
UNIT 9 ARCHAIC *HOMO SAPIENS**

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Learning Objectives

After reading this unit, you will have an understanding of:

- climatic conditions in the Middle Pleistocene period;
- distribution of fossils which are labelled as Archaic *H. sapiens*;
- how Archaic *H. sapiens* is different from both *H. erectus* and *H. sapiens* anatomically;
- the cultural behaviour such as tool technology, subsistence strategy and campsites of Archaic *H. sapiens*; and
- taxonomic and phylogeny issues concerning Archaic *H. sapiens*.

9.0 INTRODUCTION

Every living being on earth is related to every other living being. However, if we go back far in time we will find that we all had a common ancestor. This principle of evolution is applicable to the origin of human beings also. If we look back in time we will find that our ancestors resembled us and must have looked the way we look today. This is exactly we would expect in an evolutionary process. However, what we were in the earlier is recorded in the fossils which give us the glimpse of our evolutionary past. It is now well established that only one living species of humans exist i.e. *Homo sapiens* (*H. sapiens*) today but millions of years ago many species of homo genus were present as discovered from the fossil evidence. One out of many was *Homo erectus* which is considered as the possible ancestor of all the later hominin species but its linkage with modern human is still sketchy as there are other intermediary forms that showed similarities both with the *H. erectus* on one hand and modern *H. sapiens* on the other. These species which represents the transition from *H. erectus* towards the line of *H. sapiens* are popularly labelled as Archaic *H. sapiens* or advanced *H.*

erectus or pre-modern humans. The distinct feature that places archaic *H. sapiens* close to modern *Homo sapiens* is their large brain size. However, their large and heavy facial skeletons place these hominin closer to *H. erectus*.

The fossil records of archaic *H. sapiens* are found during Middle Pleistocene that lasted from 800,000 to 150,000 years ago. Their records have been unearthed from Africa, Europe and Asia which clearly exhibits their similarities with *H. sapiens* with respect to cranial capacity and distinction from *H. sapiens* in terms of cranial facial anatomical features. In this unit, we will be discussing them in detail.

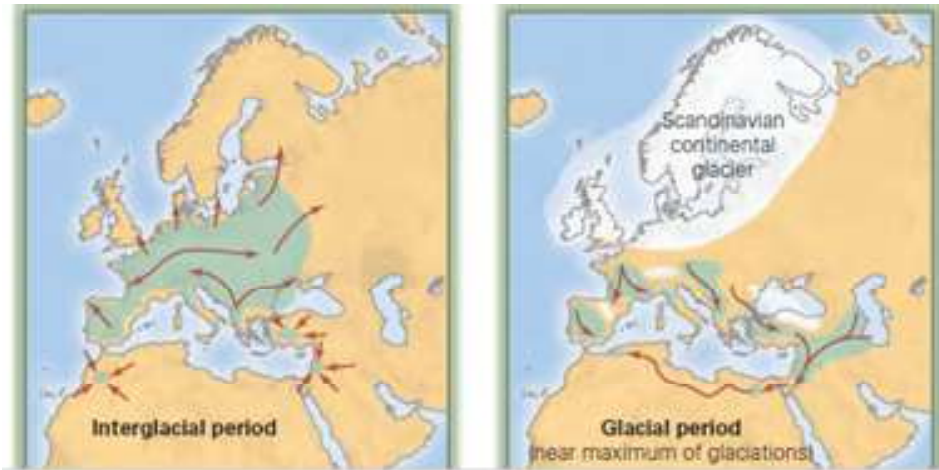
9.1 TIME AND TEMPERATURE IN MIDDLE PLEISTOCENE PERIOD

The fossils remain of Archaic *H. sapiens* are confined to the Pleistocene time especially during the middle and late part of Pleistocene epoch. The middle Pleistocene which began around 800,000 to 125,000 years ago and late Pleistocene, a period beginning 125,000 and ending approximately 10,000 years ago is marked by harsh climatic conditions and is popularly known as the ice age. This time period is marked by the frequent glaciations during which thick sheet of ice covered much of Europe, Asia, North America and Antarctica. The glaciations period was not continuous rather interpreted in between by warmer climatic condition and melting up of ice sheets known as an interglacial period. Corresponding to the glaciations period in the northern hemisphere, the south part of the world experienced a shift in rainfall patterns. The south during glaciations became a rider while during inter-glaciations rainfall increased. This fluctuation in rainfall patterns are termed as pluviation and inter pluviation.

Understanding of these periodic geo-climatic shifts is imported from the point of that these conditions affected the availability of the food as well as opening, creating and closing of migration routes. Overall it affected the dispersion of early hominin in the old world especially. For example, during the glacial period, much of Western Europe would have been cut off from the rest of Eurasia and reconnected during the interglacial period. Similarly, in Africa during glacial periods the Sahara Desert expanded, blocking migration in and out of sub-Saharan Africa (Lahr and Foley, 1998).



a. In Africa



b. In Eurasia

Fig. 1: Changing Middle Pleistocene environment a. In Africa b. In Eurasia. Distribution
Source: R. Jurmain, Essentials of Physical Anthropology, 2009

9.2 DISTRIBUTION OF FOSSILS

H. erectus was one of the first hominid species that moved out of Africa and migrated to Europe and Asia. These successors of *H. erectus* were also widely distributed and their fossils have been unearthed from Europe, Asia and Africa (Figure 2). Whereas in Africa and Asia these hominids either coexisted with or replaced the earlier forms, in Europe, they extended their geographical range and occupied new terrains. We will study the Archaic *H. Sapiens* remains from all the three continents.



Fig. 2: Location of Major H.heidelbergensis sites

Source: Relethford J, The Human Species: An Introduction to Biological Anthropology, 2010

9.2.1 European Archaic *H. sapiens*

The formal name *Homo heidelbergensis* (*H. heidelbergensis*) of archaic *H. sapiens* was derived from the discovery of a mandible in 1907 near the village Mauer, close to the Heidelberg, Germany. It was the first discovery of archaic *H. sapiens* and therefore surrounded by scepticism to place it under which taxon. The jaw was quite different from the established taxa from that time. It could not be placed under *H. sapiens* in being robust and lacking chin, feature very unlikely of modern man. Its classification under *H. erectus* was also debated due to two reasons. First, *H. erectus* fossils itself were in its initial stages discovery and it was not a generally accepted taxon and secondly the mandible showed the difference with *H. erectus* mandible. Therefore, the Mauer mandible was given the status of new hominin species *H. heidelbergensis*. Even a decade later when *H. erectus* became an established taxon in the human evolutionary history it was seen that the feature of *H. heidelbergensis* were quite different from *H. erectus*.



Fig. 3: The mandible from Mauer, Heidelberg, Germany

Source: Stein and Rowe, Physical Anthropology 1974

Apart from Heidelberg fossils, another interesting discovery of *H. heidelbergensis* comes from Atapuerca, Spain. The site which is about 500,000 to 600,000 year old unearthed the fossils of approximately 28 individuals of different age groups (Arsuaga et al., 1997) from a cave site called as *Sima de los Huesos*, literally meaning “pit of bones”. Rightmire (1998) has suggested that these fossils represent the earliest well-dated remains of *H. heidelbergensis* from Europe. The postcranial remains from this sites and another site from Europe such as tibia bone from



Fig. 4: Skeletal remains from Atapuerca, Spain

Source Stanford Craig et al, Biological Anthropology: The Natural History of Humankind, 2017

Boxgrove, England indicate that archaic *H. sapiens* were robust and heavily built with strong muscle marking, large joint surface area and broad pelvis. Another important feature of these fossils were their crania facial similarities with *Neanderthal* fossils such as double arched brow ridges and forward projection of the middle facial region, receding cheekbones which compels the experts to

believe that in Europe archaic *H. sapiens* may be directly ancestral to late Pleistocene *Neanderthals*.

Many and more complete *H. heidelbergensis* fossils have been found throughout Europe such as finds from Petralona (Greece), Steinheim (Germany), Arago (France), Swanscombe and Boxgrove, (England) and other sites from Atapuerca (Spain).

9.2.2 African Archaic *H. sapiens*

Many African sites have yielded *H. heidelbergensis* fossils. However, two sites need important mention here. One is Kabwe, Zambia in broken hill limestone mines and other is Bodo, Ethiopia. Kabwe finds include a complete cranium and other cranial and postcranial remains. The site which is 600,000-125,000-year old yielded remains may be 300,000-year-old showing mixture of *H. erectus* and *H. sapiens* features. The Kawabe finds are also called as a Rhodesian man on the name of Rhodesia which is now called Zambia.

Unlike European forms the Kabwe cranium had massive brow-ridge, probably the thickest of any known Pleistocene hominin discovered so far. Similar to Kabwe cranium, eight other craniums from the sites of Lake Ndotu in Tanzania, Sale' from Morocco, Florisbad and Elandsfontein in South Africa, Laetoli in Tanzania, and Bodo in Ethiopia were discovered.

The cranium from Bodo is also of special interest. It represents one of the oldest specimens of *H. heidelbergensis* approximately 600,000-year-old from the African continent. Another interesting feature associated with the Bodo cranium is the presence of cut marks, similar to that seen in butchered animal bones. Researchers have hypothesized that the Bodo individual was probably defleshed by other hominids may be for ritual or cannibalism, the reason not clear. In any case, this is the earliest evidence of deliberate bone processing of hominin by hominin (White, 1986).

The African archaic *H. sapiens* from various sites share similar craniofacial features with many European forms except the one from *Sima de los Huesos*, Spain hominin which is believed to be in the line of *Neanderthal* lineage.



Fig. 5: The Kabwe skull with a thick supraorbital torus (left) and Bodo Cranium with cut marks (right).

Source: Stanford Craig et al., Biological Anthropology: The Natural History of Humankind, 2017

Check Your Progress

- 1) What are the major climatic shifts that occurred during the Middle Pleistocene? What is the role of these geo-climatic fluctuations in human evolution?

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- 2) Why archaic *H. sapiens* is designated as *H. heidelbergensis*?

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- 3) Why the discovery of archaic *H. sapiens* from Atapureca, Spain is considered significant?

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9.2.3 Asian Archaic *H. sapiens*

The best known *H. heidelbergensis* fossils from Asia are mainly from China. Like their European and African counterparts, the Chinese fossils display both modern and ancestral features. The 200,000 to 100,000 year-old cranium from Dali in Shaanxi province is considered as one of the best evidence of archaic *H. sapiens* in Asia. Similarly, the partial skeleton from Jinniushan in northeast China which has been estimated to be 200,000 years old is interpreted as a possible ancestor of earlier Chinese *H. sapiens* and most likely to be the variant of *H. heidelbergensis* in Asia (Rightmire, 2004). Other discoveries from China includes a cranium dated 280,000 and 240,000 from Lontandong Cave, Hexian County which was the first to be discovered in eastern or south-eastern China. Two fossil skulls, recovered in Yunxian, China, are considered to be 350,000 years old or younger based on the analysis of other fossil animals. From the Indian subcontinent, the remains of AHS come from Narmada valley. Earlier classified as *H. erectus*, the cranium is later classified as archaic *H. sapiens* based on a mosaic of features (Kenedy et al., 1991). The taxonomic placement and dating of the Asian archaic *H. sapiens* fossils are still contested.



Fig. 6: Archaic *H. sapiens* from Dali, China

Source: Stanford Craig et al., Biological Anthropology: The Natural History of Humankind, 2017) and from Jinniushan. (Jurmain, R et al. Essentials of Physical Anthropology, 2009)

Check Your Progress

4) List the major evidences of archaic *H. sapiens* from Old world?

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5) Explain the significance of Bodo cranium from Ethiopia.

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9.3 ANATOMICAL FEATURES OF ARCHAIC *H. SAPIENS*

Archaic *H. sapiens* show diversity of anatomical features just like the present-day human population, however, there are some common trends which can be seen among all the fossil remains discovered from Europe, Asia and Africa. The group differs consistently from its predecessor *H. erectus* and its successor *H. sapiens*. Unlike *H. erectus*, archaic *H sapiens* had large brain size with a cranial capacity between 1100-1400 cc, almost the cranial capacity of modern *H. sapiens*. Their cranium was parallel sided, dolichocephalic with the less angular back of the skull, that is occipital bone and overall relatively rounded braincase which means that maximum cranial breadth is higher up on the sides. The facial skeleton was also less prognathic with arching and separate brow ridges instead of straight

and continuous like *H. erectus*. Despite these features, the Archaic *H. sapiens* exhibits several *H. erectus* characteristics such as the low arching forehead, projected brow ridges, large and robust face with thick cranial vaults.

Compared to modern *H. sapiens*, Archaic *H. sapiens* retained robust skull with the heavy supraorbital ridge, wide nasal aperture and lower cranial vaults but not as low as seen in *H. erectus*. With a large face, they had large teeth. But their large brain size, relatively less prognathic face, the absence of sagittal keel shows more progressive changes in them. Overall the anatomy of Archaic *H. sapiens* displays mosaic in many features between *H. erectus* and *H. sapiens*.

Table 1. Comparisons between *H. erectus*, *H. heidelbergensis* and *H. sapiens*

Sl. No.	Anatomical Features	<i>H. erectus</i>	<i>H. heidelbergensis</i> / Archaic <i>H. sapiens</i>	<i>H. sapiens</i>
1	Forehead	Low, flat	Arching	Vertical
2	Cranial Capacity (Average)	900cc	1200cc	1400 cc
3	Supraorbital ridges	Prominent as a bar and continuous	Prominent but separate	Slight and separate
4	Occipital	Angular	Less angular and relatively round	Round
5	Facial Skeletal	Large	Large	Small
6	Post orbital constriction	Pronounced	Less	Minor
7	Nasal aperture	Wide	Wide	Narrow
8	Occipital bone	Angular	Less angular and more round	Round
9	Teeth	Large	Large	Small
10	Sagittal keel	Present	Absent	Absent
11	Widest point in the cranium	Low on braincase	Relatively high on the braincase	High on braincase

Check Your Progress

6) From which region of India *H. heidelbergensis* was discovered. And why do researches debate over its status?

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7) Why *H. heidelbergensis* is considered a transitional stage between *H. erectus* and *H. sapiens*?

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9.4 PHYLOGENETIC RELATIONSHIP AND TAXONOMIC ISSUES OF ARCHAIC *H. SAPIENS*

Labelling Archaic *H. sapiens* as *H. heidelbergensis* for a group of hominins who lived about 800,000 -150,000 years ago to represent an intermediary stage between *H. erectus* and *H. sapiens* is debated on various grounds. The researcher while classifying a species follow two perspectives; a lumpers perspective who focus more on similarities and tries to club the species. This principle is also known as anagenesis or a splitter's perspective who tries to separate species on the basis of disparities of features. This principle is referred to as cladogenesis. In *H. heidelbergensis* case many scholars believe their features are not so profound enough to give them a status of separate species rather they view *H. heidelbergensis* as an evolutionary stage within a lineage towards *H. Sapiens*. In other words, it means to classify all the larger-brained species of the last half of Pleistocene as part of single evolving species and part of the continuous evolutionary process and designating all with informal terminology Archaic *H. sapiens*.

The cladogenic view, on the other hand, classifies *H. heidelbergensis* as distinct species from both *H. erectus* and *H. sapiens* based on the anatomical characteristics we discussed above. Interestingly in Europe, particularly Pertralona from Greece and *Sima de los Huesos* from Spain remains are seen as *Proto-Neanderthals*. Some have also suggested classifying Atapuerca Gran Dolina fossils from Spain as *H. antecessor* (Bermudez de Castro et al. 2004). None of the middle Pleistocene findings from Africa shows similarities with *Neanderthals* as in case of Europe hence in Africa, particularly Bodo and Kabwe are considered as an ancestral form of modern *H. sapiens*.

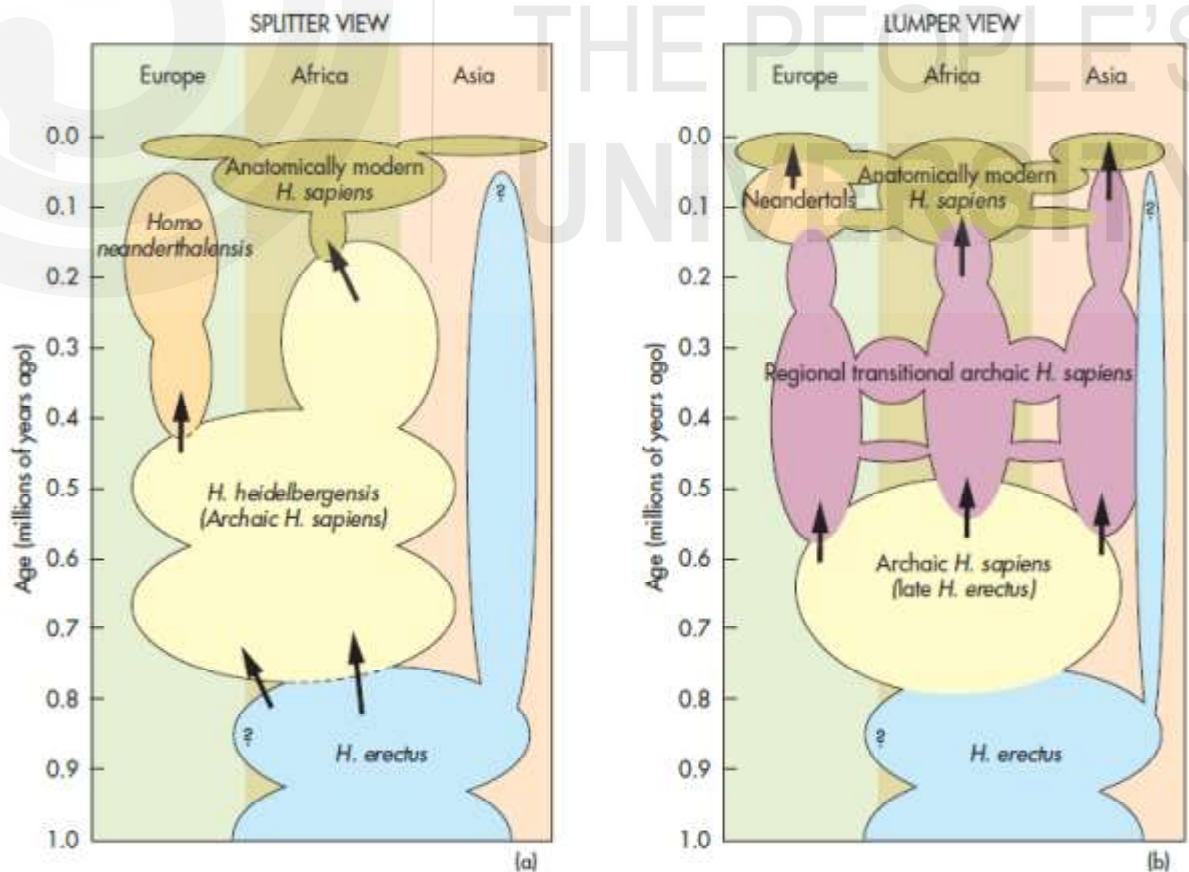


Fig. 7: The cladogenic (splitter) and anagenesis (lumper) view on the phylogenetic relationships between *H. heidelbergensis* aka Archaic *H. Sapiens*, *Neanderthals* and modern *H. sapiens*

Source: Stanford Craig et al., Biological Anthropology: The Natural History of Humankind, 2017

9.5 CULTURAL BEHAVIOR OF ARCHAIC *H. SAPIENS*

Middle Pleistocene period is not a conducive period for the preservation of fossils because of the fluctuations in climatic conditions as we discussed earlier in this unit. Thus, the tangible cultural remains associated with Archaic *H. sapiens* are scarce making reconstruction of their behaviour difficult. In addition, the relatively large brain size of Archaic *H. sapiens* develops a bias in judging the behaviour of Archaic *H. sapiens* similar to that of modern *H. sapiens*. Nonetheless, limited material cultural remain excavated at many sites gave us a glimpse of their tool technology and behaviour.

9.5.1 Stone tools

The Middle Palaeolithic stone tool industry is characterized by prepared core technology whereby the original core is modified by successive strikes for removing flakes till the flake of desired size and shape is attained. The main tool which is thus obtained is called a Mousterian point and technique is known as Levallois technique. In addition to prepared cores, the Middle Palaeolithic industry is also full of tools prepared by soft hammer technique using bone, antler, and soft stone to remove flakes. In addition, the Lower Paleolithic Oldowan and Acheulean industries still continue with sophistication.

The significance of Middle Palaeolithic culture is that it displays the increased cognitive ability and abstract thinking calibre of hominin in designing flakes with predictable size and shape. This acumen in designing tools may be the consequence of large brain size of *H. heidelbergensis*. These tools were also efficient by having more cutting surface hence better utility in scraping.

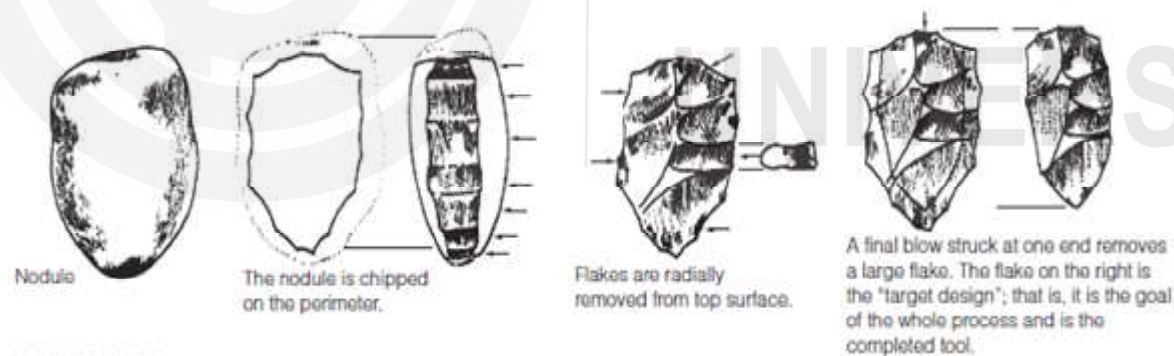


Fig. 8. The Levallois technique.

Source: Jurmain, R et al. Essentials of Physical Anthropology, 2009

Though no direct evidence of Archaic *H. sapiens* using bone or wooden tools or involvement in big game hunting has been found, but artifacts such as wooden spears and flake tools along with butchered remains of ten horses from Schoeningen, Germany may indicate the possibility of big game hunting by Middle Pleistocene hominin. Similar findings were found from Boxgrove, England where animal bones along with mostly hand axes were excavated. This evidence points out that Archaic *H. sapiens* were efficient tool makers and users who were also capable of bringing down a large game. This indirectly reflects their cooperative behaviour which is much needed for big game hunting as one of their subsistence strategies.

Indirect evidence of Archaic *H. Sapiens* using fire is also claimed based ash deposits and charred bones from a number of sites from France, Germany and Hungary (Klein, 1999). From Africa and Asia particularly China such claims are not convincing.

The evidence for Archaic *H. sapiens* campsite, home base, postholes which are used to reconstruct their lifestyle is also rare. However, the most detailed reconstruction of the life of Middle Pleistocene comes from the Tera Amata site in France (de Lumley and de Lumley, 1973). The site provides evidence for seasonal migration, small to big game hunting and exploiting marine life. However, this interpretation is not well accepted keeping in view the random scatter of bone and stone remains (Stinger and Gamble, 1993).

Check Your Progress

8) Do you agree the *H. heidelbergensis* should be referred to as separate *homo* speices?

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9) Which tool and technology is the hallmark of middle Palaeolithic stone culture?

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10) Do you agree that large brain size resulted in the development of sophisticated tool culture?

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9.6 SUMMARY

The middle Pleistocene time period is marked by harsh climatic conditions and is popularly known as an ice age in Northern hemisphere and fluctuations in rainfall pattern in Southern hemisphere. These oscillating climatic conditions

not only affected the availability of food but also lead to an opening, creating and closing of migration routes thus affected the dispersion of early hominin as recorded by their footprints in the form of fossils and associated material cultural remains from Asia, Africa and Europe.

The middle Pleistocene period also marks the evolution of intermediate species formally known as *H. heidelbergensis* and popularly Archaic *H. sapiens*. The species is designated as transitional form as it displays the mosaic of features of both *H. sapiens* and *H. erectus*. Their large brain size and changes in craniofacial anatomy are features in the line of modern *H. sapiens*. On the other hand, their large, robust and thick craniofacial anatomy reflects its link with the *H. erectus*.

Their behaviour as reconstructed from their cultural remains reflect *H. heidelbergensis* as the user of both middle stone age tools characterized by the Levallois technique as well as Lower Paleolithic Oldowan and Acheulean. Bone tools are also known from this time period and it is also a possibility that *H. heidelbergensis* was involved in big game hunting.

Taxonomic position of *H. heidelbergensis* fossils is also debated. Fossils from Africa and Europe resemble each other more than they do with the hominids from Asia. Some researchers view Chinese *H. heidelbergensis* as more modern than the contemporary fossils from either Europe or Africa and thus consider the *H. heidelbergensis* from China especially the Jinniushan remains as early members of *H. sapiens*. Other researchers (Rightmire, 1998) suggest that they represent regional variants of *H. heidelbergensis*.

In Africa, *H. heidelbergensis* is hypothesized to have evolved into modern *H. sapiens*. However, in Europe, it is believed that *H. heidelbergensis* evolved into *Neanderthals*. Meanwhile, the Chinese premodern populations may all have met with extinction.

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9.8 ANSWERS TO CHECK YOUR PROGRESS

- 1) Corresponding to the glaciations period in the northern hemisphere, the south part of the world experienced a shift in rainfall patterns. The south during glaciations became a rider while during inter-glaciations rainfall increased. This fluctuation in rainfall patterns affected the availability of the food as well as opening, creating and closing of migration routes. For further details refer to section 9.1
- 2) The name *H. heidelbergensis* is based on the first discovery of the archaic *H. sapiens* from the Village Mauer, near Heidelberg, Germany. Refer to section 9.2.1
- 3) The proto *Neanderthal* features of the remains from Atapuerca, Spain is the reason for the importance of the site. Refer to section 9.2.1
- 4) The fossils of archaic *H. sapiens* have been discovered from Europe, Africa and Asia. For further details refer to section 9.2
- 5) Bodo cranium represents one of the oldest specimens of *H. heidelbergensis* approximately 600,000-year-old from the African continent and it also represents the earliest evidence of deliberate bone processing of hominin by hominin. For further details refer to section 9.2.2

- 6) The remains of Archaic *H. sapiens* were recovered from come from Narmada valley. Earlier classified as *H. erectus* the cranium is later classified as archaic *H. sapiens* based on a mosaic of features. For further details refer to section 9.2.3
- 7) *H. heidelbergensis* is considered a transitional stage between *Homo erectus* and *Homo sapiens* because it shares various anatomical features with both of them. For further details refer to section 9.3
- 8) There are different views regarding the taxonomic position of *H. heidelbergensis*. One group of Scholars prefers to consider *H. heidelbergensis* as a part of common *Homo.* lineage because of its large brain size whereas others place it as separate hominin species. For further details refer to section 9.4
- 9) Mousterian points and Levallois technique is the hallmark of middle Palaeolithic stone culture. For further details refer to section 9.4
- 10) Yes. The increased cognitive ability and abstract thinking calibre of hominin significantly helped in designing flakes with predictable size and shape. For further details refer to section 9.5



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