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WITH THE COMPLIMENTS OF:

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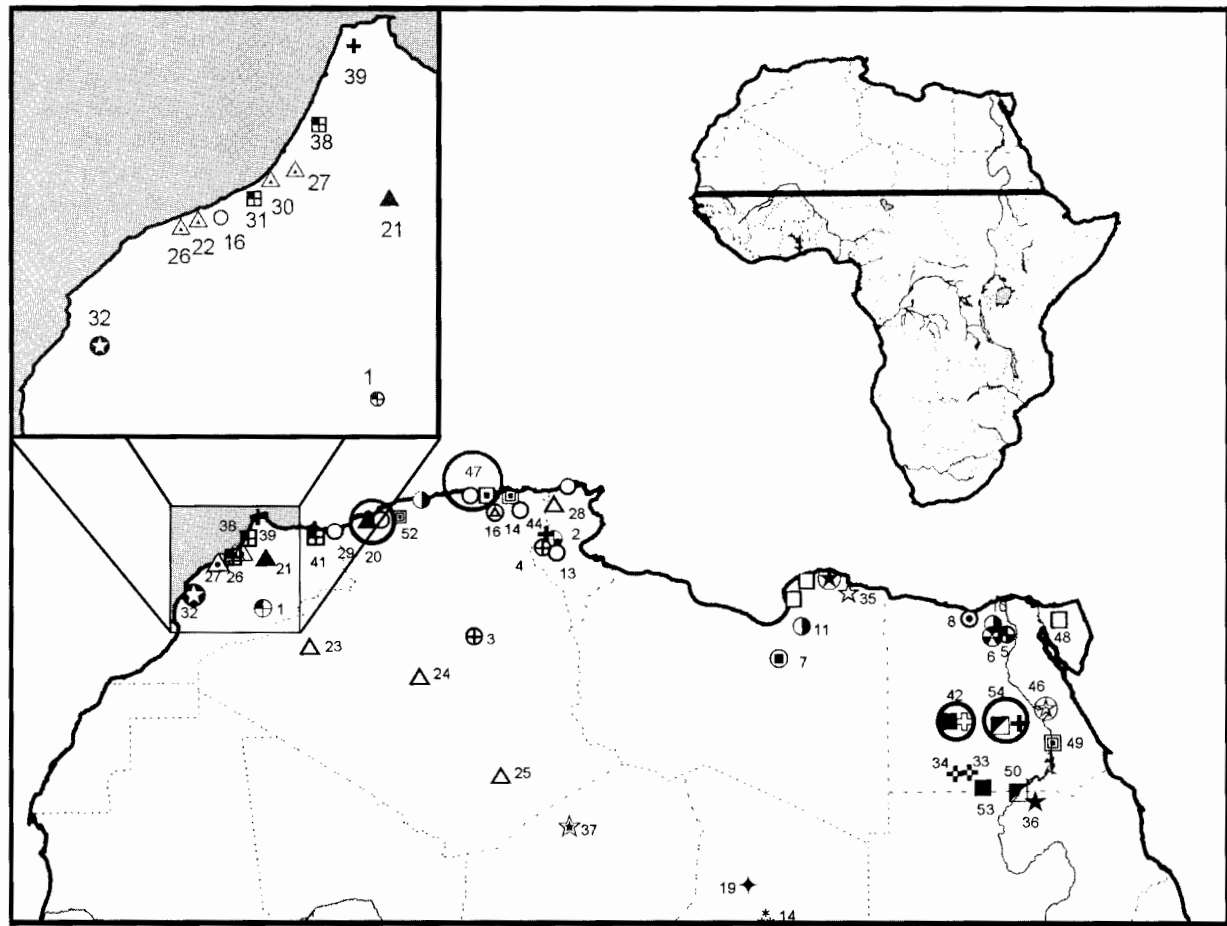
Africa, North

The northern part of Africa begins at the edge of the Sahel grasslands, along a line that closely follows the 15° N parallel from Dakar to Asmara. This region of Africa includes a narrow zone of Mediterranean ecology on the Mediterranean coast from Casablanca to Tunis, historically known as the Maghreb, and a continuation of arable drylands along the coast of Libya in Tripolitania and Cyrenaica. An interior band of brushy steppe and mountaintop deciduous forests in the high Atlas is known as the Rif. South of this is the Sahara, the Earth's largest desert, which extends across the Afro-Arabian continent from Mauritania to the Persian Gulf. In Africa, the Sahara proper also includes the outback of Morocco, Algeria, Libya, and Egypt, and the northern parts of Mali, Niger, and Chad. The Nile Valley and the Red Sea ranges to the east are demarcated as Nubia in southern Egypt and northern Sudan, and Misr (i.e., Egypt proper) in the lower reaches. The definition used here also includes Eritrea and northern Ethiopia. Major mountain ranges of northern Africa include the Atlas fold-belt, the Ahaggar and Tibesti granitic massifs in the southern Sahara, and the rifted highlands along the Red Sea. The only large river system is the Nile, which has been forced to flow north, constrained by rift highlands, since at least the Middle Miocene. Paleoclimatic and archaeological evidence suggests that, during the Pliocene and Pleistocene, periods of higher rainfall (coincident with cold-climate cycles at high latitudes) supported grasslands around the oases and evergreen forests (now a few relict groves) in the Tibesti and Ahaggar.

The Fossil Record

EARLY PRIMATES

North African sites yield nearly all known evidence for pre-Miocene mammalian evolution in Africa, with primate remains that appear to document the endemic origin of the Anthropoidea. The earliest known African primate is the indeterminate euprimate *Altiatlasius* from Adrar Mgorn 1 in the Ourzazate Basin of Algeria, which occurs in coastal-plain strata in association with insectivores (palaeoryctids and other lipotyphlans) indicating Late Paleocene (Thanetian) age, ca. 58–55 Ma. The site of Chambi in Central Tunisia contains the ?cercamoniine adapiform *Djebelemur* in a mammalian assemblage suggestive of later Ypresian (Early Eocene) age. *Algeripithecus* and *Tabelia*, from Glib Zegdou in Algeria, are considered to be of Lutetian or later Middle Eocene (Bartonian) age. These appear to be primitive parapithecids and thus among the earliest anthropoid primates. Some workers, however, arguing on morphological grounds, maintain that this material may be younger, even perhaps co-



- ⊕ Adapiformes
- ⊕ ?Omomyoidea
- ⊕ Parapithecidae
- ⊕ Parapithecidae, Oligopithecidae, Proteopithecus, Pleisopithecus, Adapiformes
- ⊕ Propitopithecidae, Parapithecidae, Tarsiiformes & ?Lorisioidea
- ⊕ Prohylobates & indet. eocatarrhine
- ⊕ Prohylobates
- Cercopithecinae
- Cercopithecinae & Colobinae
- ✱ Australopithecus bahrelghazali
- ⊕ Oldowan & Acheulean
- ◆ Homo cf. erectus
- ▲ Homo ?erectus & Acheulean
- △ Acheulean
- △ Early "archaic Homo sapiens" & Acheulean
- ★ "?Homo sapiens sapiens," Mousterian & "pre-Aurignacian"
- ⊕ Aterian
- ⊕ Aterian & ?Acheulean
- ⊕ Aterian, MSA (& ? Acheulean)
- ★ Aterian &/or Mousterian
- ☆ Mousterian
- ⊕ Early Homo sapiens sapiens? & Mousterian
- ⊕ Homo sapiens ?sapiens & MSA
- ☆ Mousterian, Aterian & Post-Paleolithic
- ⊕ ?Homo sapiens sapiens, Aterian (& Late Paleolithic)
- ⊕ Homo sapiens sapiens & Late Paleolithic
- Late Paleolithic
- ⊕ H. s. sapiens, Late Paleolithic & Post-Paleolithic
- ⊕ Late Paleolithic & Post-Paleolithic
- Post-Paleolithic

Main localities in North Africa yielding fossil primates, hominins, and Paleolithic archaeological remains. Symbols indicate site contents, while numbers represent site names (in approximate chronological order), as follows: 1, Adrar Mgorn 1; 2, Chambi; 3, Glib Zegdou; 4, Nementcha (Bir el Ater); 5, Fayum JQ 1-2 (Eocene); 6, Fayum JQ 3-4 (Oligocene); 7, Gebel Zelten; 8, Wadi Moghara; 9, Menacer (Marceau); 10, Wadi Natrun; 11, Sababi; 12, Garaet Ichkeul; 13, Ain Brimba; 14, Bahr el Ghazal; 15, Ain Jourdel; 16, Abl Al Oughlam; 17, Ain Hanech; 18, Buia; 19, Yayo (Koro-Toro); 20, Tighenif; 21, Ain Maarouf; 22, Sidi Abderrahman (Littorina Cave, Casablanca); 23, Tabelbala; 24, Tachenghit; 25, Tihodaine; 26, Thomas Quarries; 27, Salé; 28, Sidi Zin; 29, Ain Mefta; 30, Mifsud Giudice (Rabat); 31, Temara; 32, Jebel Irhoud; 33, Bir Tarfawi; 34, Bir Sahara; 35, Hajj Creiem; 36, Arkin; 37, Adrar Bous; 38, Dar es Soltane; 39, Mugharet el 'Aliya; 40, Hagfet et Dabba; 41, Taforalt; 42, Dakhla Oasis; 43, Hagfet et Tera; 44, Bir el Ater; 45, Haua Fteah; 46, Taramsa; 47, Tamar Hat; 48, Mushabi; 49, Wadi Kubbaniya, Kom Ombo; 50, Wadi Halfa, Khor Musa; 51, Afalou bou Rhumel; 52, Columnnata; 53, Nabta Playa; 54, Kharga Oasis. Note that 4 & 44 and 5 & 6 are identical sites, separated due to contents.

eval with the earliest faunal levels of the Fayum. *Biretia*, a parapithecoid from Nementcha (Bir el Ater) in Algeria, is poorly dated but is associated with other mammals that are consistent with a level of development equivalent to the lower Late Eocene (Priabonian) Qasr el-Sagha faunas in the Fayum.

Abundant and diverse primate fossils have been collected from the Jebel Qatrani Formation in the Fayum badlands of northern Egypt since 1961 by teams led by E.L. Simons. At least a dozen genera are known from four major faunal zones whose precise age and relationship to the global Eocene-Oligocene boundary are difficult to determine. The lower Jebel Qatrani beds, which conformably overlie the Qasr el-Sagha Formation (Lower Priabonian), seem clearly to belong within the Upper Eocene. The Priabonian, however, is 4.5 Myr in duration, and the age of the upper Jebel Qatrani with regard to the Eocene-Oligocene boundary is not obvious. Preliminary paleomagnetic results, and the appearance of a Fayum-like fauna in association with basal Oligocene marine microfauna in Oman, suggest that the upper two Fayum mammal zones could reasonably be considered to be of Early Oligocene age. The entire sequence would thus date between 37 and 33 Ma.

Rare Fayum remains of lower primates include possible omomyid and ?lorisid teeth, a possible tarsoid (or early anthropoid: *Afrotarsius*), and the distinctive tiny primate *Plesioptithecus*, the only representative of a new catarrhine family. Another rare taxon, *Proteopithecus*, is classified as Anthropoidea, incertae sedis. More abundant are parapithecids, including *Qatrania*, *Arsinoea*, *Serapia*, *Apidium*, and *Parapithecus* (= ? *Simonsius*); the oligopithecids *Catopithecus* and *Oligopithecus*; and the propithecoid *Propithecus* (and *Aegyptopithecus*, considered by some to be a distinct genus). The wide diversity and clear record of anthropoids makes a strong case for the African origin of this group, in contrast to the rare and transitory occurrence of Middle Eocene forms, the anthropoid status of which is still debatable, in Burma and China.

OLD WORLD MONKEYS

North Africa has yielded the earliest well-known cercopithecoid (victoriapithecine) monkey, *Prohylobates*, which is found at the late Early Miocene (c. 17 Ma) site of Jebel Zelten in Libya and in the faunally similar Wadi Moghara beds in Egypt; the genus has also been reported, provisionally, from coeval and ecologically similar sites of northern Kenya. The colobine *Libypithecus* comes from latest Miocene (or earliest Pliocene?) faunas at Wadi Natrun in northern Egypt and Sahabi in Libya, while the nearly indeterminate “?Colobus” *flandrii* is represented by somewhat older teeth from Menacer in Algeria. Macaques (or indeterminate cercopithecines tentatively assigned to that genus) are known from Menacer, Natrun, and a variety of Pliocene and Pleistocene sites (e.g., Garaet Ichkeul, Ain Brimba, Ain Mefta, and Tamar Hat), continuing into the living *M. sylvanus*, or “Barbary ape.” *Theropithecus* is known rarely in the Pliocene of Algeria and Morocco (Ain Jourdel and Ahl Al Oughlam, respectively), and more abundantly at the later Middle Pleistocene archaeological sites of Tighenif in

Algeria and Thomas Quarries in Morocco. Interestingly, none of the scattered Miocene faunas of North Africa contains any representatives of early hominoids or eocartarrhines, except for a partial humerus from Moghara that resembles those of propithecoids or pliopithecoids. By comparison, East African contemporaneous assemblages produce abundant fossils of these taxa, and a kenyapithecine is known from both Namibia and Saudi Arabia, at comparable latitudes.

HUMAN FOSSILS

As yet, the only example of an early hominin from northern Africa is an *Australopithecus*, recently described from Bahr el-Ghazal in the Koro-Toro area of northern Chad in association with a faunal assemblage similar to those from Hadar (Ethiopia), and thus estimated to date between 3.5 and 3 Ma. A partial mandibular symphysis and an isolated tooth were allocated to the new species *A. bahrelghazali*, based on features that seem similar to those of *A. afarensis* in most respects. The incomplete Yayo cranium, recovered in the 1960s from the same general area, is associated with an Early Pleistocene fauna and has been attributed by most paleoanthropologists to early *Homo*, probably *H. erectus*. A skull of similar age and identity dated to ca. 1.0 Ma has also been reported in 1998 by an Italian team in Eritrea. Middle Pleistocene faunas, younger than 1.0 Ma, have been found with *H. erectus* or “archaic *H. sapiens*” remains in Morocco at Salé, the Thomas Quarries, and Sidi Abderrahman (Littorina Cave) near Casablanca and at Tighenif (ex-Ternifine) in Algeria.

Prehistoric sites with hominin fossils assigned to later “archaic *H. sapiens*” (or, in some cases, hesitantly to “early modern *H. sapiens*”) include Rabat (= Kehibat), Mugharet el 'Aliya, Zouhrah Cave, Temara (Smuggler's Cave), and Jebel Irhoud in Morocco; Haua Fteah in Libya; and Singa in Sudan (dated at more than 130 Ka). The majority of these fossils are associated with Levalloiso-Mousterian or Aterian industries and are thought to date between 190 and 90 Ka. These finds may, in toto, represent different developmental stages in the precursors to anatomically modern humans, and, indeed, some researchers see evolutionary continuity in the assemblage of North African premodern *sapiens*.

Sites yielding Late Pleistocene remains assigned to early “anatomically modern *H. sapiens*” include Dar-es-Soltane in Morocco, where very robust cranial material in association with an Aterian industry may predate 40 Ka. Recently, a burial said to be of an anatomically modern adult female was TL-dated to ca. 40 Ka near Taramsa (Egypt), but only a preliminary report has yet been published. Later in time, Tafoult in Morocco, Afalou-Bou-Rhummel, and Columnata in Algeria, and Nazlet Khatt in Egypt have human fossils associated with Late Paleolithic industries. The majority of these are classified as the robust Mechta-Afalou physical type.

Paleolithic Archaeology

The earliest archaeological sites in North Africa belong to the Oldowan (or Mode 1) Industrial Complex, characterized by simple core forms and casually retouched flakes at the site of 'Ain Hanech in northeastern Algeria. Investigations here

over the years have identified an industry of limestone cores, flaked spheroids, and retouched flint flakes. Provisional faunal correlations with East Africa would place this site equivalent to Olduvai Bed II, ca. 1.5 Ma.

North African Acheulean sites with handaxes and/or cleavers include Sidi Abderrahman and Thomas Quarry 2 in Morocco; Tighenif (Ternifine), Tihodaine, Tachenghit, and Tabalbalat in Algeria; Sidi Zin in Tunisia; Arkin in Nubia; and Bir Sahara and Dakhla Oasis in Egypt. At Tabelbala and Tachenghit in Algeria, large side-struck cleaver flakes were produced by an unusual prepared-core (Tachenghit, super-Levallois) technique from a thick, pointed bifacial core. As has been noted previously, *Homo cf. erectus* remains have been found at several of these sites.

The Middle Paleolithic, or Mousterian, of Northeast Africa exhibits some similarities with that of Europe and western Asia, particularly in the relatively high proportion of prepared Levallois cores and flakes detached from such cores. These industries, known as Levallois-Mousterian, are characterized by flake tools such as side scrapers, denticulates, and points. In many sites, however, points with basal trimming and other signs of hafting are considerably more numerous than in most classic Mousterian sites of Europe and southwest Asia. In Nubia, where points are particularly numerous, at least two types of specialized cores were used for their production. In addition, blades made on Levallois cores by working from alternate ends (bipolar platforms) across a flat upper face are a dominant blank type in many Middle Paleolithic sites of this region. With some exceptions, both blade technology and rimmed points are more characteristic of the African Middle Stone Age than of the classic Mousterian of Europe. Well-known sites with this industry include Jebel Irhoud in Morocco; Haua Fteah and Hajj Creim in Libya; and Bir Tarfawi in Egypt. At the Haua Fteah Cave in Libya, an early blade-dominated industry with prismatic cores called the Pre-Aurignacian is found in strata below the Levallois-Mousterian.

In North Africa, particularly in the northwest in eastern Morocco, Algeria, and Tunisia, assemblages called Aterian (after the Algerian site of Bir el Ater) are relatively much more common than earlier industries. The Aterian appears to be a facies of the North African Middle Paleolithic and is characterized by tanged points and other tools; bifacial points are known from some Aterian sites, notably in the eastern and southern areas, such as Bir Tarfawi in Egypt and Adrar Bous in Niger. The emphasis on trimmed and carefully shaped points and the clear indications of hafting distinguish this facies from the classic Mousterian industries of Europe. The Aterian is found stratified above the Levallois-Mousterian at a few sites, including Adrar Bous in Niger and Bir Sahara in Egypt. Other Aterian sites include Tafalalt, el 'Aliya, and Dar-es-Soltane in Morocco. Aterian industries disappear ca. 35 Ka with the onset of extreme aridity in North Africa. Other Middle Paleolithic variants include the Khormusan of the Nile Valley, characterized by blade elements and Middle Paleolithic types of prepared cores and dated older than 40 Ka.

In many parts of North Africa, there is a hiatus in human occupation between 40 and 20 Ka, coinciding with a period of "polar desert" hyperaridity at the climax of the last glacial age.

At the same time, Upper Paleolithic blade industries begin to appear in some parts of the North African coast and the Nile Valley, indicating that populations were shifting to the areas where water is found today. The Dabban complex, from sites such as Hagfet et Dabba and Haua Fteah in Libya, represent such an early Late Paleolithic industry in coastal areas; in the Nile Valley, Mousterian industries are replaced by Late Paleolithic industries beginning before 40 Ka with significant regional variability, including the Khormusan, characterized by blade elements and Middle Paleolithic types of prepared cores, and the Halfan, which began ca. 23 Ka with small blade industries in Wadi Halfa and other sites. At the Wadi Kubaniya in Egypt, Late Paleolithic populations dated to ca. 17 Ka used grindstones to process wild tubers and possibly wild cereal crops. Perhaps the most extraordinary site in the later Pleistocene Nile Valley is Nazlet Khater, where early Late Paleolithic mining for flint was carried out at ca. 40 Ka using picks to open up underground shafts and tunnels and then wooden props to support the mine roof. Ca. 15 Ka, a distinctive group of industries known as the Iberomaurusian, or Oranian, is found at Haua Fteah and other sites. These industries are characterized by smaller elements, especially backed bladelets. Well-known Iberomaurusian sites include Haua Fteah and Hagfet et Tera in Libya; Afalou bou Rhummel, Columnata, and Tamar Hat in Algeria; and Tafalalt in Morocco. Large cemeteries with robust Mecha-Afalou populations are known from Afalou bou Rhummel, Columnata, and Tafalalt.

Early Food Production in North Africa

At ca. 11 Ka, at the very beginning of postglacial time, a period of relatively wet climates began in North Africa. Some of the most desolate interior basins of the Sahara developed lakes, surrounded with open savannah and steppe vegetation. Lake Chad, for instance, expanded to cover an area of 1,100 km × 680 km, ca. 10 times its current size. In these areas, as well as along the Nile and in the nearby oases, groups of fisher-hunters with a distinctive tool kit involving bone harpoons, net or digging-stick weights, grindstones, mud-walled construction, and microlithic arrowheads spread out widely. By 8 Ka or even earlier in some regions, a distinctive pottery decorated with wavy lines was in common use, the world's second-oldest ceramics after Japanese Jomon sites.

Scholars have considered that the typical plants and animals exploited by modern North African farmers (e.g., wheat, barley, sheep, goats, and cattle) were introduced in their domesticated form from outside the continent, most likely from southwestern Asia. Evidence from Egypt and the Sahara, however, suggests that a degree of indigenous African domestication may have preceded the introduction of Eurasian domesticates. In particular, the evidence from Nabta Playa in the western desert of Egypt indicates that semisedentary populations were living there before 8 Ka and that they were collecting and storing wild sorghum with a possible selective effect in the direction of domestication. Furthermore, the predominance of cattle bones among the bones of gazelles and other animals adapted to semiarid savannah suggests that cattle were probably being kept or wa-

tered by humans, and thus the initial conditions of domestication were satisfied. Mitochondrial DNA studies confirm that African and Eurasian domestic cattle belong to separate races whose split predates the earliest possible dates for domestication in either region. On the other side of the Sahara, at Adrar Bous in northern Niger, the skeleton of a domestic short-horned ox was recovered from a relatively early context, dating to ca. 6.5 Ka.

Throughout the Sahara, rock paintings of variegated cattle and wild game attest to the lifeways of pastoralists. Although attempts have been made to date the paintings on stylistic grounds, their age remains uncertain. Their existence, however, is testimony to a way of life that disappeared some time close to 6 Ka, when the Sahara again began to dry up and settlements were once more concentrated on the permanent rivers and oases. In the Nile Valley, the increased intensity of settlement and the apparent cultural diversity reflected in the remains found at different oasis localities led initially to the formation of small states or chiefdoms. Agriculture and the specialized production of luxury goods (e.g., pottery and stone bowls) for export subsequently led to the establishment of thriving manufacturing towns (e.g., Hierakonpolis) and to the development of a trading class and the written signs of ownership similar to hieroglyphs in both Upper Egypt and Nubia. Ideas and goods entered Egypt via the Mediterranean littoral from the north and east, as well as from the south along the Nile corridor. By ca. 5.1 Ka, one of the most important of the southern states, whose symbol was the red crown of upper Egypt, had conquered the others and established the first Egyptian dynasty.

See also Adapiformes; Africa; Africa, East; Anthropoidea; Asia, Western; Aterian; Australopithecus; Bone Tools; Cattarrhini; Cercopithecidae; Cercopithecinae; Colobinae; Domestication; Early Paleolithic; Fayum; Hominoidea; Homo; Late Paleolithic; Mesolithic; Middle Paleolithic; Neolithic; Oligopithecidae; Paleolithic; Parapithecidae; Propithecidae; Victoriapithecinae; Yayo. [N.T., K.S., A.S.B., J.A.V.C., E.D.]

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