Ina Wunn

Cognitive and ethological approaches to Paleolithic Cave Art

1. Preliminary reflections

At the beginning of the upper palaeolithic period an anatomically modern type of the species *homo sapiens* appeared in Europe, that hardly differed from recent humans.[1] In addition to the anatomical statement, the settlements, material culture, and the traces of successful hunt allow the conclusion that the intellectual abilities of the humans of the Upper Palaeolithic were not inferior to recent humankind. The camps of the last ice-age with their tents or huts present a well-known picture of the life of a typical hunter-gatherer community, so that archaeologists gain valuable insights into the life of our ancestors by comparison with recent hunter-gatherers.[2] Such an actualistic approach is only possible, because recent and palaeolithic hunter-gatherers share not only the same economy and – to a certain degree - probably even the lithic technology, but also their strategies of survival and the pertinent conceptional ideas. Recent hunter-gatherers, however, hardly do without ideas that belong to the world of the religions. Not only economy, but also religion is a useful and probably even necessary instrument in the struggle for survival and shall protect against the incidents of life.[3] Therefore, it is only consistent to look for traces of early religion even in the palaeolithic period.

2. Palaeolithic rock art and religion

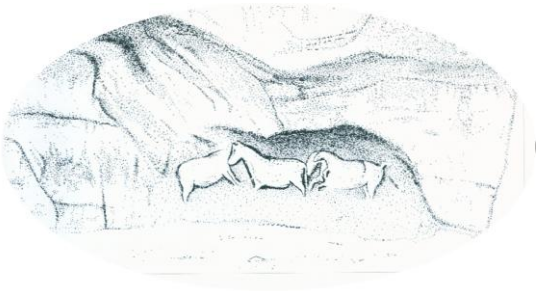
Nevertheless, the proof of ice-age-religion remains problematic, even if considerations from a sociological standpoint and ethnographic analogies suggest the existence of early religious manifestations. But in contrast to

sociological or anthropological methods of analysis, any attempt of reconstructing the world-view of prehistoric humans is restricted to interpretations of the material remains of prehistoric cultures.[4] As a result, especially such artefacts attract the attention of scholars and scientists, that obviously do not serve an economical purpose. In this context, the rock-art of the ice-age became subject of speculations concerning a suggested religious meaning.[5]

In spite of the otherwise different standpoints hold by scholars of today, hardly anybody doubts the religious sense of the representations.[6] In addition to the so-called "primary" or "natural subject matter"[7], the motifs of rock art are supposed to have an intrinsic meaning or content, constituting a world of symbolical values.[8] Ostensibly, the intrinsic meanings are understood to have played a main role in palaeolithic rituals and, therefore, point at an early religion that is still to be decoded.

Here is not the place to enter into the broad actual discussion that stretches from "ritual" or "social activities" to the religions of recent hunter-gatherers, or to discuss the main and well-known arguments in favour of one of the religions under question,[9] for example totemism, or, lately, shamanism.[10] Jean Clottes and David Lewis-Williams, for example, compare the art of the ice-age with South African rock art and come to the conclusion, that both depict a shamanistic view of life, where shamans conjure the game to cope with the needs of a hunter-gatherer community.

Hunting Scene, Lion's head, Msana Reserve, Zimbabwe



Chaire à calvin (charente), painting M. Lorblanchet

On the first glance such a comparison is convincing. Both the motifs and the naturalistic, prospective style seem to be quite similar. In European cave art the typical fauna of the ice age decorates the walls of caves and abris, in Africa the animals of the savannah are pictured. Only on a second view there are crucial differences between these two categories of rock-art: In palaeolithic Europe the motifs remain isolated, and portrays of human beings hardly ever appear. If humans are depicted, they are painted in a clumsy way, that does not match with ice-age art in general.[11] In African rock-art, however, humans and animals are

depicted with the same mastership.[12] In addition to that, there is an obvious relation between humans and animals or different groups of humans: the pictures of African rock-art are telling stories! In Africa one will find pictures of men and women in action: the observer can see hunters with their bows, warriors, the collectors of honey, magical practitioners and even supranatural spirits. While many of those old stories underlying African rock-art became extinct together with the cultural heritage of the likewise extinct hunter-gatherer-communities of prehistorical and even historical times, Lewis-Williams could preserve several of the old bushman-myths and, as a consequence, managed to interpret the historical and even ancient rock-art of Southern Africa by gaining direct information from the descendants of the former artists.[13]

In Europe, however, things are different: no late descendants of the cave artists can answer questions about their mutual spiritual heritage. The view of the world of palaeolithic European hunter-gatherers disappeared long ago together with their ancient hunting-techniques and related myths.

The differences between bushman-art and palaeolithic rock art are not restricted to the art of these two cultures, but stand for general differences in style and contents of the various manifestations of rock art in general. According to Emmanuel Anati several stilistic and substancial elements of rock art can be made out, where ever and when ever rock art appears. Those elements are closely related to the economy and technical state of the community under question.

- Primitive hunters do not yet know bow and arrow. The motifs of their art, mainly animals accompanied by signs and ideograms, remain isolated.
- Advanced hunters know and use bow and arrow. Their paintings show descriptive and narrative scenes.
- Pastoral societies, that depend on stock-breeding. Their art mainly depicts their stock.
- Societies with complex economy including agriculture. Their art often shows schematic figures and pictures of mythological content.[14]

As a result, it can be stated that bushman-art and the art of the ice-age are not to be compared directly, because the related cultures belong to different technical states. Their art treats different ideological topics and uses different stylistic elements to express the respective state of mind.

3. The methods of art-history

The problem of interpreting traditional images or symbols is well known not only in the history of religions, but also in art history. Pioneering "Kulturwissenschaftler" and art-historians such as Aby Warburg (1866 – 1929), Ernst Gombrich (1909–2001) or Erwin Panofsky (1892 – 1968) were engaged in

the interpretative study of "those areas of culture that resist hard-and-fast classification and interpretation."[15] Especially Erwin Panofsky systematized the study of art and objects. According to Panofsky, first of all the object or image under question has to be identified through familiarity. This factual and probably even expressional identification depends largely on experience. A biologist or palaeontologist, for example, will most probably identify a wide range of the animals pictured in the caves, but will fail to explain the composite figures or chimeras: To meet the requirements to understand art even at this simple level, the insight in style and concept of the art under question is necessary. The main problem of ice-age art becomes apparent even at this point of the discussion: Many of the motifs resist simple and fast-hand identification. Chimera, composed figures, abstract signs, and even clusters of dots and lines don't make sense to us and, therefore, cannot be identified.

Only after identification, however, the second step in the study of art objects can be made, that is, linking the motifs with themes, concepts or conventional meaning. Let us again take an example from ice-age art: We do not know how the first modern humans would have portrayed a shaman or sorcerer and we have nobody who could tell us (that was different in South-African rock-art). Therefore, the famous so-called *dieu cornu* or *sorcerer* of Lascaux is less-than familiar to us. We do not know what a thing with a horse's tail, a man's body and horns on his head is. Therefore we cannot identify objects like the so-called sorcerer and, to a lesser extent, we can make it the object of the third interpretatory step in art-history, the iconological interpretation.

Only in tisa third step, however, the intrinsic meaning constituting the symbolical values can be discovered. This third step is conditioned not only by familiarity with the human mind, but also by knowledge of the ideology ("Weltanschauung") of the questioned time.[16] There is only one conclusion to be drawn: The motifs in cave art that led to the assumption of shamanism or totemism cannot be recognised or identified. An iconographical or even iconological interpretation in the sense of Clottes and Lewis-Williams, therefore, is impossible.

4. Cave art and the evolution of the human mind

From the very beginning not only the precise archaeological findings determined the scholarly discussion about a religious background of cave art, but also the question of the stage of development of the human mind during the ice-age.

While several scientists are convinced that "the makers of these works of art may have had distinctly pre-modern minds",[17] others claim that the high artistic level

of ice-age art demonstrates that their makers must have possessed high-level conceptual thought.[18]

Especially perspective is thought to be the proof of complete mastery of technical means and, consequently, of expression of a symbolic process, only because in art history – not in art-prehistory – perspective appears rather late (in the Renaissance) and seems to be closely connected with the beginning enlightenment.[19] The art of the middle ages and so-called primitive art is mostly schematic and somehow abstract. This observation led to the generally accepted conclusion, that prospective and naturalistic drawings are bound to a mature, cognitively fluid mind comparable to our modern minds.[20] As a result, the ice-age artists must have had modern minds with modern capacities of symbolisation – and therefore they should have had a religion that can be detected by interpreting their art.

From a historical standpoint this assumption is simply wrong. The first kind of art we know (we don't talk about a mere sense of beauty) is not simple and abstract, but naturalistic and realistic including perspective. That means: in art (pre)history abstraction and simplification follows naturalism and realism! Also from a psychological viewpoint the idea that only sophisticated minds are able to produce realistic art cannot be sustained. Nicholas Humphrey, evolutionary psychologist at New School for Social Research, New York, was able to demonstrate that an autistic little girl named Nadia, who was hardly able to speak and for sure unable to categorise and conceptualise, painted in a way similar to cave art: "The remarkable similarities between the cave paintings and Nadia's speak for themselves. There is first of all the striking naturalism… And in both cases the graphic techniques by which this naturalism is achieved are very similar…Animals are typically 'snapped' as if it were in active motion – prancing, say, or bellowing… There is a preference for side-on views… Particularly notable in both sets of drawings is the tendency for one figure to be drawn, almost haphazardly, on top of another."[21] Especially an obvious lack of conceptualization permitted Nadia "to register exactly how things looked to her.

Whereas a normal child of her age, on seeing a horse, for example, would see it – and hence lay down a memory of it – as a token of the category 'horse', Nadia was left with the original visual impression it created."[22]

...and horses from Lascaux, after Humphrey

Humprey draws some conclusions from those surprising parallels between Nadia's and ice-age art. Firstly, the modern humans having just arrived in Europe were not necessarily equipped with all cognitive skills that we possess today; next that probably even language was not yet highly developed enough to allow people to name or designate.[23] Humphrey's thesis opened a controversal discussion in which all participants firmly rejected Humphrey's ideas in favour of the well-known arguments postulating the fully-fledged modern sensibility of the Cro-Magnons. Even if most scholars differed about Humphrey's assumption, it can be stated that cave art does not presume artists with a modern kind of mind at work – a "mature, cognitively fluid mind we know today."[24]

The previous discussion among anthropologists, psychologists, archaeologists, and neurologists failed to consider one little, but fundamental argument: The state of mind of a people and its resulting culture is not simply the outcome of their general intelligence, but of their specific social and intellectual development during history. Human evolution cannot be reduced to anatomically progressive brain evolution as Ian Tattersall describes it: "Opportunistic evolution has conscripted old parts of the brain to new functions in a rather untidy fashion, and new structures have been added and old ones enlarged in a rather haphazard way."[25] Last, but not least the evolution of modern humans is shaped by a network of different factors, among which not only the evolution towards an anatomically modern brain is important, but also cultural evolution. During the last four million years, the significance of the biological evolution decreased, while likewise the significance of cultural evolution increased. The German anthropologist Friedemann Schrenk states: "Beim Homo sapiens… beginnt sich ein Überlappungs- und Synergie-Effekt unterschiedlicher Faktoren biologischer und kultureller Evolution auszuwirken. Erst dadurch und mit gleichzeitiger Erhöhung der sozialen Organisation wird eine neue Qualität des Lebens… erreicht."[26] The evolution of modern humans, therefore, is not only the result of a progressive anatomical evolution, but likewise of progress concerning

lithic technologies and hunting strategies (technical skills), social behaviour, and communication techniques[27] - after all: culture. Culture, however, depends on experienced and inherited knowledge, transmitted from one generation to the other.

On the other hand it has to be taken into consideration that even among different cultures of today, the way how people conceptualise is different. Whilst Europeans only see rice, African Waswahili distinguish between mpunga, mchele and wali. Whilst modern Europeans recognise human bodies, ancient Egypts recognised only torsos, arms, and legs.[28] As exemplified, not only the recognition of reality is different among the various cultures, but also their prospective language and their art is a mirror of their different perception of reality.[29]

Cro-Magnons, therefore, must have been different in many aspects. Their cultural history could not yet look back on 35.000 years of cultural development, and, therefore, the sum of memorised experiences was probably much smaller than among recent hunter-gatherers. Probably even language was still in its beginnigs. For sure, the way of perception and conceptualising was different from everything that is known today.

5. Ethology

Primitive cultures do not know art for the art's sake in a European or modern sense. Masks, figurines, and even carved stools or wall paintings are related to experience and traditions. That means, on the other hand, that primitive art can be seen as an archive of the mentality of the culture in question. Just like Egyptian hieroglyphs or Mesopotamian cuneiform characters, the prehistoric figurines, wall-paintings and, later, decorated pottery are waiting to be deciphered. As discussed above, simple ethnographic analogies, however, fail as well as the methods of art-history to interpret the art of the ice age.

The special language of primitive art, however, can only be deciphered if the various symbols and signs used by the artists are known. Only if circumstances are ideal, a complete explanation of forgotten signs and patterns is possible. A perfect example for such an excellent interpretation is Johann Jakob Bachofen's (1815 - 1887) explanation of the motifs on ancient Roman tombstones. Bachofen, however, was able to refer to the well-known myths of Greek and Roman Religion.[30] Palaeolithic culture, on the contrary, was still illiterate. Myths and holy narratives did probably not yet not exist or got lost during the several thousand years of history. As a result, interpretation of prehistoric art cannot rely on sacred writ or well-known oral traditions to make itself understood. Especially the fact that the art of the ice age is still initial is quite often overlooked – this means that the historical dimension of the problem is not taken

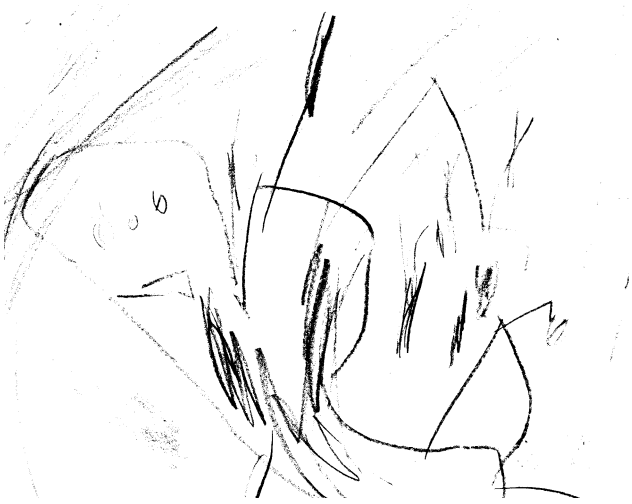
into consideration. If we compare European cave art to African rock art, or if we compare the behaviour and world view of palaeolithic humans to the behaviour of recent hunter gatherers, we assume that the way of thinking and conceptualising did not change during the last 35.000 years; an assumption that is rather unlikely. Therefore any attempt of interpretation has to refer to a kind of method which nonetheless allows to translate ancient metaphorical language into a common idiom. If, as we have seen, naturalistic art like cave art is not necessarily bound to a modern mind with the usual way of conceptualisation, but is even from a historical viewpoint still initial, we have to look for a different and probably even simpler kind of explanation. We have to investigate the fundamental customs of human communication and interaction to detect what early humans may have expressed by means of their art. Any attempt of interpreting or explaining early pieces of art, however, has to presume that palaeolithic art was initial in the literal sense of the word. That means that palaeolithic art is the origin of art and neither refers to a repertoire of traditional symbolisations nor knows a set of conceptionalisations comparable to ours. In this case the only possible approach to decipher palaeolithic imagery is the use of the knowledge of biological ethology: Only recently biological ethology succeeded in developing new strategies in deciphering complex and impenetrable imagery. Here we can search for the "historical psychology of human expression"[31] that appears continually in human culture from the very beginning. Whilst Aby Warburg was the one to describe the similarity of semantic signs in different cultures for the first time, biology found the underlying explanations.[32] Consequently, human behaviour is determined by adaptation to a specific niche in the range of perception, instinctive behaviours and learning that shape human behaviour and its expression in art.[33] Esthetical emotions, however, are not necessarily restricted to humans, but characteristic for all higher primates.

European cave art is – in the ethological sense - the expression of a momentary emotion. Little children up to two years of age like to draw and to paint in this way. They cover a sheet of paper with tangles or clusters of lines and explain the momentary meaning of their paintings. Also chimpanzees paint in that way. Obviously spontaneous and emotionally painting or drawing is a phylogenetically old way of artistic expression. Consequently, the strange clusters of lines have to be interpreted as momentary expressions of emotion. We find this initial kind of art in the drawings of children, in ice-age art and in African rock-art – it is not primitive, but one of the many human universals. Finally, the step from disorderly clusters of lines to naturalistic drawings of animals is not as

Moonface, Les Trois Frères, after Lorblanchet

decisive as it seems. Naturalistic art wants to fix a certain moment of incident and dispenses with generalisations - it is the record of a momentary impression, too.[34] Even the composite beings can be explained that way. As Humphrey puts it: "[Nadia] saw things merely as they appeared at the moment."[35]

Other motifs of cave art can be detected if the way of human perception is brought into account. Human perception is bound at least partially to genetically fixed programmes that have been achieved during human evolution. Conceptualizing and interpretation, the search for regularities and order, and automatical interpolation contribute to the act of perception, which is not only dependent of learning and experience, but also on inherited patterns of perception.[36] As experiments could prove, already infants show reactions not only if they see a human face, but also if the so called moon-face (consisting of two dots and two lines within a circle) is presented to them.
This inborn tendency to simplify and to conceptualise and to recognise basic shapes and patterns, leads likewise to certain patterns of artistic expression, if the artist is not trained and / or free from cultural cnditioning. Children, for example, like to draw the so-called moon-face, if they want to depict a person.[37] Patterns of that kind are frequently found in ice-age art, too, and have to be interpreted as reproduction of early schemes on conception.[38] The depiction of inherited perceptional schemes, therefore, obviously belongs to the oldest motifs in art. As a result, several of the unknown signs and patterns in European cave-art have to be reinterpreted as inherited or early culturally acquired patterns of perception.[39]



Moonface and lines by Zainabu, 3 years

An other sign that frequently appears in caves is the painted hand impression. The biological background of this pattern is easily outlined: During evolution the different species of primates including humankind developed a set of gestures, signs and behavioural patterns which allowed them to communicate safely even without the help of spoken language.[40] As a result, human as well as animal non-verbal communication knows several signs, for example the appeasing smile, the threatening staring look or baring one's fangs, and other attitudes or postures

displaying the mood and the intention of the individual. The display of the genitals, for example, is a threatening pose originating in the sexual behaviour of primates, where the erection of the penis displays not only a willingness for sexual intercourse, but also masculine power and vigour.[41] On the contrary, the display of the female breasts is supposed to have an appeasing effect, while the act of raising the arm and showing the palm of one's hand is usually meant as a gesture of defence. All these gestures serve as signals which safely trigger certain responses of the recipient and are universally understood, even if not acted out by the human beings themselves, but manifested by their objects of art. Hand impressions as well as images of nude women have to be interpreted as protective signs, that werde made to ward off evil forces, respectively probably hint at a territorial claim.[42]

6. Conclusion

So what can finally be said about cave art and religion? The cave art of the Upper Paleolithic cannot be taken as a proof for the existence of early religion, and to a lesser extent as evidence for an appointed religion. The latter is only the result of a long developmental process during history. During the first millenniums of the Upper Paleolithic, people were probably involved in first speculations about nature, the relation of humankind and animal, or of man and his prey, and probably about the cosmic and social order. Later, during the Gravettien, first evidence of religiosity appeared in the form of little female figurines – most probably the idols of protective spirits that developed from ethological signals. [43] In addition to that, we can find other indications for first traces of religion, for example the custom to bury one's deceased, that began during the middle paleolithic period and developed during the centuries to a relatively sophisticated stage during the Upper Paleolithic. But this is a different topic discussed elsewhere.[44]

Literature

Anati, Emanuel, article Prähistorische Kunst, in: *Religion in Geschichte und Gegenwart* 4th edition vol. 6, Tübingen 2003, pp. 1555-1558.

Anati, Emmanuel, *Höhlenmalerei. Die Bilderwelt der prähistorischen Felskunst*, Zürich and Düsseldorf 1997, pp. 26, 187 – 191.

Anati, Emmanuel, The Rock Art of Tanzania and the East Afrcan Sequence, *Bolletino del Centro Camuno di Studi Preistorici BCSP* 23/1986, pp. 15–68.

Bachofen, Johann Jakob, *Mutterrecht und Urreligion. Eine Auswahl seiner Schriften* edited by Rudolf Marx, Leipzig 1927.

Binford, Lewis R., *In Pursuit of the Past: Decoding the Archaeological Code*, London 1983.

Brunner-Traut, Emma, *Frühformen des Erkennens. Aspektive im Alten Ägypten*, Darmstadt 1996.
Clottes, Jean and J. David Lewis-Williams, *The Shamans of Prehistory: Trance and Magic in the Painted Caves, New York* 1998.
Day, Michael H. and Chris. B. Stringer, A reconsideration of the Omo Kibish remains and the erectus-sapiens transition, in: Homo erectus et la place de l'homme et Tautavel parmi les hominides fossiles, Nice 1982, pp. 814-846.
Eibl-Eibesfeldt, Irenäus, Die Biologie des menschlichen Verhaltens. Grundriß der Humanethologie, Weyarn 1997.
Forster, Kurt W., Introduction, to: Aby Warburg: The Renewal of Pagan Antiquity, Los Angeles 1999, p. 1–71.
Hasenfratz, Hans-Peter, Religion - was ist das? Lebensorientierung und Andere Wirklichkeit, Freiburg a. o. 2002.
Hawks, John, Stephen Oh, Keith Hunley, Seth Dobson, Craciella Cabana, Praveen Dayalu, and Milford H. Wolpoff, An Australian test of the recent African Origin theory using the WLH-50 calvarium, in: Journal of Human Evolution 39/2000, pp. 1-22.
Henshilwood, Christopher and Curtis W. Marcan, The Origin of Modern Human Behaviour, in: Current Anthropology Vol. 44/5 2003, pp. 627-651.
Humphrey, Nicholas, Cave Art, Autism, and the Evolution of the Human Mind, in: Journal of Consciouness Studies 6 (1999), p. 116–123.
Leroi-Gourhan, André, Die Religionen der Vorgeschichte, (Les religions de la préhistoire, Paléolithique, Paris 1964), Frankfurt 1981.
Lewis-Williams, David, The Mind in the Cave, Consciousness and the Origins of Art, London 2002.
Lewis-Williams, J. David, Seeing and construing the making and 'meaning' of southern African rock art motif, in: Cambidge Archaeological Journal 5/1995, pp. 3–23.
Lorblanchet, Michel, Höhlenmalerei, (Les grottes ornées de la préhistoire, Paris 1995), Sigmaringen 1997.
Lorenz, Konrad, Das sogenannte Böse. Zur Naturgeschichte der Aggression, München 1998 (Wien 1963).
Mithen, Steven, The Prehistory of the Mind. The Cognitive Origins of Art and Science, London 1999.
Panofsky, Erwin, Aufsätze zu Grundfragen der Kunstwissenschaft, Berlin 1998, pp.85-97.
Power, C. and L. C. Aiello, Female protosymbolic strategies, in: Lori Hager, Women in Human Evolution, New York/London 1997.
Schrenk, Friedemann, Die Frühzeit des Menschen. Der Weg zum Homo sapiens, München 1997.
Talalay, Lauren E., Deities, Dolls, and Devices. Neolithic Figurines from Franchthi Cave, Greece, Bloomington & Indianapolis 1993.
Tattersall, Ian, Becoming Human. Evolution and Human Uniqueness, Orlando 1999.
Tattersall, Ian, Comment about Humphrey, Nicholas, Cave Art, Autism, and the Evolution of the Human Mind, in: Journal of Consciouness Studies 6 (1999), pp. 131-132.

Ungerer, Friedrich and Hans-Jörg Schmid, An Introduction to Cognitive Linguistics, London / New York 1996, pp. 114–129.

Vasari, Giorgio, Le Vite de Piu Eccelente Pittori, Scultori, et Architettori, Firenze 1550

Warburg, Aby, Schlangenritual. Ein Reisebericht, Berlin 1996 (1988) (A Serpent Ritual, in: Journal of the Warburg Institute, II, 1938 - 39, pp. 222-292.)

Winckelmann, Johann Joachim, Geschichte der Kunst des Altertums, Dresden 1764-1767, reprint: History of the Art of Antiquity, Los Angeles 2006.

Wunn, Ina, article Ethology of Religion, in: The Encyclopedia of Religion, Second Edition, 2005, pp. 2867–2870.

Wunn, Ina, Die Religionen in vorgeschichtlicher Zeit, Stuttgart 2005.

Zeki, Semir, Inner Vision. An Exploration of Art and the Brain, Oxford / New York 1999.

---

1 Day, Michael H. and Chris. B. Stringer, A reconsideration of the Omo Kibish remains and the *erectus-sapiens* transition, in: Homo erectus *et la place de l'homme et Tautavel parmi les hominides fossiles*, Nice 1982, pp. 814-846; Hawks, John, Stephen Oh, Keith Hunley, Seth Dobson, Craciella Cabana, Praveen Dayalu, and Milford H. Wolpoff, An Australian test of the recent African Origin theory using the WLH-50 calvarium, in: *Journal of Human Evolution* 39/2000, pp. 1-22; Tattersall, Ian, *Becoming Human. Evolution and Human Uniqueness*, Orlando 1999, pp. 173-181.

2 Henshilwood, Christopher and Curtis W. Marcan, The Origin of Modern Human Behaviour, in: *Current Anthropology* Vol. 44/5 2003, pp. 627-651; Binford, Lewis R., *In Pursuit of the Past: Decoding the Archaeological Code*, London 1983.

3 Hasenfratz, Hans-Peter, *Religion - was ist das? Lebensorientierung und Andere Wirklichkeit*, Freiburg a. o. 2002, p. 9.

4 Talalay, Lauren E., *Deities, Dolls, and Devices. Neolithic Figurines from Franchthi Cave, Greece*, Bloomington & Indianapolis 1993, pp. 37–44.

5 Anati, Emanuel, article Prähistorische Kunst, in: *Religion in Geschichte und Gegenwart* 4th edition vol. 6, Tübingen 2003, pp. 1555-1558; Lewis-Williams, David, The Mind in the Cave, Consciousness and the Origins of Art, London 2002, pp.45-48; Leroi-Gourhan, André, *Die Religionen der Vorgeschichte*, (Les religions de la préhistoire, Paléolithique, Paris 1964), Frankfurt 1981, p. 88.

6 Emanuel Anati is one of the rare exceptions. See Anati, Emmanuel, article Prähistorische Kunst, in: *Religion in Geschichte und Gegenwart* 4th edition vol. 6, Tübingen 2003, pp. 1555-1558.

7 From a methodological standpoint, prehistoric rock art should be discussed with the help of the methods of art-history. See Panofsky, Erwin, *Aufsätze zu Grundfragen der Kunstwissenschaft*, Berlin 1998, p. 95.

8 See Henshilwood, Christopher and Curtis W. Marcan, The Origin of Modern Human Behaviour, in: *Current Anthropology* Vol. 44/5 2003, p. 630; Mithen, Steven, The Prehistory of the Mind,. The Cognitive Origins of Art and Science, London 1999, p. 167.

9 Anati, Emmanuel, article Prähistorische Kunst, in: *Religion in Geschichte und Gegenwart* 4th edition vol. 6, Tübingen 2003, pp. 1558.

[10] Mithen, Steven, *The Prehistory of the Mind. The Cognitive Origins of Art and Science*, London 1999, p. 164-167; Clottes, Jean and J. David Lewis-Williams, *The Shamans of Prehistory: Trance and Magic in the Painted Caves, New York* 1998.

[11] Lorblanchet, Michel, *Höhlenmalerei. Ein Handbuch*, Sigmaringen 1997, pp. 61 – 64.

[12] Clottes, Jean and J. David Lewis-Williams, *The Shamans of Prehistory: Trance and Magic in the Painted Caves, New York* 1998; see also Anati, Emmanuel, The Rock Art of Tanzania and the East Afrcan Sequence, *Bolletino del Centro Camuno di Studi Preistorici BCSP* 23/1986, pp. 15–68.

[13] Lewis-Williams, J. David, Seeing and construing the making and 'meaning' of southern African rock art motif, in: *Cambidge Archaeological Journal* 5/1995, pp. 3 – 23.

[14] Anati, Emmanuel, *Höhlenmalerei. Die Bilderwelt der prähistorischen Felskunst*, Zürich and Düsseldorf 1997, pp. 26, 187 – 191.

[15] Forster, Kurt W., Introduction, to: Aby Warburg: *The Renewal of Pagan Antiquity*, Los Angeles 1999, p. 2.

[16] Panofsky, Erwin, *Aufsätze zu Grundfragen der Kunstwissenschaft*, p. 85 – 97.

[17] Humphrey, Nicholas, Cave Art, Autism, and the Evolution of the Human Mind, in: *Journal of Consciouness Studies* 6 (1999), p. 117.

[18] Power, C. and L. C. Aiello, Female protosymbolic strategies, in: Lori Hager, *Women in Human Evolution*, New York/London 1997.

[19] This assumption dates from: Vasari, Giorgio, *Le Vite de Piu Eccelente Pittori, Scultori, et Architettori*, Firenze 1550, and Winckelmann, Johann Joachim, Geschichte der Kunst des Altertums, Dresden 1764-1767, reprint: *History of the Art of Antiquity*, Los Angeles 2006.

[20] Tattersall, Ian, Comment about Humphrey, Nicholas, Cave Art, Autism, and the Evolution of the Human Mind, in: *Journal of Consciouness Studies* 6 (1999), pp. 131-132

[21] Humphrey, Nicholas, Cave Art, Autism, and the Evolution of the Human Mind, in: *Journal of Consciousness Studies* 6 (1999), p. 117.

[22] Ibid., p. 119.

[23] Ibid.

[24] Ibid., p. 116.

[25] Tattersall, Ian, Becoming Human. Evolution and Human Uniqueness, San Dieao/New York/London 1998, p. 194.

[26] Schrenk, Friedemann, Die Frühzeit des Menschen. Der Weg zum Homo sapiens, München 1997, p. 121.

[27] Ibid.

[28] Brunner-Traut, Emma, *Frühformen des Erkennens. Aspektive im Alten Ägypten*, Darmstadt 1996, p. 69.

[29] Ungerer, Friedrich and Hans-Jörg Schmid, *An Introduction to Cognitive Linguistics*, London / New York 1996, pp. 114 – 129.

[30] Bachofen, Johann Jakob, *Mutterrecht und Urreligion. Eine Auswahl seiner Schriften* edited by Rudolf Marx, Leipzig 1927.

[31] Warburg, Aby, *Schlangenritual. Ein Reisebericht*, Berlin 1996 (1988) (A Serpent Ritual, in: *Journal of the Warburg Institute*, II, 1938 - 39, pp. 222 - 292.)

[32] Vgl. Lorenz, Konrad, *Das sogenannte Böse. Zur Naturgeschichte der Aggression*, München 1998 (Wien 1963).

[33] Zeki, Semir, *Inner Vision. An Exploration of Art and the Brain*, Oxford / New York 1999.

[34] See, for example, Edgar Degas' picture „La Tasse de Chocolat" 1900/05, Museum of Art, Basel, Switzerland. See also Brunner-Traut, Emma, *Frühformen des Erkennens. Aspektive im Alten Ägypten*, Darmstadt 1996, p. 69.

[35] Humphrey, Nicholas, Cave Art, Autism, and the Evolution of the Human Mind, in: *Journal of Consciousness Studies* 6 (1999), p. 119. See also Nadia's drawing of a human figure, ibid. plate 25, p. 48.

[36] Zeki, Semir, *Inner Vision. An Exploration of Art and the Brain*, Oxford / New York 1999. Eibl-Eibesfeldt, Irenäus, *Die Biologie des menschlichen Verhaltens. Grundriß der Humanethologie*, Weyarn 1997, p. 900 - 903.

[37] Zeki, Semir, *Inner Vision. An Exploration of Art and the Brain*, Oxford / New York 1999, fig. 17.7. p. 176; Eibl-Eibesfeldt, Irenäus, *Die Biologie des menschlichen Verhaltens. Grundriß der Humanethologie*, Weyarn 1997, p. 904.

[38] Lorblanchet, Michel, *Höhlenmalerei*, (Les grottes ornées de la préhistoire, Paris 1995), Sigmaringen 1997, p. 63.

[39] Leroi-Gourhan, André, *Die Religionen der Vorgeschichte*, (Les religions de la préhistoire, Paléolithique, Paris 1964), Frankfurt 1981, Abb. 7 p. 106.

[40] Eibl-Eibesfeldt, Irenäus, *Die Biologie des menschlichen Verhaltens. Grundriß der Humanethologie*, Weyarn 1997.

[41] Ibid.: pp. 122 - 124.

[42] Wunn, Ina, *Die Religionen in vorgeschichtlicher Zeit*, Stuttgart 2005, p. 133.

[43] Wunn, Ina, *article* Ethology of Religion, in: *The Encyclopedia of Religion*, Second Edition, 2005, pp. 2867 – 2870.

[44] Wunn, Ina, *Die Religionen in vorgeschichtlicher Zeit*, Stuttgart 2005, pp. 133 – 177.