

**Michael A.  
Rappenglück**

Adult Education Centre and  
Observatory Gilching  
Landsberger Str. 17 a  
82205 Gilching  
Germany  
mr@infis.org

Keywords: Housing,  
cosmography, cosmovision,  
power place, fireplace, hearth,  
membrane, partitioning, light,  
access, circumambulation, living  
entity, transfiguration, sacred  
landscape, asterisms, symbolism

Research

***The Housing of the World: The  
Significance of Cosmographic  
Concepts for Habitation***

Presented at Nexus 2012: Relationships Between Architecture  
and Mathematics, Milan, 11-14 June 2012

**Abstract.** A specific mode of human existence shows up in modelling the structures and processes of the world onto the living space, consisting of certain landscapes, locations, and habitations. Concepts of housing the world are implemented in the lodgings, cultic buildings, settlements, territories, and the artificial shaping of the landscape. These structures offered humans a 'domestic' sphere within a realm of wild nature, ensuring stability, centricity, meaning, security, familiarities, knowledge of controlling, social and power classifications. Cosmovisions of early cultures and indigenous people often address the idea of the housing as the world in miniature. Structures worked as a lively microcosm figuring the macrocosm and allowing interacting with the world by using a symbolic and ritual approach. The study points out basic principles and categories. It queries whether elements of archaic cosmovisions related architecture, ecosystems, and the mindset have survived until today and if so, why.

***Introduction***

One of the characteristics of the human mode of existence shows up in modelling the structures and processes of the world onto the living space, which consists of certain landscapes, locations, and habitations. That way the inconceivable course of events became 'tangible' by establishing and constructing spheres of spatiotemporal order. Concepts of housing the world are implemented in the architecture of lodgings, cultic buildings, settlements, territories, and the artificial shaping of the landscape. These structures offered humans a 'domestic' sphere within a realm of wild nature, ensuring stability, centricity, meaning, security, familiarities, knowledge of controlling, social and power classifications.

Archaeological and ethnological records worldwide give evidence that since Palaeolithic time cosmovisions have been an essential part of man's requirement to organize habitats. In consequence of and accompanying hominid evolution, which caused a partially freeing up from strong drives, organizing the world into a meaningful consistent and dynamic framework of interacting subsystems was necessary to integrate and orientate the human lifeworld within changing natural ecospheres. Thus specific cultural systems including cosmovisions emerged, which allowed man to establish and maintain order and rhythm in personal and social life, interacting with given environmental conditions, and to answer the human questions about the whys and wherefores concerning him and the world. Cosmographic concepts of the world edifice can be regarded as holistic, multi-layered models of evolving human ecosystems, which, by using symbolic language, helped man make the world homely and transcend the

profane. Since time immemorial and across the world archaic cultures symbolically, mythically, and ritually accompanied the configuration and weighting of the habitat as well as the placement within. People relied on an ordered and organized spatiotemporal natural world domesticated in culture, into which human life could be embedded and from which life received a deeper spirit and purpose. These cosmographic concepts of habitation across cultures are transformed into designed landscapes, cultic caves, tents, campsites, houses, cities, or temples.

### ***Human ecosystems, habitats, and cosmovisions***

The term *ecosystem* [M.A. Rappenglück 2009: 7] denotes a natural entity, which develops as a system of varying biological species (biocoenosis, biotic factors) and miscellaneous physical parts of the environment, in which they exist (biotope, abiotic factors, physiotope), interacting with each other. An ecosystem, specifically influenced by humans, involves specific and complex relations, which man being part of the community of living beings has with nature.

The phrase *cosmovation* denotes concepts of the world, including ideas of its structure (cosmology), its origin and development (cosmogony), and the relation to human life within a specific ecosystem, which all are shared and illustrated by the members of a certain social group [M.A. Rappenglück 2009: 7]. Even today certain archaic cosmovisions are still alive and play an important part in the everyday life of rural people and in endogenous development. *Cosmographic* means applying cosmovation to the whole or parts of the living space.

Ancient people tried to synchronize human life with the basing ecosystem, including astronomical phenomena. This way of referring to the spatiotemporal structure of the cosmos has been called a *living astronomy* [Rist, San Martin and Tapia 1999: 149]. It also includes other concepts, which today are allocated to the subjects of geography, meteorology, biology, medicine, sociology, psychology, etc. The idea of a living astronomy is behind the astrological worldview, found in archaic and historic cultures globally.

Such cultures perceive and describe the world as a spatiotemporal domain of interacting powers, mostly sensible in the shape of individual and collective beings. Among these the celestial luminaries and phenomena played an important role: They were thought to set up, to animate and to influence permanently the spatiotemporal world, in particular the living beings, especially humans. Man watched them carefully to know what place and time was best suited for organizing his individual and social life. Correlated to the chronobiology of animals and plants, climatic cycles, human economic, social, and religious activities, the periodical movements of the sky, sun, moon, and stars helped to structure time and to determine critical dates for a certain human behaviours.

Cosmovisions are evidently an integral part of human ecosystems, based on the respective subsistence, the changing cognitive and pragmatic conditions, and the abilities of man, bringing together the physiotope and the biotic factors [Selin 2007]. They allowed ancient and still some living cultures to construct worlds establishing a structured and stabilized habitat, being a human *microcosm* embedded in the *macrocosm*. Moreover cosmovisions support transitions from one habitat to another one, going through chaotic phases. They represent holistic, multi-layered models of evolving human ecosystems. Cosmovisions make natural and cultural processes more understandable using symbolic language. Frequently they are illustrated by given natural structures and man-made buildings, iconographies, myths, rituals, and of course written descriptions.

From the time the human species learned to handle fire, there appears a very new intercourse with the ecosphere: based on the special functionality of his self-consciousness and parallel to the progressive reduction of instincts man was aware of a certain kind of separation from the ordinary world. The anthropological concept of *eccentricity* very well describes his feeling to be somehow out of natural order and off-centre. Humans need to establish and to keep themselves and their culture in steady state. They are repeatedly urged to integrate and orientate themselves and their habitat anew into the ecosystem. Man essentially requires re-centring [Pugh 2003: 426]. Thus humans continually tried to change wilderness (*chaos*) into culture (*cosmos*) and to substitute the unknown by the well-known. Cosmovisions served to answer man's fundamental questions concerning the origin and structure of the world. They moreover offered cognitive models to encounter the riddles of life and death. Through cosmovisions man succeeded in domesticating his living environment. He *domesticated* the wild world to make it homely (Latin *domus*, meaning *house*). That way man established systems of guiding and orientating, which helped to turn his anthropologically given eccentricity [Plessner 1975: 291-326] into centricity, permitting a meaningful life [Bollnow 2011; Plessner 1975; Ashmore 1991: 199-226; Ackerman 1953: 3-7; Levenson 1984: 275-298; Lawrence and Low 1990: 453-505; Banning 2003: 4-21; Rasmussen 1996: 14-26; Wesley 1998: 118-127; Waterson 1988: 34-60; Bourdieu 1970; Richards 1996: 173-84]. Cosmovisions enabled people to recognize an ecosphere as well-ordered, domesticated and habitable domain, as a home.

Therefore it is quite understandable why ancient cultures globally considered caves, non-domestic architecture (a temple, a tomb, and sepulchral monuments), dwellings (such as a tent, a hut, and a house), a village or a city, and finally the landscape or seascape as spatiotemporal replica of the cosmos, figuring certain cosmovisions in the human habitat [Barnatt 1998: 92-105; Barnatt und Edmonds 2002: 113; Bénisti 1960; Casey 1998; Carrasco 1981; Casajus 1981: 60; Egenter 1980, 1989; Krupp 1983: 122-12; Krupp 1997; Ruggles 1999; Eisler 1910: 600-632; Frank 2001: 140-143; Griaule 1966: 40-56, 101-124; Hentze 1961; Hultkranz 1987: 285-290; Kalland 1996; McKhann 1992; W. Müller 1956: 139, 143-187, 261, 280-283, 296-318; W. Müller 1982: 74; Naumann 1971: 78-101, 174-182, 204-209; Rabuzzi 1987: 4105; M.A. Rappenglück 1999, 2007, 2009; Rawson 1999; Schroeter 1998; Snodgrass 1985, 1990; Šprajc 2005; Stein 1987: 120-253; Tan 1967: 443-444; Taube 1998: 427-478; Traube 1986: 66; Singh 2009; Sugiyama 1993; Wendell 1971; Werness 2003: 164-165, 183, 197; Wheatley 1971; Whitehead 1998: 301-326; Chevalier and Gheerbrant 1996: 167-172, 422-425, 529-531, 923-924, 978-983, 998-999, 1013-1014, 1095, 1112-1113]. Until the modern era the *housing of the world*, illustrated by symbols, myths, rituals, artwork, and buildings, was the all-encompassing, most vital and important subject for cultures.

### ***Power places***

Archaic cultures evaluated spatiotemporal positions according to the idea of quality [Bollnow 2011]. Critical dates and peculiar places were associated with the influence of definite efficacies within a certain spatiotemporal nexus. People thought that the effects of powers, depending on the point and extend in time and space, are ambivalent: They can be beneficent or maleficent. People also considered living beings, including humans, as especially sensitive for the perception of characteristic power qualities at certain spatiotemporal positions.

Archaic imagination conceived peculiar accessible places or areas on earth, but also those located at a distance from the world in the comic strata above (the sky) or below

the ground (the netherworld), as certain containers, storing creative powers [Mguni 2006: 60-61]. These efficacies are collected and concentrated. If released they cause extremely dynamic changes in the spatiotemporal system, especially influencing body and mind of living beings. At those places different powers of this world, normally perceived as opposing each other, meet – for instance, the female and male mode of existence, the individual and the community, the realm of this world and the beyond, the material and spiritual world. Right there they interpenetrate and coexist. There only are they complementary and balanced [M.A. Rappenglück 2005a; Fox 2006: 79-80]. Archaic cultures regarded those places, at which one can come in contact with the primeval cosmic powers, as ‘sacred’. In their sight exceptional vigour existed in a spatiotemporal sphere around such loci. At those places’ boundaries the sacral entity changed into a profane one. People thought that staying at the sacred loci is very dangerous, because the empowered area not only has the feature to strengthen the abilities of sensitive individuals, but also, if the influence prolonged, to destroy the person. Therefore people especially respected the peculiarity of such power places and advanced towards them with awe. Seeking such places and staying there was restricted to well-suited individuals and only possible for short periods at a specified time. Dwelling close to a power place, observing the appropriate distance, however vivifies people. Individuals or collectives believed that they participated in the special qualities of such loci. They felt provided with a certain kind of positional power [M.A. Rappenglück 2012], which allowed them to establish spheres of spatial influence through landscaping and architecture.

### ***The framework of the cosmic house: axis, supporters, and strata***

Human self-awareness defines a topocentric system of observation and order at any spatiotemporal point. Even an out-of-body state is bounded to a certain reference point of perception, which sets an origin. Hence the human motive to centre the world is an anthropological a priori. By holding the body upright the human sense of balance (equilibrioception) determines the first world axis, which is a vertical one and fixed by a line between the zenith, the observer’s location, and the nadir.

The idea of the *axis mundi*, world axis, implied a basic division of the cosmic sphere into three zones (‘worlds’) along the pivot (fig. 1): the superior realm (heaven) containing the celestial pole, the middle realm (earth) at the equator, and the nether realm (underworld), encompassing the celestial antipole. The upper and the lower stratum are polar opposites, frequently associated with beneficent or maleficent spheres. They establish a first kind of potentiality. Often the basic cosmos was further subdivided into grades of certain efficacies and knowledge following a hierarchically ordered spectrum. People thought that cosmic powers and knowledge are exchanged along the *axis mundi* between the strata up and down [Mguni 2006: 63-68]. The symbolism of the world axis also served to illustrate the interactions and transitions between the mundane and different spiritual spheres.

There is, however, another world axis, which played a more important role in the worldview of archaic cultures. Since earlier prehistory people observed the starry sky revolving around a certain fixed point, which is the north or the south celestial pole, depending on the geographical latitude of the peoples’ habitat. They imagined the whole cosmos circling a gigantic axis, pivoted in the centre of the world and the visible pole of the sky. Sometimes they extrapolated the concept that the world axis pierces through the centre pointing to the viewable pole as well as the invisible anti-pole. The latter was considered to be the pivot of an antipodean ulterior world. People living at latitudes very close to or just at the equator could in fact realize this way of thinking. Moreover by

virtue of the rotational power the polar world axis was believed to be an embodiment of the primeval motive force causing movements and changes in the cosmos.

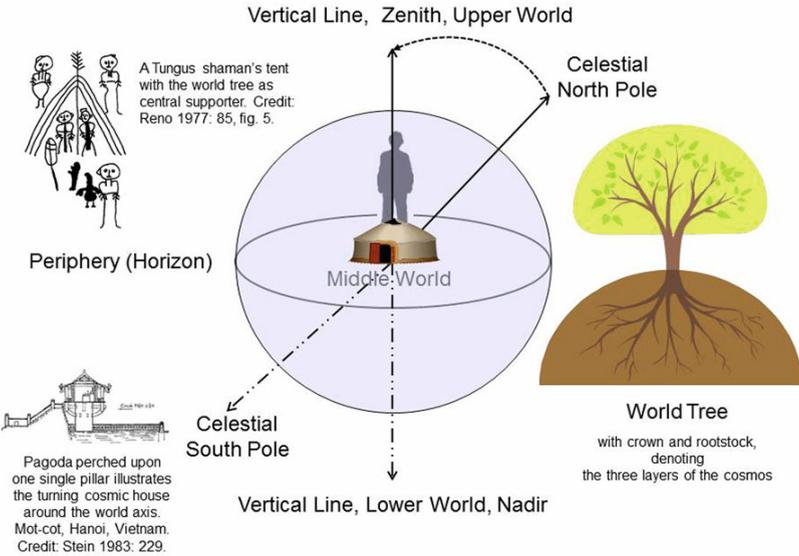


Fig. 1. The framework of the cosmic house: axis, supporters, and strata

Because it is not easy to depict or to build a model of such an inclined world axis ancient people preferred to show the vertical version instead of the polar one. Often both conceptions are given at the same time or even mixed. But the people knew the polar-aligned world axis very well and tried to express the concept in myths, rites and sometimes tangible architecture [M.A. Rappenglück 2008].

Regarding the architecture of ancient cultures, the primary strong supporter of a structure (tent, house, cultic building, and ruling-class architecture) was frequently identified with the *axis mundi* [Stahl 1985: 32; Prussin 1976: 11]. Occasionally (for example, in Japan [Naumann 1971: 108, 190, 246-247, 250]) structures have been set upon one single post, illustrating that the whole framework of the world, taken as a house, turns around the polar world-axis (fig. 1). The Russian fairy tale of the witch Baba Yaga delivers a similar example [M.A. Rappenglück 1999]. There the cosmic house revolves sitting upon a duck's one single foot.

Often the central post is not especially shaped and left bare of any decoration. However peculiar examples existed, designed to illustrate not only verticality, but also horizontal axiality and different strata in the world. That way the main supporter itself indicated the cardinal and sometimes intermediary directions to the important spatiotemporal domains of the habitat, the settlement and the dwelling [McKhann 1992: 157; W. Müller 1982: 95; Werness 2003: 177; Whitehead 1998: 311-317]. The alignments refer to characteristic powers, objects, qualities, ancestors, tutelary spirits, and divine entities in the world. Moreover, well-chosen peculiar ornaments, colours, minerals, food, animals' or human's skulls and bones, skins, feathers, masks, other powerful things and/or representations have been found ritually fixed upon the surface of the central post or deposited close to the central post, according to directionality. Analogously, the points at the top and at the foot of the post, denoting the highest and the deepest points in the cosmos – which, depending on the specific conception, were the

zenith (or celestial pole) and the nadir (or celestial antipole) – had been specifically marked. Sometimes the main supporter itself is shaped as a plant, an animal, an anthropoid or a god. Among other things, the design can visualize cosmological and/or cosmogonic symbolism and is linked to corresponding interpreting myths. Hence the main supporter, like a guidepost, signifies the peculiar efficacies existing in particular locations of the macrocosmic cosmic house, which interact with the corresponding parts of the mundane house (or further the landscape) and inhabitants, who stay at place in the correlative sector. The central post was thought to be the origin point, from which the building's framework was put up using subsidiary struts positioned at the corners of a polygon. These additional supporters were considered as helping to hold up the heavenly strata [Weyersberg 1961: 113-140]. Like the main post, they too were imagined as trees, mountains, ropes etc. to symbolize the cosmic strata around the world axis [Ackermann 1953; Irwin 1982; Mabbett 1983; McKhann 1992: 168, 171; W. Müller 1982: 102; Naumann 1971: 189, 194; Werness 2003: 5-56, 134]. The Balinese temples for example, generally rising up in their northern part, were built according to the Hindu system of nine cardinal points [Tan 1967: 444-446, 457]. Sometimes the old system of nine directions was complemented by a later addition of the vertical points of zenith and nadir, emphasizing the number 11. The layout, following the geometrically-arranged nine, addressed the number of precious stones, symbolizing the centre with the cardinal and intermediate directions stored atop the world mountain Meru. In the ancient Indian myth of whisking the cosmic sea the enigmatic objects also embody the sun, moon, the five planets, and the lunar nodes, Ketu and Rahu, the same number of asterisms, and of certain natural features and forces [M.A. Rappenglück 2006: 223]. It is quite remarkable that this idea of a cosmic grid divided into nine parts is also known from ancient China [M.A. Rappenglück 2006: 222]: eight realms are ordered symmetrically around a centre, creating a magical square. The centre is the celestial pole or the middle of the earth. The whole image is surrounded by a primal cosmic sea. The magic square refers to the nine cauldrons brought by a female turtle of the north, which create order and balance in the whole cosmos. Each square contained depictions of the emblems, living beings, products and maps of the particular country. Moreover, in the ancient Greek tradition the world mountain, resembling the polar axis, is the abode of the nine Muses [M.A. Rappenglück 2006: 224]. Similar ideas are mentioned in ancient African cosmogonic stories [M.A. Rappenglück 2006: 224].

Like the central support, the subsidiary posts could have been decorated in a similar way as discussed above. They play an important role in the symbolism, myths, and rituals of the specific people. They often were associated or even identified with the world's main spatiotemporal sectors, including the fundamental and prevailing powers, the principal elements of nature, the cardinal directions, the chief celestial objects (luminaries, asterisms, Milky Way, rainbow, etc.), the seasons, the wind rose, certain numbers, the major colours, sounds, plants, animals, body parts of living beings, vital organs, humours, social classes, stages of life (plants, animals, humans), gods, ancestors etc., all important for the worldview of the respective culture [Geertz 1984; Lethaby 1892; W. Müller 1982: 74-77; Naumann 1971; Prussin 1976: 11-12; Schroeter 1998: 76-77, 100-101; Werness 2003: 199-200, 227]. The subsidiary supports were treated as girders and guardians of the whole world, which was reproduced in the building. That is quite understandable, because they ensure the preservation of the world and the habitation, contain the symbolical encoding of processes and of life cycles, and protect the chain of living beings through time and space. There are many examples to be found worldwide across cultures and epochs [Casajus 1981: 60; Prussin 1976: 11-12].

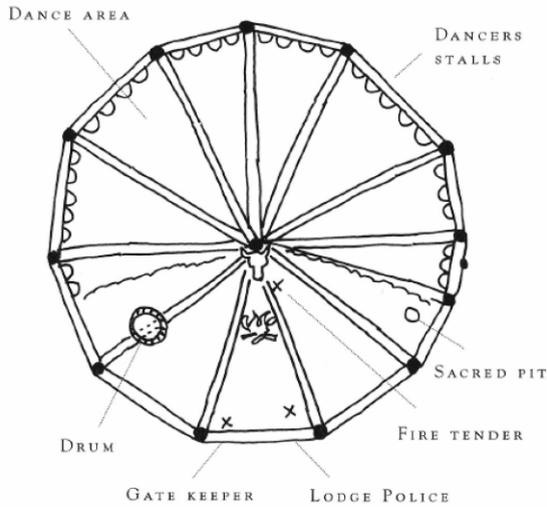


Fig. 2a. Sun Dance Lodge: The centre is a tree with forked branches at the top symbolizing the world axis, thought to connect the spheres of existence. Coloured ribbons representing heaven and earth are tied high in its branches. The symbols of earth and heaven are the head of a buffalo placed facing east and an eagle in the branches. The lodges' ring of twenty-eight vertical, forked poles symbolize the days of a sidereal lunar month [Nabokov and Easton 1989]

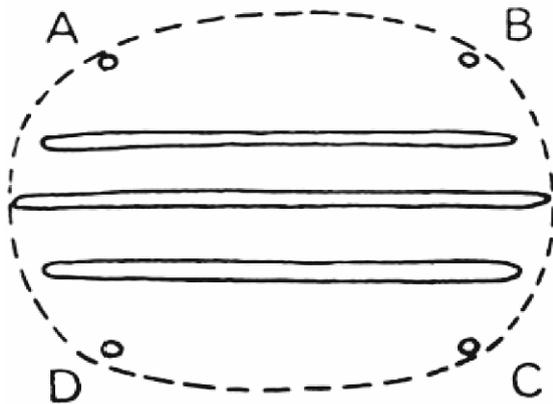


Fig. 2b. Round tent roof of the Tuareg (North Africa). The tent of the Tuareg is considered to be a replica of the celestial tent, which existed since the origin of the world [Casajus 1981: 61]

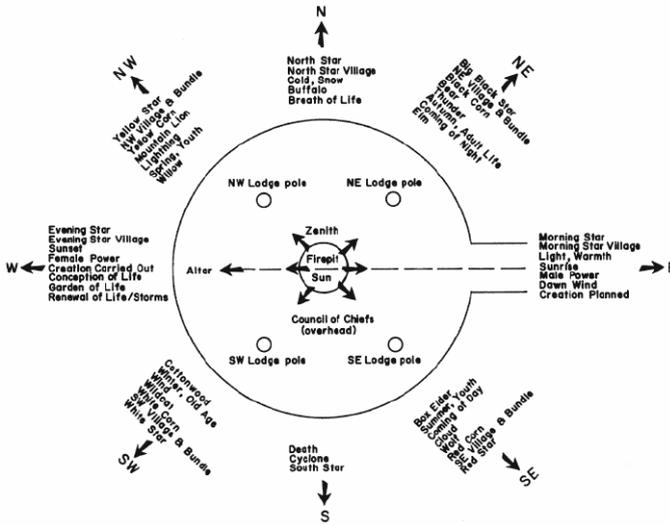


Fig. 2c. The Skidi Pawnee Earth lodge mimics the world [Von Del Chamberlain 1982: fig. 22]

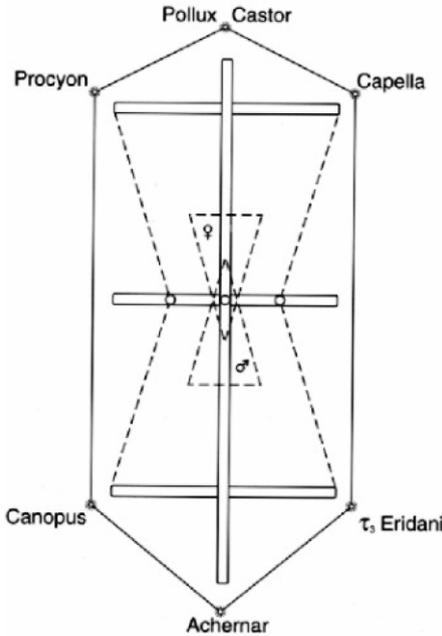


Fig. 2d. Cosmo-architectural concepts of the longhouse of the Tucano (South America) [Reichel-Dolmatoff 1982]

Sometimes not only the vertical, the cardinal and the intermediary directions are allotted to the main post and the supporters, but other cosmological elements considered relevant by the specific culture figure as well. Hence struts may represent the diagonal cross of sunrise-sunset at winter and summer solstice, the twenty-eight days of a sidereal month as in the case of the Sun Dance Lodge (fig. 2a) [Nabokov and Easton 1989] or

the twelve lunations in a solar year [W. Müller 1982: 74-77]. The round tent roof of the Tuareg in North Africa (fig. 2b) is pitched by four tent pegs corresponding to the main cosmic pillars, which hold up the world in its north-west, north-east, south-west, and south-east corners [Casajus 1981: 60-61]. The terrestrial tent is considered to be a replica of the celestial one, which has existed since the origin of the world: God used the four stars of the quadrangular asterism, which is the main part of the today's constellation Pegasus –  $\alpha$  Andromedae (Alpheratz, 2.06 mag);  $\beta$  Pegasi (Scheat, 2.43 mag);  $\gamma$  Pegasi (Algenib, 2.81 mag); and  $\alpha$  Pegasi (Markab, 2.46 mag) – to set up the tent of the world. At the time the celestial square passes the zenith, just at dawn in July, the direction of the tent's square exactly corresponds to the position of the four pillars of the world. The Tuareg say that they in olden times learned to pitch tents from these four fixed stars. The circle of the tent moreover symbolized the shape of the earth centred in the town of Mecca. The Skidi Pawnee Earth lodge mimics the world (fig. 2c): The dome-like shape represents the realm of the sky and the circular floor symbolizes the realm of the earth. The four cardinal set posts holding the dome upright are identified with certain celestial objects (two Morning Stars and the messengers to the Morning star and Black Meteor). The entrance of the lodge faces due East, allowing the rising sun at the equinox to shine on an altar at the lodge's western part. The smoke hole in the hut permitted looking up to the sky and following the path of the stars related to the winter and summer solstices, such as the Pleiades and the Chiefs in Council (R Coronae Borealis). At a larger scale the cosmologic symbolism of the lodge was assigned to the entire Pawnee village [Aveni 2008: 114-116, 122-123].

Such cosmo-architectural concepts are sometimes very sophisticated, as in the case of the longhouse of the Tucano, Columbia, South America (fig. 2d). This is formed by six struts, which display the irregular hexagon of the most important fixed stars –  $\alpha$  Carinae (Canopus, -0.63 mag);  $\alpha$  Canis Minoris (Procyon, 0.37 mag);  $\beta$  Geminorum (Pollux, 1.15 mag);  $\alpha$  Aurigae (Cappella, 0.06 mag); 11 (=  $\tau_3$ ) Eridani (4.08 mag); and  $\alpha$  Eridani (Achernar, 0.42 mag) – around the centre of the world, which on earth was found in the rock of Nyí [Reichel-Dolmatoff 1982: 165-181, fig. 4; Whitehead 1998: 305-309]. Except for 11 Eridani, these stars are all very bright and impressive. This pattern defines and illustrates territorial, social (male-female division and intermarrying groups), and ethical rules, which the individuals and the community have to respect. An additional set of six posts support the middle part of the longhouse roof, which is considered to be a ritual area. Within the celestial hexagon the asterism of the seven stars of our today's constellation Orion is situated. Its shape represents the path and resulting pattern made by male and female dancers as they weave their way through the longhouse during rituals. At its zenith passage the star  $\epsilon$  Orionis (Alnilam, 1.68 mag) defines a vertical line to the rock of Nyí, around which the Tucano area is centred and which is localized at a place where the equator and the north-south flowing Piraparaná river cross each other. It corresponds to the centre of the longhouse. The hexagonal pattern combines terrestrial and celestial features with events and tasks of social, individual and sexual life, as well as with the imagined organization of the human brain.

The recognition and vertical layering of the third dimension had been an important factor of order and orientation in the development of human consciousness. Examples from all over the world provide evidence of the importance of vertically-arranged strata related to layers in caves, levels of hills and mountains, or artificial terraced structures [Lewis-Williams and David Pearce 2005; M.A. Rappenglück 2005a; Snodgrass 1985, 1990; Wang 1999].

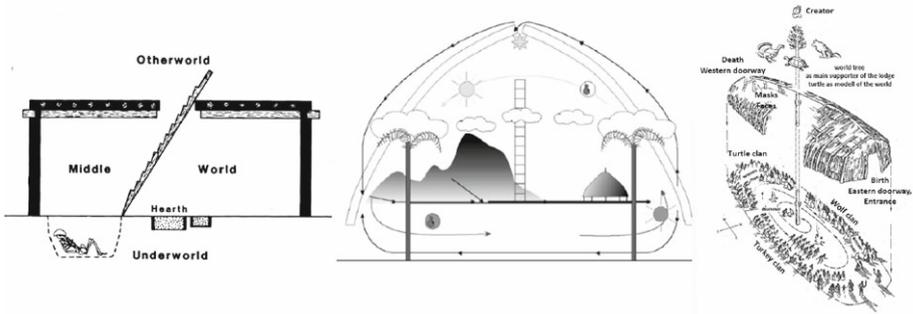


Fig. 3. a, left) Mibre people (Mogollon culture, 1000-1150 A.D.; North America): The three cosmic strata (Upper, Middle, Lower World), connected by a ladder. The hearth as symbol of the fire in the centre of the building [Shafer 1995: 26, fig. 3C]; b, middle) The assembly hall of the Wayana people (South America) symbolizes the tripartite world [Duin 2002/2003: 48, fig. 7]; c, right) The center post of their Big House of the Delaware (North America)

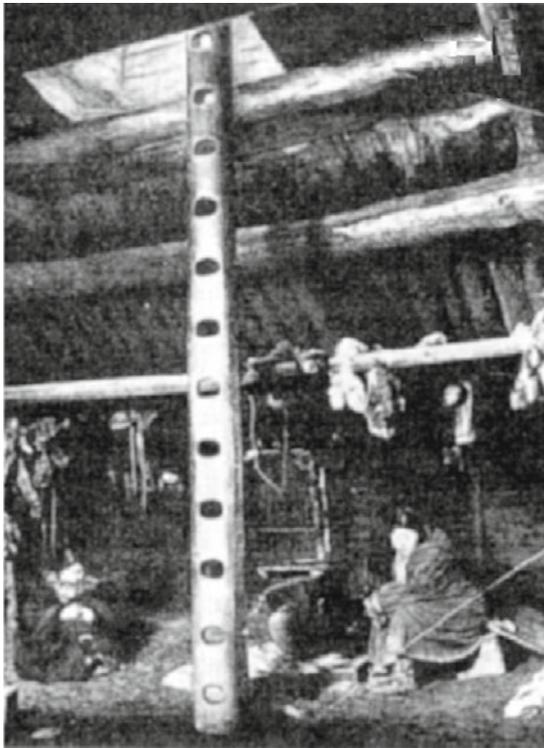


Fig. 3d. Koryaks house: Central ladder, symbolizing the world axis [Stein 1987: 163]

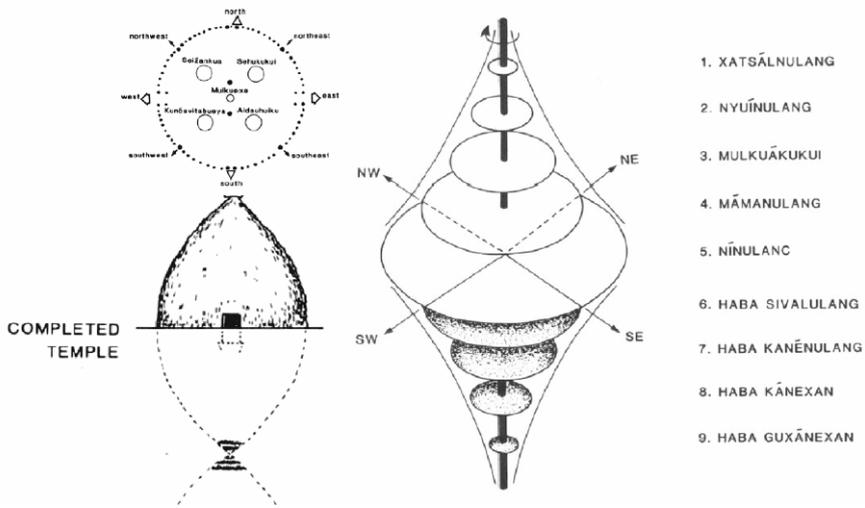


Fig. 3e. Kogi temple (South Africa) as a model of the cosmos [Krupp 1983: 238-241]

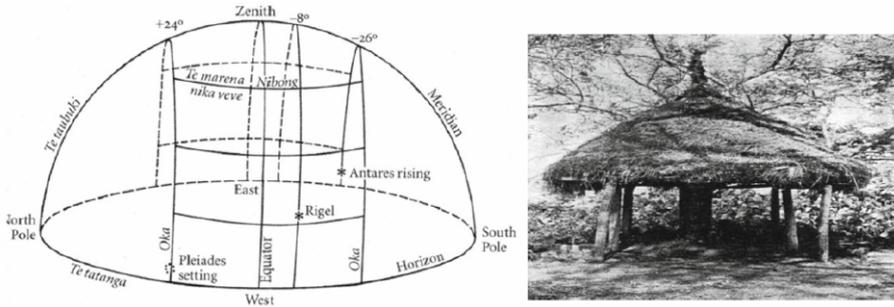


Fig. 3. f, left) The Gilbertese sky dome is patterned after the house, with each important celestial coordinate named after the corresponding part of the architecture of the house [Lewis 1974: 136, fig. 3]; g, right) Tottiyen (Africa): Hut with main and secondary posts (the world axis and the cardinal directions), related to the ancestors [Naumann 1971, fig. 2]

With regard to building (fig. 3), ancient people often identified the roof, the floor, and the level beneath the ground (when provided the basement or as a kind of marker for the substructure a cistern, a well or a fountain) with the three cosmic strata of the upper world ('the heavens'), the middle world ('the earth') and the lower world ('the never world') [Chevalier and Gheerbrant 1996: 529-531; Pevsner et al. 1999: 2447; Coomaraswamy 1977: 192-241; Reichelt 1913: 23-57; Metevelis 2000: 79-88; Preston Blier 1981: 111-112, 1983; B. Rappenglück 2004; M.A. Rappenglück 2008: 23]. A tree with its branches, a mountain having different levels, a terraced artificial building or the central post in a dwelling, shaped as a ladder with its steps, served as other models of the hierarchical stratified cosmos [Kaufmann 2006: 15-19; Lethaby 1892: 71-234; McKhann 1992: 168, 171; Meister 2000; W. Müller 1982: 102; Naumann 1971: 189, 194; Sugiyama 1993; Werness 2003: 5-56, 134, 168-169, 177, 227, 232, 296; Chevalier and Gheerbrant 1996: 680-685, 1026-1033, 580-585, 776-778; García-Goyco 2007; Singh 2009]. But while the latter only shows the layering, the former by their conical shape pinpoint a highest possible level of power in the world. Sometimes ancient people horizontally flipped the above mentioned shapes with respect to the horizontal plane for

the purpose of illustrating the power levels of the upper world (heavens) and the lower world (underworld) respectively reaching the highest and lowest possible value. In the counter world of spirits and ancestors, all things are inverted. Hence they occasionally created the motif of the reversed world tree, the tree with crown and rootstock, the inverted post and ladder, the mirrored house, doubled step pyramid and other symbols, which even architectural were materialized [Chevalier and Gheerbrant 1996: 776-778; Jacobi 1928: 78-85; Krupp 1983: 239-240; Fox 2006: 80-81, 116; Mguni 2006: 66; Domenig 2008: 4709]. In the decorated caves used for cultic purposes since Palaeolithic times, different levels, the dead ends of rearmost galleries and deep shafts also have been attributed to the model of a layered underworld or even the whole cosmos [M.A. Rappenglück 1999].

In the worldview of archaic cultures the partitions of the vertical and horizontal strata, including boundary marks, refer to social, psychical, religious, and natural properties [Griaule 1966: 101-110; W. Müller 1970: 130-222; Reichel-Dolmatoff 1978; Schroeter, 1998: 25; Singh and Khan 1999; Traube 1986: 67]. There exist numerous examples where the idea of the world spheres stepped around a central axis parallels the concept of hierarchical graduated social classes related to a monarchic government [Rappenglück 2005a: 161].

The world axis holds up and connects, but also pierces the hierarchically layered cosmic domains, which were considered to be 'other worlds', and often equated with different physical and psychical levels. The respective cosmic strata are figured by landscapes, objects, living beings (plants, animals, humans) or gods existing there [W. Müller 1982: 74; M.A. Rappenglück 2005a: 157-161; Reichel 1998: 35-47, 63; Reichel-Dolmatoff 1978: 80; Traube 1986: 6]. Hence the world axis was regarded as a way to reach and to travel through the hierarchical layered, but coexisting realms of the universe. The Delaware (North America) compared the centre post of their Big House, which they considered to be the tree-like *axis mundi*, with a human's heart, being the essence of the individual's body (fig. 3c) [Miller 1979: 799-800]. Both are interconnected, allowing the authorised person to move from the microcosm to the macrocosm and vice versa. The house of the Andaman (India) is thought to reproduce the cosmos, and especially the sphere of the ancestral world [Hugh-Jones 1979: 35]. That way the building itself as a terrestrial replica of the cosmic world housing makes it possible to go to the world beyond. The house of the Sa'dan Toraja, Sulawesi, Indonesia recreates the family tree of the living and the ancestors. The latter are localized in a special ancestral house, which are suspended between sky and earth until they come down to ground via a terrestrial dwelling and the chain of descendants [Nooy-Palm 2001: 152-153]. Moreover, a stone or wooden pillar in the centre is the 'navel post' [Nooy-Palm 2001: 159]. It connects the mother earth (living area) with the sky (roof) and the netherworld (room under the floor, stables). The house is also oriented in relation to the cardinal directions, respecting the course of the sun and the cycle of life, death, and new life [Nooy-Palm 2001: 159-165].

According to one ancient worldview, it was only possible at the centre of the world (or at least nearby) to contact the creative powers of the cosmos and to gain otherwise hidden knowledge about their application. It is quite understandable why ancient cultures compared the original point of space and time with the 'navel' (omphalos) of the world [Roscher 1913, 1918, 1919]. Across many cultures natural objects (a mountain, a cave, a well, a striking big stone or tree) as well as representative artificial structures (single megaliths, altars, buildings etc.) all having special properties, which served to mark the centre within a human lifeworld [Hori 1966; Feeley-Harnik 1980: 562; Mabbet 1983; Prussin 1999: 429-431; Helms 2002; García-Goyco 2007; Blanchard

2010: 7]. At the start of the twenty-first century the archaic and archetypal symbol of the tree of life in the middle of the habitat was again addressed by the American science fiction movie 'Avatar' (James Cameron, USA; released London 12/10/2009, USA 12/18/2009; 20th Century Fox).

Sensitive persons, such as shamans, and power-conscious rulers, tried to reside at the middle of the world or nearby, because only there was it possible to access cosmic power and knowledge. Even common people hoped to participate in the forces of the world that were pre-set and focused at a certain natural place or at an artificial structure, hence the attempt to settle on the brink of a power place, or at least be buried there after death. However, they knew that it was impossible and dangerous for the unprepared to cross the border between the profane and the sacred, this world and the beyond. This capacity was reserved for the specialists. In any case, locations recognized as the centre of the world were regarded as the right places for sensitive individuals to fall in ecstasy. Moreover, in those places rulers were enthroned, judgements took place, sacrifices were carried out, and meeting places, houses, shrines, temples or cities were founded [Malecka 1999: 25, 31 fn. 49; M.A. Rappenglück 2007; Werness 2003: 69, 168-169, 173, 227; Chevalier and Gheerbrant 1996: 998-999; Huxley 2000: 118-119; Mguni 2006: 66; Stahl 1985: 33].

***The fire place: focusing power, offering protection, and transforming matter***

From the Lower Palaeolithic epochs, producing and keeping fire have been very important and exceptional human activities. Sitting around a fire helped to protect against the attacks of wild animals. This behaviour coincided with another one: people crowd around if threatened and charged. In the case of fire, it is necessary to keep the right distance to the fire to profit from its power and at the same time to avoid being burned. This led to a natural domain in which activities are concentrated and distributed around a fire place. There are three distances which define human intercourse with fire (fig. 4).

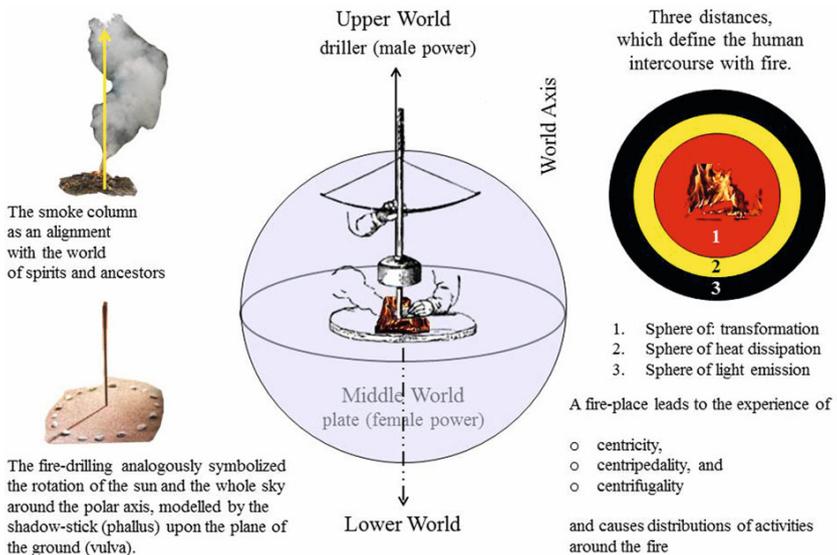


Fig. 4. The fireplace: focusing power, offering protection, and transforming matter. Image: author

Looking from the centre to the periphery there is a first inner domain where one can put things into the fire for transformation, such as cooking, burning clay, and destruction purposes. A second sphere of activity has its borderline where one can no longer feel the heat. Finally, the area where one can no longer see the light defines the outer domain around a fire place. Setting up a fire place leads to the experience of centrality, centripedality, and centrifugality and causes distributions of activities around the fire according to an ordinary scale. Examples handed down by people worldwide show that producing, taming, and using fire means having great power and controlling activities of production, transformation and destruction [Chevalier und Gheerbrant 1996: 1178; Lewis-Williams and Pearce 2005: 101, 181-189; Salokoski 2006: 194; Wilson 1988: 27, 42; Mguni 2006: 65]. According to the traditions of ancient cultures and archaeological records, the fire place and the hearth symbolize the act of creation, which is profoundly related to the birth and death of the individual, the community, and sometimes the whole world [Freidel, Schele and Parker 1993: 130, 178; Reichel-Dolmatoff 1978: 80-81].

Often the hearth is regarded as a symbol of the sexual intercourse, the union of man and woman, and the male and the female powers which set up and move the whole world. People thought that making fire by drilling a stick into a wooden plate (fig. 4) imitates the creative coition and the origin of both the world and man [Salokoski 2006: 193-194]. That explains the importance of fire rituals across different cultures. However, the procedure of making fire using the drilling procedure was also representative of the rotation of the sun and the whole sky around the polar axis, symbolised by the stick as a phallus upon the ground as a vulva [Parpola 1985: 117; M.A. Rappenglück 2005a: 160-161]. According to ancient conceptions, the drilling world axis and the rotating sun, both symbols of the heavens, exerted their power upon the susceptible earth, producing and preserving the life in the world. Hence Mughal emperors, considering themselves as the cosmic sun in the zenith, have a seat on the pivotal throne of the world [Malecka 1999: 25]. The whole world is interpreted as a giant womb in which female and male powers come together to produce primordial elements, things, and living beings. It works like a hearth, transforming matter. This idea appears in alchemistic traditions, for instance in ancient China, where the images of earth and sky were depicted on the floor and ceiling of special containers like the laboratory, the furnace, or the reaction vessel [Needham et al. 1980: 210-305].

It is understandable that people thought that the fire place represents a creative womb, which they compared and related to the sun as a symbol of the celestial source of power in the world [Parpola 1985: 88, 159; Rabuzzi 1987: 4106]. The close relation of the female principal to the fire place/hearth is reflected in the performance of special fire rituals carried out by woman within the domestic space. A derivative of such ideas is the identification of the fire-place or hearth with both, the navel of the human body and the centre of the world, which denotes the origin of transformational physical and spiritual power. Thus the place where a fire is kindled offers the possibility to come into contact with the primordial origin of the cosmos and to communicate with the ancestors who are present there. That idea helps us to understand why some ancient cultures had a custom of intentionally placing certain objects (bones, clay balls, animal or human figurines) near or into the fire. While at first it might appear that such object may have served as aids in cooking, heating of water, making ceramics, and so forth, traditions of cultures show that people used the deposit of objects in around and in the fire place to relate themselves to the chain of ancestors, which is bound to the origin of the cosmos, and to get in contact with the spirits. The Kwara'ae in Africa, the Maya in Mesoamerica, the Dakota in North

America, the Dravidian and the Indus-Culture in India or the Tibetan for example put 'sacred stones', mostly three or four, into a hearth [Welchman-Gegeo and Watson-Gegeo 2001: 68-69; Hodder 2006: 120-121; McKhann 1992: 164; W. Müller 1956: 177; W. Müller 1970: 212; Parpola 1985: 56, 84, 88, 159; Stein 1987: 159]. A similar ritual act might have existed 7400- 6200 B.C. in Çatalhöyük (Konya, Anatolia, Turkey [Hodder 2006: 120-121]). Thus the fire-place and hearth anchored a family or a clan at a place, giving life, protection, stability, unity, and ensuring the linkage and communication with the ancestral domain or even the powerful centre of the world itself [Crandall 1996]. The position of fire-altars in the dwellings, close to the centre and the main supporter, if one exists, follows a similar symbolism [Parpola 1985: 116]. In addition ancient people regarded the smoke rising up from the fire-place/altar as a symbol of verticality, joining together and relating the cosmic strata between heaven and earth to each other [Chevalier and Gheerbrant 1996: 889-890]. In some cases, for example the Harlan-Style Charnell House (North America), the smoke column resulting from the ritual burning of a complete house was identified with the *axis mundi* and the path the souls take to the other world [Kay and Sabo III 2006: 33, 39]. Finally the four poles of a *tipi* signified the paths on which the spirits, being smoke-like, ascended to the sky [Oetelaar 2000: 40].

### ***Partitioning and membranes***

For organizing the world and installing human life within the specific natural environment it was essential that cultures perceive, fix and respect certain physical, psychic and social limits. These allowed partitioning, structuring and directing activities. Hence individuals and communities were able to concentrate physical and mental power, to establish and to protect human life and culture [Werness 2003; M.A. Rappenglück 2008]. That's why peripheries and containers have been very important for humankind's existence and evolution. Caves were among the first human experiences of housing offering the transition between two realms, defined by a dichotomy and polarity of experiences: a world of light (day) outside and another one of darkness (night) inside; an area of high and low sensual perception; an ordinary and a miraculous space-time; a profane and sacral sphere, each related to the other [M.A. Rappenglück 2005b, 2007]. The high cosmographic significance of natural caves later is transformed into artificial structures, most notably cultic and lordly buildings.

For the most part, the archaic divisions and arrangements follow concepts of iteration, symmetries, polarity, interplay of things, living beings, events, properties, social relationships, myths and rituals, psychic and spiritual powers [Duin 2002/2003: 47; Egenter 2001: 43-81; W. Müller 1956: 199-203; Lamp 1985: 40-43; Rabuzzi 1987: 4104; Reichel-Dolmatoff 1978; Schroeter 1998: 76-77; Werness 2003: 25, 291-292; Ruggles 1999; Krupp 1983: S. 157-211; 1997: 127-151; Lewis-Williams and Pearce 2005; M.A. Rappenglück 2007; Donley 1987: 181-192; Shore 1982; Whitridge 2004: 213-250]. Depending on the specific culture, people conceived symbolic macrocosmic patterns and processes that were reproduced in the spatiotemporal organized microcosm of the profane or sacred building [Kus and Raharijaona 2000: 98-113; W. Müller 1956; Krupp 1997: 205-211, 231-241; Ray 1977; M.A. Rappenglück 2009: 166-167; Roe 1982; Snedegar 2000: 456, 458; Snodgrass 1985]. In special cases a breaking through the principles of structuring is all the more conspicuous.

The establishment of a spatial enclosure constitutes a first partition, separating an outer from an inner living space (exosphere / endosphere [K.E. Müller 1987]). It determines proximity and distance, as shown, for example, by the shrines and royal court of Ganda in Africa [Ray 1977: 372-373]. The shell divides the wild sphere from the

domestic sphere [Lamp 1985], denoting areas of threat or shelter and signifying kinship and foreign parts. It distinguishes the sacred from the profane sphere, a male and female sphere of nature and life and the realm of the living from the world of the dead, leaving a sphere for an intermediary realm [Tan 1967: 457; Ray 1977; Geertz 1984; Fox 2006: 79-80]. Such ideas seem to be rooted in the Upper Palaeolithic epoch: At the Salpêtrière Grotto (France), 19,000 to 13,000 B.C., the oval floor of a tent, localized at the cave entrance, is divided into a red and a black area, according to the east and the west section [Schmandt-Besserat 1980: 132]. At the cave of Chauvet (France), approximately 32,000 to 34,000 B.C., the red paintings are placed in the sections of the entry area, while the black depictions are located in deep galleries and side corridors [Clottes 2003: 200-214]. It is interesting that the Luiseño in North America apply a fundamental division of the cosmos into a red and black realm, which represent the polarities of male and female, night and day, wild and village, etc. [Applegate 1979]. Moreover, the iteration of divisions establishes a sequence of other polarities, such as the left and the right sides, the north-south and the east-west axes, the horizon arcs of the sun's annual cycle [Barnatt 1998; Brown 2004: 31-58; Duin 2002/2003: 47; Fox 2006: 80-81; McKhann 1992: 160, 164; K.E. Müller 1987; Oetelaar 2000: 40; Ray 1977: 369-370; Shiner 1972: 425-436; Whitehead 1998: 311-317; Kalland 1996].

Archaic cultures likened the origin and the revolutionary changes in the habitats' internal structures to the course of primeval cosmogony. They thought that the original, pre-existing, simple and singular entity was somehow divided into two realms, mostly identified with earth and sky, female and male, sometimes leaving the place for a third intermediary sphere, setting up a primeval polarity [Prussin 1976: 11-12]. This was followed by the generation of an iterative process of further binary divisions. Their interplay produced the multiple figures of the cosmos [Ivanov 1983; Ohnuki-Tierney 1972: 426-457; Staudacher 1968]. Although the parts are locally different, they nevertheless remained related to each other thanks to their primeval unity. Hence a sequence of polarities was created, constituting the world. Ancient cultures often imagined the matrix of the cosmos as an egg, as a primordial chaotic substance (mostly water) or even as a kind of giant living being [Staudacher 1968]. They then likened the cosmogonic first and essential dichotomy, which gives rise to the world with a kind of primordial sacrifice of a giant cosmic living entity (a turtle, a shell, a bovine, a human being, and other creatures). Archaic cultures repeated the process of primeval creation ritually at the founding of habitations and the inauguration of power and sacral-cosmic landscapes, because they wanted to participate in the originally creative power of the cosmos [M.A. Rappenglück 1999: 237-287; M.A. Rappenglück 2007: 72; Beck 2010]. That motivated the traditions of laying the first stone, sacred delimitation, and building sacrifices [Irwin 1982: 343, 354-357].

Enclosures are essentially defined by fences and walls. They separate and encase space for a certain time. According to archaic views, envelopes are not completely sealed off. Rather, they act as selective barriers, or as selective permeable membranes which, depending on time and transmittance, enable the fluxes of energy and matter, communication between this and another realm. Such barriers have a front side and a back side. The two realms meet and exchange at the shell of the membrane, where they are polar opposites. The concept of a selective membrane may derive from the functionality of biological membranes [Singer and Nicholson 1972]. To a certain extent it has been applied to the symbolic interpretation of walls in Upper Palaeolithic decorated caves and Neolithic houses [Lewis-Williams 2002; Lewis-Williams and Pearce 2005: 110-113; M.A. Rappenglück 2005b, 2007], where rocks and murals may act as a

kind of membrane that both separates and connects an outer and an inner realm, an ordinary from a transcendent world. It was believed that such ‘membranes’ enabled contacts with the sphere beyond, or even a transition there. Then the backside of the everyday world, which represents the foreside, appears and is accessible [Lewis-Williams 2002; Lewis-Williams and Pearce 2005: 110-113; M.A. Rappenglück 2007: 74-76]. The archetypal creatures of the ancestral past – luminaries, minerals, plants, animals and people, and other things – existing in the spheres beyond become perceptible at the rocks of shelters and caves. They are also manifested at the walls of dwellings and cultic buildings, in the form of pictures or sculptures. Archaic people thought that touching the walls with the hands makes it possible to communicate with the entities and processes behind. This might provide a partial interpretation of the hand silhouettes depicted on Upper Palaeolithic cave walls [M.A. Rappenglück 2007]. In some cases the same significance might correspond to similar depictions at the murals of houses in later epochs.

Openings in natural or artificial enclosures and walls allowed passages from, one sphere into another one [Coomaraswamy 1977: 6-61; McKhann 1992: 161; Stross 1996; Werness 2003: 87, 227]. Aided by specific architectural elements (ropes, ladders, stairways etc., cracks in scarps, portals in tents, houses, protective walls, bays to slip through, false doors, gates, spirit holes, oculi, windows, flues, and wells), openings were used or at least considered to grant horizontal and vertical access into different strata of three-dimensional space (fig. 5).

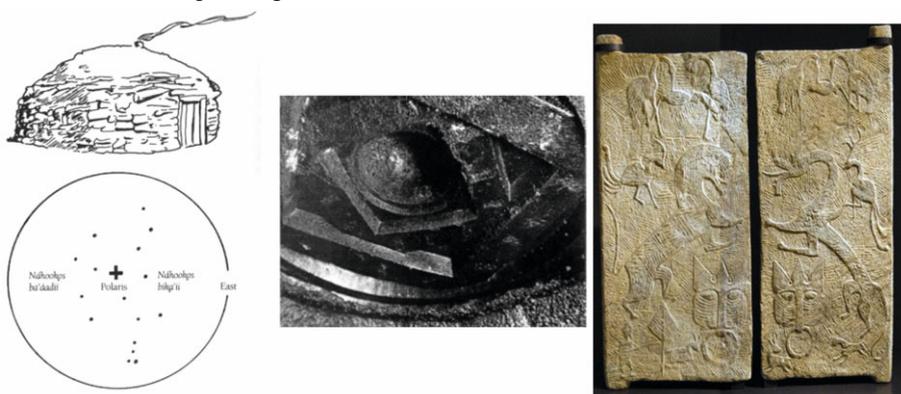


Fig. 5. a, left) Navajo Hogan (North America): The central fire place with the smoke outlet correspond to the pole star, around which the asterisms of Big Dipper and Cassiopeia revolve [Griffith-Pierce 1992: 154, fig. 6.5]; b, middle) Afghanistan: The ‘Well of the Heavens’ in the Cave of the Great Buddha [Stein 1987: 144]; c, right) Chinese: Door to a burial chamber from Sichuan. Eastern Han Dynasty (24-220 AD) show the tiger and the dragon, constellations of the west and east, Museum Rietberg, Zurich, Switzerland [M. A. Rappenglück 2007]

Where there are openings the spatiotemporal organization of housing becomes diaphanous so that other spheres of the world become perceptible and accessible, but placement on the threshold is dangerous and unsure [Fox 2006: 214-215]. It signifies the boundary between a timeless world (that of the the ancestors) and a temporal world (that of the living), but crossing that boundary unprepared is dangerous. The gates of a courtyard of the temple of Assure, in the town of the same name built under the Assyrian king Sennacherib (705-681 B.C.), were aligned to the main asterisms, the cardinal directions, and the three paths of the stars of Enlil, Anu, and Ea, reflecting cosmology in

the architecture [Huxley 2000]. Another example is the house of the Taberma in Togo (Africa), which is compartmentalized into three terraces. On the middle floor a ceremonial hole allows the spirits to pass through to the heavenly world of ancestors [Preston Blier 1981: 111-112].

The symbolism of vertical outlets in tents, some traditional constructed houses and cultic buildings is especially interesting: The flue in a tent or a house opened the membrane vertically to align the dwelling, which is the terrestrial world, to the highest point in the sky, which represents the divine celestial world. Moreover, in principle the outlet makes the structure susceptible to celestial powers, such as light, wind or rain, which were thought to fertilize the earth. Ancient traditions demonstrate the importance of the outlet, which is called a 'window, door or well of the sky' [Stein 2001: 143-157]. In certain cases the opening is not only an exit for the smoke, but is also the sole entrance to the structure [Stein 2001: 157-167], as in the case of Çatalhöyük buildings [Lewis-Williams and Pearce 2005: 107-108]. Though this is actually troublesome for accessing the dwelling, it makes the path into and out of the man-made structure parallel to the axis mundi of the column of smoke.

Archaic people often identified artificial breakings, e.g. doors, windows, vents with natural ones, like crevices, holes, vulvae, mouths etc. Their opening and closing frequently was compared with processes of ingestion and excretion or birth, death, and rebirth of individuals, the passage between different levels of being and perception during shamanic ecstasy, and the emergence from other worlds into the actual one [Preston Blier 1981: 111; M.A. Rappenglück 2007; Shafer 1995: 31, 41-44; Stross 1996; Weaver and Weaver Adams 2007].

### *Playing with light, shadow, darkness*

Worldwide, the spatiotemporal courses of sun, moon, and especially the stars, helped archaic cultures to perceive and determine spatiotemporal events, thereby organizing the living environment [Krupp 1983; Lehner 2006: 57-64, 107-130; Rabuzzi 1987: 4105; M.A. Rappenglück 1999, 2007; Reichel 1998: 60-67; Reichel-Dolmatoff 1978; Ruggles 1999; Whitehead 1998: 308-310, 316]. Hence astronomical factors can be found essentially integrated and symbolically expressed in the human organization of buildings and the landscape from the Upper Palaeolithic epoch on. There is sufficient evidence of orientations towards the points of solstices, equinoxes, lunar standstills, rising and setting of fixed stars, the Milky Way, culminations or zenith passages of luminaries, and calendrically given points such as the rising or setting sun on a Saint's day, etc. [Krupp 1983: 157-211; 1997: 127-151; Sofaer 1997; Ruggles 1999].

Openings in buildings (windows, doors, flues, vents, etc.) were constructed to make use of the changing incidence of light during the daily and annual course of the sun for everyday practical purposes (fig. 6). Furthermore, the play of light and shadow or periods of complete darkness was associated symbolically to active and passive times of daily and yearly life [Lethaby 1892: 235-253]. This applied a fourth dimension to the house, the cultic or lordly building, or even the landscape. Thus architecture become a visual representation of a kind of *chronotope* [Bachtin 2008]. In contrast to the common availability of artificial light in buildings today, the buildings of archaic people fit into the natural rhythm of light and darkness. Conversely, this idea was sometimes connected with the notion that the cosmos itself was a house with special gates for the sun to pass through [Heimpel 1986].

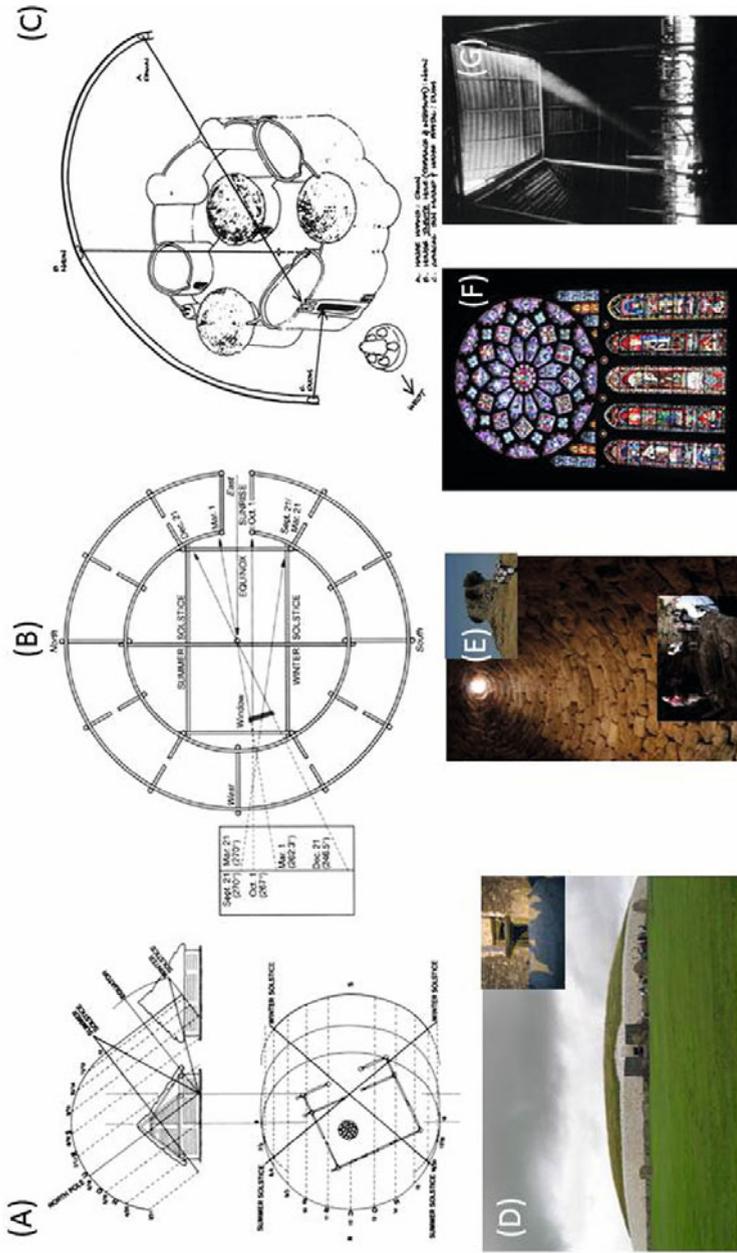


Fig. 6. A) Biskupin house in Poland, dating from the Early Iron Age (738-737 BC) [Iwaniszewski 1996: 90, fig. 4]; B) The roundhouse of the Ye'cuana (South America) respects the solstices and equinoxes [Wilbert 1981: fig. 20]; C) Barammaliba (Africa) [Snedegar 2000: 458, fig. 2]; D) The lighting of the back wall in the passage grave of Newgrange (Ireland) at the winter solstice [M. A. Rappenglück 2007]; E) Light and Water in Nuraghes, 2.000-500 B.C., Sardinia, Italy [M. A. Rappenglück 2005]; F) Light narrates biblical stories through the Northern Rose, Chartres, France, 1233 A.D. [M. A. Rappenglück 2009]; G) The Maloca, the longhouse of the Yukuna and Tanimuka (Amazonia) [Reichel 1998: 41]

The concept of indicating important spatiotemporal events through the incidence of light in architectural structures can be traced back several thousands of years. A few examples are given here: the serpent descending from the sky, seen at the stairway at the northern side of the step pyramid of Castillo, Chichén Itza, Mexico, eighth-tenth centuries A.D. [Krupp 1983: 298-299]; the houses of the Biskupin settlement in Poland (fig. 6A), dating from the Early Iron Age, Lusatian culture, 738-737 B.C. [Iwaniszewski 1996: 85-92]; the so-called 'miracle of the sun' in the rock temple of Abu Simbel, Assuan, Egypt, built between 1260 and 1250 B.C. by Pharaoh Ramses II, New Kingdom [Belmonte and Shaltout 2005]; the Nuraghes of Sardinia (fig. 6E), 2,000-500 B.C. [Zedda 2005]; the Bell Beaker's houses, Csepel Group, Carpathian Basin, Hungary, 2800-2000 BC [Pásztor 2005]; the Old Kingdom pyramids, Egypt, 2,707-2,216 B.C. [Belmonte and Zedda 2005]; the lighting of the back wall in the passage grave of Newgrange (County Meath, Ireland) at the winter solstice (fig. 6D), about 3,100-2,900 B.C. [Krupp 1983: 122-125]; the illumination of the innermost chamber in the cave of Parpalló, Gandía, Valencia, Spain, in which humans have left stone tools and bones showing 21,000-11,000-year old engravings of animals and geometric shapes [Esteban and Tortosa 2001: 8-14]. Elsewhere and in other periods archaic cultures used such peculiar daily or annual events of illumination by the sun for purposes of time-reckoning and symbolism [Bourdieu 1970; Goodison 2004; Krupp 1983: 132-137, 152-156, 245-248, 234-237, 253-258].

The Maloca, the longhouse of the Amerindian tribes of Yukuna and Tanimuka (Amazonia, Columbia, Brazil) shows a detailed model of the indigenous worldview (fig. 6G). Among other things, the building serves for fixing important times for daily life and the date of rituals in the course of the year. Special chosen openings in the house's walls and roof allowed light to enter, depending on the daily and annual altitude of the sun, illuminating certain architectural elements [Reichel 1998: 58-69]. The Roundhouse of the Ye'cuana (Venezuela, South America) also represents a chronotope (fig. 6B). Its construction respects the solstices and equinoxes [Wilbert 1981: 37-72; Whitehead 1998; Aveni 2008]. The traditional built houses of the Batammaliba in Togo and Benin (fig. 6C) are related to the east-west course of the solar god Kuyi [Snedegar 2000: 456, 458; Tilley 2000: 41-49; Aveni 2008]. Kuyi is a polar entity: while his soul appears shaped as the sun, his body is hidden to humans. He shows a red side (female, north) and a black side (male, south). The villages and the houses are partitioned accordingly. The solar god nourishes humans and their houses. Very similar ideas are known from Austronesian longhouses, which were longitudinally aligned upstream-downstream and north-south in such a way that the sun's daily east-west course above the building mirrored the cycle of life and death [Fox 2006: 80-81, 116]. While the illuminated exterior, especially the gallery, symbolized day and the actual world of the living, the dark interiors denoted night, which was identified with the hidden, transcendent, and inverted world of the beyond, where the sun shines during the night.

The temporization of architecture, which completes the cosmic model, was also mediated by the seasonally-aligned lighting through specific openings in churches [Onasch 1992; Heilbron 2003: 153-170]. The same ideas are illustrated by the rose windows of the Gothic cathedrals (fig. 6F), which are variously illuminated by the sun in the course of the year, thus narrating the most important motifs of the Old and New Testament, following the salvation history [Painton 1979]. Ancient people sometimes used openings in architectural structures (such as windows, doors, roof openings, and skylights) for watching and setting their sight on certain fixed stars and asterisms, which

were most important for time-reckoning, orientation and symbolism. Evidence of this is found in many cultures and epochs [Krupp 1983: 48-58, 102-105, 237; Griffin-Pierce 1992: 154; Trejo 2009: 255-256].

### ***Access and tour***

For archaic cultures the opening of housings, especially cultic and lordly buildings, are rich in symbolic meaning. They create structural designs, which enable and emphasize accesses and tours, for instance the public or hidden path to a peculiar location regarded as endowed with natural powers [Lehner 1998, 2006; Snodgrass 1985; Krupp 1983]. Architectural elements guided the ritual circumambulation, the helical approach to a site and the concentration upon a place. Notably, they made it possible for people to ascend and descend with the help of ropes, ladders, stairways, etc. They also offered gradual accessibility for the purpose of delaying the revelation of spaces and things. In this way horizontal and vertical levels of powers, interactions, perceptions, meanings, and adaptations to altered circumstances, caused by nature or required by culture, became symbolically tangible. In particular the approach, the contact, and the bearing of the powerful Idea of the Holy, which impressed humans as a *mysterium tremendum* or *mysterium fascinans* (Rudolf Otto), called for an appropriate architectonic design of cultic buildings, but also to a lesser extent in domestic daily life, which also depended on the proper handling of natural powers.

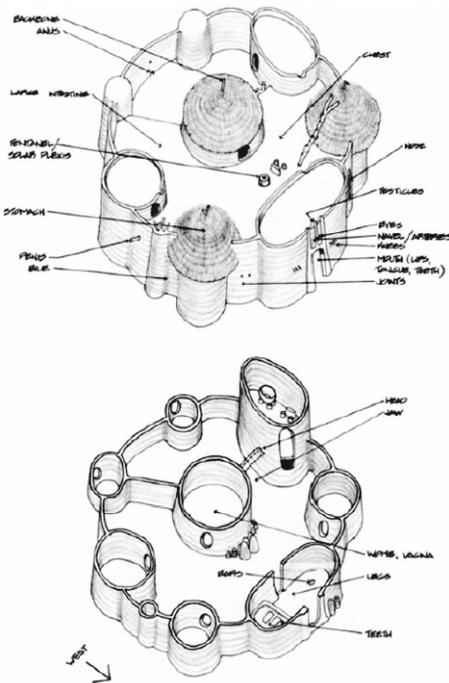
Apart from the spiritual dimension, the socio-political function of the terrestrial authority of rulers and adepts belongs to the symbolism of cave, house, and sacred building [K.E. Müller 1987; Lehner 1998, 2006; Krupp 1983]. Globally, the aloofness, the saliency, the demonstration of having power over regions, things, and times are characteristics which potentates claim for themselves or which they are awarded. They are symbolically illustrated in corresponding architectural designs.

Often, access and tour of the structures, settlements, and the landscape followed certain cosmological concepts and astronomical time-factored organization [Krupp 1983: 157-211; 1997: 127-151; Ruggles 1999; Singh 2009]. Frequently, order and orientation are given by particular alignments, with a focus on one-dimensional sequences and directionality [Ruggles 1999]. In addition, one can find domains in which ordering and intensification of certain objects within a special flat space follows a net-like reference system or is done around a centre, often according to an ordinary scale of weighting the arrangement with reference to the middle. Another set of spatial order and orientation is indicated by divisions of a domain along a binarily-iterated scheme. Furthermore the recognition and ordinary scaling of the third dimension has played a role in order and orientation. There are examples concerning the importance of vertically-arranged strata related to caves, hills, mountains and artificial structures [Lewis-Williams and Pearce 2005; M.A. Rappenglück 2007, 2008, 2009, 2012; Singh 2009].

### ***The habitat as a living entity***

The archaic worldview also understood housing and the environment (landscape, seascape, skyscape) as being alive (fig. 7). People variously identified the living organism of a building, the landscape or the whole world as a kind of living entity, such as a huge egg, a plant, an animal, a man or a woman [Eisler 1910: 723, fn. 8; Griaule 1966: 101-110; Lamp 1985: 40-43; W. Müller 1982: 167-168, 170-174; Rabuzzi 1987: 4104; Stuart 1998: 395; Werness 2003: 87, 134, 199, 238, 296]. Domes and pillars exemplify the female and male powers of nature [Lethaby 1892: 254-272; Prussin 1999: 428]. Frequently, they are considered to be the mother or father of the world or of man. Both

housing and environment possess ‘body’ and ‘mind’, illustrating the physical and the spiritual realm they combine. These huge living beings show a form of metabolism. Metaphorically speaking, they breathe, eat and drink, store, exude, excrete, and reproduce. Sometimes these ideas (air and moisture exchange, thermal regulation, etc.) anticipate knowledge of today’s discipline of building biology expressed in a symbolical, mythical, and ritual language. The dwelling organisms are formed, grow, degenerate, and perish. A worship building of the Bernburger culture, Germany (ca. 3,100-2,650 B.C.) was decorated with breasts made of loam (on display at the Landesmuseum für Vorgeschichte Halle, Sachsen-Anhalt, Germany). Within the building, spirals and stools (thrones of gods) all made of loam indicate that the structure was related to a power place. This is comparable to the Toraga house at Talonge, Ulusalu [Nooy-Palm 2001], where a pair of breasts, symbolizing fertility and the house’s founding ancestress, decorates the façade. The central ‘navel’ post also features breast sculptures. The Kayapo (Brazil, South America) conceive the individual, the domestic household, and the villages as interwoven natural matter and fluxes, a spatiotemporal cosmological fabric and socio-cultural processes [Turner 1993]. There is a tripartite horizontal stratum (space) fixing concentric areas of socialized, transitional and savage spheres, which are characterized by cyclical and reversible transformations in and out. Moreover, a vertical realm (time), exemplified by the sun’s course from East to West, is responsible for linear and irreversible events.



Together they cyclically produce and destroy human culture within nature. Similar ideas are realized in Austronesian houses [Fox 2006: 146, 229-230] and the Balinese structures of house, court and village [Tan 1967: 443-444, 468]. The Bantu (Africa) consider the house as a living organism whose main organs are comparable to those of a human: The dwelling possesses a head, arms, navel, genitals, legs and feet, and an anus [Tan 1967: 453]. The Taberma (Togo, Africa) rather similarly look upon their houses (fig. 7) [Preston Blier 1981: 111, 1983]). The Bantu and Chewa (Africa) linked the women’s house with the female body, the related processes of menstruation, maturity, and birth (including death), and cosmological concepts [Comaroff 1985; Taylor 1993; Kaspin 1996: 570-571].

Fig. 7 (left). The Taberma (Africa) consider the house as a living organism with organs like those of a human [Preston Blier 1983: 374, fig. 5, drawing by Donn Thompson]

In the archaic view, the constructive components of a dwelling or a cultic building especially illustrated the body parts of the habitations’ organism. The primary structure was expressly associated with a living being’s skeleton, sustaining and keeping together the creature [Henderson and Ostler 2005; W. Müller 1982: 167-168]. The framework of a building and the ancestors of a human clan were considered analogous: both bear the

burden of being responsible for the stability of the entity. The ancestors established the chain of descendants, guided the clan into the future, accompanied it from place to place, and protected it [Geertz 1984; Griaule 1966: 40-56, 101-107, 109-124; Rabuzzi 1987: 4106; Werness 2003: 68-69]. Hence the building's primary structure was especially thought to embody the ancestors. The deceased, in their role as forebears, continued to influence the world of the living. They assembled together with the living beneath the same roof of a common cosmic house, whose replica is the terrestrial structure. Their remains are buried beneath the floor or within the walls, supporting elements and other architectural components of the dwelling. Hence they essentially transform into the building stock. They not any more are agents in the space defined by the housing, but in its structural design. They don't exist within the spatiotemporal interior of the world, but in a commentary exterior sphere. Though it is a hidden realm normally imperceptible only to a chosen few, it nevertheless encompasses and sustains the manifest world. The ulterior reality of the dead isn't another world separate from the one we perceive in everyday life [Hentze 1961: 14-22].

The identification of a residential or cultic building as a whole or in its parts with a living organism consequently conveys the idea that it must be tamed, treated with care and periodically purified and fed [Henderson and Ostler 2005: 155-156, 172-173; Stuart 1998: 393; Werness 2003: 135]. Moreover, rituals of founding, renewal, and dedication served to vivify the sphere of habitation or the structure by cosmic powers, to establish order and to animate the living space [Stuart 1998: 395]. Ritual processions especially related to the structures and the landscape, time-factored by the biotope or astronomical phenomena, served to animate and empower the house, the cultic building or the court, and to renew cosmogony [Barnatt 1998: 93, 96; W. Müller 1982: 79-80, 125, 166]. Ancient peoples developed a rich symbolism with many myths and rituals related to foundation laying, renovation and dedication of dwellings, cultic buildings, settlement areas or whole landscapes. According to archaic concepts, if one wants to reside in a given location or area without being harmed, it must be ordered, vivified by appropriate natural forces and protected from threatening danger and destroying forces by activating vital power, [Stuart 1998: 395; Houston 1996: 132-151]. The tradition of building sacrifices is related to this understanding [Beilke-Voigt 2007; Dinzlacher 2000: 247, 300; Hinz 1976: 111-112; Merrifield 1987; Irwin 1982; Schmidt 2001: 25-34; Stübe 1987].

### ***Housings as containers of transfiguration: cave, house, temple, and grave***

Ethnological and archaeological data as well as the comparative mythology show that man at least as far back as the Upper Palaeolithic period (ca. 40,000 to 10,000 years ago) caves were considered to be like a woman's womb with the internal and external female genitals [M.A. Rappenglück 2005b, 2007, 2009]. The cave embodied the matrix of the Great Mother of the cosmos, who inseminated by male powers, creates and destroys the diverseness of the world. Archaic cultures symbolically identified a vessel (a pot, an oven, an alchemistic furnace) as well as artificial architectural structures (tents, houses, sacred and lordly buildings, graves) as mesocosmic and microcosmic replicas of the original cosmic container [Ehrich 1948; Hentze 1961; Hugh-Jones 1993; Rawson 1999; Kay and Sabo 2006: 33, 39]. They all illustrated the outer and the inner structure of the world, running parallel to the physical body and the psychonoetic essence of a human being [Paul 1976; Snodgrass 1985; Rappenglück 2005b, 2007, 2009]. They were all thought to be special vessels for a peculiar change transforming body and mind from the level of temporal life to transcendent realms (fig. 8).



Fig. 8. House urn, ninth-eighth century B.C., Northern and Middle Italia, Innsbruck. Museum [M. A. Rappenglück 2011]

Hence death is considered to be a transition from one housing to another one (fig. 9a-b). For that to happen, it is necessary to open the limitations of the sphere of life to be born at a new level of existence. Ancient cultures symbolized this idea in architectural elements meant to be passed through, such as a stone or wooden spirit hole, a false portal, a vulva, or the gaping jaws of an animal [Hentze 1961: 71-73, 135-137].

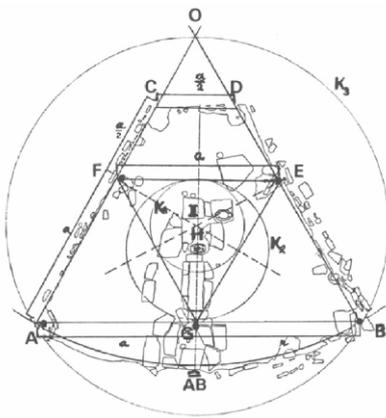


Fig. 9a (left) Example of a hut (level I a, No. 37) at Lepenski Vir (Majdanpek, Serbia), 6,200–5,400 B.C. [M. A. Rappenglück 1995: 13, fig. 8];

Fig. 9b (right) House of Palau, showing the path of the ancestors along the Milky Way through different cosmic strata [M. A. Rappenglück 2010]

At Lepenski Vir (Majdanpek, Serbia), 6,200-5,400 cal B.C., houses and burials have been found, which reflect some of the cosmographic symbolism (fig. 9a) that combines and relates several of the ideas mentioned above, such as the human body, the house, the grave, the hearth, the navel, the cycle of life, death, and rebirth, the alignment of the object with the cardinal directions, etc. [M.A. Rappenglück 1995]. The dwellings were constructed as trapezoids, according to geometrical rules and astronomical aligning along the cardinal points. At the centre of each building a special stone was intentionally set very close to the hearth. The dead had been buried so that their body with flexed legs formed a trapezoid, mirroring the shape of the houses and likewise aligned to the cardinal

points. From the way of construction one can derive a ‘ritual of the rope’, which is known from the old Indian scripture of the Sulbasutras (fifth century B.C.) and related to cosmomagical rituals. Moreover, the structures were grouped following a binary division upstream and downstream [Radovanović 2000: 339].

### *The Embedding of the Settlement into the Environment*

There is archaeological evidence which shows that the design of structures (dwellings, cultic and lordly buildings, settlements, graves) or the selection of particular sacred places (striking rocks, hills, mountains, sources, lakes, rivers, coastlines, and caves) is not casual. Instead, these activities conform to certain ideas about order and orientation [Carrasco 1981; Meyer 1978; Kalland 1996; O’Brien 2002; Singh 2009; Vastokas 1969; Wheatley 1971]. This holds true for sacred landscapes, in which structures like those just mentioned are embedded and related to each other. Again ancient people applied the concept of a living entity having specified organs at different locations, to the environment in which the settlement is embedded (figs. 10, 11).

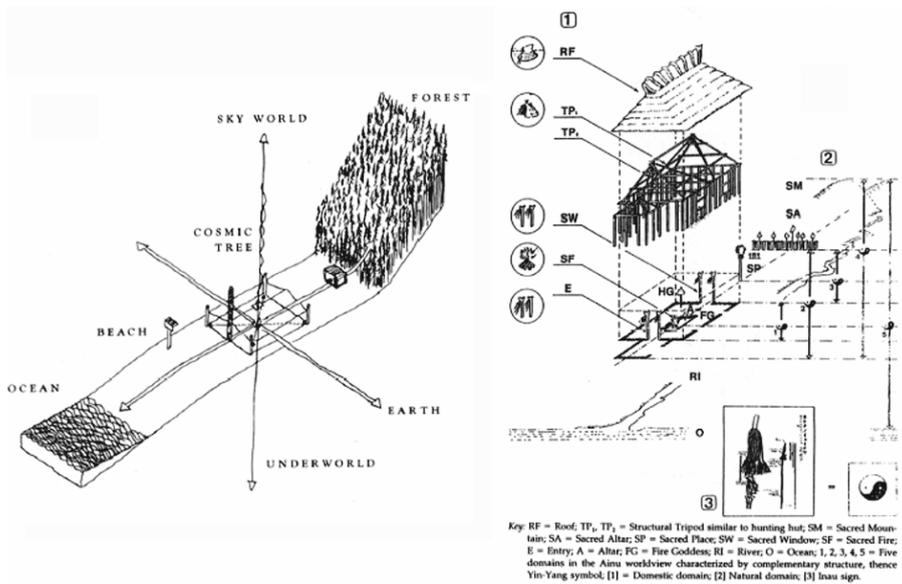


Fig. 10. a, left) Haida: houses represent the structure of the world divided into three cosmic layers around a central world-axis, orientated between the Ocean and the Forest. A giant tree piercing through the smoke hole is the world axis, which links the tripartite cosmos vertically. The cycle of life and death is related to the three horizontal realms [Werness 2003: 68-69]; b, right) Elements of the Ainu house and the cosmography of the sacred landscape [Egenter 2003: 124, fig. 4]



very complex architectural structures illustrate the profound relationships between biological, anthropological, socio-political, religious and cosmographical (cosmological, cosmogonic) concepts all converging in the ecosystem of a culture. Among a range of structures (Hindu and Buddhist stupas [Bénisti 1960; Snodgrass 1985, 1990], premodern Islamic architecture [Akkach 2005], Gothic cathedrals [Painton 1979], Renaissance architecture [Sack 1976: 317], and others) Angkor Wat, built from 1113 to about 1150 A.D. [Mannika 1996], is an outstanding, still existing example of cosmographic multifacetedness.

By now, everyday architectural design has by and large lost these cosmo-anthropological dimensions. Power feeding, artificial light, and temperature regulations of contemporary buildings as well as structural engineering have persuaded people that man is decoupled from and independent of natural conditions. Although the ecological movement has posed some resistance to this (as for example a renewal of the heliotrope alignment of structures), the cosmovisional awareness of people who don't live in close touch with nature has vanished.

Here and there, however, quite a number of people have tried to translate results and ideas of contemporary natural sciences into architectural interpretations [Jencks 1995; Masaharu 1998] (fig. 12).

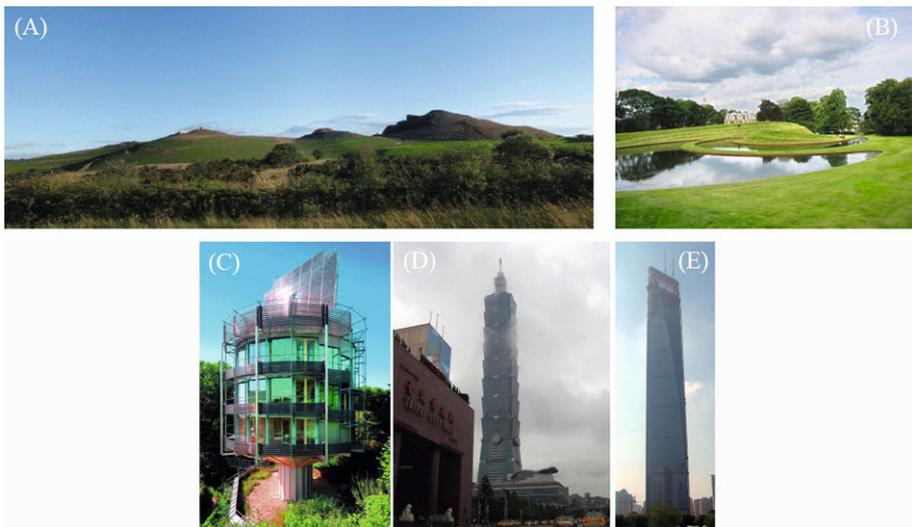


Fig. 12. A) Charles Jencks: Under construction is Northumberlandia (the 'Goddess of the North') near Cramlington, England, a gigantic land sculpture (1.5 million tons of soil, 34 m high, 400 m long) of a recumbent female, emerging from the ground. Source: en.wikipedia.org;

B) Charles Jencks: *Landforms*, Scottish National Gallery of Modern Art, Edinburgh, UK, 2004. Source: Gerardus 2002, en.wikipedia.org;

C) Heliotrope in Freiburg. Source: Andrewglaser 2009, en.wikipedia.org;

(D) Taipei 101 as seen from Sun Yat Sen Memorial Hall. The skyscraper is aligned with the cardinal directions. Its construction is based on the Chinese lucky number eight and the feng shui doctrine. Source: Shajksd 2007, en.wikipedia.org;

E) The Shanghai World Financial Centre in Shanghai, China. The construction follows Chinese symbolism: Earth as a square and the sky as a circle. A 'moon gate', shaped trapezoid, is placed at the top of the 492 m high tower. A 'sky bridge' span across the 50-meter-wide opening. Source: Tee Ming 2007, en.wikipedia.org

Others have attempted to resurrect archaic cosmographic ideas in a modern way of doing as a kind of new *Cosmic Architecture* [Mozuna 1978]. James Turrell has launched the Skyspace (2007) and the Rodin Crater Project (2011) to revive a new consciousness of the powers of nature, especially concerning the sky [Penprase 2011: 234-237]. Finally some of the highest skyscrapers in the world, built in China, embody a certain astronomical symbolism [Penprase 2011: 229]. The anthropological need to embed culture in nature is still relevant. The archetypal language, though sometimes unobvious, is also present. It is, however, a challenge to realize a few of the archaic ideas, combined with modern scientific knowledge, in architectural structures at least at public places.

## References

- ACKERMAN, Phyllis. 1953. The Symbolic Sources of Some Architectural Elements. *Journal of the Society of Architectural Historians* **12**, 4: 3-7.
- AKKACH, Samer. 2005. *Cosmology and Architecture in Premodern Islam. An Architectural Reading of Mystical Ideas*. Albany: State University of New York Press.
- APPLEGATE, Richard B. 1979. The Black, the Red, and the White: Duality and Unity in the Luiseño Cosmos. *Journal of California and Great Basin Anthropology* **1**, 1: 71-88.
- ASHMORE, Wendy. 1991. Site-Planning Principles and Concepts of Directionality among the Ancient Maya. *Latin American Antiquity* **2**, 3: 199-226.
- AVENI, Anthony. 2008. The House, the family, and the sky. Pp. 111-128 in: *Foundations of New World Cultural Astronomy: A Reader With Commentary*, Anthony Aveni, ed. Colorado: University of Colorado Press.
- BACHTIN, Michail M. 2008. *Chronotopos*. Frankfurt am Main: Suhrkamp.
- BANNING, E. B. 2003. Housing Neolithic Farmers. *Near Eastern Archaeology* **66**, 1/2: 4-21.
- BARNATT, John. 1998. Monuments in the Landscape: Thoughts from the Peak. Pp. 92-105 in *Prehistoric Ritual and Religion*, A. Gibson and D. Simpson, eds. Stroud: Sutton.
- BARNATT, John and Mark Edmonds. 2002. Places Apart? Caves and Monuments in Neolithic and Earlier Bronze Age Britain. *Cambridge Archaeological Journal* **12**, 1: 113-129.
- BECK, Roger. 2010. *The Religion of the Mithras Cult in the Roman Empire. Mysteries of the Unconquered Sun*. New York: Oxford University Press.
- BEILKE-VOIGT, Ines. 2007. *Das Opfer im archäologischen Befund. Studien zu den sog. Bauopfern, kultischen Niederlegungen und Bestattungen in ur- und frühgeschichtlichen Siedlungen Norddeutschlands und Dänemarks*. Berliner Archäologische Forschungen, vol. 4. Rahden/Westfalen.
- BELMONTE, Juan Antonio and Mauro Peppino ZEDDA. 2005. Light and Shadows on the Pyramids. Pp. 188-196 in: *Lights and Shadows in Cultural Astronomy*, M. P. Zedda and J. A. Belmonte, eds. Isili: Associazione Archeofila Sara.
- BELMONTE, Juan A. and Mosalam SHALTOUT. 2005. On the orientation of ancient Egyptian temples: (1) upper Egypt and lower Nubia. *Journal of the History of Astronomy* **36**: 173-192.
- BÉNISTI, Mireille. 1960. II. Étude sur le stūpa dans l'Inde ancienne. *Bulletin de l'Ecole française d'Extrême-Orient* **50**, 1: 37-116.
- BLANCHARD, Katie. 2010. Maya in the Mountains: Ecology and Cosmology in the Rocks and Caves of Highland Guatemala. 2010. Carleton College, Sociology and Anthropology in Guatemala and Chiapas, Field Research Paper Archives. [apps.carleton.edu/curricular/ocs/guatemala/assets/Blanchard.pdf](http://apps.carleton.edu/curricular/ocs/guatemala/assets/Blanchard.pdf). Accessed 04/08/2013.
- BOIVIN, Nicole. 2004. Landscape and Cosmology in the South Indian Neolithic: New Perspectives on the Deccan Ashmounds. *Cambridge Archaeological Journal* **14**, 2: 235-257.
- BOLLNOW, Otto Friedrich. 2011. *Human Space*. London: Hyphen Press.
- BOURDIEU, Pierre. 1970. The Berber house or the world reversed. *Social Science Information* **9**, 2: 151-170.
- Bradley, Richard. 2002. *The Past in prehistoric societies*. London: Routledge.
- BROWN, Linda A. 2004. Dangerous Places and Wild Spaces: Creating Meaning with Materials and Space at Contemporary Maya Shrines on El Duende Mountain. *Journal of Archaeological Method and Theory* **11**, 1: 31-58.

- CARRASCO, David. 1981. City as Symbol in Aztec Thought: The Clues from the Codex Mendoza. *History of Religions* 20, 3: 199-223.
- CASAJUS, M. Dominique. 1981. La tente et le campement chez les Touareg Kel Ferwan. *Revue de l'Occident musulman et de la Méditerranée* 32: 53-70.
- CASEY, Edward S. 1998. *The Fate of Place: A Philosophical History*. Berkeley: University of California Press.
- CHEVALIER, Jean and Allain GHEERBRANT. 1996. *Dictionary of Symbols*. London.
- CLOTTES, Jean. 2003. *Return to Chauvet Cave: Excavating the Birthplace of Art: The First Full Report*. London: Thames & Hudson.
- COOMARASWAMY, Rama P. 1977. *The Door in the Sky. Coomaraswamy on Myth and Meaning*. Princeton: Princeton University Press.
- COMAROFF, Jean. 1985. *Body of Power, Spirit of Resistance: The Culture and History of a South African People*. Chicago: University of Chicago Press.
- CRANDALL, David P. 1996. Female over Male or Left over Right: Solving a Classificatory Puzzle among the Ovahimba. *Africa: Journal of the International African Institute* 66, 3: 327-348.
- DINZELBACHER, Peter. 2000. *Handbuch der Religionsgeschichte im deutschsprachigen Raum II*. Paderborn: Ferdinand Schöningh.
- DOMENIG, Gaudenz. 2008. Timber orientation in the traditional architecture of Indonesia. *Bijdragen tot de Taal-, Land- en Volkenkunde* 164, 4: 450-474
- DONLEY, Linda W. 1987. Life in the Swahili Town House Reveals the Symbolic Meaning of Spaces and Artefact Assemblages. *The African Archaeological Review* 5: 181-192.
- DUIN, Renzo S. 2002/2003. Wayana architectuur in zuidoost-Suriname: bouwen naar de oorsprongsmythe. *SOJAbundel 2002/2003*: 41-51.
- EGENTER, Nold. 1980. *Bauform als Zeichen und Symbol. Nichtdomestikales Bauen im japanischen Volkskult*. Zürich.
- . 1989. *The Master of the Wilderness, the bear, lives in the upper part of our home. House and World-view of the Ainu*. Zürich.
- . 2001. The Deep Structure of Architecture and Human Evolution. Pp. 43-81 in *Architectural Anthropology*, Mari-Jose Merlinck, ed. Westport (CT) and London: Bergin & Garvey.
- EHRICH, Paula. 1945. Die vorgeschichtlichen Totenhäuser und der Hausgedanke im Bestattungsbrauch. Doctoral thesis, University of Hamburg.
- EISLER, Rudolf. 1910. *Weltenmantel und Himmelszelt. Religionswissenschaftliche Untersuchungen zur Urgeschichte des antiken Weltbildes*. 2 vols. Munich: C. H. Beck.
- ESTEBAN, César and J. Emili Aura TORTOSA. 2001. The winter sun in a Palaeolithic cave: La Cova del Parpalló. Pp. 8-14 in: *Astronomy, Cosmology and Landscape*, C. Ruggles, F. Prendergast and T. Ray, eds. Bognor: Ocarina Books.
- FEELEY-HARNIK, Gillian. 1980. The Sakalava House (Madagascar). *Anthropos* 75, 3/4: 559-585.
- FOX, James J. 2006. *Inside Austronesian Houses. Perspectives on domestic designs for living*. Canberra: ANUE Press / The Australian National University.
- FRANK, Rozlyn M. 2001. Hunting the European sky-bears: the Candlemas Bear Day and World Renewal Ceremonies. Pp. 133-157 in: *Astronomy, Cosmology, and Landscape*, C. Ruggles, F. Prendergast and T. Ray, eds. Bognor Regis: Ocarina Books.
- FREIDEL, David, Linda SCHELE, and JOY Parker. 1993. *Maya Cosmos: Three Thousand Years on the Shaman's Path*. New York: Morrow.
- GARCÍA-GOYCO, Osvaldo. 2007. The Mapa de Cuauhtinchan No. 2 and the Cosmic Tree in Mesoamerica, the Caribbean, and the Amazon-Orinoco Basin. Pp. 357-387 in: *Cave, City, and Eagle's Nest. An Interpretive Journey through the Mapa de Cuauhtinchan No. 2*, D. Carrasco and S. Sessions, eds. Albuquerque: University of New Mexico Press.
- GEERTZ, Armin W. 1984. A Reed Pierced the Sky: Hopi Indian Cosmography on Third Mesa, Arizona. *Numen* 31, 2: 216-241.
- GOODISON, Lucy. 2004. From tholos tomb to Throne Room: some considerations of dawn light and directionality in Minoan buildings. *British School at Athens Studies* 12: 339-350.
- GRIAULE, Marcel. 1966. *Dieu d'Eau*. Paris: Fayard.

- GRIFFIN-PIERCE, Trudy. 1992. *Earth is My Mother, Sky is My father. Space, Time and Astronomy in Navajo Sandpainting*. Albuquerque: University of New Mexico Press.
- Gullov, Hans Christian and Martin Appelt 2001. Social bonding and shamanism among Late Dorset groups in High Arctic Greenland. Pp. 146-162 in: *The Archaeology of Shamanism*, N. Price, ed. London & New York: Routledge.
- Heilbron, John L. 2003. *Astronomie et églises*. Paris: Belin.
- Heimpel, Wolfgang. 1986. The Sun at Night and the Doors of Heaven in Babylonian Texts. *Journal of Cuneiform Studies* **38**, 2: 127-151.
- HELMS, Mary W. 2002. Sacred Landscape and the Early Medieval European Cloister. Unity, Paradise, and the Cosmic Mountain Reviewed work(s). *Anthropos* **97**, 2: 435-453.
- HENDERSON, Hope and Nicholas OSTLER. 2005. Muisca settlement organization and chiefly authority at Suta, Valle de Leyva, Colombia: A critical appraisal of native concepts of house for studies of complex societies. *Journal of Anthropological Archaeology* **24**: 148-178.
- HENTZE, Carl. 1961. *Das Haus als Weltort der Seele*. Stuttgart: Klett.
- HINZ, H. 1976. Bauopfer. Pp. 111-112 in: *Reallexikon der Germanischen Altertumskunde* Bd. 2 Berlin.
- HODDER, Ian. 2006. *The Leopard's Tale. Revealing the Mysteries of Çatalhöyük*. London: Thames & Hudson.
- HORI, Ichiro. 1966. Mountains and Their Importance for the Idea of the Other World in Japanese Folk Religion. *History of Religions* **6**, 1: 1-23.
- HOUSTON, Stephen D. 1966. Symbolic Sweatbaths of the Maya: Architectural Meaning in the Cross Group at Palenque, Mexico. *Latin American Antiquity* **7**, 2: 132-151.
- HUGH-JONES, Christine. 1979. *From the Milk River*. Cambridge: Cambridge University Press.
- HUGH-JONES, Stephen. 1993. Clear Descent or Ambiguous Houses? A Re-Examination of Tukanooan Social Organisation. *L'Homme* **33**, 126-128: 95-120.
- HULTKRANZ, Åke. 1987. Diversity in Cosmology: The Case of the Wind River Shoshoni. *The Canadian Journal of Native Studies* **VII**: 285-290.
- HUXLEY, Margaret. 2000. The Gates and Guardians in Sennacherib's Addition to the Temple of Assur. *Iraq* **62**: 109-137.
- IRWIN, John C. 1982. The Sacred Anthill and the Cult of the Primordial Mound. *History of Religions* **21**, 4: 339-360
- IVANOV, Vjaeslav Vsevolodovi: Gerade und Ungerade: Die Asymmetrie des Gehirns und der Zeichensysteme. Stuttgart: Hirzel S. Verlag, 1983.
- IWANISZEWSKI, Stanislaw. 1996. Archaeoastronomical investigations at Biskupin, Poland (Early Bronze Age enclosure and Early Iron Age settlement)—first results. Pp. 85-92 in: *Archaeoastronomical Traditions in Past Cultures*, V. Koleva and D. Kolev, eds. Bognor Regis: Ocarina Books.
- JACOBI, Adolf. 1928. Der Baum mit den Wurzeln nach oben und den Zweigen nach unten. *Zeitschrift für Missionskunde und Religionswissenschaft* **43**: 78-85.
- JENCKS, Charles. 1995. *The Architecture of the Jumping Universe: A Polemic: How Complexity Science Is Changing Architecture and Culture*. Wiley-Academy.
- KALLAND, Arne. 1996. Geomancy and Town Planning in a Japanese Community. *Ethnology* **35**, 1: 17-32.
- KASPIN, Deborah. 1996. A Chewa Cosmology of the Body. *American Ethnologist* **23**, 3: 561-578.
- KAUFMANN, Eva-Maria. 2006. *Jakobs Traum und der Aufstieg des Menschen zu Gott. Das Thema der Himmelsleiter in der bildenden Kunst des Mittelalters*. Tübingen, Berlin: Wasmuth.
- KAY, Marvin and George SABO III. 2006. Mortuary Ritual and Winter Solstice Imagery of the Harlan-Style Charnel House. *Southeastern Archaeology* **25**, 1: 29-47.
- KING, Victor T. 1985. Symbols of Social Differentiation in Borneo. *Newsletter Museum Ethnographers Group* **18**: 8-20.
- KRUPP, Edwin C. 1983. *Echoes of Ancient Skies. The astronomy of lost civilizations*. New York and Oxford: Oxford University Press.
- . 1997. *Skywatchers, Shamans and Kings. Astronomy and the Archaeology of Power*. New York: Wiley.

- KUS, Susan and Victor RAHARIJAONA. 2000. House to Palace, Village to State: Scaling up Architecture and Ideology. *American Anthropologist*, New Series 1, 102: 98-113.
- LAMP, Frederick. 1985. Cosmos, Cosmetics, and the Spirit of Bondo. *African Arts* 18, 3: 28-43, 98-99.
- LAWRENCE, Denise L. and Setha M. LOW. 1990. The Built Environment and Spatial Form. *Annual Review of Anthropology* 19: 453-505.
- LEHNER, Erich. 1998. *Wege der architektonischen Evolution*. Vienna: Phoibos-Verlag.
- . 2006. *Ideen und Konzepte der Architektur in außereuropäischen Kulturen*. Vienna and Graz: Neuer Wissenschaftlicher Verlag.
- LETHABY, W.R. 1892. *Architecture, Mysticism and Myth*. London: Percival & Co.
- LEVENSON, Jon D. 1984. The Temple and the World. *The Journal of Religion* 64, 3: 275-298.
- LEWIS-WILLIAMS, James David. 2002. *The Mind in the Cave: Consciousness and the Origins of Art*. London: Thames & Hudson.
- LEWIS-WILLIAMS, James David and David PEARCE. 2005. *Inside the Neolithic Mind. Consciousness, Cosmos and the Realm of the Gods*. London: Thames & Hudson.
- LEWIS, R. Barry and Charles STOUT. 1998. *Mississippian Towns and Sacred Spaces. Searching for an Architectural Grammar*. Tuscaloosa: The University of Alabama Press.
- MABBETT, I. W. 1983. The Symbolism of Mount Meru. *History of Religions* 23, 1: 64-83.
- MALECKA, Anna. 1999. Solar Symbolism of the Mughal Thrones. A Preliminary Note. *Arts asiatiques* 54: 24-32
- MANNIKA, Eleanor. 1996. *Angkor Wat: Time, Space, and Kingship*. Honolulu: University of Hawai'i Press.
- MASAHARU, Takasaki. 1998. *An Architecture of Cosmology*. New York: Princeton Architectural Press.
- MCKHANN, Charles F. 1992. Fleshing out the Bones: The Cosmic and Social Dimensions of Space in Naxi Architecture. Ph.D. Thesis, University of Chicago.
- MEISTER, Michael W. 2000. Mountains and Cities in Cambodia: Temple Architecture and Divine Vision. *International Journal of Hindu Studies* 4, 3: 261-268.
- MERRIFIELD, Ralph. 1987. *The archaeology of ritual and magic*. London: Batsford.
- METEVELIS, Peter. 2000. The Lapidary Sky over Japan. *Asian Folklore Studies* 59: 79-88.
- MEYER, Jeffrey F. 1978. "Feng-Shui" of the Chinese City. *History of Religions* 18, 2: 138-155.
- MGUNI, Siyakha. 2006. Iconography of Termites' Nests and Termites: Symbolic Nuances of Formlings in Southern African San Rock Art. *Cambridge Archaeological Journal* 16, 1: 53-71.
- MILLER, Jay. 1979. A Strucnon Model of Delaware Culture and the Positioning of Mediators. *American Ethnologist* 6, 4: 791-802.
- MOZUNA, Monta. 1978. Theory of Cosmic Architecture. Pp. 80-85 in: *A new wave of Japanese architecture*. Institute for Architecture & Urban Studies, catalogue 10. New York: IAUS.
- MÜLLER, Klaus E. 1987. *Das Magische Universum der Identität. Elementarformen soziologischer Verhaltens, ein ethnologischer Grundriss*. Frankfurt a. Main/New York: Campus Verlag.
- MÜLLER, Werner. 1956. *Die Religionen der Waldlandindianer Nordamerikas*. Berlin: Reimer.
- . 1970. *Glauben und Denken der Sioux. Zur Gestalt archaischer Weltbilder*. Berlin: Reimer.
- . 1982. *Amerika - die Neue oder die Alte Welt?* Berlin: Reimer.
- NAUMANN, Nelly. 1971. *Das Umwandeln des Himmelspfeilers: ein japanischer Mythos und seine kulturhistorische Einordnung* (Asian Folklore Studies 5). Tokyo.
- NABOKOV, Peter and Robert EASTON. 1989. *Native American Architecture*. New York: Oxford University Press.
- NEEDHAM, Joseph, et al. 1980. *Science and Civilisation in China*. Cambridge: Cambridge University Press.
- NOOY-PALM, Hetty. 2001. The Ancestral House of the Sa'dan Toraja, Sulawesi, Indonesia. Pp. 145-169 in: *Architectural Anthropology*, Mari-Jose Merlinck, ed. Westport/London: Bergin & Garvey.
- O'BRIEN, William. 2002. Megaliths in a Mythologized Landscape. South-west Ireland in the Iron Age. Pp. 153-176 in: *Monuments and Landscape in Atlantic Europe. Perception and Society during the Neolithic and Early Bronze Age*, Chris Scarre, ed. London/New York: Routledge.

- OETELAAR, Gerald A. 2000. Beyond Activity Areas: Structure and Symbolism in the Organization and Use of Space Inside Tipis. *The Plains Anthropologist* **45**, 171: 35-61.
- OHNUKI-TIERNEY, Emiko. 1972. Spatial Concepts of the Ainu of the Northwest Coast of Southern Sakhalin. *American Anthropologist* New Series **74**, 3: 426-457.
- ONASCH, Konrad. 1979. *Lichthöhle und Sternenhaus. Licht und Materie im spätantik-christlichen und frühbyzantinischen Sakralbau*. Dresden: Verlag der Kunst Dresden.
- PAINTON, Cowen. 1979. *Die Rosenfenster der gotischen Kathedralen*. Freiburg, Basel, Vienna: Herder.
- PANDYA, Vishvajit. 1990. Movement and Space: Andamanese Cartography. *American Ethnologist* **17**, 4: 775-797.
- PARPOLA, Asko. 1985. *The Sky-Garment. A study of the Harrapan religion and its relation to the Mesopotamian and later Indian religions* (Studia Orientalia 57). Helsinki: Finnish Oriental Society.
- PÁSZTOR, Emilia. 2005. Sunshine in Bell Beaker's Houses: On the Orientation of the Houses of the Bell Beaker-Csepel Group. Pp. 116-123 in: *Lights and Shadows in Cultural Astronomy*, M. P. Zedda and J. A. Belmonte, eds. Isili: Associazione Archeofila Sara.
- PAUL, Robert A. 1976. The Sherpa Temple as a Model of the Psyche. *American Ethnologist* **3**, 1: 131-146.
- PENPRASE, Bryan E. 2010. *The Power of Stars. How Celestial Observations Have Shaped Human Civilization*. New York: Springer.
- PEVSNER, Nikolaus, Hugh Honour and John Fleming. 1999. *Lexikon der Weltarchitektur*. Munich, New York, London: Prestel.
- PLESSNER, Helmuth. 1975. *Die Stufen des Organischen und der Mensch*, 3rd ed. Berlin/ New York: Gruyter.
- PRESTON BLIER, Suzanne. 1981. The Dance of Death: Notes on the Architecture and Staging of Tamberma Funeral. *Anthropology and Aesthetics* **2**: 107-143
- . 1999. Non-Western Sacred Sites: African Models. *Journal of the Society of Architectural Historians* **58**, 3: 424-433
- . 1976. Fulani-Hausa Architecture. *African Arts* **10**, 1: 8-19, 97-98.
- Pugh, Timothy W. 2003. The Exemplary Center of the Late Postclassic Kowoj Maya. *Latin American Antiquity* **14**, 4: 408-430.
- RABUZZI, Kathryn Allen. 1987. Home. P. 4105 in: *Encyclopedia of Religion*, 2nd ed. Macmillan Reference USA.
- RADOVANOVIĆ, Ivana. 2000. Houses and Burials at Lepenski Vir. *European Journal of Archaeology* **3**, 3: 330-349.
- RAPPENGLÜCK, Barbara. 2004. The material of the solid sky and its traces in cultures. In: *The Inspiration of Astronomical Phenomena*, Nicholas Campion, ed. (Proceedings of the Fourth Conference on the Inspiration of Astronomical Phenomena, Magdalen College, Oxford, 3-9 August 2003). *Culture and Cosmos* **8**, 1-2: 321-331.
- RAPPENGLÜCK, Michael A. 1995. Lepenski Vir vor 7000 Jahren: Messen mit Schnur und Stab. Pp. 8-10 in *Zur Geschichte des Vermessungswesens* (VDV-Schriftenreihe, Der Vermessungsingenieur in der Praxis; 8), D. Klemp and H.-J. Lagoda, eds. Wiesbaden: Chmielorz.
- . 1999. *Eine Himmelskarte aus der Eiszeit? Ein Beitrag zur Urgeschichte der Himmelskunde und zur paläoastronomischen Methodik, aufgezeigt am Beispiel der Szene im Le Puits, Grotte de Lascaux* (Com. Montignac, Dép. Dordogne, Rég. Aquitaine, France), Munich: Peter Lang.
- . 2005a. The Pivot of the Cosmos: The Concepts of the World Axis across Cultures. In: *Cosmic Catastrophes*. Kõiva, M., Pustyl'nik, I. and Vesik, L., 160-161. Tartu.
- . 2005b. Cave and Cosmos, a Geotopic Model of the World in Ancient Cultures. Pp. 241-249 in: *Lights and Shadows in Cultural Astronomy*, M. P. Zedda and J. A. Belmonte, eds. Isili: Associazione Archeofila Sara.
- . 2006. The whole world put between to shells: The cosmic symbolism of tortoises and turtles. *Mediterranean Archaeology and Archaeometry* **4**, 3: 221-228.

- . 2007. Copying the cosmos: The archaic concepts of the cave across cultures. In: *Signaturen des Lebens: Bilder und Zeichen von Kosmos und Bios und Symbole des Alltags – Alltag der Symbole* (= Symbolon NF 16), Jung, H. and Rappenglück, M.A., eds., Frankfurt a. Main: Peter Lang
- . 2008. The “Domestication” of the World into a House and a Home: Cosmographic Symbolism as a Basic Expression of the Human Mind. Pp. 21-26 in *Cognitive Archaeology as Symbolic Archaeology*, Fernando Coimbra and George Dimitriades, eds. UISPP, Proceedings of the XV World Congress 23, BAR International Series 1737.
- . 2009. Constructing Worlds, Cosmovisions as Integral Parts of Human Ecosystems. Pp. 107-115 in *Cosmology across Cultures* (= ASP Conference Series, vol. 409), José Alberto Rubifio-Martin, et al, eds. San Francisco.
- . 2012. Weltgehäuse, Zur kosmographischen Symbolik von Höhle, Heiligtum und Haus. In: *Symbolon XIX* (Beinhauer-Köhler, Bärbel und Jung, Hermann, eds.).
- RASMUSSEN, Susan. 1996. The Tent as Cultural Symbol and Field Site: Social and Symbolic Space, ‘Topos’, and Authority in a Tuareg Community. *Anthropological Quarterly* **69**, 1: 14-26.
- RAWSON, Jessica. 1999. The Eternal Palaces of the Western Han: A New View of the Universe. *Artibus Asiae* **59**, 1-2: 5-58.
- RAY, Benjamin. 1977. Sacred Space and Royal Shrines in Buganda. *History of Religions* **16**, 4: 363-373
- REICHEL, Elisabeth. 1998. Die Öko-Politik im Schamanismus der Yukuna und Tanimuka vom nordwestlichen Amazonas. Pp. 25-95 in *Schamanische Wissenschaften. Ökologie, Naturwissenschaft und Kunst*. Franz-Theo Gottwald and Christian Rättsch, eds. Munich: Eugen Diederichs Verlag.
- REICHEL-DOLMATOFF, Gerardo. 1978. The Loom of Life: A Kogi Principle of Integration. *Journal of Latin American Lore* **4**, 1: 5-27.
- . 1982. Astronomical Models of Social behaviour among Some Indians of Columbia. Pp. 165-181 in *Ethnoastronomy and Archaeoastronomy in the American Tropics*, A. F. Aveni and G. Urton, eds. New York: New York Academy of Sciences.
- REICHEL, Hans. 1913. Der steinerne Himmel. *Indogermanische Forschungen* **32**: 23-57.
- RICHARDS, Colin. 1996. Life is not that simple: architecture and cosmology in the Balinese house. Pp. 173-184 in: *Neolithic Houses in Northwest Europe and Beyond*, T. C. Darvill and J. Thomas, eds. Oxford: Oxbow, 1996.
- . 1996. Monuments as Landscape: Creating the Centre of the World in Late Neolithic Orkney. *World Archaeology* **28**, 2: 190-208.
- RIST, Stephan, Juan SAN MARTIN and Nelson TAPIA. 1999. Andean cosmovision and self-sustained development. Pp. 144-156 in *Food for Thought: Ancient Visions and New Experiments of Rural People*, B. Haverkort and W. Hiemstraeds, eds. London: Zed Books Ltd.
- ROE, Peter G. 1982. *The Cosmic Zygote: Cosmology in the Amazon Basin*. New Brunswick: Rutgers University Press.
- ROSCHER, Wilhelm Heinrich D. 1913. *Omphalos. Eine philologisch-archäologisch-völkscundliche Abhandlung über die Vorstellungen der Griechen und anderer Völker vom ‚Nabel der Erde‘*. Berichte über die Verhandlungen der Sächsischen Gesellschaft der Wissenschaften zu Leipzig, Philologisch-historische Klasse 29, 9. Leipzig.
- . 1918. *Der Omphalosedanke bei verschiedenen Völkern, besonders den semitischen. Ein Beitrag zur vergleichenden Religionswissenschaft, Volkskunde und Archäologie*. Berichte über die Verhandlungen der Sächsischen Gesellschaft der Wissenschaften zu Leipzig, Philologisch-Historische Klasse 70, 2. Leipzig.
- . 1919. *Neue Omphalosstudien*. Berichte über die Verhandlungen der Sächsischen Gesellschaft der Wissenschaften zu Leipzig, Philologisch-Historische Klasse 71, 1. Leipzig.
- RUGGLES, Clive. 1999. *Astronomy in Prehistoric Britain and Ireland*. New Haven and London: Yale University Press.
- SACK, Robert David. 1976. Magic and Space. *Annals of the Association of American Geographers* **66**, 2: 309-322.

- SALOKOSKI, Märta. 2006. How Kings are Made – How Kingship Changes. A Study of Rituals and Ritual Change in Pre-Colonial and Colonial Owamboland Namibia. Ph.D. Dissertation, University of Helsinki.
- SCHMANDT-BESSERAT, Denise. 1980. Ochre in Prehistory: 300,000 Years of the Use of Iron Ores as Pigments. Pp. 127-150 in *The Coming of the Age of Iron*, Th. A. Wertime and J. D. Muhly, eds. New Haven and London: Yale University Press.
- SCHMIDT, Volker. 2001. Tierische und menschliche Bauopfer bei den Nordwestslawen. *Studia Mythologica Slavica* **IV**: 25–34.
- SCHROETER, Willy. 1998. *Indianische Wohnformen. Vom Tipi zum Pueblo. Vom Wickiup zum Hogan. Vom Langhaus zur Earth Lodge*. Wyk auf Föhr: Verlag für Amerikanistik.
- SELIN, Helaine. 2007. *Nature Across Cultures: Views of Nature and the Environment in Non-Western Cultures*, 2nd ed. Dordrecht: Springer Netherlands.
- SHAFER, Harry J. 1995. Architecture and Symbolism in Transitional Pueblo Development in the Mimbres Valley, SW, New Mexico. *Journal of Field Archaeology* **22**, 1: 23-47.
- SHORE, Bradd. 1982. *Sala'ilua: A Samoan Mystery*. New York: Columbia University Press.
- SHINER, Larry E. 1972. Sacred Space, Profane Space, Human Space. *Journal of the American Academy of Religion* **40**, 4: 425-436.
- SINGH, Rana P.B and John McKim MALVILLE. 2009. *Cosmic Order and Cultural Astronomy: Sacred Cities of India*. Newcastle upon Tyne: Cambridge Scholars Publisher.
- SINGH, Jai Pal and Mumtaz KHAN. 1999. Hindu Cosmology and the Orientation and Segregation of Social Groups in Villages in Northwestern India. *Geografiska Annaler. Series B, Human Geography* **81**, 1: 19-39.
- SINGER, S.J. and NICOLSON, Garth L.: The fluid mosaic model of the structure of cell membranes. *Science* **175** (4023), 1972: 720–731.
- SOFAER, Anna. 1997. *The Primary Architecture of the Chacoan Culture: A Cosmological Expression. Anasazi Architecture and American Design*. Baker H. Morrow and V. B. Price, eds. Albuquerque, NM: University of New Mexico Press.
- SNEDEGAR, Keith. 2000. Astronomical Practices in Africa South of the Sahara. Pp. 455-473 in *Astronomy across Cultures*, H. Selin, ed. Dordrecht: Kluwer Academic Publishers.
- SNODGRASS, Adrian. 1985. *The Symbolism of the Stupa*. Ithaca, New York: Cornell University.
- . 1990. *Architecture, Time and Eternity: A Studies in the Stellar and Temporal Symbolism of Traditional Buildings*. Sata-Pitaka Series vol. 356-357. South Asia Books.
- ŠPRAJC, Ivan. 2005. More on Mesoamerican Cosmology and City Plans. *Latin American Antiquity* **16**, 2: 209-216.
- STAHL, Peter W. 1985. Native American Cosmology in Archaeological Interpretation: Tropical Forest Cosmology and Early Valdivia Phase at Lomo Alta. Pp. 31-37 in *Status, Structure and Stratification: Current Archaeological Reconstruction*, M. Thompson, M. T. Garcia and F. Kense, eds. Calgary: University of Calgary Archaeological Association.
- STAUDACHER, Willibald. 1968. *Die Trennung von Himmel und Erde: Ein vorgriechischer Schöpfungsmythos bei Hesiod und den Orphikern*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- STEIN, Rolf A. 1987. *Le monde en petit: jardins en miniature et habitations dans la pensée religieuse d'Extreme-Orient*. Paris: Flammarion.
- STROSS, Brian. 1996. The Mesoamerican Cosmic Portal: An Early Zapotec Example. *Anthropology and Aesthetics* **29/30**: 82-101.
- STUART, David. 1998. *The Fire Enters His House. Architecture and Ritual in Classic Maya Texts*. Washington, D.C.: Dumbarton Oaks Research Library and Collection.
- STÜBE, R. 1987. Bauopfer. Secs. 962-966 in *Handwörterbuch des deutschen Aberglaubens*, H. Bächtold-Stäubli and E. Hoffmann-Krayer, eds. Berlin/New York: Walter de Gruyter.
- SUGIYAMA, Saburo. 1993. Worldview Materialized in Teotihuacan, Mexico. *Latin American Antiquity* **4**, 2: 103-129.
- TAN, Roger Y. D. 1967. The Domestic Architecture of South Bali. *Bijdragen tot de Taal-, Land- en Volkenkunde* **123**, 4: 442-475.
- TAYLOR, Christopher. 1993. *Milk, Honey and Money*. Washington, DC: Smithsonian.

- TAUBE, Karl. 1998. The Jade Hearth: Centrality, Rulership, and the Classic Maya Temple. Pp. 427-478 in: *Function and Meaning in Classic Maya Architecture*, S. D. Houston, ed. Washington D.C.: Dumbarton Oaks Research Library.
- TILLEY, Christopher Y. 2000. *Metaphor and Material Culture (Social Archaeology)*. London: John Wiley & Sons.
- TRAUBE, Elizabeth G. 1986. *Cosmology and Social Life. Ritual Exchange among the Mambai of East Timor*. Chicago/London: University of Chicago Press.
- TREJO, Jesus Galindo. 2009. Mesoamerican Cosmology: Recent Finds. Pp. 255-256 in: *Cosmology Across Cultures (ASP Conferences Series 409)*. J. A. Rubiño-Martin, J. A. Belmonte, F. Prada and A. Alberdi, eds. San Francisco.
- TURNER, Terence. 1993. From Cosmology to Ideology: Resistance, Adaption and Social Consciousness among the Kayapo. In: *Cosmology, Values, and Inter-Ethnic Contact in South America*, Terence Turner, ed. South American Indian Studies 2. Bennington: Bennington College.
- VASTOKAS, Joan M. 1969. Architecture and Environment: The Importance of the Forest to the Northwest Coast Indian. *Forest History* 13, 3: 12-21.
- WANG, Eugene Y. 1999. What Do Trigrams Have to Do with Buddhas? The Northern Liang Stupas as a Hybrid Spatial Model. *Anthropology and Aesthetics* 35: 70-91.
- WATERSON, Roxana. 1988. The House and the World: The Symbolism of Sa'Dan Toraja House Carvings. *Journal of Anthropology and Aesthetics* 15: 34-60.
- WEAVER, Jace and Laura Weaver Adams. 2007. Indigenous Migrations, Pilgrimage Trails, and Sacred Geography. Pp. 335-355 in: *Cave, City, and Eagle's Nest. An Interpretive Journey through the Mapa de Cuauhtinchan No. 2*, D. Carrasco and S. Sessions, eds. Albuquerque: University of New Mexico Press.
- WELCHMAN-GECEO, David and Karen Ann WATSON-GECEO. 2001. Villagers Doing Indigenous Epistemology. *The Contemporary Pacific* 13, 1: 68-69.
- WENDELL, Charles. 1971. Baghdad: Imago Mundi, and Other Foundation-Lore. *International Journal of Middle East Studies* 2, 2: 99-128.
- WERNES, Hope B. 2003. *The Continuum Encyclopedia of Native Art. Worldview, Symbolism & Culture in Africa, Oceania & Native North America*. New York, London: Continuum International Publishing Group.
- WESLEY, Richard. 1998. The Idea of a House. *Anthropology and Aesthetics* 34: 118-127.
- WEYERSBERG, Maria. 1961. Das Motiv der ‚Himmelsstütze‘ in der altägyptischen Kosmologie. *Zeitschrift für Ethnologie* 86, 1: 113-140.
- WHEATLEY, Paul. 1971. *The Pivot of the four quarters, A preliminary enquiry into the origins and character of the ancient Chinese City*. Edinburgh: Edinburgh University Press.
- WHITEHEAD, N. L. 1998. Indigenous Cartography in Lowland South America and the Caribbean. Pp. 301-326 in: *The History of Cartography*, vol. 2, D. Woodward and G. M. Lewis, eds. Chicago and London: University Of Chicago Press.
- WHITRIDGE, Peter. 2004. Landscapes, Houses, Bodies, Things: 'Place' and the Archaeology of Inuit Imaginaries. *Journal of Archaeological Method and Theory* 11, 2: 213-250.
- WILBERT, Johannes. 1981. Warao Cosmology and Yekuana Roundhouse Symbolism. *Journal of Latin American Lore* 7: 37-72.
- WILSON, Peter J. 1988. *The Domestication of the Human Species*. New Haven: Yale University Press.
- ZEDDA, Mauro Peppino. 2005. When astronomical meaning goes beyond orientation and becomes architectural design. Pp. 31-38 in: *Lights and Shadows in Cultural Astronomy*, M. P. Zedda and J. A. Belmonte, eds. Isili: Associazione Archeofila Sara.
- ZUIDEMA, R. Tom. 1993. The Social and Cosmological Replication of the Upriver-Downriver Dichotomy in Incaic Cuzco. *South American Studies* 2: 63-66.

### ***About the author***

Michael A. Rappenglück, Dr. rer. nat. (history of sciences, history of astronomy) and M.A. (philosophy); \*1.12.1957 in Karlsruhe, Germany; Studies of philosophy, logic and theory of

sciences, Christian philosophy and theological propaedeutic at the Ludwig-Maximilian-University Munich; 1984 MA in Philosophy; studies of history of natural sciences, astronomy and systematical theology at the Ludwig-Maximilians-University Munich; 1998 Dr. rer. nat. in History of Natural Sciences; 2001-2009 Vice-President of the Society for Scientific Research of Symbols; Since 1990 general manager and head of the Adult Center Gilching, close to Munich; since 2004 research member of the Chiemgau Impact Research Team (CIRT); 2005-2011 Secretary of the Société Européenne pour l'Astronomie dans la Culture (SEAC); since 2011 President of the Société Européenne pour l'Astronomie dans la Culture (SEAC); Founder and director of the public observatories Adult Education Centre Fürstenfeldbruck (1989) und Adult Education Centre Gilching (2005); Since 2007 member of the Astronomical Society (Germany); 2008-2011 co-founder and secretary of the Society for Archaeoastronomy (Germany); since 2011 president of the Society for Archaeoastronomy (Germany); member of ISAAC; member of the IAU Working Group "Astronomy and World Heritage"; since 2011 president of the German Society for Archaeoastronomy.