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Magnetostratigraphy of the Plio-Pleistocene Konso Formation in the southern Main Ethiopian Rift, East Africa

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The Plio-Pleistocene Konso Formation in the southern end of the Main Ethiopian Rift, Ethiopia, has produced abundant Oldowan and Acheulean (Early Stone Age) artifacts. The formation yields many mammalian faunal fossils including those of Homo erectus and Australopithecus boisei. The Konso formation comprises fluvial and lacustrine sediments and contains more than 30 tephra layers. $^{40}Ar/^{39}Ar$ dates of some of these tephra layers and correlation with the Pleistocene tephra layers of the Omo-Turkana Basin sediments (southwest of Konso) indicate that the formation had been deposited between ca. 2.0 and 0.75 Ma. Despite intensive faulting and post-depositional deformation, the relative stratigraphy of almost all outcrops of the Konso Formation has been established, based on detailed and careful tephra correlation. Paleomagnetic analyses performed on samples of volcanic ashes and finer sediments taken from such outcrops define the upper and lower boundary of the Olduvai Subchron and the Matuyama-Brunhes boundary in the Konso Formation. A short normal polarity zone was detected immediately below the tephra layers with $^{40}Ar/^{39}Ar$ dates of around 1.6 Ma, possibly correlated with the Gilsa Event and/or the Stage 54 Event. The three magnetic polarity boundaries and single short polarity event in the Konso Formation provide reliable age constraints to the occurrence and development of the Acheulean lithic assemblages in this region of East Africa.

Keywords: Main Ethiopian Rift, Konso Formation, Magnetostratigraphy, Tephrostratigraphy, Acheulian lithic assemblages