

THE FIRST AMERICANS, like the dinosaurs, the origin of life, and human evolution, is a subject that fascinates both scientists and the general public.

The peopling of the Americas is extraordinarily rich in areas of interest—humans coping with changes in their environment at the end of the Ice Age; the remarkable courage and perseverance of human colonizers undaunted by unfamiliar terrain and wildlife; the enviable versatility and ingenuity of toolmakers, who learned to make implements of stone for every purpose, from everyday chores to killing game the size of giant ground sloths, mammoths, and mastodons.

As we enlarge our knowledge, our fascination with the First Americans grows ever more intense. That is why the editors are pleased to present this special issue of *Current Research in the Pleistocene*, which illuminates the earliest existence of humans on the continent of South America. Here 98 Latin American scientists, from México to Argentina, apply their scholarship in Quaternary science, archaeology, and anthropology to answer—at least in part—such seminal questions about this complex feat of colonizing as, Who were the first inhabitants of the southern continent? When did they arrive? Which routes did they follow from their places of origin? How long did it take to complete this task?

After a century of research, our fascination is more acute than ever. We are encouraged to pursue our search for knowledge by this thought of Florentino Ameghino, the scientist whose discovery of fossils on the Argentine Pampas at the turn of the century rivals the accomplishments of his North American coevals:

“Por nuestra parte, no vamos a hacer más que descorrer una punta del tupido velo que encubre la pasada existencia del hombre Americano. Descorrerlo por completo está reservado al esfuerzo de muchos.”

[From our side, we will not do more than pull back an extreme of the veil that covers the history of American man's existence. Uncovered it is reserved entirely to the efforts of many of us.]



SOUTHBOUND
Late Pleistocene Peopling
of Latin America

 **SPECIAL EDITION**
Current Research in the Pleistocene

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Editors
Laura Miotti • Mónica Salemme
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**Center for the Study
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A Peopling of the Americas Publication
Michael R. Waters, General Editor
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SOUTHBOUND: LATE PLEISTOCENE PEOPLING OF LATIN AMERICA

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Technological and Functional Analysis of Pleistocene Components from La Maria Locality, Santa Cruz, Argentina

Manuel Cueto¹ and Alicia Castro²

► **Keywords:** Functional analysis, Pleistocene components, Santa Cruz

Technological studies related to late-Pleistocene hunter-gatherers from the Central Plateau of Santa Cruz, Argentina, have historically tended to describe morphologically and typologically samples of lithic artifacts from individual sites (Cardich and Flegenheimer 1978; Cardich et al. 1987; Miotti 1996). Very few comparative studies have been done, especially in relation to early technologies (Aguerre 1979; Cattaneo 2002; Mansur 1984; Paunero and Castro 2001; Gradín et al. 1987).

Here we present a comparative analysis of samples of lithic artifacts from two different early cultural components from the Patagonia Central Plateau. We study the kinds of tasks tools were made for and analyze differences and similarities between both sites, taking into consideration the information provided by analyzing stone-tool production and use strategies. The materials we analyzed come from unit 4 (U4) of the Casa del Minero 1 site (CDM1) and from units 8, 9 and 10 (U8/10) of the Cueva Túnel (CT) site. Both are multicomponent sites located in caves and dated to ca. 10,600 CALYBP (Castro et al. 2011).

Tools yield a corpus of information related to ancient societies and provide knowledge about exploiting resources, manufacturing techniques, preference for certain kinds of rock, and morphological characteristics of the edges. Analyzing goes beyond the material object and considers techniques and strategies that figure in producing artifacts (Pfaffenberger 1992).

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Our goal is to analyze the techno-morphological characteristics and use made of stone tools from two late-Pleistocene components, CDM1-U4 and CT-U8/10. A secondary aim is to compare the macroscopic characteristics of the stone tools of both sites with neighboring sites from the Central Plateau to determine whether they are technologically related.

8 Methodology

We described and classified the samples through an analytical approach, compatible with functional analysis, based on criteria built on regional lithic research (Castro et al. 2011). Among the technological traits considered when analyzing stone artifacts were the type of blank, platform, characteristics of blank flaking, module, and size.

For the comparative analysis with other early components from the region, we considered published papers (see above) on lithic technology. Information from sites Los Toldos (LT), El Ceibo (EC), Piedra Museo (PM), Cerro Tres Tetas (C3T), and Cueva de las Manos (CdM) have been averaged. The lithic assemblages from these sites share certain technical and morphological characteristics such as: flakes used as blanks; predominance of angular flakes, followed by secondary backed flakes and primary flakes; production of predetermined shapes such as blades; prepared platforms and artifacts with unifacial marginal retouch predominate; marginal dorsal retouch that is mostly scalar. The preferred raw material was flint, followed by chalcedony and silicified wood. Artifacts are usually large, but there are also medium-sized and very large artifacts. The typology is dominated by scrapers, sidescrapers, and knives; morphological standardization is absent. Microscopic functional analysis was used to verify the function of the artifacts (Castro et al. 2011).

11 Results

We found technological similarities between the stone artifacts from CDM1-U4 and CT-U8/10. The selected raw materials were flint and chalcedony. The typological structure of the analyzed assemblages from both sites is dominated by retouched flakes and knives, followed by scrapers, sidescrapers, and retouched blades. There is also a chopper/hammerstone. All the artifacts are of large, medium, and very large size. In both assemblages the principal blanks selected are angular and primary flakes, followed by blades and cobbles. There is a prevalence of flat platforms, followed by prepared ones. No cortical platforms were recorded, which signifies that the flaking surface of the core was prepared before producing a blank. For the final shaping of blanks, marginal and extramarginal retouch and microretouch prevail. The type of retouch is in all cases scalar. This kind of flaking does not change the general shape of the blank. Bifacial retouch is less represented.

Functional analysis was done on 32 edges from 18 stone tools (Table 1 and Figure 1). The tools at CDM1 were always used applying a single movement on a single substance. Those artifacts which, according to functional analysis, were used—scraper/side scraper and retouched flakes—scraped hides and cut bones; the applied movement was transverse to the edge, in a minor proportion longitudinal movements were detected. In other cases indicators refer to a probable use, because use-wear was not diagnostic. One of these cases shows evidence of wear of a longitudinal movement; another two show transverse actions, all on unspecified substances. The remaining stone tools did not have any traces of use, in spite of having finely regularized edges (Castro et al. 2011). The stone artifacts from CT were used for up to two actions on different substances. Side scrapers, knife/side scrapers and a chopper-hammerstone were used to cut meat and bone, to strike stone and to crush hard substances such as bone or

Table 1. Traces of use wear detected on stone artifacts from Casa del Minero 1 and Cueva Túnel.

Stone tools	No. edges	Used?			Action	Substance
		Sure	Probable	Unused		
Unit CDM1 U4						
Retouched flake	2	X			Transversal	Hide
Retouched flake	2	X			Longitudinal	Bone
Retouched flake	2			X		
Retouched flake	2			X		
Retouched flake	1			X		
Retouched flake	2					
Edge 1			X		Transversal	Undet.
Edge 2				X		
Scraper	1		X		Transversal	Undet.
Sidescraper	2			X		
Knife	3					
Edge 1			X		Longitudinal	Undet.
Edge 2				X		
Edge 3				X		
Scraper/sidescraper	2	X			Transversal	Bone
Biface	2			X		
Unit CT U8/10						
Knife	2					
Edge 1			X		Longitudinal	Meat
Edge 2			X		Longitudinal	Meat
Knife	1		X		Longitudinal	Meat
Knife/sidescraper	2					
Edge 1		X			Longitudinal	Meat
Edge 2				X		
Retouched flake	1			X		
Retouched blade	1			X		
Chopper/hammer	3					
Edge 1		X			Strike	Stone
Edge 2		X			Crush	Bone
Edge 3		X			Strike	Stone
Sidescraper	1	X			Longitudinal	Meat

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wood. These artifacts performed longitudinal and punctual movements. In two other cases the indicators refer to a probable use, both knives with traces of longitudinal action on a soft substance such as meat, skin, or some other soft tissues. The remaining stone tools did not have diagnostic traces of microwear.

The technomorphological comparative analysis performed with the other contemporary sites from the region (see above) shows that there are similarities in the manufacturing techniques and in the kinds of rocks selected; therefore, we think there was a similar way of doing (regarding ideas and gestures) in the production of lithic artifacts during the late Pleistocene in the region.

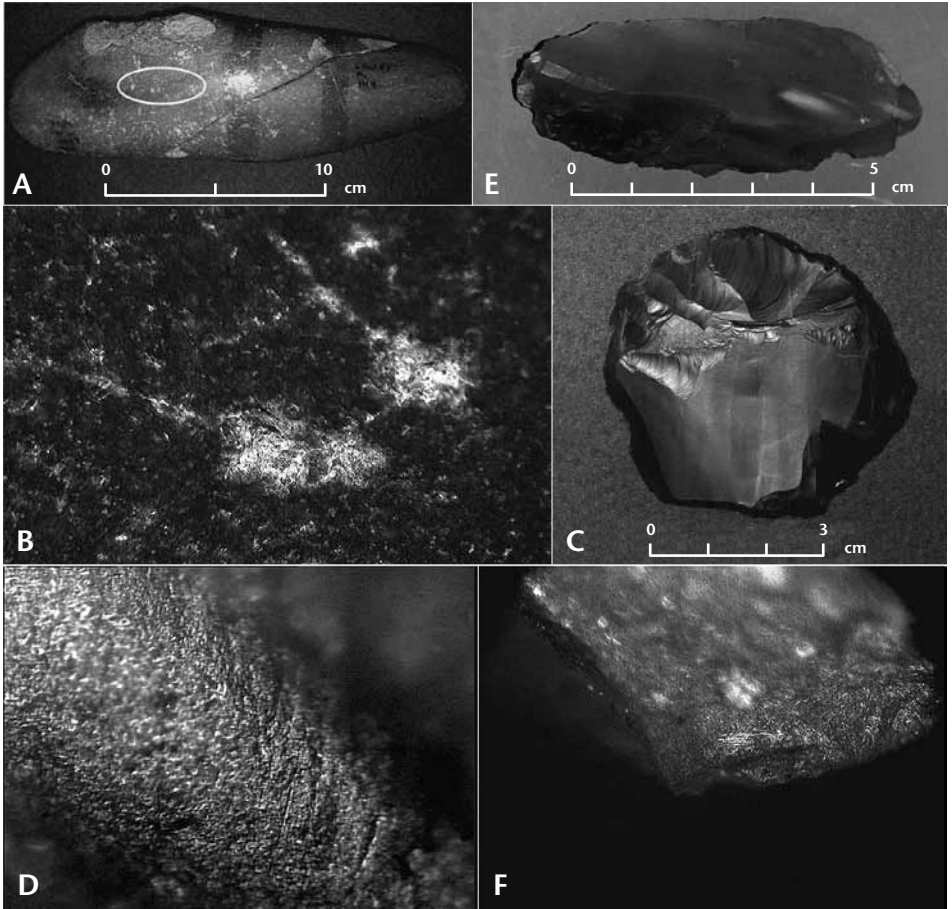


Figure 1. Artifacts and micrographs of materials from Casa del Minero 1 and Cueva Túnel. **A–B**, chopper/hammer from Cueva Túnel, magnification 70X (note rushed marks in kite-shaped oblique orientation); **C–D**, scraper/sidescraper from Casa del Minero 1, magnification 300X (microwear and transverse striations of action imply scraping of leather); **E–F**, knife/sidescraper from Cueva Túnel, magnification 150X (note longitudinal movement of microwear implying cutting of flesh and bone).

Conclusions

Regularity is evident in the stone-artifact technology of the earliest lithic assemblages from the area, including CDM1 and CT. Tools of all the assemblages are of a size suitable for manual handling, and the toolkits are characterized by a low investment of work on good-quality rocks. The prevalence of large stone tools only marginally modified by retouch suggests that resharpening was implicit in the conception of the artifact.

Differences between CDM1 and CT arise when considering functional aspects. Stone tools of CDM1 were made to process hides, to remove fleshy matter or to tan by scraping; and to cut bone when dismembering or when separating soft tissue from bone. These activities may have been a part of the secondary processing of bones for making tools like those

found in the component. The technological repertoire and inferred activities suggest a site where primary butchering and secondary processing of prey were done and tools were given their final shaping. At CT, on the other hand, artifacts were designed for the primary processing of prey. This is evident in the retouched edges of knives and sidescrapers, which bear microwear and other traces associated with cutting hard substances such as bone and soft tissue such as meat. Percussion marks around the edge of the chopper-hammerstone suggest impacts from breaking wood or bone. We also detected evidence of percussion on rocks by marks on its working surfaces.

The evidence suggests a technology for making stone tools to perform simple and planned tasks. We wish to emphasize the importance of supplementing technological analysis with functional analysis, thereby yielding great benefits in interpreting the activities performed in settlements and the variability of contemporary sites, such as those occupied by the first societies of Patagonia. 18

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