Excavations at Ghar-e Boof in the Fars Province of Iran and its bearing on models for the evolution of the Upper Palaeolithic in the Zagros Mountains

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ABSTRACT
The Upper Palaeolithic (UP) record of the Zagros Mountains is of critical importance for our understanding of the dispersal of modern humans into Southwest Asia. Most researchers interpret the record as reflecting the existence of two developmentally related cultural groups, the Baradostian of the early UP and the Zarzian of the late UP or Epipalaeolithic. In this paper we analyse techno-typological characteristics of early UP assemblages from the Zagros to assess the degree of variability. We use here new chronometric and typo-technological data from the early UP assemblages of the cave site Ghar-e Boof in the north western Fars province of Iran and compare these data with key sites of the Zagros UP, including Shanidar, Warwasi and Yafteh. Our study reveals important technological differences between assemblages from these sites, which led us to argue that the UP record of the Zagros Mountain range reflects multiple technological traditions instead of a single one. We further argue that a model reflecting a mosaic pattern for the evolution of the early UP in the Zagros Mountains fits better with the increasing evidence for a chronologically deep and spatially complex process of the spread of modern human populations over Southwest Asia.

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1. Introduction

 Locating close to the junction of Africa, Asia and Europe, the Zagros Mountains situated on the probable route of migration out of Africa towards the eastern Asia and Europe. This location of the Zagros made it an ideal place for answering important questions regarding the time and geographical position of the migration route of the anatomically modern humans (AMH) towards north and east. While in some scholarly works, the complex topographical setting of the Zagros Mountains has been viewed as barrier for the migration and expansion of the hominins, some others refer to it as a corridor from west towards east and from south to north (Heydari-Guran, 2015, pp. 48–49). Regardless of which idea is more acceptable, to understand the role of Zagros in the migration route of AMH, we need first to fully study the archaeological records from the Zagros and understand them in their context and then use them in the frame of the UP models of expansion.

 Research into the UP archaeology of the Zagros Mountains has a long and punctuated history and led to a large body of research addressing the character of the evolution of the UP (Braidwood and Howe, 1960; Conard and Ghasidian, 2011; Conard et al., 2013; Garrod, 1930; Ghasidian, 2014; Hole and Flannery, 1967; Ikeda, 1979; Olszewski, 1999; Otte and Kozlowski, 2004; Piperno, 1974; Rosenberg, 1988; Tsanova, 2013; Otte, 2014; Otte et al., 2007, 2011). The UP of Iran, and more particularly the Zagros Mountains, has been divided into two main cultural groups, the Baradostian of the early UP and the Zarzian of the late UP or Epipalaeolithic. Both entities are defined based on assemblages excavated in Iraqi Kurdistan in the Northern Zagros Mountains (Fig. 1). The type site of the Zarzian is Zarzi Cave excavated by Dorothy Garrod in 1928 (Garrod, 1930). The Zarzian is a microlithic industry with small (thumbnail) scrapers, backed bladelets and geometric forms (Garrod, 1957; Olszewski, 2012). The type site of the Baradostian is Shanidar Cave (Solecki, 1958, 1963). Solecki excavated the site as part of his PhD research during three seasons in 1951, 1953 and 1956/57. In layer C he recovered a “... blade-burin industry related to the Aurignacian of Europe” (Solecki, 1958, p. ...
Despite some general similarities between layer C and the European Aurignacian, Solecki questioned the applicability of the European classification scheme outside Europe and concluded that the Palaeolithic sequences in areas like the Near East must be analysed separately first and then any connections with other areas can be considered (Solecki, 1958, p. 33).

Probably related to these concerns, Solecki invited Dorothy Garrod in 1953 to examine the lithic collection of Shanidar Cave and to discuss the naming of the industry from layer C.

"The artifact inventory from layer C was poorer in numbers than that from the other layers at Shanidar Cave. However, upon examination and consultation with Garrod, who viewed the collection in Baghdad in December 1953, the assemblage from Layer C was thought to deserve a distinguishing new identity. Dr. Garrod with her long experience in the archaeology of the Near East, could not immediately think of any exact counterparts. Certainly the industry represented in the layer was not fully characteristic of the western Aurignacian. It was decided to call the industry of Layer C the Baradostian after the name of the mountain which so prominently looms above Shanidar."

[Solecki, 1958, pp. 23–24]

Solecki defined the Baradostian as an industry including high number of various well-made burins and large number of reutilized blade cores, Font-Yves points, and the Mousterian points. He observed that some of the burins and other tool types were made on flakes with facetted butt which technology is commonly observed in the Mousterian (Solecki, 1958, p. 145).

Despite some Middle Palaeolithic characteristics in its definition of the Baradostian, Solecki argued that the Baradostian at Shanidar is not related to the local Mousterian of the Middle Palaeolithic (MP). Apparently Garrod was in agreement with him about this idea (Solecki, 1958, p. 145).

While details about the evolution of the UP in the Zagros Mountains changed over the subsequent decades, researchers have followed the classificatory schemes proposed by Garrod and Solecki and helped to establish the Baradostian and Zarzian as the most widely used terms for the Upper and Epipalaeolithic in the Zagros. Significant in this context is the archaeological field work in the West Central Zagros Mountains during the 1960s and 1970s, which added further important data to the UP record of Iran. In Kerman-shah, about 400 km crow flies south of Shanidar (Fig. 1), Bruce Howe excavated the site Warwasi Rockshelter in 1960 (Olszewski, 1993a). The sequence contains Mousterian, Baradostian and Zarzian assemblages. The excavators did not publish detailed descriptions of the recovered assemblages but claimed based on their field data that: "[...] there is reason to suspect little typological disconformity in this developing sequence, which probably ends at about 10,500 years ago." (Braidwood et al., 1961, p. 2008).

Inspired by Howe's work in Warwasi and the possible continuous sequence from Mousterian to Baradostian and Zarzian, Hole and Flannery explored the Palaeolithic in the Khorramabad Valley, Lorestan, about 120 km southeast of Warwasi (Fig. 1). The main goal of their Palaeolithic field work was finding evidence for answering the question of continuity or discontinuity between MP and UP (Hole, 2012, p. 11). They excavated a number of caves and rockshelter sites including Kunji, Ghamari, Gar Arjeneh, Pa Sangar and Yafteh (Hole and Flannery, 1967). Unfortunately, the majority of sites featured evidence for either MP or UP. Gar Arjeneh is the only exception. Here they recovered a sequence containing both MP and UP assemblages without great hiatus (Hole and Flannery, 1967, pp. 153–154). However, they also found that the critical levels were disturbed by porcupine burrows, which made...
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