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The world's oldest tools date back 3.3 million years

Following the discovery of the world's oldest stone tools and its announcement at the annual meeting of the Paleanthropology Society in San Francisco on 14-15 April, researchers from the CNRS, Inrap and Université de Poitiers¹ have published their findings in *Nature*, on 21 May 2015. The researchers report their discovery of the stone tools, which date back 3.3 million years, at a site in Kenya. Although the scientific community had long thought that the first stone tools ever made were the work of members of the genus *Homo*, this latest discovery shows that another kind of hominid, perhaps a much older form of *Australopithecus*, had all the necessary capacities to make tools.

Lake Turkana, in the north of Kenya, is home to many archaeological sites, dating from 700,000 to more than three million years ago. These sites have yielded tools ranging from the most primitive to the most sophisticated. For thirty years, research conducted as part of the *Mission Préhistorique* and the West Turkana Archaeological Project in Kenya has allowed the reconstruction of the technical evolution of stone cutting over time. This is essential for shedding light on the cognitive and motor capabilities of early hominids.

The latest remains, found on the western shore of Lake Turkana, are 3.3 million years old and immediately push back the emergence of the first stone tools by 700,000 years. Until now, the oldest known tools, dating back 2.6 million years, came from a find in Ethiopia. The artefacts from the present discovery are mostly heavy, bulky lava blocks, which were used to produce sharp-edged flakes using the so-called "bipolar" technique. This method requires three separate objects: a block to cut from, a hammerstone and an anvil. The block is held on the anvil with one hand and hit with the hammerstone held in the other hand so as to strike off sharp-edged flakes. Other tools were developed using the "passive hammer" technique, whereby the block is directly struck on the anvil. Despite their rudimentary appearance, the wide range of objects found on the site (flakes, anvils, hammerstones and cores²), clearly indicates that these hominids intended to make tools.

As the Turkana region is highly volcanic, the site and its finds were dated by tephrostratigraphy, a technique that uses physicochemical processes to date ash layers intercalated with the sediments in which

¹ From the Laboratoire Préhistoire et Technologie (CNRS / Université Paris Ouest Nanterre-La Défense), Laboratoire Méditerranéen de Préhistoire Europe Afrique (CNRS/Ministère de la Culture et de la Communication/Aix Marseille Université), Laboratoire de la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie (CNRS / Ministère de la Culture et de la Communication/ Université de Bordeaux), Laboratoire Dynamique de l'Évolution (CNRS), Institut de Paléoprimatologie, Paléontologie Humaine: Evolution et Paléoenvironnements (CNRS/Université de Poitiers), and Centre Mixte de Recherche Archéologique - Domaine de Campagne et du Centre Archéologique de La Courneuve, Inrap.

² A core is the part of a block of stone that remains after the flakes have been knocked off.



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the tools were embedded. The researchers coupled these measurements with the paleomagnetism method, which involves taking sediments from around the tools and measuring their polarity (as the latter depends on the orientation of the Earth's magnetic field, which varies over time).

This discovery revolutionizes our knowledge of human evolution. It provides the first archaeological evidence for the existence, more than 3 million years ago, of hominid cognitive and motor skills necessary for manufacturing hard stone tools. The conditions under which these tools were developed remain to be explained. Investigations are therefore continuing on-site, on the west bank of the Turkana, which still harbors many secrets.





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Pictures 1, 2 and 3: Tools discovered during the dig © MPK-WTAP



Picture 4: Overall view of the Lomekwi site area, on the western shore of Lake Turkana © MPK-WTAP



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Bibliography

3.3-million-year-old stone tools from Lomekwi 3, West Turkana, Kenya. Sonia Harmand, Jason E. Lewis, Craig S. Feibel, Christopher J. Lepre, Sandrine Prat, Arnaud Lenoble, Xavier Boës, Rhonda L. Quinn, Michel Brenet, Adrian Arroyo, Nicholas Taylor, Sophie Clément, Guillaume Daver, Jean-Philip Brugal, Louise Leakey, Richard A. Mortlock, James D. Wright, Sammy Lokorodi, Christopher Kirwa, Dennis V. Kent, and Hélène Roche. *Nature*, 21 May 2015.

Contacts

CNRS Researcher | Sonia Harmand | T +254 (0)7 00 932 288 (au Kenya) | sonia.harmand@stonybrook.edu

CNRS Researcher | Hélène Roche | T + 33 (0)1 46 69 25 80 | helene.roche@mae.u-paris10.fr

CNRS Press Office | Alexiane Agullo | T +33 (0)1 44 96 43 90 | alexiane.agullo@cnrs-dir.fr