EARLY HOMINID EXPANSION INTO EURASIA:
BIOGEOGRAPHICAL AND ECOLOGICAL ISSUES

ABSTRACT: Early Pleistocene hominid expansion beyond Subsaharan Africa is discussed with reference to varying and habitat conditions, environmental change, natural obstacles, and probable dispersal routes throughout Eurasia, and to concepts from historical zoogeography. The oldest securely identified and dated anthropic evidence points to a 1.4 my date, coinciding with Homo erectus and a mode 3 (Acheulian, Non-Acheulian) repertoire. Hominids followed natural dispersal routes along the subtropical and tropical zones of Asia, then into the Far East and Central Asia, adapting to characteristics characteristic of these regions. They may have colonized Europe directly out of Africa by crossing the Gibraltar Strait.

KEY WORDS: Biogeography - Faunal regions - Dispersal routes - Ancient hominids - Early Pleistocene - Endemism - Biomes - Mode 2 technology - Landbridges - Glacio-eustatic sea levels - Anthropic evidence - "Long" and "short" chronologies

The initial hominin colonization of Eurasia was momentous, doubling eventually that primate species' realm, involving adaptation to diverse and unfamiliar biomes. Few surveys cover this theme comprehensively e.g. Bostinski (1992) or in aspects (Turner 1982) other than toolmaking or chronology. We review issues relating to the biogeographic and ecological frameworks of Eurasia's first settlement, and how the anthropic record articulates with it.

CONCEPTS

Hominids originated as members of the Ethiopian faunal region evolved sonically in semi-arid tropical savanna/bushland habitats. Biogeographic concepts apply to ancient humans (Rolland 1996), providing insights about how they overcame physical, climatic or ecological barriers during the Pleistocene, after dispersing beyond their Subsaharan cradle. Dispersal probabilities include corridors of movements across environments presenting few impediments, filters, involving more obstacles, and sweepstakes routes where barriers restrict emigrations to few species. The dominant geomorphological structure of Eurasia consists of a network of West to East trending high altitude mountains and plateaux ranges. This factor, along with a diversity of biomeclimatic conditions, from tropical and subtropical to temperate and boreal, along with sharp variations in seasonal temperatures and daylight durations confronted human populations expanding into this landmass.

Human/animal/plant relationships varied according to hominid omnivorous aptitudes, and already developed technological, organisational and cognitive repertoires. Subsistence scheduling had to shift from broad-spectrum to specialized exploitation patterns, with increased reliance on animal proteins and fats in temperate and boreal zones.
ANTecedents

Zoological and palaeontological evidence testify that Africa remained a major mammalian evolution centre and reservoir for emergent species. The Mi-Pliocene witnessed the emergence of anthropoids in increasingly open environments, especially in Africa East, the focus for anthropogenesis, which was followed by successive biocultural formative stages and adaptive radiation episodes among Australopithes and early Homo. Toolmaking began by 2.5 my (Kada Gona, Ormo Valley), expressed by the Oldowan or mode 1 Complex (Koobi Fora, Olduvai), coinciding with increased carnivorous propensities. Homo erectus appears by 1.7 my. Toolmaking developed into Acheulian or mode 2 large cutting tool assemblages by 1.5 my (Penny, Olduvai).

East Central Africa's unusually rich ungulate diversity and biomass, It seems obvious that when, between 1.6 and 1.8 my, the landscape was changing, and the environment became more open, the animals were moving away from the mountains and into the plains, probably driven by the changing climate. This led to the development of new habitats and the expansion of species ranges.

TROPICAL ASIA

This narrow portion of the Indo-Pacific region, characterized by the presence of semi-arid biomes to the west, becoming progressively more humid and oceanic to the East, belongs entirely to the Oriental faunal realm.

The Indian subcontinent

This vast area offered incoming hominin immigrants a series of suitable habitats, facilitating their spread across the subcontinent. The Adult finds in the Indian subcontinent, characterized by the presence of semi-arid biomes to the west, becoming progressively more humid and oceanic to the East, belongs entirely to the Oriental faunal realm.

Beyond the Levant

These regions' deficiency in direct evidence is due to lack of research. Population movements beyond the Levant could spread in several directions: Northwest along Anatolian coastal plain up to the southern Taurus, a barrier whose effectiveness could have been mitigated by the long-lasting faunal endemism, and with probing into southern Central Taurus intermontane areas, e.g. Dersulu, of late Matuyama age; Northeast following the Fertile Crescent foothills and Assyrian steppe barrier, then down the Zab and Persian gorges, towards the Upper Tigris and Euphrates Delta, further on along Iran's coastal plain (broadened during Pleistocene marine regressions) up to the gates of the Indian subcontinent.

Dispersals directly into the Anatolian and Iranian plateaus would meet with the Taurus, Armenian Knot and Zagros barriers, major obstacles to hominin migrations. The area east of the Taurus would be more open, allowing easier access, particularly during the Pleistocene (1.8 my) when the climate was drier and vegetation was more open. The area would be suitable for hominin settlement, with the potential for the development of new technologies and cultural innovations.

Many of the early hominins found their way into the Middle East, spreading from Africa and populating the region as they moved across it. The Middle East provided a rich environment for the evolution of human societies, with the development of agriculture and the domestication of animals. The area was also a key link between Africa and Asia, allowing the spread of early human species.

The transition from the Middle East to the Near East was marked by the development of new technologies and cultural innovations, such as the development of the Natufian culture in Jordan, which marked the transition from the Middle to the Upper Paleolithic.

The Near East is known for its rich archaeological record, with sites such as Jericho, Tell Halaf, and Ugarit providing valuable insights into the development of human societies.

The Near Eastern landscape was characterized by a mix of arid and semi-arid regions, with the presence of rivers such as the Tigris and Euphrates providing valuable water resources. The area was also home to a variety of animals, including woolly mammoths, which provided valuable resources for early human populations.

The Near East was also a key region for the spread of early human species, with the development of new technologies and cultural innovations allowing them to colonize new areas and adapt to changing environments. The region was also a key link between Africa and Asia, allowing the spread of early human species across the continent.
sequences in East Asia (Schäfer et al. 1996). Datable occurrences from the Khovaling area comprise Khonako II, PK8 (700 ky), and Kul’Dar, PK11 and 12, (850 ky), whose Non-Achenian mode 2 artifactual contents resemble those from the Nihewan Basin. Colonization of this distant region directly across the Near East (Zagros, Iranian Plateau) (Gladilin, Ranov 1986) is conceivable but, as for the Caucasus, implies overcoming major mountain obstacles. An East Asian origin (Bordes 1968-89, Chard 1974-10, Rolland 1992-94-99), would involve hominin population movements along a less problematic expansion route, following lateral montane paths, analogous to those by Palaeoarctic mammalian migrations North of the Hindu Kush, Paninis, Karakorum, Tien Shan, Hymalaya and Kunlun orogenic systems. It would connect similar Lower Palaeolithic occurrences from East to West, such as those in the Nihewan basins, Kul’dara, Khonako II, Kashshad basin and Dmanisi. This alternative hypothesis, however, requires a more robust, unambiguous data base.

EUROPE

This narrower prolongation of the Asian landmass combines a variety of biomes, from Mediterranean to boreal and arctic latitudes, all bearing oceanic influences. Pleistocene ice ages altered these environmental characteristics, with glacial advances creating widespread peripheral zones, marine regressions, and reshuffling vegetation zones into mosaics with few extant parallels. Year-round climates became more continental, with pronounced seasonal variations. The Palaeoarctic faunal succession records the alternations of cold-adapted species originating in Eurasia’s high latitude core areas, during stadials, and temperate species refluxes out of refugia during interglacials (Bonifay 1980: Fig. 1). The absence of Pleistocene landbridges across the Mediterranean precluded species exchanges between North Africa’s Ethiopian fauna and that of Palaeoarctic Europe.

Centrally confronting ancestral hominids reaching Europe include water barriers, mountain range filters, and high latitudes winter conditions, with short daylight, especially during ice ages. Settlement boundaries would undergo disintegration into Southern refugia during glacial advances. Palaeoanthropetic research began much earlier in Europe, focussed at first in establishing human antiquity, producing a comparatively abundant and better dated Lower Palaeolithic record (Balkans excepted). Discussions opposing “long” and “short” chronologies for identifying and dating Europe’s first occupants have remained intense to this day e.g. Bonifay and Vandeemersch (1991), Kossmak (1986) for the “long” position, Roebroeks and van Kolfschoten (1995) for the “short” one. The latter outlines these methodological and documentary issues sharply, concluding from a critical evaluation of all evidence, that the peopling of Europe did not take place before a 500-600 ky datum, synchronous with Cromerian IV and Arvicolterrestrial cattania’s appearance, and correlated with oxygen isotopic stage 13. This implies a substantial time lag in settling Europe, compared with adjacent regions, and raises fundamental questions. Factors such as climatic or ecological barriers are at variance with evidence from Northern China, while invoking a conceivable shift in human social and landuse organization remains difficult to test, and without concrete indications from other regions.

New finds from Siberia i.e. Atapuerca TD6, Fuentenesueva 3, however, may push back the date from initial entry into Southern Europe back to Late Matuyama times (0.8-1.0 my) but this amounted to little more than isolated exploratory forays, until a more rapid and sustained spread beyond the Pyrenees (or southern Balkans) by 400-600 ky (Denennol, Roebroeks 1996). Either alternatives, whether caused by a mutation-like shift in hominid organization or by sudden breaking of physical barriers, suggest an “ertirkive, "sweepstake route” - like colonization model, spreading rapidly throughout Europe. One possible trigger physical factor may have been a hitherto unidentified short-lived combination, in the Gibraltar Strait, of intense tectonic activity, with deeper marine regression caused by a severe glacial episode (stage 167), narrowing the Strait and creating less forbidding current conditions for crossing.

The settlement of Europe, on the other hand, may have proceeded more progressively than appears from available evidence, with a series of small-scale punctuated dispersal stages, building on the initial presence of founder populations in Europe’s southern boundaries. Recent findings from Stránská Skála (Muñoz et al. 1995) provide new indications of anthropetic activities from fire traces and diagnostic butchering traces on animal bone fragments. This documentary development revives the notion that short-lived incursions reached as far as Central Europe before 400-600 ky Stránská Skála and the Cervenka locality, where a possible quartzite ore or mortar came from the PK X horizon (Late Matuyama), consequently deserve renewed investigations.

CONCLUSION

Diagnosed anthropetic evidence (Figure 1) allows the conservative conclusion that ancient hominids had settled and adapted to substantial portions of Eurasia not later than 1.4 my (putting aside disagreements over the age of some of the occurrences), encompassing a wide range of continental and coastal biomes, across the Palaeoarctic and Oriental regions. This record testifies that Homo erectus had already developed versatile technological, organizational and cognitive attributes. When fitting the distribution of anthropetic occurrences against the outstanding features of Eurasia’s physiographic relief, the pattern is compatible with a reconstruction of dispersal movements whose tendency was to espouse a lateral axis, was a filter rather than a barrier. Furthermore, early mid-Pleistocene anthropetic localities e.g. Yuannou, Gwanyindong, confirm that South China must represent the area of initial dispersal from Southeast Asia.

Northern China contains well-known early anthropetic sites such as Zhudoudian, Gwanyindong, 1.0 – 0.8 my, and the Nihewan basin occurrences associated with an early Pleistocene or Sammyan fauna, dateable to 1.6 my (Schick et al. 1991). The latter lies North, near the edge of the Eurasian steppe, implying that Homo erectus could already cope with mid-latitude conditions with marked seasonal contrasts. All these Lower Palaeolithic assemblages in time displaying Non-Achenian mode 2 artifactual characteristics, a pattern related partly to continued availability of bamboo resources but mainly to remoteness from interactive contacts with populations manufacturing Achenian repertoires. Present-day Western China (Xinjiang/Uighur regions, Qinghai) is dominated by desolate arid environments (Ala Shan, Takla Makan), with a continental climate. Historic communication routes followed narrow river valleys, e.g. Qaidam depression. Quaternary research findings (Zhang 1988) on the other hand, show that milder, wetter conditions, with more oasis-type rivers and palaeolakes prevailed, hence habitat circumstances more attractive for human settlement, before ongoing orogenic uplift and the onset of climatic deterioration made this region less hospitable. Direct evidence for early human occupation remains inexistent, for the time being. More focussed and sustained palaeoanthropological investigations in the future should determine whether erectus populations actually dispersed into Western China by the Lower Pleistocene.

CENTRAL ASIA

This vast, remote and topographically complex arid inland region, progressively cut off from msson Asia by tectonic uplift, yields growing evidence for Lower Palaeolithic occupation (Ranov 1995), in a series of stratified horizons with a loess and pedocomplex succession which can be correlated with analogous loess and glacio-fluvial
from Southwest to the Far East, bypassing major interior mountains and high plateau barriers, subsequently penetrating North of these barriers from East Asia, along a chain of filter routes of the Palaeartic region, to reach the Caucasus (Figure 3). The null hypothesis, at present, would be that early hominin expansion beyond Sub-Saharan Africa was initiated by Homo erectus with a mode 2 technology.

REFERENCES


