

**The Paleolithic Settlement of Asia.** Robin Dennell. 2009. Cambridge University Press, Cambridge, U.K., 548 pp., ISBN-13: 9780521848664, \$100 (hardcover), ISBN-13: 9780521613101, \$50 (paperback).

Since the mid-20th century, paleoanthropological research has identified Africa as a major engine for developments in hominin biological and cultural evolution. The origins of the Hominina early *Homo*, *Homo erectus* (*cf. ergaster*), and *Homo sapiens* lineages, and the emergence of Acheulian large biface technologies and modern human behavior are seen as African events that subsequently spread to other areas of the globe. Where Asia has played a role in paleoanthropological debates, it has usually been as a minor foil to the major empirical findings and models developed elsewhere. Robin Dennell's new book aims to show that Asia itself was a major engine of human biological and cultural evolution independent of Africa. It is successful on most fronts.

The focus of this volume is the current state of knowledge regarding hominin settlement of Asia before it was colonized by modern humans, a time period spanning roughly 1.8 Ma to 125 ka. Therefore, debates about the origins of modern humans and the role that Asia may play in this process are mentioned only fleetingly. The book is conceptually divided into two parts focused on the Late Pliocene–Early Pleistocene and Middle Pleistocene geological, paleontological, and archaeological records of Asia. Following a very brief introduction outlining the goals of the volume, individual chapters in the first part cover (1) the place of Asia in paleoanthropology; (2) the African background to hominin settlement of Asia; (3) paleoclimate and paleoenvironment in Asia prior to 1 Ma; (4) the earliest inhabitants of Southwest Asia; (5) the earliest inhabitants of South Asia, Southeast Asia, and China; and (6) an appraisal of the so-called “Out-of-Africa 1” model describing the earliest colonization of Asia around 1.8 Ma or earlier. The second part of the book follows a similar structure, with individual chapters on (7) paleoclimate and paleoenvironment in Asia from 1 Ma to 125 ka; (8) the Middle Pleistocene archaeological record of Southwest and Central Asia; (9) the Middle Pleistocene archaeological record of South Asia; (10) the Middle Pleistocene archaeological record of China and Southeast Asia; and (11) the Middle Pleistocene human fossil record in Asia. Chapter 12 offers a brief summary of the volume.

A central thesis of the book is in the close correlation between the hominin settlement of Asia and the development and subsequent fluctuations of the monsoon in India and Southeast Asia. The development of the monsoon is linked in part to the uplift of the Tibetan Plateau and brings precipitation to inland areas primarily during summer months. Northern hemisphere glaciations play a peripheral role in the settlement of Asia, though Dennell recognizes that glacial and monsoon dynamics are broadly in-phase such that the monsoon strengthens during interglacials and weakens during glacials. Fluctuations in the Indian and Southeast Asian monsoon led to changes in habitats across Asia and Africa that subsequently regulated the timing and nature of hominin settlement of Asia.

Dennell provides a comprehensive review of the terrestrial, lacustrine, and marine records related to the Asian monsoon. *Geoarchaeology* readers will find Chapters 3 and 7 particularly useful as a reference source for models of monsoonal climate dynamics and for the summaries of the key proxy measures used for reconstructing monsoonal strength. Substantial attention is given to data from the Chinese Loess Plateau, which offers a terrestrial paleoclimatic record rivaling both marine and ice cores for their time-depth and chronological resolution. The Chinese Loess Plateau sequence is usefully compared with the most up-to-date evidence from loess records in Central Asia, sediment records from Lake Baikal in Siberia, and marine sedimentary records from Asian waters.

The main conclusions stemming from the review of the paleoclimatic and paleoenvironmental evidence come in two parts relevant to the Early Pleistocene and Middle Pleistocene periods. First, as detailed in Chapter 3, development of the Southeast Asian and Indian monsoon around 22 and 15 Ma, respectively, drove the expansion of grasslands across Asia beginning 7–8 Ma. Further Late Pliocene uplift of the Tibetan Plateau caused drying across East Africa, which precipitated the emergence of African grasslands around 3–2 Ma. These newer African grasslands then merged with older Asian grasslands to form a vast savanna belt stretching from West Africa to North China, which Dennell dubs “Savannahstan,” a necessary backdrop to the initial dispersal of hominins from Africa into Asia. Indeed, the presence of this grassland belt suggests that there was a limited biogeographic barrier to dispersal for hominins

adapted to life in open habitats. In Dennell's view, the formation of this grassland belt means that we should be cautious in concluding that hominins did not disperse out of Africa prior to the appearance of *H. erectus* in Africa around 1.65 Ma. The poorly known Asian faunal and geological record for the Pliocene epoch means that we are confronted with an absence of evidence for earlier dispersals. Dennell makes a strong case that certain aspects of the Asian and African paleoanthropological records make much more sense if we consider an earlier, pre-*H. erectus* settlement of Asia. For instance, in a concise overview of the fossil evidence from the pivotal site of Dmanisi in Georgia, dated to 1.8 Ma, he argues that the hominin represented is the most primitive *H. erectus* yet found and that it may be ancestral to *H. erectus* populations elsewhere in Asia and in Africa. That is, *H. erectus sensu lato* evolved from early *Homo* in Asia and then dispersed into Africa from Asia, rather than the other way around. This "Out of Asia" hypothesis for the origin of *H. erectus* is bound to have its detractors, but Dennell shows that it is a hypothesis well worth entertaining.

Dennell's second major conclusion hinges on evidence for a protracted transition from the vast Savannahstan grassland belt to significantly more arid conditions that saw much of Asia and Africa invaded by deserts by 600 ka. Dennell dubs the latter configuration of environments "Aridistan," and illustrates the biogeographic barriers erected to faunal exchange between Africa and Asia, as well as between different subregions within Asia. Here again, the Chinese Loess Plateau features prominently in environmental reconstructions, especially in documenting a Middle Pleistocene shift toward longer glacial periods of a severely weakened monsoon and only short interglacial periods of a strengthened monsoon. For most of the Middle Pleistocene, hominin populations were confined to refugia in the Levant, Purana Basins in India, and mainland Southeast Asia. Under these isolated conditions, hominin populations evolved independently, producing the Late Middle Pleistocene mosaic of species that is the backdrop for modern human origins. At the height of Marine Isotope Stage (MIS) 6, 180–125 ka, for instance, Dennell concludes that there were three independent hominin populations in sub-Saharan Africa (*H. helmei/sapiens*), Europe (*H. neanderthalensis*), and Southeast Asia (derived *H. erectus* or archaic *H. sapiens*). Very small populations probably persisted in portions of the Levant, based on archaeological finds from Tabun, Israel, which are discussed at length. Dennell also suspects that hominins were present in South Asian refugia during MIS 6, but there is no conclusive evidence to support this. Virtually everywhere else was abandoned. The one major exception to the middle Pleistocene pattern is MIS 11, 423–362 ka. During this exceptionally long interglacial, Dennell shows that there is considerable evidence for hominin populations expanding out of core refugia to occupy Central Asia and northern China. The fossil and archaeological evidence from Zhoukoudian Locality 1, in northern China, is described in detail as one such instance of an MIS 11 range expansion in Asia.

The isolation of Asia from Africa during the Middle Pleistocene also informs interesting observations about long-standing archaeological problems, such as the spread of Acheulian bifacial technologies. Dennell provides a convincing argument for the repositioning of the so-called Movius line, which has been used traditionally to divide areas of East Asia, dominated by simple core-and-flake technologies, from western Eurasia and Africa, where Acheulian bifacial technologies are more common. Dennell presents detailed evidence on the nature of South Asian large biface assemblages from sites such as Chirki and Bhimbetka, central India, leaving little doubt that these are closely allied with the Acheulian as recognized elsewhere. He also shows that the several East Asian localities that have yielded large bifaces are very different from the Southwest Asian and Indian Acheulian, both in the morphology of the bifaces present and their numbers. While Dennell accepts the validity of the Movius line, he is also careful to dispel any notion that the persistence of core-and-flake technologies on the other side of the line reflects "cultural backwardness." A pre-*H. erectus* dispersal into East Asia followed by a long period of effective isolation are the suspected mechanisms for the persistence of the Movius line, but a single convincing explanation is still elusive.

It is difficult to be completely confident in conclusions about the timing and nature of hominin settlement of Asia without a sound chronological framework. Dennell recognizes this weakness and has assembled the most up-to-date chronological evidence available. Much of this evidence is not available in any other single source. For example, Dennell provides detailed discussions of the stratigraphy, fauna, and dates from the Siwaliks in Pakistan and India and from the Sangiran Dome in Java, Indonesia, both of which are critical for understanding the earliest colonization of Asia 1.8 Ma. Similarly, tables of radiometric

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dates from sites in Southwest Asia, the Caucasus, South Asia, and China provide a valuable resource for evaluating the chronological distribution of Middle Pleistocene hominins in Asia.

The volume is less useful when it comes to its graphic content. The volume contains a large number of figures, but there are some glaring omissions. In particular, the only hominin fossil illustrations are from Dmanisi, Georgia. The lengthy discussion of Middle Pleistocene hominins in Asia (Chapter 11), including the tricky transitional or “archaic” *H. sapiens*, does not include a single illustration or photograph of the specimens in question. Cambridge University Press is also to be singled out for its carelessness in publishing so many poor-quality images; I counted 35 illustrations (21% of the total) that were “not of publishable quality.” The quality of the paper and text layout is also comparable to desktop publishing. Given these issues, the retail price of \$50 would be enough to make me think twice before purchasing the volume. I would rather purchase a much less expensive PDF and print out parts only when absolutely needed.

Nevertheless, Dennell has put together a very useful book because of the considerable evidence amassed in support of broad and provocative conclusions. It will remain a useful reference source on the Asian early and middle Paleolithic for the foreseeable future.

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