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CULTURE AND COSMOS

A Journal of the History of Astrology and Cultural Astronomy

Vol. 8 no 1 and 2

Spring/Summer and Autumn/Winter 2004

Papers from the fourth conference on the Inspiration of
Astronomical Phenomena (INSAP IV), Magdalen College, Oxford,
3-9 August 2003.

Published by Culture and Cosmos
and the Sophia Centre Press,
in partnership with the University of Wales Trinity Saint David,
in association with the Sophia Centre for the Study of Cosmology
in Culture, University of Wales Trinity Saint David,
Institute of Education and Humanities
Lampeter, Ceredigion, Wales, SA48 7ED, UK
www.cultureandcosmos.org

Cite this paper as: Campion, Nicholas, 'Introduction: The Inspiration of
Astronomical Phenomena', *Culture and Cosmos* 8, nos. 1 and 2,
Spring/Summer and Autumn/Winter 2004, pp. xxxviii–xxxix.

British Library Cataloguing in Publication Data
A catalogue card for this book is available from the British Library

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ISSN 1368-6534

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Introduction

The Inspiration of Astronomical Phenomena

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Two things fill the mind with ever new and increasing admiration and awe, the oftener and the more steadily we reflect on them: *the starry heavens above and the moral law within.*

Immanuel Kant¹

To the Greek philosophers the ability of the sky to reconnect humanity with its divine origins was perfectly natural. Drawing on the traditions they observed and absorbed from Egypt, the Near East and, doubtless, the oral traditions of the European world, a series of Greek thinkers constructed a systematic view of the heavens as responsible for inspiring all humanity's finer qualities. Plato, the great synthesiser of such ideas, developed the notion of the sky as simultaneously divine and precisely ordered, according to principles which could be understood mathematically or geometrically; God, the great Mind, created time as a vehicle for life and set the stars and planets in the sky so that they might reveal his unfolding intent through time. In *Timaeus* Plato taught that,

Wherefore, as a consequence of this reasoning and design on the part of God, with a view to the generation of Time, the sun and moon and five other stars, which bear the appellation of 'planets' [i.e., 'wanderers'], came into existence for the determining and preserving of the numbers of Time.²

¹ Immanuel Kant, *Critique of Practical Reason*, Great Books of the Western World 42 (London: Encyclopaedia Britannica 1952), p. 360; 'Zei Dinge erfüllen das Gemüt mit immer neuer und zunehmender Bewunderung und Ehrfurcht, je oeffter und anhaltender sich das Nachdenken damit beschaefigt: der besternte Himmel über mir und das moralische Gestez in mir'.

² Plato, *Timaeus*, trans. R.G. Bury (Cambridge MA and London: Harvard University Press, 1931), 38C.

As the entire cosmos emanated out of the Creator, so its higher visible manifestations revealed the divine intelligence. It follows, Plato reasoned, that astronomy teaches mathematics and stimulates the intelligence. 'The most important benefit... bestowed on us' by the planets, he concluded, is the fact that, by observing them we can learn about the nature of the universe. He continued,

But as it is, the vision of day and night and of months and circling years has created the art of number and has given us not only the notion of Time but also means of research into the nature of the Universe... God devised and bestowed upon us vision to the end that we might behold the revolutions of Reason in the Heaven and use them for the revolvings of the reasonable that is within us.³

The point was reinforced in the *Epinomis*:

And so the heaven, revolving these very objects for many nights and many days, never ceases to teach men one and two, until even the most unintelligent have learnt sufficiently to number.⁴

Logically, then, for Plato, it was self-evident that the study of astronomy leads to belief in the gods.⁵ God, or a Creator, the argument runs, must exist because the universe is so incredible that a consciousness must have designed it. In the *Republic*, Plato argued that astronomers are likely to 'concede that the artisan of heaven [God] fashioned it and all that it contains in the best possible manner for such a fabric'.⁶ He repeated the argument later, countering critics who had argued that the study of astronomy leads to atheism, claiming that such critics made the mistake of believing that 'all things come into being by necessary forces and not by the mental energy of the will aiming at the fulfillment of good'.⁷ He added that the charges of atheism levelled at astronomers were brought by materialist philosophers who mistakenly imagined that the stars were

³ Plato, *Timaeus*, 47B-C.

⁴ Plato, *Epinomis*, trans. W.R.M. Lamb (Cambridge MA and London: Harvard University Press, 1929), 978D.

⁵ Plato, *Laws*, 2 Vols, trans. R.G. Bury (Cambridge MA and London: Harvard University Press, 1934), X.886A.

⁶ Plato, *Republic*, 2 Vols, trans. Paul Shorey (Cambridge MA and London: Harvard University Press, 1937), VII.xi.C-D.

⁷ Plato, *Laws* XII. 967A.

lifeless lumps or rock, rather than divine beings animated by soul. In other words, in Plato's view no astronomer *could* be an atheist, for the very sight of the stars naturally leads the mind to higher things.

Like Plato, Aristotle declared the spectacle of the starry sky to be (together with dreams) one of the origins of religion. In his lost work, *De Philosophiae*, he imagined a race of men who lived underground, and described what might happen on their first sight of the sky:

When all at once they saw the land and sea and sky, beheld the majesty of the clouds and felt the power of the wind, and looked at the sun in its splendour, and came to understand its power, how it brought day-light to the world and shed its light across the sky; then, when night cast its shadow over the earth, they saw the whole heaven bright and glorious with stars, the varying brightness of the waxing and the waning moon, the rising and the setting of these heavenly bodies, and their sure and changeless course through all eternity. When they saw all these things, would they not be immediately convinced of the existence of the gods and that all those wonders were their handiwork?⁸

Cicero, following both Plato and Aristotle, argued that 'as the stars arise and are born in this element [aether] we must infer that they are conscious and intelligent beings. From this it follows that we must include the stars in the company of the gods'.⁹

The belief that Heaven was located in the sky, rooted as it was in Platonic teachings, and for so long a central feature of Christianity, was derived both from the Babylonians' identification of their most important creator deities with the sky and stars, and from Egyptian astral theology. As earth divinities appear to have been progressively devalued so, it seems, the celestial gods and goddesses had become all important.

⁸ Cited by Cicero, *The Nature of the Gods*, trans. Horace C.P. McGregor (Harmondsworth, Middlesex: Penguin, 1972), fragment 14, II. 94-96, p. 162 (see also 37).

⁹ Cicero, *The Nature of the Gods*, II. 40-42, p. 139. For Cicero see also Joshua Stein, 'Cicero's Use of Astronomy as Proof of the Existence of the Gods', *The Inspiration of Astronomical Phenomena: Proceedings of the fourth conference on the Inspiration of Astronomical Phenomena*, Magdalen College, Oxford, England, 3-9 August 2003, special issue of *Culture and Cosmos* 8, nos. 1 and 2, (Spring/Summer-Autumn/Winter 2004): pp. 423-35.

When Plato borrowed and democratised the Egyptian concept of the soul, he located its source and origin in the stars, sowing the seeds for those Hermetic, Gnostic and Mithraic cosmologies which envisaged a literal pathway through which it might travel between the stars and earth. The soul descended from the stars at birth, returned at death and, in the meantime, salvation might be achieved by the practice of the necessary stellar-related rituals and morality. In such a world, familiar in Europe until the seventeenth-century, the starry sky was a mirror of perfection, a source of divine inspiration, and the structure of the cosmos was moral as much as physical.

Eighteenth century philosophers, familiar with Plato's astral theology yet sceptical of religious claims – and often hostile to the Church – developed the notion that all religion actually originated not just in awe of the sky, but with fear of the natural environment, including the stars. This adaptation of the Platonic theory of the origin of religion was to be most closely associated with Max Müller, the nineteenth century orientalist and the most influential of all the founders of the study of comparative religion.¹⁰ Müller believed that this existential fear was focused initially on the sky, but that it then became localised to the sun, and that all forms of religious worship and dogma therefore originated in solar religion, a model now known as 'sun-as-god' theory.¹¹ Nowadays, few historians of religion take such ideas seriously (mistakenly, in my opinion), dismissing them without much thought,¹² leaving the field clear to the odd maverick, such as the archaeologist Jacquetta Hawkes, to identify religion's solar origins,¹³ and to historians of astronomy to trace the history of astral worship.¹⁴

If it can be argued that the inspiration upon which religion is based was derived from the very sight of the sky, then astronomy and religion share

¹⁰ See Max Müller, *Introduction to the Science of Religion* (London: Longmans, Green and Co., 1873); Max Müller, 'Solar Myths', *The Nineteenth Century* 18, no. 106 (December 1885): pp. 900-922.

¹¹ Nicholas Campion, 'The Sun is God', *The Inspiration of Astronomical Phenomena: Proceedings of the fourth conference on the Inspiration of Astronomical Phenomena*, Magdalen College, Oxford, England, 3-9 August 2003, special issue of *Culture and Cosmos* 8, nos. 1 and 2 (Spring/Summer-Autumn/Winter 2004): pp. 45-56.

¹² See for example Eric J. Sharpe, *Comparative Religion: a History* (London: Duckworth, 1975), pp 35-41, 43.

¹³ Jacquetta Hawkes, *Man and the Sun* (London: the Cresset Press, 1962).

¹⁴ See for example Bartel Van der Waerden, *Science Awakening* (Leyden and New York: Oxford University Press, 1974), Vol. II. p. 3.

common origins, a hypothesis for which the surviving evidence is found in sacred calendars. This, in turn, suggests that the study of consciousness may provide a useful area of inquiry. This was, in fact, an idea implicit in the work of Edward Tylor (1832–1917), one of the most influential figures in the early development of religious studies. Tylor asked whether 'there have been tribes of men so low in culture as to have no religious conceptions whatsoever?',¹⁵ a question to which his answer was 'no'. He concluded that religion was a universal culture trait and an integral part of society that must be as old as humanity itself, and therefore evolved with consciousness. The observation of the sun, moon and stars is also universal and, if religion has an astronomical component, even if only as respect for the alternation of light and dark through the movements of the sun and moon, then astronomy, as a religious phenomenon, must have emerged in parallel with human consciousness. To emphasise the point, Ernst Cassirer claimed that, amongst all peoples and in all religions, creation begins with light, together with the perception of space that allows people to orient themselves to the heavens.¹⁶

The origins of astronomy itself are still often attributed to the numinous awe of the heavens supposedly felt by ancient people: where Cumont spoke of the 'splendour [and] awe of the eastern night',¹⁷ van der Waerden described the 'beauty and sublimity of the stars' that lies at the heart of both ancient astral religion and modern astronomy.¹⁸ Pannekoek admitted the influence of the numinous awe experienced by the beauty of the starry sky. He asked,

Was it the beauty of the starry heavens, of the countless radiating points in a wonderful variety of brightness, colour and pattern, that caught his eye? Did the stately regularity of their motion across the

¹⁵ Edward Tylor, *Primitive Culture* (1872; New York: Harper Torchbooks, 1958). Vol. 2, Chap. 1.

¹⁶ Ernst Cassirer, *The Philosophy of Symbolic Forms* (1955; New Haven and London: Yale University Press, 1971), Vol. 2, p. 94. See also the discussion in Erich Neumann, *The Origins and History of Consciousness* (Princeton NJ: Princeton University Press, 1954), p. 6.

¹⁷ Franz Cumont, *Astrology Among the Greeks and Romans* (1911; New York: Dover Publications, 1960), p. 11.

¹⁸ Bartel Van der Waerden, *Science Awakening*, 2 vols, II: The Birth of Astronomy (Leyden and New York: Oxford University Press, 1974), pp. 23, 59.

vault with irregularities superimposed, provoke his curiosity as to the cause?'¹⁹

Having posed the question, Pannekoek argued that this would have become a motivating force only in later, more comfortable times, outlining a view which is part Marxist, part derived from Max Müller, in which intellectual activity follows from social struggle and religion from environmental pressures. 'Primitive man', he suggested, 'had so hard a struggle simply to make his life secure that there was no room for luxury incentives'. He continued,

To maintain himself he had to fight for his existence incessantly against the hostile forces of nature. The struggle for life occupied his thoughts and feelings entirely, and in this struggle he had to acquire such knowledge of the natural phenomena as influenced his life and determined his work; the better he knew them, the more secure his life became. It was in this way, therefore, that astronomical phenomena entered his life as part of his environment and as an element in his activities, capturing his attention. Science originated not from an abstract urge for truth and knowledge but as part of living, as a spontaneous practice born of social needs.²⁰

From a primitive concern with the sun, the theory continues, 'attention to the heavenly phenomena themselves became necessary when labour developed more complicated forms'.²¹ It follows that the expansion of production, perhaps of stone axes, perhaps of copper ore, stimulated trade, which required navigation and – in turn – demanded a knowledge of the sky.

The belief that early astronomy was intimately tied up with the need for security is also persistent. For example, in Shlain's opinion, 'virtually all cultures project their inner fears and yearnings out on to the empty screen of the night sky'.²² As noted above, according to Pannekoek, the stars then provided the solution for, the more they were known, the greater the level of security felt by human beings.²³ The sight of the night

19 Pannekoek, *Astronomy*, p. 19.

20 Pannekoek, *Astronomy*, p. 19.

21 Pannekoek, *Astronomy*, p. 20.

22 Leonard Shlain, *The Alphabet Versus the Goddess: the Conflict Between Word and Image* (London: Penguin, 1998), p. 22.

23 Pannekoek, *Astronomy*, p. 1

sky might be comforting as much as inspiring. And, as Ed Krupp pointed out, arguing from a broadly evolutionary perspective, the projection of order and meaning onto the heavens may operate as a survival tool,²⁴ facilitating the construction of instruments of social order. Keith Thomas said something similar when he argued that astrology became the basis of natural law. Writing of the fifteenth to seventeenth centuries in particular, he argued that,

In the absence of any rival system of scientific explanation and in particular of the social sciences - sociology, social anthropology, social psychology - there was no other existing body of thought, except religion, which offered so all-embracing an explanation for the baffling variousness of human affairs. Nor had medicine, biology, or meteorology developed enough to offer a convincing and complete understanding of the world of nature. This was the intellectual vacuum which astrology moved in to fill, bringing with it the earliest attempt at a universal law.²⁵

Is humanity, in the familiar modern computer-inspired metaphor, hard wired to find meaning – or inspiration – in the sky? Stephen Pinker, perhaps the most prominent evolutionary psychologist, regards 'meaning' as an essential human attribute, an argument he has developed extensively in *How the Mind Works*.²⁶ In an interview in 1999 he claimed that 'We have meaning and purpose here inside our heads, being the organisms that we are. We have brains that make it impossible for us to live our lives except in terms of meaning and purpose'.²⁷ Perhaps such a claim reinforces C.G. Jung's (profoundly Platonic) claim that 'it is only meaning that liberates'.²⁸ If meaning is found in the sky, does, then, the sight of the sun, moon, stars and planets then liberate us? For Condos the

²⁴ E.C. Krupp, 'Night Gallery: the Function, Origin and Evolution of Constellations', *Archaeoastronomy: The Journal of Astronomy in Culture* XV (2000): pp 43–63, see pp. 43–44.

²⁵ Keith Thomas, *Religion and the Decline of Magic* (Harmondsworth, Middlesex: Peregrine Books, 1971), p. 353.

²⁶ Stephen Pinker, *How the Mind Works* (London: W.W. Norton, 1999).

²⁷ Ed Douglas, 'Stephen Pinker: the Mind Reader', *The Guardian Saturday Review*, 6 November 1999, pp. 6–7, p. 7.

²⁸ C.G. Jung, 'Psychotherapists or the Clergy', in *Psychology and Religion: East and West*, Collected Works Vol. 11, trans. R.F.C. Hull (London: Routledge and Kegan Paul, 1969), p. 330.

night sky naturally invites speculation: we have an innate and natural tendency to project meaning on to the Heavens.²⁹

Mircea Eliade, one of the twentieth-century's most prolific historians of religion, developed this idea:

... the discovery that your life is related to astral phenomena does confer a new meaning on your existence. You are no longer merely the anonymous individual described by Heidegger and Sartre, a stranger thrown into an absurd and meaningless world, condemned to be free, as Sartre used to say, with a freedom confined to your situation and conditioned by your historical moment. Rather, the horoscope reveals to you a new dignity: it shows how intimately you are related to the entire universe. It is true that your life is determined by the movements of the stars, but at least this determinant has an incomparable grandeur. Although, in the last analysis, a puppet pulled by invisible ropes and strings, you are nevertheless a part of the heavenly world. Besides, this cosmic predetermination of your existence constitutes a mystery: it means that the universe moves on according to a pre-established plan; that human life and history itself follow a pattern and advance progressively toward a goal. This ultimate goal is secret or beyond human understanding; but at least it gives meaning to a cosmos regarded by most scientists as the result of blind hazard, and it gives sense to the human existence declared by Sartre to be *de trop*. This parareligious dimension of astrology is even considered superior to the existing religions, because it does not imply any of the difficult theological problems: the existence of a personal or transpersonal God, the enigma of Creation, the origin of evil, and so on. Following the instructions of your horoscope, you feel in harmony with the universe and do not have to bother with hard, tragic, or insoluble problems. At the same time, you admit, consciously or unconsciously, that a grand, through incomprehensible, cosmic drama displays itself and that you are a part of it; accordingly, you are not *de trop*.³⁰

²⁹ Theony Condos, *Star Myths of the Greeks and Romans: a Sourcebook* (Grand Rapids MI: Phanes Press, 1997), p. 24.

³⁰ Mircea Eliade, *Occultism, Witchcraft and Cultural Fashions* (Chicago IL: University of Chicago Press, 1976), p. 61.

For a sociologist of religion, such as Eliade, the relationship between astronomy and astrology is natural and unquestioned: the former leads naturally to the latter. However, like some forms of classical Neoplatonic scepticism,³¹ post-Enlightenment secularism may recognise general numinous awe but deny its inevitable progression from metaphysical structures and dogma. For John Gribbin, then, the difference between the best physicists and ordinary adults is that the physicists have not lost this child-like sense of wonder at the universe.³² Gribbin's distinction between the best physicists and ordinary adults, is unfortunate – many amateur astronomers are ordinary adults – and his words may have been distorted by his natural enthusiasm; but the point is well made. Whether Jim Gunn is an ordinary adult we cannot say, but he did express the modern secularised version of the soul's journey to the stars when he said that,

I think that we should care about our place in the Universe because, as far as we know, we are the only species who wonders where we came from and where we're going. It's one of the greatest adventures of the human mind to try to understand the Universe around us.³³

The real, spiritual journey to the stars of the Hermetic initiates and Platonic philosophers has been replaced by a voyage of the imagination, as belief in the soul has diminished and the distance to the stars increased. The sense of wonder and awe which seems to come from within as we gaze at the starry sky is often referred to in passing but receives little comment; it's certainly largely absent from the print media. Eclipse watchers know this well enough. I observed this at first hand on witnessing the June 2001 solar eclipse in Zimbabwe. Beforehand I met a prominent Zimbabwean astronomer, at a moment when he was concerned that all practical arrangements were complete and all technical equipment was in place. When we met after the eclipse he looked like he'd had a Damascene conversion. So did everyone else who was present, including

³¹ See for example, Plotinus, 'On Whether the Stars are Causes', *Ennead* II.3, Vol., 2, trans. A.H. Armstrong (Cambridge MA: London: Harvard University Press, 1929).

³² John Gribbin, 'Explaining the Universe - it's child's play', *Independent Review*, 25 January 2001, p. 5.

³³ Jim Gunn, Deep Space astronomer, quoted in Heather Couper and Nigel Henbest, *Space Encyclopaedia* (London: Dorling Kindersley, 1999), p. 20.

teenage boys who had spent the run-up to totality in a spirit of irreverent jollity but who, afterwards, couldn't wait for their next experience.

Occasionally, between the mass of technical information which swamps astronomy books and magazines, we find the occasional acknowledgment of something deeper, more atavistic in our fascination with the sky. Heather Couper, for example, recently commented not on the wondrous awe, but on the terror induced by a total solar eclipse.³⁴ Evidence is more often to be found on television or radio than in books. Interviewed on BBC Radio 4's *Today* news programme on the morning of 8 June 2004, Alan Longstaff of the Royal Greenwich Observatory declared that, to watch that day's Venus transit, was to observe the 'beauty of the universe'. An eloquent account of such feelings was posted on line by John McMahon, Professor of Classics at Le Moyne College:

It was an absolutely lovely clear and damply mild morning with a gentle sw breeze wafting the aroma of hundreds of acres of freshly cut alfalfa and timothy hay over the entire area. An almost last quarter moon hung high in the south in the brightening blue sky. The sun had just cleared the NE horizon when I arrived, and the heaviness of the air allowed me to look directly at the red orb without any eye protection. Venus was unmistakably visible on the sw quarter of the disk... The slow and stately progress of the Venusian disk was wonderful to watch, even indirectly. As is my observing custom, I made some tape recorded comments along the way. The event ended at c. 7:25AM EDT... and I'm glad to say that I did see the so-called 'black drop effect' as the dark disk of the planet neared the limb of the Sun... the combination of the actual visual event, the absolute quietness of the surroundings, the heavy perfume of the drying hay, the swallows, the redwings, the killdeer ... all contributed to one of the finest intellectual and sensual experiences I've ever had.³⁵

In an earlier email John fluently described the inner meaning of astronomical observing:

³⁴ 'Worlds Beyond', BBC Radio 4, 9 pm 5 January 2005.

³⁵ John M. McMahon, 'Transit story', E mail 08 June 2004, History of Astronomy Discussion Group HASTRO-L@LISTSERV.WVU.EDU.

Actually, for many of us it's much more than 'just looking at the stars'... and surely involves more than a simple 'leisure activity.' My earliest astronomical involvement began at 7 yrs. old with such books as the Zim/Baker *Stars* and later -- when I moved on to binoculars and a number of telescopes -- Olcott/Mayall and the like. I'm still at it almost 5 decades later. I'm pretty dedicated (compulsive?)... and regularly give up a lot more comfortable forms of relaxation to get outside at night. There's very little that I'd rather do, frankly. And I do keep pretty precise and detailed records, actually recording my notes on a cassette recorder before transcribing them. I know quite a few other folks who are at about the same level of astro-intensity... and it's more than just about collecting equipment.

That intensity has some downsides, though. When, for example, my daughter found out how much effort I have been putting into observation as I get older (she can recall the days of simply lying out on our backs sharing 7x50 binos at night some 30+ yrs ago.) -- and particularly when I said that I was several months behind in my transcriptions -- she quipped something like this: 'So, Dad. Let me get this right. You've taken something that you truly love and have done for most of your life, something that has enriched you and brought you intellectual pleasure, tranquility, and a release from the stresses of daily life, a constant companion in good times and bad-- and .. you've turned it into, well, WORK. What does *that* say?'³⁶

The beginner, on approaching most astronomy books and magazines, might get the impression that astronomy is purely a matter of mathematics, and that it is essentially meaningless, a matter of some demonstrable, precisely measurable truth in which human values, meanings and perceptions play no part. In that case, what do we do with Stephen Pinker's belief that evolutionary biology has hard-wired human beings to seek meaning as a survival tool? Is astronomy somehow exempt from the evolutionary drive for meaning? The personal testimony which points to the inspiring effects of a brilliant dawn, a bright starry sky, a glowing crescent moon or total solar eclipse suggests not. Instead, the sky is a canvas on which we paint our human dramas, our quest for origins,

³⁶ John M. McMahon, 'Re: History of amateur astronomy', E mail 6 May 2004 History of Astronomy Discussion Group HASTRO-L@LISTSERV.WVU.EDU.

fear of ends and quest for meaning. The heavens can be a source of inspiration now as much as they ever were.