

Dal Paleolitico al Genocidio Armeno

Ricerche su Caucaso e Asia Centrale

a cura di Aldo Ferrari, Erica Ianiro

The Palaeolithic Site of Dmanisi in Georgia and Its Role in the Earliest Prehistory of Eurasia

Paolo Biagi (Università Ca' Foscari Venezia, Italia)

Abstract This paper examines the role played by the Early Palaeolithic site of Dmanisi (Georgia) in the prehistory of Eurasia. The site was discovered by chance during the excavation underway at the Medieval settlement. Its discovery has radically changed our view of the chronology and behaviour of the first hominids that started to move out of Africa around 2 Ma ago. The researches carried out at Palaeolithic Dmanisi have shown that this event took place some 1 Ma before as compared to what had been previously suggested by most anthropologists and archaeologists.

Sommario 1. The Site and Its Discovery. – 2. The Archaeological Sequence. – 3. The Human Remains. – 4. The Chipped Stone Assemblages. – 5. Discussion.

1 The Site and Its Discovery

The Medieval settlement of Dmanisi is located some 85 km southeast of Tbilisi (Georgia), at the confluence of the Mashavera and Pinezouri Rivers, and an altitude of c. 900 m (cfr. Gabunia et al. 2000b) (Fig. 1). Built on a volcanic terrace of triangular shape, protected by a thick wall of basalt stones (Fig. 2), the city played an important economic role especially during the sixth-fourteenth centuries, thanks to its strategic position along a caravan route leading to Asia (cfr. Kopaliani 2000).

Reported from written sources for the first time in the sixth century, and later in the ninth, the city is more frequently mentioned since the eleventh century when king Dmitri conquered it in 1128 (cfr. Allen 1932, p. 102).

The first excavations at the site were carried out in 1936. They were resumed in 1960, and continued until 1982. In that year a large pit, some 3 m deep, dug out into a sandy-clayey layer, was brought to light during the excavations underway in the medieval settlement (Fig. 3). Unexpectedly, the pit-fill yielded many fossilized animal bones that were preliminarily attributed to a period undoubtedly earlier than the Middle Ages (cfr. Vekua, Lordkipanidze 2010).

Following the above discoveries, systematic palaeontological excavations were undertaken in the same area between 1983 and 1991. They led to the recovery of many fossilized animal bones, sometimes found in as-



Figure 1. Dmanisi. Site location (dot) at the confluence of the Mashavera and Pinezouri rivers (drawing by P. Biagi)

Figure 2. Dmanisi. The Medieval settlement from the citadel. The Palaeolithic excavated area is in the woodland in the background (photograph by P. Biagi)



Figure 3. Dmanisi. The Palaeolithic excavation area in 2007. The Medieval pit from which the first fossil bones and chipped stone tools were occasional recovered is on the right (photograph by P. Biagi)

sociation with chipped stone tools that did not find comparison with any other Palaeolithic assemblage previously discovered in the Caucasus (cfr. Doronichev 2000; Gabunia 2000; Lioubine 2002). Following these observations it was suggested that they belong to an unspecified earlier date.

In particular the 1991 season was very productive. The excavations carried out during that year yielded a great amount of faunal remains of rhinoceros, elephant, deer, gazelle and other fossilized animals often found associated with as many more chipped stone tools (cfr. Vekua et al. 2011). During the September excavations of the same year the first human remains consisting of a mandible were recovered in good condition from a layer that yielded also bones of rhinoceros and sabre-tooth tiger.

The above human bone was first attributed to an African *Homo erectus* (cfr. Henke 1995). Following this discovery it became clear that the Dmanisi hominid was the oldest ever discovered outside Africa. The mandible had been uncovered from a layer just above a basalt deposit dated to some 1.8 Ma (cfr. Schmincke, Bogaard 1995; Sologasvili et al. 1995), a result later confirmed by another radiometric date obtained from the dolerite component of the same deposit (cfr. Gabunia et al. 2000a). These assays undoubtedly indicated that the Dmanisi hominid had moved from Africa just after

the above period, most probably moving across the Levant to reach the southern regions of the Caucasus during the first human diasporas towards Asia Europe and Asia (cfr. Cavalli Sforza, Pievani 2011).

Further radiometric dates have shown that Dmanisi's occupation by *Homo erectus* was even slightly earlier than previously suggested, shortly after 1.85 Ma (cfr. de Lumley et al. 2002), and that the site had been repeatedly settled roughly between 1.85 and 1.78 Ma (cfr. Ferring et al. 2011), showing that the southern regions of the Caucasus had played an important role in the first hominid dispersal across Eurasia (cfr. Bruch et al. 2014).

Many other human remains have been recovered from Dmanisi in the following years. At present the collection consists of 5 skulls and 5 mandibles of men and women, 12 isolated teeth and about 50 parts of a postcranial skeleton (vertebrae, bones of extremities) (cfr. Vekua et al. 2011).

2 The Archaeological Sequence

The Palaeolithic deposits of Dmanisi were first discovered at the eastern edge of the above-mentioned volcanic terrace on which the medieval city had been built on the Mashavera basalt formation (Fig. 4). The Palaeolithic stratigraphy is some 4 m thick, while the extension of the hominid site is supposed to cover some 5000 sqm, only 300 of which so far have been investigated (cfr. Nioradze, Nioradze 2011). The upper part of the sequence has been partly damaged during the excavation of Bronze Age and Medieval pits and other structures (Fig. 5).

The Palaeolithic sequence has been subdivided, from the bottom to the top, into 2 main overimposed units A and B lying just on top of the Mashavera basalt formation. The above units have been further subdivided into thinner layers (A: VI to IV; B: III to I). The lowermost unit A belongs to the Olduvai sub-chron normal polarity of the geomagnetic timescale, while the overlying unit B to the Matuyama inverse polarity (cfr. Džaparidze et al. 1991).

Evidence of intense climatic events that led to the abrupt erosion of the uppermost levels of unit A, before unit B began to develop, are clearly visible all over the area so far excavated (Fig. 5).

According to the available data, the general environment surrounding Dmanisi, when it was inhabited by groups of early hominids was quite different of that of the present. They settled close to a lake that formed after the cooling of the Mashavera basalt formation, when a Mediterranean-type climate, characterized by warmer and dryer conditions was established in the area (cfr. Gabunia et al. 2000a, p. 24).

Most of the human remains come from the lowermost part of the sequence (cfr. Bermúdez de Castro et al. 2014, Fig. 2), from which chipped stone tools and faunal remains have also been recovered, although in lower percentage (Fig. 6). Both human and animal bones are considered to be

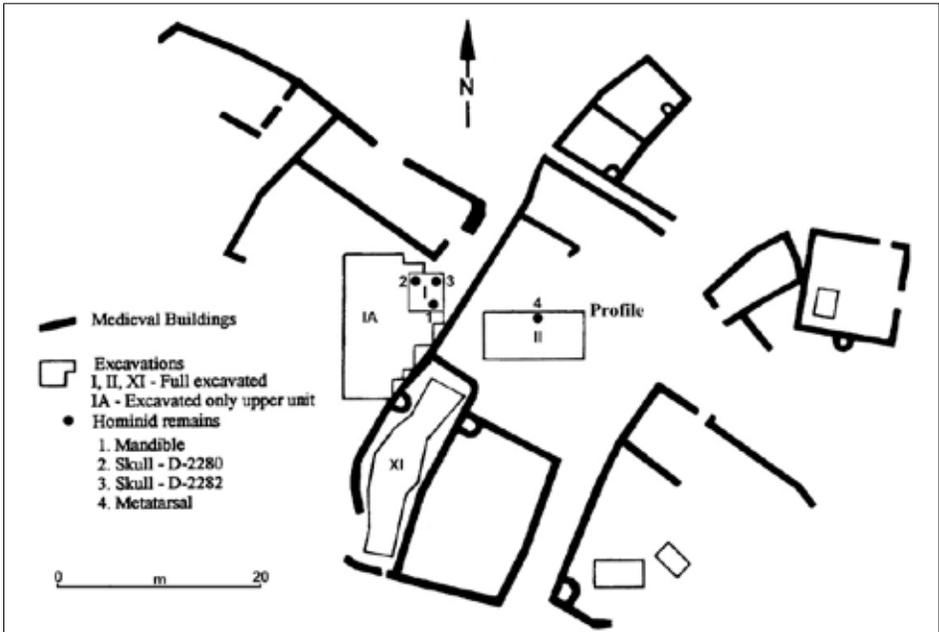


Figure 4. Dmanisi. Plan of the excavations carried out until 2000 (from Gabunia et al. 2000b, Fig. 4)



Figure 5. Dmanisi. Profile and surface of the site at the end of the 2013 excavations from which the eroded surface of layer A is clearly visible. The pits in the profile are Bronze Age pits and more recent features (photograph by P. Biagi)

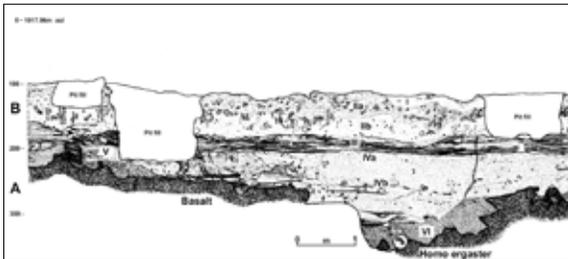


Figure 6. Dmanisi. Profile of the Palaeolithic site (from Nioradze, Nioradze 2011, Fig. 2, with modifications)

almost in situ. In effect they do not show evidence for transport and are «remarkably unweathered» (Dennell 2009, p. 87) indicating that their burying took place very rapidly.

3 The Human Remains

The human remains from Dmanisi represent the largest assemblage of early hominids so far recovered from a site in Eurasia holding great «implications for the history of our own genus» (Dennell 2009, p. 84).

Their attribution to *Homo erectus*, *Homo ergaster* or even *Homo georgicus* has long been debated in the archaeological literature (cfr. Tattersall 2007, pp. 1646-1651) since the earliest discovery of human remains from the site (cfr. Gabunia et al. 2000b, p. 15). The recent find of a fifth skull in a remarkably good state of preservation, and the great morphological variability of Dmanisi's skulls and other bones (Fig. 7) (cfr. Antón et al. 2007; Van Arsdale, Lordkipanidze 2012; Lordkipanidze et al. 2013) has further complicated the already intricate attribution of the hominid finds to a well defined taxon (cfr. Zollikofer et al. 2014).

According to Lordkipanidze et al. (2013, p. 330) «When seen from the Dmanisi perspective, morphological diversity in the African fossil *Homo* record around 1.8 Ma probably reflects variation between demes of a single evolving lineage, which is appropriately named *H. erectus*». Following the above statement the origin of Dmanisi population is most probably to be sought within an Early Pleistocene expansion of the lineage *H. erectus* lineage from Africa «despite the scattered and fragmentary fossil record in Africa that predates Dmanisi» (Lordkipanidze et al. 2013, p. 330).

4 The Chipped Stone Assemblages

Chipped stone tools have been recovered from all the layers into which Dmanisi's deposit has been subdivided, although they recur in quite different percentages throughout the entire sequence. According to de Lumley et al. (2005), who analysed the lithics collected during the 1991-1999 excavations, the industry is composed mainly by simple tools (primary choppers), unretouched small flakes and cores. According to its typological characteristics it predates the Olduvan or Mode I (cfr. Toth, Schick 2007) assemblages and has been attributed to the Pre-Olduvan.

Chipped stone tools are more represented from layer II (unit A), which yielded the richest complex consisting of 8,462 pieces. Only 59 specimens come from the lowermost layer VI (unit B) (cfr. Nioradze, Nioradze 2011, p. 112).

The present collection consists of over 10,000 artefacts, 86% of which come from layer II. Most specimens are debitage and debris flakes. The im-

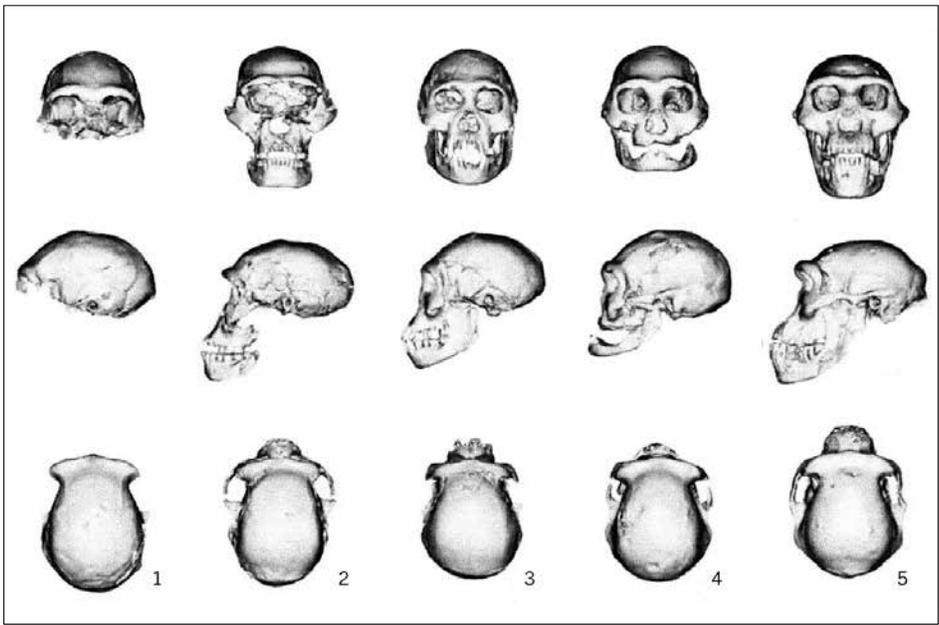


Figure 7. Dmanisi. Hominid skulls from the site (from Lordkipanidze et al. 2013, Fig. 2)

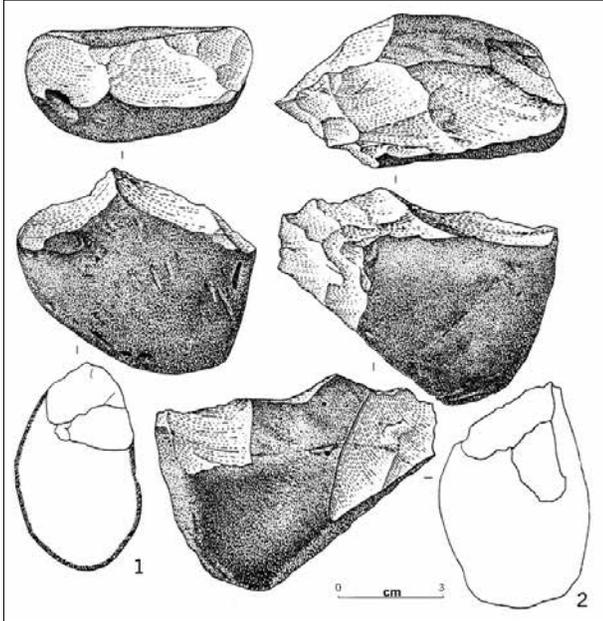


Figure 8. Dmanisi. Chopper (1) and chopping-tool (2) from unit A (layer IV) (from Nioradze, Nioradze 2011, Fig. 20)

plements are some 2,400, c. 25% of the total. The raw materials utilized for making tools consist of both volcanic and non-volcanic rocks, among which are tuff, basalt, porphyry, granite, quartzite, quartz, sandstone and limestone. All these materials are locally available within one-hour radius from the site. In most cases they are from river pebbles (cfr. Gabunia et al. 2000b, p. 25), as shown by the presence of numerous whole pebbles, most probably used as anvils, collected from the Mashavera and the Pinezouri watercourses that at present flow below the terrace on which the site is located.

According to all the above authors the assemblage is homogeneous. It does not show any evident typological change throughout the entire sequence, despite the fact that the number of tools is very variable according to the different layers. Primary choppers are the most common tools, while chopping-tools are rare (Fig. 8). Choppers were mostly collected from layer II (153 out of a total of 187). Cores are also common. They consist of 122 complete specimens and 118 fragments collected from layer II, out of a total number of 173 and 130 respectively. They are mainly unifacial although polyhedral and spherical types with many detachments also occur. Most flakes are unretouched; only a few show a secondary retouch or are notched. Many of them show small detachments derived from utilization.

5 Discussion

Given that the number of archaeological sites attributed to a period prior to 1.5 Ma in Europe and the Levant is very scarce, the discovery of Dmanisi has brought new light to the problem related to the earliest inhabitants of Eurasia that probably started to move out of Africa for the first time prior to c. 2.0 Ma (cfr. Turner 1995). This event probably followed dramatic climatic changes that took place in the continent some 2.5 Ma (cfr. Turner, Wood 1993). Opinions on this topic are nevertheless still very contentious as are those regarding the dispersal route they followed (cfr. Turner, O'Regan 2007, p. 431) because of the absence of a reasonable environmental and chronological control.

At present Dmanisi (Georgia) and Ubeidiya (Israel) (cfr. Tchernov 1987; Bar-Yosef et al. 1993) represent the only sites from which a consistent set of data is at our disposal to understand their eventual route.

The discovery of Dmanisi, and the changes that followed in the chronological frame of the first human dispersal across Eurasia (cfr. Bar-Yosef, Belfer-Cohen 2000), led to a noticeable general predating of the above event. While variable morphological characteristics of the human finds of *Homo erectus/ergaster* are intriguing, the very simple characters of the chipped stone artefacts, and their well-established chronology, reinforce the impression that core and flake technology was in use at least until 1.5 Ma and was soon after replaced by Acheulian-type bifacial hand-axes (cfr. Porr 2005).

Acknowledgements

The author is very grateful to Dr. B.A. Voytek (Berkeley University, USA) for the critical revision of the original English text.

Bibliography

- Allen, William Edmund David (1932). *A History of the Georgian People from the Beginning down to the Russian Conquest in the Nineteenth Century*. London: Routledge & Kegan Paul.
- Antón, Susan C.; Spoor, Fred; Fellman, Connie D.; Swisher, Carl C. III (2007). «Defining *Homo erectus*: Size Considered». In: Henke, Winfried; Tattersall, Ian (eds.), *Handbook of Paleoanthropology: Phylogeny of Hominids*, vol. 3, pp. 1655-1693. Berlin; Heidelberg; New York: Springer.
- Bar-Yosef, Ofer; Belfer-Cohen, Anna (2000). «Early Human Dispersal: The Unexplored Constraint of African Diseases». In: Lordkipanidze, David; Bar-Yosef, Ofer; Otte, Marcel (eds.), *Early Humans at the Gates of Europe*. Liège: Université de Liège, pp. 79-86. ERAUL, 92.
- Bar-Yosef, Ofer; Goren-Inbar, Naama; Gilead, Isaac (1993). *The Lithic Assemblages of Ubeidiya: A Lower Palaeolithic Site in the Jordan Valley*. Jerusalem: Institute of Archaeology, Hebrew University.
- Bermúdez de Castro, José M.; Martínón-Torres, Maria; Sier, Mark Jan; Martín-Francés, Laura (2014). «On the Variability of the Dmanisi Mandibles» [online]. *PLOS One*, 9 (2), e88212, pp. 1-15. Available at <http://10.1371/journal.pone.0088212> (2015-05-30).
- Bruch, Angela A.; Kandel, Andrew W.; Lordkipanidze, David (2014). «The Role of the Southern Caucasus on Early Human Evolution and Expansion: Refuge: Hub or Source Area?» [online]. *Antiquity*, 88 (339). Available at <http://antiquity.ac.uk/projgall/bruch339/> (2015-05-30).
- Cavalli Sforza, Luigi Luca; Pievani, Telmo (2011). *Homo Sapiens la grande storia della diversità umana*. Torino: Codice edizioni.
- Dennell, Robin (2009). *The Palaeolithic Settlement of Asia*. Cambridge: Cambridge University Press.
- Doronichev, Valentin B. (2000). «Lower Paleolithic Occupation of Northern Caucasus». In: Lordkipanidze, David; Bar-Yosef, Ofer; Otte, Marcel (eds.), *Early Humans at the Gates of Europe*. Liège: Université de Liège, pp. 67-77. ERAUL, 92.
- Džaparidze, Vachtang; Bosinski, Gerhard; Bugianišvili, Tamas; Gabunia, Leo; Justus, Antje; Klopotovskaja, Nina; Kvavadze, Eliso; Lordkipanidze, David; Maisuradze, Givi; Mgeladze, Nugsar; Nioradze, Medea; Pavlenišvili, Elisabetha; Schminke, Hans-Ulrich; Sologašvili, Deze-mal; Tusabramišvili, David; Tvalčrelidze, Merab; Vekua, Abesalom (1991). «Der altpaläolithische Fundplatz Dmanisi in Georgien (Kauka-

- sus)». *Jahrbuch des Römisch-Germanisches Zeltralmuseums Mainz*, 36, pp. 67-116.
- Ferring, Reid; Oms, Oriol; Agustí, Jorge; Berna, Francesco; Nioradze, Medea; Shelia, Teona; Tappen, Marta; Vekua, Abesalom; Zhvania, David; Lordkipanidze, David (2011). «Earliest Human Occupations at Dmanisi (Georgian Caucasus) dated to 1.85-1.78 Ma» [online]. *PNAS*, 108 (26), pp. 10432-10436. Available at <http://www.pnas.org/content/108/26/10432.full> (2015-05-30).
- Gabunia, Leo (2000). «On Ancient Man in the Volcanic Mountainous Region of South Georgia». In: Lordkipanidze, David; Bar-Yosef, Ofer; Otte, Marcel (eds.), *Early Humans at the Gates of Europe*. Liège: Université de Liège, pp. 43-47. ERAUL, 92.
- Gabunia, Leo; Vekua, Abesalom; Lordkipanidze, David; Swisher, Carl C. III; Ferring, Reid; Justus, Antje A; Nioradze, Medea; Tvalchrelidze, Merab; Antón, Susan C.; Bosinski, Gerhard; Jöris, Olaf; de Lumley, Marie-Antoinette; Majsuradze, Givi; Mouskhelishvili, Alexander (2000a). «Earliest Pleistocene Hominid Cranial Remains from Dmanisi, Republic of Georgia: Taxonomy, Geological Setting, and Age». *Science*, 288, pp. 19-25.
- Gabunia, Leo; Vekua, Abesalom; Lordkipanidze, David; Ferring, Reid; Justus, Antje; Maisuradze, Givi; Mouskhelishvili, Alexander; Nioradze, Medea; Sologashvili, Djemal; Swisher, Carl C. III; Tvalchrelidze, Merab (2000b). «Current Research on the Hominid Site of Dmanisi?». In: Lordkipanidze, David; Bar-Yosef, Ofer; Otte, Marcel (eds.), *Early Humans at the Gates of Europe*. Liège: Université de Liège, pp. 13-27. ERAUL, 92.
- Henke, Winfred (1995). «Qualitative and Quantitative Analysis of the Dmanisi Mandible». In: Radlanski, Ralf J.; Renz, Herbert (eds.), *Proceedings of the 10th International Symposium on Dental Morphology*. Berlin: Christine und Michael Brüne GbA, pp. 459-464.
- Kopaliani, Jumber (2000). «Dmanisi and Its Past». In: Lordkipanidze, David; Bar-Yosef, Ofer; Otte, Marcel (eds.), *Early Humans at the Gates of Europe*. Liège: Université de Liège, pp. 11-12. ERAUL, 92
- Lioubine, Vladimir P. (2002). *L'Acheuléen du Caucase*. Liège: Université de Liège, pp. 1-140. ERAUL, 93.
- Lordkipanidze, David; Ponce de León, Marcia S.; Margvelashvili, Ann; Rak, Yoel; Rightmire, G. Philip; Vekua, Abesalom; Zollikofer, Christoph P.E. (2013). «A Complete Skull from Dmanisi, Georgia, and the Evolutionary Biology of Early Homo» [online]. *Science*, 342 (326), pp. 326-331. Available at <http://www.sciencemag.org/content/342/6156/326/suppl/DC1>. DOI: 10.1126/science.1238484 (2015-05-30).
- de Lumley, Henry; Lordkipanidze, David; Féraud, Gilbert; Garcia, Tristan; Perrenoude, Christian; Falguères, Christophe; Gagnepain, Jean; Saos, Thibaud; Voincheta, Pierre (2002). «Datation par la méthode $40\text{Ar} / 39\text{Ar}$ de la couche de cendres volcaniques (couche VI) de Dmanissi (Géorgie)

- qui a livré des restes d'hominidés fossiles de 1,81 Ma». *C.R. Palevol*, 1, pp. 181-189.
- de Lumley, Henry; Nioradze, Medea; Barsky, Deborah; Cauche, Dominique; Celiberti, Vincenzo; Nioradze, Giorgi; Notter, Olivier; Zvania, David; Lordkipanidze, David (2005). «Les industries lithiques préoldowayennes du début du Pléistocène inférieur du site de Dmanissi en Géorgie». *L'Anthropologie*, 109, pp. 1-182.
- Nioradze, Medea; Nioradze, Giorgi (2011). «Early Palaeolithic Site of Dmanisi and Its Lithic Industry» [in Russian]. *Archaeology of Caucasus*, 4, pp. 103-147.
- Porr, Martin (2005). «The Making of the Biface and the Making of the Individual». In: Gamble, Clive; Porr, Martin (eds.), *The Hominid Individual in Context: Archaeological Investigations of Lower and Middle Palaeolithic Landscapes, Locales and Artefacts*. London; New York: Routledge, pp. 68-80.
- Schmincke, Hans-Ulrich; van den Bogaard, Paul (1995). «Die Datierung des Masavera-Basaltlavastrom». *Jahrbuch des Römisch-Germanisches Zentralmuseums Mainz*, 42 (1), pp. 75-76.
- Sologashvili, Djemal; Pavlenisvili, Elizaveta; Gogicajsvili, Avtandil (1995). «Zur Frage der paläomagnetischen Stratigraphie einiger junger Vulkanite und Sedimentgesteine im Masavera-Becken». *Jahrbuch des Römisch-Germanisches Zentralmuseums Mainz*, 42 (1), pp. 51-74.
- Tattersall, Ian (2007). «*Homo ergaster* and Its Contemporaries». In: Henke, Winfried; Tattersall, Ian (eds.), *Handbook of Paleoanthropology: Phylogeny of Hominids*, 3, pp. 1943-1963. Berlin; Heidelberg; New York: Springer.
- Tchernov, Eitan (1987). «The Age of the Ubeidiya Formation, an Early Hominid Site in the Jordan Valley». *Israel Journal of Earth Sciences*, 36, pp. 3-36.
- Toth, Nicholas; Schick, Kathy (2007). «Overview of Palaeolithic Archaeology». In: Henke, Winfried; Tattersall, Ian (eds.), *Handbook of Paleoanthropology: Phylogeny of Hominids*, 3, pp. 1633-1653. Berlin; Heidelberg; New York: Springer.
- Turner, Alan (1995). «Hominid Evolution in Perspective». In: Ullrich, Herbert (ed.), *Man and Environment in the Palaeolithic*. Liège: Université de Liège, pp. 9-17. ERAUL, 65.
- Turner, Alan; O'Regan, Hanna (2007). «Zoogeography: Primate and Early Hominin Distribution and Migration Patterns». In: Henke, Winfried; Tattersall, I. (eds.), *Handbook of Paleoanthropology: Principles, Methods and Approaches*, vol. 1, pp. 421-440. Berlin; Heidelberg; New York: Springer.
- Turner, Alan; Wood, Bernard (1993). «Comparative Palaeontological Context for the Evolution of the Early Hominid Masticatory System». *Journal of Human Evolution*, 24, pp. 301-318.
- Van Arsdale, Adam; Lordkipanidze, David (2012). «A Quantitative Assessment of Mandibular Variation in the Dmanisi Hominins» [online]. *Paleo-*

- Anthropology*, pp. 134-144. Available at <http://10.4207/PA.2012.ART73> (2015-05-30).
- Vekua, Abesalom; Lordkipanidze, David (2010). «Dmanisi (Georgia): Site of Discovery of the Oldest Hominid in Eurasia». *Bulletin of the Georgian National Academy of Sciences*, 4, pp. 158-164.
- Vekua, Abesalom; Lordkipanidze, David; Bukhsianidze, Maia (2011). «Dmanisi: the Oldest Eurasian Site of Fossil Hominines» [in Russian]. *Archaeology of Caucasus*, 4, pp. 16-94.
- Zollikofer, Christoph P.E.; Ponce de León, Marcia S.; Margvelashvili, Ann; Rightmire, G. Philip; Lordkipanidze, David (2014). «Response to Comment on “A Complete Skull from Dmanisi, Georgia, and the Evolutionary Biology of Early *Homo*”» [online]. *Science*, 344 (360), pp. 360-b. Available at <http://10.1126/science.1250081> (2015-05-30).