**HTS Teologiese Studies/Theological Studies**
ISSN: (Online) 2072-8050, (Print) 0259-9422



# Has evolution 'prepared' us to deal with death? Paleoanthropological aspects of the enigma of *Homo naledi's* disposal of their dead

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**Dates:**
Received: 22 Sept. 2016
Accepted: 08 Dec. 2016
Published: 28 Mar. 2017

**How to cite this article:**
Du Toit, C.W., 2017, 'Has evolution "prepared" us to deal with death? Paleoanthropological aspects of the enigma of *Homo naledi's* disposal of their dead', *HTS Teologiese Studies/Theological Studies* 73(3), a4074. https://doi.org/10.4102/hts.v73i3.4074





The *Homo naledi* discovery introduced questions that had not been previously posed regarding fossil finds. This is because, apart from their fascinating physiology, they seemingly deliberately disposed of their dead in a ritualised way. Although this theory may still be disproved in future, the present article provisionally accepts it. This evokes religious questions because it suggests the possibility of causal thinking, wilful and cooperative behaviour, and the possibility that this behaviour entails traces of proto-religious ideas. This poses the challenge to develop a hominin hermeneutics that endeavours to reconstruct the possible motivation behind this action. The relatively larger brain with its enlarged Broca's area suggests the possibility of a sophisticated communication system and an enhanced way of dealing with emotion. We know that almost all life forms have some form of awareness and that more sophisticated degrees of consciousness may be present in the higher primates. Various 'clues' are investigated to try and understand the *H. naledi* phenomenon: lessons from chimpanzee studies, the implications of tool making for hominin development, the possibility of a proto-language and the role symbol formation may have played. The *H. naledi* case also indicates on a theological level that religion is natural. Some attention is given to this thesis. Biological and environmental factors come into play to illuminate biological factors like emotion and higher cognition without which religion would not be possible. Sophisticated cognition is coloured by affect (basic emotions are typical of all mammals) and this makes some form of reflection on the fate of loved ones who have died a strong possibility.

## Introduction: The discovery of *Homo naledi*

On 10 September 2015, Professor Lee Berger announced the discovery (in 2013)[1] of an extinct species of hominin that was assigned to the human (homo) family tree, named *Homo naledi* after the Dinaledi Chamber where it was found. Some 1500 fossils (from 15 individuals) were excavated during the Rising Star Expedition. The Rising Star Cave system is part of the Cradle of Humankind World Heritage Site. The cave is about 1.8 km away from the Sterkfontein caves where the world-famous 'Mrs. Ples' and 'Little Foot' were discovered in 1936, including an almost complete *Australopithecus* skeleton dating back more than 3 million years (see the work of Robert Broom and Raymond Dart). The *H. naledi* fossils are the largest collection of a single species of hominin that has been discovered in Africa so far (Berger et al. 2015:3). The overall morphology of *H. naledi* places it within the genus *Homo* rather than *Australopithecus* or other early hominin genera (Berger et al. 2015:23). The cranium of *H. naledi* has been equated with that of *Homo erectus*.[2] The shoulders are smaller and more ape-like than *Homo sapiens*. The pelvis is also more primitive, but the feet are similar to those of *H. sapiens*. The thumb is much longer than that of *H. sapiens*. The hand is typified as a 'tool-making' hand, although the curved fingers are not ideal. All bones of *H. naledi's* anatomy were found, which makes this the most complete find in the fossil history of all hominins.

### What if?

But what if *H. naledi* is not a new species but simply a variant of *Homo ergaster*? What if the bones were not deliberately disposed of in the Dinaledi chamber but were washed in from the previous chamber, where there was an earlier collapse of the ground claiming the lives of the community

1.The entry to the cave which is part of the Rising Star Cave system was found on 13 September 2013 by the Rick Hunter and Steven Tucker of the Speleological Exploration Club of South Africa. They found a narrow, vertically oriented 'chimney', 12 m long with an average width of 20 cm which led to a room 30 m underground. The cave surface was littered with fossil bones. On 01 October 2013, Lee Berger was informed about the find (see https://en.wikipedia.org/wiki/Homo_naledi. Accessed 10 June 2016).

2.It must be remembered that *Homo erectus* was not the first hominid to walk on two legs. Australopithecines were walking on two legs a few million years earlier than *H. erectus*.

whose fossils were found in the Dinaledi chamber?[3] Why are most of the bones broken if there was not a collapse of the ground?[4] If the bodies were brought into the Dinaledi chamber as claimed, and if no water or foreign material entered the cave, one would have expected to find many more unbroken bones. If *H. naledi* is simply *H. ergaster,* then the suggestion of this paper that we have here a possible case of higher consciousness, higher forms of communication and cooperation, perhaps even a form of proto-religious ideas and so on is false. The question is what future excavations will yield and whether the thesis of 'deliberate disposal' will be disproved.

The thesis of this contribution is that if we have here a case of deliberate disposal then it may imply higher forms of consciousness, the possibility of proto-religious ideas and so on leading to the conclusion that religion is natural and based on human biology. From a theological point of view, the naturalness of religious ideas, the role of higher consciousness, emotion and all other arguments developed in the article would still be valid, although they may have emerged only much later with early *H. sapiens*. If they did indeed already occur in *H. naledi*'s case, it is simply so much *more* remarkable.

## Is the cave where *Homo naledi* was found a burial place?

Dirks et al. (2015) proposes that the Dinaledi remains represent deliberate and repeated body disposal. This begs the question of whether this constitutes burial, which is not common among very early hominids. Every previously known case of cultural deposition, he notes, 'has been attributed to a species of the genus *Homo* with cranial capacities near the modern human range' (Dirks et al. 2015). What the Berger research team are confident about is that the deposits were made over a long period of time. That was clear from the varied levels on which the remains were found. This indicates a ritualised behaviour, which means in paleoanthropological terms that it was repetitive. To what extent it may be indicative of a sense of self and others is unknown. We can simply speculate on the kind of consciousness (or awareness) *H. naledi* had and whether it played a role in the ritualised behaviour, if at all. What is clear is that no animal or hominin would venture into such a long dark shaft without fire.[5] One could also surmise that the effort of depositing the dead in the cave most likely depended on cooperative behaviour. No artefacts were found in the caves, nor were any remains of any other species.

Did *H. naledi* have a brain too small to understand death and burial? Four skulls were discovered, thought to be two females and two males, with a cranial volume of 560 $cm^3$ for the males and 465 $cm^3$ for the females. The brain size was thus between 450 and 550 $cm^3$. This is closer in cranial volume to australopithecine skulls and about half the volume of the modern human skull. Average *H. erectus* skulls are 900 $cm^3$. The cranium is small but very complex, with a huge Broca-area (the region in the frontal lobe of the dominant hemisphere, usually the left of the hominid brain, with functions linked to speech production).

The preferred explanation of researchers is that the skeletal remains testify to a deliberate disposal of the dead. In this hypothesis, they write, 'bodies of the individuals found in the cave would either have been carried into, or dropped through an entrance similar to, if not the same as, the one presently used to enter the Dinaledi Chamber' (Dirks et al. 2015). Dropping the bodies onto a soft surface inside the cave may have happened, but the hominins might also have entered the chamber:

> carrying the bodies or dying there, which would explain not only the absence of green fractures but also the presence of delicate, articulated remains in the excavation pit deep in the chamber, well away from the entrance point. (see Dirks et al. 2015; Killgrove 2015)

No easy ancient access to the Dinaledi Chamber was found. There are no other entrances to the cave (seismic and other tests were done), and there is no indication of ground that collapsed, which would have damaged the remains and covered them with rock and other deposits. The researchers found no evidence that the bones had been exposed on the surface of the ground prior to finding their way into the chamber of the cave. All of the fractures in the bones were post-mortem, excluding the possibility of bodies falling into the cave; there is also no evidence of predator bones anywhere near the bodies. It is very unlikely that large carnivores put the remains of their meals there. There was no evidence that the bones were transported into the cave by water (the hand bones, for example, were found in one place and would have been scattered if transported there by water). The arrangement of the bones suggested the individuals did not all die at once (see Dirks et al. 2015; Killgrove 2015:3).The demographics are varied, from a foetus to young children, adults and elderly.[6] So what can account for the skeletal remains within the cave? The answer points towards the possibility that this was a disposal site for the dead.

If *H. naledi* did indeed bury their dead, it may be a pointer to some form of consciousness about the dead and what happened to them, and this may suggest a form of proto-religiosity or abstract thinking. We know that religion proper only originated with *H. sapiens,* but forms of proto-religion must have been present among some of the earlier hominins. The notion 'forms of proto-religion' is very vague and difficult to prove. Yet it is important because one can accept a

3.Thackeray (2016:1–2) from the Witwatersrand University suggests that there was indeed another opening to the cave big enough to let in sufficient sunlight to allow lichen to grow on the carcasses. He found tiny black spots of manganese dioxide on the bones and these were most likely deposited on the bones by lichen. He suggest that a family was trapped in the cave after a rockfall but that enough light still penetrated the chamber to allow the growth of lichen. Over time the chamber was sealed again by rock falls in a phreatic maze.

4.Theory of palaeontologist Dr Francois du Rand of the University of Johannesburg (see Du Rand 2015).

5.Chances are good that *Homo naledi* used fire. Estimates for hominids using fire date from 300 000 to 1.5 million years ago (Wolpert 2006:75).

But what are the chances that *H. naledi* could fabricate a torch and move down a narrow chute, 18 cm wide at places, holding a torch while dragging a corpse behind it? It sounds too improbable to be true.

6.The team identified three infants, three young juveniles, one old juvenile, one sub-adult, four young adults and one old adult.

gradual development of all characteristics that identify *H. sapiens*. It also indicates that religion, irrespective of when it emerged as an identifiable phenomenon, can be considered to be natural. Elementary transcendent or supernatural concepts were thus a natural consequence of hominin consciousness that suited their experience of reality. These ideas may have prepared the way for the later emergence of higher cognition in *H. sapiens*, and *H. naledi* may have fulfilled a preparatory role in this development.

Van Huyssteen (2006:105) considers the origin of the human mind as closely tied to the kind of cognitive fluidity that includes symbolic and mythical dimensions. This means that our cognitive behaviour cannot be fully understood apart from the origins of religious behaviour. 'On this view, then, the prehistory of the human mind points to the naturalness of religion and supports the broader argument for the rationality and plausibility of religious belief' (Van Huyssteen 2006:105).

We will never know what kind of thinking or awareness was present when *H. naledi* disposed of their dead. There is however no firm evidence of burial among the early hominids. The Shandinar caves in Iraq where Neanderthal bones were found testify to the possibility of funeral rites (Reanney 1995:11). Neanderthals might have buried their dead, but the evidence is inconclusive. We also know that some of the great hominids as well as many other species paid special attention to their dead, without any indication of a special awareness that accompanied this attention.

One can surmise that in later developments the burial of the dead may be indicative of higher consciousness, which may include some idea of an afterlife, which spells out some kind of religious or metaphysical thinking. What is certain is that the dead came to play a significant role in the later development of all religions, and the roots of this link between afterlife and religion may be traced back to early hominin history.

Early hominins used caves as shelters and also as locations to dispose of the dead. The concept of a cave is important in the development of human consciousness. The cave metaphor in Plato's understanding of being is significant in this context. The cave represents the nether world. The underworld (see the later Greek *hades* and Hebrew *sheôl*) was part and parcel of the three-tiered worldview that formed the picture of the universe for a very long time in human history. It was present in the Sumerian culture and was passed on to the Hebrews. No strict distinction was made between the grave and the underworld. Without suggesting that *H. naledi* had the ability to form a concept of the underworld, one must recognise that the Dinaledi Chamber is a good example of a cave that represents the underworld. It must have taken some effort to reach the chamber 30 m below the surface, which represents a journey to the underworld. For Clark (2006), the notion of a nether world appears to be an imaginative extrapolation from the individual grave or tomb:

> It is as if the ancients imagined that the graves, being subterraneous, were connected, or that the spaces of soil and rock between them were traversable by the spirits, so that they could find their way down the lower hallows, and that the whole formed a vast underground cavern or tomb complex as a habitation for the shades. (p. 230)

What *H. naledi* did perhaps intuitively may have influenced later conceptual thinking about the dead and the underworld.

It is important to note the role death plays in human life. Our genes are in a sense immortal. They need to be if you consider the millions of years of trial and error it took to develop organisms fit for their environment. Immortality means preservation of the gains attained. In this sense, genetic 'immortality' is a matter of pragmatism. This works pretty well in the case of most organisms and 'genetic immortality' simply needs the 'selfish' gene to be successful and not higher brain functions and consciousness. The level of higher intelligence and consciousness brings a whole new order of awareness to the fore. In the case of humans, we have to appreciate the role language, conceptual thinking and the like play before we come to the point where the human brain foresees its own death. On this level we may encounter the dilemma that is spelt out by Reanney (1995:10): 'This brings the open-ended compulsion to survive forever (the legacy of the genes) into direct confrontation with the foreknowledge of death (the legacy of experience)'.

We often have an over-optimistic view of the early hominins and males in hunter-gatherer societies. The basic adaptation of the hominin line is bipedalism. *H. naledi* was about 1.5 m (150 cm) tall, weighing about 45 kg. Females would likely have been a little shorter and weighed a little less. Barbara Ehrenreich (quoted in Sheldrake, McKenna & Abraham 2005:6) indicates that early human beings were small and not very strong. They could not run very fast, had very primitive tools and were often the prey rather than the predator. Many hominin bones indicate scratches and tooth marks of large cats. They were very vulnerable and a great deal of their mentality was shaped by millions of years of being preyed on. It was not until about 50 000 years ago that there was an improvement in hunting technology. This must be read in light of higher forms of consciousness that developed over time and how they dealt with fear, death, compassion and so on.

Primitive man did not think of or experience death as we do today. Death was probably not substantiated as a metaphysical entity in itself because that presupposes a high level of conceptual thinking. What was substantiated were threats in the form of predators, accidents, enemies, lack of food and the like. 'In his own inner world, archaic man, like a modern child, was subjectively immortal' (Reanney 1995:11). The bulk of life on earth is microscopic and do not die but are killed! (Reanney 1995:65). Life expectancy among prehistoric man was not great and was on average 18 years (Reanney 1995:10). Death was normally violent. For Reanney (1995:11) '… men did not die, they were killed' either by wild animals or by the hand of an enemy.

This is not to say that apart from physical predators immaterial forces that could influence individuals were not recognised as well. In later developments, non-physical dangers were recognised and feared and had to be combatted. In this sense, death was not natural but caused by evil spirits, and they were combatted by magic spells and protective talismans. It is unclear at what stage burial of the dead can be linked to fear of death or belief in the afterlife. Corpses would soon decay and had to be disposed of, and this was done for a very long time without any accompanying thoughts. The burial of the dead is as old as early hominid tool making and must have started very early in prehistory.

## Hominin hermeneutics?

Reconstructing the minds of our early ancestors is complicated and makes hominin hermeneutics extremely challenging. The ancestors of *H. sapiens* diverged from the early chimpanzees around 6 million years ago in Africa. The ape line diverged as well. After the separation the early humans can be regarded as hominins (known as australopithecines) who initially did not differ much from the chimpanzees on a physiological level.

The *Homo* species, which is the same genus as us, evolved between 1 and 2 million years ago (*Homo habilis, Homo rudolfensis*). *H. naledi* can be compared to *H. habilis and H. rudolfensis* and earlier specimens. *H. naledi*'s origin is thus between 2 and 3 million years ago. *H. habilis* evolved around 2.8 million years ago and is the earliest species for which there is positive evidence of the use of stone tools.[7] *H. erectus* and *H. ergaster* were the first to use fire and complex tools and were the first of the hominin line to leave Africa for Asia and Europe 1.3–1.8 million years ago. About 60 000 years ago, waves of modern humans started to emigrate from Africa to the Middle East, and then to Europe. Early European humans from 30 000 to 15 000 years ago had long bones, thicker skulls, a 100-cc larger cranium and were more rugged than modern humans. In Africa, contemporary *H. sapiens* is assigned to the Upper Palaeolithic (see Clark 2006:148–150).

Modern humans have a cranium size between 1000 cc and 2000 cc, with an average of 1300 cc –1400 cc. Australopithecines had a much smaller cranium (about 400 cc) than present-day humans and were about 1 m – 1.2 m high. *H. erectus* was physically similar to present-day humans with brain sizes between 700 cc and 1200 cc. Neanderthals date from after 150 000 years ago, with a physique similar to humans although much stronger and with thicker bones and a brain size of 1300 cc –1600 cc. They disappeared about 28 000 years ago, probably because of contact with modern humans. South African fossils with significant human characteristics date from 160 000 years ago. As we have seen, the brain size of *H. naledi* was between 450 cc and 550 cc. The question is what level of abstract thinking, symbolisation, sense of self, sense of social norms and so on becomes possible with different brain capacities. If *H. naledi* intentionally buried their dead, what were they thinking – if at all? Apart from burial rituals there is no evidence of religious activity among prehuman hominins.

To answer the question about intelligence and possible use of symbols, many researchers turn to modern-day chimps, who also seem to mourn the loss of their fellows. Some researchers believe that the so-called human revolution, which saw the emergence of culture, symbolic behaviour, language, self-awareness and the like, came about in the genus *Homo* abruptly. This implies no gradual development of these characteristics and makes them exclusive to humans (which exclude chimps and other hominids) and which renders any kind of protolanguage or proto-religion unnecessary. Clark differs from this and holds onto a gradual development of these factors, some of which may have been shared by other species. In this light researchers try to understand early hominins from present-day chimpanzee behaviour. Humans diverged from chimps and bonobos about 8 million years ago. Chimpanzees and bonobos are viewed as the best available surrogates to try and imagine our common ancestor. Gangestad and Simpson (2007:27) are sceptical, because key aspects of human evolution occurred after our divergence from these ancestors and consequently comparative information has little relevance to understanding human conduct.

To understand hominin behaviour, we read their customs in terms of our present-day self-understanding, which gives a skewed picture. In Renfrew's words (1994):

> In all attempts to investigate the early past there is the risk that we first conceptualize, setting up a whole series of categories of our own construction, and then order our date (our observations bearing upon the past) in terms of such categories. The past is then presented in these terms, and it is easy to assume that our description is telling us about the way the past was and the way it was ordered. In some cases, however, all that we are seeing is a reflection and an exemplification of our own a priori categories. (p. 47)

Lancaster and Kaplan (2007:117) correctly indicate that chimpanzees are similar to humans, but there are far more differences than similarities. But opinions differ and the work of De Waal and Goodall (see Clark 2006:158ff.) points to important similarities that may help us to understand early hominins from chimpanzee behaviour.

Clark (2006:151–152) acknowledges problems in taking chimpanzees as a model for the way our earliest ancestors lived. We are taking the developmental outcome of chimpanzees of about 5 million years and then claiming that the present-day chimpanzees that we study can teach us about their early ancestors. Aspects of their behaviour like hunting, foraging, tool making, community life and so on

7.Recent scientific finds date the time for evidence of tools back to 3.3 million years. Harmand et al. (2015:310) discovered at an archaeological site in Kenia (named Lomekwi 3) stone tools 3.3 million year old (predating the Oldowan by 700 000 years) associated with Pliocene hominin fossils. The inhabitants of Lomekwi mastered the art of knapping which include understanding a stone's fracture properties, the technique of reducing the core through battering, which all presuppose excellent coordination and ambidexterity. The tools are made from large-sized cobbles or blocks of lava (see Harmand et al. 2015:213ff.). This indicates higher intelligence and intentional behaviour of primates much older than previously thought.

may have changed dramatically over time. Nevertheless, Clark (2006) believes that:

> … the fact those behaviours are shared by us with living chimpanzees indicates that even if they were not shared with the common ancestor, they could have developed in our linage at an early stage when our ancestors were more apelike that we are now: that is, at the stage of australopithecines. (p. 152)

The studies done on present-day chimps like Kanzi (see Du Toit 2015) may direct the focus to issues like problem-solving, numerical and linguistic 'abilities', but these were probably not natural phenomena in early chimpanzees and humans. The world famous chimp, Kanzi's ability to communicate does constitute a kind of proto-language (see Wolpert 2006:65).

Clark names interesting factors that may point to similarities between early chimps and early humans (Clark 2006:152–154). Unlike most other hominids, chimpanzees recognise themselves in a mirror. If a chimp loses self-confidence when challenged by another male and becomes afraid, he bares his teeth in a 'grin of fear'. De Waal (quoted in Clark 2006:155) mentions an alpha male who was challenged by another male and immediately covered his mouth with his hand when he became aware of baring his teeth. When the other male later reappeared he pressed his lips together with his fingers. Chimps do not look each other in the face when in conflict, but do look at the other in the eye during reconciliation.

Primates recognise other individuals, anticipate their intentionality and form alliances (Wolpert 2006:53). They can control their own behaviour and conceal knowledge from others. They interpret their circumstances and the possibilities they offer to manipulate the behaviour of others. They are able to detect moods and mood shifts (Clark 2006:156).

De Waal (quoted in Clark 2006:155) compares chimp behaviour to human societies and the conduct of the tribal chief with that of the Alpha male. The chief receives gifts from others like the alpha male, keeps others at bay without exploiting them and returns favours by supporting the needy. A dominant male cannot afford to be too violent because he may lose his dominant position.

Clark (2006:168ff.) sketches how the earliest hominins may have lived. He takes his cue from the behaviour of chimps and superimposes that on the early hominins, adding some advanced features. Early hominins formed affectionate bonds. They groomed, embraced and kissed. They helped each other in adversity amidst a great deal of intra-community violence and conflict with outside groups. Like chimps they were curious about, yet repelled by, the sick and dying. They were frightened by noisy natural phenomena such as lightning, thunder, storms, heavy rain and so on. When sick they ate plant material to purge themselves. Compassion, caring, charity and a community spirit are regarded as precursors to later religious elements. Although this scenario sounds probable, it cannot be tested against any archaeological record. This does not only concern the early hominids but also *H. sapiens* during its later stages of development. Hill (1994:87) indicates, for example, that although it is probable that hominins as well as early *H. Sapiens* believed in an afterlife, it is by no means clear that that belief would leave material evidence in the archaeological record. The same goes for the generalisation that all people grieve when close relatives or friends die. It is only the acting out of a specific belief that has the potential to leave evidence in the record. Mithen (2007) underscores the sentiment:

> Two million years ago, *H. habilis* may have had profound thoughts about the nature of the universe, morality, and truth; it may have believed in supernatural beings, undertaken mental mathematics, and composed poetry. Because such thoughts may have no material correlates, paleoanthropologists are unable to infer with absolute degree of confidence whether they actually existed. (p. 321)

## The emergence of higher consciousness

Proto-religious ideas and all supernatural thinking play a significant role in any cognitive archaeology. How do we approach a cognitive archaeology? One view is to link ancient cognitive abilities to the archaeological approach to religion (see Renfrew 1994:47). Consciousness developed gradually over millions of years. It started off with cells that could sense light, vibration, pressure, or changes in chemistry. These cells formed sensory organs that opened up great quantities of new information about the world, which enabled organisms to interact much better with their environment. The increased amount of information required a central processing system, and with it a more integrated picture of the world appeared. As brains evolved, new features were added to consciousness. The development of the limbic system (mammalian brain) added emotion and affect to consciousness, which changed the way organisms experience reality. The development of the cortex was next, which added more memory and recognition. Eventually the cortex grew to develop the neo-cortex, which made simple reasoning, abstractions and higher levels of consciousness possible. The most significant of these was the ability to use symbols. Without this development language could not have developed. Language made shared experience possible, as well as a collective body of experience and knowledge that could be passed on the next generation. Consciousness must have some selective advantage for humans. How else can we understand its emergence (Reanney 1995:197)? Part of this selective advantage was the ability of the brain to recognise unity:

> That faculty does not exist as such at birth. We build it up over time in much the same way we build language skills, by evolving a structure of experience in which various elements integrate with each other until they form a neural recognizer, a kind of inner eye. (pp. 197–198)

Language development stimulated memory. Van Huyssteen (2006:101) mentions that knowledge of our prehuman ancestors was stored in gene pools of species-specific populations so that each species has a different knowledge of the reality it lived in, which was focused on the specific

challenges of its environment. In human beings, this knowledge is partly stored in gene pools and partly held in individual and collective memories and the traditions of each society. It is this capacity that explains the cultural and other achievements of the human race.

Evolution is geared to adapt organisms to their environment. In the case of humans the environment 'changed' through the development of higher consciousness. This made the construction of the human 'inner world' possible, where 'reality' is co-determined by fantasy, creativity and dreams to deal with metaphysical issues like meaning, purpose, time, death and eternity. The duplication of reality in the inner world of mind sets humans apart from all other species. Through the inner world the environment could be reconstructed to fit the basic interpretations and desires of humans. Early hominins must have had some form of anthropomorphic thinking, which is necessary to predict how animals would behave (Wolpert 2006:76). This presupposes some sense of self. While non-human species have a sense of environment and some sense of presence, they do not have a sense of self as humans do. They lack the duplication of environment in the inner world of intelligent consciousness. The construction of environment in the human mind was linked to the experience of the outer environment, as well as challenges posed by this environment. One of the main challenges was dealing with death.

Tool making is indicative of higher consciousness. We have noted that *H. naledi* had a 'tool-making' hand. Tool making is linked to purposeful action and causal thinking. Language had to evolve out of neural structures and cognitive abilities already present, and for Wolpert (2006:79) the relationship between verbs and causal thinking is an argument for believing that the evolution of language required causal thinking. Although tool making requires planning, it can be performed independent of language abilities. Language was preceded by manual signs. *H. naledi* had a tool-making hand, and it cannot be ruled out that they used it for this purpose, although the curved fingers may have been a nuisance. Wolpert (2006:77–78) states that the opposability of the thumb and the associated dexterity could have promoted consciousness as the manipulation of objects became a self-conscious activity. Tool making would promote cooperative behaviour.[8]

It is improbable that *H. naledi* could speak, although as we have seen their Broca's area was enlarged.[9] In humans, Broca's area in conjunction with Warnicke's area processes language and integrates auditory and sensory information. Broca's functioning concerns the encoding of vocal signals into meaningful words and sentences (see Taglialatela et al. 2008:343). The study of Taglialatela et al. has indicated that '… the neurological substrates underlying language production in the human brain may have been present in the common ancestor of humans and chimpanzees'. As gestures and vocalisations occur simultaneously in chimpanzees, research suggested that the precursors to human language are present at both the neural and anatomical levels (Taglialatela et al. 2008:344). Without reading much into this, we can surmise that the indication of a larger Broca area in *H. naledi* may be a significant precursor in the development of language.

One of the functions of Broca's area is to help the species to express or verbalise emotional experience. Emotion is mediated by the limbic system via the amygdala and hypothalamus via the temporal lobe and neocortex. Much of the emotional input is on an unconscious level and responses are a-reflexive. Broca's area helps in making emotional feeling reflexive via linguistic means. We have seen that *H. naledi* must have had communication abilities that enabled them to cooperate and to plan on an intentional level to 'preserve' their dead. Perhaps some form of proto-language or a more sophisticated sign language was at their disposal. This could help to explain their will to dispose of their dead in a ritualised way.

Neanderthals had the same version of the FOXP2 gene[10] as modern humans and most probably had speech abilities not radically different from those of modern *H. sapiens*. Their tool-making and hunting tactics would have been difficult to perform without some kind of speech. The hyoid bone allows a wide range of tongue, pharyngeal and laryngeal movements and is present in many mammals. The australopithecines had a hyoid bone in their neck that is functionless in humans. If this structure is present in *H. naledi*, it will give us clues as to how the species vocalised.

Language stimulated the mind and reasoning. Instead of simply interacting with the environment, the species gained the ability to understand the environment and interact with it to benefit us better. Questioning reality became possible, as well as the will to figure things out, how they work, whence they come and so on. A whole new dimension was added to our consciousness – understanding. We could form hypotheses and beliefs about the world in which we found ourselves. We developed an inner world of thinking, became aware of the fact that we are conscious, developed self-reflective consciousness, and became aware of being a self. Abstract thinking, imagination, metaphysics and religion became a possibility. So did thinking about the dead, about powers greater than ourselves and all similar ideas that became possible through human imagination.

## Religious ideas 'stimulated' by biology and environment

In spite of much speculation we know that somewhere along the developmental line of early hominins and later *Homo* symbolic thought, abstract thinking and the concept of

8.Hafted tools were made in the Middle Stone Age (Wolpert 2006:74).

9.It must be mentioned that the enlarged Broca's area is also typical of *Homo habilis*. This implies the possibility that at least some of the neurological hardwiring that controls the vocal tract musculature was already developed 1–2 million years ago in *H. habilis*. Broca's area is exactly where such cortical structures are found in humans (see Kemmer 2012; Tobias 1987:741ff.).

10.The FOXP2 gene plays a role in controlling the orofacial movements which are involved in speech.

unseen powers and a supranatural world must have arisen. This development was linked to the biological and psychological makeup of the species as well as their experience of and interaction with their environment.

Van Huyssteen (2006:95) briefly addresses this when he concurs with Darwin that metaphysical and religious beliefs in humans were related to evolutionary processes, and could be explained like all other cognitive abilities in terms of human evolution. Somewhere along the line we transcend the biological and physical: '… we clearly transcend our biological origins, and in doing so have the ability to transcend what is given us in both biology and culture'.

There is a sense in which religion slumbers in our biology. Wuketits (quoted in Van Huyssteen 2006:98–99) sees it as a fallacy to use the principles of biological evolution to explain cultural evolution. But this is a dualism and divides human consciousness and all its procedures from human physicality. Van Huyssteen (2006:99) correctly argues that cultural evolution has channelled the creative human brain. It is not a matter of a unilateral top-up process, but a mutual interaction between physicality, consciousness and interaction with the environment.

Munz (quoted in Van Huyssteen 2006:100) argues, with reference to the manner in which Popper's philosophy of science was embedded in Darwinian evolution, that biology can 'help' philosophy by providing the missing link in arguments about objectivity. Evolution implies taking the presence of an objective world for granted. The 'realism' involved here, says Van Huyssteen (2006:101), is 'hypothetical' because, as we have embodied minds, it is reasonable to accept a real world out there that has produced our minds through the process of evolution.

Wolpert stresses the biological basis of belief (Wolpert 2006:28). To understand how the biological basis develops into specific behaviour and to something like belief, we must consider the physical cause, how it develops, its function and evolution. Hunger and sadness can be used as examples: the biological bases are those that cause us to feel sad or hungry; they develop both in the embryo and after birth and their function is to advantage the individual – hunger to ensure eating and sadness to make up a loss.

It is both biological factors and environmental factors that stimulate religious ideas. Human emotion forms a very important part of the biological factors that codetermine religious feelings. Humans are gregarious animals bound to each other by attachment and affection. This is mediated by human emotion, which explains the strong bonds that bind us to each other as well as our strong response to fear and danger. Religion cannot be understood in isolation from human emotion. Conscious and preconscious perceptions are accompanied by the associated emotion. Religious feelings depend indirectly on emotional factors like fear, joy, love, compassion and caring (see Clark 2006:187). Something like a religious emotion does not exist. Not even a feeling of awe is a religious emotion. Emotions do serve as vehicles for religious feelings, experience and memory. Altered states of consciousness and hallucinations are also not inherently religious but can be adopted for religious purposes. The same goes for the experience of what may be interpreted a miracle. A phenomenon that cannot be explained may simply be seen as a mystery or a miracle. It is only when divine agency is attributed to a phenomenon that it becomes religious.

*H. naledi* experienced emotions typical of what can be expected from hominins. They were biologically equipped with the emotions typical of higher primates and other hominins. The question is the extent to which these emotions were further developed in light of higher cognitive functions. As mentioned before, their enlarged Broca's area does suggest that this was the case.

## Signs of proto-religiosity among higher primates and early hominins

Religion is proper only to humans. Van Huyssteen (2006:103) links cognition to evolutionary development. He sees human cognition as mediating between cultural and biological levels. This builds upon the idea that evolution is a knowledge-gaining process. It is difficult to see, however, how cognition could affect human DNA. Cognition, human understanding and the development of skills and technologies do have a huge impact on the human environment and may change it dramatically. This may then influence the way the species adapt to this environment. Changes brought about on this level may take a very long time to materialise.

The development of religion is greatly dependent on increased cognitive abilities and this is why humans have religion and *Homo neanderthalensis* did not. Religious belief, seen from an evolutionary epistemological perspective, became part of what it means to be human (Van Huyssteen 2006:103).

Wuketits (quoted in Van Huyssteen 2006:94) sees metaphysics as the human need for metaphysical beliefs, including religion and all other irrational worldviews. Metaphysical belief originates from the interaction between early humans and their specific life conditions in prehistoric times. The *H. naledi* fossils and the possibility that the cave was a burial site pose the questions: to what extent were metaphysical beliefs present among very early hominins, and to what extent do we have to do with the precursor of metaphysical and religious ideas?

Clark (2006:151) believes that for the ancestors of human beings religion was a natural development. He poses some conditions necessary for the development of basic aspects of religious behaviour which were present among apes. These conditions did not lead to religious behaviour as such, but were necessary preconditions for the development of religious behaviour.

He sees pre-religious behaviour as showing resemblances to human stressful situations which have evoked religious responses, for example, having to face sickness, death and the unknown (Clark 2006:160). Before conjecturing about proto-religion among the early hominins, he cites examples of chimpanzee behaviour under stressful situations. In dominance struggles, brothers help each other. Chimps show concern and compassion for sick and distressed relatives but not to 'outsiders'. Der Waal (quoted in Clark 2006:162–163) describes a chimp mother who had a succession of babies die. After each death she went into a state that humans would unhesitatingly call depression. She huddled in a corner for weeks on end, sometimes letting out shrieks for no reason. Another mother chimp that lost a baby carried the dead infant around for 3 days, looking dazed. Goodall (in Clark 2006:163) describes cases of infant and juvenile distress after the death of a mother. One infant chimp that was strongly attached to the mother performed repetitive behaviours after her death, pulling out hair and rocking back and forth. The juvenile survived the death of the mother for 3.5 weeks, eventually dying of gastroenteritis.

Goodall (in Clark 2006:165) suggests that the bizarre behaviour of males around a corpse could develop into a ritual. It may be to solicit a response from a fellow chimp that died after a fight to find out whether he is still alive.

Although dealing with death is pivotal to Christianity and Islam, one should be careful not to surmise that religion is the inevitable consequence of the experience of death. Judaism gives very little attention to an afterlife and the Nuer, for example, care little about what happens after death although they fear it (see Wolpert 2006:133). Religion can play a crucial role in countering the fear of death. Reanney (1995) says:

> By inventing gods and investing them with the power to preserve life indefinitely, man restored to himself the necessary ability to act purposefully in the face of death. For while he could not outrun death, he could perform goal-oriented actions – rituals – which, according to his traditions, would enable him to survive beyond the grave. (p. 6)

Wolpert (2006:122) suggests that some aspects of religion may promote survival. Feelings of awe, the experience of intense unity with God, feeling at peace and so on are all examples of rewarding belief based on emotion.

But not all emotions are positive. Melancholy is essential to every complete religious transformation, as well as the happiness that religion can confer (Wolpert 2006:126). It is probable that we are genetically programmed to have a psychology sympathetic to the adaptive rules of religion (see Wolpert 2006:135). This brings Wolpert (2006:137) to conclude that religion is deeply rooted in our biology. He believes that religious beliefs were adaptive for two main reasons: 'they provided explanations for important events, and offered prayer as a way of dealing with difficulties'.

Many explanatory arguments for the existence of religion depend on higher cognitive functions. On these higher levels, religion gives meaning to life and is used as a causal explanation of where things come from. Religion thus explains existence. Causal beliefs are partly programmed by our genes, and religion can be used in this sense as well. The human brain acquired a number of specialised mechanisms, modules or schemata that determine emotion, reasoning, pattern finding and so on. Modules like these probably underlie the belief engine. There may be a causal operator in the brain that compels us to try and find out why things that matter happen to us (see Wolpert 2006:29). Throughout vertebrate evolution there has been a strong adaptive incentive to recognise common patterns in variable circumstances. Finding patterns was a great evolutionary advantage which stimulated causal thinking. This is basically a metaphoric process where meaning is attained by selecting points of similarity in a context of differences. We proceed from the known to the unknown and read the unfamiliar in terms of the familiar. Our brains construct images of the world around us, including our bodies, to suit the various signals we get from our senses. The brain usually tries to coordinate various stimuli.

## Resume: Does evolution prepare us to deal with death?

To return to our original question of whether evolution prepares us to deal with death, we have to say 'yes' and 'no'. Evolution does not prepare us directly to cope with death, apart from the normal stimulus-response mechanisms that ensure successful survival, of which the fight-flight syndrome is an example. We have to respond in the affirmative, in the sense that evolution provided humans with higher intelligence and cognition, on which level the question of death can be dealt with. This is not always effective, as is clear from many depressed people grappling with death. But many mechanisms, both philosophical and religious, are successful in helping people deal with their own mortality and that of loved ones. It is also a possibility that *H. naledi's* disposal of their dead, if that indeed happened, had a positive effect on them. The act would have been meaningless if this was not the case.

## Acknowledgements

### Competing interests

The author declares that he has no financial or personal relationships which may have inappropriately influenced him in writing this article.

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