



The Early and Middle Pleistocene Technological Record from Sierra de Atapuerca (Burgos, Spain)

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FIRST PARAGRAPH: The Sierra de Atapuerca sites offer a chronological sequence that allows the study of the evolution of technology during the Early and the Middle Pleistocene, at least at a local scale. Here we present updated information of the lithic assemblages recovered at the different levels of the sites of Sima del Elefante, Gran Dolina, Galería and Sima de los Huesos. Also, other archaeological and environmental data will be crossed with the technical features in order to understand the peopling that took place at Atapuerca during Pleistocene times. Comparing these assemblages allows determining which variables are present and absent of each site/level, and which may be significant to understand the technological evolution.

西班牙布尔戈斯的阿塔坡卡山遗址的更新世早中期技术记录

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首节: 阿塔坡卡山遗址提供了研究更新世早、中期技术进化的年代序列, 至少在局部地区范围内是这样。我们在这展示了从埃勒芬特裂谷、格兰多林、画廊和胡瑟裂谷几个不同平面的遗址中得到的石器组合的新信息。通过比较可以分析每个遗址或平面中这些石器变异特征的出现或缺失, 哪些特征对理解技术进化更有意义。并且, 将技术特征结合其它考古学和环境学的数据, 来了解在更新世时期发生在阿塔坡卡的人类定居情况。

The first peopling of Atapuerca occurred at 1,2 Ma, and it is represented at TE9 and TD3-4 by *Homo antecessor* and a Mode 1 technology very immediate and poor although both assemblages yielded few artifacts. Subsistence strategies were also opportunistic, focused in making profit of the carcasses fell into the cavities.

Before 800 ka there is a second cultural phase represented at TD6, and characterized by new subsistence and technological strategies, although still belonging to Mode 1 and represented by *Homo antecessor*. At TD6 the lithic assemblage is rich and diversified, although it may be the result of technological evolution from the oldest assemblages. Intensive occupations with well organized subsistence strategies have been documented.

These include hunting, as well as the earliest trace of cannibalism in Prehistory.

A hiatus of approximately 300 ka without hominin activities separates TD6 from the next occupations of Galería and TD10. They match with the third cultural phase that ranges between 500 ka-300 ka, and is represented by Mode 2 technology, and systematic and directional carcass processing, including hunting events at TD10. This time there is a replacement of *Homo antecessor* by *H. heidelbergensis*. From a technological point of view, there is no way at present to evaluate whether Mode 1 could have evolved to Mode 2 in Atapuerca. However, it is probably not a coincidence that a different hominin species appeared, and at the same time Mode 2 dispersed relatively fast throughout Europe.

Finally, TD10.1 may represent the transition to Mode 3, which evolved at Atapuerca as a local transition from Mode 2. Interestingly, and as exposed elsewhere [1], at Atapuerca there is no relation between climatic changes and cultural and faunal turnovers, including hominins.

After studying the assemblages, several technological features have been observed to keep on or change along the Atapuerca sequence, and they may determine the technological evolution at a local scale. These factors and their evolutionary trends at the Atapuerca assemblages are:

1) Raw materials selection. Use of local varieties of rocks, used simultaneously only from the late Lower Pleistocene onwards. Progressive increase of selection of the most workable varieties along the Middle Pleistocene.

2) Production sequences through unipolar, multipolar ortogonal, multidirecional, bipolar and centropolarized (group of centropolarized, centripetal and Levallois) knapping methods. All of them may be present whatever the chronology, but the younger the assemblage, the more abundant centripetal methods, and lastly, Levallois-like techniques. Increasing flake predetermination and standardisation.

3) Chopper and chopping-tools are very scarce, slightly shaped, and so, without any special significance.

4) Small tools on flake appeared only at the end of the Lower Pleistocene, and increased in number, complexity and standardisation along the Middle Pleistocene.

5) Large cutting tools (on flake or on cobble) appear c. 500 ka ago. Along Gran Dolina TD10 they progressively decrease in number, standardisation and intensity of shaping.

TE9和TD3-4两个地位层中的先驱人和简单粗糙的第一模式技术证明,阿塔坡卡遗址的第一拨人是在120万年前到达的,虽然这两个组合中的人工痕迹很少。这批人的生存策略也很机会主义,往往以掉落深穴的动物为食。

80万年前在TD6地位层中有第二个文化形式,以新的生存和技术策略为特征,但仍属于第一模式和先驱人的特征。在TD6地位层中,石器组合很丰富并且多样,虽然它可能是从旧的组合通过技术进化的结果。就生存策略而言,出现了狩猎和营地的社会结构。并且,也出现了史前时期人吃人的最早证据。

大约20万年前没有人类活动的断层将TD6地位层和下一个有人类的画廊和TD10地位层隔开。这些地位层与50~30万年前第三种文化形式一致,以阿舍利技术为特征,系统地直接地获得猎物,包括在TD10中的狩猎事件。这段时期,先驱人代替海德堡人。从技术的角度来说,目前没有办法判断阿塔坡卡的第一模式是否演化为阿舍利文化。但是,另一种人种的出现,以及与此同时阿舍利文化在整个欧洲较快地扩散,这很可能不是巧合。

最后,TD10.1地位层可能代表了向莫斯特文化的转变,在阿塔坡卡当地的莫斯特文化是由第二模式进化而来的。有趣的是,和其他有些地方一样[1],在阿塔坡卡气候变化与文化和动物区系包括人类的更替是没有关系的。

研究完这些组合后,在阿塔坡卡序列中观察到一些因素得以保留或改变,它们可能说明了局部区域的技术进化。这些阿塔坡卡石器组合的因素和趋势如下:

1) 原材料选择。阿塔坡卡遗址出土的工具的原材料都是当地产的。所有应用的材料在下更新统顶部出现了,更新世中期人类增加了对更多可用材料的选择。

2) 通过单极、多极、直角的、多方向的、双极的和向心的(包括勒瓦卢瓦)的打击方法。所有年代的石器组合都展现了每个特征,但组合年代越短,向心方法越丰富,最后是类勒瓦卢瓦的技术。

3) 罕见切割器和切割工具,造型简单,所以没有特殊意义。

4) 小工具的多态性, 标准化, 加工的连续性和构造的尖锐程度。考虑到这两个因素, 小工具在下更新统出现, 并且更新世中期数量和复杂性都增加。

5) 50万年前出现薄石片或卵石打制的大型切割工具。在格兰多林TD10, 渐渐减少, 并变得不规则而且结构强度降低。(袁媛 译)

参考文献

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