

The Pleiades in the „Salle des Taureaux“, Grotte de Lascaux. Does a Rock Picture in the Cave of Lascaux Show the Open Star Cluster of the Pleiades at the Magdalenian era (ca 15.300 BC)?

The cave of *Lascaux* (Com. Montignac, Dép. Dordogne, Rég. Aquitaine; φ : 45°03'17" | N : 01°10'44"E, 216 m above NN) is famous for its prehistoric paintings and above all for its magnificent portrayals of animals in the „Salle des Taureaux“.

Although the animals receive a great deal of attention during the guided tours the sign-like shapes which are also depicted are mostly passed over. But the puzzle surrounding one of these figures might now have been solved, thereby throwing light on the painting beneath it as well as on all the other pictures. The group of spots floating above the back of the largest Auroch might represent the open cluster of the stars - the Pleiades (M 45/NGC 1432; 3.^m0), which lie above the constellation of the bull (Taurus).

The Aurochs with the six spots.

The Aurochs (picture no. 18 in the cave; fig. 1), with a length of 5.5 m and a perimeter of 20 m, is the largest picture in the whole collection of cave drawings in Lascaux and is painted almost entirely on the ceiling. Its location is exactly in the south of the hall, between the junction of the „Diverticule axiale“ and the „Passage“.

Above the Aurochs back a strange figure, a cluster of six floating points can be seen (fig. 1). The distribution of the spots does not seem to be haphazard, having instead a clear structure, which is more or less suggestive of a natural object.

The painting is almost entirely preserved, except for quite a large area around the animals neck region, where a part of the rock has broken off. Other animals are portrayed to the left of the Auroch, being located either above or below it. These pictures could originate from earlier or later epochs but they fall outside the scope of this paper.

The six spots: the open cluster of the Pleiades.

Above the animals back a cluster of six floating points can be seen. Anyone who is familiar with the night sky is immediately reminded of a very well known open cluster of stars, which have been observed since ancient times: the *Pleiades* ...

The *Pleiades* are certainly one of the first constellations, which excited the interest of the earliest star-gazers enough for them to figure prominently in the myths and literature of many cultures. Some researchers believe they have found the first indications of the oldest observations. BAUDOIN (1916; 1926) speculated pretty wildly - many of his claims are untenable - that people had observed this open cluster in the *Aurignacien* (33000-26000 BC) right up to the *Azilien* (10000-8000 BC) era. And EELSALU (1985: 65, ill. 6 and 83) guessed that the Aurochs, speckled with spots in the cave of *Lascaux* was somehow connected with the stars - a brilliant intuition, which he unfortunately did not further substantiate. CONGREGADO (1994: 71-72 and fig. 2.3/2.4) stated, that the six points above the aurochs no. 18 in the „Salle des Taureaux“ be the open cluster of the *Pleiades*. A fine idea, but he does not compute the positions of the stars, including precession, proper motion and other corrections for the place and time of the Magdalenian era, to which the pictures had been drawn upon the walls.¹ That the *Pleiades* were already observed and depicted in the time of *Magdalenian* (16000-10000 BC), the most probable date when the Aurochs in the cave of Lascaux was painted, shall become clear.

In all parts of the world people have observed this magical cluster of twinkling stars. Not only the *Germans* (SCHERER, 1953: 145-146) call them the „seven sisters“, with reference to the number which can be usually be seen in normal conditions (that is of weather and powers of vision) by the unaided eye,

Nonetheless, the ancient people and even some of those living today see different numbers of stars: mostly seven (GUNDEL, 1952: c. 2498-2499; KRUPP, 1991: 134, 241-242; ALLAN, 1963: 391-413), but also, - six, eight, ten, eleven, thirteen, fourteen or sixteen (KRUPP, 1991: 246-247). Many traditions speak emphatically of six stars: the *Chinese* (KRUPP, 1991: 245), the *Indian* (SCHLEBERGER, 1986: 136) the *Japanese (Ainu)*; KRUPP, 1991: 245), the *Amerindians (Natives of North America)*, for example the *Cherokee*, *Chumash*, *Navajo*, *Tachi Yokut*, *Yurok* [HUDSON, 1984: 46; KRUPP, 1991: 245] and some tribes in South America [ALLAN, 1963: 400]), the *Chuckchees in Siberia* (GUNDEL, 1952: c. 2523; WERNER, 1952, 142), the island inhabitants of *Borneo* (for example the *Dajak* tribe; MAAS, 1924/25: 403 and fn. 36/37), and inhabitants of *Polynesia* (for example of the *Hervey-* and *Cook-Islands*; KRUPP, 1991: 245, NORMAN, 1925: 132), some *Aborigines* tribes in *Australia* (for



Fig. 1 In the „Salle des Taureaux“: the Aurochs (no. 18; Ruspoli, 1986: 201). Above the animals back a strange figure, a cluster of six floating points can be seen. Photo from Bataille, 1986: 61.

example the *Pirt-Kopan-noot*; NORMAN, 1925: 132). The *Greek* (GUNDEL, 1952: c. 2496-2497; NORMAN, 1925: 145), the inhabitants of *Borneo* (NORMAN, 1925: 132), the *Aborigines* in *Australia* (ALLAN, 1963: 406), the *Cherokee* in *North America* (NORMAN, 1925: 134), the *Buriats, Kirgise, Mongolian, Tatar* in *Asia* (HOLMBERG, 1964: 427, 431; KRUPP, 1991: 248-249) tell star myths, which speculate about the missing seventh *Pleiad* and therefore also only talk of with six. Therefore, when we widen our study to include other cultures, we can see that the six stars above the Aurochs in the cave of *Lascaux* could well represent the six Pleiades. Still today the *Japanese* automobile producer *Suburu* shows the maker's emblem of the six stars (jap. suburu), presented in ball and links style, on its cars (KRUPP, 1991: 245).



Fig. 2 The cluster of the six points above the aurochs; from Bataille, 1986: 61

That these six Pleiades can also be depicted in the same way as the stars above the Aurochs in the „Salle des Taureaux“ is shown by a drawing handed down to modern times by the *Navajo Natives* in *North America* (CHAMBERLAIN, 1983: 49, fig. 1 B' and 50 based upon the work from TOZZER, 1908: fig. 7). It is extraordinary how similar these paintings are, although seventeen thousand years separate them (fig. 2 and 3).

When we look at the *Pleiades* only six stars can really be seen clearly by the naked eye under normal conditions: 25 • Tau (*Alcyone*; 2^m.9), 27 Tau (*Atlas*; 3^m.6), 17 Tau (*Electra*; 3^m.7), 20 Tau (*Maia*; 3^m.9), 23 Tau (*Merópe*; 4^m.2, 19 Tau (*Taygete*; 4^m.3). The stars 16 Tau (*Celaeno*; 5^m.6) und 21 Tau (*Asterope*; 5^m.8) being almost on the limits of visibility. The apparent brightness of 28 Tau (*Pleione*; 4^m.8-5^m.5v) can vary by 0^m.7 with the result that this star can be clearly seen during its phase of maximum luminosity, but only with difficulty during its phase of minimum luminosity. When the sky is really clear the last three stars mentioned can be spotted

(GUNDEL, 1952: c. 2498) and then the number of stars in the Pleiades which can be seen by the naked eye, consequently can rise from six to nine.

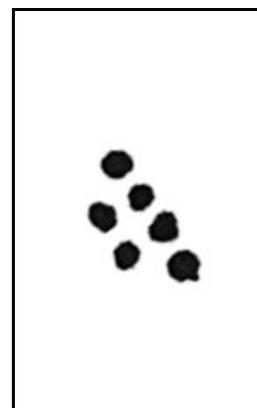


Fig. 3 The *Pleiades* in a picture drawn by the *Navajo*; from Chamberlain, 1983: 49, fig. 1 B', based upon the work of Tozzer, 1908: fig. 7

The Aurochs: today's constellation Taurus and the open cluster of the Hyades.

Beneath the Pleiades lies a group of stars which has since the oldest times been known as the constellation of Taurus. The *Accadians* for example recognised in these stars a bristle on the back of the neck of the bull (*zappu*, GUD.AN.NA [=GU₄.AN.NA]). The *Babylonians* called the animal the heavenly bull (VAN DER WAERDEN, 1980: 68). In most depictions the *Pleiades* are located above the shoulder of the bull (BODE, 1805: Tafel VII; KRUPP, 1991: 134) or lie above the backbone (GUNDEL, 1952: c. 2500). The heavenly constellation has been cut in half in the course of the centuries. Originally a whole animal formed the constellation but perhaps for reasons connected with the calendar, only the front part has remained. Even in ancient times (KUNITZSCH, 1974: 265) the bull was cut in half around the star 39 Tau (5^m.9), the back part creating space for a small but quite convincing constellation, the ram. The back part of the bull was originally composed of stars which today belong to the whale and the ram. We can only speculate about which stars these were. The rock painting in the „Salle des Taureaux“ shows a whole animal constellation, and is therefore in keeping with the oldest traditions of ancient times.

Another open cluster of stars, the *Hyades* together with the brightest star 87 • Tau (*Aldebarán*; 0^m.9), form the v-shaped head of the bull, in line with many descriptions which have been handed down to us from ancient times (GUNDEL, 1913: c. 2617-2618). These stars shape the speckled patterning of the face of the bull (GUNDEL, 1913: c. 2623). The name *is li-e* (= ^{gi} li-e), »jawbone of the bull« was given to the Aurochs and the Hyades together as early as the time of the *Babylonians* (VAN DER WAERDEN, 1980: 295; HARTNER, 1968: 233). Various reports exist about the number of stars which can be seen by the unaided eyes under the best conditions (GUNDEL, 1913: c. 2617-2618). Most reports speak of five stars, which all have the apparent brightness of between 3^m.4 and 3^m.8 or of six, when the star *Aldebarán* (0^m.9), as often happened, is included (GUNDEL, 1913: c. 2618, 2622).

The star $87 \bullet$ Tau (*Aldebarán*; $0^m.9$), shining in a bright red colour, was used even in ancient times at least up to the sixth millennium BC to mark the right eye of the bull (GUNDEL, 1913: c. 2618, 2619; HARTNER, 1968: 230; KRUPP, 1991: 134; KUNITZSCH, 1974: 266-268). In the face of the Aurochs number eighteen there can be seen a large dark dot with a half bow drawn across it, the eye with the brow (fig. 1). Around it are five spots of medium size and seven or more, smaller ones: a picture which reminds one very much of the distribution of the *Hyades* around the *Aldebarán* [$87 \bullet$ Tau (*Aldebarán*; $0^m.9$) (eye) - $78 \bullet \delta^2$ Tau ($3^m.4$), $74 \bullet$ Tau ($3^m.5$), $54 \bullet$ Tau ($3^m.6$), $61 \bullet$ 1 Tau ($3^m.8$), $77 \bullet \delta^1$ Tau ($3^m.8$) - $68 \bullet$ 3 Tau ($4^m.3$)]. The tips of the horns of the Aurochs could have the following position as is clear from the oldest traditions, for example from the nomenclature in the *Almanac of Klaudios Ptolemaios*² (ERREN, 1967: 320; KUNITZSCH, 1974: 268-269, 271); for the southern horn - $123 \bullet$ Tau ($3^m.0$), $126 \bullet$ Tau ($4^m.9$) „tip of the horn“, $104 \bullet$ Tau „horn“, $97 \bullet$ i Tau „base point of the horn and the ear“ and for the northern horn - $94 \bullet$ Tau „base point of the horn“, $121 \bullet$ Tau „horn“, $112 \bullet$ Tau ($1^m.7$) “tip of the horn (*Elnath*, *Nath*).

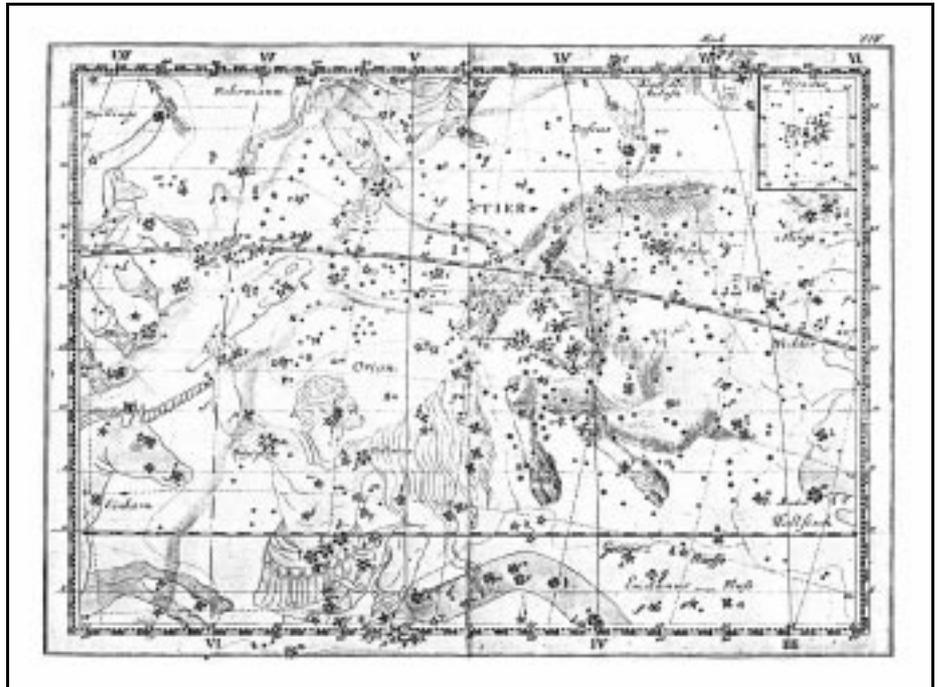


Fig. 4 The copperplate engraving VII from Bode, 1805. The figure of the constellation looks like the rock picture of the aurochs no. 18 in the "Salle des Taureaux". In this case the open cluster of the *Pleiades* (M 45) is integrated in the drawing of the animal. In the picture on the wall it is above the neck of the aurochs. The graphic representation changes during different epochs. The copperplate engraving clearly shows, how the beast takes the *Milky Way* on its horns. In the rock picture the glowing band of stars must be left from the aurochs.



Fig. 5 The constellation *Taurus* together with the planet *Venus* on a coin from the time of the Roman emperor Antonius Pius, 145 AD (Gundel, 1992: catalogue no. 254, 2). The minting shows a complete animal.

Which stars in the astral bull correspond to which parts of an earthly bull can be seen from the Table VII, which is taken from a work of JOHANN ELERT BODE³, published in 1805 (Fig. 8). This is very much in keeping with the oldest traditions which have been handed down to us (KUNITZSCH, 1974: 264-271). The depiction of the bull however showed large variations. Particularly interesting in the respect is a coin (Fig. 9; GUNDEL, 1992: 279, catalogue no. 254, 2; fig. 10) which has the alexandrine minting and which comes from the time of the Roman emperor ANTONIUS PIUS⁴ (145 AD). It shows a complete and strong bull in motion with its horns turned forwards, a powerful animal with a high arched withers, sunken back and firm rump, the tail being raised up high; that is the constellation bull. Above it can be seen the planet Venus. The coin is an important discovery, showing the rich variations with which an animal constellation could be portrayed and which bears a remarkable resemblance to the Aurochs number eighteen in the „Salle des Taureaux“. The depiction of the Aurochs with the six spots can therefore be seen to be in line with one of the traditions in which the constellation of the bull was often portrayed. Certain deviations are naturally possible in free hand drawing.

The large formal similarities between the rock picture and the constellation therefore make it likely that the painting in the „Salle des Taureaux“ portrays the constellation of the bull with the open cluster of the *Pleiades* and the *Hyades*. Were these stars then visible above the horizon at that time? And if the answer is yes, did the constellation have an especially significant and striking position at any time during the year, which might have fired the imagination of the artistic members of the star gazers enough for them to paint it. In order to answer these questions about how the stars might have appeared to the people of Lascaux at that epoch and to which time in the year, it is necessary to know the age of the cave picture.

How old is the rock painting?

The determination of the exact date of the rock painting is problematic. The painters used charcoal only very sparingly. Nonetheless pieces of charcoal were found in the corridors in front of the picture and in those layers of the earth which are archaeologically relevant. Their age was determined with the help of the carbon fourteen method. Eight carbon fourteen datings have been made up to now:⁵ 17190 ± 140 BP⁶ (GrN-1632), 16100 ± 500 BP (Sa-102), 15516 ± 900 BP (C-406), 9070 ± 90 BP (GrN 3184), 8660 ± 360 BP (Ly-1197), 8510 ± 100 BP (GrN-1182), 8060 ± 75 BP (GrN-1514), 7510 ± 650 BP (Ly-

1196). The results can be divided into two main groups: a younger one with a mean of 8380 ± 60 BP (6430 ± 60 BC) and an older one with a mean of 17070 ± 130 BP (15120 ± 130 BC). About nine thousand years lie between both. No date in either group falls outside the set standard limits of deviance. The values vary: between 15240 and 14050 BC (17190 ± 140 BP; 16000 ± 500 BP) indicating an average of 17070 ± 130 years of age (BP). The dates are not yet calibrated, that means that it is not at the moment possible to convert them into solar years. It is likely that there are certain, probably small deviations. The carbon fourteen method dates the painting to a time span between the *Magdalenian* I-III (18000-15000 BP) and the *Epipaleolithic* or *Mesolithic* (10000-6000 BP) era. It seems probable that people from the end of the *Interstadial of Lascaux* (16000-15000 BC) settled in this period near the caves and ventured into the grotto. At which positions in the heavens were the *Pleiades*, the *Hyades* and the *Bull* during the era, which carbon fourteen has established for the art works in the cave of *Lascaux*?

The six stars and the Aurochs: markers of the start of spring 17300 years ago.

It is highly probable that the *Pleiades*, *Hyades* and the *Bull* must have marked a special point at the ecliptic at the time when the cave paintings of *Lascaux* came into being. Such points could be the equinoxes and solstices in summer and winter. The era in which the *Pleiades* were nearest to one of these heavenly annual points, can be calculated using the precision of the equinoxes, taking into account the slowly proper motion of the stars.

The calculations show, that the point of the solstice in summer and the point of the vernal equinox for the position of the *Pleiades* are out of the question, when we consider the likely age of the picture. In one case the cave painting is too young, in the other too old. The *Pleiades* would have marked the summer solstice around 21600 BC, the vernal equinox about 2300 BC. But both epochs fall outside the period suggested by the carbon fourteen dating, even if we assume a two to threefold deviation ($2/3$) from the means and a mistake in the astronomical calculations of 500 years. The *Pleiades* reached the point of the winter solstice around 8700 BC. This date lies exactly between the two possible ages, being roughly 1,500 years older than the maximum of the youngest group and almost 500 years younger than the minimum of the oldest group. The position of the winter solstice can also be excluded. Therefore only the autumn equinox remains as a possible candidate for the position of the *Pleiades* at the times of the cave artists from *Lascaux*.

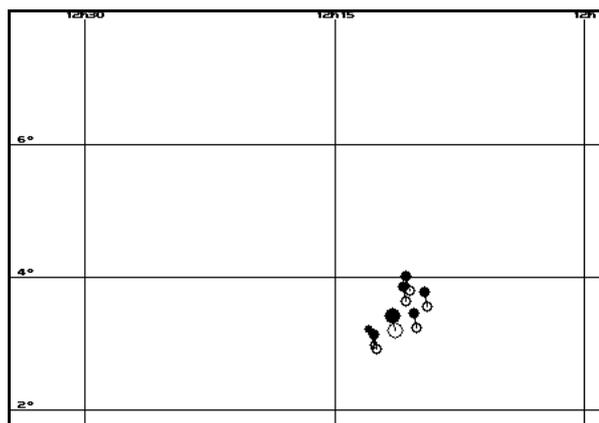
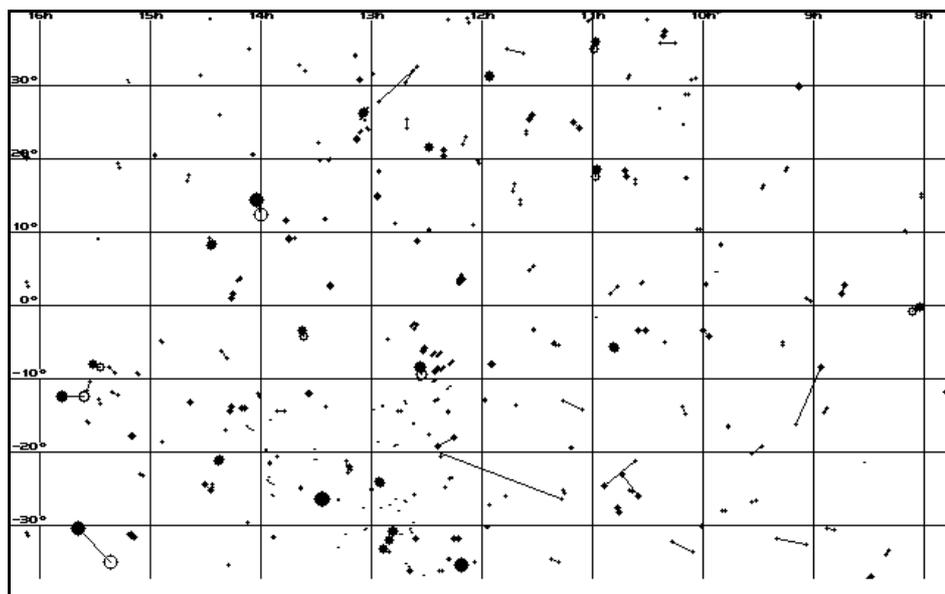


Fig. 6 The *Pleiades* (M 45) 17300 BP. Empty circles mark the position of the stars today (J 2000.0), filled circles the position at the epoch -15300. The proper motions of the stars are shown by connecting lines between the black and white circles. The shifting by reason of the precession of equinoxes is taken into account. Software *Hipparcos 2000.0* for the Atari ST 1040 from ANDREAS KAMMERER, Karlsruhe, Germany.

In this case, the astronomical and the carbon fourteen dates coincide. The *Pleiades* in 15300 BC were very near the point of the autumn equinox (: 12^h , : 0°), when we consider the relation to the position of the brightest star $25 \bullet$ Tau (*Alcyone*; $2^m.9$, : $12^h 16.6^m$, : $+2^\circ 51'$). That means that the distance separating the two was the equivalent of only 5.5 times the width of the moon, that is only 2.8° away from the equinoctial point. Even better is the star $27 \bullet$ Tau (*Atlas*; $3^m.6$) with : $12^h 17.8^m$, : $+2^\circ 34'$. This star reached its smallest distance - 2.6° - at the time of 15300BC. Only hundred years earlier or later the distance was already larger. The six stars in the „Salle des Taureaux“ therefore represent a striking and excellent heavenly marker for the beginning of autumn and of spring. The epoch calculated astronomically lies extraordinarily close to the uncalibrated oldest carbon fourteen dating: 17190 ± 140 radiocarbon years (with the reference point being 1950) and 17300 astronomical years (in reference to the year 2000.0), corresponding to 15300 BC. The difference is minimal even if the margin of error of the astronomical calculation is taken as being ± 500 years. It could therefore really be the case that, in the „Salle des Taureaux“, the autumn position of the constellation of the *Bull* together with the *Hyades* and the *Pleiades* is portrayed.

Could the constellation at that time be seen in a form as striking as today's? To tackle this problem, use was made of the software *Hipparcos 2000.0* for the Atari ST 1040 (from ANDREAS KAMMERER,

Karlsruhe), which has already been implemented in two other similar paleoastronomy studies (RAPPEGLÜCK, 1995a; 1995b).⁷ The orbit of the stars during this carbon fourteen epoch were calculated and represented in a graph for the year 17300. From this we can see, that the shape of the *Pleiades* (fig. 6) has not changed for the unaided eye. However, the open cluster as a whole was located the equivalent of about $1/4$ of the radius of the Moon north of its present position. For the same epoch a calculation was made of the constellation of the *Bull* as a whole (fig. 7). During the period of 17300 years, the star $112 \bullet$ Tau (*Elnath*, *Nath*), the upper horn tip and the star *Aldebaran* ($87 \bullet$ Tau), the eye of the bull, all moved. The change in the position of *Aldebran* is significant. 17300 years ago this star was much more clearly framed by the “spotted drawing” of the *Hyades* than it is today, a fact which is brought out clearly by the painting in the „Salle des Taureaux“.⁸ The orbit of the star has not influenced the form of the painting, except for some negligible exceptions. The constellation of the bull together with the *Pleiades* and the *Hyades* must have been a very impressive heavenly marker, signifying the opening of spring and the end autumn, 17300 years ago. But what exactly could be seen?



Then and at the time of the autumnal equinox the sun is in a position not far from the *Pleiades*. Because of the luminosity of sunlight, the open cluster of stars cannot be seen in the daytime sky. On the geographical latitude of the cave of *Lascaux* (φ : $45^{\circ}03'17''$ N), the six stars at the time of 15300 were invisible for 46 days between the 26th of August and the 11th of October (some days plus/minus). Under the best conditions of observation, for example the top of the hill of *Lascaux*, the *Pleiades* were visible around the 11th, that is the 283 day in the year, eighteen days after the autumn equinox in the dusk shortly before sunrise. The first glow took place at 7° above the horizon. The sun was located at this moment in time 8° under the true horizon (with an arcus visionis about 15°). After another 161 days, exactly at the beginning of spring at midnight local time, the *Pleiades* reached their highest position of about 47.8° in the south above the true horizon. The constellation of the Bull loomed up

Fig. 7 The sky at springtime 17300 BP (-15300). Empty circles mark the position of the stars today (J 2000.0), filled circles the position at the epoch -15350. The proper motion of the stars is shown by connecting lines between the black and white circles. The shifting of the coordinates by reason of the precession of equinoxes is taken into account. Software Hipparcos 2000.0 from Andreas Kammerer, Karlsruhe, Germany. To that time in the year the back part of the aurochs rises high in the sky. But the drawing on the rock shows the animal in a horizontal position. At the time of his heliacal setting in mid-August -15300, the celestial aurochs „stood“ on the visible western horizon.

steeply in the sky with its head turned downwards and its rump upwards (fig. 7). 158 days later, on the 237th day of the year, the 26th of August, they could be seen for the last time in the dusk after sunset. The position of the Aurochs in the rotunda could result from the attempt to convey this image (fig. 1). The autumnal equinox came 28 days later (a sidereal month) and the cycle of the star year of the *Pleiades* was completed again. About 319 days passed from the first morning to the last evening, the beginning of spring dividing this period almost exactly in half (161 to 158 days). The fact that the *Pleiades* served as a heavenly time marker for the earthly seasons has been documented for thousands of years in word and picture among many peoples.

The sidereal year of the Pleiades

The division of the year according to the star phases of the *Pleiades*, that is their heliacal rise and fall, was accepted practice throughout the world: in *Eurasia* (ERREN, 1967: 48-53; GUNDEL, 1952: c. 2502, 2505; SESTI, 1991: 455), *North and South America* (STEINEN, KARL VON DEN, 1894: 243-246; URTON, 1980: 178, 180-181; GINZEL, 1906: 59 and fn. 2, 1911: 128, 149) and *Indonesia* (GINZEL, 1906: 59 and fn. 2, 1911: 128)

The islanders of *Polynesia* spoke of the „*Pleiades* above and the *Pleiades* below“ (SESTI, 1991: 455): The heliacal (near dawn) rising of the *Pleiades* has marked from ancient times (HARTNER, 1968: 233, 236-238) the start of spring and the setting of the group in autumn signified the seasons end, thus dividing, as said, the year in two, and defining the fixed points to help count the days: the so-called „Year of the *Pleiades*“ (Fur-Year). In front of the figure of the bull, we find in the drawings of antiquity a curious sign-like shape, whose form varies; at one time it looks like a „branch“ or a „trident“, an „ear of corn“ or a „kind of tree“. This sign, which always has some reference to a vegetable, was used by the *Babylonians* thousands of years ago to indicate the ascent of the star sign *Taurus* (HARTNER, 1968: 238). Interestingly, a strange sign similar to a branch can also be seen in front of the Aurochs no. 18 with the six spots. Is this a prototype of a heavenly signal, used something like an exclamation mark, to announce the beginning of spring?

Even the precision of the equinoxes was related by the people of ancient times to the seven stars. The „Great Year of the *Pleiades*“ referred to that enormous period of time, when the location of the pole of the (northern) sky together with the points of solstices und equinoxes changed under the stars (SESTI, 1991: 455). They were the points of reference for measuring space and time (GUNDEL, 1952: c. 2506, 2522-2523, 1981: 45, 57-58, 66-67, 108, 113, 173-175), the heavenly markers for the natural seasons, - of hunting, fishing, fieldwork (ANDREE, 1893: 362-366; GUNDEL, 1952: 2507).

A myth of the *Blackfoot Natives* in *North America* (NORMAN, 1925: 135) throws light on the picture in the „Salle des Taureaux“. These people synchronise the star phases of the *Pleiades* with the changes in the coats of the buffalo calves. The rutting time of the buffalo, as was the case with the Aurochs in olden time, is between August and October, that is in autumn.

After about 280 days, that is nine synodic or ten sidereal months the cow delivers her calf. Its coat has a yellowish colour. In the course of the month the coat of hair grows darker and has a deep brown tone by the time its first autumn comes. Adult animals undergo their annual change of coats at the beginning of spring (KUEGLER, 1990: 15).

The calendar of the *Teton Sioux* and of the *Cheyenne in North America* (GINZEL, 1911: 147; KUEGLER, 1990: 32) follows the natural rhythm of the life of the bison. The year begins in October (the first month). The names of some months are very interesting. November was „the moon of the fertilisation of the buffalo cows“ (the second month) - January, was „the moon, when the coat of the young buffaloes takes on colour“ (the fourth month), - February, was „the moon, when their hair grows stronger“ (the fifth month), and July, was „the moon, in which the buffalo cows give birth“ (the tenth month). In the same way the Aurochs in the „Salle des Taureaux“ could depict a calendar, which is based on the seasonal rhythms of the bovines and is cross-referenced to a special astral time signal: the heavenly Aurochs with the six spot. The year in those times could have begun with the season of heat and rutting of the Aurochs, which was pretty well determined by the open cluster of *Pleiades* plus or minus some days from the evening dusk until the early morning around the 11.th of October.

The position of the *Pleiades* near the ecliptic and therefore, depending on the epoch, not far from the seasonal points on it, was continuously used in ancient times to define the origin of ecliptically divisions, the so-called „houses“ or „stations“ in a the circle of the star groups, the different zodiacs in the ancient civilizations. For example the six stars, which were called *mao* in old *Chinese* and *krittikäh* in old *Indian* star lore, represented the starting point of the lunar zodiac, the 28 *Chinese hsui* and 27/28 *Indian nak satra* at the vernal equinox around 2300 BC (GINZEL, 1906: 72-73, 75; GUNDEL, 1952: c. 2493; KIRFEL, 1920: 34-36, 138; SCHERER, 1953: 152-154). The *Pleiades* are according to the oldest tradition closely linked to the zodiacal constellations (VON BUNSEN, 1879). The second station of the *Indian* moon station is incidentally called *röhine*, »the red, the red-like«, which refers to a red cow, the star *Aldebaran* (SCHERER, 1953: 154). 15000 years earlier a very similar distribution could be seen in the night sky, only with opposite positions: at that time the *Pleiades*, the open cluster of six stars marked the autumn and was therefore the main constellation of the spring. Their disappearance signalled the approach of autumn.

This study raises many new questions. Could the set of animals in the „Salle des Taureaux“ be a „circle of animals“, a „zodiac“ in the proper sense of the word? Is the aurochs with the six spots the first constellation of the whole zodiac to be identified? These questions would have to be tackled in another more comprehensive study. The first steps have already been taken.

In the first nights of autumn the sky must have a magnificent sight to the people of Lascaux in the *Magdalenian* times. The constellation of the Aurochs shone to the west of the hilltops which surround the cave. The star speckled face of the animal, the *Hyades*, the wildly twinkling red eye, the *Aldebaran*, the strong legs, the high powerful hair covered back, the massive body could clearly to be made out in the sky. The brilliant cluster of six stars, the *Pleiades* glittered above its huge back. East of the animal shone the Milky Way and it seemed as if the Aurochs with its colossal strength wanted to take them by the horns. This dramatic scene in the heavens was captured by the artist on the ceiling of the cave, the heavenly picture above the earth being turned into an rock painting beneath the earth, in the same as much later, the *Dogon* in *Africa (Bandiagara, Mali/Burkina-Faso)*, following tradition, drew in their caves the heavenly signs on the ceiling, the earthly one on the ground (GUMAN, 1989: 8).

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Translated from German by Jan Burgermeister.

¹And his statement, that the three points near to the left of the aurochs are the belt stars of the constellation Orion could be easily refuted: There are really four points drawn upon the wall (Bataille, 1986: 61).

²Klaudios Ptolemaios, * about 100 AD in Ptolemais, Egypt, † about 160 AD probably in Canopus near Alexandria, Egypt. He wrote the „Almagest“ about 140/141 AD.

³Johann Elert Bode (* 19.1.1747 Hamburg, † 23.11.1826 Berlin), astronomer

⁴* 19.9.86 Lorium, Latium, ☐ 7.3.161 just there

⁵Evin and Leroi-Gourhan, Arl., 1979: 81-84. The shortening in brackets notates the name of the laboratory which had examined the sample together with a serial numbering.

⁶BP shortening for Before Presence (the era 1950)

⁷The computed positions of the stars are corrected for precession, refraction, extinction and visual horizon using the software Hipparcos 2000.0, the Sky Catalogue 2000.0, vol. 1 und 2 (HIRSHFELD UND SINNOTT, 1982a und b), the Sky Atlas 2000.0 (TIRION, 1981) and the formulas of BERGER (1984: 3-39) and SCHAEFER (1985: 261-263, 1987: S19-S33).

⁸The position of *Aldebaran* for -15300 was : 12^h 38.2^m, : 8° 60', his relative magnitudo at this epoch: 0^m.7.