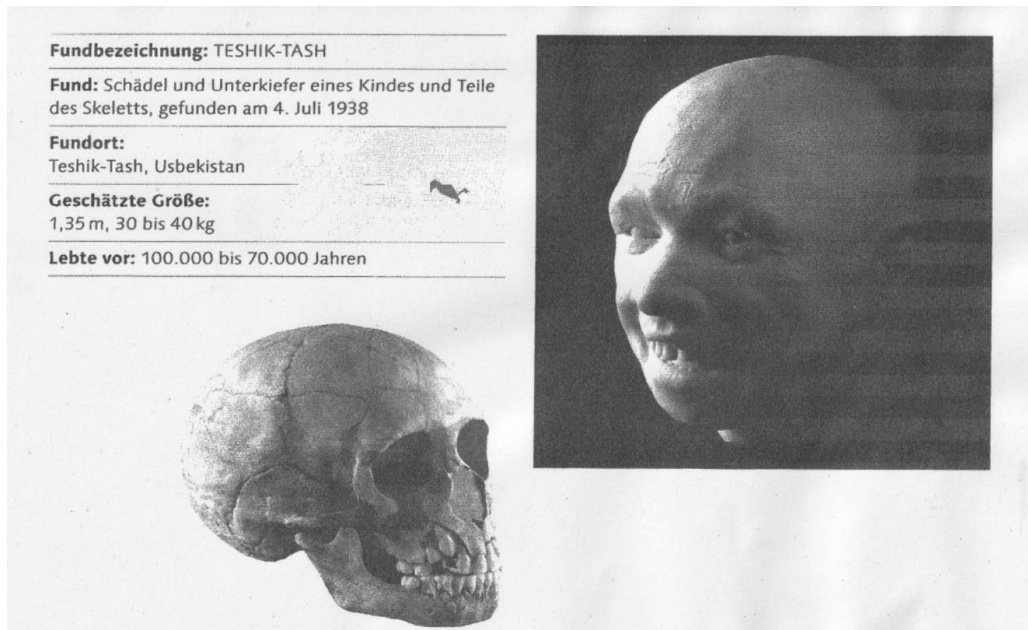


**Fig. 1** Approx. 9-year-old Neanderthal child (Teshik-Tash)



**Source:** Hardt, Herkner & Menz (2009:132)

### *How Intelligent Was the Neanderthal?*

Modern quantitative-experimental intelligence research<sup>3</sup>, developed with reference to *Homo sapiens sapiens*, has existed for over 100 years (cf. Lamberti, 2006) and has produced various concepts of intelligence. Important aspects of the modern understanding of intelligence include the novelty of the problems to be solved and the ability to restructure given patterns of thought and behavior. Equally significant are creativity, problem-solving, recognition, thinking, information processing, and a pronounced degree of interest and involvement in the relevant fields of work (cf. Roth, 1998; Piaget, 2000).

An operational definition of intelligence such as “intelligence is what intelligence tests measure” is, of course, not applicable to paleo-psychology, firstly because intelligence tests are inherently culture-dependent (cf. Harris, 1989; see below: psychodiagnostics in foreign cultures), and secondly because the individual tasks of such tests do not correspond to the life circumstances and environmental conditions of the Neanderthals. A modern human being, deprived of technological aids, would likely have appeared as a “feeble-minded dullard” in Neanderthal culture and environment.

Nevertheless, more or less reliable conclusions can be drawn from the archaeological finds of Neanderthal culture regarding the intelligence-related behavior and the “primitive or archaic thinking” of the Neanderthals. When speaking of “primitive thinking” (cf. Stubbe, 2005:66–72), we must first offer a conceptual clarification by distinguishing it from so-called archaic thinking, that is, the thinking of prehistoric humans. From an evolutionary-psychological

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<sup>3</sup> In German, the term “Geist” is used synonymously with intelligence, consciousness, wit, esprit, mind, soul, etc. Etymologically, Geist derives from moving air, breath, or spirit (pneúma, spiritus, mind).

perspective, this type of thinking can be characterized by the following four features, according to *Friedhart Klix* (1993):

- high integration of the individual with nature
- high integration of the individual with the social community, of personality with ethnicity
- high emotional sensitivity and affective responsiveness
- high degree of imagistic thinking and thus iconic fidelity of mental representations and memory

According to this, archaic thinking fulfilled primarily two functions: first, it interpreted the unknown, the new, and the unconscious aspects of events, effects, and phenomena in nature by relating them to familiar things through similarity or analogy; second, it created social identification within the community by aligning the self with the rules of the group or ethnic identity.

*Dietrich Mania* (1998:60, 61) writes the following about the consciousness of *Homo erectus* in Europe:

“Purposeful and planned actions, as demonstrated by *Homo erectus* in the application of his technology and the manufacture of his specialized tools, already presuppose a high degree of mental capabilities. Above all, the ability for abstract thinking must have been developed to a certain extent. This was also linked to linguistic communication. We see direct evidence of this in some bone artifacts from *Bilzingsleben* with intentionally incised sequences of lines and patterns.”

The neo-Darwinist *Robert Foley* (2000:128) proposed an insightful heuristic model illustrating the interrelationship between social life, intelligence, and ecology, referred to as the so-called eternal triangle.

“When we asked what role social factors played in the development of larger brains, we were able to identify two connections: First, brain volume was markedly linked to social life – a positive correlation, then, suggesting that the more complex the social behavior or the more numerous the group, the larger the brain is expected to be. Second, we found that there is a relationship between brains and food quality – or, more generally, ecology. However, this does not refer to the earlier-mentioned idea that large brains are necessary for exploiting certain resources, but rather that brains are metabolically expensive organs and their evolutionary existence therefore depends on the availability of high-quality nutrition. Our discussion thus completes the triangle of biological relationships, specifically at the intersection of sociality and ecology. This triangular framework enables us to decipher the nature of complex evolutionary events.” (Foley, 2000:128)

Some prominent and interrelated pieces of evidence for the intelligence-related behavior of Neanderthals shall be briefly listed below. Moreover, it must be assumed that the distribution of intelligence-related behavior within a Neanderthal population followed the Gaussian normal distribution, meaning that it likely also included highly intelligent and gifted Neanderthals (approximately 1.5%)!

## 1. *Brain size:*

Although a larger brain does not necessarily imply higher intelligence (cf. Gould, 1988; Henke, 1999:129ff; Foley, 2000:113ff), the cranial capacity of Neanderthals ranged from 1,200 to 1,750 cubic centimeters and was therefore larger than that of modern *Homo sapiens* (approximately 1,450 cubic centimeters).

“If we examine brains primarily from an ecological perspective, we are approaching the problem from the wrong angle. It is not the case that a large brain became necessary for a more complex form of food acquisition; rather, high-quality nutrition—that is, a stable and rich source of energy and protein—was required in order to sustain larger brains. This explains the relationship between brain volume and dietary range.”

“When we factor in the costs, the rarity of human evolution becomes more comprehensible. Certainly, large brains may offer advantages, both from a social and ecological point of view, and there are indeed selection pressures in favor of larger brains, but under normal circumstances, the costs outweigh the benefits.”

“The selection pressures that promote brain enlargement are likely connected to environmental complexity or multilayered social structures, or a combination of both factors; but the conditions that allow the benefits to outweigh the costs must ultimately be energetic in nature.” (Foley, 2000:120f)

To date, no clear conclusions can be drawn about the brain-based mathematical abilities of Neanderthals (cf. Haarmann, 2008:9f). However, there is evidence of a sense of symmetry and of abstract motifs such as zigzag patterns and cross symbols (cf. *Ethnomathematik, Spektrum der Wissenschaft*, 2, 2006).

## 2. *Adaptation to different climates and geographical regions:*

“As a ‘generalist,’ *Homo erectus*, who settled in a wide variety of geographical regions, evidently possessed the ability to cope with nearly all climatic and vegetative zones. Whether savanna, desert, high mountains, or tropical rainforest. His species proved to be successful and capable of survival everywhere, largely because he had lost his body hair and developed sweat glands.”

“While humans were therefore superior to most other animals in hot regions, their nakedness became a disadvantage in colder climates with pronounced seasonal variations. To survive there, they had to invent warm clothing as a substitute for their lost fur, which was initially made, without doubt, from the pelts of other mammals. This, in turn, required anticipatory thinking.” (Ludwig, 2006:98)

As is well known, the lifespan of *Homo erectus* also coincided with several significant climatic fluctuations (cf. Campbell, 1979:125f, 427; Ludwig, 2006; Schrenk & Müller, 2005:47, 52ff, 60; Schrenk, 2019), which brought about major changes in the environment and all areas of Neanderthal life. Coping with these challenges required a high degree of cognitive flexibility (flexibility is an intelligence factor!), creativity, and physical robustness (cf. also their relatively high life expectancy; Schrenk & Müller, 2005:91). The Neanderthals mastered these challenges impressively, as Schrenk & Müller (2005:114) write:

“The Neanderthals were also well established in the alternating cold and warm climates of Ice Age Europe. Although a total of 18 detectable climate fluctuations occurred between 50,000 and 30,000 years ago, their extinction therefore seems unlikely to have been caused by climatic catastrophes.”

“...what is certain is that the Neanderthals were the final link in a very successful human lineage in evolutionary history, and that they effectively responded to the Ice Age

environmental conditions with strategies and techniques and managed well in their surroundings.” (Schrenk & Müller, 2005:101)

Neanderthals are described as “short, robust, and strong” (cf. Schrenk & Müller, 2005:61, 69f). However, muscle-bound individuals do not automatically imply a lack of intelligence, as demonstrated by the Klitschko brothers in the present day, both of whom hold doctoral degrees.

### 3. *The manufacture and use of tools.*

Our knowledge of the longest period in human history, the Paleolithic, is based primarily on skeletal remains and, to a large extent, on stone tools.

“There is no doubt, however, that these represent only a small portion of the total number of objects used and manufactured by early humans. Items made from plant-based and animal materials, which are subject to decay, have for the most part not been preserved.” (Ludwig, 2006:101)

“Based on tool finds, it can be inferred that the stone material was collected from as far as 80 kilometers away from certain settlement sites—an enormous achievement that required forward planning, deliberate action, and, not least, cultural flexibility on the part of the toolmakers.” (Schrenk & Müller, 2005:56)

“Sharpened mammoth bones from the Neanderthal site at Salzgitter-Lebenstedt, and evidence of 45,000-year-old birch pitch (Fig. 16), a natural adhesive presumably used to bind wood and stone, which could only be obtained through a rather complex distillation technique, leave no doubt: the Neanderthal’s toolkit included more than just stone tools. The assumption that Neanderthals relied exclusively on stone implements, long upheld due to the better fossil preservation of stone compared to softer materials like wood, has now been disproven.” (Schrenk & Müller, 2005:87f)

Stone tools such as hand axes, scrapers, and hatchets, as well as wooden implements like spears (used as early as 400,000 years ago; Schrenk, 2019:93), were increasingly refined over time and adapted to their diverse functions. For the Paleolithic period, approximately 20 types of tools with over 200 variations are known. As hunters and gatherers, Neanderthals were highly adept at adapting to specific environmental conditions, changing climates, and shifting animal and plant life.

The manufacture and use of these tools can be regarded as clear evidence of a developed practical intelligence, of the kind also measured in many modern intelligence tests (cf. HAWIE).

### 4. *The controlled use of fire.*

The question of when early humans first mastered the controlled use of fire cannot even be answered with any real precision, as the available evidence from excavated hearths does not allow for definitive conclusions regarding the intentional kindling and sustained maintenance of fire (cf. Narr, 1961:66ff; Müller-Karpe, 1976:69ff; Hoffmann, 1999:133ff; Schrenk & Müller, 2005:41f; Schrenk, 2019).

Early humans probably began using fire around 1.8 or 1.6 million years ago. A hearth at Gesher Benot Ya’aqov in Israel has been dated to approximately 790,000 years and may provide evidence for the controlled use of fire. A hearth surrounded by a ring of stones in the cave of Ménez-Drégan on the Breton coast, estimated to be 450,000 years old, clearly indicates controlled fire use. The oldest known hearth in Germany is located at Bilzingsleben in Thuringia and is dated to between 400,000 and 350,000 years ago. *Bernhard Vandermeersch* considers the use of fire to be the most important prerequisite for the settlement of Europe by

Neanderthals. Without fire, they would hardly have been able to survive the cold climates of the Ice Age in Europe (cf. Hackler, 1999:127).

The production, control, and diverse uses of fire, which represent a true “cultural revolution” in human history, presuppose a complex psychological interplay of cognition, emotion, and manual dexterity. The “natural” primal fear of fire had to be overcome, and at the same time, its usefulness as a source of warmth (protection against cold and moisture, fuel for cooking) had to be recognized. It is also well known that making fire requires a high degree of manual skill and fine motor coordination.

In addition to its function as an external source of energy, fire also served a protective role against dangerous animals.

On the social function of fire, *Ludwig* (2006:103) writes:

“In addition to providing warmth on cold nights and keeping predators away, campfires also had an important social function. They served as gathering places for members of a group who likely spent their days apart as hunters and gatherers, offering an opportunity to exchange experiences and to plan future collective activities. The hearths of early humans were therefore probably of great importance for both community cohesion and the development of language.” (...) “...fire and the smoke rising from it also played an important magical-religious role...”

*Gerhard Bosinski* (2009:32f) rightly states:

“The mastery of fire as a decisive step in our history can hardly be overestimated. Fire provided effective protection against predators, especially big cats, which had been the most dangerous enemies of our species up to that point. The possession of fire was also of crucial social importance. People gathered around the fire, and the hearth became the center of the group and of life itself. Only humans master fire, and when a lion roared outside, there was no doubt: it was an animal. The mastery of fire marked the definitive separation between humans and animals. Fire provided warmth and made it possible to inhabit cooler regions.”

The mastery of fire, together with the use of tools, likely contributed indirectly to the development of human speech, that is, to language-based thinking, by gradually relieving the jaw, not least due to the newly possible cooking of food. Fire not only brought “light into darkness,” but also fostered the development of consciousness and social life.

*Sigmund Freud* engaged with the theme of fire on various occasions, beginning with “The Interpretation of Dreams” (1900). At the end of his essay “On the Acquisition of Fire” (1932), he writes:

“And the primitive man, who was dependent on understanding the external world through his own bodily sensations and physical conditions, can hardly have failed to notice and make use of the analogies revealed by the behavior of fire.” (Freud, 1974:454)

In this text, as well as already in “The Interpretation of Dreams” (Standard Edition, Vol. II, 2001:386), *Freud* also noted a connection between fire and the urge to urinate, and stated that “the acquisition of fire presupposed an act of instinctual renunciation” (Freud, 1974:451; cf. also Rattner, 1994:101f).

## 5. Artistic productions

Stone Age artworks - although no linguistic or musical documents have survived (cf. the prehistoric flutes; Conard & Wertheimer, 2010:105ff) - can also provide insight into the intellectual development of humans. The oldest known ornaments attributed to Neanderthals date from approximately 115,000 to 35,000 years ago. There is also evidence of (bone) engravings and the use of pigments, particularly ochre and black manganese oxide (cf. Schrenk & Müller, 2005:94ff; Arsuaga, 2003).

“Until just a few decades ago, Neanderthals were not thought to possess any particular intellectual capabilities. This view has since been challenged by the discovery of a facial mask, estimated to be at least 32,000 years old, found in 1975 between Tours and Saumur (Loire region, France) in the cave of La Roche-Cotard. The piece, measuring only about 10 by 10 centimeters, consists of a flint stone into which a 7.5-centimeter-long bone splinter has been inserted through a natural opening in such a way that its visible ends appear to form eyes. The object gives an immediate impression of a face and is thus regarded as a kind of primordial figurine on the path to Paleolithic art.” (Ludwig, 2006:105)

“...and for the first time in human history, art can be identified that presupposes advanced manual dexterity, a high capacity for abstraction, and a sense of aesthetics. This includes the 32,000-year-old Lion Man figurine from the Swabian Vogelherd Cave, mammoth ivory pendants shaped like horses from Sungir in Russia, flutes, and cave paintings—all created at the same time that the last Neanderthals were struggling in vain to preserve their population.” (Schrenk & Müller, 2005:101)

A 50,000-year-old shell ornament, recently discovered by *João Zilhão*, was found to be painted with red and ochre pigments and featured two perforations, suggesting that Neanderthals likely wore it on their bodies (SZ, January 12, 2010:16).

The production of ornaments, as well as the use of pigments, represents a considerable cultural and intellectual achievement and highlights the significant role of art in prehistoric societies.

Methodological difficulties can generally arise in the analysis of engraved drawings, for example those produced by Ice Age hunters, whose art was, until the 1920s, often compared with that of children and “primitives.” After *Lartet* (1801–1887), the founder of Paleolithic research in France, discovered in 1864 (five years after *Darwin’s* “On the Origin of Species...”) an engraved image of a mammoth on a piece of bone in an Ice Age cave (La Madeleine) - the first figurative drawing by a Paleolithic human - the exciting search for further artistic productions by prehistoric humans began. In 1879, the cave paintings of Altamira were discovered by a young girl, but were ignored by researchers for twenty years. By 1895, five caves with Ice Age paintings were already known: Altamira, Pair-non-Pair, Marsoulas, La Mouthe, and Chabot. Between 1903 and 1908, the French prehistorian *Breuil* (1877–1961) and *Obermaier* (1877–1946) published the first studies on Ice Age art (cf. from 1925: “Jahrbuch für prähistorische und ethnographische Kunst”; Kühn: “Die Kunst der Primitiven”, 1923). This is a brief overview of the prehistory of prehistoric research.

In 1968, during an excavation of an Ice Age camp (Magdalenian, ca. 10,100–10,400 BCE) at Gönnersdorf (Germany), slate tablets were discovered bearing approximately 400 human figures (mostly women), about 200 animal depictions (74 horses, 61 mammoths, etc.), and an unspecified number of symbolic signs. While the animals are depicted so realistically that one might speak of a “photographic style,” the human figures are systematized or abstracted—a typical stylistic feature of Ice Age art. The distinctive, encrypted, abbreviated, and abstract image of the human being is deliberately contrasted with the image of animals (Bosinski & Fischer, 1974; Bosinski, 1981).

If one were to apply the method of statistical detail analysis of human drawings developed by *Ziler* (1958) to these Ice Age works, a very low “human-figure quotient” would be calculated (a measure that is currently highly correlated with the intelligence quotient). This could lead to

the mistaken conclusion that Ice Age humans were of low intelligence or developmental level. However, anyone who considers their remarkable technology and ergology will quickly be convinced otherwise.

In addition, a fundamental question arises as to whether actual human beings or supernatural entities were being represented, whether they depict specific individuals (whom it may not have been permissible to portray realistically for magical reasons?), or whether they are representations of particular ideas and motifs such as female fertility, the “maternal principle,” or sexual desire. A scholarly explanation must therefore be based on the archaeological context of the respective objects and the general cultural conditions (cf. Stubbe, 2005:329–331).

## 6. *Hunting behavior*

The world’s oldest fully preserved wooden spears, recovered from the lignite opencast mine at Schöningen (dating to approximately 400,000 years ago),

“provide clear evidence that early humans did not, as is still frequently assumed, secure their food supply by scavenging carrion, but were in fact highly skilled hunters, equipped with outstanding technical abilities in woodworking and already capable at this early stage of planning, organizing, coordinating, and successfully executing big-game hunts using specialized weapons. These spear finds thus offer broad and at the same time subtle insights into Lower Paleolithic working and living practices, particularly with regard to effective food procurement and the associated cooperative labor, thereby contributing to a new image of early humans, their intellectual capacities, and also their social behavior.” (Thieme, 1997:311)

“Hunting large game such as mammoths required not only an arsenal of weapons including throwing spears and thrusting lances, but also the hunters’ ability to plan, to abstract, and to act strategically.”

“Massive animals such as mammoths and bison were by no means easy prey, and yet they were hunted by Neanderthals—a true challenge which, according to archaeologists such as Bärbel Auffermann and Jörg Orschiedt, could only have been managed by a well-coordinated hunting team of at least twenty individuals.” (Schrenk & Müller, 2005:90)

It is difficult to imagine this kind of organized and dangerous group-based big-game hunting (cf. hunting accidents, e.g. Schrenk & Müller, 2005:93) without some form of verbal communication. The skeletal remains of hunted animals found at archaeological sites provide unequivocal evidence of the Neanderthals’ outstanding hunting abilities.

## 7. *Burials and Mourning Behavior*

Burial serves both the ritual disposal of the body and the ritual processing of the experience of death and separation (cf. Müller-Karpe, 1976:248ff; Stubbe, 1985; Metzler Lexikon Religion, Vol. 1, 1999:149).

In addition to pragmatic considerations, burials may be psychologically motivated, among other things, by fear of the “powerful” dead. Since the deceased often “reappear” in the dreams of the bereaved, this can evoke fear or ambivalence, which may be managed through ritual practices. At the same time, the loss of a fellow human being invariably triggers mourning reactions in both the individual and the group.

“The most compelling evidence for the existence of rituals is provided by the dead of the Ice Age. For the first time in human history, burials occur, which can certainly be interpreted as a sign of care, compassion, and culturally developed forms of interaction among members of a group. However, this view was not necessarily shared until the early 20th century. At that time, the prevailing academic opinion held that such burials could hardly have been carried out intentionally according to our standards. Yet the burial of a person ultimately presupposes that the survivors mourn and, in their grief, honor the deceased.” (Schrenk & Müller, 2005:96f)

About 30 years ago, *Stubbe* expressed some skepticism in his book “Formen der Trauer” (forms of mourning) regarding the mourning behavior of prehistoric humans, particularly in relation to the archaeological findings and their interpretation:

“It is primarily burials that can provide us with clues about prehistoric mourning behavior. However, the difficulties that can arise in interpreting such findings become clear through a detailed description of the burial of a girl that took place in 1966 among the Kogi ‘Indians’ (Chibcha) in the Sierra Nevada de Santa Marta in Colombia (cf. Reichel-Dolmatoff, 1967:55–72). After the burial site is selected, the shaman performs a series of ritual acts and declares: ‘This is the village of death; this is the ceremonial house of death; this is the uterus. I open the house. The house is closed, and I will open it.’ He then proclaims: ‘The house is opened,’ and withdraws. The deceased is wrapped in a white cloth, and the father sews the shroud closed. While all of this is taking place, the mother and grandmother of the deceased sing a solemn song, almost without words. At the bottom of the grave, green stones, shells, and the shell of a gastropod are placed. The shaman then makes several failed attempts to lift the body, pretending that it is too heavy. Only on the ninth attempt is he able to raise it. The body is laid in the grave with the head facing east, and ‘the house is closed,’ that is, the grave is filled in. Further ritual movements around the grave follow, and finally all participants withdraw. The ceremony lasted two hours.”

“As *Reichel-Dolmatoff* notes, a future archaeologist examining this grave would find only a skeleton oriented with its head to the east, along with a few stones and shells. The rituals and, above all, the religious ideas implied in them can no longer be ‘reconstructed’ from these remains. It must be emphasized that the symbolism associated with the burial, when considered solely on the archaeological level, remains as inaccessible to us today as that of a Paleolithic grave. This is the particular nature of archaeological arguments, which limit and constrain their potential ‘messages.’ This, in fact, constitutes the ‘poverty and opacity’ of our sources on prehistoric mourning behavior.” (Stubbe, 1985:156f)

Today, a wide range of evidence exists that strongly suggests the presence of developed mourning behavior among Neanderthals. On the one hand, mourning behavior is already observed in our “closest relatives,” the great apes (cf. e.g. Stubbe, 1985:209ff; 2013:296f; Hess, 1997:298ff), as well as in other mammals. On the other hand, burial and mourning rituals in prehistoric societies serve to consolidate both social roles and social structure, while also reinforcing the bonds among members of the group. These bonds are expressed, among other things, in grave goods, the special treatment of skulls (possibly even their transport), and in endocannibalism (cf. Schrenk & Müller, 2005:97ff; Stubbe, 2012:138). Furthermore, burial rites are situated within a religious context (cf. Narr, 1961:83f; Leroi-Gourhan, 1981) and, as an additional binding element, take on the form of ancestor worship. This creates a continuum between the living and the dead. These various ways of connecting and stabilizing the group represent clear factors of outstanding importance in the evolution of humankind (cf. Campbell, 1979:395f; Stubbe, 2013:295ff).

Both the burials and mourning behavior of Neanderthals can thus be seen as expressions of their developed emotional intelligence and competence (Saarni, 1999), as well as of their capacity for empathy.

### 8. *Seafaring*

Today, scholars are discussing the possibility of a direct migration of *Homo erectus* via the Strait of Gibraltar, which reopened around 5.5 million years ago (cf. Hoffmann, 1999:394ff).

“If *Homo erectus* actually constructed vessels—such as rafts—that enabled them to cross sea passages several kilometers wide, this would presuppose both a high degree of social organization and more than just rudimentary verbal communication. Without such communication, cooperation among several group members on a project based on a shared plan would be hardly conceivable.” (Ludwig, 2006:99) (cf. also the recent findings on Flores!)

### 9. *Social behavior*

Today, when speaking of “social intelligence,” the term generally refers to behavior within groups that is guided by social competence.

How “human” and socially oriented Neanderthals were

“is shown by the fact that 40% of burial findings involve children and adolescents. This suggests that both the young and the elderly—who were cared for until their deaths—were just as important within the social structure of our Ice Age contemporaries as fully capable Neanderthals.” (Schrenk & Müller, 2005:100)

“Life-sustaining measures such as the care and feeding of the sick and toothless elderly can be demonstrated in many findings of older Neanderthals. The old man from the Neander Valley was thus not a solitary case of care. Healed injuries even suggest a form of ‘medical’ treatment involving medicinal plants.” (Schrenk & Müller, 2005:92f)

*Cornelia Hackler* (1999) also concludes from the existence of burials, the care of the sick and frail elderly, and well-healed bone fractures that Neanderthals exhibited pronounced social behavior. She writes:

“These individuals, who due to their limited mobility were unable to feed themselves, were cared for by the group—despite the fact that this must have placed a considerable burden on the community as a whole. This applies particularly to elderly people, who were evidently considered valuable enough by their social group to be kept alive. One cannot help but think that it was their years of rich experience and knowledge that provided the group with an invaluable intangible advantage in knowledge—and thereby in biological survival. How else but through language could such complex communicative transmission of knowledge have been possible?” (Hackler, 1999:124)

### 10. *Language Ability*

The capacity for language in Neanderthals is highly probable. Brain anatomy, tool production, social life, group hunting, the use of symbols, and burial practices all clearly point in this direction (cf. Schrenk, 2019:89f).

“Endocranial casts, that is, internal casts of braincases, indicate a highly developed brain with both Broca’s and Wernicke’s areas, along with the cerebellum, as further prerequisites for human language ability.” (Schrenk & Müller, 2005:67f)

“Even though the discovery of the Kebara hyoid bone is not definitive proof of Neanderthal language capacity, the mere fact that Neanderthals were biologically capable of producing shaped sounds using their palate is a significant indication, at the very least, of their anatomical ability to speak. Their lifestyle, hunting practices, and the production of tools and culture all point to a communication system whose complexity was comparable to that of modern humans.” (Schrenk & Müller, 2005:66)

The engraved bone artifacts from Bilzingsleben with sequences of notches are, for Dietrich Mania, clear evidence of the existence of language in *Homo erectus*.

“For us, these artifacts, especially the first one described with its fan-like sequence of incised lines, represent the transmission of thoughts and ideas in a visually effective form. The use of geometric, almost symbol-like patterns demonstrates the capacity for abstraction. A being capable of abstract thinking could have communicated on this level only through a language based on word symbols or through transformation into graphic representations of the type described here. For us, this is proof of our developed *Homo erectus*’s capacity for abstract thought and language.” (Mania, 1998:61)

11. What effect the fascinating experience of the starry night sky (which, unlike today, was not yet obscured by city lights), with all its phenomena, had on the thinking and cosmological vision of the Neanderthals is something we do not know. But we may assume that it was significant (cf. archaeoastronomy).

*Conclusion:* Even if it may be difficult for some “stone and bone paleoanthropologists” to admit, we must now recognize Neanderthals as fully human, endowed with all intellectual, psychological, and social functions, capacities, and competencies, including a developed intelligence. They were human beings who were highly adapted to their changing environment and knew how to solve the problems and challenges of their reality in creative, flexible, and intelligent ways. Since April 2010, we also know that Neanderthals and modern humans interbred genetically (cf. e.g. Conard & Wertheimer, 2010:13; Stubbe, 2024; Pääbo, 2024).

### ***On Animism***

The study of concepts of the soul from an emic perspective is a central research topic in ethnology and ethnopsychology. (For the history of soul concepts and their localization, cf. Révész, 1917; Stubbe, 2012:562–569.)

“The ‘Naturvölker’,” (Bastian already wrote in 1875: 10), “have, on average, developed an exceedingly complex psychology, and in the doctrine of the soul, a peculiar case arises in that one may say it has been more carefully elaborated among the ‘Naturvölker’ than among the ‘Culturvölker’. While the latter are content with rather vague designations and the distinctions become unstable and indeterminate as a result of philosophical interpretations, the ‘Naturvölker’ possess a clearly defined designation for each modification and realm of appearance of the soul. Nor is the explanation for this far to seek. The savage still lives in uninterrupted interaction with the deceased among him, in immediate connexion; the spirits of the departed remain among the living, constantly intervening in everyday affairs, he receives counsel and assistance from them whenever needed, and he has not yet devised a mythological system with a heaven and hell in which to localize the souls.”

Animism (from Latin *anima*) refers to the belief that both living beings and inanimate objects possess a soul. In his work “Primitive Culture” (1871), *E. B. Tylor* (1832–1917) identified belief

in the soul as the essential element and origin of all religions. He assumed that in early cultures, the idea that humans possess a soul was extended to animals, plants, and inanimate objects (cf. Haller, 2005:241). *Robert R. Marett* coined the term “animatism” in 1899, which he used to describe belief in an impersonal, omnipresent natural force that, he argued, stood at the beginning of all religion (cf. also pre-animism, dynamism). In “Totem and Taboo” (1912/13), *S. Freud* provided a psychoanalytic interpretation of animism. According to this view, it involves the projection of internal psychic processes onto the external world. However, the speculations surrounding this evolutionary stage theory of religion have since been disproven (cf. Thiel, 1977:139–141; Haller, 2005:241). Developmental psychology also refers to “childhood animism,” on which *Jahoda* (1958) published a cross-cultural study (cf. also Werner, 1959:50f, 54f, 332f). In theological usage, the term animism is still employed today, often in a clearly derogatory and prejudiced manner, to label non-Christian (“pagan”) religions in Africa, Asia, and Latin America. An example provided by *Koch (-Grünberg, 1900)* concerning the South American “Indians” illustrates this in an evolutionist manner:

“Among the Karayá, too, there exists the belief that during dreams the spirit leaves the body of the sleeper in order to wander about and to engage with other persons or other spirits (Ehrenreich, 1891:33).” (Koch, 1900:4)

“If we briefly recapitulate the course of the investigation into the animism of the South American Indians as it is presented to us in this study, we see that it is initially dream phenomena that lead the Indian to the belief in the existence of a soul in humans and in a supernatural world in which the spirits of deceased ancestors lead a life similar to that on earth. These spirits are in constant interaction with the living, especially with the sorcerer-doctor endowed with supernatural powers, offering them assistance in times of distress, though much more often tormenting them and bringing them death and destruction. In order, on the one hand, to gain the favor of the spirits and secure their help, and on the other hand, to avoid their wrath, people do everything at the time of burial that might be pleasing to them and attempt by every possible means to block the spirit’s path to the survivors.

From the effort to avert the wrath of the spirit of the dead, a formal ancestor cult eventually develops, which, with the advancement of culture—by allowing earthly rulers to continue their rule in the heavens—necessarily leads to the veneration of a higher being.” (Koch, 1900:132)

Did prehistoric humans have an animistic worldview?

For *Peter Nittmann* (in: Clottes & Lewis-Williams, 1997:6), shamanism (see below) is an essential part of the animistic worldview:

“In trance, the shaman acts as a medium for the spirits; he contacts them during his ‘soul flights’ and simultaneously makes them serve his purposes—to control the forces of nature, drive out illness, ensure success in the hunt, in short: to subject the unpredictable and uncontrollable turns of fate to the will of human beings through magical actions. And even though research has for the most part avoided far-reaching conclusions, it has repeatedly returned to this central, still-enigmatic figure of the shaman, particularly to his ecstatic soul journeys, the core of the shamanic cult, which are induced through trance.”

Dreams also hold great significance in this context, as they can, for example, “move outside the body.” In ethnopsychology and transcultural psychology, dreams and dreaming are important objects of study, even though they are still scarcely mentioned in modern ethnological lexicons. Among the Tapirapé, a horticultural group living in central Brazil, for instance, shamans (as elsewhere) draw their power from dreams in which they encounter spirits who become their helping spirits (cf. Baldus, 1970). The credit for rekindling the “lost curiosity” about dreams among ethnologists and ethnopsychologists goes to *Peter Probst* (1993) (cf. also Ahrens, 1996).

He provides a cursory history of ethnological dream research, showing that initially *Tylor's* conception (1871) was predominant, followed later by *Freud's* dream theory (1899) (on its reception in the United States, cf. Herrmann et al., 1943), while the dream models of *C. G. Jung* and *A. Adler* were apparently hardly taken up. As is well known, *Edward Burnett Tylor* (1832–1917), in his work “Primitive Culture...”, traced the origin and development of religion to the human experience of dreaming (animism), thereby officially introducing the topic of dreams into ethnology. *Koch's* (later: *Koch-Grünberg*, 1872–1924) comprehensive ethnopsychological monograph “Zum Animismus der südamerikanischen Indianer” (1900) stands in this tradition.

From the *Durkheim* school, which vehemently rejected *Tylor's* concept of animism (cf. Probst, 1993:154; Thiel, 1977:139f), comes *M. Halbwachs's* article “L’interprétation du rêve chez les primitifs” (*J. de Psychol.* 19, no. 7, 1922).

*Freud's* dream theory (1900), which regarded the “dream as the via regia to knowledge of the unconscious in mental life” (Freud, 1964:494), was based on *Freud's* self-analysis (Schott, 1985), the analysis of the dreams of his Viennese patients, and an intensive study of the literature (notably, with very few ethnological and cross-cultural works!). It was frequently applied uncritically to dreams in non-European, foreign, and collectively oriented cultures with their distinct psychologies, religions, social structures, and economic systems.

According to Freud, the dream was, as he famously wrote in “An Outline of Psychoanalysis”:

“a psychosis, with all the absurdities, delusions, and hallucinations of such. A psychosis, to be sure, of short duration, harmless, even assigned a useful function, initiated by the consent of the person, terminated by an act of will.” (Freud, 1938:40)

Within this framework, for example, attempts were made to verify the wish-fulfillment hypothesis of dreams among “Negroes” (Lind, 1914), to identify the dream mechanisms of displacement and condensation in the art, dreams, and rituals of the Melanesians (Rivers, 1918), or to confirm *Freud's* hypothesis of the universality of the Oedipus complex in the dreams of “Indians” (Lincoln, 1935), or to search for “ethnopsychological parallels” to specific dream symbols (e.g., the cloak) (Reik, *Internat. Zeitschrift für Psychoanalyse*, VI, p. 310ff). An emic perspective on dreams, by contrast, was rarely pursued.

The more recent ethnological studies on dreams

“are characterized by the attempt to understand the dreams of the ‘others’ and the various ways of dealing with them from the perspective of their respective self-conceptions.” (Probst, 1993:156)

Even modern dream research in Western industrialized countries (cf. e.g. Strauch & Meier, 1992) combines scientific experiments with interviews of test subjects in order (by capturing dream experience and dream behavior in a “complementary” manner) not only to obtain biologically objective data, but also to more precisely determine the place and meaning of the dream in the dreamer’s life. This is a research approach that is also well suited to cross-cultural studies.

#### *Example: The Dreams of the Wauja*

*Aristóteles Barcelos Neto* (2002:251ff) recently presented in his monograph “A arte dos sonhos” (“The Art of Dreams”) an ethnography of the visual culture of the Wauja (an Arawak-speaking group living in the Brazilian Amazon [Upper Xingú], also known since the Xingú studies of the German ethnologist *Karl von den Steinen* in the 1880s under the name “Waurá”). In it, Aulahu recounts a dream in which he transforms into a “jiboia” (Constrictor constrictor; a 3 to 5 meter long, beautifully patterned and timid snake, which is even partly “domesticated” in some cases; cf. Ihering, 1968:392) (apapaatai, extrahuman entity). This transformation is the punishment for killing a “jiboia” and for disobeying his father, both of which are violations of Wauja ethics. Only the shamans are able to reverse the transformation through a “feitiço”

(magical ritual). Animal transformations are well known in many cultures (cf. e.g. zooanthropy, Grimm's fairy tales, berserkers, fox people, shamanism, etc.).

„Por matar um apapaatai e por desacreditar em seu pai, Aulahu sofreu a severa punição de transformar-se no próprio apapaatai que ele matou. A narrativa expressa ainda seu medo de morrer, ou seja, de sua alma não retornar do seu sonho e ficar eternamente entre os monstros:” (Barcelos Neto, 2003:253)

The reported dreams find their analogues in the myths of the Wauja and are scarcely accessible from the etic perspective of Western dream interpretation, as their understanding requires an intimate knowledge of Wauja culture, their social organization, their cosmology, their concepts of personhood, their rites and myths, etc. (cf. in this regard, for example, the dreams of the Trobrianders: Sprenger, 2000; for the dreams of the Aborigines: Lommel, 1951; Lawlor, 1993; Craan, 2000; bibliography: Ahrens, 1996; Stubbe, 2012; on the Dreamtime cf. Türccke, 2009:79ff).

### ***Paleopsychology of “primitive,” “prelogical,” “magical,” and “savage” thought***

In general, cognitive psychology understands “thinking” as the interpretive and ordering processing of information, or refers to the use of intellectual functions and cognitive behaviors such as concept formation and various operations involving concepts or other schemas of differing levels of abstraction to recognize, discover, or invent relationships between them. Problem-solving is also frequently referred to as thinking in this general sense.

In a narrower sense, general psychology restricts thinking to the following more elementary thought operations:

- Recognition and identification, i.e., cognition in the narrower sense
- Memory performance (without which thinking does not occur)
- Deriving a logically necessary conclusion (convergent thinking)
- Generating various logically possible conclusions (divergent thinking)
- The order recognized or established through thinking, i.e., a hypothesis is examined and evaluated with regard to its applicability to the required transformation of the actual state into the desired state (i.e., in terms of the problem)

In the psychology of information processing (e.g. Klix, 2000:297–299), a distinction is often made between the structure of surface forms (i.e. signals directly accessible in perception) and the structure of deep forms (i.e. the meanings of these signals) (cf. Dorsch, 1994:148f).

A variety of thinking styles can be distinguished: logical thinking, discursive (logically inferential and goal-directed) thinking, emotional (intuitive) thinking, dialogical thinking, visual thinking, language-bound thinking, pre-linguistic thinking, productive (innovative) thinking, thinking as trial action (Freud), prelogical thinking (Lévy-Bruhl), magical thinking, physiognomic thinking (Werner), associative thinking, schizophrenic thinking (Storch), “savage thinking” (Lévi-Strauss, 1962), etc. One also speaks of a “thinking type” of a person (Leisegang) and of the “thinking space” as the totality of the cognitive possibilities and centers of thought of an individual or group. In ontogenetic cognitive development, *Jean Piaget* (1896–1980) refers to symbolic-preconceptual thinking (between the ages of 2 and 4), followed by the stage of intuitive thought (ages 4 to 7). This is succeeded by the stage of concrete operations, and finally, from around the age of 12, the stage of formal operations.

In his “Philosophie des Traums”, *Christoph Türccke* writes:

“‘Primitive mental activity’ is, after all, Sigmund Freud’s definition of the dream (cf. Freud, 1972:539). This book takes its cue from that. Anyone who wants to understand what thinking is must try to understand what dreaming is. Nowhere does human thinking appear in such a primitive state as in dreaming, even in the twenty-first century.” (Türcke, 2009:15)

Magical thinking (also referred to as primitive or archaic thinking) is discussed in religious contexts such as cult practices, invocation rituals, and acts of sorcery. Magical thinking is opposed to logical-scientific and causal reasoning. Imaginative fantasy always takes precedence over empirical verification or experimentation in the objective world. Magical concepts are often based on free associations and represent a form of so-called associative or ideational thinking. In older comparative-psychological perspectives (e.g. Kafka, 1922; Werner, 1926), this mindset was found among so-called “primitive peoples,” children, and “mentally ill” individuals in developed societies. It is closely related to what has been termed “physiognomic thinking,” a mode of cognition in which objects are not perceived in a factual or analytical manner, but rather according to an inner expression, as if animated or ensouled. Developmental psychologist *Heinz Werner* (1880–1964) provides numerous examples of the magical world of the child:

“When one speaks of magical phenomena within ontogenetic development, one must be aware of the distinction between the developed, nature-people’s magic and the magical tendencies of children. The magic of the ‘natural man’ is a fully developed form of life corresponding to his entire culture; the magic of the child and adolescent can only exist in isolated pockets within a completely different cultural sphere.” ... “One must distinguish between an early form of magic, which differs little from the most primitive forms of perception and action, so that it is difficult in such cases to determine whether a purely primitive or already magical structure is present, and a later worldview-like form (‘genuine superstition’).” (Werner, 1959:301, 302)

“If one wishes to systematically characterize the magical practices of children, it must be taken into account that the connection between the person and the environment results in two things: 1. a dependence of the ego on this fatefully perceived environment, which cannot be naturally managed through reason and technology; 2. magical acts toward the living and non-living environment as a result of this connection through the ego. On the basis of such complex ties, two types of magical acts are possible: first, a steering of fate; second, an inquiry into fate in the form of the so-called oracle.” (Werner, 1959:306)

*Werner* provides numerous examples from the world of childhood, such as prayer and wish magic, “verrufen” (verbal cursing), “form-shaping magic” (model magic), “contact magic,” talismans and amulets, performance magic (e.g., seeking to influence fate favorably through offerings), oracles, and more. He also identifies “magical formations,” that is, modes of thinking and behavior, in individuals with mental illness. Regarding the so-called primitive peoples, he writes:

“The processes of thinking, which manifest as magical associations and connections, as magical concept formation and abstraction, judging and reasoning, do not in any way deny their origin in a diffuse and complex form of thinking, as we have previously described. That pre-magical mode of original thinking is characterized as concrete; and it is only on the basis of such primordial, concrete modes of apprehension that specifically magical thinking develops. Concrete thinking appeared to us as a mode in which figurative formation has not yet become distinct from abstract thought; thinking is, so to speak,

implicit, complex, and embedded within the figurative formation itself.” (Werner, 1959:296f)

Magical thinking in European children (as a developmental phase or stage) was mistakenly equated with the thinking of “primitive peoples” in earlier developmental psychology.

*Franz Resch* (1994) has emphasized the value of magic as a form of cognition, highlighting its role as the foundation for the irrational in all human beings. According to this view, magical thinking holds particular significance for the normal development of the child.

“It reveals analogies in the properties and relations of things, allowing for the first generalizations of individual cases without having to suppress the accompanying emotion of the individual case. In this way, it stabilizes the child’s self-image and relationship to the world. And now to us adults: when we are creative, prelogical mechanisms come into play again, but in a form that remains within the boundaries of abstraction and common sense, which prevents uncontrolled growth and overflow into everyday life.”

“For prelogical approaches to thinking, magical probing and anticipating can be refined through cultivation and contextual conditions, and their scope of meaning can be limited.” (Resch, 1994:156)

*Otto Lippross* (1971) already demonstrated how strongly modern medical practice, for example, moves between strict natural science and “magical ritual”: even in the modern scientific age, irrational elements in the relationship between doctor/therapist and patient influence the success of healing (cf. e.g. the placebo effect).

When we speak of “primitive thinking,” we must first provide a conceptual clarification by distinguishing it from so-called archaic thinking (that is, the thinking of prehistoric humans), which, from an evolutionary psychological perspective, can be characterized according to *Klix* (1993) by the following four features:

- high integration of the individual with nature
- high integration of the individual with the social community, of personality with ethnicity
- high emotional sensitivity and affective responsiveness
- highly visual mental imagery, and thus iconic fidelity in memory and representation

Archaic thinking, according to this view, served primarily two functions: first, it interpreted the unknown, the new, and the unconscious aspects of events, effects, and phenomena in nature by analogy or resemblance to what was already known; second, it created social identification by aligning the self with the rules of the ethnic group.

What did early ethnopsychology understand by “primitive mentality” or “primitive thinking”? In early ethnopsychology, *Lucien Lévy-Bruhl* (1857–1939), based on sources from the Bibliothèque Nationale rather than his own field research, spoke of the *mentalité primitive*, which he described as “prelogical,” “collectivistic,” or “alogical.” According to the law of participation mystique (mystical participation), which he believed governed this mode of thought, “primitives” had not yet reached the stage attained by Europeans, namely Cartesian thinking, on which it becomes possible to distinguish between logical and nonlogical relations among phenomena.

In contrast to the animist theories of *J. G. Frazer* and *E. B. Tylor*, *Lévy-Bruhl* assumes that the mentality and collective representations of so-called “primitive peoples” represent an early stage in the developmental process of thinking that is fundamentally different from our own. He refers to this stage as “prelogical.” The worldview of so-called primitive peoples is shaped by the “law of participation,” according to which objects, beings, and phenomena can

simultaneously be themselves and something else. For example, the harmful sorcerer becomes a man-eating crocodile and yet remains himself. Due to the constant orientation of these people toward the occult and their indifference to the fundamental logical principle of non-contradiction, their mentality acquires a mystical character (participation mystique: everything is interconnected). *Lévy-Bruhl* attempts to illustrate this especially with reference to the concept of causality. Instead of causal relationships, which form the structure of the civilized European conception of reality, the “primitive,” in his view, perceives nature as a complex web of mystical participations. Events in the sensory world are ultimately always traced back to occult forces (mystical cause). In other words, the visible and invisible world, the natural and the supernatural, always form one identical totality and a continuously magical whole. According to *Lévy-Bruhl*, the various aspects of reality merge into a single mystical unity for the so-called primitives, so that the distance between subject and object disappears and “primitive mentality” does not grasp the object through thought but experiences it through communion with it. There is, therefore, an “inability” to distinguish between the act and the content of thought, as well as between thinking and feeling. For this reason, the so-called primitives think in a “prelogical” way, and are largely unfamiliar with abstract, logical, and discursive thinking. Their notions of time and space are vague and qualitatively different, and their language is rich in visuality (pictorial thinking) and qualitative descriptions, while analytical and quantitative concepts are relatively underdeveloped. A mystical worldview of this kind also excludes chance from human existence: every event manifests a supernatural force that can only be grasped intuitively. *Lévy-Bruhl* divides these invisible forces of reality into the following three categories:

- the spirits of the dead
- the spirits of animals, plants, natural phenomena, and inanimate objects
- the forces exercised through invocations and incantations by sorcerers.

This type of characterization of so-called “primitive” thinking is characteristic of a particular stage in the early history of ethnocentrism in European social science. Ethnological fieldwork, especially that which falls within the domain of ethnosociology, has demonstrated the inaccuracy of this generalizing view and simultaneously revealed the arrogance of the armchair ethnology of that period. Particularly, the technology and ergology of so-called “indigenous peoples” reveal the underlying causal and logical thinking involved. Examples include the detoxification of manioc (tipiti), the production of salt among Brazilian Indigenous groups in Amazonia, and the dyeing of bird feathers (cf. Hirschberg & Janata, 1966; G. Hartmann, 1981; B.G. Ribeiro, 1989).

Logical as well as prelogical thinking can be found in all humans. From a typological perspective, *Lévy-Bruhl*’s distinction remains valid. In defense of *Lévy-Bruhl*, it should be emphasized that he was a noteworthy exception within the scientific community, as he revised his own theory in his “Carnets” (1949). The ethnologist *Horst Nachtigall* (1974:21) even suggests that *Lévy-Bruhl* may have used his concept of prelogical thinking among Indigenous peoples merely to hold a mirror to his own society and its illogical or superstitious behavior, rather than to discriminate against other cultures. *Lévy-Bruhl*’s main objective was to better understand the concrete actions of so-called Indigenous peoples by studying their intellectual habits, and thereby to remove the apparent absurdity of those actions when viewed through the lens of the Western logical worldview.

*Lévy-Bruhl*’s concept also influenced the psychopathology of the time. Thus, the thinking of individuals with schizophrenia and psychosis was compared to the thinking of so-called Indigenous peoples, and a wide range of similarities was observed. What *Sigmund Freud* referred to as “primary process thinking,” *Carl Gustav Jung* (1912ff) described as “mythic thinking in psychosis”, *Ernst Kretschmer* (1922, 1950:73ff, 115, 131) called “pictorial-strip

thinking” or “image agglutination,” *Heinz Werner* (1926) termed “physiognomic thinking,” *Silvano Arieti* (1959) described as “paleologic,” and *Alfred Storch* (1922) referred to as “archaic thinking and behavior in schizophrenia,” all relate to this framework. *Karl Jaspers* (1973:180, 618f), in his “General Psychopathology,” critically observed that these are always only comparisons. Archaic thinking, he noted, is

“a historical developmental state of the human mind (which lives primarily through tradition, not through biological inheritance). In contrast, schizophrenia is an empirically observable disorder that involves a primary disturbance in the course of mental life.”

“Archaic thinking, as a state of primitive consciousness, is fundamentally different from psychotic illness. It is the result of a collective development and serves a functional role within the community, whereas schizophrenic thinking isolates the individual and separates them from the community.”

*Karl Jaspers* (1883–1969) also formulated the following key questions regarding this complex of issues:

1. “Have schizophrenic experiences been a source of primitive views and ideas? This question cannot be answered at all.
2. How does the thinking of ‘primitives’ compare to that of schizophrenics? Apparently ‘healthy’; it does not have the character of schizophrenic primary experiences or schizophrenic mental processes.
3. What does it mean when one speaks of the ‘re-emergence’ of archetypes, myths, symbols, possibilities, and forces that were buried or lost in civilization? This is a very vague, non-verifiable theory, a connection that has not yet been researched, a grand and unfounded claim that merely repeats itself with different material, without advancing knowledge.”

Developmental psychology was also strongly influenced by these ethnopsychological studies, as demonstrated, for example, by *Heinz Werner’s* “Einführung in die Entwicklungspsychologie” from 1926, which contains a wealth of ethnographic and ethnopsychological references. Nevertheless, it would be a fundamental error to interpret the analogy between child psychology and the psychology of so-called primitive peoples as some sort of “psychogenetic law” (Stanley Hall, 1904). This theory famously asserts that the psychological development of the individual (ontogeny) recapitulates the psychological development of the species (phylogeny). However, from a phylogenetic perspective, today’s “primitive peoples” are by no means more primitive than Europeans.

The English social anthropologist *C. R. Hallpike* (\*1938) stated in his book “The Foundation of Primitive Thought” (1979) that the many attempts to systematically identify and explain the differences between primitive thought and the thinking of the educated person in industrialized Europe have so far failed, mainly due to the lack of a clear and generally accepted theory of learning and cognition. *Hallpike* therefore proposes an integrated epistemology, an empirically grounded psychological framework that could serve as a basis for stricter classification and analysis, and provide greater terminological clarity and precision. As a model and point of departure, *Hallpike* draws on the work of *Jean Piaget* and other developmental psychologists, whose concepts can, with slight modifications, be applied to the problems posed by primitive thought. In this sense, primitive thinking would correspond to what *Piaget* described as the preoperational stage. In this second stage of human cognitive development, the child is able to think symbolically, but does not yet understand operations such as the concept of conservation, nor can it organize information logically. According to *Piaget*, this stage is also marked by “moral realism,” in which children regard social rules as absolute and unchangeable (cf. *Piaget*,

J. (2003): “Meine Theorie der geistigen Entwicklung”). *Hallpike* attempts a dual task: to demonstrate that the failure of anthropologists and ethnologists to grasp even the basic aspects of primitive thinking is largely due to their insufficient understanding of the nature of their own thought.

The Cologne ethnopsychologist *Eno Beuchelt* (1988:96) notes, with regard to recent cross-cultural research on thinking, that more recent, primarily empirical studies have shown

“that while the prerequisites for thinking—knowledge of natural phenomena, the causes of diseases, technical relationships, and so on—may vary culturally, the formal cognitive processes are the same and, with appropriate schooling, lead to the same results.”

These findings support the hypothesis of the “Psychic Unity of Mankind” proposed by *Adolf Bastian* (1826–1905) (cf. Stubbe, 2012, 2021). However, whether the increasing Western education of former “indigenous peoples” in the so-called Third World will render the study of so-called primitive thinking increasingly irrelevant, as *Beuchelt* assumes, remains questionable. An empirical investigation of thinking from both emic and etic perspectives seems to be of great theoretical and practical significance, especially today in the so-called Third World. In any case, the study of so-called primitive thinking is of great historical and heuristic value (cf. Thurnwald, 1928; Hallpike, 1990).

Some German intelligence tests (e.g., MIT) also include proverbs as a means of assessing intelligence. For example, how would the following Thai proverbs (cf. Otrakul, 1991:84ff) be understood? And what cognitive processes would they trigger in Western persons.

- “To mistake the wheel spoke for a lotus flower.”
- “To play the violin in front of a water buffalo.”
- “To hold young tigers and young crocodiles.”
- “To fetch the bamboo rod before seeing the water and to draw the bow before spotting the squirrel.”
- “The boat needs water, the tiger needs the forest: amicably.”
- “One spirit strikes, another one hits back.”
- “With the elephant, look at its tail; with the woman, look at her mother, and to be certain, also at her grandmother.”

Similarly complex are the extraspective methods, which measure physical changes during the thought process using EEG (brain waves), PGR (skin potential), EMG (muscle actions, micro-vibrations), EKG (heart activity), EOG (eye activity), respiratory activity (frequency and volume), and general physical states (temperature, glandular secretion, erection, etc.). However, body perception and body schema are highly culture-dependent, so that in cross-cultural studies, significant differences would have to be expected if it were possible to find a thinking task that could be posed in exactly the same way across all cultures - a prospect that seems highly unlikely.

Performance measurements during cognitive activities or problem-solving techniques can also be employed as specific tests for studying cognitive processes. Here, the challenges associated with testing in foreign cultures, as mentioned below, apply. Likewise, the *in vivo* method (computer model) used by *Dietrich Dörner* can only be transferred to foreign cultures to a very limited extent. “Lohausen” is not “Erzurum” (Turkey), “Maputo” (Mozambique), “Ratchaburi” (Thailand), or “São Luis” (Brazil).

Finally, the development of logical operations, as proposed by *Jean Piaget*, can be examined in cross-cultural studies (cf. Liebing & Ohler, 1993). Cultural and linguistic-historical research has repeatedly emphasized the cultural dependence of thinking (cf. Whorf, Sapir). For example, *Lily Abegg* (1970) convincingly demonstrated that East Asia “thinks differently,” and *Köster*