

Neolithic Fertility Symbolism During the Winter Solstice at the Newgrange Passage Tomb in Ireland by Rick Doble

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A GENERAL UNDERSTANDING OF THE PURPOSE

I have made the argument that the winter solstice alignment 'instrument' (the roof-box that only allowed light to enter the carefully constructed narrow passageway around the time of the solstice at the Newgrange Passage Tomb in Ireland) was more precise and employed more exact science than that available to the Greeks or the Romans. This was because it could indicate the actual day of the solstice on the day of the winter solstice, i.e. in real time, which the Greeks and Romans could not.



The 'roof box' in the middle of the left photograph was designed to only allow light to enter around the time of the winter solstice. This carefully shaped shaft of light then entered the passageway and slowly advanced and then retreated. The entire event took seventeen minutes on the day of the winter solstice.



In this enlargement of the 'roof box' the baffles around the box can be clearly seen. These restricted the Sunlight so that only light around the time of the winter solstice could enter the passageway.

Having made this argument, several people, after reading my article, asked why would they do this -- what was the reason? While we will never have a precise knowledge, we can take some educated guesses in a general way.

FIRST:

They created this 'instrument' because they had a compelling need -- otherwise there was no reason to build it. They needed to know exactly when the winter solstice occurred and they needed to know on the day of the solstice or very close to the day of the solstice -- if the weather was cloudy. In either case what they built was more accurate than the science available to the Greeks or Romans according to my research.

One probable reason is that because they were a farming community on an island in a cold climate, the timing of the growing season was crucial to their survival. Knowing the exact day of the winter solstice would allow them to reconcile the lunar calendar with the solar year. Once they knew the day of the solstice, they could then reset their calendars and make predictable plans for plowing, planting and harvesting.

We know that determining the day of the solstice was important because understanding the Sun's annual movement and building an 'instrument' that aligned with the winter Sun and that measured that movement was a monumental task. While the following is speculation, it presents a plausible scenario of the work involved that led to the construction of Newgrange.

The mathematical understanding and then the building of this instrument might have taken a thousand years or more. This was because they would have needed: to carefully measure the alignment and movement of the Sun on the horizon around the time of the winter solstice, to notice the precise virtually imperceptible movement (solstice means standstill) of the Sun near the exact day of the solstice (a quite difficult task), then to build some early devices that magnified that movement so that the precise day of the solstice would be indicated and finally to perfect these science/observations and then to build the monumental structure at Newgrange that has survived intact with this remarkable solstice alignment for five thousand years.

See my blog-article about the precision of this 'instrument':

Computing the Winter Solstice at Newgrange: Was Neolithic Science Equal To or Better Than Ancient Greek or Roman Science?

<http://deconstructingtime.blogspot.com/2015/03/computing-winter-solstice-at-newgrange.html>

Widespread evidence indicates an interest in creating carefully orchestrated interplays of shadow and light at sacred places, sometimes producing special effects visible on only very rare occasions. A famous example occurs at the passage tomb of NEWGRANGE in Ireland. Here, for a few precious minutes after Sunrise on a few days around winter solstice, the dark interior of the tomb becomes lit up by Sunlight shining directly down the passage.

What was the purpose and meaning of such hierophanies? There is no simple answer, but further clues can be found by looking at more modest examples, often to be found in rock art. By carefully placing rock art designs, Sunlight could be made to play across them at certain times, with impressive effect.

Ruggles, Clive. (2005). "Introduction." In *Ancient Astronomy: An Encyclopedia Of Cosmologies And Myth*. Santa Barbara, Calif.: ABC-CLIO. Print. Page xxvi.

While characterized today as pre-science by astronomers, the culture at Newgrange, nevertheless fashioned a precise and accurate instrument that could read the time of the winter solstice better than Greeks or Romans could. And while the driving impulse to do this was probably a desire to magically interact with the forces of nature and supernatural spirits, the result was good science.

Very early cosmology...was extremely local. The Universe was what you immediately interacted with. Cosmological things were weather, earthquakes, sharp changes in your environment, etc. Things outside your daily experience appeared supernatural, and so we call this the time of Magic Cosmology.

Schombert, James. (2014). "Ancient Cosmology." In *Astronomy 123: Galaxies and the Expanding Universe*. University of Oregon: Lectures. Web. Accessed 29 June 2015.
<<http://abyss.uoregon.edu/~js/ast123/lectures/lec01.html>>

SECOND:

It is probably safe to assume that the Sun, the planting, growing and harvesting of plants, had a spiritual aspect to them -- as well as the annual winter 'death' of plants and the 'rebirth' in the spring. The building of Newgrange and its precise alignment, provided a meeting place for Heaven and Earth, one that humans had created and one that made them feel that they were in touch with the Heavens and Heavenly powers, a timeless world of spirits that were normally out of reach.

THIRD:

It is likely that Neolithic societies had a circular sense of time rather than a linear sense of time such as we have today. This meant that in addition to having the need for a ritual to stay in harmony with the spiritual forces of nature, they needed to perform critical rituals at critical times, rituals that would assure that the circular nature of time would continue to revolve for another year.

This aspect of time is particularly important -- as it is hard for us today to understand circular time because we live in a culture of linear or progressive time. Circular time means that time and growth and fertility are understood as repeating cycles that wax and wane year after year. The critical aspect is that time needs to repeat in an orderly fashion -- for example, these Neolithic people knew that plants would not grow in the winter, but they wanted a bountiful harvest by the late summer.

The passage of time (as we would think of it) might have been conceived in many different ways. One of the most fundamental conceptual distinctions is between circular and linear time — the one implying an endless perceived repetition of regular events and the other a single history and future.

Similarly, there are numerous ways of perceiving the world that differ from our view of things separated by empty space, from which stems our own idea of space as an abstract backdrop. Notions of the spatial interrelationship of things were inherently conceptualized in places and paths with particular qualities and meanings. Furthermore, spatial and temporal attributes of things were intricately bound together in many ways, with the distinction between them (as we would see it) rather blurred. Thus, for the Lakota, the names and meanings of some places changed according to the time of year as they followed the buffalo through the landscape, mimicking the passage of the Sun through the sky.

Ruggles (2005:391)

Circular time also meant that certain times of the year were sacred and consequently must be observed with reverence. I believe that the winter solstice was the most sacred time -- the critical time for this culture. Therefore knowing when the winter solstice occurred and enacting a ritual with that occurrence would have been quite powerful, probably the pivotal point in time for the year.

FOURTH:

Such societies felt the need for 'cosmic maintenance', for rituals that assured a good harvest and that made sure they were in harmony with the spiritual forces of nature. Most experts believe that, for Neolithic people, nature was alive.

Now magic and ritual are shared among thousands to invoke "Cosmic Maintenance." The collaboration from the unknown worlds to ensure and improve survival in the known world becomes the new way to understand and think about solutions to problems of survival.

"Pre-Axial Thought: The Neolithic Era." In *The Human Journey*. Cambridge, MA: Institute For The Study Of Human Knowledge. Web. Accessed 29 June 2015. <<http://www.humanjourney.us/NeolithicEra.html>>

For these farming communities, the collaboration of the spirit world and of their newly conceived gods of nature – the sun, wind, rain and soil – was needed to maintain the cycles of nature and ensure their survival. The increase in population lead to organized religion involving collaboration and control of large numbers and with symbolism, ceremonies and iconography...

"Pre-Axial Thought: The Neolithic Era." In *The Human Journey*. Cambridge, MA: Institute For The Study Of Human Knowledge. Web. Accessed 29 June 2015. <<http://www.humanjourney.us/NeolithicEra2.html>>

When a religion's purpose was cosmic maintenance, the religion functioned chiefly as a ritual means for human beings to collaborate with the divine powers to assist in keeping the world in good working order. The gods and goddesses relied on humans to help them provide the means to ensure reproduction and the productivity of the land, and to keep the Sun and the seasons on course.

Muesse, Mark W. (2013). "Introduction." *The Age of the Sages: The Axial Age in Asia and the Near East*. Minneapolis: Augsburg Fortress. Print. Page 5. Accessible online:

<www.augsburgfortress.org/media/downloads/9780800699215Intro.pdf>

I believe their rituals, performed in and around the Newgrange Passage Tomb during the time of the winter solstice, joined the Sun with the Earth at the most auspicious time of day, the dawn, on the most auspicious day of the year, when the Sun was at it's lowest and weakest point. On that day, the light penetrated the passageway and created a union -- a connection between Heaven and Earth -- and after that day the Sun grew stronger.

For a society that saw time as circular, this was vital, as this ritual renewed the bond between Sun and Earth, between humans and Heaven -- it was a kind of annual covenant between the spiritual world and the human world. It was also quite likely a fertility ritual, one that was meant to assure abundant crops and healthy babies.

What made these ideas powerful [ED: a fully developed symbolic language], easy to remember and easy to transmit was people's ability to signify abstract and even supernatural concepts in terms of physical symbols. They turned the building of houses into symbolic architecture...

Finally and most importantly, they symbolised their ideas about the supernatural world and its population in terms of physical embodiments of supernatural beings and forces.

Watkins, Trevor. (2000). "The Neolithic Revolution and the Emergence of Humanity: A Cognitive Approach to the First Comprehensive Worldview." ETANA. [Http://www.etana.org](http://www.etana.org). Web. Online document. Accessed 29 June 2015. <http://www.arcl.ed.ac.uk/arch/watkins/humanity_paper.pdf>

TOWARD A MORE SPECIFIC UNDERSTANDING

These general notions describe a possible overview of what the Neolithic people at Newgrange were trying to accomplish. But could we go even further, could we speculate about a more exact description?

It turns out that Ireland, in particular, has left us many clues -- many pieces of the puzzle. I will attempt to put these together and suggest a more precise meaning for the winter solstice event at Newgrange.

With no written records, I will, of course, be only making educated guesses, but in Ireland there does seem to be a continuity from prehistoric times to the present. For example, the central symbol of Ireland, the triple spiral, was carved in stone at Newgrange -- and has continued as a central symbol ever since that time up to the present day.

Also the only way that O'Kelly, the archaeologist who discovered the winter solstice alignment at Newgrange, suspected there was some kind of solar alignment was due to stories he was told by a number of locals in the 1960s. This indicates that very old lore from Neolithic times was passed down for thousands of years and that it perhaps merged with Celtic and Irish myths.

So while much of the following deals myths and stories in the bronze age or iron age -- much later than Neolithic times -- perhaps a core of Neolithic thinking is still present in these mythologies.

EVIDENCE FOR A FERTILITY PURPOSE

There is ample evidence that suggests the event of the winter solstice Sun lighting up the passageway at Newgrange was in part a fertility rite and highly sexual. Fertility for these early societies was a critical and compelling need.

Every known culture past and present has and has had specific and usually strict rules about sexual behavior. Having said that acceptable practices in one culture might be unacceptable in another. It is probably safe to assume that the rules were quite different for Neolithic people than the rules for people today.

Since the Neolithic people were farmers, I think we can assume that the mating of animals was a common occurrence and that sex in general was seen as simply part of nature and part of being alive. With human population constantly at risk, crop failure likely and death a common event, fertility was a major concern. Whether it was to help the crops grow or to breed children, we do know that fertility rituals with explicit imagery, symbols or actions were performed throughout much of the ancient world and we can assume the Neolithic world.

The imagery surrounding [ED: early Irish mythology] would appear to confirm that in Irish oral traditions of the early Middle Ages, Newgrange was associated with birth at winter solstice — a place where a god was conceived and born. In these myths, the entry of the Sun into the passage and chamber at dawn is the moment of conception (i.e. the marriage of the gods), and the subsequent day the product or offspring of this union (the birth of the cosmos).

Prendergast, Kate. (2012). "The Neolithic Monument Of Newgrange In Ireland: A Cosmic Womb?" In *Archaeology of Mother Earth Sites and Sanctuaries through the Ages: Rethinking Symbols and Images, Art and Artefacts from History and Prehistory*. Edited by G. Terence Meaden. Oxford: Hadrian. Print. Page 63. Accessible online: <http://kateprendergast.typepad.com/files/newgrange_bar_12.pdf>

THE EARTH AS THE MOTHER GODDESS

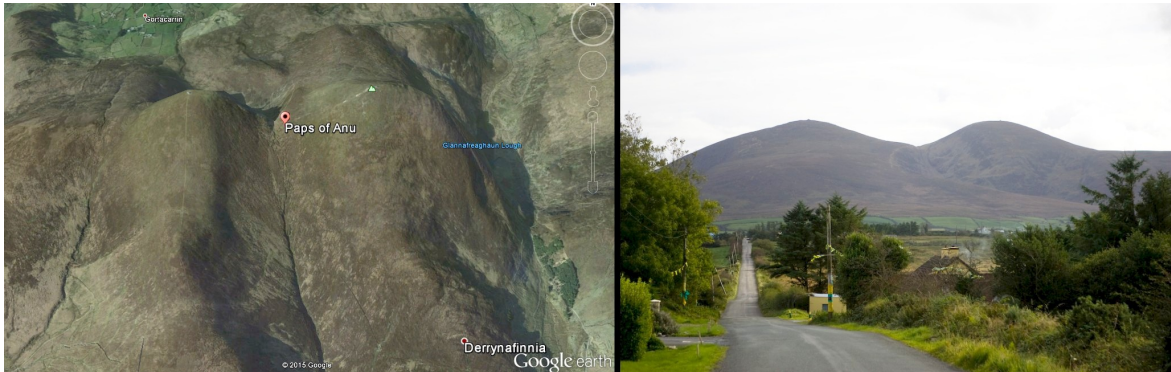
There is solid evidence to support the idea that early Irish people believed in a Mother Earth goddess. First we can point to the Paps of Anu, a geological feature of two mountains that look like female breasts.

The hills are named after Anu [also known as Danu]; believed to have been an ancient mother goddess. *Cormac's Glossary* (published 1862) describes Anu or Danu as "the mother of the gods of Ireland" and "from whose name are called the Two Paps of Ana."

<https://archive.org/details/threeirishglossa00cormuoft>

In the case of "Danu"/Danand, one particular element should hold our attention: her relation to a specific feature of the Irish landscape, the Dhá Chíoch Anann, two hills in Luachair in West Munster whose shape suggests the breasts of a vast supine woman whose body is the Land itself. It "was recognized as a place of importance in some of our earliest written sources."

Murphy, Anthony. "Danu and Bile: The Primordial Parents?" In *Mythical Ireland*. Web. Accessed 29 June 2015. <<http://www.mythicalireland.com/mythology/tuathade/danubile.php>>



"The Paps of Anu (Irish: Dá Chích Anann, 'the breasts of Anu') are a pair of breast shaped hills near Killarney in County Kerry, Ireland ." (Picture left: Google Earth)
<http://en.wikipedia.org/wiki/Paps_of_Anú>

Squire's [ED: Charles Squire, Celtic Myth and Legend, Poetry and Romance, 1905] comparison of her [Danu] to Demeter is particularly apt, since the Greek goddess was...first and foremost tied to the processes of the agricultural cycle, and relevant to the lives of farmers ... her name meant "Mother Earth" (suggesting that she once had a more primordial role)... The association of Danann with a probably much older figure named 'Anann' or 'Anna' also suggests that she may have been superimposed on a goddess with more primeval "Mother Earth" traits.

Murphy, Anthony. "Danu and Bile: The Primordial Parents?" In *Mythical Ireland*. Web. Accessed 29 June 2015. <<http://www.mythicalireland.com/mythology/tuathade/danubile.php>>

Newgrange is known as a brugh, or brú, which is sometimes translated as mansion. But the old Irish word for womb is Brú.

....

Many researchers, archaeologists, and artists, plus your average adventurer, believe that the layout of the entrance, passage, and the chamber of Newgrange resembles the female reproductive organs.

"Newgrange: 20 intriguing facts." Authentic Ireland. Web. Accessed 29 June 2015.

<<http://www.authenticireland.com/newgrange>>



Many passage tombs resemble a human mons Venus.

Neolithic groups in southern Europe and the Near East also drew on explicit images of female fertility and reproduction.

Prendergast (2012:63)

Because of the importance of her function in the life of the Neolithic agricultural community, Earth Mother was often the most important spirit or god within the extensive religious pantheon of the community.

Thus the "life principal" of Neolithic culture was essentially "sexual" and the manipulation of these religious insights in order to guarantee crops and herds involved the periodic performance of what we consider shocking sexual fertility rites. Thus we think of these ancient cultures as sexually "loose." Actually, the very sacredness of the sex act also involved conformity of society's members to a very strict sexual code regulating human sexual relations...

We now believe, in general, that settled agriculturalists tended to emphasize the female principle of life: the earth or womb out of which their crops grew and life depended on this rite as the true source of life...

All agricultural peoples of the Ancient World worshiped some variant of the Great Goddess or "Earth Mother": Inana (Sumeria), Ishtar (Babylon) or Ashtarte (Syria), Anat (Canaan), Isis (Egypt), Aphrodite (Greece).

Mckay, Dr. Edrene S. (2010). "Paleolithic & Neolithic Societies." In *World Civilizations I; Prehistory*. Web. Online document. Accessed 29 June 2015.

<<http://online-history.org/wc1-docs/Paleolithic-Neolithic-Societies.doc>>

THE MALE ASPECT OF NEWGRANGE



This object which is widely believed to be a phallic symbol was found at Newgrange.

The following Irish myth show the close association between Newgrange and the Sun

Newgrange is said to have been the place where the great mythical hero Cúchulainn was conceived by his mother Dechtine. His spiritual father, Lugh, visited Dechtine in a dream while she stayed at the Brugh—Newgrange.

Murphy, Anthony. "Danu and Bile: The Primordial Parents?" In *Mythical Ireland*. Web. Accessed 29 June 2015. <<http://www.mythicalireland.com/mythology/tuathade/danubile.php>>

Lugh or Lug is an Irish deity.

*Lugh's name has been interpreted as deriving from the Proto-Indo-European root *leuk-, "flashing light", and he is often surrounded by solar imagery, so...he has often been considered a Sun god, similar to the Greco-Roman Apollo.*

<http://en.wikipedia.org/wiki/Lugh>

CONCEPTION & BIRTH

Dagda gains possession of the Bru Na Boinne [ED: Newgrange] and achieves carnal union with Boand by utilizing his mastery over time. He sends Eclmair on an errand which lasts for nine months, during which time Oengus, or 'Mac ind Oc'—'the Youthful Son'—Is conceived and born. Boand describes Oengus as the son who was begotten at break of day and born betwixt it and evening. His birth is associated with a magical lengthening of the day at Newgrange. Newgrange is most widely known in the ancient literature as 'Bru Mac ind Oc', or the 'Bru of Oengus', as Oengus takes over habitation of the mound from Dagda, by utilizing his own power over time

The imagery surrounding Oengus in these accounts would appear to confirm that in Irish oral traditions of the early Middle Ages, Newgrange was associated with birth at winter solstice — a place where a god was conceived and born. In these myths, the entry of the Sun into the passage and chamber at dawn is the moment of conception (i.e. the marriage of the gods), and the subsequent day the product or offspring of this union (the birth of the cosmos).

.....

It is notable in this context that in Rome in the fourth century AD, Jesus' birth was synchronised with the winter solstice—a direct echo in the Christian Trinity of earlier pagan and prehistoric beliefs and practices revealed at Newgrange (Miller 1993:10-11).

Prendergast (2012:63)



Danae receiving the Golden Rain, painting by Gaspar Becerra, 1560.

Danae, locked in a dark dungeon, is impregnated by Zeus who leaves Mount Olympus to come down to her as a shower of golden rain from the sky. There are many myths about gods impregnating mortal women, Gods who descend from the sky.

The winter solstice, especially in the Northern climates, has been associated with conception and birth in a wide range of ancient cultures including those of Egypt, Greece, Rome and Scandanavia -- this is true to this day with the celebration of Christmas, the birth of Jesus, at the time of the solstice.

SEXUAL RITUALS

Neolithic religion reflected the new interest in food production, for the Neolithic peoples had learned the secret of reproducing food through controlled implantation of the seed into the womb (whether the earth or a female animal). So too, Neolithic peoples typically performed "pre-enactments" of the all-important agricultural or animal life cycles – often in ways that are shocking to our more prudish sensitivities.

Mckay (2010)

Thinking and acting by metaphor is the key characteristic of the modern mind (Mithen 1996), especially those metaphors that draw upon the human body (Lakeoff & Johnson 1999).

Mithen, Steven; Finlayson, Bill; Shaffrey, Ruth. (2005). "Sexual symbolism in the Early Neolithic of the Southern Levant: pestles and mortars from WF16." Documenta Praehistorica XXXII. Ljubljana, Slovenia: Ljubljana University Press, Faculty of Arts. Page 109. Accessible online: <<http://revije.ff.uni-lj.si/DocumentaPraehistorica/article/view/32.6>>

The following annual ritual is quite similar to what I am suggesting. While there is not a direct connection between this particular myth and the Neolithic culture at Newgrange, nevertheless this example demonstrates that such rituals did in fact exist.

The Oraons of Bengal worship the Earth as a goddess, and annually celebrate her marriage with the Sun-god Dharme...

*With beating of drums and singing, dancing, and jumping, all proceed to the priest's house, which has been decorated with leaves and flowers. Then the usual form of marriage is performed between the priest and his wife, symbolising the supposed **union between Sun and Earth** [ED: my emphasis]. After the ceremony all eat and drink and make merry; they dance and sing obscene songs, and finally indulge in the vilest orgies. The object is to move the mother earth to become fruitful." Thus the Sacred Marriage of the Sun and Earth, personated by the priest and his wife, is celebrated as a charm to ensure the fertility of the ground...*

Frazer, Sir James George. (1926). "Ch.12: The Sacred Marriage: Part 2, The Marriage of the Gods." In *The Golden Bough: A Study In Magic And Religion*, Third Edition. London: Macmillan Press. Accessible online: <<http://www.gutenberg.org/ebooks/3623>>

COSMIC INTERCOURSE

Dr. Kate Prendergast in her article 'The Neolithic Monument Of Newgrange In Ireland: A Cosmic Womb?', which I have quoted here extensively, has suggested that the Neolithic Passage Tomb at Newgrange is a cosmic womb. I would agree but I would take it one step further.

On the day of the winter solstice when the light from the Sun entered the passageway at Newgrange for only seventeen minutes, it was 'cosmic intercourse'.

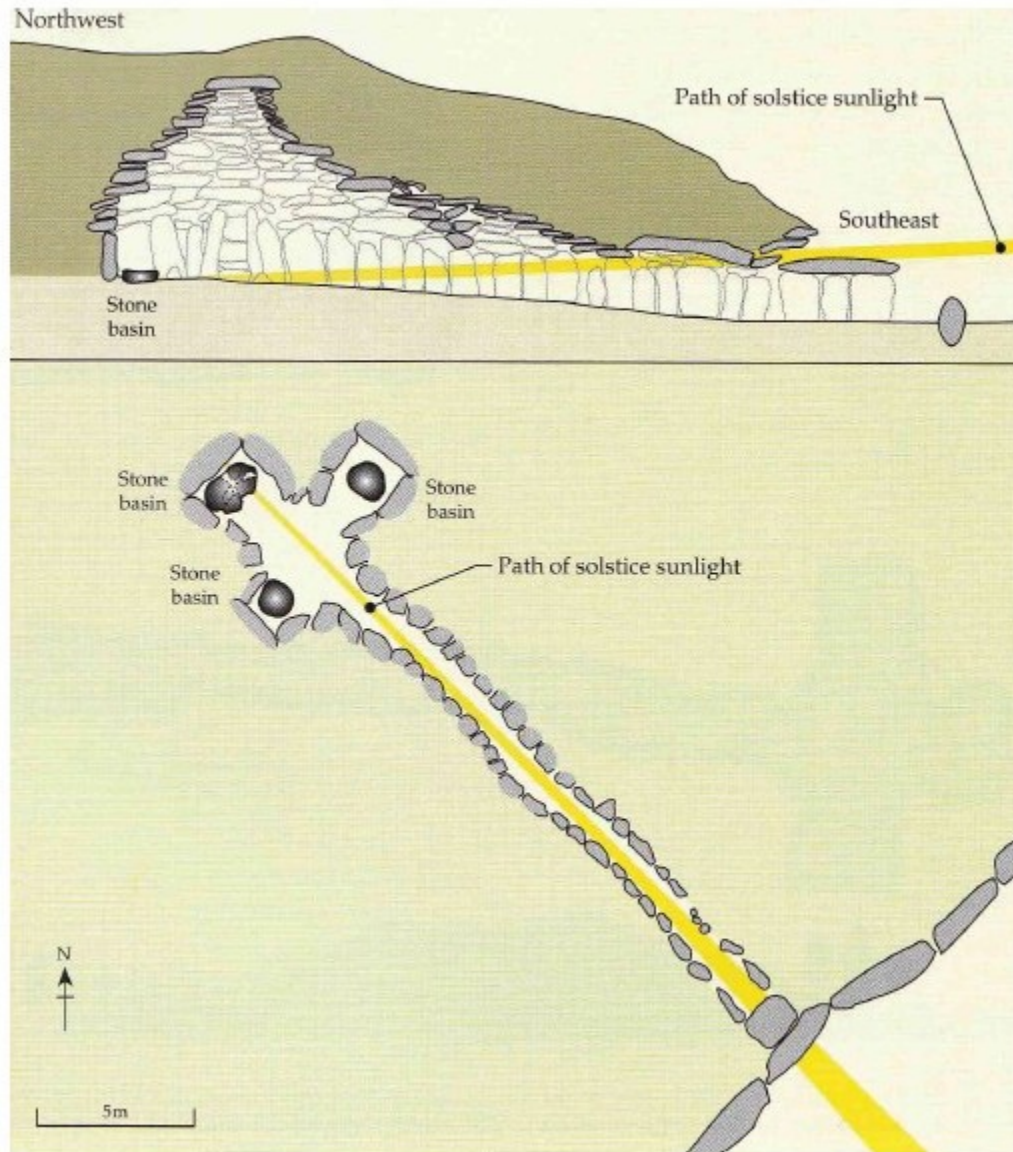


Diagram of Newgrange showing 2 views: one from the side and one from above. The diagram shows how the light from the Sun penetrated the passageway during the winter solstice. It is believed that when Newgrange was first built, on the exact day of the solstice, the Sun penetrated the entire length of the passageway, to shine on the stones at the back. This event took 17 minutes from the first entry of the Sun, to the light slowly spreading and advancing to the end of the passageway, to its final withdrawal.

(Irish Art History Section, Professional Development Service for Teachers, P.D.S.T., Ireland)

The supernatural force of light penetrated the womb of Mother Earth connecting the people to its power. The annual ritual/event at the holiest moment (the dawn) of the holiest day renewed a promise that for one more year the Sun would be reborn and that the Sun's light would return in full strength -- the Sun that warmed the Earth, brought the plants back from the dead and made the crops grow.

In a modern sense it can be seen as a ritual, but to the Neolithic people, I believe it was an event -- a critical moment of extreme importance, a cosmological crisis -- a meaning shared with other cultures.

The Luiseño [ED: a hunter-gatherer tribe in California], for example, had an intense ceremonialism, a rich sky lore, and a calendar regulated by various astronomical observations. Although their seasonal calendar was lunar based, they observed and celebrated the solstices, attaching particular importance to the winter solstice, which they regarded as a time of cosmological crisis.

Ruggles (2005:xxvi)

"A ritual can be defined as an enactment of a myth. By participating in a ritual, you are actually experiencing a mythological life. And it's out of that participation that one can learn to live spiritually."

Joseph Campbell

<http://www.crossroad.to/Books/UnderSpell/7-sacred-sex.htm#campbell>

Nine months later -- the length of a human pregnancy -- the crops would be fully grown and the fall equinox would occur. Their name for the month of September (Meán Fómhair) meant 'middle of harvest' and was an important time for farming communities -- as by then they knew how successful their farming had been.

If this interpretation is correct, then the solstice light at Newgrange was a powerful annual ritual in which the Neolithic people connected with the eternal timeless immortal supernatural spirits of the heavens in a fertility rite that assured people of another year of harvests and births.

AFTERWORD: ADDITIONAL THOUGHTS

SACRED TIME

The sunrise on the day of the winter solstice would have been seen as the most sacred moment of the year. Sunrise in many mythologies, [such as those of Greece, Rome and India](#), is seen as the most powerful moment of the day. The winter solstice is seen in many mythologies as the most critical moment of the year -- as the Sun finally stops its decline and begins its return -- a promise of rebirth and renewal. For Neolithic people the combination of the two possessed cosmic power that their structure at Newgrange was able to connect with. This moment in time combined with the Newgrange structure, an *axis mundi* (see next), would have given the people immense power and also crucial contact with the world of the spirits.

AXIS MUNDI -- A SACRED POINT ON THE EARTH

The axis mundi (also cosmic axis, world axis, world pillar, center of the world, world tree), in certain beliefs, and philosophies is the world center or the connection between Heaven and Earth. As the celestial pole and geographic pole, it expresses a point of connection between sky and earth... At this point travel and correspondence is made between higher and lower realms. Communication from lower realms may ascend to higher ones and blessings from higher realms may descend to lower ones and be disseminated to all.

The image is mostly viewed as feminine, as it relates to the center of the earth... It may have the form of a natural object [such as a mountain, a tree, or a fire] or a product of human manufacture... The axis mundi symbol may be found in cultures utilizing shamanic practices or animist belief systems...

Axis Mundi are quite common throughout history, for example:

http://en.wikipedia.org/wiki/Axis_mundi

The social implications of archaic [ED: Neolithic] religion are to some extent similar to those of primitive religion. The individual and his society are seen as merged in a natural-divine cosmos. Traditional social structures and social practices are considered to be grounded in the divinely instituted cosmic order, and there is little tension between religious demand and social conformity. Indeed, social conformity is at every point reinforced with religious sanction.

Bellah, Robert N. (June, 1964). "Religious Evolution." American Sociological Review, Vol. 29, No. 3, pages 358-374. Washington, DC: American Sociological Association. Page 365. Accessible online: <http://www.jstor.org/stable/2091480>

It is impossible to distinguish between what we are accustomed to viewing as practical problems and matters we now believe belong on a more rarefied plane [ED: religion, spiritual beliefs]. Technological and spiritual challenges went hand in hand.

"The Unseen World: The Rise of Gods and Spirits." (2002). Monograph Series No. 43. London: The Institute for Cultural Research. Page 10. Accessible online: <http://www.i-c-r.org.uk/publications/monographarchive/Monograph43.pdf>

Man tries to make for himself in the fashion that suits him best a simplified and intelligible picture of the world; he then tries to some extent to substitute this cosmos of his for the world of experience, and thus to overcome it. This is what the painter, the poet, the speculative philosopher, and the natural scientist do, each in his own fashion. Each makes this cosmos and its construction the pivot of his emotional life, in order to find in this way the peace and security which he cannot find in the narrow whirlpool of personal experience.

Albert Einstein

http://www.todayinsci.com/E/Einstein_Albert/EinsteinAlbert-Quotations.htm

MY THOUGHTS ABOUT LIGHT:

The event of the winter-solstice light entering and penetrating the passageway had many layers of meaning: it was a ritual of fertility, a union, a consummation but also a ritual about light itself where light under these conditions would have had a sublime meaning. The light was perhaps a bridge to the Heavens or to a pre-Celtic mythological [otherworld](#) or even a physical connection as the heat of the light would have warmed the stones and the people in the passageway. The light would have gone from dim to blinding to fading perhaps like celestial music that approached, got louder and then faded away.

In this sense, the light itself might have been seen as an actual bridge that connected the spirit world and the timeless world of the 'gods' with the Earth and with people.

ABOUT RELIGION AND SCIENCE

Quite simply, spiritual matters and astronomy (or what we call science) were not separated; they were one and the same. The Sun, the moon, the stars were spirits and gods -- and making precise calculations about how they moved and their annual cycles was a way to understand these spirits and to be in better contact with them.

Sky knowledge was typically interwoven with the broader ability to access supernatural power from the spirit world and from powerful forces of nature. The specialists concerned often considered themselves, and were considered, as operating not so much in the realm of science as in that of magic. Yet we should not see an inherent dichotomy between these realms so much as different (and not necessarily exclusive) cultural perceptions of ways of perceiving the cosmos. Studying perceptions of the history and meaning of occult magic offers, in other words, the opportunity for broader insights into the cultural context of different perceptions of reality (Aveni 1996).

Ruggles, Clive & Urton, Gary, Editors. (2010). "Introduction." In *Skywatching in the Ancient World*. Boulder, CO: University Press of Colorado. Page 12. Accessible online: <<http://upcolorado.com/university-press-of-colorado/item/1919-skywatching-in-the-ancient-world>>

"... the concentration which they bestowed upon their spiritual ideas led men to new ways of thinking which broadened their outlook in other directions. And from early on, this spiritual quest drove people to Herculean efforts which in turn expanded the frontiers of technical possibility at the time. ... Without their gods to drive them on, it is unlikely that men would have considered, let alone undertaken, such a vast achievement of engineering. ...Technological and spiritual challenges went hand in hand."

"The Unseen World: The Rise of Gods and Spirits." (2002:10).

DOING THE MATH?

Whether Neolithic people had a developed sophisticated mathematical system of numbers is not important -- although from our modern point of view it would seem essential. At its core math is about relationships, how one thing relates to another based on certain criteria. I believe Neolithic people had keen powers of observation, much more acute than ours when it came to understanding nature and patterns in nature. It was the recognition of patterns, more than abstract math, that allowed them to determine the day of the winter solstice and then to build an 'instrument' that would indicate the exact day of the winter solstice in real time. As I pointed out in my [blog-article](#) this was quite difficult and something that the Greeks and Romans about 3000 years later did not do with their mathematical methods and their instruments. This was probably because the Greeks and Romans did not feel a compelling need to know the exact day of the winter solstice in real time whereas the Neolithic people did feel such a need.

This idea should not seem odd, but may in our number obsessed world where computers use numbers to almost think like people. Music, for example, can be understood entirely as numbers, e.g., frequencies, decibels, overtones etc. However, most musicians play based on relationships between notes, a relationship that does have a mathematical structure but which is not understood mathematically but instead understood melodically.

It would be possible to describe absolutely everything scientifically, but it would make no sense. It would be without meaning, as if you described a Beethoven symphony as a variation of wave pressure.

Albert Einstein

http://www.todayinsci.com/E/Einstein_Albert/EinsteinAlbert-Quotations.htm

***All religions, arts and sciences
are branches of the same tree.***
Albert Einstein

BIBLIOGRAPHY

Bellah, Robert N. (June, 1964). "Religious Evolution." *American Sociological Review*, Vol. 29, No. 3, pages 358-374. Washington, DC: American Sociological Association. Page 365. Accessible online:
<<http://www.jstor.org/stable/2091480>>

Frazer, Sir James George. (1926). "Ch.12: The Sacred Marriage: Part 2, The Marriage of the Gods." In *The Golden Bough: A Study In Magic And Religion*, Third Edition. London: Macmillan Press. Accessible online:
<<http://www.gutenberg.org/ebooks/3623>>

Mckay, Dr. Edrene S. (2010). "Paleolithic & Neolithic Societies." In *World Civilizations I; Prehistory*. Web. Online document. Accessed 29 June 2015.
<<http://online-history.org/wc1-docs/Paleolithic-Neolithic-Societies.doc>>

Mithen, Steven; Finlayson, Bill; Shaffrey, Ruth. (2005). "Sexual symbolism in the Early Neolithic of the Southern Levant: pestles and mortars from WF16." *Documenta Praehistorica XXXII*. Ljubljana, Slovenia: Ljubljana University Press, Faculty of Arts. Page 109. Accessible online:
<<http://revije.ff.uni-lj.si/DocumentaPraehistorica/article/view/32.6>>

Muesse, Mark W. (2013). "Introduction." *The Age of the Sages: The Axial Age in Asia and the Near East*. Minneapolis: Augsburg Fortress. Print. Page 5.

Murphy, Anthony. "Danu and Bile: The Primordial Parents?" In *Mythical Ireland*. Web. Accessed 29 June 2015.
<<http://www.mythicalireland.com/mythology/tuathade/danubile.php>>

"Newgrange: 20 Intriguing Facts." *Authentic Ireland*. Web. Accessed 29 June 2015.
<<http://www.authenticireland.com/newgrange>>

"Pre-Axial Thought: The Neolithic Era." In *The Human Journey*. Cambridge, MA: Institute For The Study Of Human Knowledge. Web. Accessed 29 June 2015. <<http://www.humanjourney.us/NeolithicEra.html>> and
<<http://www.humanjourney.us/NeolithicEra2.html>>

Prendergast, Kate. (2012). "The Neolithic Monument Of Newgrange In Ireland: A Cosmic Womb?" In *Archaeology of Mother Earth Sites and Sanctuaries through the Ages: Rethinking Symbols and Images, Art and Artefacts from History and Prehistory*. Edited by G. Terence Meaden. Oxford: Hadrian. Print. Accessible online:
<http://kateprendergast.typepad.com/files/newgrange_bar_12.pdf>

Ruggles, Clive. (2005). "Introduction." In *Ancient Astronomy: An Encyclopedia Of Cosmologies And Myth*. Santa Barbara, Calif.: ABC-CLIO. Print.

Ruggles, Clive & Urton, Gary, Editors. (2010). "Introduction." In *Skywatching in the Ancient World*. Boulder, CO: University Press of Colorado. Page 12. Accessible online:
<<http://upcolorado.com/university-press-of-colorado/item/1919-skywatching-in-the-ancient-world>>

Schombert, James. (2014). "Ancient Cosmology." In *Astronomy 123: Galaxies and the Expanding Universe*. University of Oregon: lectures. Web. Accessed 29 June 2015.
<<http://abyss.uoregon.edu/~js/ast123/lectures/lec01.html>>

SQUIRE, Charles. (1979 [1905]). *Celtic Myth and Legend, Poetry and Romance* (original title: *The Mythology of the British Islands*). New York: Bell Publishing Company. Accessible online:
<<https://archive.org/details/celticmythlegend00squi>>

"The Unseen World: The Rise of Gods and Spirits." (2002). Monograph Series No. 43. London: The Institute for Cultural Research. Accessible online:
<<http://www.i-c-r.org/publications/monographarchive/Monograph43.pdf>>

Watkins, Trevor. (2000). "The Neolithic Revolution and the Emergence of Humanity: A Cognitive Approach to the First Comprehensive Worldview." ETANA. [Http://www.etana.org](http://www.etana.org). Web. Online document. Accessed 29 June 2015.
<http://www.arcl.ed.ac.uk/arch/watkins/humanity_paper.pdf>