwin, *Arktos*³⁷

From a modern perspective, cosmologies can be defined as thought systems about the origin, the structure, the workings and the future of the universe. Generally, two categories can be distinguished. *Scientific cosmologies* look forward as they evolve, continuously reinventing themselves in response to the latest knowledge (fig. 2). By contrast, *traditional cosmologies* are conservative by nature, according a higher status to traditions than observations and thus – despite occasional embellishments – looking backward as they decay (*e.g.*, figs. 3-4). They comprise much of what is called mythology and are epitomised in *nature myths*.³⁸

Traditional cosmologies resemble scientific ones in basing some knowledge on observations of nature, using forms of nomenclature and modes of theorising. A protoscientific spirit is glimpsed in isolated cases when myths make an intellectually honest attempt to understand an aspect of nature and are modified to reflect newer insights; “Origins of nearly all major scientific topics are lost in tales of mythology and folklore”, wrote the Hungarian-American priest and physicist Stanley Ladislav Jaki (1924-2009).³⁹ Joseph John Campbell (1904-1987), the popular American mythologist, characterised the protoscientific element in myth as artistic:

As thought mythology approaches – or is a primitive prelude to – science; and as experience it is precisely art.⁴⁰

³⁷ Godwin 1993: 141.

³⁸ See further van der Sluijs 2011a: 3-13.

³⁹ Jaki 1972: 1.

⁴⁰ Campbell 1959: 179.

A fourth revolution in thought would be the realisation that unprejudiced deduction from cross-cultural data is open-ended and can thus hold surprises. The earliest mythologists of the modern period, who were invariably Christian, typically screened traditions of non-Christian cultures for information consistent with their own world view, which they perceived to come in garbled pagan form. This changed when more rational enquirers learned that a true comparative method ought to be capable of producing unexpected results. In 1847, the Scottish lawyer and amateur mythologist James Richardson Logan (1819-1869) composed an eloquent statement on comparative techniques in anthropology, in which he made the crucial point that the comparatist is in a better position to judge the relevance or accuracy of field data than the individual data collectors themselves:

Traits which the general traveller, or the writer who merely seeks to entertain his readers for the moment, would pass over as trifling or suppress from motives of delicacy, cannot, with any safety, be omitted if it is desired to advance science. ... Whatever the observer finds as a general characteristic of a people ought to be noted, because it is impossible to say which facts are the most important for purposes of comparison. A fact which his own knowledge or taste would lead him to reject, may be one which, in itself or in connection with others, is a record of times antecedent to those in which the more striking peculiarities originated or received their existing shape, and the true value of which may remain undetected until a careful investigation of some other country discovers the presence of similar records, and opens up chapters of the past which tradition has forgotten, but which may thus be better authenticated than those which rest on tradition.⁶⁴

This is a vital insight, as it enables responsible extraction of genuinely new information from mythical data, including the recognition of hitherto unsuspected motifs shared between unrelated cultures and possible implications of such motifs for our knowledge about the physical world. Kuhn and Müller must have embraced a similar position, for their ac-

for both types of materials – the written evidence of the ancient Old World civilisations, many of which were Indo-European, and oral traditions culled from elsewhere in recent times – and that as a form of unidisciplinary reconstruction it is not at odds with ‘higher theorising’ of the interdisciplinary sort contributed by anthropological theory, such as the links between myth, ritual and psychoanalysis. As in linguistics, the comparative method merely aids the reconstruction of earlier stages using tools internal to the field, leaving questions of evolutionary origins in deep time and psychosocial correlates to other disciplines.

⁶⁴ Logan 1847: 175-176.

3

mythogeography

It is strange to find fables similar to those of the more northern nations even in the heart of Africa.

– David Livingstone, *Missionary Travels and Researches in South Africa*⁹⁹

A meaningful discussion on the nature and origin of myth can only be had when the data are viewed within their proper chronological and geographical contexts. The question of geographic distribution, which is intimately tied to chronology, requires some elucidation.

Mythogeography may be defined as a subdiscipline mapping the geographic distribution of individual themes in myths and perhaps other traditions. As soon as attested information is projected back into a hypothetical past, the migration patterns of ideas as well as people must be taken into account, as traditions travelled with or without the relocation of people. The geographic range within which a traditional theme occurs is a function of time and mass migrations have always been frequent, whether they involved the spread of belief systems – such as Mithraism, Christianity or Buddhism – or of people – such as Mongol, Chinese and European colonialism, the Jewish diaspora or the dispersion of the Polynesians, the Bantu or the speakers of Proto-Indo-European or Proto-Semitic. For example, if traditions concerning the world axis arose more than 4000 years ago, the forerunners of versions collected from medieval Iceland and the Māori of 19th-century New Zealand must be linked not with Iceland and New Zealand, but with the respective Indo-European and Polynesian homelands whence the bulk of their historical inhabitants arrived.

In practice, mythogeographical mapping is less straightforward than it may seem, due to limitations on our knowledge of the past. One problem is that the maps must necessarily remain incomplete, both because modern analysis cannot reasonably access all existing sources and because countless traditions were never recorded on a durable medium

⁹⁹ diary (14 November 1855 at the Chobe River, northern Botswana), ed. Livingstone 1857: 517.

This was sensed by Clube & Napier, who cited the “tales of the kind brought back by Solon, in which the devastation involved not the arbitrary actions of gods but the wholly natural action of bodies from space” as epitomising the “rise of *theory* in the Greece of the seventh century BC, in which the cosmos was explained in natural terms rather than through divine wilful action”.¹⁴⁰ Plato’s dialogues spawned no less than four major strands of catastrophist engagement, all continuing in modern discourse: the theory of a Great Year as pursued by Stoics, millenarians and the like;¹⁴¹ the idea that the deluge or any large catastrophe could have had an extraterrestrial cause; Atlantidology;¹⁴² and attempts to explain the myth of Phaethon, which over the centuries amount to a literature so vast as to playfully warrant the term ‘Phaethontology’.

The European Renaissance sparked a renewed interest in myth, focussing on the classical legacy before widening to include the non-Christian folklore of other parts of Europe and eventually the entire world. At first, the mythologists of this period were generally Christians who subscribed to a literalist interpretation of the Bible, combined with a high degree of respect for Graeco-Roman literature. One should think that a strict adherence to the doctrines of creation, the Fall, the deluge, the overturning of Sodom and Gomorrah, the coming destruction of the world by fire and other salient elements of Biblical lore necessarily implies a catastrophist outlook – and for the most part this is correct. Paradoxically, however, allegorical interpretations in which mythical acts or actors represented abstract principles such as ‘time’, ‘love’, ‘virtue’ or ‘justice’ enjoyed most preference as far as the myths of classical antiquity were concerned. Consequently, the dominant Renaissance attitude to myth may be characterised as selective catastrophism.

La Peyrère, in his plea for an independent, less prejudiced attitude to the mythologies of other cultures, promoted a decidedly uniformitarian agenda: the Biblical marvels of the flood of Noah, Joshua’s arrested sun and moon, the retrogressive shadow on Ahaz’s ‘steps’ and the darkness during Jesus’ crucifixion were all regional events with relatively mundane explanations.¹⁴³ Similarly, as noted earlier, there is no indication that the physical phenomena which de Fontenelle had in mind as the original objects of myth were anything other than common and be-

¹⁴⁰ Clube & Napier 1990: 77.

¹⁴¹ *e.g.*, van der Sluijs 2006; 2005b.

¹⁴² The common form ‘Atlantology’ is grammatically incorrect and suggests the study of Atlas.

¹⁴³ La Peyrère 1655: 202-234; *cf.* Popkin 1987: 2, 51-52; 2003: 221-222.

All these thematic parallels amount to a reasonable argument that the myths cited above from some of the most ancient known literate societies are kindred to the lunisolar myths of most other cultures and were inspired by the same causes as they were. This may mean that the respective Greek and Near Eastern deities mentioned above were originally 'suns' and 'moons', but were no longer so identified by the time the texts were composed. Conversely, it could be that the 'suns' and 'moons' of traditions recorded in other parts of the world in more recent times were metaphors for certain luminous aerial or celestial entities of some other description and that the ancient cultures in the Fertile Crescent, from which the Greeks borrowed heavily, had not or not yet resorted to such metaphorical terminology for the same phenomena.

It may not be coincidental that this same constellation of adjoining ancient cultures in their pantheons assigned a much more prominent rôle to planets other than Venus than the rest of the world did, as noted above. Conceivably, a single category of celestial or atmospheric phenomena spawned traditions of 'kings of heaven' and their relatives which developed into myths of planets in some areas and ones of peculiar suns and moons in others, perchance with a general preference for planets in earlier times and for suns and moons in more recent centuries. Yet because the planetary identities of the mythical characters in question, excepting Venus, cannot be convincingly demonstrated in sources preceding the 1st millennium BC or indeed the Hellenistic period, when planetary astronomy was in its infancy, and because some players – like Ra, Horus and Osiris – did have a solar aspect at least from the outset of their appearance in texts, it would be premature to infer that the original referents of the traditions were more likely planetary than solar or lunar. That many of these descriptors were metaphors for some other type of natural agent is eminently possible.



eclipses

Some themes may be related to transient visual effects related to the sun or moon, all of which are in some way 'optical' or significantly conditioned by perspective.²⁷³ These effects fall into the three subtypes of eclipses, atmospheric optical effects and zodiacal or interplanetary light. Discussion of the zodiacal light is deferred to a future volume, as the mythical world axis is more prominent in its associated mythology than the sun and moon are.

Lunar and solar eclipses can metaphorically be regarded as an amorous union (fig. 32) or a competition of sorts between Sun and Moon (§391*). The widespread traditional belief that the sun and moon once swapped rôles might even be linked to a sense that the moon's reddening during a lunar eclipse makes it more sun-like, while the waxing and waning of the sun's disc during a solar eclipse involve crescentic phases, a property normally reserved for the moon.²⁷⁴ However, these interpretations presuppose the understanding that the eclipsing shadow is cast by the moon or the earth.

It is not outrageous to suggest that non-Western cultures could have identified at least the shadow eclipsing the sun as the moon, especially because the ensuing darkness suggests the night, which was popularly viewed as the moon's province.²⁷⁵ The Yolngu of Yirrkala (eastern Arnhem Land, Australia) provide an example in which the meeting between the bodies at a solar eclipse is of an erotic nature:

When there is an eclipse of the sun it means that the Sun woman is covered by the Moon man and they are copulating.²⁷⁶

Harder to understand is how prescientific minds could, conversely, have worked out the sun's involvement in lunar eclipses. Plutarch (1st century AD) astutely acknowledged that the Greeks of the 5th century BC did not comprehend it:

... there came an eclipse of the moon by night. ... The obscuration of the sun towards the end of the month was already understood, even by the common folk, as caused somehow or other by the moon; but

²⁷³ See also the discussion in James 2000: 106–107.

²⁷⁴ This point was made by Humphreys & Waddington (2017: 41, 42 figure 4), albeit in the context of a hypothesis which must otherwise be rejected – van der Sluijs in press.

²⁷⁵ Compare the comments in van der Sluijs in press.

²⁷⁶ recorded 1926–1929, in Warner 1937: 538.

Although few of the listed authors seem to have been familiar with Warren's vision of a mythologised rotation axis,⁴³¹ all but the classicists, Wensinck and de Buck took the same basic 'polarist' position. Still countenanced among some modern anthropologists, this entailed a uniformitarian outlook, reducing diverse mythical expressions of the column to symbols of the earth's rotational axis stretched out into space as a single abstract scientific concept, and the liberal extension of terms for that axis – eventually including the Latin '*axis mundi*' – to cosmological notions which were assumed but not proven to reference it.⁴³²

As early as 1883, Massey, who was an English poet and writer, declared that "the Mythical Tree, like the Pillar and the Mount, is a *type of the celestial Pole*. ... the Mount of the North and the celestial Tree are the same, as *surely as the North Pole is single* ..."433 His disjointed attempt to validate these claims was feeble and rebarbative, but he did reveal a glimmer of historical insight with this vague observation, which he, regrettably, did not follow through:

*The Mythical mount was the initial point of the geocentric system of astronomy, the earth-centre of motion before it was known that the earth itself was a rotating and revolving globe.*⁴³⁴

Warren's idea of an Arctic homeland inspired a string of researchers who confined it to all or a segment of the 'Aryan race', speakers of the hypothetical Proto-Indo-European language. Until the German geophysicist Alfred Lothar Wegener (1880-1930) announced his groundbreaking geological findings, first in 1912, these authorities did not consider the possibility that the north pole may in the past have been in a geographically different part of the world than where it is today. Among them, the Welsh scholar John Rhys (1840-1915)⁴³⁵ and a Vinayak Mahadev Apte,⁴³⁶ presumably Indian, displayed no interest in traditions of the world axis. Tilak, a Marathi journalist, lawyer and political activist, published a hefty

⁴³¹ e.g., Vail (below); O'Neill 1893: 28, 35, 191 note 5, 244, 359, 380, 418 note 4, 428, 450, 457, 491; 1897: iv, 860, 870, 881, 890, 907, 914, 982, 998; Nuttall 1901: 310 note 1, 475; Tilak 1903: viii, 6, 40, 42, 48-49, 78, 275-276, 307, 412, 429-430.

⁴³² In contrast to some anthropologists preoccupied with a single culture, comparative mythologists (e.g., Puhvel 1987: 7-20) as a rule do not even mention the polarist current of research any more than catastrophism.

⁴³³ Massey 1883: 354, 356, cf. 355.

⁴³⁴ Massey 1883: 359.

⁴³⁵ Rhys 1888: 636-637.

⁴³⁶ Apte 1960.

In his efforts to substantiate these claims, Vail drew heavily on mythology, initially concentrating on the traditions of the ancient Hebrews. He claimed to have been unravelling, from the early 1890s onwards, an elaborate complex of transcultural 'polar mythology', inspired by the works of Warren and O'Neill:

Just before the close of the last century I found this polar picture fossilized in the oldest thought of many peoples. The scholars of the world must know that the ancient North World was a point of supreme regard for all humanity.⁵³⁹

In the early nineties of the past century, in looking over the wide field of ancient thought I found a great many such survivals ..., and a host of my pupils urged me to incorporate this fact as an essential of Canopy Evolution, and claim the 'Polar Sky-hole' as a 'discovery' of my own.⁵⁴⁰

In turgid prose, Vail identified a range of interlocking cross-cultural mythical themes supportive of the canopy theory, with emphasis on the polar regions. Some of the themes had been recognised earlier: primordial darkness and 'chaos' (§§4-7, 9-11),⁵⁴¹ which according to Vail was really due to the canopy filtering daylight so heavily as to conceal the sun;⁵⁴² a 'low sky' (§3), later separated from the earth (§39), which predictably was the canopy;⁵⁴³ a celestial serpent or dragon (§§14-15, 27, 104-110, 178, 180, 184, 251, 256), frequently believed to have swallowed the sun, which again described the swirling waters of the canopy with its belts, bands and striae;⁵⁴⁴ a cosmic centre or navel (§§18, 20, 94, 126-127, 136);⁵⁴⁵ and a cosmic hole, enclosure, eye, egg or wheel (§§24-29, 46-51, 92, 282-298), all of which Vail located at the pole and identified as the

are the sea, catastrophic downpours of solids, liquids, and gases during periods of convulsions of dividing and binding."

⁵³⁹ Vail 1912: viii.

⁵⁴⁰ Vail 1913: 8. Vail seems to have discovered the works of Warren and O'Neill only after 1900, acknowledging the former as "the illustrious W. F. Warren, Dean of Boston University" (1912: vi, absent from the 1902 edition) and "This learned author" with his "wonderful book" (1913: 82, *cf.* 17), the latter as his "revered and lamented instructor" (1913: 92), the "immortal O'Neil [*sic*], to whom I am constantly indebted" (1972a [original date unknown]: 62; *cf.* 1972b: 27, 29, 40, 42, 62-63, 68).

⁵⁴¹ Vail 1905: 52; 1972b: 56; *cf.* d'Espiard de Colonge 1865: 540-541; Donnelly 1883: 208.

⁵⁴² *e.g.*, Vail 1905: 62, 66, 68, 97-101; 1912: 96, 129, 166/167 figure 6; 1913: 10-12, 24-25, 27, 45; Bowers 1892: 8.

⁵⁴³ Vail 1905: 34-35, 40-41, 43; 1972a: 23.

⁵⁴⁴ Vail 1905: 51-52; 1972b: 29-31; *cf.* Donnelly 1883: 132-340, 361, 364, 395, 409-410, 424-425, 429.

⁵⁴⁵ Vail 1913: 50; 1972b: 5, 24-25, 46, 59.

From an electromagnetic point of view, the sun and earth are intermittently coupled at the interface of the solar wind and the earth's magnetosphere. This so-called solar-terrestrial environment facilitates an electrical discharge with a permanent supply of electrical charge – conveyed by electrons as well as a smaller amount of ions – in a gaseous or rather plasmatic medium.⁶⁴⁰ Electrical engineers grade low-pressure or 'cold' direct-current discharges – such as discharges through a gas – according to three régimes of intensity, which “can be distinguished by their luminescence and also by their current-voltage characteristic, current density, and breakdown voltage”.⁶⁴¹ The Townsend dark discharge produces a relatively weak current and “There is no luminosity in the discharge gap.” The glow discharge contains a stable plasma and “shows various luminous regions which fill the gap.” And even stronger currents produce an arc discharge,⁶⁴² which “will lead to a destruction of the target.”⁶⁴³ The aurora involves a combination of dark and glow discharge modes, but – as will be argued in this series – can sport arc discharges under extreme circumstances.

The following overview of the various components of this discharge structure opens with a few science-historical highlights. The French military engineer and *magister* Petrus Peregrinus ('Peter the Pilgrim') of Maricourt, who was possibly a Crusading knight, appears to have been the first Western scholar to have postulated a magnetic dipole field to which the earth is susceptible as a whole. This is based on a letter he wrote in 1269, which has been hailed as “the earliest known work of true experimental science in Europe”,⁶⁴⁴ “the first scientific treatise ever written”⁶⁴⁵ and “Europe's first work of true science”.⁶⁴⁶ However, understandably for his day, Peregrinus mistakenly assumed that the magnetic poles and their axis were identical to the rotational poles and their axis.

⁶⁴⁰ Peratt 2015: 23; Akasofu & Kamide 1987: 143, 146, 148-151, 158; Akasofu 1981; 2015: 36; Alfvén 1950: 204-206. Earlier scientists who understood the aurora as an electrical discharge include Faraday (1832: 177 = 1839: 56-57), Loomis (1868: 200), Lemström (1871: 157-162), Reynolds (1871) and Ennis (1878: 102).

⁶⁴¹ Aoki 2011: 188.

⁶⁴² Piel 2010: 323-324.

⁶⁴³ Aoki 2011: 188.

⁶⁴⁴ Smith 1970: A17.

⁶⁴⁵ Merrill *et al.* 1996: 5, *cf.* xiii, 3-4.

⁶⁴⁶ Turner 2010: 16. Wrote Harradon 1943a: 5: “The most important results in magnetic theory which de Maricourt communicated to his friend concern the recognition of the two unlike poles, the distribution of the magnetic field, the attraction of unlike poles, and the improvement of the mariner's compass.” For a discussion of the importance of Peregrinus' ideas, see further Courtillot & Le Mouél 2007: 1-4.

The observer did not “consider the almost stationary column of white light first appearing in the east, before the aurora began, as being of an auroral character, its motion, its peculiar wild and steady lustre and the uniform breadth which it preserved from the horizon to the zenith, distinguishing it from the fanciful and shooting flashes of the auroral columns.”⁷⁵² However, a sun pillar is out of the question because of the position and the time of day, a moon pillar is ruled out because the moon, which had not yet risen, is not mentioned and the zodiacal light is excluded as well, because for this latitude and time of day and year it ought to have been in the west.

At an unspecified time prior to 1859, a “Fire-pillar” (*hi no hashira*) appeared one evening over Minowa (Taitō, Tōkyō, Japan), being “a red fire, which in the Northwest rose out of the earth to the sky and then disappeared.”⁷⁵³ As a part of the great aurora concomitant with the ‘Carrington event’ of 1859, a John Baptist Austin, stationed at Kapunda, South Australia, reported a veritable pillar in the west:

... on Friday, Sept. 2nd, when the most gorgeously brilliant display took place. ... about nine o'clock, a huge pillar of fire appeared in the west, where it remained until midnight.⁷⁵⁴

And, with more ambiguity again, on the evening of 4 March 1896 an auroral pillar much resembling the zodiacal light or the tail of a comet was observed across Great Britain.⁷⁵⁵

multiple auroral pillars

Reports of multiple sky columns are as common as those of isolated ones, but their auroral identity tends to be more clear-cut due to their multiplicity. The columns may be the only visible auroral feature, may rise up above an arc or may combine into a vault-like corona.

For example, the visions attributed to the legendary Hebrew Enoch include one at “a place, the edge of the great earth; there the heavens come to an end”, where the sage “saw a great chasm among pillars of heavenly fire. And I saw in it pillars of fire descending; and they were

⁷⁵² Bonnycastle 1837: 395.

⁷⁵³ Katō Jakuan (1796-1875), *Saezurigusa* (*Twitterings*; 1859), 53 (in Japanese), in de Visser 1914: 184.

⁷⁵⁴ *London Times* (14 November 1859), in Loomis 1860b: 399.

⁷⁵⁵ Turner 1896; Ellis 1896; Cope 1896; Corliss 1982: 8-9.

Finally, the occasional appearance of the aurora at very low altitudes could well have fed into the common traditional motif of a time when ‘the sky was low’ (§3). That the aurora does sometimes descend below its accustomed minimal height of c. 80 km is well documented, though not fully acknowledged or explained.⁸²⁹ For example, the Swedish naturalist Nils Gissler (1715-1771) had noticed that ‘although the northern lights appear to be very high up in the air, at least much higher than the normal clouds; he has nevertheless seen convincing proof, that they also commune with the sphere of air, and often sink very deeply into that, so deep in fact that they occasionally seem to touch the earth itself: that on the highest mountain ridges they are wont to fan the face of travellers like a wind’.⁸³⁰ Sailing at 62° S, 66° E on 2 April 1831, John Biscoe, cited above (p. 237), sensed that the *aurora australis* appeared “at times only a few yards above our heads”.⁸³¹ While he was wintering off the southeast coast of Baffin Island on 23 November 1860, the American Arctic explorer Charles Francis Hall (1821-1871) watched as the *aurora borealis* “plainly painted its golden rays upon the face of the clouds, thus proving it was at play *between me and them*.”⁸³² In 1882, Paulsen – already introduced earlier (p. 212) – and his team were based at Nuuk (southern Greenland) when they registered the descent of many aurorae to heights as low as 600 metres, sometimes with the summits of local mountains enshrouded by the aurora.⁸³³ Citing similar observations by others from 1885, Paulsen concluded that this was a local phenomenon:

*In a certain area which crosses southern Greenland to a width of at least four degrees of latitude, the field where the northern lights can occur extends from the most elevated regions of the atmosphere to the surface of the ground.*⁸³⁴

Anticipating Birkeland’s work on the profile of auroral currents by some decades, as seen, Paulsen speculated that a combination of horizontal and vertical electric currents was the cause of the dramatic variations in

⁸²⁹ Corliss 1982: 16, 21; Botley 1947: 18-19. Among a legion of dismissive judgments is von Humboldt’s (1848: 194) verdict: “The assertion so frequently maintained of late, that the rays of the aurora have been seen to shoot down to the ground between the spectator and some neighbouring hill, is open to the charge of optical delusion, as in the cases of strokes of lightning or of the fall of fire-balls.” Gartlein (1947: 673) was equally emphatic on the illusory nature of aurorae touching the ground.

⁸³⁰ Gissler, paraphrased in Wargentin 1753: 82 (Swedish) = 86 (German) (•).

⁸³¹ Biscoe 1901: 326.

⁸³² Hall 1865: 124-125.

⁸³³ Paulsen 1893: 4, 8-9, 13-14, 23, 25, 27-28, 36, 38.

⁸³⁴ Paulsen 1893: 14 (•).

Contrary to a popular misconception, the aurora is not actually restricted to the circumpolar regions, but sporadically appears at lower latitudes, accounting for sightings in the Mediterranean basin once a decade or so and in the Middle East on average perhaps twice in a century, for example. However, the extreme geomagnetic storms during which this happens seldom last longer than a night or two, because the earth's orbit around the sun takes it outside the focussed beam of assaulting particles. Moreover, the lights are easily missed due to cloud cover, a full moon, sleep or presence inside a dwelling. As a result, the majority of people live their lives without ever seeing the aurora – or even having heard of its existence. This widespread lack of personal familiarity with the phenomenon is arguably the foremost reason why the northern and southern lights have been systematically overlooked in scholarly investigations into the nature and origin of myth: how could such a restricted sight account for the mythology of the *axis mundi*, which – as noted – is widely attested on both hemispheres and at many latitudes?

A reasonable solution is that the mundane aurora is merely an approximation, a close generic relative, of a far more dramatic phenomenon recalled in traditional cosmologies – a 'mother of all aurorae', which might tentatively be designated an *aurora universalis*. The first person to whom the notion of a scaled-up or 'intense' aurora occurred might well have been Fourier (fig. 93), who was introduced earlier (p. 42) and deserves some discussion if only because his cosmological ideas – as opposed to his sociological philosophy – have so far received scant attention from scholars. Beginning with a prospectus published in 1808, this bold thinker and *soi-disant* 'continuator' of Isaac Newton⁸⁴⁴ outlined a complex thought system comprising a hodgepodge of geo- and anthropocentric cosmological and sociological ideas or – as modern commentators have put it – "an outlandish, disorganised and disconcerting mixture of ingredients" which nevertheless contains "intimations of a great scientific discovery discreetly deposited by Fourier amid the queerly assorted passages which made up the book."⁸⁴⁵ One such grand brainchild was that the earth goes through a farming cycle of 80,000 years, during most of which its northern auroral oval extends much further south than at present and can act as a bright 'boreal crown':

⁸⁴⁴ Beecher 1986: 334, 337.

⁸⁴⁵ Jones & Patterson 1996: vii-viii.

no single, stationary column

To a new truth, nothing is more injurious than an old error.

– Johann Wolfgang von Goethe⁹⁶³

Despite the failure of the polar test, cosmic pillars in their diverse manifestations are an absolutely global and ancient theme. In some traditional cosmologies, the upper terminus of the mythical world axis is the zenith, not the celestial pole (compare §129);⁹⁶⁴ this is especially common at equatorial latitudes, as among the Warao (central Orinoco Delta, Venezuela), where the distance between the zenith and the pole is most striking.^{965, 966} Again, in many traditions a celestial column is located in the east or west instead of the direction of the pole (§120). When presented in a context suggestive of the contemporary sky rather than the distant time of ‘creation’, the zodiacal light springs to mind as one source of inspiration which is more plausible than any phenomenon gracing the rotational axis, as will be argued elsewhere.

The natural inference of all this is that the core motifs associated with the mythical sky pillar, including its location at a scientifically unspecified ‘centre’ or ‘navel’, did not always originate – and perhaps never originated – in relation to the rotational pole or axis. It was this conclusion, anticipated in a uniformitarian framework by Massey, Tilak, Roscher, Cook, Richardson, Mus and Hultkrantz, that I first presented in a catastrophist context in an article published in 2005.⁹⁶⁷ Yet even though I realised that association of the traditional *axis mundi* with the earth’s rotational axis on the basis of historical sources is beset with problems, for want of a better alternative I provisionally continued to allow it, setting store in Peratt’s vision of a single intense-auroral column fixed at one of the earth’s rotational poles.

⁹⁶³ Goethe 1829: 399 (•).

⁹⁶⁴ Compare van der Sluijs 2005a: 8, 23-24, 26.

⁹⁶⁵ van der Sluijs 2018b: 15-19.

⁹⁶⁶ On the verticality of the mythical world axis in relation to geographical latitude, see also van der Sluijs 2011b: 129.

⁹⁶⁷ van der Sluijs 2005a: 21-25; 2007a: 39-46; cf. 2011b: 113-129.

axes mundi

The mythical history of the *axis mundi* can conveniently be divided into categories of formation, appearance, duration, location, number, movement and termination.

formation

The columnar world axis was variously regarded as primordial itself (§65) or as having evolved from a primordial particle. By its prodigious growth, it was held to have separated sky and earth, pushing up the former, if not also forcing down the latter or the underworld (§§55-64). This resulted in a triple-sheet cosmos of sky, earth and underworld or sky, atmosphere and earth, arranged around the axis (§§79-81).

The separation of sky and earth provoked a sudden outburst of water (§§50, 58), wind (§59) or light (§§49, 60). The latter dispelled the original darkness to an extent.

appearance

The sources present the axis – once formed – under a breathtaking array of different forms, including a tree, a mountain, a pillar, a ladder, a stairway, a giant being, a backbone or spine, a rope, a spider's thread, a string of arrows, a river, a column of smoke, a whirlwind and a pathway. The equivalence of these motifs is well established as they all share the same set of functions and occupy the same structural slots in the spatial and the temporal fabric of the common template, while many individual cultures explicitly linked two or more such expressions to the same object (e.g., §§61-62, 193).⁹⁸⁴ Nevertheless, many of these forms seem mutually exclusive; it is practically impossible to conceive of a visual prototype that could have exhibited characteristics of all of these descriptors at once. If all of these labels were applied to a single generic phenomenon at one time or other, their remarkable morphological diversity suggests that the phenomenon manifested in a variety of forms, either as it evolved over time or in different locations. The descriptions can be viewed as metaphors, incorporating visual and functional aspects perceived by the myth-makers in the underlying phenomenon.

The axis is mostly represented in forms suggesting a *vertical* geometry, such as a tree, mountain, pillar, ladder, stairway, standing man or

⁹⁸⁴ See van der Sluijs 2011a: 30-31.

On the Origin of Myths

		natural order was vastly different during the 'golden age', with a different apparent movement of the sun and a different climatic régime**			
late 1680s	Bernard le Bovier de Fontenelle	many myths were originally devised as protoscience, attempting to allegorically explain visible natural phenomena	+		-
1696	William Whiston	first scientific – but still Biblically inspired – argument that not only the sun, but the entire sky or rather atmosphere looked vastly different during the 'golden age', without mention of a mythical world axis**	-		+
1725	Giambattista Vico	recognition of the mythical theme of a sky-touching or sky-supporting column within the classical world only	-	-	-
1750s	Nicolas A. Boulanger	first secular argument that there was an 'age of myth' or 'golden age' in real time, ended by catastrophes, on which many cross-cultural mythical motifs are based, but the 'golden age' is defined only by the human values of egalitarianism and pacifism and the mythical world axis is not yet recognised	+		+
1774-1776	Jacob Bryant	cross-cultural motifs including the cosmic navel, the cosmic egg and sacred pillars recognised, but Biblically and Euhemeristically explained	-	-	+
1780	Erik Lindahl & Johan Öhrling	earliest reference to a mythical world axis by the Latin term <i>axis mundi</i> in the astronomical sense	+	+	-
1816	George S. Faber	the global uniformity and internal consistency of myth noted but Biblically explained, with cross-cultural motifs including the cosmic mountain (often twin-peaked and conical), the cosmic tree and sacred towers and temples recognised, but reduced to memories of Mount Ararat, which was also the mountain of paradise, besides some other motifs like four rivers of the cardinal points and anomalous suns	-	-	+ -
1823	Johann G. Radlof	first secular argument that myths recall a past epoch with an 'alien sky', when celestial bodies and their antics differed dramatically from the present situation, but the mythical world axis is not yet recognised**	+		+
1865-1871	Edward B. Tylor	recognition of numerous cross-cultural mythical motifs including	+		-

appendix 1

Anaximander and the shape of the universe

Couprie argued that Anaximander of Miletus (c610-c546 BC) did not postulate a spherical universe but promoted an unbounded one; that he could have imagined the starry realm – which he is known to have situated below the sun and moon – as a cylinder, although a sphere remains more likely; and that he envisioned two imaginary cylinders defined by the rings of the daily paths of the sun and moon as they slide between north and south in their respective annual and monthly courses.¹⁰²⁰ Although Couprie convincingly rebutted an objection raised by Kahn to the cylindrical geometry of the stars,¹⁰²¹ the extant testimony, scant as it is, never mentions a cylinder and rather suggests that Anaximander fathered the spherical theory at least for the starry sky.¹⁰²²

He used the expression ‘sphere of flame’ (*phlogòs sphairan*) for the primordial form from which the “circles” (*kýklous*) of the sun, moon and stars arose.¹⁰²³ Couprie objected that the word for ‘sphere’ is “an anachronistic addition” in this passage and something more annular could have been meant.¹⁰²⁴ This argument could be supported by the related report that Anaximander declared the heavenly bodies to have come to be as “a circle of fire” (*kýklon pyrós*).¹⁰²⁵

Anaximander is also on record for the view that the heavenly bodies “are moved by the circles and the spheres on which each of them has mounted”.¹⁰²⁶ In addition, he was credited with having “constructed a

¹⁰²⁰ Couprie 2003: 174–228. On the cylinders, see 2003: 221–228.

¹⁰²¹ Couprie 2003: 250 note 185; Kahn 1970: 107.

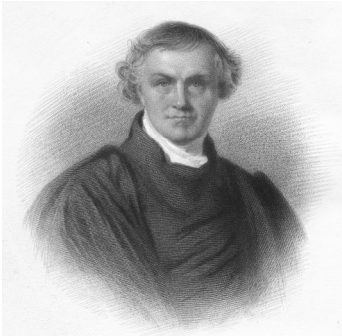
¹⁰²² Cf. Kahn 1970: 102, 106–109.

¹⁰²³ pseudo-Plutarch, *Stromata (Miscellanies)*, in Eusebius, *Praeparatio Evangelicae (Preparation for the Gospel)*, 1. 8 (22c), tr. Graham 2010: 56–57 #19.

¹⁰²⁴ Couprie 2018: 49, cf. 50; 2003: 174, 210–211.

¹⁰²⁵ Hippolytus, *Refutatio Omnium Haeresium (Refutation of All Heresies)*, 1. 6. 4, ed. Marcovich 1986: 64 = 1. 5 (17), tr. Legge 1921: 42.

¹⁰²⁶ Aetius, *Placita Philosophorum (Opinions of the Philosophers)*, 2. 16. 4, trs. Mansfeld & Runia 2009: 493.



(top) 24. William **Whewell** (1794-1866): introduced the terms 'catastrophist' and 'uniformitarian'. © unknown.



(right) 25. Nicolas Antoine **Boulanger** (1722-1759): a secular catastrophist approach to myth suggests a real past 'golden age' and the remembrance of the latest catastrophes in a long series as the 'creation' and 'destruction' of the previous world. Painted by Maurice Quentin de Latour (1704-1788) and engraved by Jean Baptiste Raphaël Urbain Massard (1740-1822). Courtesy Bibliothèque municipale, Lille (France).



26. Michael **Faraday** (1791-1867): 'radiant matter' is a fourth state of matter. Painted by Henry William Pickersgill (1782-1875) and engraved by John Cochran (active 1821-1865). Courtesy History of Medicine Division, U. S. National Library of Medicine (Bethesda, Maryland).

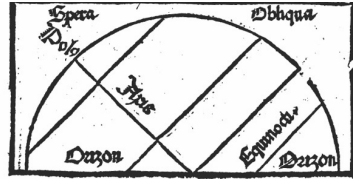


27. Irving **Langmuir** (1861-1957): coined the word 'plasma' for the fourth state of matter, analogous to blood plasma. © unknown (1932). Nobel Foundation (Sweden).

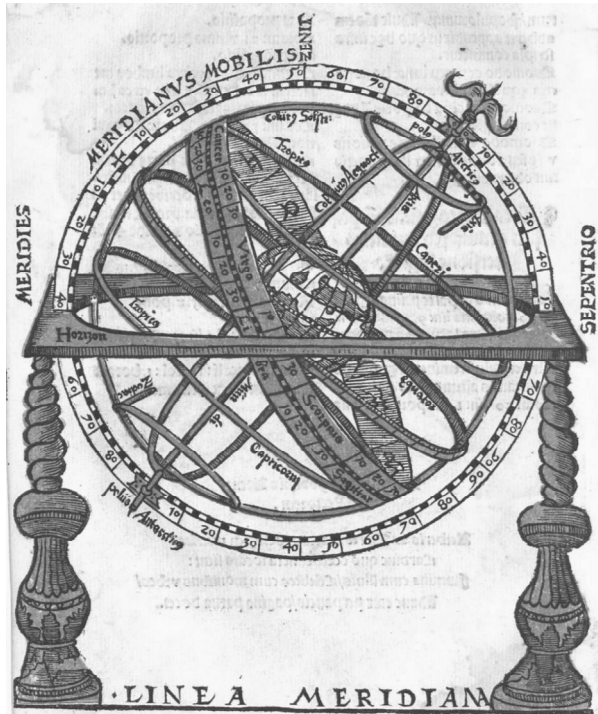


(left) 53. Diagram of the earth at the centre of the cosmos, with the axis mundi passing vertically through it, as envisioned by Johannes de Sacrobosco (1501). © unknown.

(below) 54. Diagram showing the pole, axis and equator in relation to the horizon, as envisioned by Johannes de Sacrobosco (1501). © unknown.



55. A Ptolemaic armillary sphere in which the astronomical axis is identified by the Latin term axis mundi (1524). © Peter Biewnitz (1495-1552).



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