

**A PALAEOLOGIC PLANETARIUM UNDERGROUND –
THE CAVE OF LASCAUX (PART 2)**

by

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Summary

Continuing the first part part which showed certain astronomical aspects of some rock pictures in the cave of Lascaux (near Montignac, Dép. Dordogne, France) I now present an overview about a very detailed analysis a complete cycle of paintings in the so-called "Well of the Dead Man" situated deep in the grotto. The scientific results base the suggestion that the hunter-gatherer people of Lascaux possessed a complete cosmography, which included certain conceptions of life. At approx. 14,500 BC, around midnight, summer-solstice day, an extraordinary view of the sky was visible: A triangle shaped by three prominent bright stars turned around the northern Pole Star δ Cyg in the Swan, which in those days was situated in the Milky Way. This unique position of the world axis pointing to the Galaxy may have motivated the people of Lascaux to develop a complete cosmography, based on an archaic kind of shamanistic-totemistic conceptions of the world and of life, related to hunter-gatherer economy. In that world view different experiences of the world and of man himself had been combined into a unified whole. In additions the research shows that the picture panel of the "Dead Man" also presents a fundamental instrument, which was used to take one's bearings and to get the time from the sky - a sundial. Moreover this device was closely related to an ancient world-view. Taken both parts of the whole research, it is suggested to belief that one function of the cave of Lascaux was to act as a kind of prehistoric planetarium, which at the same time was a sanctuary.

An archaic cosmography deep in the cave ("the Well")ⁱ

Far away from daylight, about 60 m after the entrance, one arrives at the entering into the so-called "well", which leads to a deeper layer of the galleries. During the Badegoulian and Magdalenian epoch man, using a 2 cm thick rope, twisted from plant fibres, climbed down from a ledge and arrived at the ground of the shaft 5 m deeper. Today one descends a step-ladder.

DOWN THERE you can see a panel of rock-picture, which without any doubt, is one of the strangest cave-paintings known from the Palaeolithic – the famous scene of the so-called "Dead Man" (ill. 9 a, c, d). Looking from East over North to West, the northern rock face shows the following sequence of paintings: A Bison with a peculiar mesentery hanging under his hindmost belly – two peculiar objects, which remind one of a spear and an arrow – a "bird-man" and a "bird-stick" – a 2 x 3 (or 3 x 2) matrix of six dots and two faded strokes below – and finally a woolly rhino. Almost vis-à-vis of the strange scene a incomplete wild horse (only the front part with the head and the line of the back are painted) is depicted on the southern rock face (ill. 9 b, c, d).

This impressive and enigmatic scene gave the researchers a lot of food for thought. It stimulated manifold, mostly unusual interpretations. The panel mostly was thought to be a depiction of a hunting, of an accident during a game, of a funeral monument of a ritual for the veneration of a dead person, of a sacrificial ritual, of a divination or of a very intensive hallucination. In addition sexual, magical, totemistic and shamanistic components were discovered. It also was supposed that certain celestial phenomena may be illustrated.

Each of these attempts to decode the strange scene have contributed to an understanding of certain parts of the panel. But the single points of view, which in part contradicted

each other, weren't balanced with the other ones. A really conclusive interpretation, which would have been able to integrate the most, hopefully all, of the explanations in a consistent view, was missing.

To solve the problem, my idea was, to develop a so-called „integral methodology“, which made it possible to expound the multileveled picture panel concerning its unity and at the same time to understand the different interpretations made so far. In the course of the scientific investigation it became clear, why a complete deciphering wasn't successful up to now: The picture composition illustrates a complex cosmography, which was developed by a Magdalenian culture living in the neighbourhood of the cave. This world view of Palaeolithic hunter-gatherers combined constituents of an archaic astronomy and their philosophy of life, based on an ancient kind of shamanism and totemism, in a multi-layered concept of the world.

The integral methodology is an interdisciplinary approach, which respects and relates data and procedures of archaeology, astronomy, ethnology, cartography, mathematics, mythology, phenomenology, science of art, science of religions, semiotics, symbolism and adjacent sciences.

IN PARTICULAR it was very important to include our knowledge about the life of Palaeolithic and present-day hunter-gatherers into the research work. It turned out that just the ancient shamanistic and totemistic traditions, handed down by people all over the world, allowed to understand the scene in the shaft as a kind of a cosmography.

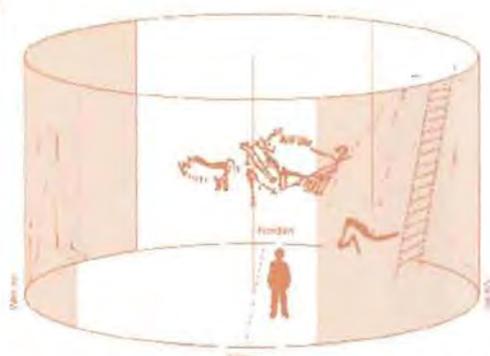
It is well-known, that among hunter-gatherer societies man or women live, who are gifted with high sensitive, creative, emotional and rational abilities. Aided by sophisticated methods, first of all, the trance, they can change their perception and mind specific in



(a)



(c)



(d)



(b)

III.9: The panorama of rock pictures in the “Well”, cave of Lascaux:

(a) northern wall, (b) southern wall, (c) ground-plan, (d) 3D-graphics, photos and graphics after Rappenglück, 1999: 54 (fig.30), 61 (fig.45), 62 (fig.46), 210 (fig.209).

such a way, that they get experiences, which helped them to establish welfare and well-being for the individual person and the community: These men and women, are called shamans by ethnology and science of religions. Shamanistic traditions were common world-wide. Still today they can be found occasionally. They belong to the most original styles of human culture and are rooted in Upper Palaeolithic cultures.

THE TYPE of the shaman combines versatile knowledge in one single person: He heals, that means his is an expert of life and soul, e.g. a medicine man. He handles with strong powers as a magician, priest, sorcerer. He teaches as a kind of a "scientist" and the "wise man" of a group. He is artistically active as a sculptor, poet, craftsman, painter, actor, singer, dancer. He also is worried about the basic living conditions of the members of his tribe: That means, he knows much about the adequate ways of economizing. He is legally trained. He is educator. He is defender of the group. He keeps the traditions: That means, he tells the history of the group, he reports the myths, he interprets the symbols, and he takes care of the rites. Thus the shaman works as a generalist and integralist for his community: He embodies the unity in diversity of feeling, thinking and action in very different fields. In the today's global world culture, which is characterised by a strong interweaving of science, technology, and economics, a top-class equipped "team" of experts, well-trained in different disciplines, would have to work instead of a shaman. The shaman therefore extensively takes care of the welfare of the individual person and the community. He discusses and accompanies both, and provide his unusual knowledge, first of all his ecstatic abilities, with them.

Shamans are not only masters of trance and spiritual healers, but also experts of cosmography. This fact is often neglected today, if people speak about shamanism. It isn't well known that they really followed the celestial phenomena closely, day and night.

In particular shamanistic healing was deeply related to certain concepts of the cosmos. Therefore a spiritual healer needed an excellent cosmographical knowledge. In their view the world is a space-time of interacting individual and collective beings. To know what place and time was best suited for acting in such an universe, and in particular for organizing the society, shamans observe the cosmic figures and structures, events and proceedings with high accuracy. Celestial phenomena are frequently connected with power animals, totems of a clan and with class systems. These are personified in single fixed and wandering stars, the constellations and in the Milky Way. The Pole Star itself as a supreme divinity and the circumpolar constellations in particular are considered to be the mighty lords of animals. Residing in the sky they represent the primeval cosmic archetypes of all living beings or objects on earth, which are permanently influenced and animated by them. In particular they are responsible for generating and increasing their number. Shamans want to arrange the communication between the heavenly and the earthly nature whenever it seemed to be disturbed. To re-establish the cosmic harmony they travel through the cosmic regions and seek contact with archetypal ancestors. Because hunter-gatherer societies want to preserve the fecundity of the beasts, they carefully look upon the cosmic totem animals. These served as spirit helpers and were asked for advice on important matters, in particular for help in healing.

TO CONTACT the primeval power and the prototypes of creatures, shamans look for places that contained both concentrated. They find them in peculiar landscapes, rock-shelters and grottos. Shamans go into power-caves - a term used by Southern Central California Natives - which in their belief contain the inner forces of nature and the creatures of other worlds. They are convinced to communicate there with the totem-ancestors and to read the mind-maps of the world, written on the rock walls. Shamans

enter the caves to travel through the cosmic strata and to learn more about the forces and structures of nature. There they believe to be inaugurated in secret knowledge and to acquire strength given by the cosmic power, which could help them to understand the processes of the world and to heal suffering beings. Being in the depth of a cave they consider to be at the very centre, heart and origin of the world, the womb of the universe.

THUS IT becomes clear why in ancient hunter-gatherer cultures maps of the sky and the earth much as calendars, which all were considered as holy, helped to regulate the life and to perform the rituals properly. Important times and locations at which myths had to be narrated, rituals celebrated and initiations executed, were fixed by celestial phenomena like the solstices and equinoxes, certain positions of stars, constellations or special events as for example comets.

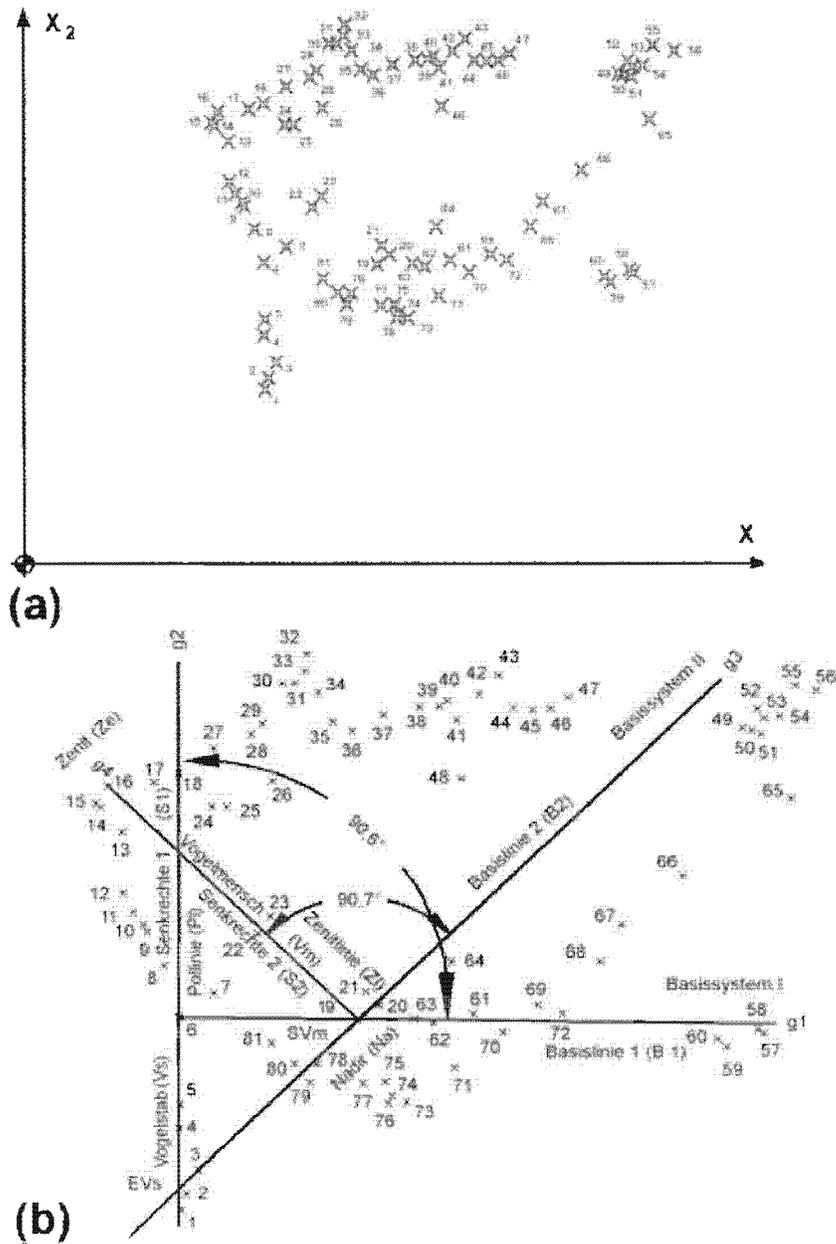
To determine the special times for the rituals, shamans observed very accurately the positions of the stars and constellations, their culminations (high / lower) and zenith distances in the course of the night and the year. They used them as a kind of "celestial clock", which allowed minute exactness. On hides, rods and plates made from very different material, the periods were recorded and connected with special historical events and cult requirements: Thus calendars had been established and kept.

At the sacred events and times shamans created and renewed rock pictures at particularly selected places, for example below rock-shelters (*abris*) and in caves. This is why pictograms and ideograms with astronomical and at the same time shamanistic meaning (healing ceremonies, transmutations) can be discovered frequently at those places. Celestial phenomena, rock art and shamanistic-totemistic conceptions are closely connected with each other.

The rock panel in the shaft shows certain elements, well-known from a shamanistic-totemistic world view, which indicate that there may be a kind of cosmography hidden in the depictions. This is confirmed by the astronomical meaning of straight lines and angles, which can be found in the central part of the scene and run parallel to the symbolical and mythical interpretation.

In the middle of the picture panel (ill. 9 a) the two hybrids attract attention very first: a "bird-stick" and an ithyphallic "bird-man" with spread out arms running into hands with four fingers. Showing both a bird head, they are strikingly similar to each other. Prominent are also the three "linear" objects, which each optical denote straight lines and to one another certain angles: the bird-stick, once again, the arrow and the spear. Thus on the one hand it was well-grounded to search for a symbolical-mythical meaning of the bird chimeras, and consequently also of the other constituents of the scene. But on the other hand it was necessary to prove a possibly existing geometry, which was embedded in parts or in the whole representation.

HOW DID I proceed? In a first stage it was necessary to describe all constituents of the picture panel as exactly as possible. Therefore a phenomenological approach was applied to ensure an image interpretation to a very large extent without prejudice. In a second stage a photogrammetric photo, centric taken from the middle part of the painting, was used to mark the essential elements of the scene, in particular the geometrical ones, scene by 90 points (ill. 10 a, b). Then a monocomparator (Kern MK2) was brought in to determine their coordinates. Based on this work a CAD-software helped to compute angles, to find geometrical shapes and to deduce a possible astronomical structure, which might be present in the picture panel. The results were amazing.



III. 10: (a) points in the central part of the scene in the “Well” had been determined by a monocomparator; (b) the two basic reference systems in the scene, both drawings in Rappenglück, 1999: 66 (fig.47), 104 (fig.95).

The key to decode the scene are the bird-stick and the bird-man in the middle of the northern rock face (ill. 9 a). These figures share certain similarities but also display crucial differences. To "read" the pictures, it is necessary to split the images into their elements, in one case the bird and the stick, in the other, the bird and the human body. Symbols and myths handed down by the people worldwide help to understand both bird-hybrids as ideograms. In particular the shamanistic-totemistic traditions of ancient and today's hunter-gatherers contain a lot of information concerning both of the chimeras. According to these concepts ascending and flying birds symbolise the wide areas of the air and the sky, the celestial bodies, the sun, the moon, the stars and the constellations moving in these upper spaces. Only they have the power to reach the highest points in the sky, the zenith and the pole, hovering there. Therefore they are often regarded as the dominating animal lords or gods of these celestial places and regions. Thus it seems probable that bird-hybrids in general symbolize the sky and in particular two important points there, the zenith and the celestial pole.

Seen from the bottom of the shaft the bird-stick seems to be drawn exactly vertical to an imaginative horizontal line (ill. 12 a). Then the bird-man appears to be inclined. Indeed the bird-stick is vertical as confirmed by attaching a plumb line. The hybrid also indicates true north (azimuth 0°), as measured with a nautical compass. Thus this strange thing gives the direction to the zenith (vertical line) and depicts a part of the meridian.

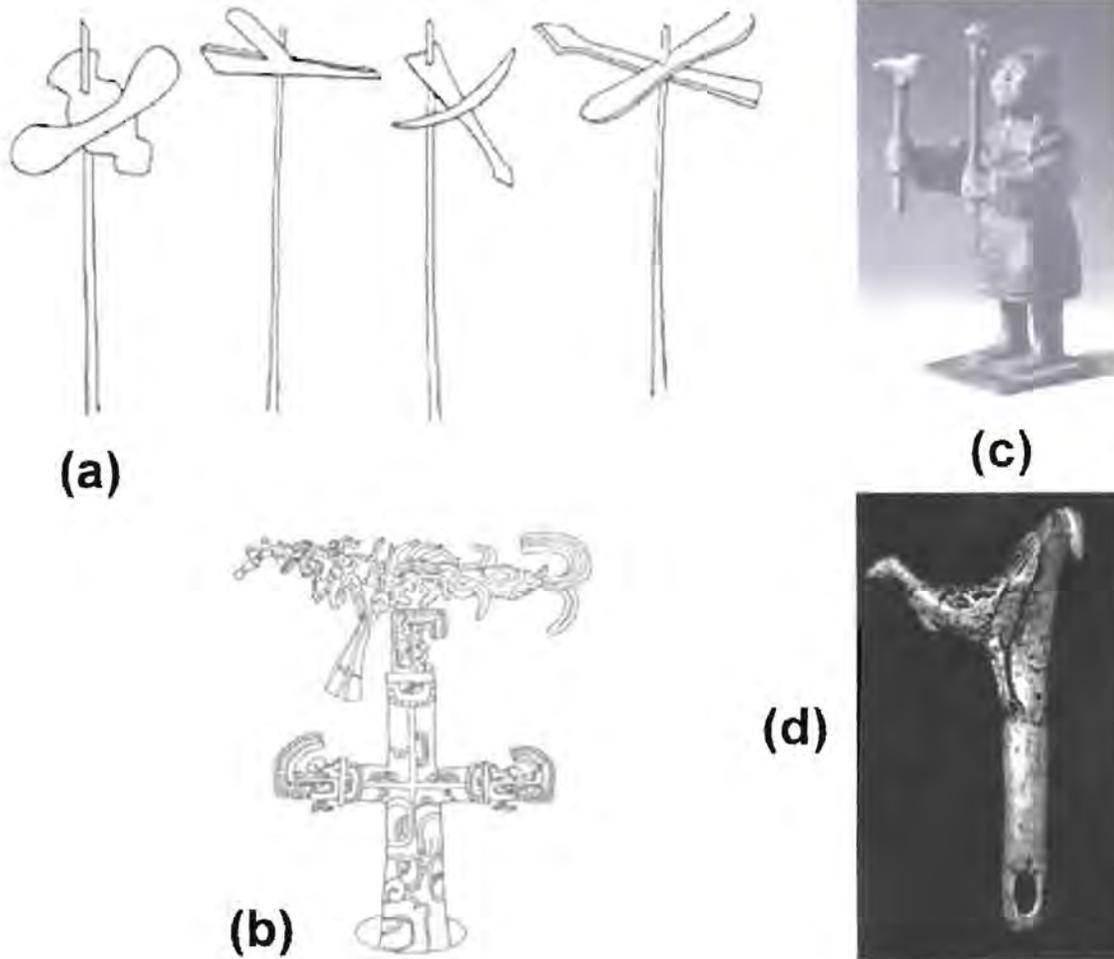
BIGGER AND smaller figure-posts crowned by birds were common in many ancient cultures worldwide (ill. 11 a, b, c). Some existed in the Magdalenian epoch, too (ill. 11 d). The bird, hovering above or sitting on a support, can be an eagle, a raven, a cock, a cuckoo, a crane, a quetzal or another species. The sticks are often replaced by a column, a cross, a mountain, a nail, a phallus, a pillar, a

pole, a plug, a sceptre, a temple, a tree or a vertebral column. Though the type of both parts of the hybrids varies, the idea remains the same: Such a figure-post symbolized the divine power of a particular location, the centre of an important area or the whole universe, at which the cardinal directions crossed each other. It was considered to be the cosmic axis extending from the centre to the highest point in the heaven. According to shamanistic view the figure-post was also thought to illustrate the connection of the different, mostly three, strata of the cosmos, which are the lower, the middle and the upper world. Thus bird-sticks represented an essential supporting framework of the universe.

BUT LOOKING at the scene from the access into the shaft the view changes significantly (ill. 12 b). Now the bird-stick appears to be inclined to a not explicit drawn baseline, running from the tip of the figure-post to the feet of the bird-man, who then seems to stand upright. This impression can be proved to be correct by computing the corresponding angles with the CAD-software (ill. 12 c): With reference to the above mentioned baseline the results are 90.7° for the angle between a straight line running through the body of the bird-man, from top to toe, and 45.3° for the oblique bird-stick. The last-named value makes one sit up: The cave of Lascaux is located at a latitude of 45.1° . Is this only pure chance or is there more to this that meets the eye?

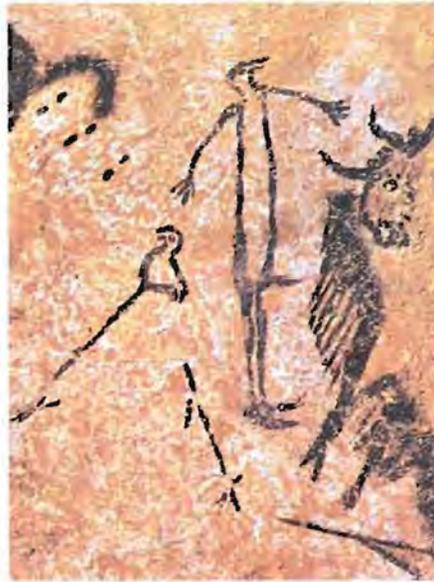
The answer can be given taking an astronomical view (ill. 13 a, b): The bird-stick points to the northern celestial pole above Lascaux ($\varphi: 45.1^\circ \text{ N} \mid \lambda: 1.2^\circ \text{ E}$), while the bird-man indicates a line from the zenith (Arabic: point of the top of the head) to the nadir (Arabic: point of the foot).

This idea is further supported by analysing the difference between the both bird-chimeras. The bird-stick can be comprehended as a creature which has only one single leg, while the bird-man shows

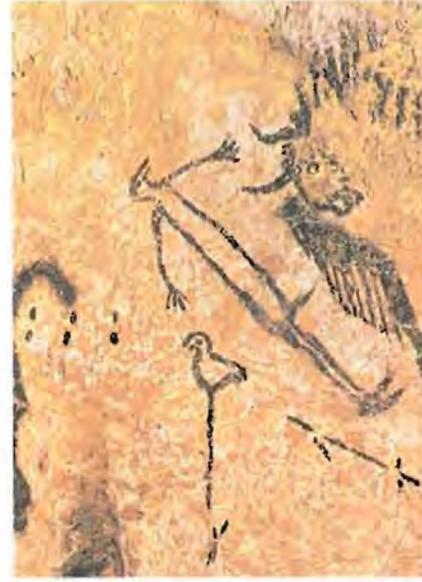


Ill. 11: (a) Bird-sticks of Evenki shamans, (b) Wacah chan, the cosmic tree of the Maya, is located in the centre of the universe, topped by a bird, (c) A young man holding a bird-sceptres in each hand, ca 400 BC, China, (d) bird-stick excavated in the cave of La Mas d'Azil (Com. Le Mas-d'Azil, Dép. Ariège, France).

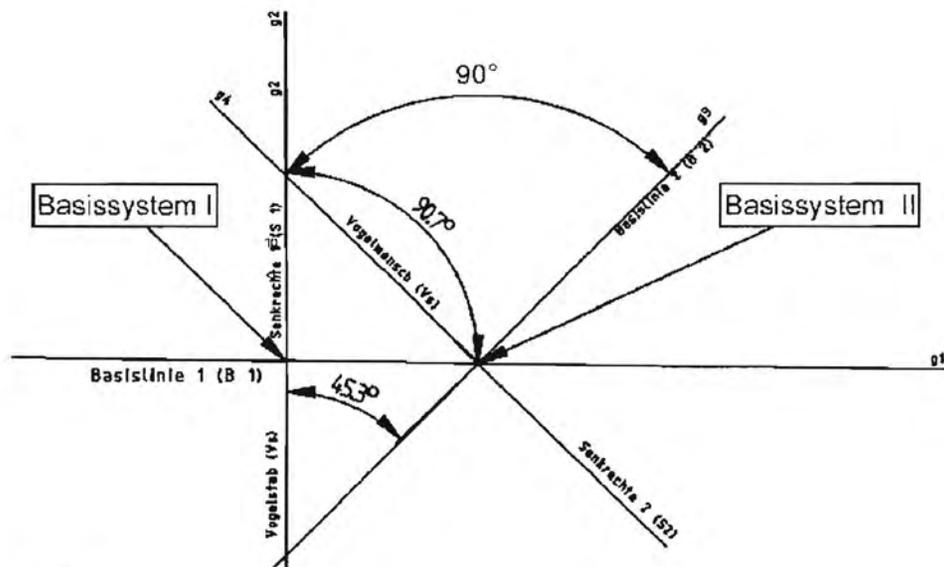
Pictures after Rappenglück, 1999: 93 (fig.76), 95 (fig.82), 107 (fig.97), 255 (fig.259).



(a)



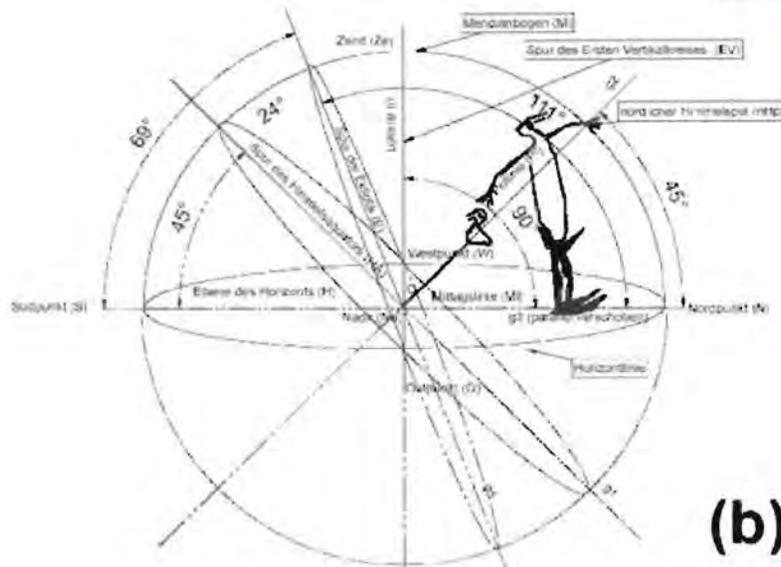
(b)



(c)

III. 12 (a) The bird-man stands upright, seen from the access into the shaft, (b) The bird-man is inclined, seen from the bottom of the shaft, (c) The two basic reference systems related to the bird-man and the bird-stick, after Rappenglück, 1999: 58 (fig.40), 102 (fig.89), 104 (fig.94).

(a)



(b)

III.13 (a) The bird-man stands upright, (b) The view from the eastern point; The bird-stick points to the northern celestial pole above Lascaux, while the bird-man indicates a line from the zenith (Arabic: point of the top of the head) to the nadir (Arabic: point of the foot), after Rappenglück, 1999: 104 (fig.94), 208 (fig.207).

two. He, so to speak, has both feet firmly on the ground. Of course, it isn't possible to turn around two legs. Therefore the bird-man as an ideogram personifies a non-rotating axis and a fixed support of the cosmos. He then can be associated with the vertical between nadir and zenith. A rotation around one leg only, however, works pretty well. Thus the bird-stick really embodies a pivot and can be related to the axis reaching from the centre to the celestial pole, which according to ancient thought works as a rotating support of the cosmos.

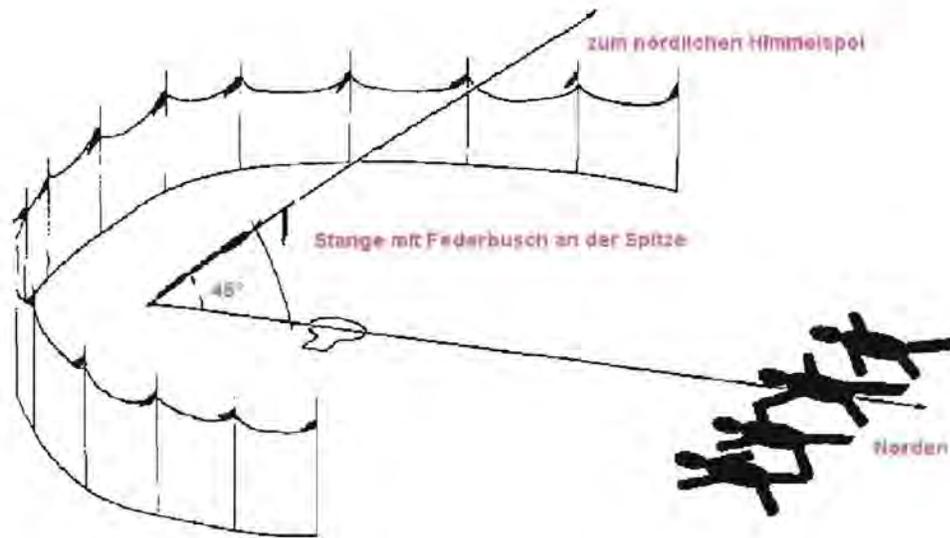
THE TYPE of this so-called „one-legged“ beings is well-known from the traditions of the people all over the world. In some cases it can be shown that they are referring to the polar axis and the star or constellation above or nearby depending on the precession cycle. For an ancient skywatcher it looked like the world axis would impale the celestial creature of the pole star or the polar constellation. Examples for such beings topped on a post and related to the cosmic axis are a turtle, a stag, an elk, a bear, a snake, a horse and as in the case of the rock panel in the shaft, the bird.

Usually ancient people erected bird-sticks upright, because this was a more practical to handle construction, which could be done at day. In such cases without any delivered context it isn't easy to decide, whether the figure-post embodies the nadir-zenith-axis or the polar axis. But fortunately there exist many examples which present the custom of oblique bird-sticks (ill. 14). Then the angle of inclination corresponds to the altitude of the celestial pole above the natural horizon. If one wants to align the bird-stick to this important point, this must be done by night. Only then the circumpolar constellations or much better a well-suited star close by the celestial pole, if one exists at the given epoch, can be used to adjust the figure-post. If this practice of a polar align procedure, like

an example in a teaching book, was illustrated on the rock panel, then one can expect that the constituents of the scene all or in parts represent important circumpolar constellations.

All over the world shamanistic and totemistic traditions of hunter-gatherer people strongly support this supposition. They identified single stars and constellations as celestial archetypes of certain terrestrial species. They are responsible for generating and increasing their earthly counterparts. The brooding and throw places of the animals, the seed beds of the plants, the places of birth of the people and the origin place of the objects on the earth are named after the stars, in which the astral protection spirits are domiciled. The celestial master and mistress goes into the terrestrial being and vitalizes it. Once in time certain of the primeval creatures, mostly the prototypes of the animals, didn't descend to the earth and stayed behind in the sky, where they became stars and constellations. These strong and powerful celestial beings were thought to be enormously big. They dominated and protected them as their master and mistresses, fathers and mothers. They also ruled over the games. The mundane plants, animals, humans, and objects referred closely to their heavenly archetypes. Thus hunter-gatherer-societies frequently organized their personal and their social life in the tribes following the cosmic model, as it was given by the phenomena and movements of the celestial beings. The celestial beings were their relatives in the heavens, their ancestors of the clans (or class systems), and their totems up in the sky.

ACCORDING to ancient conceptions in hunter-gatherer societies the celestial totem beings secure that earthly food was sufficiently available. If this wasn't the case, the balance of powers in the world and the communication between people and the celestial creatures were obviously troubled. The shamans then put themselves into alternate states of perception and mind –



Ill. 14 During Waxthexe xigithe, the “ceremony of renewal”, Waxthexe, the “holy post” in the traditions of the Omaha-Sioux Natives, is aligned into the direction to the celestial pole (ca 45° at the latitude of the dwelling area of this tribe), after Rappenglück, 1999: 110 (fig.102).



Ill. 15 The bird-like soul of a Karesuando shaman – after he had died – on his journey through the cosmic strata; after Rappenglück, 1999: 259 (fig.264).

trance and ecstasy – to restore the equilibrium again. They tried to reach the celestial masters and mistresses on dangerous "journeys" through the cosmic strata, between the lower and the upper world (ill. 15). There he passes the lightning, the thunder, the rainbow and other phenomena, crosses the courses of the sun, moon and the wandering stars and reaches the pole star or the Milky Way. The most powerful of the primeval celestial beings were among the stars and constellations along the course of the Moon (the zodiac), in the Milky Way and the circumpolar ones, especially at or near the celestial pole. The shamans asked them for advice and support to fulfil their tasks in the tribe, above all to work well as doctors. It is known that the celestial masters and mistresses, among other beings, which exist on the three strata of the upper, middle and lower world, were also regarded as spirit-helpers: They guarded and supported the shamans in difficult situations, which frequently occur while touring through the cosmic spheres.

The celestial pole or even the pole star, if one exists at that time, was regarded as the most powerful celestial master, because all celestial beings subserviently turned around him. It was believed, that likewise the whole mundane society or indeed the world would turn around a mighty chief or leading shaman. Because he got his power from the rotational creative centre of the world the polestar and the area nearby were observed and related to special rituals. A symbol of this cosmic power on earth is the bird-sceptre of the shaman and the ruler (ill. 11 c). It is a handy model of the cosmic spatiotemporal structure and rotation. Thus the bird-sceptre symbolizes power and the way to contact the main spirit-helper of the cosmos, the pole star.

THUS THE bird-stick in the rock panel, deep in the cave of Lascaux, can be regarded as a pointer into the direction of the shaman's journey to the supreme divinity and celestial chief of the world, the very centre and origin

of the cosmos - the pole star or a constellation close by the celestial pole. In addition it is a symbol of the power, which the shaman got from there. The shaman himself is depicted as the bird-man (ill. 9 a) and all the animals at his right, the bison (ill. 9 a), and at his left, the woolly rhino (ill. 9 a), embody his spirit-helpers, which also are supposed to be circumpolar constellations. The depiction of the wild horse at the contrary rock face (ill. 9 b) may be another grouping of stars, which also is associated to the shaman's cosmic journey. Being opposite of the central scene it is supposed to represent not a circumpolar constellation.

KEEPING THE above mentioned in mind it is quite more understandable what the rock panel in the shaft of the cave of Lascaux does present: It is a kind of mind-map for the "voyage" of a shaman to his totem ancestors in the area of the northern celestial pole. The bird-stick, which also embodies a spirit-helper, directs the way up there to the rotational centre of the cosmos, which according to ancient concepts is the origin of the world, too. Thus one can expect that the figures depicted in the rock panel at the same time represent totem ancestors, spirit-helpers and stars or constellations

Did the starry sky at the place and epoch of Lascaux offered any special and fascinating sight? To answer this question first one has to respect the boundaries of the archaeological epoch, given by the calibrated radiocarbon dates. Secondly the above-mentioned very exact astronomical computations have to be applied once more. Using the software Guide 8.0 or Starry Night Pro 5.2, for example, which within some limits is well-suited for this job, the starry sky above Lascaux at the Magdalenian epoch can be reconstructed.

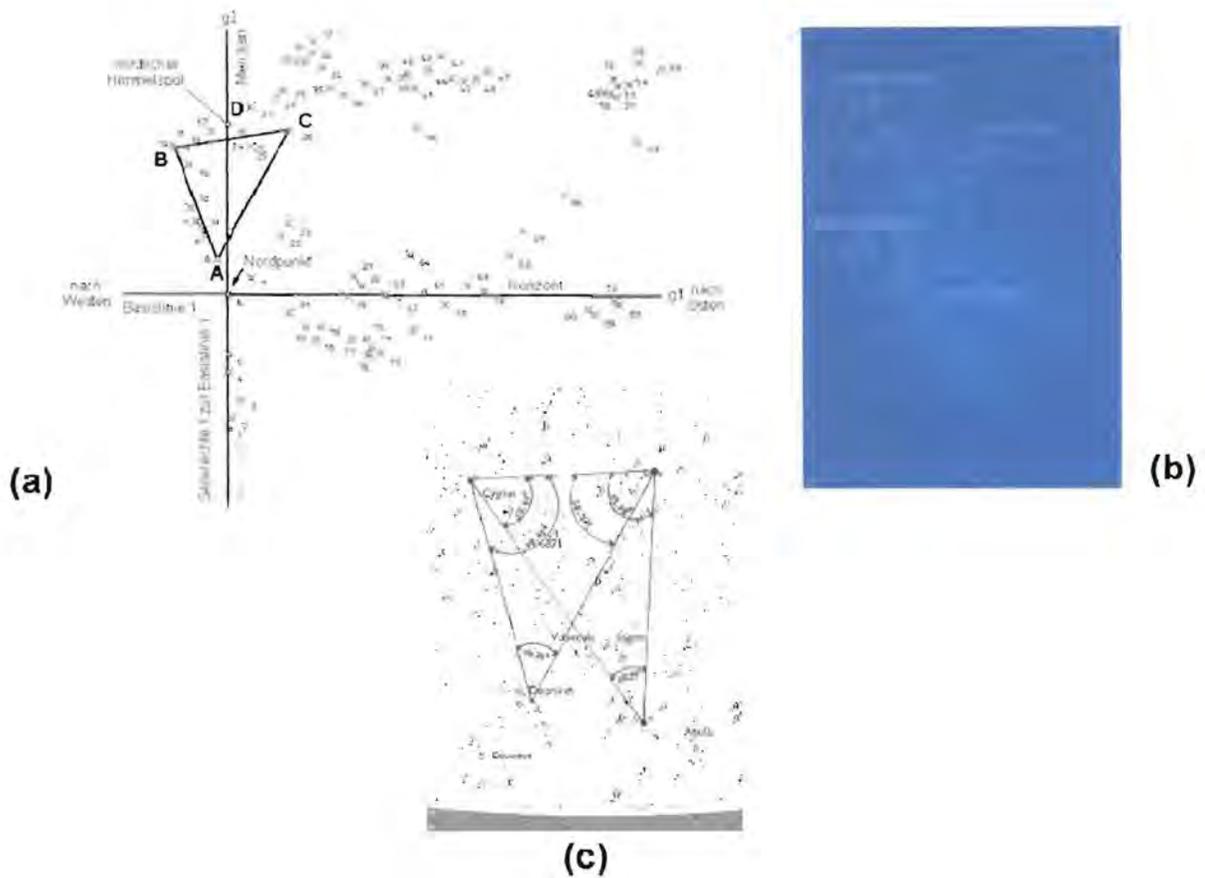
The computation and graphical display show that during the Badegoulian and Magdalenian the northern pole of the sky moved through the Milky Way from the constellation King (Cep) into the Swan (Cyg). At about 16,430 years ago (ca 14,430 calBC*) the northern

celestial pole lies very close to δ Cyg (2.84^m): The distance is only $0^\circ 20'$ or approximately $2/3$ of the Moons apparent diameter (position angle: about 339°). Between 14,600 calBC and 14,300 calBC the distance is below 1° (the double apparent diameter of the Moon). At this epoch δ Cyg could serve as a beautiful northern pole star very comparable to our Polaris (α UMi, 1.96^m) today, only one relative magnitude fainter (ill. 37). But in contrary to the present time the northern celestial pole at the Magdalenian epoch is placed in the Milky Way, a fact, which leads to a fascinating sight: The world-axis is centred in the gleaming band of light, which seems to originate from there, streaming down from heaven to earth, while turning around. As we will see later, that impressive astronomical sight may have stimulated the people of Lascaux to create symbols and myths, which they depicted in the rock panel of the shaft. The time span, during which the northern celestial pole approaches δ Cyg fits very well to the youngest limit of the older group of calibrated radiocarbon dating: about 12,865 calBC (99,7 % probability). If a standard deviation of 2σ (95,4 % probability) is taken as a basis, the astronomical date agrees perfectly with the lower limit of the calibrated $14C$ -date of 14,400 calBC. In every case the dating by methods of astronomy would indicate to classify the rock panel in the shaft into the later Magdalenian era.

We now have the probable epoch in which the scene was painted. But what can be said about the time in the year? Flowers, grass, and herbs and other plants were brought into the cave by man. The pollen analysis of these plants proved that the grotto was visited exclusively from May to September. Thus the art work was created during the warm summer time. It is very probable that the Palaeolithic artists and starwatchers painted the scene with reference to a special time in that season. It is very obvious that this date is the day of the summer solstice.

The time at night, however, remains to be found out. A thoroughly examination of the scene with respect to the CAD-reconstruction shows that the eyes of the birdman, of the bird on the stick, and of the bison form a striking triangle (ill. 16 a). This can be identified composed of the bright stars Vega (α Lyr) in the Lyre, Deneb (α Cyg) in the Swan, and the fainter Rotanev (β Del, 3.54^m) in the Dolphin (ill. 16 b). Today we know a quite similar shape of stars in the starry sky, the so-called "Summer-Triangle" (ill. 16 c). This also consists of Vega and Deneb. But instead of Rotanev the luminous Altair (α Aql) in the Eagle is taken. Rotanev at the epoch of Lascaux like Altair at present marks the tip of the striking triangle. The geometrical shape then functions like the hand of a giant sky clock. The position of the triangle, rotating around the celestial pole, indicates the time at night. During the late Magdalenian epoch a trained skywatcher would have been able to "read" the clock in the heavens. The same can be done today by an astronomical reconstruction of the sky for the era of Lascaux. The position of Rotanev is close to its lower culmination. As a result from all above mentioned the picture panel fits completely well, if it illustrates the starry sky around midnight local time, at summer-solstice, approximately 14,600 calBC to 14,300 calBC.¹¹

AT THAT TIME an observer standing at the top of the hill (216 m MSL), slightly above the cave, would have seen the following (ill. 17): The upper part of the bird-man is composed of stars in Swan and Fox, the lower part is shaped by stars of Eagle, Serpent Bearer, Hercules and Arrow. Even today a star-bird is still flying along the Milky Way: the Swan. The bird-man lies in the midst of the Milky Way. His body and legs can partly be identified with the dark obscuring clouds – the so-called "Great Rift" – stretching between the Swan and the Archer. The bird-man is inclined to the meridian. At his right side, that is in the



III.16 (a) The circumpolar triangle above the northern horizon. The meridian runs central through it and is identical with the bird-stick, (b) The “summer-triangle” in the middle of the Milky Way, today, (c) The three stars Vega, Deneb and Altair, better, however, Rotanev fits very well to the triangle shaped by the animals eyes in the scene, represented for ca 15.600 year ago, after Rappenglück, 1999: 122 (fig.114), 128 (fig.122), 129 (fig.123).



Ill. 17 The topography of the rock pictures correspondends closely with the constellations comoutet for ca 13.600 BC, date of summer-solstice, 22.45 UT. The proper motions of the stars are respected. The limit of the star brightness is 6.0^m. The outline of the Milky Way, the lines of the celestial equator and the ecliptic are represented.

Graphic after Rappenglück, 1999: 169 (fig.157).

eastern quadrant, the Bison forms a giant constellation out of stars in Lyre, Hercules, Serpent Bearer, Serpent, and Scales. At his left side, that is in the Western Quadrant, the woolly rhino consists of stars in Pegasus, Fish, Andromeda, Triangle and Ram. The little bird sitting on the stick can be discovered in stars of Dolphin and Eagle. The animals incorporate large constellations, each covering a quarter of the sky. The bison reaches from north to east. He indicates springtime and summer. The woolly rhinoceros occupies the heaven between north and west. It signifies autumn and winter. The bird-stick and the bird-man represent the northern area, indicating the winter.

It is remarkable how some of the natural peculiarities, which these constellations show to the observer at present, can be found also in certain features of the figures in the scene (ill. 17). The tiny Lyre for example fits excellent to the small head of the bison, looking backwards to the hindquarter of the animal. In addition the horns of the beast coincide with a part of the constellation, which according to ancient

The cruciform shape of the Swan can be identified in the bird-man with his spread-out arms. The also tiny, a little bit crooked Dolphin models the head and the neck of the bird, which is topped on the stick.

BESIDE THIS results there is another, completely unexpected confirmation of the hypothesis that the scene illustrates the important areas of the starry sky at the place and for the epoch of Lascaux. As already above mentioned the southern rock face shows the painting of a little wild horse. This depiction is still waiting for an interpretation. As mentioned some paragraphs above, it was suggested that it also may represent a constellation, but not a circumpolar one. Looking on the computer display of the reconstructed starry sky above Lascaux at the late Magdalenian, it can be seen that the constellation Lion, placed only

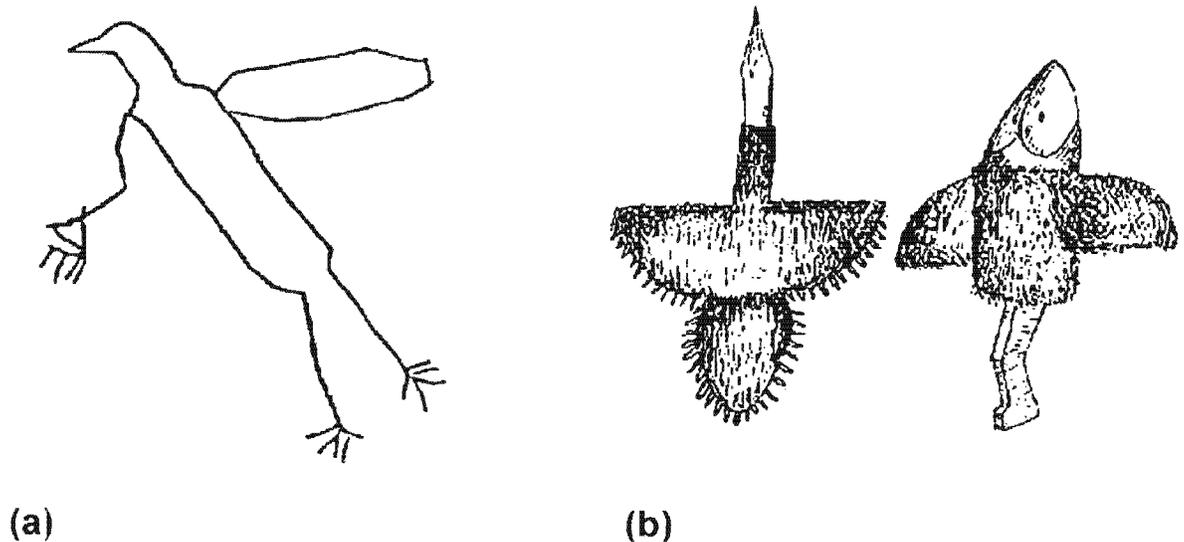
approximately 10° east of the south, perfectly fits to the appearance of the wild horse (ill. 17). The wild horse represents the southern area, between east and west. It shows the summer.

These identifications of the rock pictures with certain constellations can be further supported based on a lot of material (symbols, myths, rituals) handed down by many people all over the world. It would be beyond the scope of this small paper to go in any detail. I therefore ask the interested reader to study my original doctoral thesis to get an impression of the complete argumentation.

THUS THE complete circle of the rock pictures illustrates a kind of panorama of the starry sky as it was perceived by the people of Lascaux, in particular their shamans, who at the same time were artists and skywatchers.

In the case of Lascaux the shaman, artist, and scientist, has set himself into the picture and at the sky, shaped as the bird-man, flying in the Milky Way (ill. 17). The constructor of a medieval cathedral, who left a sculpture or painting of his person at a certain place in the building, did it later quite similarly.

According to ancient traditions worldwide birds were regarded as the only creatures, who are able to reach all realms in the sky, on earth and in the netherworld, because of their ability to fly, walk and dive. Additionally it was thought they could peck openings in the firm strata of the cosmos, allowing them to pass through from one to another level. People handed down that similar a shaman's path goes through these several (often three) apertures along the polar axis, centred in the middle of the world. The highest gaps to slip through, were the point off the zenith and the northern (or southern) celestial pole. Thus shamans only could travel up there and into far-away regions of the cosmos, if they transformed themselves into a bird (ill. 18 a, b). But there is another meaning hidden in the shape of the bird-man in the scene: An



III. 18 The shaman changes himself into a bird-man, (a) A bird-shaped spirit helper of the ghost, who resides in the zenith, according to a Chuckchi shaman, (b) The bird-man-hybrids Koori and Buccu, which are spirit helpers of the God shamans, after Rappenglück, 1999: 96 (fig.84), 251 (fig.255).

ornithological analysis of the bird-man shows that the hybrid may depict a migratory bird, probably a crane.

Often the shamans were compared with migratory birds, because both were recognised as vigorous, responsible, sensible and guiding clan-leaders. They each helped their respective societies to orientate themselves in the world. According to ancient opinions the migratory birds, flying from North to South, were closely related to the meridian, the Milky Way and to some selected constellations, guiding them on their migration. Moreover, scientific research has

proven, that the migratory birds have the ability to orientate themselves aided by the sun, the magnetic field of the earth and some selected constellations, among which one is the „Summer-Triangle“.

Shamans used a certain method to get in ecstasy: They looked to the circumpolar constellations rotating around the celestial pole (or a Pole Star, if existing at the given epoch). This practice of meditation about the turning cosmos helped to concentrate the powers first on trance, then on the ecstatic flight through the cosmic strata, and finally at a safe return into the ordinary world.

BEING IN ecstasy the powers of mind bend wings to the shamans. Therefore they can turn into mixed creatures, which fly in the sky as a bird and walk about on ground as a human being. Often these chimeras look like a heron, stork or crane as in the rock panel. The communication between the worlds goes well, when the shaman – the bird-man – is standing in the centre of the cosmos, near the polar axis – the bird-stick. With the help of bird spirits and turning himself in a bird (ill. 18 a, b), the shaman moves between the different areas in the cosmos, which are filled with the primordial elements of water, earth, air and fire. In particular he transforms himself in a bird, sometimes a migratory bird. He stretches his arms like a flying bird's wings. He acquires feathers on the head and a beak, a plumage and claws. This is why the bird-man in the scene has attributes of a human and a bird. In particular the four fingers on each of his hand represent the claws of a bird.

A pretty myth, which could be read as an abbreviation of the bird-man in the cave of Lascaux, is delivered by the Beaver, North American Natives. They tell about the ecstatic journey of a primeval shaman through space and time. He transforms himself into a migratory bird, a swan, because this is the only animal, which can reach the supreme area in the sky. The shaman, a young boy, spread out his arms like wings and stretches his body, assuming the form of a cross (the Northern Cross or constellation Swan) and flies up. He finds the path to the inner centre of the heavens, the Milky Way and the polar axis.

Continuing the interpretation of the scene other details of the bird-man attract attention (ill. 13 a). He is raw-boned, because of his feeling of dismemberment ("death") during ecstasy. According to shamanistic concepts the skeleton of a bird, often pictured on the costume, symbolises the flight of the soul through the cosmic strata and at the same time the dismemberment of the psychosomatic body in ecstasy, which is a

kind of anticipated death. Finally the ithyphallic depiction of the bird-man is understandable, too. It is known that while being in trance a male shaman can be highly sexual excited. He sometimes ejaculates. Traditions of the ancient peoples all over the world associate ithyphallic beings, often the master shamans, with the origin of live-giving substances, which created, renewed, restored and conserved the cosmic fertility. This inseminating essence was distributed and at the same time condensed in the fixed and wandering stars, but also collected and extended in the Milky Way. The gleaming white fluid effusing all over the world was considered as divine sperm, urine, light or milk, dropping down from heaven to earth. It was thought that shamans flying in the Milky Way ejaculate these fertilising streams, like the primeval creator. This is why the bird-man in the scene shows an erect phallus. According to several myths the cosmic ejaculation happens in the centre of the world-cave. Not only the Milky Way, but the zodiac is generated, too.

THE MILKY WAY, which according to ancient traditions worldwide is conceived as a path of birds, souls, spirits, and heavenly hunters, but also as a spermatic river or the backbone of the sky, served the shaman as a trajectory to alternate worlds through the stratified cosmos, to get in contact with the original point of creation, to stay there or to bring down the essence of life to the earth. Only if the Milky Way touches the ground at special places, mostly the points of the cardinal directions, or intercardinal points at the dates of solstices or equinoxes at the horizon, it was possible to harmonize the interaction between the heaven and earth.ⁱⁱⁱ At those moments the shamans were able to go up along the Milky Way to reach the place of origin of the cosmos and to bring curative knowledge back down to the earth. Then the journey was expected to be successful.

The ancient people noticed the touching points of the Milky Way at the horizon related to the cardinal directions, to the points

of sunrises and sunsets at the equinoxes and solstices or the passage through the Zenith. It should be noted that they didn't observe any abstract modern nodes of the main sky-circles. Ancient people used the Milky Way as a regulator of daily and yearly time and sometimes as an indicator of directions. But according to archaic worldview the Milky Way also beat the time of life at a very long time-scale in the course of the millenia. Then the crossings of the Milky Way with the Zodiac and the celestial equator and the passage of the celestial poles had to be taken into account. The intersection between the Milky Way (galactic equator) and the Zodiac (ecliptic) is stable. The constellation of Taurus and Gemini, Scorpio and Sagittarius signified the crossing bands area. In ancient terms there are the gates for shamans, kings, souls, ghosts, gods and demons to ascend and descend along the Milky Way and to reach the celestial poles or the Zenith. With respect to the cycle of precession, the celestial equator is shifting along the ecliptic through the galaxy. Thus the abstract points of the equinoxes and solstices "pass" the Milky Way in the course of the millenia. The real nodes are unobservable. Therefore the ancient watched the star-phases of the selected bright stars in constellations near or opposite the Milky Way. With regard to the last cycle of precession the equinoxes or solstices together with the celestial poles passed the Milky Way between 19,500 BC and 12,000 BC. Hence the Milky Way seemed to really organize and balance the movements in the cosmos by establishing a harmonizing reference system and setting up crossroads of cosmic energy, because the centre of the rotating sky hemisphere and two seasonal points were situated in the gleaming band perceived as a trajectory of power. Such an important and fascinating situation, a bright pole star (δ Cyg) in the Milky Way, and the summer-solstice in the constellation Capricorn directly nearby, was given at the place of Lascaux about 14,500 BC.

Again we are allowed to change the point of

view and to look at the bird-man standing upright and the bird-stick being inclined (ill. 13). Then the bird-stick points to the northern celestial pole and the bird-man indicates the direction from nadir to zenith. Now the symbolical and mythological correlation of both bird-hybrids in reference to these two important astronomical axes is remarkable. According to traditions of the people bird-men also carry the vault of the heaven. They stand with both feet on the ground and reach with their vortex the sky in the highest point above, the zenith. On their heads they wear a crown of feathers or a single feather, because they enter the regions, where only birds can stay. These bird-men turn the stars around. The living being, which should support the world, must be in rigor mortis. It serves like a backbone of the universe. Its vertebral column with the ribs stretches the circles of the heavens and really looks like a cosmic skeleton. Often these carriers are shown as ithyphallic mummies. Primeval rulers and shamans, mostly seen as giants, spread their extremities to create and conserve the cosmos. In old traditions the primeval shaman incorporates the cosmic axis, supporting the levels of the universe. The transformation of the shaman (bird-man) must happen at the rotational centre of the universe, in the world-cave, where all energy is concentrated and from where streams flow all over the entire world. Only at that place the communication between the worlds goes well. That is why the bird-man stands close to the bird-stick, which represents the world-axis. He makes the stars revolve around it. In addition he is the guardian of the rotational centre in the sky, which contains the creative power of the world.

THE PEOPLE of Lascaux looking up to the starry sky saw a circumpolar celestial shaman, located in the Milky Way, who every night turned around the world axis.^{iv} He was surrounded by mighty astral animals, which were archetypal creatures, cosmic totems and spirit helpers. Together with them he ruled and fertilized the whole cosmos. The

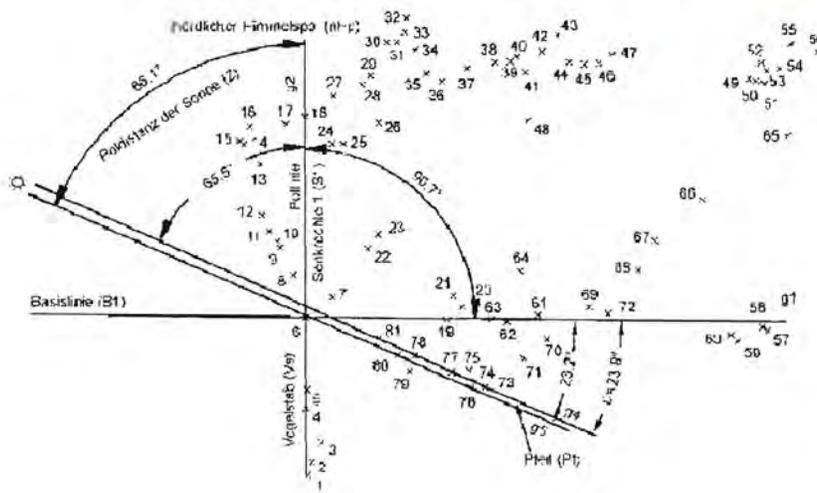
bird-stick as a symbol of his dominion represents the main axis of the world and the origin of a reference system, which include essential astronomical relations.

That becomes clear, if one investigates the meaning and function of another object depicted on the rock panel: the arrow (ill. 19 a, b). In the course of analysing both it is confirmed moreover that the picture panel in the shaft illustrates the date of summer-solstice.

IN THE SCENE the arrow takes aim exactly at the point, at which the little bird is topped on the stick. People worldwide handed down symbols, myths and rituals dealing with the solar bird, which perches high on top of the world-tree. In general it symbolizes the sun, culminating at every day in the noon. But in particular it represents the special date of summer-solstice midday. At this time a strange ritual took place, delivered by some ancient people: An arrow was shot at the solar bird, mostly a chicken, which was topped on a stick or post. This practise should indicate, that from this time on the sun descended the ecliptic leading to a declining daylight during the second half of the year. Another version of this solar-bird-stick is the solar-ring or ring of time, which is also the object of a shooting ritual. The angle between the arrow and the bird-stick is 68.6° (ill. 19 b). This fits very well to the altitude of the sun above the place of Lascaux, at the date of summer-solstice, about 16,500 years ago, which should be about 69.3° . Could the bird-stick symbolize the world-axis in connection with the daily and yearly course of the sun? But what is really depicted here on the rock wall? There is a fascinating answer: The bird-stick embodies a special kind of gnomon, a polar sundial. The arrow marks the shadow at the place and epoch of Lascaux and the date of the summer-solstice. To ensure that the sundial works very well, it has to be aligned to the celestial pole. This can be done only at night, watching the circumpolar constellations and a Pole Star, if one exists at the given epoch. Such a procedure is shown

looking from south to north straight onto the rock panel in the shaft. Then the stick seems to appear vertically in front of the starry sky with the constellations (bison, bird-man, bird, woolly rhino). It represents the trace of the meridian plane. On this straight line the northern celestial pole, marked by the wrist of the bird-man's hand (ill. 20), as well as the zenith (and the nadir) are situated. The south and the north coincide just in the point, at which the bird is topped on the stick. According to this point of view the horizon appears as an imaginative straight line, on which the bird sits, the man put his feet and the bison stands with his cloven hooves. The gigantic constellation of the "bison" is placed in the eastern quarter, and constellation of the "woolly rhino" in the western quadrant. The bird-man and the bird constellations occupy the northern sector, while the constellation of the wild horse is situated opposite of the main scene, in the southern quadrant. If the gnomon was very well polar aligned at night, then, at day, the sun-dial would work fine. If the point of view is changed from south to east, the function of the polar sun-dial at summer-solstice day is depicted. Now the bird-man stands upright with his both feet on an imaginative horizon. The bird-stick punctures the same ground and is polar aligned. The straight line indicated by the arrow, which takes aim at the bird just in the point, where the animals sits on the stick, can be considered as the shadow produced by the polar sun-dial at midday on summer-solstice. This important date, which occurred several times in the course of the analysis, is confirmed anew and can be corroborated once more again looking on the angle between the arrow and the imaginative baseline on which the bird-stick and the bird-man put their feet. This intersection measures about 111.4° (ill. 21 a, b). The angle corresponds approximately to the azimuth between the point of sunrise and sunset at the day of summer-solstice for the place and epoch of Lascaux: 109.2° . There exist some more astronomical values in the geometric construction of the picture panel, which

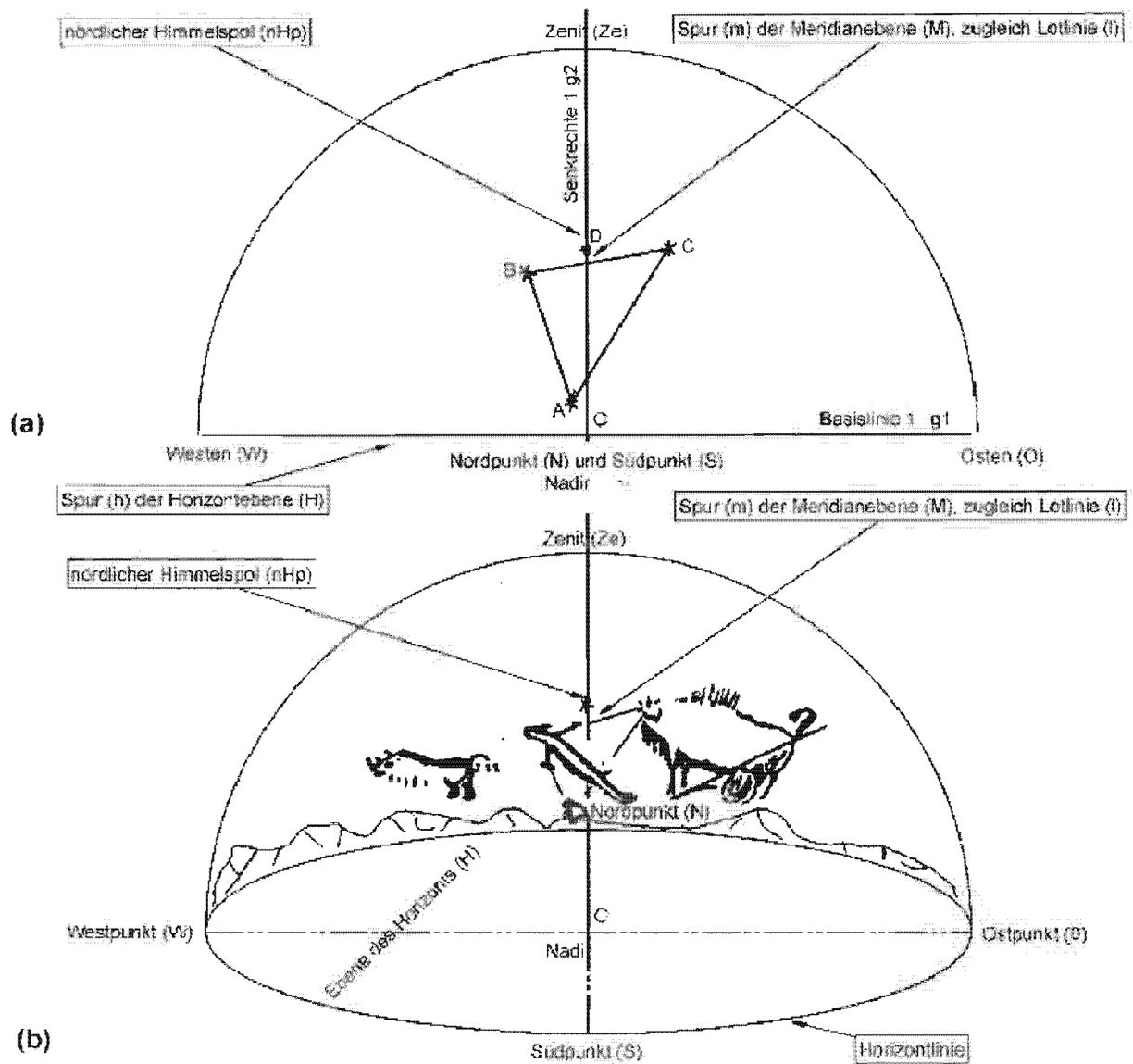
(a)



(b)

III. 19 (a) The angle between the arrow and the imaginative baseline, given by the foot of the bird (-on-top of the stick -), the feet of the bird-man and of the bison, indicates another significant astronomical value, (b) The angle is about 23-24°, taken into account the width of the arrow. It corresponds very well to the obliquity of the ecliptic, which had been 23,7° about 16.500 years ago. An angle of 68,6°, which can be found between the arrow and the bird-stick, being approximately the complement, represents the altitude of the sun above the location of Lascaux, at the date of summer-solstice, about 16.500 years ago;

After Rappenglück, 1999: 179 (fig.165), 180 (fig.166).



III. 20 (a) At Lascaux: The view to the circumpolar triangle composed of the stars Vega, Deneb, Rotanev at the northern sky, summer-solstice day, ca 14.500 BC (b) The same view as in (a) with the rock pictures added, after Rappenglück, 1999: 207 (fig.206).

celestial pole and to determine even the obliquity of the ecliptic and much more. Sundials, which are topped by a figure, quite similar to the bird-stick, are well-known in ethnoastronomy (ill. 22). Ancient people knew many simple, but nonetheless very exact and effective working methods to get astronomical relevant angles and times. Two interesting examples are handed down by the Dayaks (Kalimantan): They determine the altitude of the culminating sun at summer-solstice using an upright gnomon, which is crowned by a figure. They also appoint the seasons by the elevation of the Pleiades at dusk. For that purpose they employed a long hollow bamboo tube, closed at one end. In a first step it was filled with water. In a second step it was aligned with the constellation. In a third step it was tipped back and the level of water was marked. When it agreed with the mark made by previous measurements, it was the right time of the year.⁹ Another simple "instrument", which in fact is only the human hand, may be depicted in the rock panel to: The bird-mans left wrist is situated exactly at the position of the pole star. The hand with the fingers could be used as a kind of a clock. Petrus Apianus (1533) described this technique, which helps to determine the time down to about 15 minutes in his "Instrument Buch / durch Petrum Apianum erst von new beschriben".

IT ISN'T amazing, why then the bird-stick in the scene is so important and really the "pivot" of the cosmos: As a polar sundial it is a symbol for the structure of the cosmos and the dynamic forces, which hold the universe in rotation. It serves as a measure of the spatiotemporal structure of the cosmos. It fixes the origin of a reference system of all phenomena in the universe. The people of Lascaux depicted the principle function of this instrument, together with the related shamanistic-totemistic cosmography onto the rock wall. But in addition it seems that they also told a cosmogonic myth of creation and destruction in the picture panel. Finally we

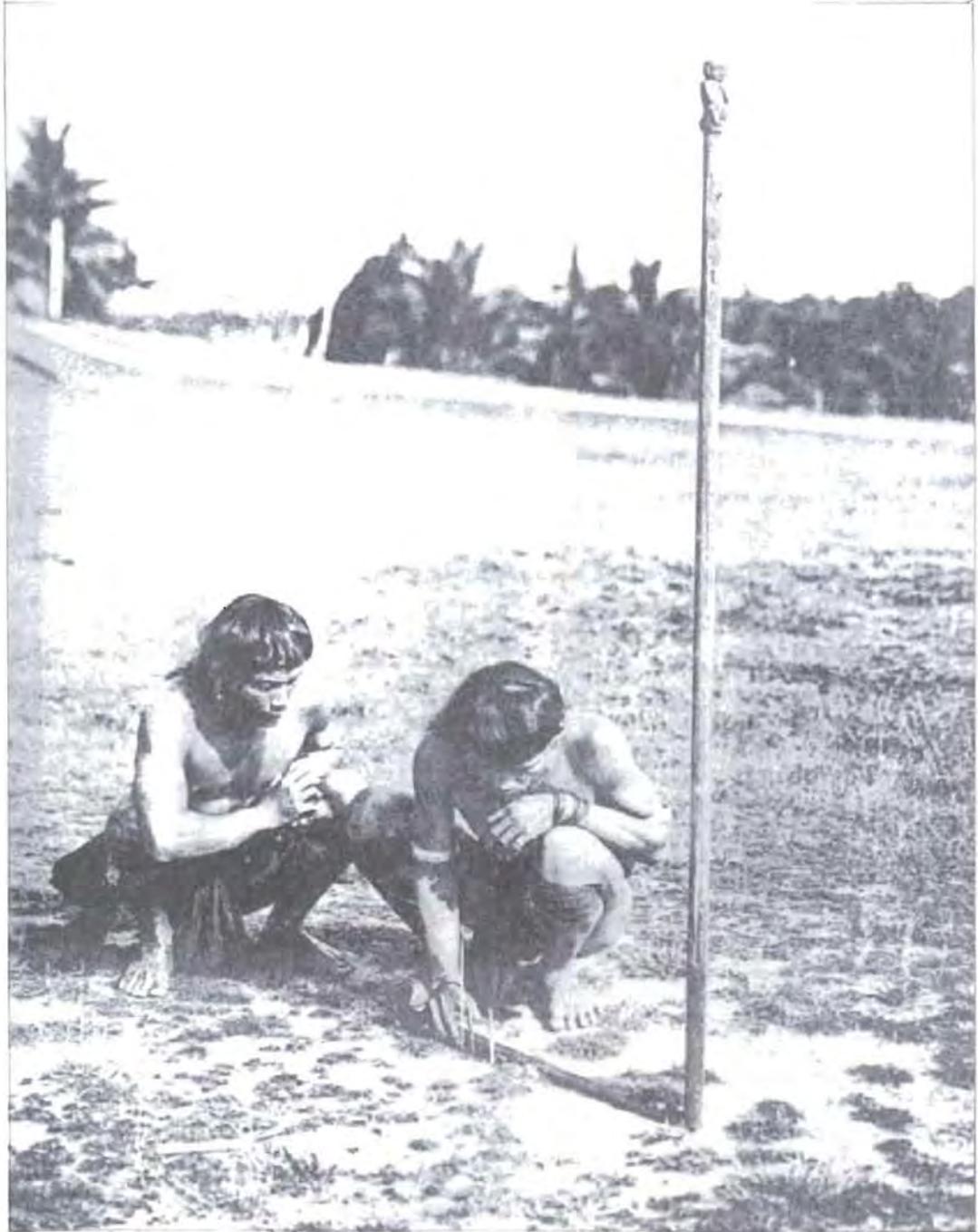
should take a short view on that.

The astral hunting

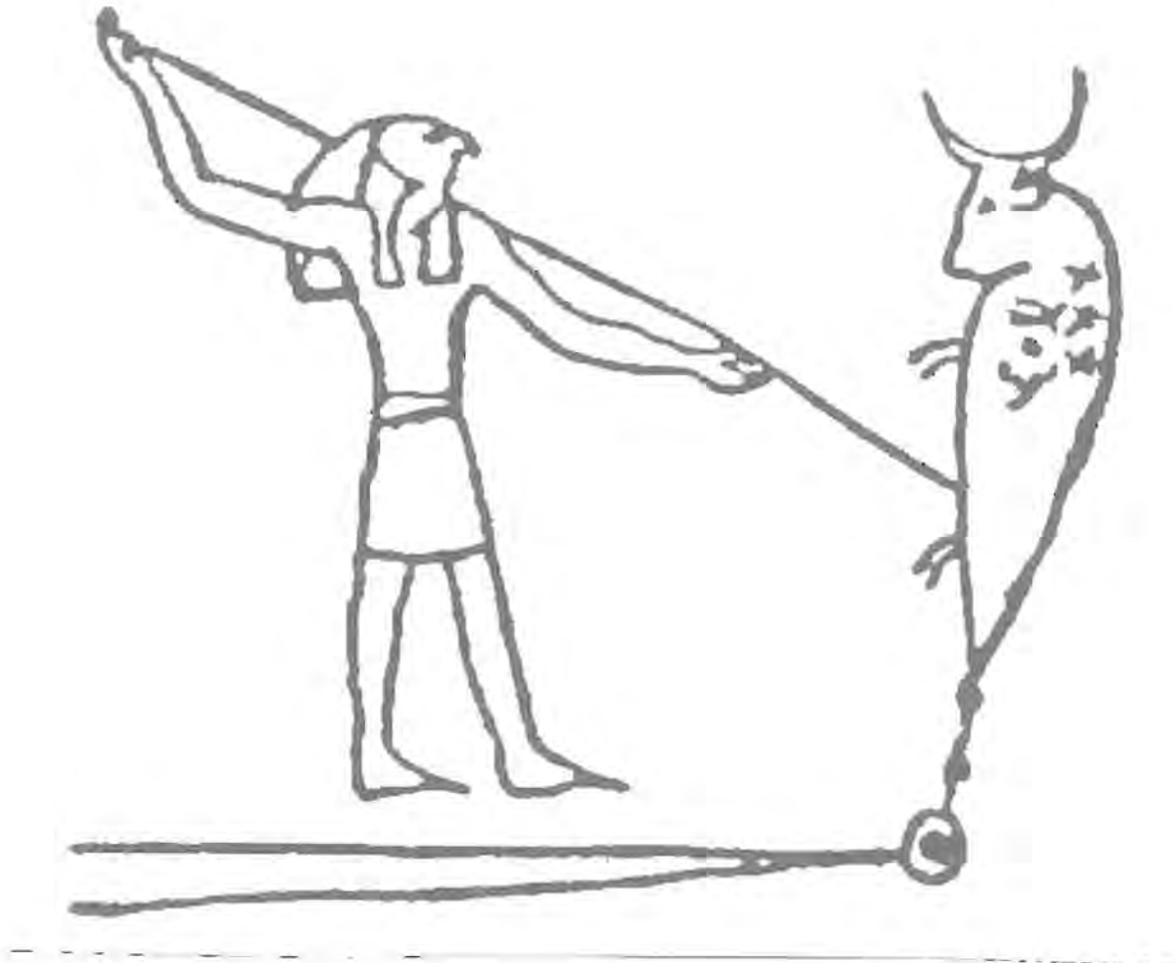
Hunter-gatherer recognise the Milky Way as a path of the lord of the animals. They tell from a sometimes primeval celestial hunting. A human hunter, represented in different constellations traces star animals on a gleaming hunting-ground, the Milky Way. Often the astral hunting is connected with the Pole Star and circumpolar constellations too. Therefore high in the sky a lot of dead beasts and some humans are floating in rigor mortis. That's another argument why the rock pictures in the shaft, in particular the bird-man appear so rigid.

THE SCENE in the «shaft» includes an astral «hunting scene» at the sky pole and the shot on the sun-bird, expressing the primeval sacrifice, creation and recreation in the cosmic cave. Very similar scenes could be found in other old cultures, in particular for example the Egyptian or Iranian. Often the Pole Star or the pole constellations, a hunter and at the same time a shaman, who chases a big celestial animal, an elk, a stag, a reindeer, a bear, a bovine, that is a constellation, which is circumpolar at a given epoch. He follows a particularly trail to get his quarry. This path is the Milky Way, sometimes connected with the zodiac. The scene shows all elements of such a celestial hunting: the bird-man is the hunter, the bison and perhaps the woolly rhinoceros are the quarry and bag. Ancient Egyptian representations (ill. 23) show astral combats, which remind strongly of the Lascaux scene. There Dewen-anwi, a god with the head of a falcon, tries to kill meskhetiu, a bovine or a part of it, an ox-leg. These figures could be identified. Dewen-anwi and meskhetiu are the today constellations Swan and Great Bear. Often the bovine is bound to a post. That is the polar axis. After the death of the Pharaoh his soul turned into the constellation Dewen-anwi.

In the world-cave the cosmic and celestial



III. 22 The Kendayan-Dayaks on Kalimantan (Borneo) determine the altitude of the sun at summer-solstice aided by a gnomon, crowded by a figure, after Rappenglück, 1999: 184 (fig.169).



Ill. 23 In the tomb of Senenmut (18th dynasty, ca 1463 BC) a painting at the ceiling shows a falcon-headed being, which points a spear to a bull. The beast is bound with a rope, which has two knots, to a post. That the bovide originally was a complete animal is proven by the four stump legs. He post probably is to be identified with the polar world-axis;

after Rappenglück, 1999: 153 (fig.146).

primeval animal, often a bovine, but also a bear, horse, bird or sometimes a primeval human being is killed and dismembered. If the perpetrator is known, then it's mostly a primeval human being, frequently shown with an erect phallus. The genital symbolises the power of fertilising the universe. The weapon, for example a club, a spear, a bow and arrow or a dagger, used to kill the beast, is presented in the scene. Often not only the animal, but also the killer dies. With this first sacrifice, happening at the equinoxes or solstices, begins the creation of the world and of human culture. All things are growing from the parts of the animals or mans body. Occasionally the generating energies are shown by the sun coming out of the killed animals belly or womb (ill. 24 a, b). Myths from the ancient Greek, Iranian, Chinese, the Oglala-Sioux (ill. 25), and from the traditions of the Mithraic Mysteries throw light upon this ancient cosmogony and help to clear up the scene of the Lascaux grotto.

The World-Grotto – Place of Initiation, Transmutation, and the primordial Sacrifice

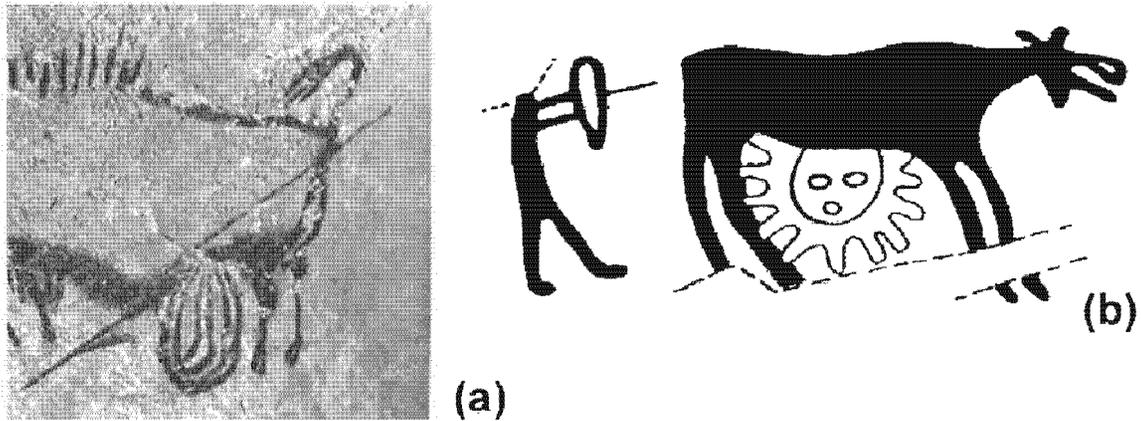
In particular the Mithraic Mysteries show a striking similar scene of the bull killing Mithras in the world-grotto, which was considered as an image of the universe and at the same time as a place of initiation, transmutation as well as a primordial sacrifice (ill. 26).

THE CONCEPTION of the holy world cave is well illustrated by the natural caverns and artificial crypts (Spelaea), in which the Mithraic Mysteries were celebrated. They symbolized the cosmos and the primordial sacrifice, by which the universe was created. The night-sky with the stars and often also the zodiac were shown. Oil lamps served to intensely illuminate the ritual images of certain cosmic events, in particular the bull-slaying scene. Mithras (Orion or Perseus?) cutting the throat of the celestial bull (Taurus) is closely related to a cosmology,

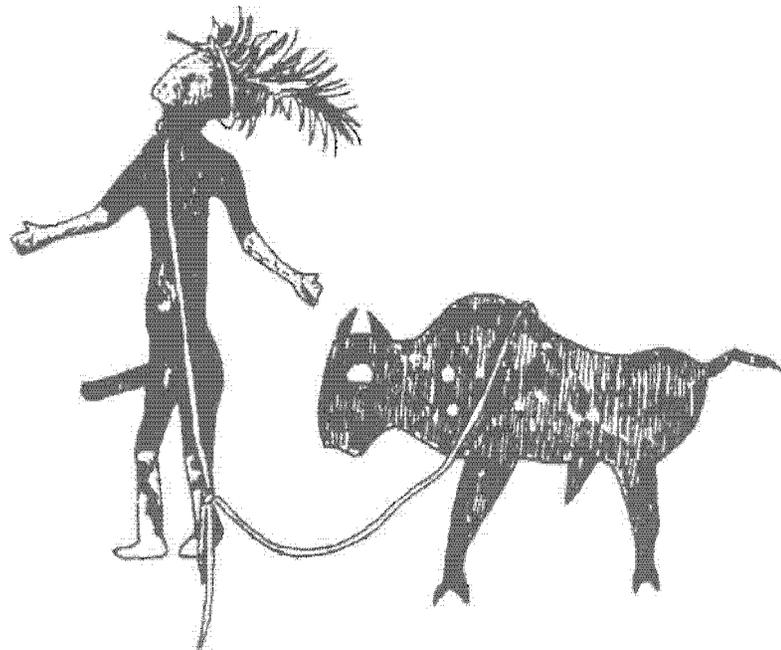
cosmogony and a specific way of the initiated. The world-cave, where waters run and magical plants grow, is the residence of the sun. She is enclosed in the rock, which had to split open to free the light and the vital elements (Mithras sol invictus) bringing the universe in existence.

The „Cave of the Nymphs“, written by Porphyrios of Tyros (3rd/4th c. A.D.) reveals details about the layout of a cosmic cave, based on older Iranian and Greek conceptions. The suns daily and yearly course is related to the movements of humans and gods as well as to the entrance and the exit of the cave (both are denoted as *heavens*). The human souls and the gods descend in the earthly world through the „northern gate“ (constellation Cancer), carried by the northern wind, which originates there. Both ascended to the celestial realm passing the „southern gate“ (constellation Capricorn), supported by the southern wind, which arose there. The Horai, the goddesses of the hours, set the opening and closing of the gates. These two portals mark the north and the south and the points of the solstices in winter and summer. There exist two others indicating the east and the west as well as the equinoxes in spring and autumn.

THE CAVE OF Trophonios, a place of a tremendous oracle, described in detail in the Greco-Roman literature, is another example: A cold source bubbled at the secret place. Who wanted to visit the location had to descend in the unfathomable darkness of the grotto (katabasis) with the feet first. There the visitor had several auditions and visions. He saw the moon, the sun, the Milky Way and the stars. These all while moving up and down turned heliacally around the world-axis. They not only were celestial bodies, but at the same time human souls, who migrate between heaven and earth embodying and disembodiment themselves. After he met the oracle he had to ascend to the daylight (anabasis). He „died“ and was „newborn“. The cave was a place of birth, death and



III. 24 (a) The strange object below the backpart of the bison's belly, (b) A rock picture from northern Asia shows how an archer takes aim at an elk, which presents the sun hanging under his belly; after Rappenglück, 1999: 198 (fig.193), 202 (fig.199).



III. 25 An ithyphallic shaman during his ecstatic flight to the sky. He wears a feather-crown and is bound to the celestial bull, marked by some constellations. Painting on a tipi of the Oglala-Sioux, North America; after Rappenglück, 1999: 268 (fig.277).



**Ill. 26 Mithras is killing the Bull. Sculpture found in Carnuntum, Austria;
Photo taken by Rappenglück, 2001 in the Museum of Carnuntum.**

rebirth, and at the same time a womb of the cosmos and of the human individual.

Thus a grotto is a place of initiation and transmutation. The passage of the galleries by certain animals and humans, in particular shamans, often is equated to the journey of celestial bodies, primarily the Sun and the Moon, but also selected stars, through the underground galleries. Their course mapped the different stations during transformation of all the beings from life to death and vice versa, which also build a shaman's alternate states during his ecstatic journey.

THE OLD CHINESE described the cave heavens (dongtian), which can help to understand why Paleolithic man probably

went into the caves. According to the Daoists^{vi} the cosmic cave is situated in the center of the world mountain and contains the universe with sun, moon and stars. The dimensions of space and time are special ones in this cavern. This underground realm consists of a net of cave heavens, which are connected to each others by tunnels. The disciple enters the deep caves, which are a labyrinth, accompanied by certain animals. On his way to supreme initiation he has to find the secret entrances and exits of the opposite world, going through very narrow and hidden passages. There in the innermost chamber the hidden principles of life are waiting for discovery and a supernatural pearl which is both the Sun and the Moon

illuminates the cave and the disciple's way. His journey underground and similarly through the starry sky is equated to the transformation during meditation. The voyage through the grotto corresponds to the ascend to the heavens. While it wasn't really possible for man to rise up to the heavens, he was able to descend into the caves. There he could discover and primarily touch the transcendent membrane of the sky. Thus the sacred grottos are regarded as the celestial cave and shaman's seek contact there the primeval power and ancestors.

Lascaux a Temple-Planetarium Underground

Thus the cave of Lascaux, and probably other grottoes, may be compared to a temple, e.g. a cathedral, a mosque, a stupa or a kiva. These buildings are known as architecturally representations of ancient religious based worldviews, including several topics in one single structure. The Dogon (Africa) recorded in the caves the terrestrial phenomena on the ground and the celestial ones on the ceiling.^{vii} It is plausible that Upper Palaeolithic man similar placed cave art appropriate to a certain cosmography and the decorated grottos were a storehouse of worldviews. Cave art then can be compared to an ancient "library", which proficiently and permanently kept the experiences, the conceptions of the world and the philosophies of life in rock-pictures for the instruction of the people. The grottos also were places of initiation, enlightenment, transmutation, oracle and healing. There shamans thought to get in touch with the potentiality behind the phenomena, the spatiotemporal framework an the origin of the world. So the rock pictures in the "well" show a plain and spatial copy of the cosmos, with the ancestral and archetypal star beings and spirit helpers. They represent a kind of shamanistic sky chart, comparable to the sketch maps on shamanistic drums or other objects. Recent research work all over the world proofs, that these drawings are

multidimensional cognitive maps for travelling to other worlds on earth (geographical maps), in the heavens (astronomical maps) and in the inner space-time of the animated cosmos (spiritual maps).

THE SHAMAN has to know, how to reach the selected localities in the cosmos. Therefore he needs a drivers log, a kind of map, which shows all important regions and places of the universe and the paths to go there. Shamans all over the world made cosmographic charts, on which earthly and heavenly dings were registered: mountains, living beings, constellations and wandering stars, the pole star, the Milky Way, sometimes shooting stars and comets, the rainbow, the cardinal points and cardinal directions, the horizon and meridian, the ecliptic, some kind of zodiac and also calendar events. These maps mostly are drawn on drum-skins, but also on rocks and wooden artefacts (ill. 27 a, b). Sometimes they are very elaborated and complex. Some of them show a model of the cosmos, a net of concentric circles and radial bines, reminding of a modern chart equipped with a grid (ill. 27 c). They are used for the purposes of magic, mantic and orientation.

THE DRUM WITH the chart on the skin was aligned to the north. Holes drilled in the drum and arranged in shapes of circumpolar constellations permit to adjust the map to the northern sky pole. The horizon, the meridian, the axis to the pole and to the zenith, the Milky Way and the constellations guide the shaman on his flight. Often such maps show a dyadic division. The cold and warm, dark and light seasons of the year, the left and right side of the cosmos, the moon and the sun. Different animals represent these dyadic areas and the powers radiating from them. Cross bars indicate the levels of the cosmos (mostly three), the horizon, the zodiac, the Milky Way and sometimes the rainbow. Often shamans use two drums to reproduce both hemispheres of the sky. Recent studies proofed the astronomical function oft he drums.

The rock pictures in the «shaft» of the Lascaux grotto form such a multidimensional, cosmographical map. In the Lascaux scene as in the known shamanistic sketch maps, the orientation of the sky chart to the north, the horizon, the meridian, the left and the right side of the sky, the three levels of the vertical and the four quarters, the three worlds (the “upper”, the “lower”, the “middle” one), the four directions of the horizontal bevel, the sun (the horse) and the moon (the bison, the woolly rhino), the stars and constellations (the bird-stick, bird-man) are noted. It's as well a manifold two-dimensional sky map showing the view of the northern, eastern and western heavenly regions in one panel and the southern area in another like a three-dimensional sky planetarium, putting all points of views together. It may be applied to a shamans initiation, very similar to the usage of the drums or comparable magic and mantic objects.

SO THE SHAMANISTIC cosmography of the “well” in the Lascaux grotto includes an archaic cosmogony, showing the totem and at the same time stellar creatures of the primeval times. These beings, lords of the universe, appear in the rocks of a cave and produce all phenomena in the world, leaving their images on the walls. There, in the cave, at the centre of the cosmos, shamans could be inaugurated in secret knowledge, which helps them to understand the processes in the world and to heal the suffering beings. The

cosmographical map in the «shaft» of the Lascaux grotto reveals the shaman ways of passage between the different bevels of reality in the universe.

Could Lascaux indicate a kind of a prehistoric planetarium? Planetaria are multifunctional “dark caves”, which map the dome of the sky above the landscape of the location (often at other planets – so to speak “other worlds”) and permit a view into the universe (at different levels). Among their sky vault magical picture shows and animations, including musical presentations, are performed. They sometimes serve for purposes of meditation or philosophical recitations. Planetaria like the decorated caves of the Upper Palaeolithic get their attraction from the darkness, the change from a world outside to a world inside, the “ceremonial aspect” of performing pictures at the walls. It isn't amazing that modern planetaria arouse some archetypal experiences of the Upper Palaeolithic decorated caves. But the today's planetaria are lacking of an important aspect: They haven't any characteristics of a cosmic womb, place of initiation and transformation. Thus the religious aspect is clearly absent. In contrary a decorated grotto, such as the cave of Lascaux, is like a really hunter-gatherers temple-planetarium.

*BP = before present (1950), calBP = calibrated BP, calBC = calibrated BC

Zusammenfassung:

Mit einem interdisziplinär begründeten Forschungsansatz, der „integralen“ Methode, die Ergebnisse aus Archäologie, Astronomie, Ethnologie, Kartographie, Mythologie, Photogrammetrie, Religionswissenschaften, Semiotik und Symbolik zusammenfasst, werden verschiedene Felsbilder in der Höhle von Lascaux (bei Montignac, Dép. Dordogne, Frankreich) eingehend untersucht. Dabei zeigen sich saisonale, kalendarische und kosmographische Aspekte. Im „Saal der Stiere“ dürften der offene Sternhaufen der Pleiaden über dem damaligen Sternbild „Auerochse“ (in etwa das heutige Sternbild Stier) in Zusammenhang mit einer Kalenderrechnung abgebildet worden sein. Im „Axialen Divertikel“ gibt es einen klaren Hinweis auf die Darstellung des Mondlaufs im Zusammenhang mit wichtigen saisonalen Rhythmen. Schließlich führt die detaillierte Untersuchung eines kompletten Bildzyklus im „Schacht (des toten Mannes)“ auf die Abbildung eines außergewöhnlichen Himmelsanblicks, der sich dem Menschen des Magdalenien ca. 14,500 BC, kurz vor Mitternacht Ortszeit, zum Datum der Sommersonnenwende darbot. Aber es ist nicht nur ein Himmelsbild, sondern eine komplette uralte Kosmographie dargestellt, die von Menschen des Eiszeitalters gebildet wurde. Sie basierte auf einer archaischen Form einer schamanistisch-totemistischen Weltanschauung, die eng mit der Lebensweise der Jäger-Sammler-Völker jener Zeit verbunden war. In dieser Kosmographie vereinigten sich, symbolisch dargestellt, in Mythen ausgedrückt und mit Riten verbunden, Bereiche menschlicher Erfahrung von der Welt und sich selbst, die im Verlauf der weiteren Jahrtausende Kulturgeschichte stetig verfeinert, jedoch auch zusehends voneinander getrennt wurden: Fertigkeit, Glaube, Heilung, künstlerischer Ausdruck, Überlieferung, Wissenserwerb und Zusammenleben waren in einer Weltbeschreibung und Weltanschauung kombiniert, die als Verbindung und Rückbezug auf den Ursprung des Kosmos verstanden werden muß. Die Ergebnisse dieser Forschung führen zur Vorstellung, die Höhle von Lascaux könnte eine Art urgeschichtliches Planetarium gewesen sein, das zugleich die Funktion einer Kultstätte besaß.

NOTES

ⁱMy papers and doctoral thesis list very much references to prove my argumentations. The quantity of the matter makes it impossible to repeat all what I wrote elsewhere. Therefore I refer generally to my published studies and only make further notes, if I present new material.

ⁱⁱReichholf, 1983: 208

ⁱⁱⁱRuspoli, 1986: 46

^{iv}Ruspoli, 1986: 175

^vRuspoli, 1986: 172-173

^{vi}The following paragraphs summarize my research work, which I published in Rappenglück, 1997, 2001a, 2003

^{vii}Some researchers also believed in having found the first indications to the oldest observations of the Pleiades: In 1916 and 1926 Marcel Baudoin speculated that the people would already have watched them some ten thousands of years ago. In 1978 Robert Burnham jr. suggested that the rock paintings of the bovine in the caves of Altamira and Lascaux are somehow related to the zodiacal bull. In 1985 Heino Eelsalu supposed that in the „Hall of Bulls“ of the Lascaux cave the aurochs speckled with spots represent the Pleiades. In 1991 and again in 1997 Frank Edge tried to prove that the aurochs no. 18 and the group of six spots depict the zodiacal bull with the Pleiades as a part of a complete archaic zodiac cycle. In 1994 Luz Antequera Congregado suggested the same interpretation. In 1996 I presented my interdisciplinary attempt which supplies a detailed analysis and interpretation, instead of the partly very speculative explanations above. In the year 2000 Chantal Jegues-Wolkiewicz supposed again the same hypothesis as Frank Edge has it done, without citing any of the research papers above mentioned. These papers, except my own one, didn't include all necessary astronomical computations, e.g. the proper motions of the stars. They also missed to respect the archaeological and stylistical data. In particular the other authors didn't take care of the calibrated radiocarbon datings. It isn't here the place to criticize these studies much more in detail. This remains for a future paper.

^{viii}Allan, 1963: 391-413 ; Gundel, 1952: c. 2498-2499; Krupp, 1991a: 134, 241-242, 1991b; Scherer, 1953: 145-146

^{ix}Allan, 1963: 400; Gundel, 1952: c. 2523; Hudson, 1984: 46; Krupp, 1991a: 245, 1991b; Maas, 1924/25: 403 and fn. 36/37; Norman, 1925: 132; Schleberger, 1986: 136; Werner, 1952, 142

^xKrupp, 1991a: 246-247, 1991b

^{xi}Jobes, 1964: 335-348; Krupp, 1991a: 6; 1991b; Roe, 1993; Miller, 1997; Selin, 2000 (catchword: Pleiades); Vaiškunas, 1997; Kolev, D., Kaloyanov, A. and Koleva, V., 1997

^{xii}Allan, 1963: 391-413; Jobes, 1964: 335-348; Schlosser and Cierny, 1996: 96-97

^{xiii}Krupp, 1991: 245

^{xiv}In contrary see the suggested interpretation of the at the Nebra disk (Schlosser, 2003).

^{xv}See fn. 10.

^{xvi}Van der Waerden, 1980: 295

^{xvii}Van der Waerden, 1980: 296

^{xviii}Koch, 1989: 16-18

^{xix}Allan, 1963: 392

^{xx}Allan, 1963: 392; Bode, 1805: Tafel VI; Gundel, 1952: c. 2500; Krupp, 1991: 134

^{xxi}around the star 39 Tau (5.9^m)

^{xxii}See e.g. Gundel, 1992: p. 69-70. Gundel gives several examples in his book and catalogue.

^{xxiii}Kunitzsch, 1974: 265

^{xxiv}Künzli, 2000: coloured plate VIII, 1, b/w plate 34, 4 and 36, 1

^{xxv} θ^2 Tau (3.4^m), ϵ Tau (3.5^m), γ Tau (3.68^m), δ^1 Tau (3.8^m), θ^1 Tau (3.8^m), δ^3 Tau (4.3^m)

^{xxvi}Allan, 1963: 387; Gundel, 1913: c. 2617-2618, 2622

^{xxvii}Gundel, 1913: c. 2617-2618, 2623

^{xxviii}Van der Waerden, 1980: 295; Hartner, 1968: 233. It is very interesting that some Amerindian tribes also have the concept of the „jawbone“ of an animal – here a Tapir - related to the Hyades (Roe, 1993: 312).

- ^{xxix}Allan, 1963: 384-385; Gundel, 1913: c. 2618, 2619; Hartner, 1968: 230; Krupp, 1991: 134; Kunitzsch, 1974: 266-268
- ^{xxx}Mellaart, 1967: 148, fig. 36
- ^{xxxi}Calibrated with Radiocarbon Program CALIB Rev. 4.4.2, Copyright 1986-2002 M Stuiver and PJ Reimer. Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230; Raw 14C data given by Stuckenrath and Ralph, 1965: 191-192 and Stuckenrath and Lawn, 1969: 154-156.
- ^{xxxii}Biedermann, 1989: 357
- ^{xxxiii}See fn. 10 and
- ^{xxxiv}Matossian, 1980: 9-17.
- ^{xxxv}Rappenglück, 1999; Aujoulat et al. 1998; The shortening in brackets notates the name of the laboratory which had examined the sample together with a serial numbering.
- ^{xxxvi}Kromer and Spurk, M. 1998: 1117-1125. There are several attempts to continue the calibration further back in time (up to 12,410 cal BP).
- ^{xxxvii}Völker et al., 1998, 2000
- ^{xxxviii}Jöris and Weninger, B. 2000: 461-471. Also see: Comparison of Dating Results achieved with Different CALPAL Calibration Curves, Latest CalCurve-Update: January 2004, CALPAL (Cologne Radiocarbon Calibration & Paleoclimate Research Package), URL: <http://www.calpal.de>
- ^{xxxix}The calibration was made with OxCal Viewer Version 3.9 (Software created by Bronk Ramsey, 2003; URL: <http://www.rlaha.ox.ac.uk/orau/oxcal.html>); The 14C-date of 18,600 ± 160 BP (Gif A 95582) indicates that the cave had been visited as early as the end of the Badegoulian (18,500-17,000 BP).
- ^{xl}Up to now the age of the rock pictures in the cave of Lascaux isn't really clear. See Lorblanchet, 2000: 285, 299-300, 316
- ^{xli}I discuss this problem much more in detail in Rappenglück, 1999: 43-48.
- ^{xlii}A debate on the necessary features that an astronomical software has to include, to be really useful for purposes of archaeoastronomy, in particular paleoastronomy, can be found in Rappenglück, 1999: 72-80. The newer versions of programs, such like Guide 8.0 or Starry Night Pro 5.2, are well-suited, but they also lack some important tools of analysis or partly don't work exactly enough. Therefore by all means it is demanded to work with several software packages, to get an impression of accuracy and to apply a calculus of error.
- ^{xliii}The computation refers to Alcyone (η Tau; 2.9^m), the brightest star of the Pleiades.
- ^{xliv}Steinen, Karl von den, 1894: 243-246; Ginzel, 1906: 59 and fn. 2, 1911: 128, 149; Gundel, 1952: c. 2502, 2505; Erren, 1967: 48-53; Sesti, 1991: 455; Urton, 1980: 178, 180-181
- ^{xlv}Rappenglück, 2001b
- ^{xlvi}Norman, 1925: 135
- ^{xlvii}Kuegler, 1990: 15
- ^{xlviii}Ginzel, 1911: 147; Kuegler, 1990: 32
- ^{lix}Hartner, 1968: 238
- ⁱVon Bunsen, 1879
- ⁱⁱGinzel, 1906: 72-73, 75; Gundel, 1952: c. 2493; Scherer, 1953: 152-154; Parpola, 1985: 100, 135-140
- ⁱⁱⁱScherer, 1953: 154
- ⁱⁱⁱⁱAndree, 1893: 362-366; Gundel, 1952: 2507; Gundel, 1952: c. 2506, 2522-2523, 1981: 45, 57-58, 66-67, 108, 113, 173-175; and fn. 10; Krupp, 1982
- ^{iv}Hartner, 1968: 233, 236-238; Sesti, 1991: 455; Albani, 1994
- ^{lv}Albani, 1994
- ^{lvi}Eelsalu, 1985, Edge, 1997; Jegues-Wolkiewiez, 2000
- ^{lvii}Kuhn und Kuhn, 1968: 12-14; Frolov, 1978: 77; Marshack, 1972: 185, 189, Fig. 82.
- ^{lviii}Rappenglück, 2002
- ^{lix}Larichev, 1998

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- ⁴ Ruspoli, 1986: 175
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- ⁶ The following paragraphs summarize my research work, which I published in Rappenglück, 1997, 2001a, 2003
- ⁷ Some researchers also believed in having found the first indications to the oldest observations of the Pleiades: In 1916 and 1926 Marcel Baudoin speculated that the people would already have watched them some ten thousands of years ago. In 1978 Robert Burnham jr. suggested that the rock paintings of the bovine in the caves of Altamira and Lascaux are somehow related to the zodiacal bull. In 1985 Heino Eelsalu supposed that in the „Hall of Bulls“ of the Lascaux cave the aurochs speckled with spots represent the Pleiades. In 1991 and again in 1997 Frank Edge tried to prove that the aurochs no. 18 and the group of six spots depict the zodiacal bull with the Pleiades as a part of a complete archaic zodiac cycle. In 1994 Luz Antequera Congregado suggested the same interpretation. In 1996 I presented my interdisciplinary attempt which supplies a detailed analysis and interpretation, instead of the partly very speculative explanations above. In the year 2000 Chantal Jegues-Wolkiewicz supposed again the same hypothesis as Frank Edge has it done, without citing any of the research papers above mentioned. These papers, except my own one, didn't include all necessary astronomical computations, e.g. the proper motions of the stars. They also missed to respect the archaeological and stylistical data. In particular the other authors didn't take care of the calibrated radiocarbon datings. It isn't here the place to criticize these studies much more in detail. This remains for a future paper.
- ⁸ Allan, 1963: 391-413 ; Gundel, 1952: c. 2498-2499; Krupp, 1991a: 134, 241-242, 1991b; Scherer, 1953: 145-146
- ⁹ Allan, 1963: 400; Gundel, 1952: c. 2523; Hudson, 1984: 46; Krupp, 1991a: 245, 1991b; Maas, 1924/25: 403 and fn. 36/37; Norman, 1925: 132; Schleberger, 1986: 136; Werner, 1952, 142
- ¹⁰ Krupp, 1991a: 246-247, 1991b
- ¹¹ Jobes, 1964: 335-348; Krupp, 1991a: 6; 1991b; Roe, 1993; Miller, 1997; Selin, 2000 (catchword: Pleiades); Vaiškunas, 1997; Kolev, D., Kaloyanov, A. and Koleva, V., 1997
- ¹² Allan, 1963: 391-413; Jobes, 1964: 335-348; Schlosser and Ciemy, 1996: 96-97
- ¹³ Krupp, 1991: 245
- ¹⁴ In contrary see the suggested interpretation of the at the Nebra disk (Schlosser, 2003).
- ¹⁵ See fn. 10.
- ¹⁶ Van der Waerden, 1980: 295
- ¹⁷ Van der Waerden, 1980: 296
- ¹⁸ Koch, 1989: 16-18
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- ²¹ around the star 39 Tau (5.9^m)
- ²² See e.g. Gundel, 1992: p. 69-70. Gundel gives several examples in his book and catalogue.
- ²³ Kunitzsch, 1974: 265
- ²⁴ Künzl, 2000: coloured plate VIII, 1, b/w plate 34, 4 and 36, 1
- ²⁵ θ^2 Tau (3.4^m), ϵ Tau (3.5^m), γ Tau (3.68^m), δ^1 Tau (3.8^m), θ^1 Tau (3.8^m), δ^3 Tau (4.3^m)
- ²⁶ Allan, 1963: 387; Gundel, 1913: c. 2617-2618, 2622
- ²⁷ Gundel, 1913: c. 2617-2618, 2623
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- ²⁹ Allan, 1963: 384-385; Gundel, 1913: c. 2618, 2619; Hartner, 1968: 230; Krupp, 1991: 134; Kunitzsch, 1974: 266-268
- ³⁰ Mellaart, 1967: 148, fig. 36
- ³¹ Calibrated with Radiocarbon Program CALIB Rev. 4.4.2, Copyright 1986-2002 M Stuiver and PJ Reimer. Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230; Raw 14C data given by Stuckenrath and Ralph, 1965: 191-192 and Stuckenrath and Lawn, 1969: 154-156.
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- ³⁶ Kromer and Spurk, M. 1998: 1117-1125. There are several attempts to continue the calibration further back

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³⁷Völker et al., 1998, 2000

³⁸Jöris and Weninger, B. 2000: 461-471. Also see: Comparison of Dating Results achieved with Different CALPAL Calibration Curves, Latest CalCurve-Update: January 2004, CALPAL (Cologne Radiocarbon Calibration & Paleoclimate Research Package), URL: <http://www.calpal.de>

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⁴⁵Rappenglück, 2001b

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⁴⁷Kuegler, 1990: 15

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⁴⁹Hartner, 1968: 238

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⁵²Scherer, 1953: 154

⁵³Andree, 1893: 362-366; Gundel, 1952: 2507; Gundel, 1952: c. 2506, 2522-2523, 1981: 45, 57-58, 66-67, 108, 113, 173-175; and fn. 10; Krupp, 1982

⁵⁴Hartner, 1968: 233, 236-238; Sesti, 1991: 455; Albani, 1994

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⁵⁶Elsalu, 1985, Edge, 1997; Jegues-Wolkiewiez, 2000

⁵⁷Kuhn und Kuhn, 1968: 12-14; Frolov, 1978: 77; Marshack, 1972: 185, 189, Fig. 82.

⁵⁸Rappenglück, 2002

⁵⁹Lanichev, 1998

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