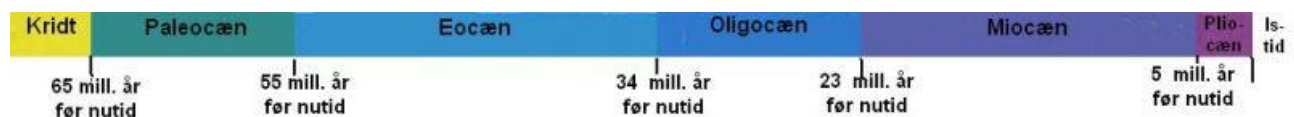


2. Denmark's History

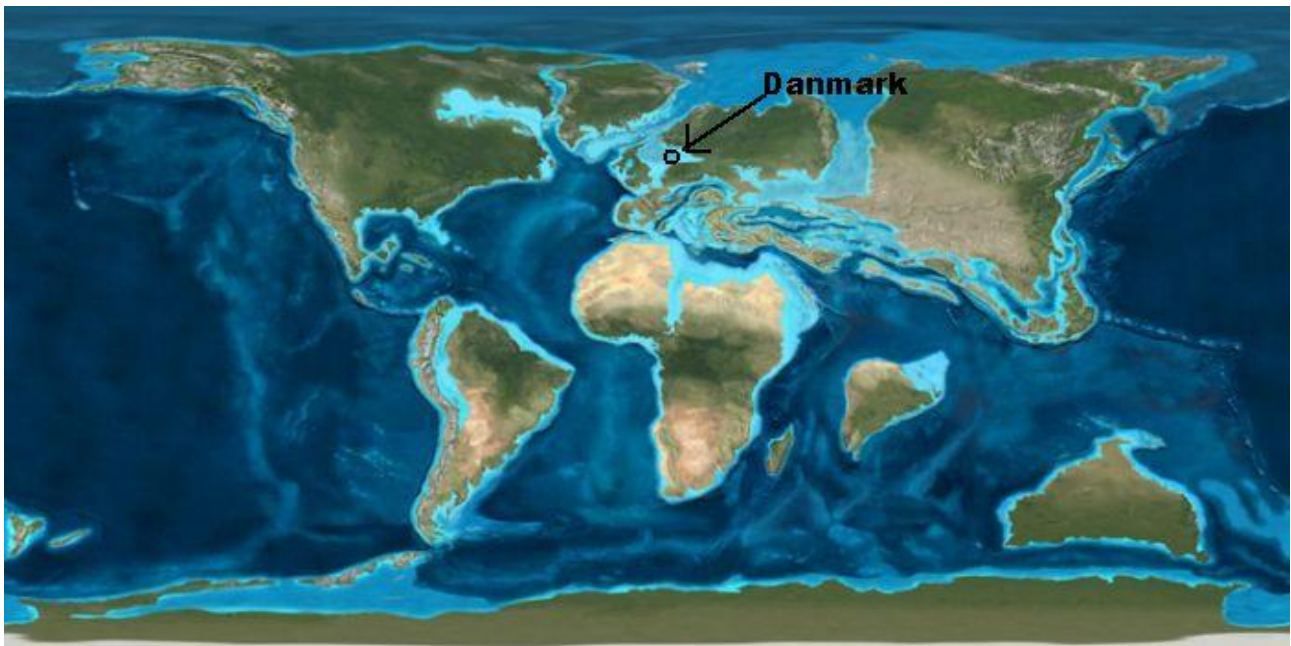
2.0 Tertiary

The Tertiary era began 65 million years ago and lasted to 2 million years before present. Some divide the period into two and call them respectively the Paleogene period and the Neogene period.

During most of Tertiary the part of the earth's crust, which was to become Denmark, was covered by sea.



Timeline for the Earth around the Tertiary periods, which started 65 million years before present. The Pleistocene ice ages began about 2 million years before present. Earth's age is assumed to be 4,54 billion years (9 zeros), which is 4.540 million years (6 zeros) - Tertiary time is thus a fairly recent period in Earth's history.



The world as it appeared at the beginning of the Tertiary - Note that North America and Europe were quite close together, North and South America were separated, India was still swimming around in the Indian Ocean, and the future West Siberian Lowland was then a sea. The Mediterranean was still part of the Tethys Sea. Note also that the future North Sea was being separated from the Tethys Sea, and the part of the Earth's crust, which was to become Denmark, was flooded by that sea. Scotese.com

Tertiary actually means "the third time", it can be subdivided into five epochs:

- Paleocene lasted from 65 to 55 million years before present.
- Eocene 55-34 million years before present.

- Oligocene 34-23 million years before present.
- Miocene 23-5 million years before present.
- Pliocene 5-2 million years before present.

The beginning of the Tertiary 65 mill. years before present is marked by the large mass extinction of dinosaur species.



By the transition from Cretaceous to Tertiary 65 mill. years ago, all dinosaur species became extinct at the same time. Foto [Eureka.com](https://www.eureka.com)

Most researchers believe that the exit of the dinosaurs was caused by a large asteroid that hit Earth near the Yucatan Peninsula in Mexico. The remain of the impact crater is called the Chicxulub crater, which measures more than 170 km in diameter.

The impact caused directly widespread firestorms, earthquakes and tidal waves. Large amounts of dust and soot were hurled into the atmosphere, the troposphere and further into the stratosphere, where the particles could not be washed out by rain. Here the remains of the impact stayed for several years and blocked the sun's rays, and thus generated a long-lasting "nuclear winter".



A reconstruction of *Eozostrodon*, which was one of the earliest mammals. It lived during the late Triassic and early Jurassic. It was about one meter in length. *Eozostrodon* laid eggs, and after the kids had come out of the egg, they suckled the mother. Its teeth were typical mammalian teeth. It may have been the ancestor of the tertiary - and thus contemporary - mammals. It has certainly been an important food item for the dominant dinosaurs. Foto [Quora](https://www.quora.com)



The lake Kara Kul in Tajikistan has been created by a meteor impact. [Google Earth](https://www.google.com)

No terrestrial species weighing more than about 25 kg. survived. This set the stage for the Cenozoic, "the age of mammals", which Tertiary and the following Pleistocene and Holocene until present also is called.

The Yucatan asteroid was possibly not alone in causing the disaster; also, in other places on Earth there are large impact craters - larger than 25 km or 40 km in diameter, which date from the time of the transition from the Cretaceous to Tertiary. In Russia, there is the Popigai Crater in northern

Siberia, in the United States the Chesapeake crater in Maryland and in Canada the Montagnais crater in Nova Scotia.

The last major of impact-crater from an asteroid that hit the Earth is the Kara Kul Lake in Tajikistan. It has a diameter of more than 50 kilometers. It happened maybe 25 million years ago; some say 5 million years ago.

2.1 Paleocene



A reconstruction of the giant aggressive bird *Gastornis* from Paleocene and Eocene in Europe and North America. A mural by Rudolph F. Zallinger.

The Paleocene period represents the first 10 mill. years of the mammalian era. The name comes from Greek and means "old-new", that is the oldest period of the new age.

It started with the extinction of the dinosaurs. When they were gone, the world lay open to all the other species. Birds, reptiles and mammals competed to fill the biological niches that had become vacant. In only ten million years Earth became filled with small and medium-sized mammals and birds.

Paleocene mammals looked like their humble ancestors from the Cretaceous Period. They were mostly small herbivores, the size of rats and cats

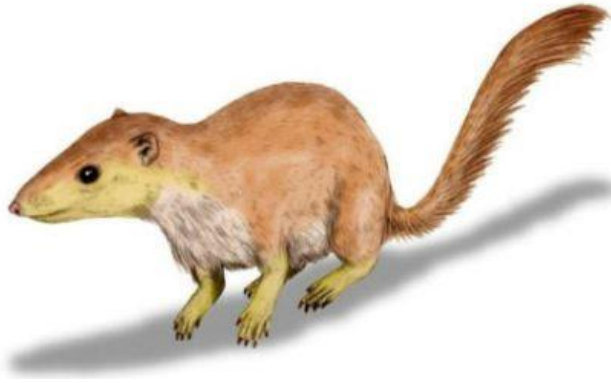
or less. These early mammals were only distantly related to existing species; they had very primitive teeth and skeletons



Part of a mural by Rudolph F. Zallinger, "The Age of Mammals", which shows reconstructions of Paleocene mammals. From left to right *Palaeoryctes*, *Loxolophus*, *Tetracaelonodon* and *Tetracaelonodon*..

In late Paleocene emerged in Europe the giant bird Gastornis. It was 1.8 meters high, that is as high as a man; it had big strong legs and a large bone-crushing beak, but it could not fly.

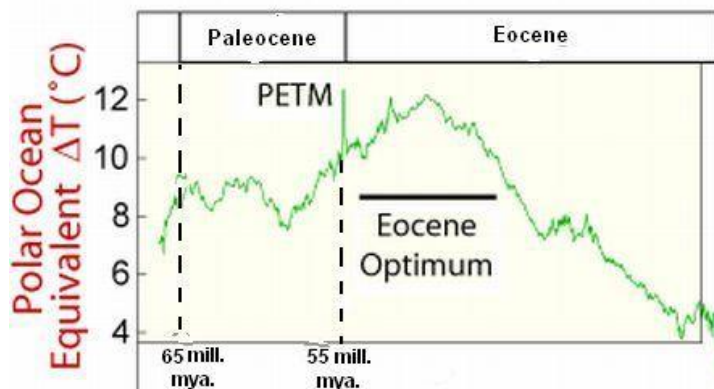
The famous Purgatorius was one of the early mammals in the Paleocene. It had the size of a small rat and lived most likely of insects and fruits.



A reconstruction of Purgatorius from Paleocene, which is considered to be the primate's and thus humans' earliest known ancestor. Wikipedia.

The climate of the Paleocene was mild with small temperature fluctuations. Land masses were covered of tropical and subtropical broadleaf forests. It was teeming with flowering plants and insects. The pine trees emerged during this period in areas near the poles; palm trees emerged in the tropical regions.

In the whole world, the climate was hot and humid with subtropical vegetation on Greenland and in Patagonia.



The Paleocene-Eocene Maximum lasted approx. 20,000 years and occurred in the transition from Paleocene to Eocene 55 mill. years before present. Wikipedia

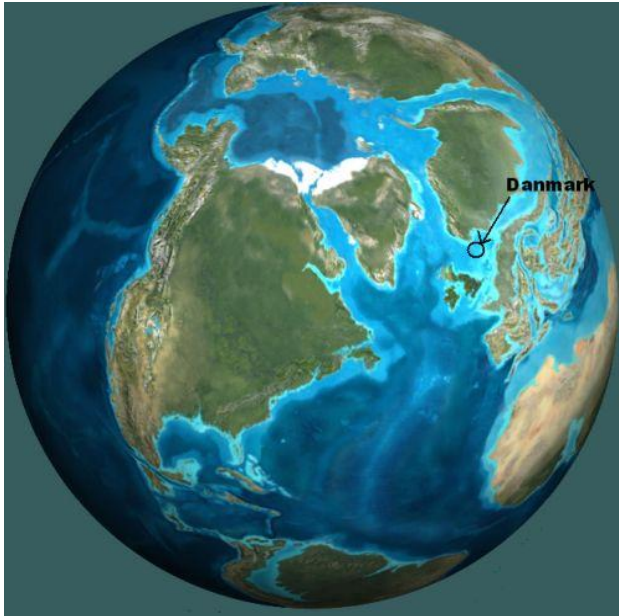
Mangroves and rainforests were found as far north as England and Belgium, and as far south as Tasmania and New Zealand. Globally there was little or no frost. The average temperature was maybe 17 degrees on Northern European latitudes; it

should be compared with today's annual average temperature in Denmark at 8 degrees. The temperature slowly rose through the period's 10 million years.

The period ended abruptly with the mysterious Paleocene-Eocene Thermal Maximum (PETM). The global temperature rose to about 12 degrees higher than present through a period of about 20,000 years or more. Many sea creatures and land mammals became extinct, and many more modern mammals emerged. Then the temperature dropped again. - We can only guess the reasons, perhaps due to volcanic activity, peat fires, changes in solar radiation or perhaps increased methane content in the atmosphere due to methane release from the seabed. It is quite likely that the tectonic plates activity, for example in connection with the creation of the Atlantic, has been the cause of widespread and unpredictable volcanism.

2.2 Eocene

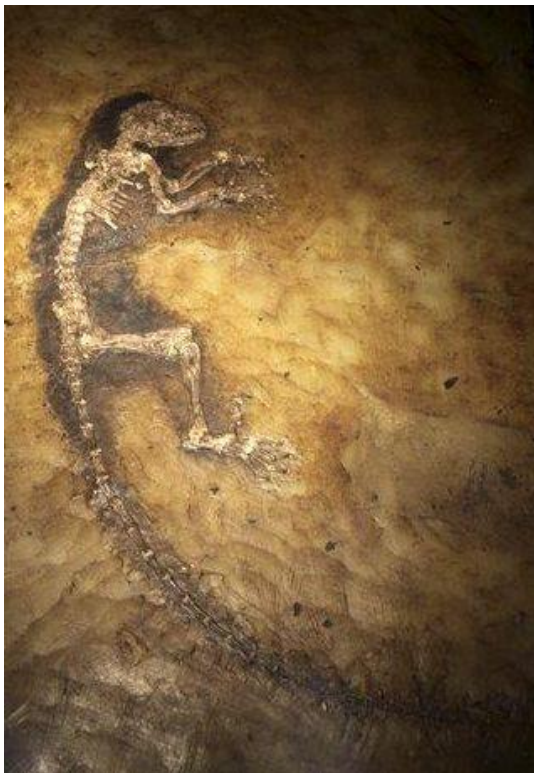
"Eocene" comes from Greek and means something like "new dawn", and the period is so called because the ancestors of many presently living mammals showed up shortly after PETM. Rodents, horses, mooses and tapirs, bats, elephants and whales all emerged in the early Eocene. The period began 55 million before present and lasted for 21 million years.



The world in the Eocene. Europe and America are still fairly close to each other. The Mediterranean is not formed. North and South America are still separated. The West Siberian Lowland is covered by ocean. India has hit Asia and has started slowly to press up Himalaya and the Tibetan Plateau. Denmark is covered by a sea, in which molasse is being deposited. Scotese.com

The first primate-like fossils appeared in early Eocene without transitional forms. They had forward-facing eyes and grasping hands. These traits show adaptation to a life in the trees. Otherwise, it was only predators who developed forward-looking vision.

In late Eocene, the Indian subcontinent bumped against Asia and thus began creating the Himalaya Mountains and the Tibetan plateau. Also, in late Eocene South America became completely separated from Antarctica.



In Germany has been found a very well-preserved skeleton of Adapid from 47 million years before present; it has been named *Darwinius masillae*, but it has also been nicknamed Ida. It was 60 cm long. It represents a kind of missing link between the first primitive mammals and the later evolved primates, including humans - including of course, Danes. [Wikipedia](https://en.wikipedia.org/wiki/Darwinius_masillae)

The Atlantic Ocean continued its expansion, and the distance between North America, Greenland and Europe was still increasing. This process is still going on today, accompanied by volcanic activity on Iceland, just as it in the Eocene probably have been accompanied by extensive volcanic activity.

The early primates were very small, weighing about one kilogram or less. They had deep eye sockets and forward-looking eyes, front teeth, which were specialized to a diet of insects and fruits, hands that could grasp and had actual nails on the tips of the long

fingers instead of claws. They can remind of today's lemurs.

In North America, Europe, Asia and Africa, several groups of monkeys emerged in the early Eocene that scientists consider to be candidates to be the ancestors of modern primates - and thus human ancestors. The candidates are: Adapidae, an extinct group of lemur-like primates, which *Darwinius* *Masillae* belonged to; Omomyidae, an extinct group of Tarsi-like primates; and the Tarsi, which are small primates with strange, big eyes with living representatives, 10-15 cm long. Most believe, however, that Adapidae are the ancestors of primates and that Omomyidae are ancestors of today's Tarsi only.

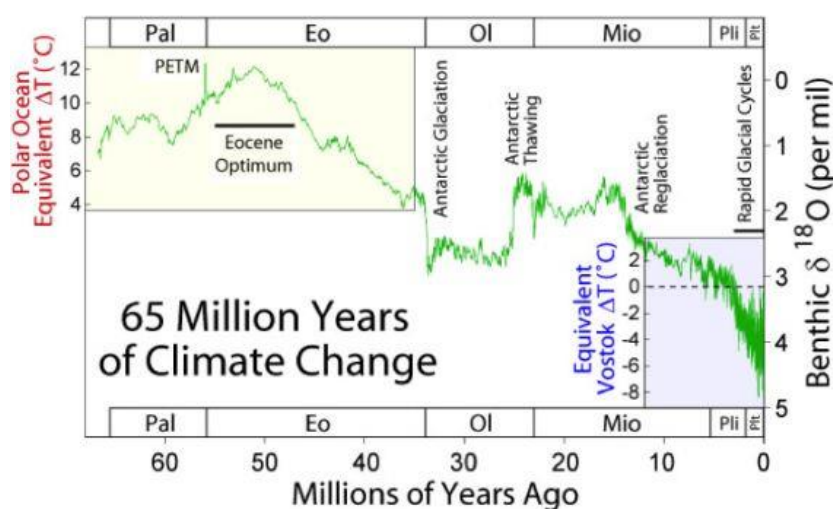


Left: A reconstruction of an Adapid from Eocene. Darwinian.com
Right: A modern Tarsi from the Philippines. Wikipedia

In China's southern Jiangsu province in 1999, there was found fossils of the early primate, *Eosimias*. It existed in the middle Eocene. Some write that it lived in the treetops from insects and fruits as a nocturnal, solitary creature.

During Eocene, temperature rose towards "Eocene Maximum" about 49 million years before our time, reaching almost as high as

during the PETM. The beginning ice cover at the poles melted again, and the seas rose. American scientists believe that the Arctic Sea on this occasion became filled with a duckweed-like water plant called *Azolla*. That is the so-called "Azolla Event", which lasted about 1 mill. years. Then Earth's temperature began to fall steadily, and it has since been the tendency.



The figure shows temperature changes in the Arctic Ocean as a function of a special oxygen-isotope found in sediments of the seabed created by foraminifera plankton - adjusted with data from ice cores from the Vostok station on Antarctica. Wikipedia.

In the Eocene, the part of the crust of Earth, which would later become Denmark, was the bottom of a deep sea. Through millions of years, sediments

were deposited on the ocean floor. Mucilage, as it is called, consists of a mixture of fine clay and incredible amounts of microscopic organisms that lived, died and sank to the bottom during all

these millions of years in the early Eocene's warm seas. On the Danish islands of Mors and Fur in Limfjorden, these deposits come up to the surface. Moclay in Limfjorden is world famous; With a thickness of 60 meters, it surpasses by far other deposits in the World from Eocene. The thickest layer that you find in other locations is typically from 10 cm. to 1 meter..



Left: A moclay cliff on the Danish Island of Fur with many ash stripes from Eocene's volcano eruptions. Wikipedia



Right: A bird fossil from Eocene. Moclay Museum Mors

Fish, birds, insects, trees and plants that lived and grew in and around the Eocene Sea, one can find as well-preserved imprint in the moclay. The Moler Museum on the island of Mors exhibits many fine examples.



A piece of Baltic amber containing an ant. Baltic amber was formed in Eocene's pine forests. It is believed to have been washed out to sea in the following Oligocene period. Wikipedia

The yellow moclay cliffs are interrupted by more than 179 black and gray horizontal stripes, which shows just as many big and small eruptions of volcanoes located at the Eocene Sea.

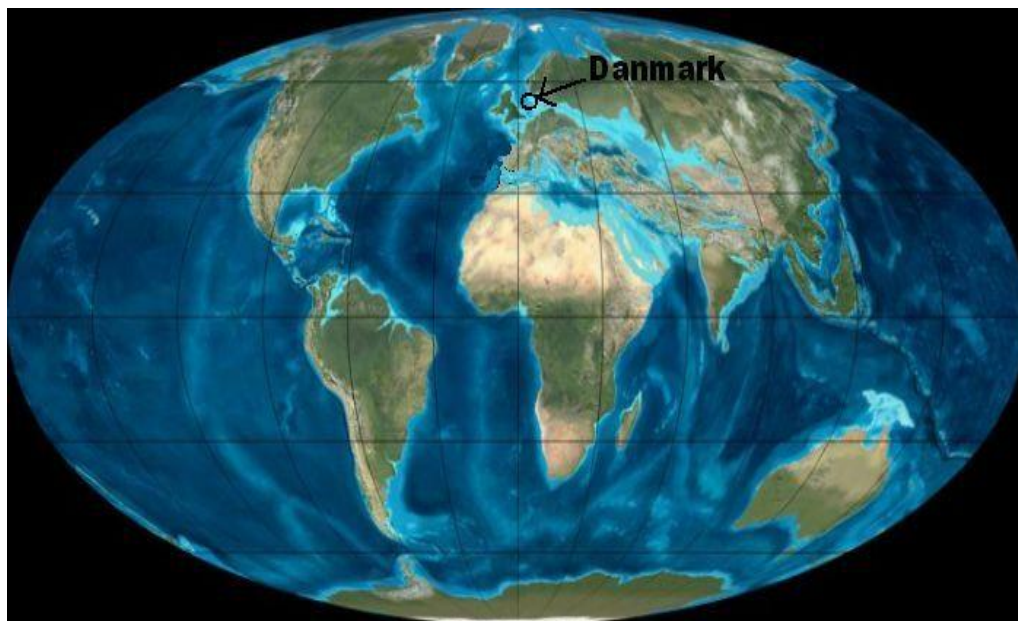
In the moclay deposit on the islands of Fur and Mors, more than 30 different kinds of birds have been found from Eocene; they are special in that they on Mors are preserved spatially. In almost all other sites in the world, the fossils are made flat by the pressure of the weight of the overlying soil.

The bottom of the moclay-layers represents material that sank to the ocean floor for 55.8 million years ago. The top-layers represent material that sank to the bottom for about 53 million years ago. Analyses of the layers tell about a local climate, which first was almost tropical, and thereafter

developed to subtropical. The fossils tell simultaneously how that ocean first was an inland sea, which later on became connected with the open ocean.

The mid Eocene epoch marked the beginning of a slow global cooling, which would eventually lead to the ice ages that began at the end of the Tertiary. Eocene ended with a sharp temperature drop that wiped out many species.

2.3 Oligocene



The world in Oligocene. The part of Earth's crust, which later would become to Denmark, is still covered by a sea. North America and Europe have moved further away from each other. North and South America are separated and Antarctica and South America are separated. - Scotese.com

The name "Oligocene"

comes from Greek as "oligos" means few and "Kainos" means new. It refers to that only few more modern mammals emerged compared to the fertile development in Eocene. Oligocene started 34 million before present and lasted 11 million years.

But the name is not quite fair; the types of mammals, which were already made, grew dramatically in size because some of Eocene's forests and jungles were replaced by open steppe

North America and Europe continued moving away from each other. The Indian subcontinent was still pushing against the Eurasian continent, thereby gradually creating Himalaya and the Tibetan plateau. The remains of the Tethys Sea were further isolated, but the Mediterranean was still not formed. South America was finally detached from Antarctica and drifted north toward North America. This allowed the Antarctic circumpolar current to be formed, which led to a rapid cooling of that continent. During the Oligocene, therefore, the South Pole, but not the North Pole, was covered with ice.

That part of the Earth's surface, which was to become Denmark, was still covered by sea. Danish fossils are therefore all different sea creatures that are found in clay, which is formed of sediments on the bottom of the Oligocene Sea.



A snail from Oligocene found in the so-called Brejning clay at a motorway excavation near Skanderborg - photo: Soren Bo Andersen.

The Oligocene period marked the beginning of a general cooling; in Antarctica, glaciers were formed for the first time in the Tertiary era. The growth of ice sheets led to a decrease in sea level in the world's oceans, which by some are estimated to have been around 50 meters. The lower temperature caused tropical forests and jungles to give way for cooler forests and open grass plains. Although there was a slight heating period in the late Oligocene, the general trend was cooling, which would

later culminate in the Pleistocene ice ages.



A short-necked, Three-toed Oligocene horse gallops across the steppe - Painting by Heinrich Harder.

The average temperature on the Northern European latitudes can have been more than 10 degrees, but this is still higher than today's average annual temperature in Denmark, which is about 8 degrees.

The new, drier and cooler climate, created new open spaces which allowed new galloping and fast-running species, and

much larger species than those, who lived in the tropical Eocene period.

Oligocene saw the dawn of the first elephants with trunks, and the first horse-types roamed around on the grass plains



Tourists admire a reconstruction of Indricotherium from Oligocene in New York's American Museum of Natural History. The weighted as much as four African elephants together. Photo American Museum of Natural History

Indricotherium is the largest land mammals that ever existed, larger than the largest mammoth species. It is known as "the giraffe rhinoceros", as it is supposed to have looked like a cross between a giraffe and a rhinoceros. An

adult Indricotherium is estimated to have had a shoulder height of 5 meters and a maximum height

with a raised head at about 7 meters. Weight estimates vary widely, but about 20 tonnes is not unrealistic.

But Oligocene corresponds to its name in terms of discovery of potential human ancestors among the primates. There are few and poor findings of primate fossils. In Libya, have been found some teeth, which is thought to originate from primates. In Australia, have been found the remains of the monkey *Branisella*, and at the Red Sea and in Catalonia, have been found some fossils of the species *Catarrhine*, which is a kind of higher primates - similar to gibbons and the like.



[Rekonstruktion af Aegyptopithecus Zeuxis. Photo Quora](#)

There are only few and poor finds of primate fossils. In Libya they have found some teeth which are believed to be from primates, in Australia they have found remains of the monkey *Branisella*, and at the Red Sea and in Catalonia they have found some fossils of the *Catarrhine* family, which is a kind of primate of a higher order - related to gibbon monkeys and the like.

The prime candidate to be the primates' direct ancestor among the Oligocene apes is said to be *Aegyptopithecus Zeuxis* from Fayum in Egypt, which by then was overgrown by subtropical forest. Based

on the significant difference in size of canines, skulls, bones and limbs can be inferred that there was a significant size difference between males and females. Males were about a quarter larger than females. This indicates that they were a social and polygamous species, where males competed intensely for females' favor. However, in layers from Oligocene, almost nothing has been found from the Eocene primates on the northern continents.



[Skull from Aegyptopithecus Zeuxis. Foto Facebook](#)

Adapids and Omomyids (*Tarsis*) are largely unknown among the finds from the otherwise well-documented Oligocene period. However, it may really not be surprising, since monkeys live in trees, and Oligocene was precisely characterized by that forest and jungle were replaced by steppe

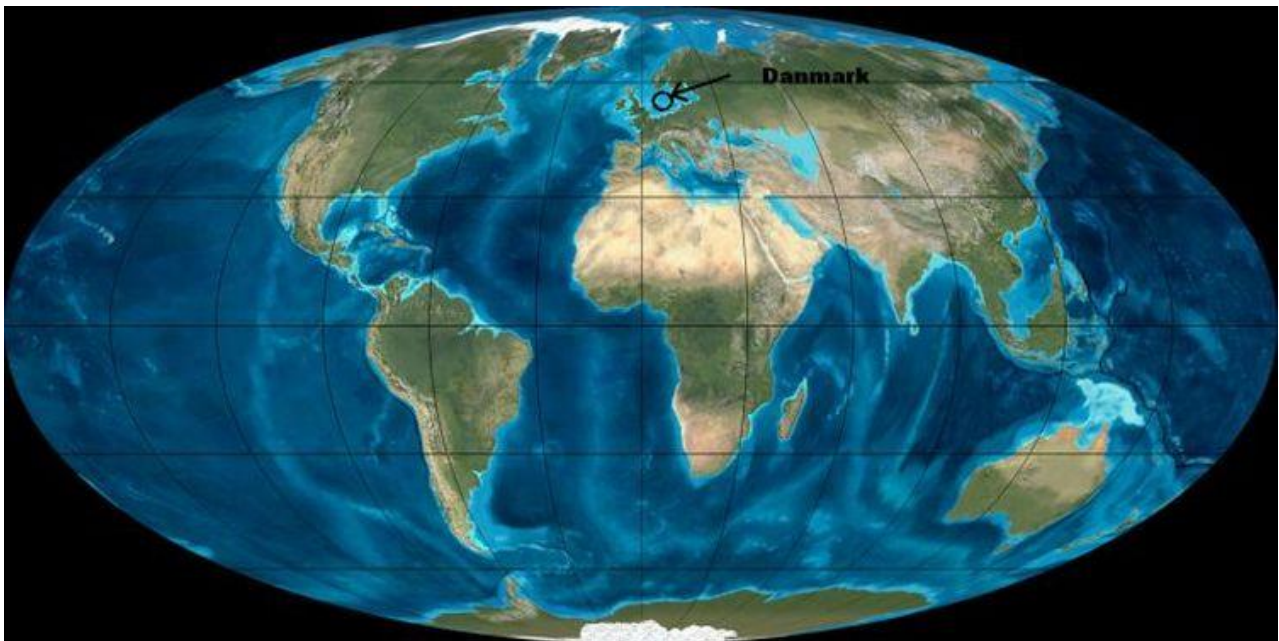
Some researchers believe that the early primates simply died out and that *Aegyptopithecus* are the real ancestors of modern primates.

An abrupt rise in temperature marked the end of Oligocene.

2.4 Miocene

Previously it was thought that the Miocene was just another step down in the general cooling of the planet that has taken place since the middle of Eocene, 50 million years before present. However, in recent times, analyzes of samples of sediments, taken from the bottom of the Polar Sea, shows that first half of Miocene was a warm-period, where the ice sheet in Antarctica temporarily melted away, and the surface level of the oceans rose. Miocene started 23 million years before present and lasted for 18 million years.

But the second half of the Miocene was really such a step down in a cooling process, in which the temperature probably fell to less than two degrees over today's temperature.



The world in last half of Miocene. Scotese.com

Like all the other names of the tertiary periods Miocene comes from Greek; "Meion" means "less" and "Kainos" means new; that is "less new". The name refers to that the number of modern species was somewhat smaller in Miocene than in the following Pliocene.

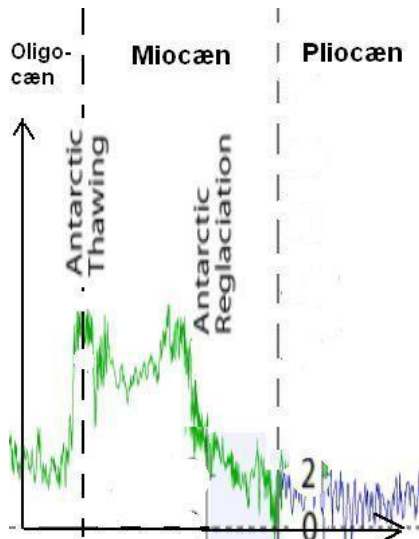


Workers in Jutland lignite deposits during Second World War. Photo Midtjyllands Avis

The continents continued to drift against their present positions. South America and North America were still separated. India continued its relentless pressure against the Asian plate, causing Himalaya mountains and the Tibetan plateau to raise even higher.

The part of the Earth's surface, which would later become Denmark, was in early Miocene

still covered by sea. However, when the glaciers on Antarctica reformed in the latter half of the period, sea surface level sank, and some seabed came to the surface, where it became to swamp forests. The fallen trees in these forests sank to the bottom of the sump and were converted to lignite. It is formed by anaerobic and incomplete conversion of buried dead remains of trees and plants. The Mississippi Delta has been widely used as illustration of this process. Lignite is a cross between peat and coal.



The temperature in the Miocene as a function of time. [Wikipedia](#)

In Denmark, the largest lignite deposits are located in mid-Jutland south of Herning. The Jutland lignite reserves gave a significant contribution to the Danish energy supply, during and just after the Second World War. One can imagine that also in eastern Denmark have been swamp forests in Miocene, where they can have formed lignite, but however, all traces must have been removed by the later Ice Age glaciers.

In Gram Teglværksgrav in Jutland have been found the remains of 18 whales in the Gram clay, including a nearly complete skeleton of a baleen whale from the Miocene. Worldwide it is something very special.

The Tethys Sea continued to shrink to eventually disappear completely in late Miocene about 6 million years ago, when Africa collided with Eurasia at the present Middle East and at Gibraltar. Thus, the Mediterranean Sea was initially cut off from the world's oceans. The Mediterranean, the Black Sea, the Persian Gulf and the Caspian Sea are today the last remnants of the Tethys Sea.

A subsequent drying out lowered the surface level and reduced the Mediterranean to several separate salt lakes, which must have resembled today's "Dead Sea". The incident is called "Messinian salinity crisis".



Messinian salinity crisis. [Foto Youtube](#)

After about 0.7 million years the Atlantic Sea broke through at Gibraltar and the world's oceans re-captured the Mediterranean.

The name Miocene, "less new", is not quite fair. The cool climate in the latter part of the Miocene favored extensive grass plains, on which plant-eaters, that were adapted to life on the steppes, roamed, including the ancestors of horses, rhinos, elephants and the very successful ruminants, which already then were

more numerous than their competitors. Many modern animals existed as early as the early Miocene, including raccoons, coyotes, bears, camels, deer and whales.



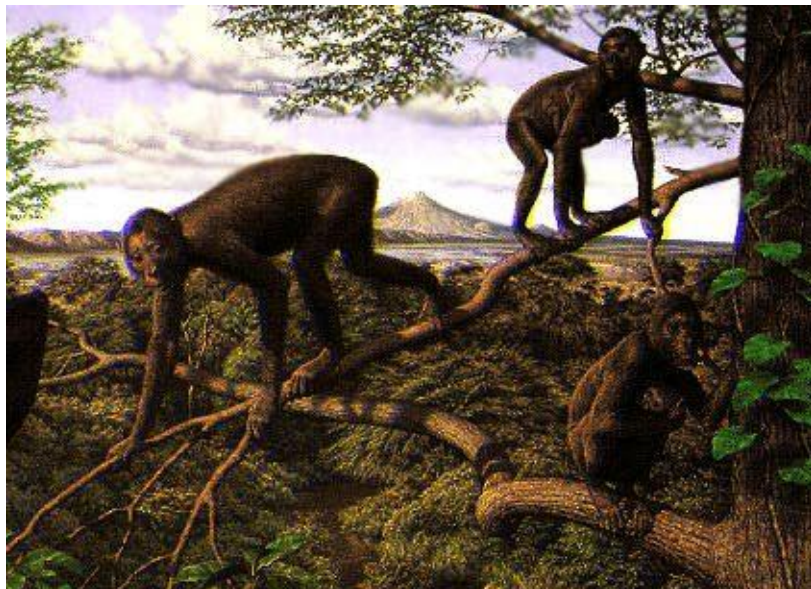
Elotherium entelodon, a now extinct wild pig species from the Miocene - Painting by Heinrich Harder.

There have been many finds of fossils from the primate-like apes from the Miocene. But they are all rather small species, which are not really very convincing as human ancestors.

The Leakey expedition to East Africa 1947-1948 excavated several samples of Proconsul africanus on Rusinga Island in

Lake Victoria.

Louis Leaky wrote about Proconsul: "A particularly important creature was proconsul Africanus. He, as many authorities have accepted, gave us an indication of the common origin of apes and humans. We have good front leg bones from this, and in 1948 Mary Leakey discovered on Rusinga Island a skull, the first almost complete specimen ever found. Its canines suggest a monkey, while its forehead reminds us of our own. It seems to me that neither to be ancestor of apes, nor ancestor of man, but a side branch with characteristics of both species."



Left: Skull of Proconsul Africanus, found by Mary Leakey. Photo Wikipedia.

Right: Reconstruction of Proconsul Africanus, who lived in the Miocene more than 15 mill. years ago, in East Africa's forests. There have been many discoveries of the Proconsul, and it was undoubtedly a primate. Photo Dons Map.

Like most other paleontologists also Leakey did change opinion about the exact classification of Proconsul a few times. Currently, the general perception is that proconsul is a cross between monkeys and apes. Proconsul's weight alive has been estimated to 10 to 38 kg.

The other candidates from the Miocene to be humans' ancestors are even more monkey-like. Pierolapithecus Catalaunicus were found in Catalonia in Spain, where it lived about 15 million years ago. Its weight alive has been estimated to be about 35 kg.

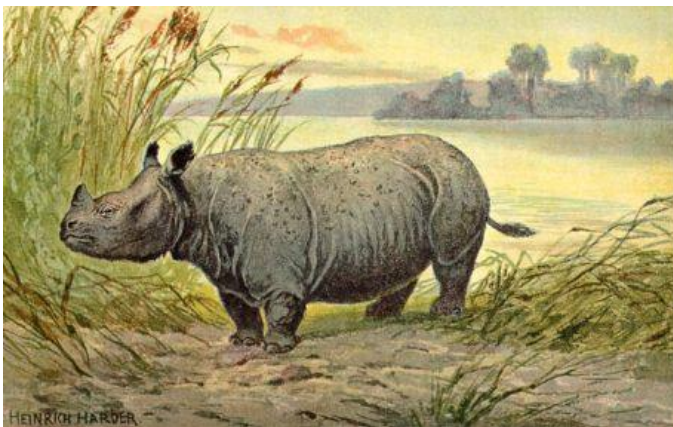


Left: Reconstruction of Pierolapithecus Catalaunicus found in Catalonia in Spain, where it lived about 15 million years ago in Miocene. Photo Ancient World News.

Right: Reconstruction of Pierolapithecus Catalaunicus found in Catalonia in Spain, where it lived about 15 million years ago in Miocene. Photo

emaze

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Teleoceras, a now extinct species of rhinoceros from the Miocene - Painting by Heinrich Harder.

Dryopithecus was found in France in 1856. It is estimated that it had a body length of about 60 centimeters and looked more like a monkey than a modern ape. The structure of its limbs and wrists shows that it walked on the same way as modern chimpanzees, but that it used the palms, as a monkey, rather than the knuckles as modern apes. Fossils from Dryopithecus have also been found in

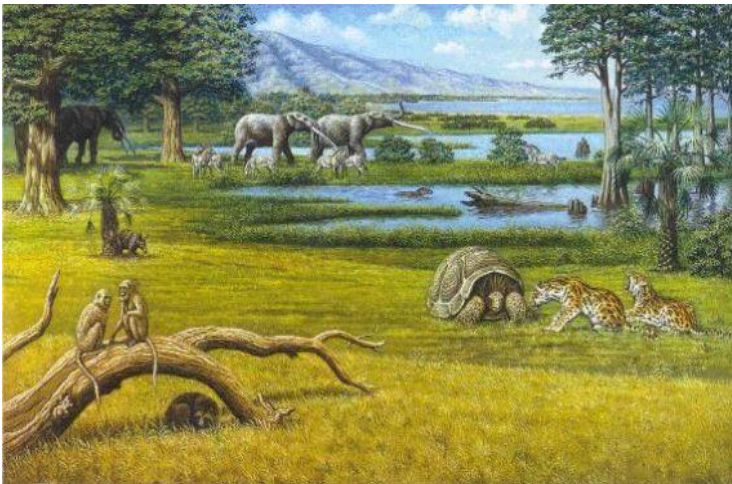
Hungary, Spain and China.

2.5 Pliocene

Pliocene was the last and shortest period of tertiary. It started at 5 million years before present and lasted about 3 million years until the start of the Pleistocene, which is what, we call the Ice Age.

In the Pliocene, the continents came very close to their current positions. South America became attached to North America by the Panama isthmus that allowed "the Great American Interchange", which almost completely destroyed South America's distinctive large marsupial predators and local ungulates

The formation of the Panama Isthmus reinforced the Gulf Stream, but not enough to prevent the ice cap in Greenland being formed. It is easy to imagine that the new climate in the North Atlantic was characterized by increased precipitation, including increased snowfall, as the trigger for the formation of the ice sheet



Reconstruction of landscape in Pliocene time by Mauricio Anton.

The part of the globe, who would later become Denmark, was still covered by sea or impassable swamp forests.

The global average temperature in the mid-Pliocene was much like today, possibly a single degree higher. The ice volume at the poles was much less, and therefore the surface level in the oceans was around 25 meters higher than today.

Pliocene's drier and cooler climate reduced the tropical forest to a narrow belt around the equator.



Deciduous forest, coniferous forest, steppe and tundra covered much of all continents except Antarctica. Dry savannas and deserts appeared in Asia and Africa. You could say that the Earth's climate and fauna were very similar today's. But there were almost no people.

Mastodont that lived during the Pliocene. by Mauricio Anton

The mammals, that lived on the Pliocene's steppes and forests, looked like the modern mammalian types, but with many differences. There were oxen, antelopes, elephants, rhinos, horses and camels on the steppes, and deer and bears in the forests.

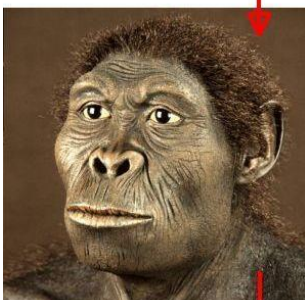
It was in the Pliocene that the first convincing hominids appeared; as an evolutionary quantum leap from the



Australopithecus Afarensis



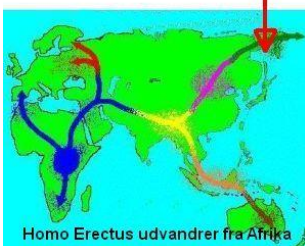
Australopithecus Africanus



Homo Habilis



Homo Erectus

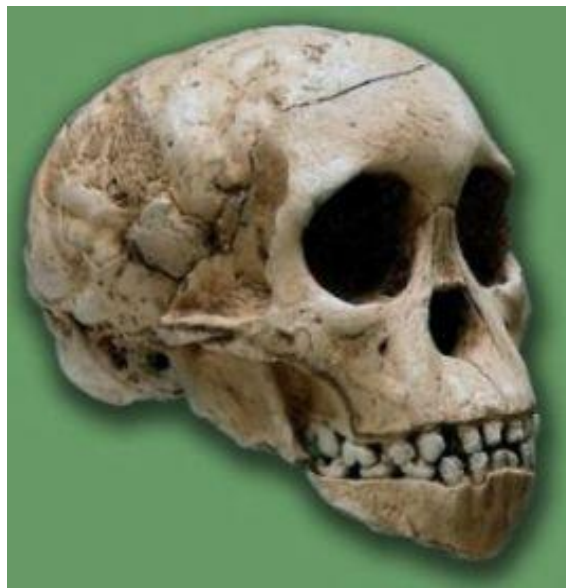


Homo Erectus udvandrér fra Afrika

The family Homo evolved in Africa and Homo erectus emigrated to the rest of the World.

loose volcanic ash from the nearby volcano Sadiman. A soft rain had then made the cement-like ash layers (15 cm thick) to solidify without destroying the tracks. The human footprints were made by three people one of which stepped in the footsteps of another.

Since the tracks led in the same direction, they must have been produced by a group - perhaps a Pliocene family on the run from a volcanic eruption. The ash layer has been dated to 3.5 million years before present.



The skull of the Tuang child.
[Wikipedia.](#)

Many believe that the tracks were set by some Australopithecus Afarensis. The best-known fossil of Afarensis is the incomplete skeleton that was found and named "Lucy" in 1974 by Donald Johanson and his colleagues at Hadar in Ethiopia. They celebrated their discovery by playing the song "Lucy in the Sky"

by the Beatles again and again. Lucy lived about 3.18 million years ago; she was probably between 25 and 30 years old and showing some signs of arthritis. She was 110 cm tall and weighed about 30 kg. Her brain volume was less than 500 cm³, which is less than half of modern humans.

It is believed that Australopithecus Africanus descended from Afarensis. The first finding of Africanus was the fossilized remains of a three-year-old child, who was found by workers in a quarry in Taung in South Africa around 1924. The anatomist Raymond Dart examined the finding and came to the conclusion that it had a number of human-like traits, and realized that it was an early ancestor of man. The Tuang-child is believed to have lived 2.5 million years ago.

An adult Australopithecus africanus' brain volume has been measured to about 500 cm³, which is slightly more than Afarensis, but still far from a modern human brain volume of about 1400 cm³. A male Africanus measured about 140 cm in height and weighed about 41 kg; a female



A group of *Australopithecus afarensis* on the run from volcano eruption 3.5 million years ago.

small monkeys that are believed to be human ancestors in earlier geological periods.

In 1976, Mary Leakey found in Laetoli in Tanzania a number of human footprints, which were set in

measured 110 cm and typically weighed about 30 kg. *Australopithecus africanus* was slimly built like *Afarensis* was.



The Turkana boy found in Nariokotome in Kenya Wikipedia.

It is believed that *Homo habilis* descended from *Australopithecus africanus*. The name *Homo habilis* means "skillful man". The first fossils that could be assigned to this group were found in 1960 by Louis and Mary Leakey's son, Jonathan Leakey, in Olduvai Gorge in Tanzania. A 1.9-million-year-old skull was found in 1972 by Bernard Ngeneo near Lake Turkana in Kenya.

Homo habilis was about 130 cm tall and had disproportionately long arms compared to modern humans, but they had a less protruding face than *Australopithecus Africanus*. Their brain volume was about 750 cm³, that is about half the size of a modern human. Despite their ape-like appearance, the findings of *Habilis* are often accompanied by the discovery of primitive stone tools. Some researchers divide the *Habilis* group into several species, among others, *Homo habilis*, *Homo rudolfensis* and *Homo ergaster*, the latter is considered to be a transitional form to the later *Homo erectus*.

One of the most important finds of *Homo erectus* is the Turkana boy, also called Nariokotome boy, who was found in 1984 by a team led by R. Leakey and A. Walker in Nariokotome, Kenya.

The Turkana boy was about 11 years old when he died 1.6 million years ago. It is the most complete early human skeleton ever discovered. He was 168 cm tall, and if he had been allowed to grow up, he would probably have been 183 cm.



Homo Erectus used fire. Photo Quora.

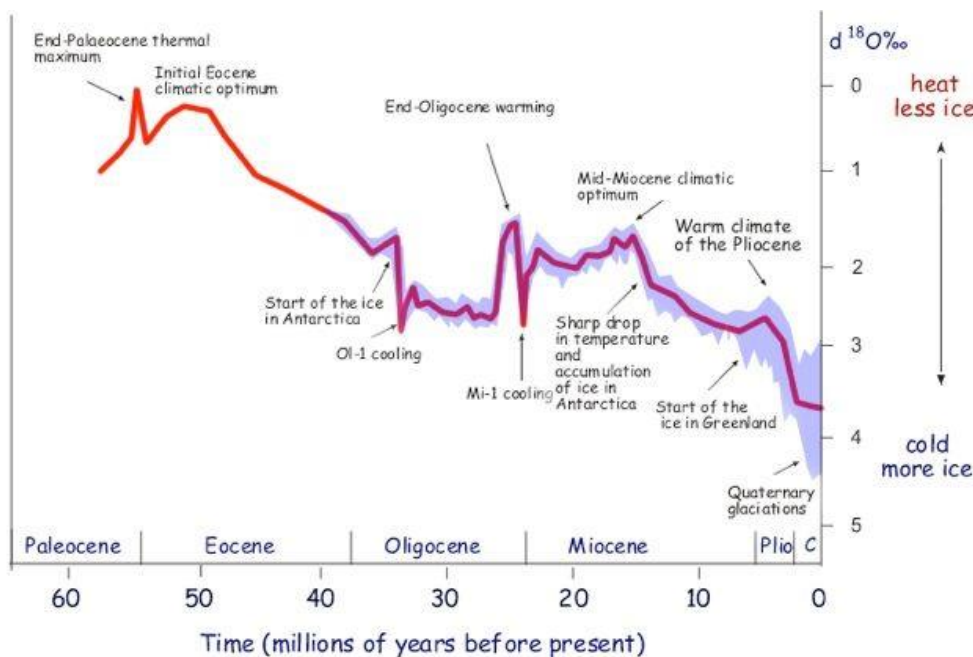
His brain volume was 880 cm³, and if he had grown up, it would have been maybe 909 cm³.

Homo erectus learned how to improve the tools that their ancestors, Homo habilis, had made. Homo erectus lived in caves, and they were the first humans, who utilized fire.

Homo erectus migrated from Africa and populated the rest of the world; both the Java man and Peking man is classified as Homo

erectus.

2.6 Planet Earth's Temperature



Anton Uriarte in his "Earth's Climate History" wisely chose not to put absolute temperatures on his graph, which shows Earth's temperature in the Tertiary as a function of time. The vertical scale represents the abundance of the heavy oxygen isotope in samples taken from strata from the relevant periods.

2.7 Literature

Earth's Climate History (Kindle Edition) by Anton Uriarte.

[Paleocene mammals of the world](#)

[Tertiary Period Britannica](#)

[Heinrich Harder Wikimedia Commons](#)

Preceding section: [1. Denmark's History - 1.0 Cretaceous](#)

Subsequent section: [3. Denmark's History - 3.0 Pleistocene](#)

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