Preface

The quest to elucidate human origins, particularly the period approximating the great evolutionary division between the lineages leading to modern chimpanzees and modern humans, was long frustrated by the lack of fossil evidence. In the 1990s the discovery of a new genus of early hominid, *Ardipithecus*, finally began to truly illuminate the late Miocene African hominid record. This volume is designed to contribute to this progress in revealing the origins of the Hominidae.

Integrated, multidisciplinary investigations of the Adu-Asa Formation exposed along the western margin of the Middle Awash study area in northeastern Ethiopia have revealed late Miocene records of volcanic and tectonic processes and rift evolution, as well as diverse fauna and flora. Despite limited geographic coverage, the late Miocene (5.2 to 5.8 million years) Asa Koma and Kuseralee Members of the Adu-Asa and Sagantole Formations, respectively, yielded the early hominid *Ardipithecus kadabba* fossils among 2,760 contemporary vertebrate remains from diverse taxa collected between 1990 and 2006 and reported in detail in this volume. These fossils were all recovered from spatiotemporally controlled contexts within geological deposits exposed by tectonics and erosion. Their geochronological, sedimentary, and paleoenvironmental contexts are reported here.

The inaugural volume of this Middle Awash series, edited by W. Henry Gilbert and Berhane Asfaw, presented extensive data about *Homo erectus* in Africa during the Pleistocene. In contrast, this volume documents the geological and paleontological evidence from the much older late Miocene Adu-Asa Formation of the western margin and from the rift-bound Kuseralee Member of the Sagantole Formation in the Central Awash Complex, located about 20 kilometers to the east. Yohannes Haile-Selassie initially described the faunal assemblages from these two members in his Ph.D. thesis, submitted to the University of California at Berkeley in 2001.

The volume provides a detailed description of the earliest hominid *Ardipithecus kadabba* and its context. This is the first complete description of an early hominid older than the 4.4 Ma *Ardipithecus ramidus* (recovered from the nearby Central Awash Complex; Chapter 7). The other taxa accompanying the *Ar. kadabba* remains are detailed within the other chapters of this volume, which offer a comprehensive description and evaluation of

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the most complete dataset available on the vertebrate evolutionary history and geological record of the terminal Miocene in eastern Africa.

Relatively few hominid remains were recovered from the Asa Koma Member of the Adu-Asa Formation, particularly compared with the number of early Pliocene *Ar. ramidus* remains collected from the Aramis Member of the overlying Sagantole Formation. Outcrops of Middle Awash late Miocene fossil localities are small and isolated because of dense faulting and the accumulation of alluvium and colluvium along the faulted slopes and displaced blocks of these ancient sediments. However, the rich and diverse vertebrate assemblages described here shed light on evolutionary patterns and on paleoecological conditions during the terminal Miocene of eastern Africa. The integrated geological, paleontological, and paleoenvironmental records detailed here provide a foundation for exploring new fossiliferous stratigraphic sections along the rift margin that predate the Adu-Asa Formation.

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