Journal of Human Evolution xxx (2018) 1–18

Contents lists available at ScienceDirect

Journal of Human Evolution

journal homepage: www.elsevier.com/locate/jhevol

The Oldowan industry from Swartkrans cave, South Africa, and its relevance for the African Oldowan

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ARTICLE INFO

Article history:
Received 5 December 2017
Accepted 13 June 2018
Available online xxx

Keywords:
Swartkrans
Sterkfontein
Oldowan
Lithic technology
Core reduction strategies
Bipolar technique

ABSTRACT

The oldest recognized artifacts at the Swartkrans cave hominid-bearing site in South Africa have long been known to occur in the Lower Bank of Member 1, now dated with the cosmogenic nuclide burial method to ca. 1.8–2.19 Ma. However, the affinities of this industry have been debated due to small sample size. In this paper we present newly excavated material from the Lower Bank retrieved since 2005 in the Swartkrans Paleoanthropological Research Project. The sample is now large enough to confirm its affinity with the Oldowan industrial complex. The assemblage is highly expedient and core reduction strategies are largely casual. Although freehand flaking is present, the bipolar technique is most significant, even in non-quartz raw materials. The Swartkrans assemblage shows some significant contrasts with the Sterkfontein Oldowan, ca. 2.18 Ma, which can be explained by its closer proximity to raw material sources, its somewhat different geographic context, and its more expedient nature. The Swartkrans Oldowan now provides us with the first good indication of Oldowan variability in southern Africa, where only two sizeable assemblages have thus far been discovered. Comparisons are made with other sites across Africa that help to place this variability within our overall understanding of the Oldowan industrial complex.

1. Introduction

Early Pleistocene artifact-bearing deposits have been known at the Swartkrans (South Africa) fossil hominid site (Fig. 1A) since C.K. (Bob) Brain retrieved a small assemblage of 30 stone tools from its lime-mining refuse dumps in the late 1960s (Leakey, 1970). This discovery followed the numerous finds of hominid and other vertebrate fossils made by Robert Broom and John Robinson between 1948–1949 and 1951–1953. The hominid[1] remains comprise those of both *Paranthropus robustus* and early *Homo*, thus making Swartkrans the first site in Africa to yield evidence of coeval hominid genera, which possibly coexisted as sympatric species (Broom and Robinson, 1952).

Between 1965 and 1986, Brain undertook systematic excavation of the Swartkrans deposits and detailed study of its stratigraphic sequence. He was the first researcher to describe the cyclical nature of the filling, erosion, and refilling of karst cave sites in the Bloubank River valley, which consist of cemented underground cavern infills (Brain, 1958, 1981, 1993). Brain linked this cyclical process to large-scale climate changes during the Pleistocene, which created periods of infilling when groundcover was sparse. These were followed by the erosion of irregular channels in the infills when water passing through a more stable ground cover was charged with humic acids. Such channels served as stormwater drains, passing water from the surface to underground caves beneath the fossil-bearing chambers (Brain, 1981).

During the early to mid-1900s, Swartkrans was mined for lime, and these activities obscured in situ cave fills with dumps

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[1] Although it is popular to use the term 'hominin' today, its usage is not consistent in the literature and 'hominid' is preferred by the first author (K.K.). Hominid here is defined as all species derived in the human direction after the last common ancestor of African apes and humans (White, 2002:407; White et al., 2015) or humans and their ancestral kin as far back as the divergence from the great apes (Clarke, 2012). It is used in the traditional sense to include modern humans and the extinct taxa more closely related to them than to the great apes.

https://doi.org/10.1016/j.jhevol.2018.06.004
0047-2484/

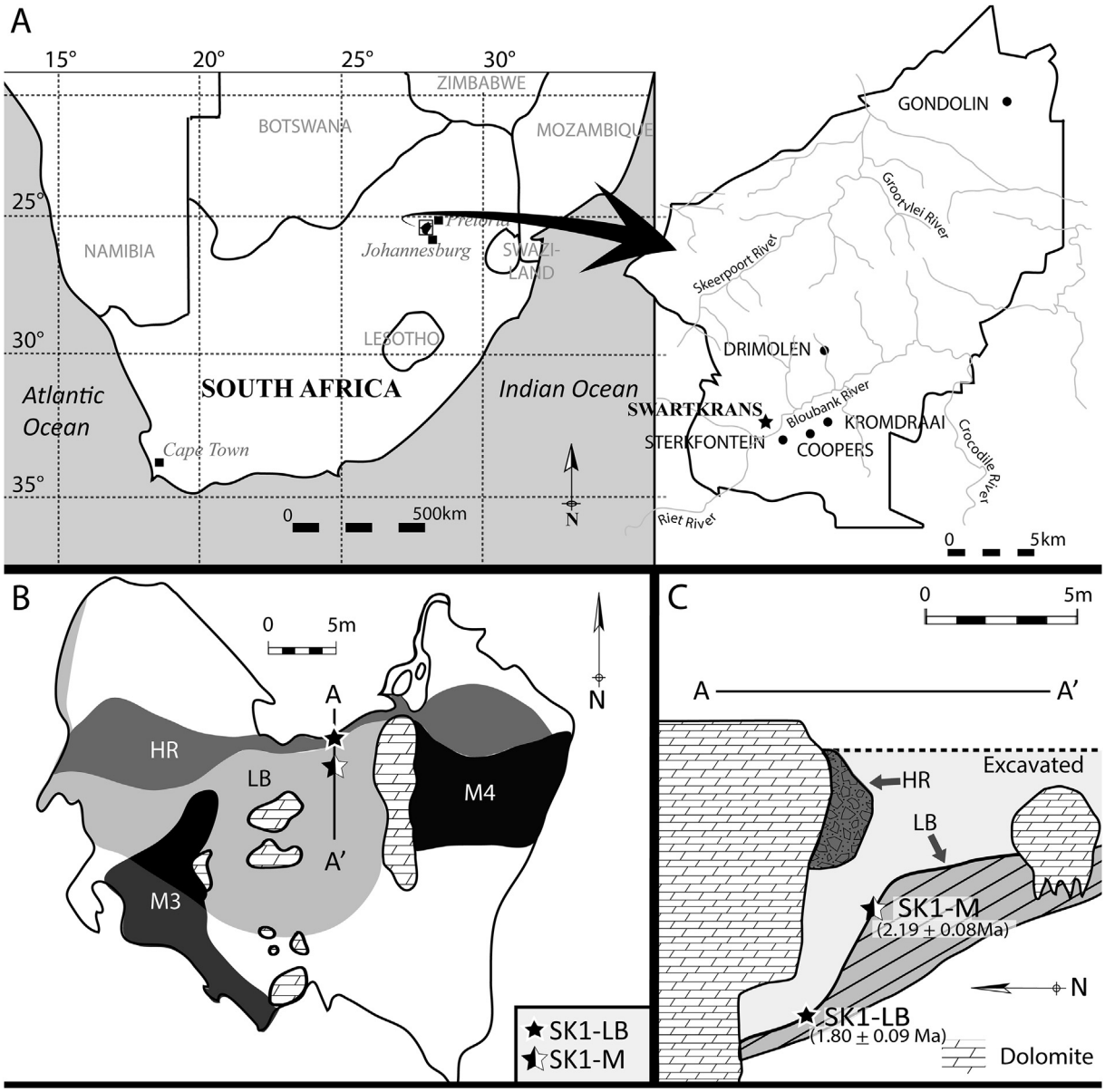

Figure 1. A) A political map of southern Africa, with South Africa's 'Cradle of Humankind' World Heritage area shown in detail at right in relation to other major sites and the Bloubank River. B) A plan view of Member 1 showing the Lower Bank (LB) deposit in relation to the Hanging Remnant (HR). Members 3 and 4 are also visible in this view. C) Schematic profile of the location of the cosmogenic dating samples from Member 1. Figure modified from Gibbon et al. (2014).

of cemented cave earth discarded across the site. Starting in 1965, Brain spent the first seven years of his work at the site processing these dumps for fossils and information on the ex situ breccia. The remainder of his 21 years was spent excavating, interpreting, and reinterpreting the strata. In 2005, a new phase of excavation and research began under T.R. Pickering's direction of the Swartkrans Palaeoanthropology Research Project (SPRP; Pickering et al., 2008, 2012, 2016; Sutton et al., 2009; Gibbon et al., 2014). This paper is now the first in the series of SPRP publications to describe stone artifacts recovered from this new generation of work.

Like all 14 karst paleoanthropological sites in Gauteng Province's 'Cradle of Humankind World Heritage Site' (CoHWHS), Swartkrans consists of a series of underground cavern infills derived from surface sediments. Kuman (2003) argued that hominids made and used stone tools around cave openings, attracted by the shade of trees that grew around these shafts. In such locations, vegetation was supported by greater moisture, and openings were in time enlarged further by humic acids. The Swartkrans cultural assemblages are thus in secondary context and derive from surface occupations that entered the cave through steep avens ca. 15–20 m in depth, to be deposited on talus surfaces in the cave below. Despite their secondary context, however, the assemblages derive from surface accumulations close to these shafts. Sites like Swartkrans and nearby Sterkfontein thus have a wealth of behavioral information recorded in their archaeology. This paper describes the data on site formation, lithic technology, and behavioral inferences obtained from the earliest lithic assemblage at Swartkrans, excavated from the Lower Bank (LB) of Member 1 of the Swartkrans Formation between 2005 and the present. We can now confidently assign this assemblage to the Oldowan industrial complex.

Please cite this article in press as: Kuman, K., et al., The Oldowan industry from Swartkrans cave, South Africa, and its relevance for the African Oldowan, Journal of Human Evolution (2018), https://doi.org/10.1016/j.jhevol.2018.06.004