Welcome!

Welcome to the Neanderthal Museum. At some spots in the museum, our visitors can listen to an audio tour, which we also provide for our deaf guests in written form.

The exhibition is parted into seven consecutive areas, each starting with a green gate. Follow the upcast way to experience the Neanderthal Museum's attractions in their considered order.

Start your tour at the first gate "A Valley and Its Secret". Follow the green tunnel up to the oil painting. Take your time to explore the first part of our exhibition and read the next section of the audio tour when you are standing in front of the large cave.

1. A Valley and Its Secrets

Did Joachim Neander discover the Neanderthals?
Has the valley always looked as it does today?
Can one tour the cave?
Is the Neanderthal the first fossil human?
Are there new discoveries about the Neanderthals?

1.1
Refuge and Quarry

The Neander Valley was once an idyllic, narrow gorge. The small stream Düssel created a 50 metres deep and 800 metres long channel running through the valley's limestone bed. Only midway through the 19th century was it named after Joachim Neander. The works of art of the painters who frequented the forest valley remain as the only testimony of the rushing waters of the Düssel, the lush vegetation and the craggy rock walls. The valley attracted nature lovers, painters and eventually quarrymen. Limestone mining destroyed the unique landscape within a few decades. In 1921, parts of the valley were for the first time placed under nature conservation. Today the valley is a refuge for numerous rare animal and plant species.

1.2
The Discovery

A mere 16 bones made up the mysterious finding discovered by workmen clearing Feldhof Cave in August 1856. They were immediately identified as human remains by Johann Carl Fuhlrott, the first person to examine them.

Little is known about the circumstances surrounding the finding. The skeleton is said to have been lying on its back and buried 60 cm deep in the cave's clay with the head pointing towards its entrance. We know today that bones of the species found in the Neander Valley had already been discovered before 1856 – in Belgium and Gibraltar. These fossils however were largely ignored. The Neanderthal discovery became famous because it coincided with Charles Darwin's pioneering work "On the Origin of Species by Means of Natural Selection". This groundbreaking book was published in England three years after the Neanderthal discovery. Following Darwin's theory, the recent find was soon cited as crucial evidence that humans too had evolved from primitive ancestors.

1.3
The Rediscovery

As Johann Carl Fuhlrott did not leave any records of the exact position behind, the destroyed cave was soon forgotten. In 1997 and 2000 two archaeologists, Ralf-W. Schmitz und Jürgen Thissen, set out to locate the site where the famous Neanderthal skeleton fragments had been found. Their efforts bore fruit in the leveled area at the base of the former quarry site. Beneath four meters of limestone rubble, they found layers of the soil that had once filled the caves in the limestone rock. In addition to stone tools and animal bones, this soil also contained bone fragments from human skeletons. Some of these fragments fitted directly onto the skeleton discovered in 1856.

1.4
In the Right - but without Glory

The teacher Johann Carl Fuhlrott from Elberfeld was the first person to examine the bones discovered in the small Feldhof cave and he preserved them himself. Right from the beginning he considered them to be skeletal remains of a human from the Ice Age, referred to in those days as the “diluvium“. This was an extraordinary scientific accomplishment by Fuhlrott and at the same time a very courageous one, as many of the high-ranking scholars at that time still doubted the existence of a fossil human. The finding ignited a heavy dispute within the scientific world, which lasted for decades. Fuhlrott passed away in 1877 without ever receiving recognition for his great discovery. One of his greatest adversaries in Germany was the famous scholar Rudolf Virchow. Virchow’s dismissive stance caused Neanderthal research in Germany to be put on hold for decades.

1.5
The Great Slight

The history of creation outlined by the Old Testament was for many years considered a verbatim account in the Christian occident. It was believed an undisputable fact that the world was at most a few thousand years old.

Increased geological findings however made it clear that, for example, deep-seated soil layers had to be far older. Furthermore, bones were found in these layers which indicated ancient life. How could this discovery be brought into harmony with the Bible?

Charles Darwin’s theory on the origin of species in 1859 created an outrage. Plants and animals were supposed to have developed over countless interstages from their archetypes and were still developing further. And even humans were subject to it. “Light will be thrown on the origin of man and his history“ Darwin cautiously formulated at the end of the book.

AUDIO GUIDE: The discovery of the Feldhof Cave

Voices: *Young Workman*
Old Workman
Narrator
Girl

(echoing steps, the sound of tools hitting on stone, the scratching of a shovel on ground – suddenly, the scratching stops….)

NARRATOR: (*over background noise*) "It all happened back in 1856. Some workmen had squeezed into the Feldhof Cave with their shovels and pick-axes. They wanted to clear it so that the limestone inside could be extracted. Nobody was expecting to find anything unusual."
YOUNG WORKMAN: "Hey, what's that over there?"
OLD WORKMAN: "Eh? *(comes over)"*
YOUNG WORKMAN: "Over there. They're bones, aren't they!"
OLD WORKMAN (*drawn out, as if trying to gain time): "*Well, yes… Few old bones. That's right."
YOUNG WORKMAN: "But look at them: This one here's over a foot long!"
OLD WORKMAN: "Hmmm… well, must have been a deer then."
YOUNG WORKMAN: "Deer? Up here in the rock? Never on your life. Hang on! I was just looking out of the entrance. I was looking down to see what happened to the clay I'd thrown out. (*mysteriously*) For a moment I thought I could see part of a skull down there. What kind of animal could it have been?"
OLD WORKMAN: "Calm down, it was probably just one of these old bears that the boss told us about...."

NARRATOR: "But the bones the two quarry workers chanced upon in August 1856 in the Feldhof Cave were actually human remains. Johann Carl Fuhlrott, a schoolteacher and scientist brought in from nearby Elberfeld, recognised this immediately. And he also noticed that this human skeleton looked exceptionally powerful and primitive. However, as the excavations had continued in the meantime, it was impossible to work out where the bones had been lying.

Along with Hermann Schaafhausen, a professor of anatomy at Bonn University, Fuhlrott presented the find to other scientists. Schaafhausen cautiously described the skeleton as a "human species at an early developmental stage". That in itself was enough to spark a violent controversy - among German scientists, in magazines and in books - during the course of which the term "Neanderthal Man" was coined.

GIRL: “Did the Neanderthal Man live in a cave?”

MALE NARRATOR: “That is what many people think. But in reality, Neanderthals mostly made their homes in tents and huts. It is impossible to say how the bones got into the Feldhof Cave - there is nothing left of the cave nowadays. The man probably did not crawl into it. It seems more likely he was laid to rest there after his death.”

Now, turn to your right and walk through the second gate with the title “A Journey Through Time”. Read the next part of the audio tour when you have reached the large sandglass.

2. A Journey Through Time

What makes us human?
When did humans first appear?
How old is the planet we live on?
Have we always been alone on Earth?

2.1
Time and Evolution

The progression of life and its changes takes place over spaces in time which are barely comprehensible to humans. This was something even Charles Darwin was already aware of: “The consideration of these facts impresses the mind almost in the same manner as does the vain endeavor to grapple with the idea of eternity. “ (From: “The Origin of Species”)

It has only been a little over 100 years since we have an idea of how old the world really is, since when life has existed on our planet and how short in comparison the existence of humans and their fossil ancestors is.

2.2
A River of People

Today we are the only human species on Earth. This is an evolutionary exception. Until the Neanderthals became extinct, there was always more than one hominin species. The fossil finds from which our evolutionary history can be reconstructed are rare. Some species are only known from individual bones, some only from DNA traces. Instead of a family tree, our evolution is today thought of as a wide river, which can branch and form new streams that can later flow together once more. Human evolution is not a directed process, but rather the result of adaptation and chance.

AUDIO GUIDE: The sandglass

Voices: *Male narrator*
Female narrator

(The part of the MALE NARRATOR is accompanied by meditative background music).

MALE NARRATOR: "Time passes. Evolution needs immense quantities of it. Species come into existence only to die out again. It is the river of time, spawning them only to sweep them away again. The earth came into existence five billion years ago. About four billion years ago the first unicellular organisms emerged, each smaller than a grain of sand. And in another five billion years the earth itself will end, crashing into the sun. We can't appreciate timescales of this size properly. In order to really understand them we would need to be like God for whom - according to the Bible - a thousand years are like a single day. But an hourglass may be of help…"

FEMALE NARRATOR: "Try to imagine that every grain of sand dropping here is the equivalent of one year. Our lives would already be over. For more than a hundred grains slip through the neck every single second. "

MALE NARRATOR: "And from the age of the Neanderthals to our modern day the hourglass would need a full five minutes."

FEMALE NARRATOR: "But what are five minutes compared to eleven hours? That would be equivalent to the time that man and all his ancestors have been living on the earth."

MALE NARRATOR: "And then again, what are 11 hours compared to 440 days? We'd have to watch this hourglass for 440 days to appreciate how long there has been life on earth."

(*Stop music)*

FEMALE NARRATOR: "There is another way to appreciate the passing of time. You can take a trip through the Neanderthal Museum."

Step up to the wooden construction behind the sand glass. There, six of your ancestors are awaiting you to tell you their stories. Approach the elderly Neanderthal woman first.

AUDIO GUIDE: Homo sapiens neanderthalensis

Voices: *Neanderthal woman*

NEANDERTHAL WOMAN (*with a warm, deep voice*): "This is our home. Where the land appears to end and you can look far out over the sea. You call it Gibraltar today. The climate is mild here, warmer than in the north. Our prey have also withdrawn to the southern areas. In our cave, my family and I can shelter ourselves from the weather. We have access to fresh water and there is a wide variety of food along the coast and in the hinterland.

Once, when I was out with my ten year old daughter and my six year old son, collecting mussels and catching turtles for the evening meal, they asked me, "Mama, what was it like before? Please tell us." I laughed and felt pleased. My children love to hear the old stories. That way they come to understand our way of life better, learn how to hunt, how to make tools, which plants can be eaten, and how injuries can be healed. It is important to me that they look after, and care for, each other. I pass my knowledge on to them just as my mother passed hers on to me when I was young. Today I am a mature and experienced woman and am valued and respected in my group. I have become familiar with many areas and experienced a lot.

Would you like to listen for a moment longer and hear more of my personal story? Captain Edmund Flint, an officer in the Royal British Navy, discovered me in 1848 in the Forbes limestone quarry. That was 8 years before the eponymous Neanderthal was discovered here in the Neander Valley. At the time of my discovery, scientists did not know what to make of me. They thought I was an ancient person who had died before the Biblical flood. Nobody took any further interest in me. Ten years later Charles Darwin appeared on the stage and published his groundbreaking book "On the Origin of Species". He – yes, the famous Charles Darwin – took a closer look at me and recognised me for what I am: a human species. More precisely put: a female Neanderthal, Homo sapiens neanderthalensis. I am very similar to you – Homo sapiens sapiens – in more than just name. We are related and even encountered each other during the Ice Age. The man from Oase over there can tell you more."

Continue with reading the story of the young man.

AUDIO GUIDE: Homo sapiens sapiens

Voices: *Young Homo sapiens sapiens man*

YOUNG MAN (*thoughtful*): “What is a human? What makes one human, I ask you. An intelligent species, with extraordinary intellectual capabilities, with the capacity for abstract thought, complex cultural behaviour, and artistic abilities, which differentiate us from all other species? When thinking about ourselves some things can seem more important than they really are. Whatever!

Life is made really interesting by our interactions with other people, isn't it? These encounters form us and make us who and what we are. Humans. Homo sapiens sapiens. I too am one of the “doubly wise” people. And I carry a secret within me….

When I was discovered in 2002 in the Peștera cu Cave in Rumania, the researchers knew as soon as they examined my skull that I was something special. They realized that I have features typical of archaic humans, like my delicate cranium for example, but also features typical of Neanderthals, like my large face and massive teeth. They wanted to be absolutely sure of their findings, however, and ten years later they examined my DNA. It delivered the proof: 9 percent of my DNA comes from Neanderthals – considerably more than the 4 percent that all other Europeans possess. What a surprise!

Me, the result of interbreeding between modern humans and Neanderthals in Europe. Until that point in time, researchers believed that archaic humans and Neanderthals had only come into contact in the Middle East. My group belonged to the first wave modern human immigrants, who came to Europe more than 40,000 years ago. In my family the story is told, that many years ago we moved around the area far to the east near the Black Sea, where Neanderthals and other humans, like the Denisovans lived. We encountered each other and, well, what can I say, there appears to have been some very close contact now and then. My great great grandmother was the result of some hanky-panky between her mother and a Neanderthal man. Was it love? Who can say?
This great great grandmother grew up as a mixed-species child in my family and sought out an archaic human husband when she was grown up and old enough to have children of her own. Interaction with other humans is part of our family history. And part of yours too.”

You can read the next part of the Audio Tour near the old hardy man who is painting his leg at the moment.

AUDIO GUIDE: Archaic Homo sapiens

Voices: *Old, hardy Homo sapiens man*

OLD HARDY MAN (*with rough but friendly voice*): "I belong to the first. To the first anatomically modern humans in Africa. Researchers discovered me in 1961 in a cave in Jebel Irhoud in Morocco, about 100km west of Marrakesh. My ancestors came here to the north from eastern Africa. Are you wondering if I am annoyed that researchers thought I was a North African Neanderthal at first? No. It isn't an insult to be called a Neanderthal. It does surprise me a little however. In terms of physique we are distinctly different. In contrast to Neanderthals I have a slender body and a rounded skull with a high forehead. Well, across from Morocco, in Gibraltar and southern Spain, there were Neanderthals living long before us. Whether we had contact with them is something researchers are still trying to find out.

We - archaic Homo sapiens, as researchers call us - use the same tool technology as Neanderthals. It is called Levallois technology. It involves the targeted striking of fine individual flakes from a prepared piece of flint. In my bag, along with other tools like a handaxe and a scraper, I have a few Levallois blades. My bag is very practical when I am travelling a long way and want to take some important things along. Using a strap across my forehead it is easy to carry. It is very hot and dry here during the day, but cold at night. That's why I also carry a light cloak in my bag, so that I don't freeze when I sleep.

Are you looking at my body painting? For the red colour I collected red ochre and ground it to powder. You can mix it with a little water and make a thick paste. I paint myself before I go out hunting. It's part of a ritual with which I prepare myself and get into the right state of mind for the hunt. Red is the colour of life. It looks powerful and vibrant, like blood. You can make other colours using yellow ochre or manganese. These coloured pastes are also well suited for painting stones and rock walls. As the coast is nearby, I collect small snail shells on the beach and use them to decorate myself. Take a look over there in the display case."

To read the next part of the tour, walk over to the young boy with his stick.

AUDIO GUIDE: Homo erectus

Voices: *Turkana boy*

TURKANA BOY (*amiable, young and energetic*): “Hi! How's it going! I am the Turkana Boy, from the Nariokotome River in Kenya. Kamoya Kimeu and other researchers found me in 1984 on the river bank and were excited by how complete my skeleton was. They also call me KNM-WT 15000, or Homo ergaster. I am one of the members of the genus *Homo* that, in contrast to the Australopithecines, could do a whole range of new things. With our larger brains we could develop manual skills. We are also constantly on the move, covering great distances as we search for prey. Some members of my species even left Africa and spread into Asia and Europe. Many species of the genus Homo lived side-by-side in eastern Africa during my time. You can see some of them over there. But now more about me.

I am the same age as Karabo, the *Australopithecus sediba* back there, but much taller than him. I grow quickly. My back often hurts though. A vertebra in my lumbar region was injured in a fall. As a result, even though I have long legs, I can't run as fast, or for as long, as the others. The sometimes day-long hikes are stressful and exhausting, because it is hot and dry during the day. The nights, on the other hand, can be cold. It is good that we can make warm cloaks from the skins and furs of our prey. The others show me how to make stone tools. It is very helpful to be able to work on the prey we kill with sharp scrapers and handaxes. You can see what they look like in the display-case over there.

I made this stuff myself too. I removed the bark and smoothed the surface with a scraper. When I am not using it to lean on, I like to use it to stir up the sand on the river's edge and scare the fish. By the way, have you noticed my teeth? I don't want to sound like a baby, but they hurt too, like my back. Something in my jaw seems to be inflamed. I wonder if it will ever get better?”

The next part of the tour awaits you near the shy young boy, who is folding his arms behind his head.

AUDIO GUIDE: Homo erectus

Voices: *Karabo*

KARABO (*shy, cautious, a bit grumpy*): “Are you looking at me? You want to know more about me? Hmmm… well, my name is “Karabo”, which means “Answer” in the local Setswana language. That's pretty funny, because researchers have more questions than answers about me. But let me start from the beginning.

In 2008 I was discovered by Matthew, the then-nine year old son of the well-known palaeoanthropologist Lee Berger, in Malapa Cave in South Africa. When he found me, Matthew was only a little younger than I was when I had my accident. I was almost 13 and was walking with one of the women from our group when we fell into the cave. An embarrassing story – I don't want to talk about it. After Matthew found us, his father and some of his research colleagues turned us inside-out.

I was given the totally uncool scientific name *Australopithecus sediba*. The researchers examined me very closely and asked themselves what I like to eat. The answer, of course, is whatever I can find in the forest and on the savannah, like roots and wild plants, and sometimes nuts too, although they are very hard. The researchers also gave a lot of thought to my physique. Well, as a teenager, what can I say about the fact that they found my proportions and how I walk very strange? My upper body is slender, my arms are long and lanky, and I walk with bowed legs because I walk on the outer sides of my feet. Walking upright on two legs is a skill that needs to be learned, when you spend most of your time hanging around in the trees. In any case, researchers believe that upright walking could have developed in many ways. Everyone's different. Meanwhile, researchers now doubt that the cradle of humanity is only located in eastern Africa. In southern Africa, in my hood, more finds of early hominins are being made all the time. As for me, researchers still can't decide if I have more features like Australopithecus or like *Homo*, or if I could even be an intermediate form between *Australopithecus africanus* and an early form of Homo erectus. Whatever! I am who I am. For a different perspective, take a look at how many hominin species lived in Africa at the same time as me, and at how different they all look.”

Continue the tour by walking up to the little woman at the end of the wooden construction.

AUDIO GUIDE: Australopithecus afarensis

Voices: *Lucy*

LUCY (*self-confident, charming, with star appeal*): “You probably know me as Lucy. I was given that name in 1974 when Donald Johanson discovered me in Hadar, Ethiopia, in eastern Africa. The researchers were so fascinated by me and so happy about my discovery that they celebrated and the Beatle's song “Lucy in the Sky with Diamonds” was played over and over again in the camp. And that's how I became famous.

I have other names too. In Amharic, the local language, I am called “Dinknesh”, which means “Wonderful One”. I couldn't have thought of a better name myself. The researchers also gave me a scientific name: *Australopithecus afarensis*. That's me.

Although I am only 105cm tall, I am 25 years old. Our men are much larger. Take a look at the skull over there. My body is perfectly built for moving around in the forest, searching for tasty nuts, fruits, and grasses. It is an advantage if you can obtain a variety of food from here and there. Although I like to get around on foot, I can also use my powerful arms to climb very well. High up in the trees it is nice and airy, and you can always find a safe place to sleep.

For a long time, researchers believed that being a good climber was all that was needed in the forest. Naturally though, we often spend time moving around the forest on two legs. Look at “Ardi” over there, *Ardipithecus ramidus* that is, the forest-dweller who comes from the same region as us. They proved to researchers that our hominin relatives living on the savannah weren't the first to discover walking on two legs.

Talking of walking and movement, let's go back to my discovery for a moment. The researchers were so excited that they took me along on their travels. From 1975 to 1980 I was in the Cleveland Museum in the USA, after which I was in Addis Ababa. Starting in 2007 I went on tour in the US, until I took a break in Houston in 2009 – being a world-renowned celebrity takes it toll on you. Finally, in 2013, I returned to Addis Ababa.

But that's enough about me. Have a look around and find out what makes the others so special.”

AUDIO GUIDE: Beginnings in Africa

Voices: *Narrator*

(etherous, meditative music, with a hushed ticking of a clock in the background)

NARRATOR: "Evolution is a game of chance and adaptation. Since its beginning, the Earth has repeatedly undergone dramatic climatic changes. From deserts and glacial landscapes, forests and steppes were created, which subsequently dried out or froze once more. Constantly in transition, species arose and then became extinct.

On this constantly changing world, people came into being. And in Africa, the cradle if humanity, the first hominins emerged.

The term hominin is used by scientists for all human species – modern-day Homo sapiens and all of their extinct ancestors. Long before the Ice Age, Africa was subject to major climatic fluctuations. Desert, savannah, and rainforest continuously expanded and contracted.

Sahelanthropus, found in present-day Chad and dating to around 6 million years ago, is currently the oldest known hominin. They lived in a landscape of lakes and open forests.

Ardipithecus walked on two legs, similarly to modern humans, more than 4 million years ago, but also spent time in the trees. There they moved through the branches on all fours.

The period between 4 and 2 million years ago was a boom time for hominins. The changing climatic and environmental conditions produced a variety of physical adaptations. Various species lived in and on the edges of forests, along lake shores, or on the savannah.

Their diets consisted of grasses, fruits, insects, tubers, termites fished from their mounds with sticks, or meat, possibly obtained by snatching it away from other animals. The varying diets and ways of life resulted in differing forms of skulls, jaws, torsos, limbs, hands, and feet. Adaptation and diversity were the recipe for success among early humans.

Over thousands of generations, particular features proved to be especially advantageous, and genetic exchange brought together the special mix of features characteristic of the genus Homo: walking upright, hands that can use tools, and an enlarged cranium.

With the rise of Homo erectus 1.9 million years ago, there existed for the first time a type of human whose physique was broadly similar to our own – only their brains were smaller. With them, the cultural flowering of the hominins began, and they were the first to leave Africa, spreading north and east."

Follow the way up to the right hand bend. Read the next chapter of the audio tour when you find yourself standing in front of the two figures with their stone boulders.

3. Life and Survival

How did the history of humankind begin?
What did the world of our ancestors look like?
What happened to the Neanderthals?
How did humans come to Europe?

3.1 Beginnings in Africa

The history of humanity began in Africa, and those beginnings were marked by changes in the natural environment. Between 9 and 7 million years ago, changes in the climate saw tropical rainforests shrink. Hominins moving about on two legs already ranged through the open lake and river landscapes.
From 3.5 to 2 million years ago, the climate in Africa became gradually cooler and drier, a process broken up by warmer phases. A variety of hominins evolved differing adaptations to the fluctuating living conditions. They lived on the savannah, in forests, in shore areas, and on the edges of forests. They ate grasses, fruits, tubers, or insects. Their differing adaptations were reflected in differing body forms.

3.2 Adapting and Changing

Species undergo constant change: the parents' genetic material is remixed during every act of procreation.
Biologists call this process genetic recombination. It is responsible for the ongoing generation of new and unique specimens within species. This process is also accountable for changes to the genetic material itself: mutations too generate new species and varieties.
The better one of these new species is adapted to its environment, the greater are its chances of survival. It uses the available resources more efficiently, eats more nutritious food, and combats enemies more successfully. The most prosperous of these species generally have abundant offspring. As a result their hereditary features gradually become dominant.

3.3
The First Humans

Some 2.5 million years ago, the genus Homo arose and the history of humankind moved on with *Homo habilis*, the first human to make stone tools out of rocks. *Homo erectus*, the oldest remains of which found so far stem from 2 million years ago, already displayed typically human features. This species was intelligent, as its highly developed brain indicates. Its members could move easily on foot, and had grown considerably in stature. By contrast, their teeth had gotten smaller, and their body hair was starting to grow thin. *Homo erectus* made a range of tools from stone and wood and took meticulous care of their offspring. *Homo erectus* spread from Africa to Asia and Europe. *Homo heidelbergensis* evolved from them and the Neanderthals evolved from *Homo heidelbergensis*.

3.4
The Neanderthals and Us

Anthropologists know a great deal about the Neanderthals (*Homo sapiens neanderthalensis*): more bones from Neanderthals have been found than from any other fossil human species. Neanderthal skeletons differ from those of humans today (*Homo sapiens sapiens*).

For example, the Neanderthals had exceptionally powerful bones, something that suggests enormous muscular power. They had no dimples in their cheeks, which gave their faces a more pointed shape. Their brows jutted out over their eyes. Their jaws and teeth were also powerful. Their front teeth were often worn down, indicating that they may have been used as a "third hand". Their brains were larger than ours.

AUDIO GUIDE: The Weightlifters

Voices: *Sports reporter*
Narrator

(*background noise: shouts of fans at sports event*)

SPORTS REPORTER: "The excitement mounts as we reach the final of the competition. Which of our two champions can lift the weight above his head …"

(Shouting grows louder, groans from the competitors)

SPORTS REPORTER *(screaming above the crowd)*: "Yes, the local hero, the discovery from Neanderthal, it looks like he's got what it takes …Yes! He's going

to make it, he's going to make it…He's made it!!! He's the true champ, outclassing the rest of the field! …”

(Shouting rises to a pitch, cheers from the audience, then sounds fade out)

NARRATOR: “That couldn't be more true. The Neanderthals really were much stronger than we are. They had much more powerful muscles. We can still see that today if we look at the places where the muscles were attached to the bones. And the walls of the bones were thicker too. So a Neanderthal shin-bone could carry twice the weight of its modern counterpart.

Neanderthal man was barrel-chested. His shoulder and neck muscles were bulging with raw strength. In fact, the skeleton and muscles in this part of his body were like a perfectly tuned engine.

His forearm could move in a wider radius from his elbow, and his hand was as strong as a vice. Not even an Arnold Schwarzenegger could have squeezed out of his iron grip.

As yet, nobody has been able to say why his face is so different from ours: the broad nose, the mighty mouth, the ridge of bone above his eyes, the outward curve of his cheeks. Did these come from adapting to the cold climate? Or maybe because he used his teeth as an "extra hand"? His incisors were often severely worn down and the enamel broken off. It's likely that the Neanderthals often held tools between their teeth - or gripped things they wanted to cut. Ethnologists have observed similar practices among modern hunter-gatherers.

The Neanderthals' brains were as large as ours. However, the fact that they had such a robust body had a distinct drawback. Moving a bulky and muscular body around cost a lot of energy. The Neanderthals would have needed lots of nourishing food, something that wouldn't always have been easy to come across in a Europe entering the Last Ice Age. In the long term, their sturdy stature may well have proved an evolutionary disadvantage.”

Continue the tour by stepping into the chamber of mirrors. On the outside of its walls, you will find additional written information.

AUDIO GUIDE: Encounters

Voices: *Narrator*

NARRATOR: "Have you noticed the man in the sharp suit leaning casually on the railing? He isn't a museum visitor. Allow me to introduce him: Mr. 4%.
The Dutch artists Adrie and Alfons Kennis brought Mr. 4% to life. They constructed the figure using a sophisticated process. The bones found in the Neander Valley were the basis, with the addition of Neanderthal bones from other sites.

Mr 4% draws attention to the fact that 4% of our genes have been inherited directly from the Neanderthals. It was a sensation when Svante Pääbo, from the Max Planck Institute for Evolutionary Anthropology, announced in May 2010: "There is Neanderthal in us." For four years, he and his team had worked on sequencing Neanderthal DNA. For the first time researchers had successfully decoded the nuclear DNA of an extinct hominid. Pieces of Neanderthal bone from Croatia, Spain, Russia, and from here in the Neander Valley, were ground to powder for this.

Comparison with our genome revealed that our ancestors and Neanderthals once had some very close contact. All people from outside Sub-Saharan Africa, have between 1% and 4% Neanderthal genes. It is probable that the two kinds of humans mixed in the Middle East between 80,000 and 50,000 years ago. That is, after our ancestors had left Africa but before they had spread further into Eurasia. It is possible they didn't encounter each other in Eurasia because the gigantic continent was too thinly settled.

To recap: We inherited up to 4% of our genes directly from Neanderthals. Our DNA, however, is 99.7% identical. To put this into context: we each share with our grandmother – and with all humans – around 99.9% of our genes. And we only inherited 12.5% of our DNA directly from her. We are 12.5% more similar to our grandmother than to any random person.

The difference between Neanderthals and us is tiny. The millions upon millions of base pairs of which our DNA is composed are 99.7% identical. It is the small difference which especially interests researchers. What do we have, that the Neanderthals didn't? Did genes make a difference that gave our ancestors a decisive advantage over Neanderthals? Will palaeogenetics provide us with an answer as to why there is now only one human species? Or has it nothing to do with their genetic composition, but instead the extreme climatic fluctuations that made survival impossible for the Neanderthals?"

Walk through the fourth gate, "Tools and Knowledge". There you will read the next chapter "Stone tool maker" when you have reached the Neatherthal sitting on your right hand side beside the staircase.

3.5
Encounters

We, *Homo sapiens sapiens*, originated around 300 000 years ago in Africa from the descendants of African *Homo erectus*. Equipped with greater adaptive abilities, we set forth to settle the entire globe. As a result, in Asia and Europe we met distant relatives like the Neanderthals and the Denisovans, descendants of earlier emigrants from Africa. We arrived in Europe approximately 40 000 years ago. We lived as Ice Age hunters and gatherers, just like the Neanderthals. Their numbers had been heavily reduced due to the constant fluctuations between warm and very cold climatic phases. Our genetic make-up reveals that we also interbred with them. However, many regions were so thinly settled by Neanderthals, that we didn't always encounter each other. The first arrivals were forced back by the extreme Ice Age climate. It was only after the coldest period had passed that we stayed.

3.6
The Population Explosion

About 10 000 years ago the first farmers started tilling the soil. Their food surpluses generated increases in population. This process continued to accelerate. In less than 10 000 years, the population of the earth had grown twenty fold. The masses started to converge on towns, and became vulnerable to epidemics and diseases. Our numbers have been growing ever since - with one exception, the bubonic plague that decimated Europe during the 14th century. In the 2015 report on world population, the UN predicted that the population would grow to 10 billion by 2050.

3.7
Aggression

When people and animals use or threaten violence to assert their interests, they are described as being aggressive. But aggression is also a product of self-defence and self-assertion – in cases where our territory or possessions are under threat, our offspring need to be protected, or enhanced social status needs to be won. Aggression between groups is often particularly brutal. When people started settling in permanent homes, this aggression acquired a new, more violent dimension. The oldest known evidence of intercultural violence in Central Europe is a 7000-year old mass grave found at Talheim in southwest Germany. The phylogenetic, biological, social and psychological causes of aggression are the subject of intense debate.

3.8

The End of Biological Evolution?

During the past century, cultural achievements - not least in medicine - have largely liberated the human race from the constraints of natural selection. To some extent, humans have now sidestepped biological evolution. For long periods of human evolution, people had a life expectancy of only 30-40 years, with women generally dying far earlier than men. Today, the life expectancy has doubled, and women live longer than men.

With the aid of genetic engineering, doctors can now decode genetic information and identify defects in people's DNA. In the future, they will be able to modify our hereditary features.

Will humans be able to control their own biological destinies in the future?

4. Tools and knowledge

Are stone tools really sharp?
Could Neanderthals make fire?
Can humans subsist without the use of metal?
Can knowledge be preserved?
Are the forecasts for the future realistic?

AUDIO GUIDE: Stone Tool Maker

Voices: *Male Neanderthal*
Narrator

NEANDERTHAL (*thinking out loud*): "The black rock runs well. It's as soft as bison fat - blow by blow - it was worth lugging all the way back to the camp. Good thing that the boy discovered the spot near the white cliff. I must remember that when we return to the valley in the spring… Just straighten the edge a little there. Hmm. Nearly took off too much there! So, left, right, left - sharp and pointed - two for the horse spear. I can take the flat one with the straight back as a knife…"

NARRATOR: "Our ancestors have been using stone instruments for over two million years. Often enough this is all that remains of them and their lifestyles: stone is more durable than wood or bone. Not every type of rock was suitable for toolmaking. It had to be easy to split and to produce sharp edges at the point of fracture. Quartzite, vitreous lava and flint were all viable options.

The Neanderthals progressed far beyond the early tools made in the African savannah. They were careful in their choice of stone - which they could find only

under specific geological conditions. Sometimes they would carry the rock for over thirty miles during their seasonal migrations.

The Neanderthals didn't simply hit rocks indiscriminately. They developed sophisticated techniques for constructing tools. This entailed the rocks being carefully prepared with a series of relatively light blows. Ultimately, this manufacturing process allowed flakes - thin cutting tools - to be made in almost any shape or size. The same technique was often applied when beveling the edges of these roughly hewn instruments, increasing the tools' efficiency.
Stone tools could be used to fashion a broad range of other implements from wood, bone, deer antlers, bark or leather. Often enough, wooden handles were attached, making them easier to hold.

The Neanderthals generally used flakes that were either oval-shaped or broad. Only rarely did they make long, narrow blades with parallel edges. These did not become the dominant tool shape until the final phase of the Ice Age, between 40,000 and 10,000 years ago. With time, these blades became increasingly uniform in appearance, and toolmakers gradually learned to exploit the full potential of the available material."

Before entering the sector "Myth and Religion", you can read the next chapter of the tour whilst watching the movie "The Past of the Future" on the displays of the three stone pillars. The movie starts after the title "*Die Vergangenheit der Zukunft*" (= The Past of the Future) and a wheel appear on the screen.

4.1
The Inventor's Workbench

The origin of many technological inventions made by humans lies far in the past. In the course of millennia, these inventions have been constantly enhanced and improved through the use of new materials and procedures. On the one hand, the combination of several parts to form complex tools with distinctly superior capabilities was technologically significant. On the other hand, transmutation, as is the case in the production of ceramics or metal processing, allowed for the production of synthetic materials.
However, large-scale transmutation and synthesizing of new materials only began during the 19th century Industrial Revolution, with the use of fossil fuels such as coal and petroleum. Similarly, under these industrial conditions, technical knowledge grew to such an extent and in such a short span of time that groundbreaking inventions were accomplished.

4.2
Tools for tools

The earliest signs of tools being used are approximately 3.3 million years old. At that time, the genus *Homo* did not exist. It was Australopithecines or *Kenyanthropus* that produced those tools. They could use them to kill animals or crack nuts. Stone tools were also used to manufacture other tools. This resulted in a constant process of manufacturing tools through the use of other tools. The foundation for our material culture had been laid.

4.3
From Know-how to Science

For the largest part of human history individuals had to rely on their own personal experiences and on orally transmitted knowledge to build tools and understand their environment. Even in antiquity, technological knowledge was still based on experience. Only during the renaissance the collaboration between scholars and experimenting craftsmen began. They developed the main features of modern science through the exchange of knowledge and experiences.

Knowledge was now more and more frequently documented in textbooks which, through printing, were widely circulated. Since the 18th century, Europe experienced a knowledge revolution. Attempts to systematize this knowledge led to the creation of encyclopedias. New knowledge could now be preserved, transmitted and continually expanded independently from the original discoverer.

4.4
The Key to the Future?

Since the beginning of scientific thought, the technological creativity of man has led to the creation of visions which far surpassed the possibilities of their time.
Leonardo da Vinci is an early example of exuberant technological vision. Since the late 19th century and with the increasing mechanization of the world arose the hope to be able to plan progress and future. The new genre of science fiction came into existence. During the 1960's futurology developed as a part of the scientific apparatus. The film industry also regularly dealt with the future. The result was mostly a bleak view of the world. The initial conviction of the futurologists, that the future could indeed be planned was replaced with a self-critical attitude towards technological progress in the 21st century.

AUDIO GUIDE: The Past of the Future

Speakers: *Narrator*

NARRATOR: “To the same degree that we unlock the secrets of the past, the future stimulates our fantasy. We are already familiar with technological visions from antiquity: Daedalus and Icarus escape from their imprisonment with self-made wings. The first documents of such visions originate from Leonardo da Vinci: He sketched countless ideas, ranging from the helicopter to the automatic spit, which much later became real inventions. Whilst Thomas Morus’ utopia remained a vision of a non-existent or ideal location, the vision of “New Atlantis“ by Francis Bacon during 1626 had different goals.

Scientific planning was intended to replace religious prophecy to better protect humans from catastrophes. During Bacon’s era, the first ‘technological buzz’ began in Europe, as well as the belief that technological advancement made actively shaping one’s own destiny possible. This optimism continued during the 19th century. The invention of the railway increased the speed of passenger and freight services. Warnings about the dangers of velocity were soon discovered to be unfounded.

The construction of the London subway – still caricatured as a pipe dream in 1846 – was already reality 15 years later. Enthralled by industrialisation, Jules Verne designed fantastic visions of the future during the end of the 19th century. In a futuristic Paris in the 20th century, automatic trams, writing machines and photographic telegraphy existed. At the same time space was conquered and the ocean bed colonised. Some of his ideas have today been realised. Others remain visions.

In the 20th century, the future and technological progress were regarded more and more critically. Subsequent to the global economic crisis, a new literary genre developed: Science Fiction. The escape into the future distracted from the dull reality. Simultaneously, technological projects became increasingly ambitious. In 1925 the “Plan Voisin“, by architect Le Corbusier, planned to tear down the entire Parisian city centre in order to erect high rises which would house 3 million people. The German architect Hermann Sörgel planned to divide the Mediterranean Sea from the Atlantic Ocean with a huge dam in his Atlantropa-Project.

Life in the futuristic world was parodied time and again. The overdrawn pictures were also supposed to cancel out fear of the future. The discovery of atomic

energy led to grotesque visualisations of future technological worlds. Even a critical thinker such as Ernst Bloch was fascinated by the vision of a peaceful use of atomic energy and believed: “A few hundred pounds of uranium and thorium are enough to make the Sahara and Gobi deserts disappear, to transform North America, Greenland, and the Antarctic into the Riviera”.

During the 1950s, futurology gradually established itself as a scientific discipline. One of its most popular representatives was Hermann Kahn, founder of the Hudson Institute, who constantly publicised new prognoses and visions of the future which didn’t hold up to any inspection. Included in these were anticipations of weather control, permanent stations on Mars and the permanent colonization of the ocean bed. At the same time however, institutions developed which could be taken seriously - such as the Club of Rome or the Rand Corporation - and also dealt with questions about the future development of society. At times they expressed heavy criticism.

Today analyses and prognoses of the future offer national governments, international organisations or commercial enterprises guidance in decision making. The initial naivety has given way to the insight that the future can only be controlled to an extent. Will major projects such as the floating city X-Seed 4000 in Japan ever become reality? Will the car of the future run without use of fossil fuels? The future lies wide open. We humans have the responsibility to do everything in our power to make it worth living.

Proceed now through the fifth gate “Myth and Religion”. Afterwards, turn left and approach the five large bronze ears. At each of these installations, you will hear an excerpt of the myths of different indigenous people.

5. Myth and Religion

Do communities without myths exist?
Did Neanderthals bury their dead?
Are cave paintings the oldest works of art?
Who erected megalithic graves?
Are the world's religions incongruous?

AUDIO GUIDE: Ear 1 – Myths of Native Americans

Voices: *Female Narrator*
Male Narrator
Creator of the World

MALE NARRATOR: "The legends of North American Indians recount how the sun, moon, earth and mankind came to exist. They explain why the seasons change and where the bison go. In the prairies of the American Midwest the Winnebago people tell how the creator's wishes alone were powerful enough to create the world."

FEMALE NARRATOR: "Long ago the creator of the earth was sitting in empty space. When he saw that nothing existed, he began to cry. The tears rolled down his cheeks and fell to his feet. When he looked down some time later, he saw that his tears had formed the Great Lakes. The creator said to himself:…"

CREATOR OF THE EARTH: "Just as my tears have turned to lakes, I need only to wish something and my will come true."

FEMALE NARRATOR: "And so he wished that there be light. And there was light. And he wished that the earth existed. And the earth came into being. He looked at it and it pleased him. But the earth would not stop moving. And so he created trees to hold it in place. But the earth still wouldn't stop moving. And so he created rocks and stones. But it still kept moving. Thus he created the four winds, from the north, south, east and west. These used all their might to try and keep the earth still. But even this didn't help. And so the creator formed four great creatures and shot them through the earth like arrows so that their heads looked out the other side. Those were the four beautiful serpents. Now at last the earth was still and everything was calm. The creator thought:…"

CREATOR OF THE EARTH: "As everything takes shape as I wish it, I will make a creature in my own image."

FEMALE NARRATOR: “He took a piece of clay and moulded it so that it resembled him. He looked at it and spoke to it. But the clay had neither mind nor spirit. Nor did it have the power of speech. So the creator of the earth gave it all these things and then spoke to it again. The piece of clay spoke now, but the creator understood nothing. And so he breathed into its mouth, spoke to it and the creature then replied in clear language. Thus it was that man appeared on earth.”

AUDIO GUIDE: Ear 2 – Myths of the Edda

Voices: *Female Narrator*
Male Narrator
Child

MALE NARRATOR: “Among the peoples of the north - where the winters are long and hard - ice has a special importance. Its melting signifies the emergence of life. In the thirteenth century the Icelandic poet Snorri Sturluson described the origins of the world in the Edda, a Nordic saga.”

FEMALE NARRATOR: “In the beginning icy cold reigned in the north. That was the province of darkness. In the south was the realm of fire, the region where great heat remained supreme. Between them lay Chaos, basking in the pleasant warmth.”

CHILD: “And what happened then?”

FEMALE NARRATOR: “The fire and the ice met. The ice melted into thousands of droplets of water, spawning life. The new creatures included Ymir, the mighty, evil giant. He was fed by a large, beautiful cow, from whose udder four rivers of milk flowed.”

CHILD: “And what did the cow eat?”

FEMALE NARRATOR: “The cow licked the salty coating of frost off the rocks. Three days later the rocks gave birth to Buri. Buri was strong and handsome and his son Bor gave birth to three sons of his own. Odin and his two brothers - Lodur and Honir - killed the evil giant Ymir.”

CHILD: “And how did the brothers create the earth?”

FEMALE NARRATOR: “They took the giant’s corpse and filled up the lakes and seas with his blood. They formed the land with his flesh and the mountains from his bones. Then they took his skull and used it to create the sky: with its daytime and nighttime, its drifting clouds and sparkling stars.”

CHILD: “That was some feat! But how did man come to be on earth?”

FEMALE NARRATOR: “One day the three brothers went for a walk by the sea. There they found two fine tree stumps. They took these stumps and created human beings from them. Odin gave breath and life to the pieces of wood. Honir gave them their souls. And Lodur took care of their appearance and made sure that they could see, hear and speak. In this way they created man and woman from the two trees. From that day onwards man and woman inhabited the earth.”

AUDIO GUIDE: Ear 3 – Myths of the Mali

Voices: *Female Narrator*
Male Narrator

FEMALE NARRATOR: “Under the rocks of Bandiagara - in Mali, West Africa - the Dogon people are preparing a funeral ceremony. The village’s wise man has died. The villagers are dressed in finery and have donned funeral masks carved from wood. They are going to perform a dance of death, to help the man on his passage into the other world. In this way the old man will join the ranks of their ancestors. Without actually seeing him, the old man will ascend to the deity Amma, the supreme creator of man and earth.”

MALE NARRATOR: “It was Amma’s task to create the world. But his first attempt ended in failure. He only managed to create the water, earth, air and fire. So Amma tried again. This time he said the word “World” and in doing so created an egg, the cosmic egg. He then put two pairs of twins inside the egg and waited for them to grow. But before the twins had grown properly, one of them broke out of the egg. He stole the power of speech from his father Amma and made off into the darkness - taking a piece of the egg with him. That piece of egg became the earth. Yet, the twin felt very lonely and decided to try and find his twin sister in the subterranean realm deep inside the earth. But in doing so, he wreaked such havoc that the earth began to decay. This gave rise to death and that made his father Amma very angry. He punished the boy by turning him into a fox and cutting off his tongue. Then he condemned him to roam for all eternity in a futile search for his sister. From that time onwards chaos reigned on earth.

(chaotic-sounding music)

In order to purge the universe, Amma then decided to sacrifice the second twin. The boy's blood became the stars, the edible plants and the animals. And at that point Amma took the remainder of the egg and used it to build an ark of the purest clay. He once again woke Nommo, the master of water, life, language and fertility, and gave him eight children - four sets of twins - to inhabit the world. Amma put all the twins in the ark and sent them down to the earth.

(seconds sound of rain)

The first rains fell. The first ocean filled with water. The sun rose for the very first time. Nommo departed to live in the sea. His children, the eight twins, took the clay from the ark and laid it out on the contaminated ground, creating a field and then cultivating it. But the twins still mumbled like small children. So Nommo taught them to speak. He showed them how to weave cloth and encouraged them to join in marriage. In this way the first community of men and women came into being.

AUDIO GUIDE: Ear 4 – Myths of the Maori

Voices: *Female Narrator*
Male Narrator

MALE NARRATOR: "Hundreds of islands dot the Pacific Ocean like pearls on a necklace. They are linked by a story of creation in the form of a song.
As the Maoris tell their children, anyone wanting to hear this song need only hold a seashell to their ear."

(*sound of the sea, fading slowly. Simultaneously, voice of female narrator fades in*)

FEMALE NARRATOR: "The idea gives rise to growth. The growth generates thought. From the thought comes recollection. From recollection, consciousness. From consciousness desire. The world becomes fertile. It pauses in the pale sunlight, it ushers in the night. The magnificent night, the long night, the deep night, the high night. The deep night that we can sense. The night that we touch, the invisible night. The night that follows night. The night that ends in death."

(sound of the sea, fading slowly again. Simultaneously, voice of female narrator fades in)

FEMALE NARRATOR: "Emptiness gives rise to procreation. The emptiness generates growth. From emptiness comes abundance. The spark of life pauses in the empty space. It creates the atmosphere above us. The sky overhead, the great expanse, pauses in the first light of day. The moon arises. The atmosphere above the earth pauses in the brightly-lit sky. The sun is born. Like gigantic eyes in the sky, the moon and sun are cast upwards. The first dawn, the first day, the first high noon. From the sky grows the glory of the day."

AUDIO GUIDE: Ear 5 – Myths of Shintoism

Voices: *Female Narrator*
Male Narrator
Izanami
Izanagi

FEMALE NARRATOR: "Shinto is the native religion in Japan. In the Nihongi - a major religious work telling the country's history - we find the parable of the two deities Izanagi and Izanami."

MALE NARRATOR: "In the beginning was the chaos where heaven and earth were one and the same. Then the pure, light part of chaos became the heavens. And the heavy part solidified and became the earth."

FEMALE NARRATOR: "The gods and spirits appeared between the earth and the heavens. They looked down and saw the sea. They saw Izanagi and Izanami flying over the sea on a heavenly raft. They looked at each other and said:…"

IZANAMI AND IZANAGI: "Isn't there supposed to be land down there under the sea?"

FEMALE NARRATOR: "And so they took a long jewelled spear and pushed it down through the water. Then something very strange happened. When they pulled the spear out of the sea, drops of water slowly fell from it and formed the large island of Onogoroyima."

MALE NARRATOR: "The Izanagi and Izanami descended from the heavens and resolved to live on the island. Izanagi walked around the left hand side of the

island and the goddess Izanami around the right. Eventually they came face to face on the other side."

IZANAMI: "Izanami cried out: "How fortunate I am to meet such a handsome young man."

IZANAGI: "Izanagi replied: "I am the man. I should be the first one to speak. We should walk around the island again."

FEMALE NARRATOR: "The two of them set off once more and came face to face again."

IZANAGI: "How fortunate I am to meet such a beautiful girl," the man cried. "What is your body like?"

IZANAMI: "A part of my body is the source of all womanhood" she replied.

IZANAGI: "My body has a male part", Izanagi added. "It would be good if we were to be as one"

FEMALE NARRATOR: "The god and goddess became man and wife and lived happily on the island. They decided to create a country with eight different islands. Then they spoke in chorus:…"

IZANAMI AND IZANAGI: "We have already created a great country with eight islands, mountains, rivers, plants and mountains. Why don't we create a ruler for the world?"

MALE NARRATOR: "And so, the two gods gave life to the sun-god, who was sent out to control the sky. And the splendor of this child illuminated the entire universe."

Turn to your right and read the next part of tour in front of the kneeling woman inside the curve.

AUDIO GUIDE: The Burial

Voices: *Narrator*
Young Neanderthal Woman

NEANDERTHAL WOMAN: *(thinking out loud, monotone voice) "*No more life in your body, my brother. Now you lie in the earth. Yes, the bison is strong and fast. Its horns are as sharp as a knife. They can cut deep into you. Your body was bleeding. The old woman spread plant sap on your wounds. This time it did not help. The others have made a grave for you. Your clothing was torn. Keep it on, brother, I will sew it back together. We have sung and danced, and the water came into my eyes. Today we will move on, following the river. There are wild horses in the blue valley. You will remain here."

NARRATOR: "For a long time people doubted whether the Neanderthals were so sensitive in the way they dealt with death, whether they buried their dead. But now we know of over fifty graves. Containing the skeletons of men, women and children. On some of the bones - including those found here in the Feldhof Cave - scientists have identified strange cut marks made by sharp stone tools. Were some of the Neanderthals cannibals? Did they perhaps have a ritual whereby their flesh was liberated from the bones before final burial? We do not know. Nor do we know whether the Neanderthals always buried their dead in the ground. Some may have been laid to rest in trees, in lakes or in crevices among the rocks."

Walk over to the red "Wendel Collection", and then further to the six stone pillars. Read the next audio tour chapter, "Western Religions" and "Eastern Religions" when you have reached the banners and engraved plates behind the pillars.

5.1
Back to the Roots
Humans have pondered the inception of the world and their own origins since time immemorial. The various interpretations have been set down in the sacred narratives forming part of every culture. In these versions of Creation, deities or superhuman beings form the world out of chaos, creating the sea, mountains, plants, animals - and finally humankind. These creation myths are passed down through the generations. They are literally accepted as the gospel truth and offer a means of orientation within a world perceived as overwhelming. Unlike modern theories on the "big bang" and evolution, these myths survive without the backing of scientific evidence. They are simply accepted for what they are.

5.2
Living with Death

Death makes us reflect upon being alive. It not only deprives individual people of life. It also leaves behind gaps in communities. Somebody loses their partner, children one of their parents, or a brother loses a sister. Rituals help us overcome these losses. When mourners gather after a funeral for a wake or meal, this strengthens the solidarity within a group. It sparks a process that is vital: the gap in the community needs to be closed and the social order restored. As far as we know, the Neanderthals were the first people to confront death. They dug graves and interred their dead.

5.3
Holy Caves

The humans of the waning ice age already had a rich spiritual life. This is impressively reflected by the abundance of cave paintings and carvings in Southern Europe. The oldest murals were created more than 30 000 years ago and are found in the grotto Chauvet in Southern France.

A central theme used by these early artists was the animals in their environment. Humanoid representations are rare. Today we have access to the motifs but the message behind them we can no longer discover. A lot of the evidence suggests that the deep holy caves were used for initiation rites and other important ceremonies. Mural art can however also be found in areas exposed to daylight, such as in the entrances to caves, or on rock-faces outside.

5.4
Anywhere and Everywhere

Humans from the Stone Age also created art that was to be displayed en route. They made small sculptures, engravings on stones and decorated commodities from everyday life. Out of painstaking work emerged pieces of art of the highest quality and expressiveness.

Carved figures made from mammoth ivory in the Swabian Alb from over 30 000 years ago are the oldest known pieces of art originating from humans. As is the case in cave art, animals are the motive most often used by the artists. One exception are the figurines of females created out of stone, horns, mammoth ivory or fired clay, which are several thousand years younger. They are found at campgrounds reaching from the southwest of France to the Lake Baikal in Siberia. Noticeable similarities across these vast distances and periods indicate the cultural significance of the symbol “woman“.

5.5
Places for the Dead

The handling of the dead displays enormous creativity throughout the world. Places are created, objects produced, rituals and rules devised. Megalithic (from the Greek: mega = large, lithos = stone) graves which were created in the period after the Ice Age after we had become sedentary, are early examples of locations created by humans where the dead could be buried across many generations and, at the same time, contact with the gods could be made.

Death rituals often include special treatment of the body of the deceased. Transport to the burial place has ritual and/or social meaning, and the final deposition of remains can be extremely varied. In addition, rituals are celebrated which extend in time long beyond the death itself.

5.6
The World Religions

5 000 years ago the first global religions were established in the Middle East and Egypt. For the most part, they were inseparably associated with a specific country and its ruler. Today some 70 per cent of the world's population subscribe to Christianity, Islam, Judaism, Buddhism, Hinduism and Confucianism. In spite of the different deities, beliefs and customs the major religions have a great deal in common. They have sacred scriptures containing key statements on religion and personal ethics, priests whose lives are devoted exclusively to religion and its dissemination and monumental structures in which their gods have their secular dwelling places.

Many of the major religions also have a founding figure. He or she either led a life worthy of imitation, or acted as a kind of "divine envoy" by promulgating the "word of god".

AUDIO GUIDE: Western Religions

Voices: *Narrator*

NARRATOR: "There are worlds of difference between Judaism, Christianity and Islam. And yet the three religions share the same roots. In many cases they cite the same primordial parents and prophets. Anyone comparing the Bible with the Koran - the sacred book of Islam - can't help noticing the similarities. For example, Islam recognizes Abraham, Noah and Jesus as orthodox religious figures. They had, it is argued, laid the groundwork for the teachings of Muhammad."

(*Recording from a religious ceremony with prayers of the apostolic creed: "I believe in God the Father, the Almighty, the Creator of Heaven and Earth. In his only begotten son, our Lord…")*

NARRATOR: "Like Christianity, the Jewish and Moslem faiths recognise one deity only. Islam champions the idea of a single god most vehemently, refusing to accept either Jesus or the Holy Ghost.

As history shows, the major religions have never concentrated exclusively on matters of faith. As a result they have always played key roles in cultural and political life. For example, Christianity is the platform on which Western civilisation was built. Christian principles have largely shaped our ethical, legal and social systems.

For a long time the Church and State were inextricably linked. During the Middle Ages, emperors were crowned by the Pope. Christianity was the official religion.
When it came to spreading the word, neither Christians nor Moslems were averse to drastic methods. If need be they even waged war in their cause.
Nowadays the powers of church and state have been separated in Western countries. The governments no longer prescribe a single religion, preferring to guarantee freedom of religion.

The situation is quite different within the Islamic sphere of influence. In many countries with largely Moslem populations, Islam is the state religion. In Saudi Arabia, for example, some very specific precepts from the Koran have been incorporated into national legislation. The punishment for non-compliance is taken from Koran rules on criminal behaviour.

By comparison Indonesia - the most populous Moslem state - has a far less strict approach to Islam. The Paucasila, the country's constitutional charter, merely requires that people believe in a god - the religion is not specified. Today Islam is one of the few major religions whose congregations are growing."

AUDIO GUIDE: Eastern Religions

Voices: *Narrator*

NARRATOR: "The view of life as an eternal cycle of growth and decay is central to major Eastern religions. The notion of an almighty God typical of Western faiths is completely foreign to them. There is no Creator or Saviour in Buddhism. Nor are there any severe commandments. People are left to find their own path to religion. The founder of the religion, Buddha Gautama, preached that life is synonymous with suffering. Suffering is rooted in greed, hatred and ignorance. Buddha, the "Enlightened One", showed man the path to redemption."

(Buddhist monk, praying)

"Redemption means not being born again, it means attaining an ultimate state of spiritual purity through meditation and asceticism - the state of Nirvana. Reincarnation is also a fundamental idea in Hinduism. According to Hindus, the soul lives many times in different bodies, until it is finally released from this recurrent cycle. The ambivalence and multi-faceted character of Hinduism makes it difficult to describe in simple terms. There is no founding figure, but a confusing number of deities, of which Vishnu and Shiva are the best-known. For this reason it has been said that Hinduism is as difficult to grasp as a snake.

By contrast, Confucianism is far more pragmatic and clearly defined. Along with Taoism, it constitutes the major spiritual force in China. The teachings derive from Confucius, whose real name was K'ung-fu-tse which translates as Master Kung. Confucius taught that love for one's neighbour, morality and integrity in both family and government circles were the prerequisites for a harmonious and well-ordered society. Confucius did not recognise an omnipotent god, but he did believe in a higher force, one that he simply called "Heaven".

Unlike in the West, there is little evidence that Oriental religions are losing their cohesive force. Their undogmatic principles and gentle spiritualism lend religious traditions like Buddhism a strong appeal for people in industrial countries as well."

Walk now through the sixth gate "Environment and Nutrition". At the campsite with the tent made from fur, you can read the next part "Hunting".

6. Environment and Nutrition

How healthy were Neanderthals?
When did caries first appear?
What does an excavation look like?
How do we know how humans lived in the Stone Age?

AUDIO GUIDE: Hunting

Voices: *Male Choir*
Man
Woman
Narrator

MALE CHOIR (*singing a capella*): *"In woods and on the hill*
Is where I get my fill -
As a huntsman roaming free
As a huntsman roaming free"

WOMAN: "And what about the women?"

MAN: "Well if you ask me, I don't think the women were strong enough to hunt. The simple fact is that men were responsible for bringing home the bacon back then too."

WOMAN: "What makes you think that? The women picked fruit and plants. And that was the staple diet, the food families could rely on getting. And women could hunt as well."

MAN: "How do you know?"

WOMAN: "Well that was the case with other so-called "primitive" peoples. Like the Indians and Eskimos. For instance, the Ojibwa in North America took their daughters out hunting. And there were women among the Inuit Eskimos who learned to pursue prey as soon as they could walk. I've no doubts at all that Neanderthal woman hunted with the best."

NARRATOR: "When we talk about hunting, we think of speed, stamina and courage. Hunting is seen as man's domain. We don't know whether the roles were really divided up that way among the Neanderthals. But we can be absolutely sure that the powerful Neanderthal women were physically equipped for this task."

Hunting had become a driving force behind human development long before the Neanderthals. It is inextricably linked to the emergence of language. After all, how else could the hunters agree on tactics?

In spite of this, plants and trees remained the main source of nutrition - particularly in warmer regions with rich vegetation. Plants had one undisputed attraction: they couldn't run away. However, meat was an indispensable source of nourishment in cooler parts of the world. The collections of bones found in Neanderthal campsites bear testimony to this.

The Neanderthals were already able to harness their environment to their own ends. But Homo sapiens sapiens refined these skills still further. Long-term planning and considerable experience were needed if people were to be in the right time at the right place - to reap the richest harvest or corner the best quarry. Having to constantly pick food or hunt animals may seem arduous to us today. But studies of the last of these peoples show that a few hours a day are usually adequate to feed a family. So what made people change? What tempted them to give up this traditional lifestyle and settle in permanent communities? We cannot say. Indeed, we may never know."

The next chapter of the Audio Guide awaits you in the upcoming right turn, in front of the elderly lady and her grandchild.

6.1
Hunting and Gathering - A Perfect Marriage

For two million years humans lived as nomads. They roamed in small groups, hunting animals and picking food that was accessible on plants and trees.
They gathered fruit, berries, nuts, roots, eggs, shellfish and insects. They hunted mammals, birds and fish of all sizes. Mobility and flexibility were the keys to this early survival strategy. Nature provides nourishment at various times of year and in different places. Early humans adapted to nature's rhythms and cycles, often spending just a few weeks in each location. The groups were small, consisting of twenty to thirty individuals. When stricken by hunger, they split up. Where food was abundant, several groups joined ranks.

6.2
The Triumph of an Omnivore

Biologically speaking, humans are omnivorous. The vital constituents of our diet - carbohydrates, fats, proteins, vitamins and minerals - are available in both the animal and plant kingdoms.
Humankind used this flexibility with exceptional creativity and consequently

succeeded in surviving in every corner of the globe. Humans not only enriched their diet, they also invented new ways of preparing their food: cooking, steaming and roasting made it softer and more palatable, for instance. In the course of evolution, humankind needed to chew less and less. As a result, the jaw, masticatory muscles and teeth have all gradually shrunk throughout the millenia: Our faces reveal our eating habits.

6.3
Settling Down

People's relationship with their environment changed when they started settling in villages. Roaming hunters and fruit-gatherers had left no discernible trail. Shortly after they had left a campsite was soon overgrown with vegetation again.

10 000 years ago cultivating the land and breeding animals sparked a spiral still evident today. The increased availability of regular food sources generated higher birth rates. And to cope with the rising populations, more land had to be cleared for planting - wiping out flora and fauna species in the process. The face of the earth was changing dramatically.

Fields and pasture ground dominated the landscape. In today's flat grasslands, many species can no longer survive. Wind and rainwater sweep away the fertile top layers of earth from the bare fields, while fertilisers and pesticides threaten the drinking water and intense irrigation increases the saline content of the soil.

6.4
Excavate, measure, research

An archaeological excavation always involves the irreversible destruction of the find site. Therefore, prior to the painstaking excavation process using trowels and brushes, it is important to document everything in great detail. Not only are measurements taken and drawings made, but the site is also photographed and scanned. A variety of scientists are involved in the analysis of the finds and features. Everything found is carefully examined. With stone tools, for example, the source of the stone is determined. Did Stone Age people obtain the stone at the find site, or bring it from elsewhere? Animal and human bones are researched by specialists using scientific methods. The individual research results are like puzzle pieces which, when they are put together, allow our past to be reconstructed.

7. Communication and Society

Is language typically human?
Did Neanderthals have different brains than us?
Do all societies know of the nuclear family?
Is competition between humans unavoidable?
Did social differences between humans always exist?

AUDIO GUIDE: Old woman with child

Voices: *Grandma*
Granddaughter
Narrator

GRANDDAUGHTER: “Grannmaaa, what are those two people doing?”

GRANDMOTHER: “The old woman is explaining something to the girl. Maybe she’s telling her about the bison trails. Bison were important back then. If the Neanderthals killed one, they had meat to eat for days on end. And they could use the thick hide to make clothes and tents.”

GRANDDAUGHTER: “But how does the old woman know which trails the bison took? Granma’s don’t go hunting, do they?”

GRANDMOTHER: “They don’t indeed. And Neanderthal grandma’s probably didn’t either. But grandma’s notice lots of things. You can be sure that she went hunting when she was younger. And she knows the mountains and valleys where her people roam like the back of her hand. She knows everything about her family history, for example that her great-great grandparents originally came from the South, crossing the mountain range on their way North. And she knows which plants can heal diseases; she knows how to make tools, tan leather, treat wounds, light fires. She can find her way around in the wilderness. And find her way back to the places that provide safe shelter.”

GRANDDAUGHTER: “Does she know more than you?”

GRANDMOTHER: “Maybe. It was certainly important that she knew a lot. Because the Neanderthals couldn’t write anything down. People only learned to write 5,000 years ago.”

GRANDDAUGHTER: “And what happened when the old woman died?”

GRANDMOTHER: “By then, she’d already passed on everything to her children and grandchildren. The Neanderthals didn’t usually live very long. Forty years, if they were lucky. Very few got really old. Maybe they reached 60.”

GRANDDAUGHTER: “So old people were really special back then.”

GRANDMOTHER: “Right you are! They were especially experienced and especially rare.”

NARRATOR: “For a long time, scientists couldn’t agree on whether the Neanderthals could speak as well as we can. By studying Neanderthal skulls they tried to reconstruct their throats and the positions of their tongues. Both of these are important for articulation. The tongue-bone found at the Kebara cave excavations in Israel supplies a new piece in the puzzle. Its shape is very similar to that of modern man. Today there can be little doubt that Neanderthal man could speak like we do.”

Behind the next turn and the “*Forscherbox*” (Researcher’s Box), you will find a showcase with skulls and a brain. Read the next text of the audio guide when the display beside shows the title “*Frühgeburt Mensch*” (A premature infant: the Human child)

7.1
Storytelling, the Oldest Art

The first hominids could only communicate through use of gestures, facial expressions and simple sounds. Soon they developed language. Since language does not leave behind any fossils, confirmation of its existence can only be established indirectly. Biological prerequisites for the faculty of speech include an adequate brain size as well as specific anatomical developments in the throat and voice box.

The biological prerequisites for speech had probably already been met by *Homo erectus*. The species could no longer communicate its extensive knowledge of the natural environment, the complex technical knowledge and the rules of everyday life which had been developed over millennia merely through observational (social) learning or gestures. Language made it possible to pass on the continually growing hoard of newly acquired knowledge from generation to generation. The later Neanderthals could without doubt speak similarly to how we do today.

7.2
The Brain and the Evolution of Humans

In relation to the size of the body, our brain is three times as big as that of apes. It only accounts for approximately 2 percent of our body weight but uses 20 percent of our body's energy. This extremely energy-intensive organ is responsible for the dominant position held by humans. The growth of the brain was fast-paced by biological standards: From the first hominids up until *Homo erectus* the volume of the brain had more than doubled.

As the size of the brain increased so did its capabilities. The perception of the habitat and the storage of information became increasingly better. Communication became more precise. With the help of the brain a cultural system for the storage of information emerged which was highly flexible and offered unforeseen expandability.

7.3
Prematurity of the Human Infant

Compared to other species, all human infants are born prematurely. The child has to enter the world in a completely unfledged state so that its head can still pass through the birth canal. If it had to reach the same level of maturity as a chimpanzee baby it would still have to spend ten months in the womb.

As a result not only the care of the mother but also that of other participants is urgently required. They have to offer direct and indirect support for the child and its mother: They provide food and other resources, make available equipment and appliances and offer protection. Aside from the involvement of the male and other group members in the childcare, the role played by the grandmother is also a human invention. Collaborative care of the offspring began at the latest during the time of *Homo erectus*. The care for children led to the development of small but closely-knit groups.

AUDIO GUIDE: A premature infant: the Human child

Voices: *Narrator*

NARRATOR: "The successful nurturing of offspring is decisive for the continued existence of a species. The longer this brood care takes, the closer the relationship between parents and children becomes. As the intensity of the parental care increases, so the learning potential of the offspring grows as well.

In the animal kingdom, a distinction is made between two basic behavioral patterns amongst young animals: precocial and altricial. Many fish, amphibians and reptiles are extremely precocial. The brood care ends with the laying of the eggs in a protected area. The newborn hatch independently and fully developed,

from the egg. Whilst they are completely self-dependent they now become an easy prey for other animals. Only the great quantity of the offspring guarantees the survival of the species.

Many rodents and predators are truly altricial. For example: mice, just like their greatest enemy - cats, are born completely helpless and require intensive care from the mother at first.

Hoofed animals are considered a secondary precocial species. Foals or calves are born fully developed and can, after a short period of time, join the roaming herd. Unlike tortoises however, a tight relationship is maintained between the mother and the child.

Chimpanzees, our closest living relatives in the animal kingdom, are also amongst the secondary precocial species. They are born after a long pregnancy which lasts 7-8 months. A long and intensive relationship develops between mother and child. The baby is breastfed for approximately 3 years and becomes grown-up between 7 and 9 years. Directly after birth the chimpanzee baby is already able to actively hold onto the mother's fur – a decisive advantage for the entire group, which can continue to roam about unhindered. After half a year it can walk independently. During this long period of intensive parental care, chimpanzee children learn many behavioural patterns from their mothers.

Us humans belong to the secondary altricial species. Human babies are completely helpless during birth and even have to be carried. The human brain experiences rapid growth after birth. Initially the brain weighs approximately 250 grams. By the end of the first year it already weighs 750 grams, and is already distinctively bigger than that of a grown-up chimpanzee. By the fifth year the weight reaches approximately 1.300 grams, as much as the brain of a grown-up. However the development of the brain is nowhere near complete by the fifth year. Together with its weight, the number of synapses of the child's brain also grows. A grown-up human today has approximately 100 billion of these circuits. A baby reaches this number after only 2 years. One year later it already has 200 billion circuits.

The enormous amount of synapses in the infant phase showcases the exceptional aptitude and adaptability of the human child. During this stage the brain is approximately twice as active as that of a grown-up. The neural pace however, is still significantly slower – no fixed circuits have developed yet. At this point in time the brain is extremely mouldable and adaptive. The number of synapses remains constant up until the 10th year. Afterwards less frequently used circuits degenerate until the typical quantity of a grown-up is reached.

This exceptional aptitude for learning makes it possible for the parenting group to steer the development of the child – this alone is how education becomes possible. The basic behavioural patterns of human coexistence and the specific characteristics of every culture can, in this way, be learnt by the child. This "cosmopolitanism" of the human child, its mouldability by its surroundings, creates the basis of the human success story and is the cause for the highly visible diversity in human culture."

7.4
Small Groups – Big Impact

Groups which go beyond the nuclear family are typical for human communities. The size of the smallest of these social units amongst hunters and gatherers around the world was approximately 25 individuals. Similar headcounts were confirmed by excavations of campgrounds from the Ice Age. These small groups were the foundation for our cultural development.
Through their exceptional resourcefulness humans have managed to establish an unimaginable diversity of family relationships and rules around the world. The present society is also subject to this dynamics.
"Patchwork Families" for example are a new variation of the middle-class family.

7.5
Authority – Power – Leadership

Humans have created five basic types of social systems, which up until recent times still existed side by side: Groups of hunters and gatherers with equal rights, small basic agricultural groups without formal leadership, chiefdoms, kingdoms and states.

Up until the end of the Ice Age 10 000 years ago, groups of hunters and gatherers made up the only form of human society. Leadership kept changing and depended on personal authority as well as social aptness. With the beginning of agriculture and stock farming, leadership was defined more precisely. The increase in political power eventually culminated in the leadership of a minority over society.

In democratic nations of today leadership - as was the case in the beginning of human societies – is decided on once again by all members of the society.