Research in the Middle Negro River Basin (Uruguay) and the Paleoindian Occupation of the Southern Cone

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Most scholars now believe that the Americas were peopled more than once and that these colonizing events produced a remarkable technological and adaptive diversity in South America during the Terminal Pleistocene and Early Holocene. The Southern Cone has played an important role in this history. The discovery in the 1930s of projectile points associated with the remains of Pleistocene fauna at Fell's and Pali Aike Caves has been followed by the discovery of similar Paleoindian artifacts in Ecuador, Argentina, and Uruguay. The Negro River basin in Uruguay has produced thousands of artifacts representing the earliest hunter-gatherer occupation. Recent investigations there have revealed strong morphological and technological similarities with other South American regions, among them similarities in blank selection, total or partial bifacial flaking in the early stages of manufacture, final shaping by short pressure retouches, carefully abraded stems, blade resharpening patterns, and variability. Although in its infancy, this research is beginning to integrate the Uruguayan record with broader archaeological processes in the region.

Advances in archaeological research in recent decades have allowed for a new appraisal of old problems such as the peopling of the American continent and the nature of its most ancient inhabitants. The field of First Americans studies is undergoing rapid change. Most scholars now believe that the Americas were peopled more than once (Dillehay 2002, 70; Bonnichsen 2000) and that these colonization events produced a remarkable technological and adaptive diversity in South America during the Terminal Pleistocene and Early Holocene (Dillehay et al. 1992; Dillehay 2002; Roosevelt, Douglas, and Brown 2002; Stanford et al. 2006).

The Southern Cone has played an important role in this history. At its southern tip, near the Strait of Magellan on the Chilean side, in the 1930s, just a few years after the Clovis and Folsom discoveries in North America, Junius Bird of the American Museum of Natural History excavated Fell's and Pali Aike Caves (Bird 1938) and found fishtail and Fell projectile points associated with the remains of Pleistocene fauna. Further investigations reported similar Paleoindian artifacts in Ecuador, Argentina, and Uruguay (e.g., Bird 1969; Bosch, Femenías, and Oliva 1980; Mayer-Oakes 1963, 1966). Chronological investigations showed that these projectile points were used by the latest Pleistocene hunter-gatherers between ca. 11,000 and 10,000 uncalibrated years BP. Table 1 gives the dates for finds of these points in stratified contexts. Contexts without projectile points such as Cerro El Sombrero Rockshelter 1, with cores and early stages of projectile point manufacture (Flegenheimer 1991; Nami 1996; Politis, Messinea, and Kaufmann (2004) and Cueva del Lago Sofia, with debitage and unifacial tools (Prieto 1991; Nami 1996; Massone and Prieto 2004), were part of the same system, reflecting Paleoindian intersite variation.

In Uruguay, Paleoindian remains and Fell projectile points have been encountered since the end of the nineteenth century (Figueira 1892). This diagnostic artifact has been recovered on the surface all over the country, but the main concentration of these points is in the Negro River basin (Baeza and Femenías 1999). Previous investigations in the basin were conducted by the pioneering amateur archaeologist Antonio Taddei and his followers, mostly on remains from surface sites (e.g., Taddei 1980). However, despite the archaeological richness and significance of the region, there has been a notable lack of systematic excavation and laboratory research aimed at clarifying its chronology.

The Middle Negro River basin has produced an unusual archaeological record. The archaeological exposures have revealed thousands of artifacts representing the terminal-Pleistocene-to-Late-Holocene hunter-gatherer occupation, including various forms of projectile points, the early stages of biface manufacture, ground stone, ceramics, and other artifacts. Buried remains of Late Pleistocene fauna are also fairly common finds. These remains, ranging in age from the earliest occupation to very recent times, have the potential to reveal regional archaeological processes. Additionally, the materials in a number of private collections contribute to our knowledge of technological developments in the region. Systematic research in the basin is therefore vital to archaeological studies from a contemporary interdisciplinary perspective (Nami and Femenías 2003, 2006). This report assembles some preliminary observations resulting from archaeological research in the Negro River basin and discusses the relationships between the Uruguayan materials and those from the rest of the Southern Cone.

Advances in Paleoindian Studies

Systematic Paleoindian studies in Uruguay have only recently begun, but the reexamination of previously excavated sites and the review of collections with new approaches are yielding significant data. Meneghin (2004, 2006) has reported reliable uncalibrated AMS dates of 10,680 ± 60 (Beta-165076) and 11,690 ± 80 (Beta-211938) years BP from Urupez, in Maldonado Department in the south of the country. Both dates

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Table 1. Uncalibrated Conventional Radiocarbon and AMS Dates from Sites with Fishtail Points in Stratigraphic Position

Site	Material Dated	Date (years BP)	Laboratory Number	Reference
Urupez	Charcoal	10,680 ± 60[a]	Beta-165076	Meneghin (2004)
	Charcoal	11,690 ± 80[a,b]	Beta-211938	Meneghin (2006)
Cerro La China 1	Charcoal	10,520 ± 75[a]	AA-8954	Flegenheimer and Zarate (1997)
		10,720 ± 150[a]	I-12741	
		10,745 ± 75[a]	AA-8952	
		10,790 ± 120[a]	AA-1327	
		10,804 ± 75[a]	AA-8953	
Cerro La China 2	Charcoal	10,560 ± 75[a]	AA-8596	Flegenheimer and Zárate (1997)
	Charcoal	11,150 ± 135[a]	AA-8955	
Abrigo Los Pinos	Charcoal	8,750 ± 160[c]	LP-684	Mazzanti (1999*a*)
	Charcoal	9,570 ± 150	LP-630	
	Charcoal	10,465 ± 65[a]	AA-24045	
Amalia-Sitio 2	Charcoal	10,425 ± 75[a]	AA-35499	Mazzanti (2002)
Paso Otero 5	Organic material	9,399 ± 116[d]	DRI-3573	Martinez (2001, 2000/2002)
	Megamammal bone	10,190 ± 120[a]	AA-19291	
	Megatherium americanum bone	10,440 ± 100[a]	AA-39363	
Tagua-Tagua	Charcoal	9,710 ± 90	Beta-45518	Nuñez et al. (1994)
	Charcoal	9,900 ± 100	Beta-45519	
	Charcoal	10,190 ± 130	Beta-45520	
	Charcoal	11,380 ± 320	GX-1205	Montané (1968)
Piedra Museo	Charcoal	9,710 ± 105[e]	LP 859	Miotti and Salemme (2004)
	Camelidae bone	10,400 ± 80[a,f]	AA-8428	Miotti, Salemme, and Rabasa (2000, 2003)
	Lama guanicoe bone	10,470 ± 65[a,f]	OXA-9249	
Cueva del Medio	Charcoal	9,595 ± 115	PITT-0244	Nami (1987)
	Mammal bone	9,770 ± 70	Beta-40281	
	Charcoal	10,310 ± 70	Gr-N 14913	
	Burned bone	10,350 ± 130[g]	Beta-58105	
	Charcoal	10,430 ± 80	Beta-52522	
	Bone	10,430 ± 100[a]	NUTA-1734	
	Burned bone	10,550 ± 120[g]	Gr-N 14911	Nami and Nakamura (1995)
	Bone	10,710 ± 100[a]	NUTA-1811	Nami (1987)
	Bone	10,860 ± 160[a,g]	NUTA-2331	Nami and Nakamura (1995)
	Charcoal	10,930 ± 230	Beta-39081	Nami and Menegaz (1991)
	Bone	10,960 ± 150[a]	NUTA-2330	Nami and Nakamura (1995)
	Bone	11,040 ± 250[g]	NUTA-2197	
	Bone	11,120 ± 130[a]	NUTA-1737	
Pali Aike	Burned *Mylodon* and *Hippidion* bone	8,639 ± 450[h]	C-485	Bird (1983)
Fell's Cave	Charcoal	10,080 ± 160[i]	I-5146	Bird (1983, 1988)
	Charcoal	10,720 ± 300	W-915	
	Charcoal	11,000 ± 170	I-3988	
Tres Arroyos	Charcoal	10,130 ± 210[a]	OxA-9666	Massone and Prieto (2004)
	Mammal bones	10,280 ± 110	DIC-2732	
	Mammal bones	10,420 ± 100	DIC-2733	
	Dusicyom avus bone	10,575 ± 65[a]	OxA-9245	
	Charcoal	10,580 ± 50[a]	Beta-113171	
	Charcoal	10,600 ± 90[a]	Beta-101023	
	Camelid bone	10,630 ± 70[a]	OxA-9246	
	Hippidion bone	10,685 ± 70[a]	OxA-9247	
	Panthera onça bone	11,085 ± 70[a]	OxA-9248	
	Mammal bones	11,880 ± 250	Beta-20219	

[a] AMS.
[b] Same level but 50 m from the previous one.
[c] May be anomalous.
[d] Dates obtained from organic materials tend to be younger (Martin and Johnson 1995; Willey, Johnson, and Isaacson 1998).
[e] From the base of stratigraphic unit #4 (Miotti and Salemme 2004).
[f] From stratigraphic unit #5 (Miotti, Salemme, and Rabasa 2000, 2003).
[g] From the same hearth.
[h] Libby's date, questioned by Bird (1983).
[i] Transitional between periods I and II.

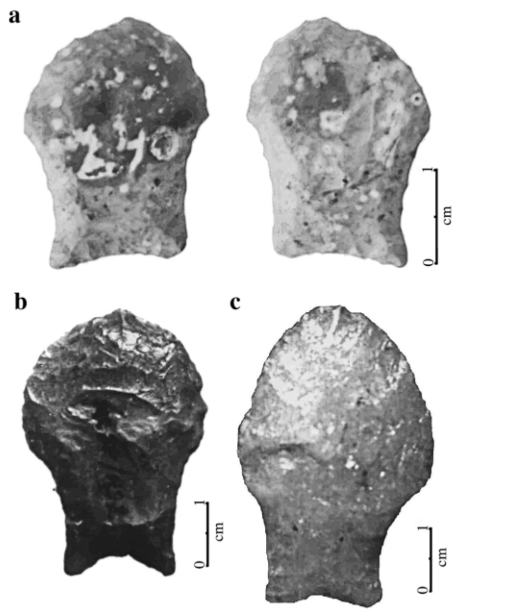

Figure 1. Fishtail Fell projectile points found at Minas de Callorda (*a*) and Monte Caseros, Corrientes Province (*b* and *c*). (Photo *a* courtesy of J. Femenías).

were obtained on charcoal from a discrete archaeological level with fishtail points. At Pay Paso in northwestern Uruguay, near Bella Unión in Artigas Department, a deep stratigraphic deposit formerly excavated by the archaeologist Antonio Austral was reexcavated, and the lower level yielded three radiocarbon dates ranging between ~9,300 and 8,600 years BP. Fell projectile points have been identified at several sites in the region (Suárez and López 2003). Despite the fact that the regional prehistoric synthesis does not take into account this kind of evidence (see, e.g., Schmitz 1987; Rodriguez 1998; Rodriguez and Cerutti 1999), it is significant that fishtail specimens have been found across the Uruguay River in Monte Caseros, Corrientes Province, Argentina (personal observation, 1993; Mujica 1995; see also fig. 1, *b* and *c*) and in southern (Politis 1991) and east-central (B. Meggers and A. Barbosa, personal communication, 2006) Brazil.

Fell lithic assemblages in other areas of the Southern Cone include ground discoidal stones (Bird 1970; Flegenheimer 1991; Meneghin 2000), and one of these was recently discovered about 4 m below the surface at Barrancas on the bank of the Santa Lucía River by F. López of the Antonio Taddei Museum. Test pits dug in this level uncovered significant quantities of bones of extinct fauna (J. Femenías, personal communication, 2004). Finds of the remains of trees in living positions from the same level yielded radiocarbon dates of 10,480 ± 100 (LP-1110), 10,500 ± 110 (LP-1143), and 11,650 ± 130 (LP 509) uncalibrated years BP (Ubilla 1999; López, Femenías, and Nami 2001).

Surveys and excavations around Paso de los Toros in Tacuarembó and Durazno Departments have identified several buried sites with surface finds of Paleoindian artifacts (fig. 2). Systematic excavation has begun at Minas de Callorda (32° 51.90′ S, 56° 25.30′ W.), a large site on the riverbank where artifacts from sedimentary deposits are exposed on the surface during the river's ebb. Through the years, this site has yielded hundreds of ground and flaked stone artifacts, and collectors have been visiting it for almost 50 years. The most conspicuous finds are projectile points, including Paleoindian fishtail specimens. Faunal remains are rare, but a bone fragment of an extinct species, probably of Pleistocene age, was collected at the site. Despite the alluvial erosion, intact deposits appropriate for excavation remain.

During the 1990s, Baeza and others carried out an excavation at Minas de Callorda and identified a single Holocene archaeological component (Baeza et al. 2001). The newly excavated area is located on the highest terrace of the river and about 70 m west of it and has slightly different stratigraphy. Four strata have been identified: Level I, the present vegetal humus surface; Level II, a gray sandy deposit; Level III, a mottled sandy gray deposit; and Level IV, a hard brown clay overlying basalt bedrock that may be attributed to the Late Pleistocene Dolores Formation. Radiocarbon dates obtained from wood samples belonging to this formation yielded dates of ~11,000–10,000 years BP (Ubilla 1999; Martínez and Ubilla 2004). This geological unit is similar to the Lujan Formation of the Argentine Pampas, a useful horizon marker for the Late Pleistocene and Early Holocene (Cione and Tonni 1995; Tonni et al. 2003). Level IV also represents a fully developed

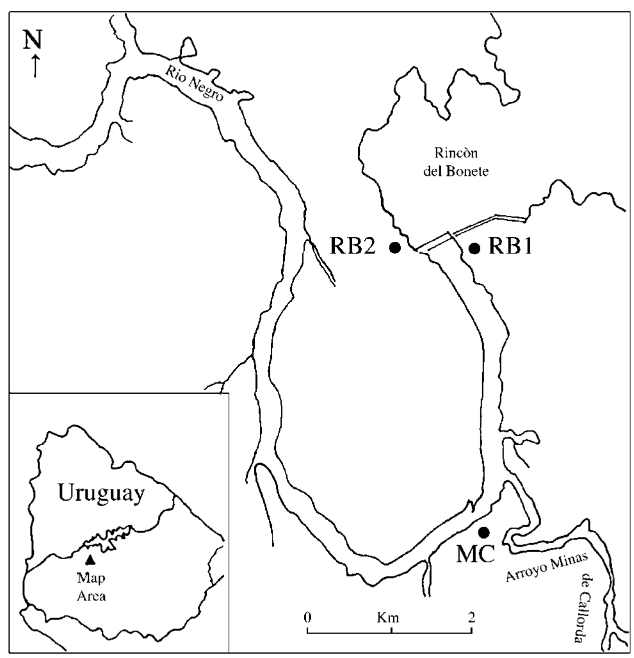

Figure 2. The Río Negro basin, showing the locations of Minas de Callorda (*MC*) and the Rincón del Bonete quarries (*RB1, RB2*).

soil that suggests a period of nondeposition and landscape stability (Holliday 1985; Kraus and Brown 1986). The bedrock of this sedimentary deposit lies only about 0.6–0.7 m below the current soil surface in some places, as was the case in the excavated sector.

The first remains were found at the transition between Levels I and II, the second in the lower portion of Level III, and the third at the top of Levels IV. The upper level showed scattered lithic artifacts, mainly debitage. The middle one is characterized by the presence of diverse types of end scrapers, among them an unusual bifacially flaked piece and others made on short blades used as blanks, along with microblade cores, early stages of biface manufacture, and stemmed projectile points (fig. 3, *a*) that may belong to an archaeological component similar to that identified by Baeza et al. (2001). This sort of projectile point characterizes the Holocene lithic assemblages from southern Brazil and northeastern Argentina. Traditionally, because of their similarity in general outline, they have been considered genetically related to those used by Late Holocene hunter-gatherers in Patagonia (e.g., Schobinger 1969, 204–5). However, while both were produced using excellent flintlike material, the Uruguayan pieces show differences in stem form and in final shaping and were not very carefully made. Remains from the lower archaeological level exhibited sharp technological differences from those of the upper ones. An interesting broken fluted base 20 mm long, 27 mm wide, and 4 mm thick was found in this level (fig. 3, *c*). It is made on a red silicified limestone by pressure flaking that left parallel flake scars on one face; the other shows a sort of flute obtained from its basal portion. This level probably represents the Early Holocene/Latest Pleistocene hunter-gatherers. Fluted projectile points (Bosch, Femenías, and Oliva 1980; Baeza and Femenías 1999) and preforms (Nami 2001*a*) have been identified in several lithic assemblages from the Negro River basin. The majority of the remains from the top of Level IV exhibited strong weathering, differing in this respect from the artifacts from the lower portion of Level III.

The flaked stone artifacts were made from local cherts from secondary sources located along the river. About 4 km north of Minas de Callorda, around the Rincón del Bonete dam, two quarry sites have been identified. Rincón del Bonete 1 shows extensive secondary deposits of pebbles of diverse petrography and colors, ranging from 5 to 20 cm in diameter, among them ordinary-to-very-high-quality cherts. Rincón del Benete 2 is a primary source (see Luedtke 1979) characterized by exposures of tabular nodules of silicified limestone. My experiments showed that these rocks have good-to-very-good flaking qualities, ranking 3.5 on Callahan's (1979) lithic grade scale (see also Luedtke 1994, 86–87). Embedded in the exposed basaltic deposits at Minas de Callorda there are primary sources of white chalcedony that were used to manufacture stone tools. The occurrence of small obsidian nodules in some places along the Negro River accounts for the discovery of a few obsidian projectile points in the region.

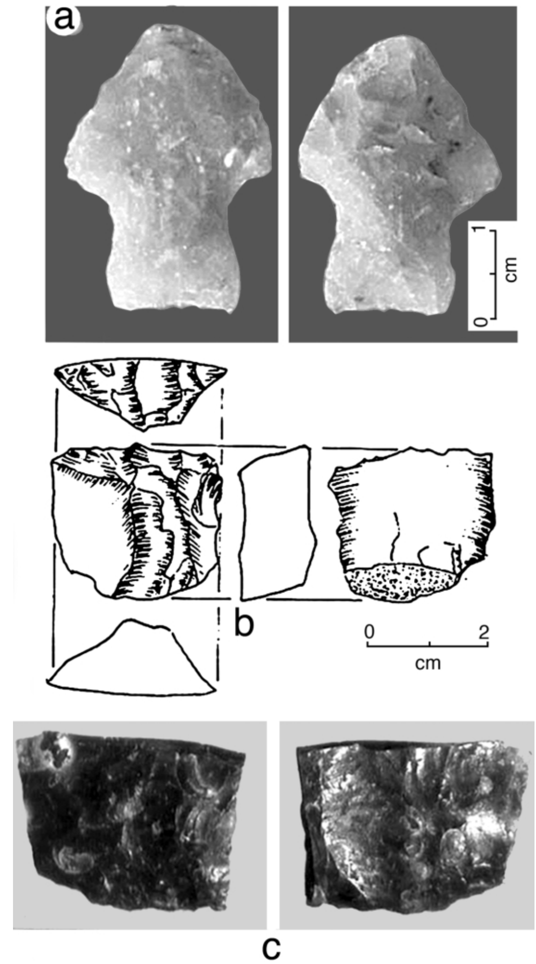

Figure 3. Lithic remains from Minas de Callorda. The projectile point (*a*) and end scraper (*b*) were recovered from the middle archaeological level and the fluted base (*c*) from the lower level. (Same scale for *a* and *c*.)

Crucial issues for understanding the colonization, dispersion, and technological organization of the earliest South American hunter-gatherers are the timing of their continental and regional spatial dispersion and their knowledge of the resources required for survival (see, e.g., Kelly and Todd 1988; Meltzer 2004). In an earlier paper on the volcanic area of Pali Aike in the Chico River basin of southern Patagonia, I suggested that for people knowledgeable about stone suitable for tool manufacture it might have required only a short time (days, weeks, or months) to recognize sources in an small unknown area such as the one described here (Nami 1994*a*; see also Suárez 1999 but cf. Borrero and Franco 1997, 229, and Civalero and Franco 2003, 79). Of course, detailed knowledge of a broad range of resources in larger regions might have required more time. In this connection, it is important to recall that landscape learning with regard to fixed, permanent, and predictable resources such as outcrops of stone for tools could have been rapid (Meltzer 2002, 34; 2004, 126).

Technological Considerations

The study of private collections allows the identification of fishtail points recently found in the area by local collectors. The metric and other relevant technological data on these pieces are recorded in table 2. A survey carried out at Arroyo Cacique, which is usually under water, when the water level was very low produced numerous archaeological remains, including a fishtail specimen (fig. 4, *a*) and a camelid (probably *Lama guanicoe*) third molar (A. Menegaz, personal communication, 2004). Two specimens resulting from fluvial erosion were recently collected by W. Aizpún at Minas de Callorda (fig. 5, *b*) and Los Molles (fig. 5, *c*). Another isolated Fell piece (fig. 5, *a*) was found by Julio Bálsamo at the Rincón de Bonete dam. Like other Fell points (Nami 1998, 2000), two pieces from Arroyo Cacique have extensively resharpened edges (fig. 4, *a* and *b*) and another has an impact fracture (fig. 4, *c*). However, the dimensional and morphological variations among Fell points in the Southern Cone are not only a result of resharpening as Suárez (2003) has recently suggested. The range of variation includes true miniatures (e.g., fig. 5, *a*), probably used as toys (see Politis 1998), pieces made from thin flakes (e.g., fig. 4), and large specimens manufactured with bifacial flaking (Bird 1969; Nami 1997, 2000, 2001*b*, 2003*a*).

Like many other South American fishtail points, all these pieces were manufactured on thin flakes used as blanks. They were partially thinned by careful bifacial flaking with soft percussion and then finished by pressure that left short retouch flake scars extending less than 10 mm from the edges. All the specimens are unfluted, and their bases were thinned by short and long pressure retouch. The stems were carefully abraded along both edges, a common feature of Fell projectile points (Flegenheimer et al. 2003; Nami 1997, 2003*a*). The piece from Los Molles has two fractures on the body and the base of the stem, both probably due to impact.

The Fell points from Los Molles, Rincón del Bonete, and Arroyo Cacique were made from similar reddish silicified limestone. This stone may have been a preferred resource for the Paleoindian groups of southeastern South America. Some pieces made of this rock, probably from Uruguayan sources, have been found in the Argentinean Pampas across the La Plata River (Flegenheimer et al. 2003), which was once significantly narrower than at present (Cavalloto, Violante, and Nami 2002). Also worth mentioning is an unusual isolated find from sediments in the Don Torcuato Plaza on the outskirts of Buenos Aires—a Fell point made of an exotic silicified limestone, probably from an Uruguayan source. (A large quarry site with similar silicified limestone is, however, located at El Fresco, La Pampa Province, Argentina [Berón, personal communication, 2005].)

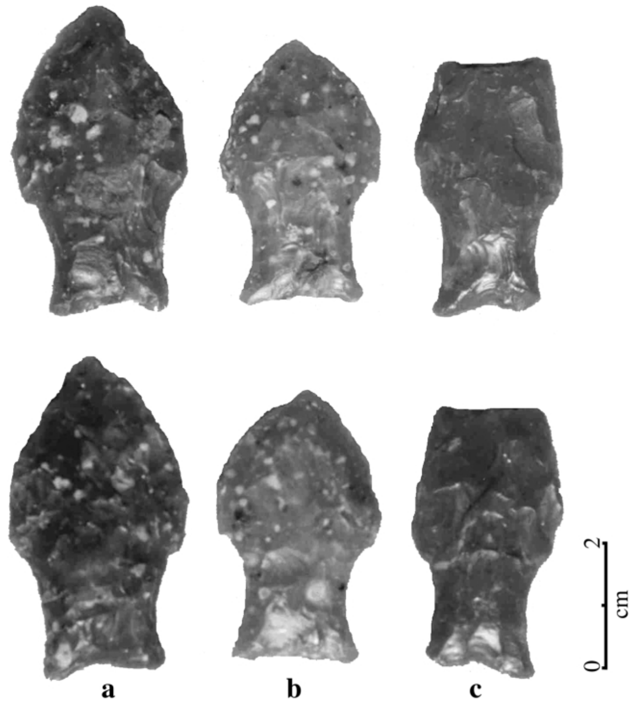

Figure 4. Fell projectile points finds from Arroyo Cacique site.

Beyond the Paleoindian significance of the Negro River basin, the region has a remarkable abundance of other lithic remains. Most of them have been classified in terms of intuitive morphological typologies (e.g., Taddei 1980) and must be restudied from new perspectives developed. However, because of their relevance for regional archaeology, some of

Table 2. Attributes of Recent Finds of Fell Projectile Points

Site	Length	Width	Thickness	Stem Length	Stem Width	Cross Section	Raw Material	Color	Blank
Arroyo Cacique	50	28	6	18	18	Planoconvex	Silcrete	Red	Thin flake
Los Molles	41.5	28	8[a]	21	–	Planoconvex	Chert	Blue-gray	Thin flake
Minas de Callorda	36	20	7.5	14	15.5	Biconvex	Silcrete	Red	Thin flake
Rincón del Bonete[b]	27	16	6	9	15	Biconvex	Silcrete	Red	Nonobservable

Note: Measurements are in mm.
[a]Maximum thickness 10 mm in a hump.
[b]Isolated find.

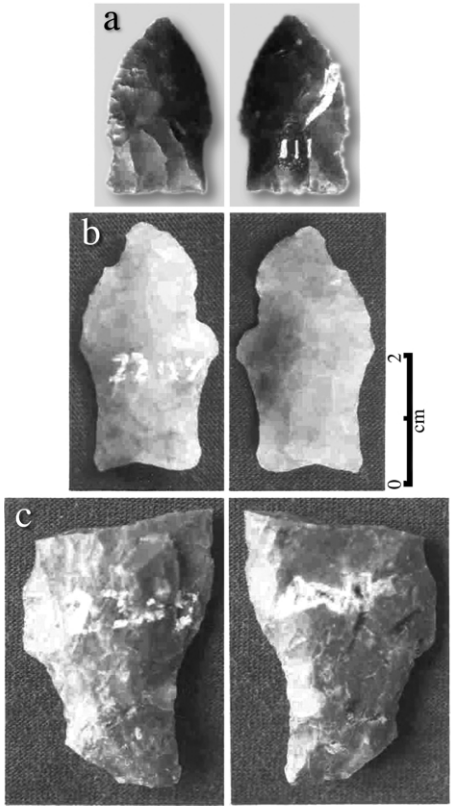

Figure 5. Recent finds of fishtail points. *a*, Rincón del Bonete; *b*, Minas de Callorda; *c*, Los Molles.

them deserve comment. A rare artifact in the Uruguayan lithic collections is a unifacial flaked knife or lateral scraper with lateral retouch (fig. 6). Most artifacts of this type have been found at sites with fishtail points. As with other Paleoindian specimens, some flake-blanks of these artifacts were probably detached from prepared cores (Nami 2001*b*, 2003*b*). An interesting piece from Arroyo Cacique (fig. 6, *a*) shows remarkable typological and technological similarities with those from Fell lithic assemblages in Patagonia (see, e.g., Nami 1994*b*, 2001*a*, 2001*b*; Miotti 2003; see also Dillehay 2002, 219). Like the Fell points from the site, the artifacts illustrated in figure 6 were made from reddish silicified limestone.

Advances in our knowledge of Paleoindian lithic assemblages in the past few decades have called attention to the considerable morphological and technological variability of the projectile points. Typical fishtail pieces (fig. 7, *b*, *e*) are found along with other forms, some of them with narrow bodies and slightly convex borders (fig. 7, *c*) or with broad stems and convex bases (fig. 7, *f*). In the light of this variability, it is possible to suggest that a small point (fig. 7, *d*) found at Cerro Los Burros, where Fell artifacts have been reported (Meneghin 1977; Nami 2001*b*), may have been made by Paleoindians. Finally, remarkable morphological similarities have been observed in other bifacial artifacts. The Paleoindian site of Urupez yielded a broken bifacial artifact with contracting stem flaked by percussion, probably an unfinished product (fig. 8, *a*). Similar pieces (fig. 8, *b*, *c*) have been found in the Paleoindian level at Cueva del Medio in southern Chile (Nami 1987*a*) and at El Inga, Ecuador (Nami 2000*a*), in both cases with fishtail projectile points.

Discussion

Vigorous discussion among North American archaeologists turns on the pre-Clovis versus Clovis controversy (Adovasio and Page 2002). For the region under consideration, the debate has recently focused on Monte Verde, a site with pre-Clovis or better, pre-Fell occupations (Dillehay 2002). Beyond this controversy, there is no doubt that the Southern Cone was populated at almost the same time as Clovis, Folsom, and other Paleoindian hunter-gatherers were living in North and Central America. Sites apparently older than 11,000 years BP include Los Toldos, El Ceibo, and Piedra Museo Caves, with single dates of ~12,500 years BP (Cardich 1987; Miotti and Salemme 2004). The lower level (#6) of Piedra Museo has produced a date of ~12,800 years BP and four dates ranging between ~10,400 and 11,000 years BP (Miotti et al. 2000, 2003). Similarly, for Cueva del Medio in southern Patagonia we have a date of 12,400 years BP (Nami 1987) and

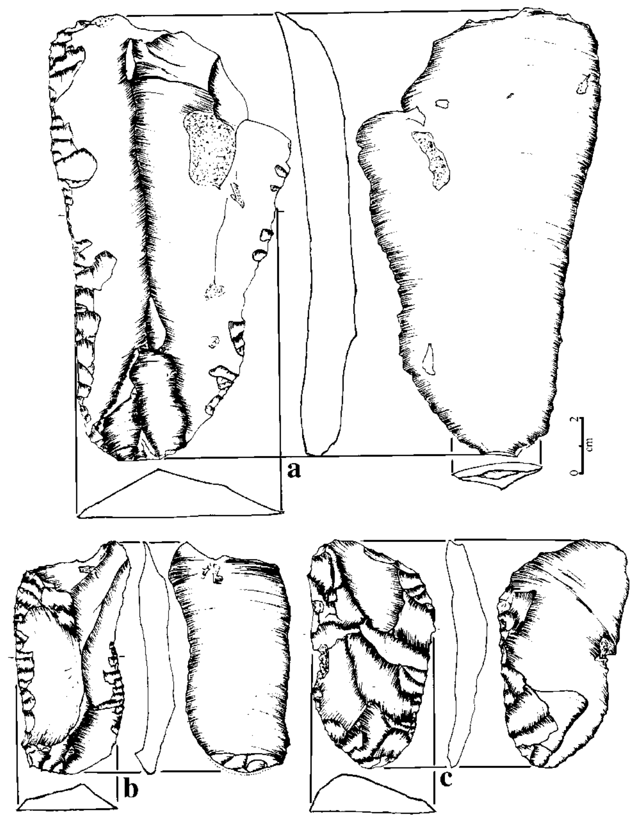

Figure 6. Knives and lateral scrapers found at Paleoindian sites in Uruguay.

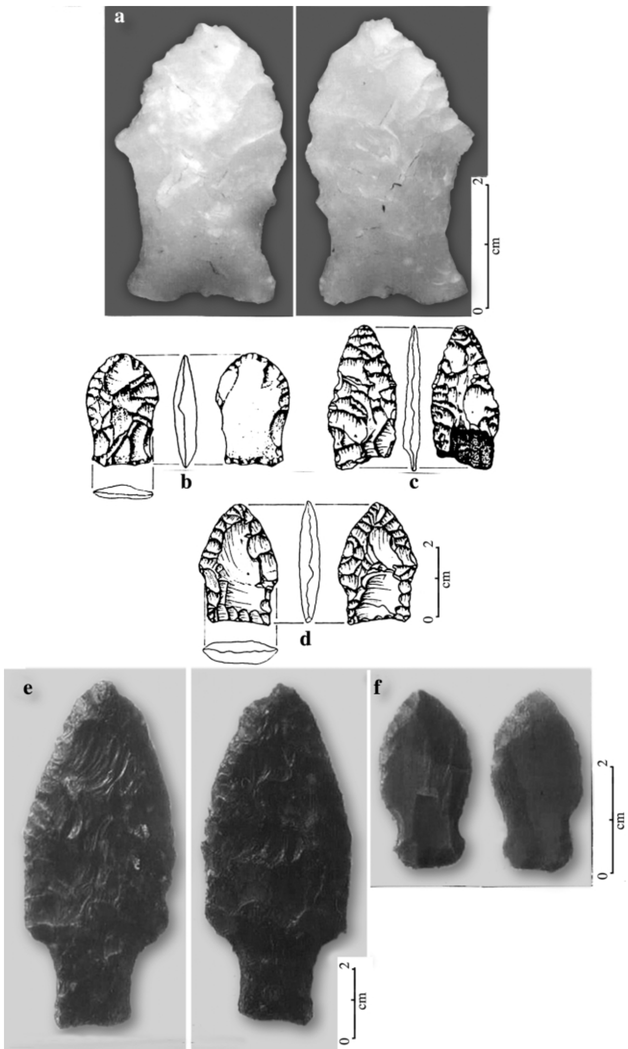

Figure 7. Typological and technological variability in Fell projectile points. *a*, Don Torcuato Plaza; *b* and *c*, Urupez; *d*, Cerro Los Burros; *e* and *f*, unknown origin (Uruguay).

five additional dates obtained from the same hearth ranging from 10,000 to 11,000 years BP.

At the Terminal Pleistocene/Holocene boundary in South America, unifacial and bifacial techniques were widespread across the continent (Dillehay et al. 1992; Dillehay 2002). Although other areas of South America have exclusively unifacial lithic assemblages (Dillehay 2002), some scholars suggest that the bifacial Fell points are an innovation derived from earlier unifacial flake industries (Bryan 1978, 316). Technologically, the flake-blanks from the "Level 11 industry" (Cardich 1987) are not so simple, because some of them were probably detached from prepared cores, and typologically they may belong to a component left by hunter-gatherers who included fishtail points in their weaponry. In fact, the unifacial stone tools from the lower levels of Los Toldos and El Ceibo Caves are very similar to those from other sites with fishtail points (Miotti 1992; Nami 1994*b*, n.d.*a*). Therefore, at least for the Pampas and Patagonia, this dichotomy may be fallacious (Miotti and Cattáneo 1997), and the earliest lithic assemblages from these caves may also have been left by people who used fishtail points (Nami 1994*b*; Miotti and Cattáneo 1997), Miotti 2003; R. Paunero, personal communication, 2005).

Specifically, at ~11,000–10,000 years BP the Southern Cone showed a pattern of projectile point use in diverse environments accompanied by different regional lithic assemblages variously produced by bifacial, unifacial, bipolar, and prepared-core techniques. In addition, these early South American people had a well-developed bone technology (Nami n.d.*b*). The differences in technique probably reflect raw-material availability and technological organization. While the assemblages from sites located far from high-quality sources such as those from Buenos Aires Province are characterized by bipolar flaking and small stone tools (Flegenheimer 1986–87; Mazzanti 1997, 1999*a*, 1999*b*, 2002), those from sites in areas where raw materials were available such as those from Patagonia have both large unifacial tools (end and lateral

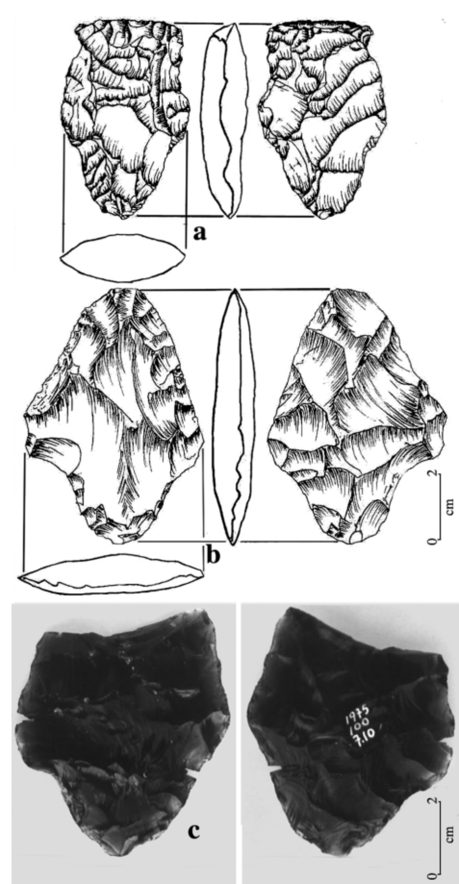

Figure 8. Stemmed bifacial artifacts finds from Urupez (*a*), Cueva del Medio (*b*), and El Inga (*c*). (Drawing *a* by U. Meneghin, *b* and *c* by H. Nami. Same scale for *a* and *b*.)

scrapers as well as knives) and Fell projectile points (Nami 1994*b*; Miotti and Cattáneo 1997; Paunero 2000, 2003). Considering the large unifacial tools presented here, the Uruguayan case may have been similar. Thus, like the North American hunter-gatherers, people using similar projectile points seem to have been coping with the changing Late Pleistocene/Early Holocene environments with diverse technological organizations, subsistence strategies, and settlement patterns. It is accepted that the Pacific slope and the Andean Cordillera were the migration route for this early expansion, but it is becoming clear that the eastern part of South America may also have been a route of colonization and dispersal. In fact, Clovis projectile points have recently been identified in Venezuela (Pearson and Ream 2005), suggesting that the Atlantic slope may have been an alternative route in the colonization process (Pearson 2004). In-depth research on the eastern part of the Americas is therefore of critical importance.

The investigations reported here represent an important addition to our understanding of the continental and regional past. Beyond projectile point morphology, Uruguay is beginning to show strong morphological and technological similarities in lithic artifacts with other South American regions, among them similarities in blank selection, total or partial bifacial flaking in the early stages of manufacture, final shaping by short pressure retouches, carefully abraded stems, blade resharpening patterns, and morphological and technological variability. A rare bifacial flaked piece with contracting stem is comparable with similar artifacts from southern and northwestern South America where Fell projectile points have been found. Unifacial flaked stone tools with blanks likely detached from prepared cores may be an additional artifact comparable with those from other areas of the Southern Cone. The presence of ground discoid stones is another technological feature shared with the Paleoindian groups of Argentina and Chile. Although in its infancy, recent archaeological research is beginning to integrate the Uruguayan record with broader archaeological processes in the region.

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References Cited

Adovasio, J. M., and J. Page. 2002. *The First Americans: In pursuit of archaeology's greatest mystery*. New York: Modern Library.

Baeza, J., and J. Femenías. 1999. Nuevas observaciones sobre puntas colas de pescado. Paper presented at the First Conference on Pampean Archaeology, Rosario.

Baeza, J., J. Femenías, R. Suárez, and A. Florines. 2001. Investigación arqueológica en el río Negro medio (Informe preliminar). In *Arqueología uruguaya hacia el fin del milenio (X Congreso Nacional de Arqueología, Colonia del Sacramento, 16–19 de junio, 1997)*, vol. 1, 285–95.

Bird, J. 1938. Before Magellan. *Natural History* 16 (1):16–28.

———. 1969. A comparison of South Chilean and Ecuatorial "fishtail" projectile points. *Kroeber Anthropological Society Papers* 40.

———. 1970. Paleo-Indian discoidal stones from southern South America. *American Antiquity* 35:205–9.

———. 1983. Enterratorios paleoindios con cremación en las cuevas de Pali Aike y Cerro Sota en Chile meridional. *Anales del Instituto de la Patagonia* 14:55–65.

———. 1988. *Travels and archaeology in South Chile*. Ed. John Hyslop. Iowa City: University of Iowa Press.

Bonnichsen, R. 2000. Comment, in The future of New World archaeology. *Scientific American*, pp. 72–75.

Borrero, L. A., and N. Franco. 1997. Early Patagonian hunter-gatherers: Subsistence and technology. *Journal of Anthropological Research* 53:219–39.

Bosch, A., J. Femenías, and A. J. Oliva. 1980. Dispersión de las puntas de proyectil líticas pisciformes en el Uruguay. In *Anales, III Congreso Nacional de Arqueología (1974)*. Montevideo.

Bryan, A. L. 1978. An overview of Paleo-American prehistory from a circum-Pacific perspective. In *Early man in America from a circum-Pacific perspective*, ed. A. L. Bryan, 306–27. Department of Anthropology, University of Alberta, Edmonton, Occaional Papers 1.

Callahan, E. 1979. *The basics of biface knapping in the Eastern Fluted Point tradition: A manual for flintknappers and lithic analysts.* Archaeology of Eastern North America 7 (1).

Cardich, A. 1987. Arqueología de Los Toldos y El Ceibo (Provincia de Santa Cruz, Argentina). *Estudios Atacameños* 8: 98–117.

Cavalloto, J. L., R. Violante, and H. G. Nami. 2002. Late Pleistocene-Holocene paleogeography and coastal evolution in the mouth of the Río de la Plata: Implications for the human peopling of South America. *Current Research in the Pleistocene* 19:13–16.

Cione, A. L., and E. P. Tonni. 1995. Bioestratigrafía y cronología del Cenozonico Superior de la región Pampeana. In *Evolución biológica y climática de la región pampeana durante los últimos cinco millones de años*, ed. M. T. Alberdi, G. Leone, and E. P. Tonni, 49–74. Madrid: Museo Nacional de Ciencias Natural/Consejo Superior de Investigaciones Científicas.

Civalero, M. T., and N. Franco. 2003. Early human occupation in Western Santa Cruz Province, southernmost South America. *Quaternary International* 109–110:77–86.

Dillehay, T. 2002. *The settlement of the Americas: A new prehistory.* New York: Basic Books.

Dillehay, T., G. Ardila Calderón, G. Politis, and M. da C. Moraes Coutinho Beltrao. 1992. Earliest hunter and gatherers of South America. *Journal of World Prehistory* 6: 145–204.

Figueira, J. H. 1892. Los primitivos habitantes del Uruguay. In *El Uruguay en la exposición histórica americana de Madrid*, 121–219. Montevideo: Imprenta Artística Americana de Dornaleche y Reyes.

Flegenheimer, N. 1986–87. Excavaciones en el sitio 3 de la localidad Cerro la China (Provincia de Buenos Aires). *Relaciones de la Sociedad de Antropología* 17(1):7–28.

———. 1991. Bifacialidad y piedra pulida en sitios pampeanos tempranos. *Shincal* 3 (2):64–78.

Flegenheimer, N., C. Bayon, M. Valente, J. Baeza, and J. Femenías. 2003. Long distance tool stone transport in the Argentine Pampas. *Quaternary International* 109–110: 49–64.

Flegenheimer, N., and M. Zarate. 1997. Considerations on radiocarbon and calibrated dates from Cerro la China and Cerro el Sombrero, Argentina. *Current Research in the Pleistocene* 14:27–28.

Holliday, V. T. 1985. Archaeological geology of the Lubbock Lake site, southern high plains of Texas. *Geological Society of America Bulletin* 96:1483–92.

Kelly, R. L., and L. C. Todd. 1988. Coming into the country: Early Paleoindian hunting and mobility. *American Antiquity* 53:231–44.

Kraus, M., and T. M. Brown. 1986. Paleosoils and time resolution in alluvial stratigraphy. In *Paleosoils: Their recognition and interpretation*, ed. W. P. Wright, 180–207. Princeton: Princeton University Press.

López, F., J. Femenías, and H. G. Nami. 2001. Fell evidence and new data on Late-Pleistocene landscape from Canelones, Uruguay. *Current Research in the Pleistocene* 18: 41–44.

Luedtke, B. 1979. The identification of sources of chert artifacts. *American Antiquity* 44:744–57.

———. 1994. *An archaeologist's guide to chert and flint.* Los Angeles: Institute of Archaeology, University of California, Los Angeles.

Martin, C. W., and W. C. Johnson. 1995. Variation in radiocarbon ages of soil organic matter fractions from Late Quaternary buried soils. *Quaternary Research* 43:232–37.

Martinez, G. 2000/2002. Análisis preliminar del sitio Paso Otero 5 (Area Interserrana Bonaerense): Implicancias para las ocupaciones tempranas de la región Pampeana. *Cuadernos* 19:401–19.

———. 2001. "Fish-tail" projectile points and megamammals: New evidence from Paso Otero 5 (Argentina). *Antiquity* 75:523–28.

Martinez, S., and M. Ubilla. 2004. El Cuaternario en Uruguay. In *Cuencas sedimentarias de Uruguay: Cenozoico*, 195–227. Montevideo: DIRAC, Facultad de Ciencias.

Massone, M., and A. Prieto. 2004. Evaluación de la modalidad cultural Fell 1 en Magallanes. *Chungara* 36:303–15.

Mayer-Oakes, W. J. 1963. Early man in the Andes. *Scientific American* 208(5):117–28.

———. 1966. El Inga projectile points: Surface collections. *American Antiquity* 31:644–61.

Mazzanti, D. 1997. An archaeological sequence of hunter-gatherers in the Tandilla Range: Cueva Tixi, Buenos Aires, Argentina. *Antiquity* 71:450–52.

———. 1999*a*. El sitio Abrigo Los Pinos: Arqueología de la ocupación Paleoindia, Tandilla Oriental, Pcia. de Buenos Aires. In *Actas del XII Congreso Nacional de Arqueología Argentina* 3, 145–48. La Plata.

———. 1999*b*. Ocupaciones humanas tempranas en Sierra La Vigilancia y Laguna La Brava, Tandilla Oriental, Provincia de Buenos Aires. In *Actas del XII Congreso Nacional de Arqueología Argentina*, vol. 3, 149–55. La Plata.

———. 2002. Secuencia arqueológica del sitio 2 de la localidad arqueológica Amalia (Provincia de Buenos Aires). In *Del mar a los Salitrales: Diez mil años de historia pampeana en el umbral del tercer milenio*, ed. D. Mazzanti, M. Berón, and F. Oliva, 327–39. Mar del Plata: Universidad Nacional de Mar del Plata.

Meltzer, D. J. 2002. What do you do when no one's been there before? Thoughts on the exploration and colonization of new lands. In *The First Americans: The Pleistocene colonization of the New World*, ed. N. Jablonski, 27–58. Memoirs of the California Academy of Sciences 27.

———. 2004. Modeling the initial colonization of the Americas: Issues of scale, demography, and landscape learning. In *The settlement of the American continents*, ed. C. M. Barton, G. A. Clark, D. R. Yesner, and G. A. Pearson, 123–37. Tucson: University of Arizona Press.

Meneghin, U. 1977. *Nuevas investigaciones en los yacimientos del "Cerro Los Burros."* Montevideo.

———. 2000. *Primer registro de un artefacto discoidal (?) paleoindio del Uruguay*. Comunicaciones Antropológicas de los Museos Nacionales de Historia Natural y Antropología de Montevideo 2 (19).

———. 2004. *Urupez: Primer registro radiocarbónico (C-14) para un yacimiento con puntas líticas pisciformes del Uruguay*. Montevideo: Fundación Arqueología Uruguaya.

———. 2006. *Consideraciones sobre dos registros radiocarbónicos (C-14) en el yacimiento Urupez, Maldonado, Uruguay*. Montevideo: Fundación Arqueología Uruguaya.

Miotti, L. 1992. Paleoindian occupation at Piedra Museo locality, Santa Cruz Province, Argentina. *Current Research in the Pleistocene* 9:30–31.

———. 2003. Patagonia: A paradox for building images of the First Americans during the Pleistocene/Holocene transition. *Quaternary International* 109–110:147–73.

Miotti, L., and R. Cattáneo. 1997. Bifacial/unifacial technology ca. 13,000 years ago in southern Patagonia. *Current Research in the Pleistocene* 14:62–65.

Miotti, L., and M. Salemme. 2004. Poblamiento, movilidad y territorios entre las sociedades cazadoras-recolectoras de Patagonia. *Complutum* 15:177–206.

Miotti, L., M. Salemme, and J. Rabassa. 2000. Cronología radiocarbónica. In *Guía de campo de la visita a las localidades arqueológicas*, ed. L. Miotti, R. Paunero, M. Salemme, and G. R. Cattáneo, 83–87. La Plata.

———. 2003. Radiocarbon chronology at Piedra Museo locality, Santa Cruz. In *Where the south winds blow*, ed. L. Miotti, M. Salemme, and N. Flegenheimer, 99–104. Austin: Center for the Study of the First Americans.

Montané, J. 1968. Paleo-Indian remains from Laguna de Tagua Tagua, Central Chile. *Science* 161:1137–38.

Mujica, J. 1995. Puntas colas de pescado de la costa occidental del río Uruguay medio, litoral argentino. *Comechingonia* 8: 199–207.

Nami, H. G. 1987. Cueva del Medio: Perspectivas arqueológicas para la Patagonia Austral. *Anales del Instituto de la Patagonia* (*Serie Ciencias Sociales*) 17:71–106.

———. 1994*a*. Paleoindio cazadores-recolectores y tecnología lítica en el extremo sur de Sudamérica continental. In *Arqueología de cazadores-recolectores: Limites, casos y aperturas*, ed. J. L. Lanata and L. A. Borrero, 89–103. Arqueología Contemporánea 5.

———. 1994*b*. Reseña sobre los avances de la arqueología finipleistocénica del extremo sur de Sudamérica. *Chungara* 26:145–63.

———. 1996. New assessments of early human occupations in the Southern Cone. In *Prehistoric Mongloid dispersals*, ed. T. Akazawa and E. J. E. Szathmáry, 254–69. Oxford: Oxford University Press.

———. 1997. Investigaciones actualísticas para discutir aspectos técniocos de los cazadores-recolectores del tardiglacial: El problema Clovis-Cueva Fell. *Anales del Instituto de la Patagonia (Serie Ciencias Humanas)* 25:151–86.

———. 1998. Technological observations on the Paleoindian artifacts from Fell's Cave, Magallanes, Chile. *Current Research in the Pleistocene* 15:81–83.

———. 2000. Technological comments of some Paleoindian lithic artifacts from Ilaló, Ecuador. *Current Research in the Pleistocene* 17:104–7.

———. 2001*a*. New data on Fell lithic technology from Paso del Puerto, Río Negro Basin, Uruguay. *Current Research in the Pleistocene* 18:47–50.

———. 2001*b*. *Consideraciones tecnológicas preliminares sobre los artefactos líticos de Cerro de los Burros (Maldonado, Uruguay)*. Comunicaciones Antropológicas de los Museos Nacionales de Historia Natural y Antropología de Montevideo 3(1).

———. 2003*a*. Experimentos para explorar la secuencia de reducción Fell de la Patagonia Austral. *Magallania* 30: 107–38.

———. 2003*b*. Experiments to explore the Paleoindian flake-core technology in Southern Patagonia. In *Skilled production and social reproduction: Aspects of traditional stone tool technologies*, ed. J. Apel and K. Knudsom. Uppsala: Societas Archaeologica Upsaliensis/Department of Archaeology and Ancient History. In press.

———. n.d.*a*. Arqueología y análisis morfológico y tecnológico de los instrumentos líticos de Cueva del Medio: Observaciones para conocer la organizacion tecnológica paleoindia en Patagonia. MS.

———. n.d.*b*. Las excavaciones arqueológicas de Cueva del Medio, artefactos de hueso y consideraciones sobre tecnología ósea paleoindia en Patagonia. MS.

Nami, H. G., and J. Femenías. 2003. Paleoenvironments and Paleoindian archaeology in the Middle Negro River Basin (Republic of Uruguay). Project presented to the Dirección de Cultura, Ministerio de Educación y Cultura, República Oriental del Uruguay.

———. 2006. Paleambiente y arqueología paleoindia en la cuenca del Rio Negro (Republica Oriental del Uruguay). Project presented to the Dirección de Cultura, Ministerio de Educación y Cultura, República Oriental del Uruguay.

Nami, H. G., and A. Menegaz. 1991. Cueva del Medio: Aportes para el conocimiento de la diversidad faunística hacia el Pleistoceno Holoceno en Patagonia Austral. *Anales del Instituto de la Patagonia* 23:125–33.

Nami, H. G., and A. Nakamura. 1995. Cronología radiocarbónica con AMS sobre muestras de hueso procedentes del sitio Cueva del Medio (Ultima Esperanza, Chile). *Anales del Instituto de la Patagonia* 23:125–33.

Nuñez, L., R. Casamiquela, V. Schiappacasse, H. Niemeyer, and C. Villagrán. 1994. Cuenca de Taguatagua en Chile: El ambiente del Pleistoceno y ocupaciones humanas. *Revista Chilena de Historia Natural* 67:503–19.

Paunero, R. 2000. Localidad arqueológica Cerros Tres Tetas. In *Guía de campo de la visita a las localidades arqueológicas*, ed. L. Miotti, R. Paunero, M. Salemme, and G. R. Cattáneo. 89–100. La Plata.

———. 2003. The Cerro Tres Tetas (C3T) locality in the central plateau of Santa Cruz, Argentina. In *Where the south winds blow*, ed. L. Miotti, M. Salemme, and N. Flegenheimer, 133–40. Austin: Center for the Study of the First Americans.

Pearson, G. A. 2004. Pan-American Paleoindian dispersals and the origins of fishtail projectile points as seen through the lithic raw-material reduction strategies and tool-manufacturing techniques at the Gardiría Site, Turrialba Valley, Costa Rica. In *The settlement of the American contiments*, ed. C. M. Barton, G. A. Clark, D. R. Yesner, and G. A. Pearson, 85–102. Tucson: University of Arizona Press.

Pearson, G. A., and J. W. Ream. 2005. Clovis on the Caribbean Coast of Venezuela. *Current Research in the Pleistocene* 22: 28–31.

Politis, G. G. 1991. Fishtail projectile points in the Southern Cone of South America: An overview. In *Origins and adaptations*, ed. R. Bonnichsen and K. L. Turnmire, 287–302. Corvallis.

———. 1998. Arqueología de la infancia: Una perspectiva etnoarqueológica. *Trabajos de Prehistoria* 55(2):5–19.

Politis, G. G., P. G. Messineo, and C. A. Kaufmann. 2004. El poblamiento temprano de las llanuras pampeanas de Argentina y Uruguay. *Complutum* 15:207–24.

Prieto, A. 1991. Cazadores tempranos y tardíos en Cueva del Lago Sofia 1. *Anales del Instituto de la Patagonia (Serie Ciencias Sociales)* 20:75–100.

Rodriguez, J. A. 1998. Esquemas de integración cultural y síntesis en la arqueología del noreste argentino. In *Homenaje, Alberto Rex González, 50 años de aportes al desarrollo y consolidación de la antropología argentina*, 121–53. Buenos Aires: Fundación Argentina de Antropología y Facultad de Filosofia y Letras.

Rodriguez, J., and C. Cerutti. 1999. Las tierras bajas del Nordes y litoral mesopotámico. In *Nueva historia de la nación argentina*, vol. 1, 109–22. Buenos Aires: Editorial Planeta.

Roosevelt, A. M., J. Douglas, and L. Brown. 2002. The migrations and adaptations of the First Americans: Clovis and Pre-Clovis viewed from South America. In *The First Americans: The Pleistocene colonization of the New World*, ed. N. Jablonski, 159–235. Memoirs of the California Academy of Sciences 27.

Schobinger, J. 1969. *Prehistoria de Sudamérica.* Barcelona: Editorial Labor.

Schmitz, P. I. 1987. Prehistoric hunters and gatherers of Brazil. *Journal of World Prehistory* 1:53–126.

Stanford, D., R. Bonnichsen, B. Meggers, and D. G. Steele. 2006. Paleoamerican origins: Models, evidence, and future directions. In *Paleoamerican Origins: Beyond Clovis*, ed. R. Bonnichsen, D. Stanford, B. Lepper, and M. Waters, 313–54. Austin: Center for the Study of the First Americans.

Suárez, R. 1999. Cazadores-recolectores en la transición Pleistoceno-Holoceno del norte uruguayo: Fuentes de abastecimiento de materias primas y tecnología lítica. In *Primeras jornadas del Cenozoico en Uruguay*, 27–28. Montevideo.

———. 2003. Paleoindian components in north Uruguay: New data on early human occupations of the Late Pleistocene and Early Holocene. In *Where the south winds blow*, ed. L. Miotti, M. Salemme, and N. Flegenheimer, 29–36. Austin: Center for the Study of the First Americans.

Suárez, R., and J. M. López. 2003. Archaeology of the Pleistocene-Holocene transition in Uruguay: An overview. *Quaternary International* 109–110:65–76.

Taddei, A. 1980. Un yacimiento de cazadores superiores en el Río Negro (Paso del Puerto) (Uruguay). In *Anales, III Congreso Nacional de Arqueología (1974).* Montevideo.

Tonni, E. P., R. A Huarte, J. E. Carbonari, and A. J. Figini. 2003. New radiocarbon chronology from the Guerrero Member of the Luján Formation (Buenos Aires, Argentina): Paleoclimatic significance. *Quaternary International* 109–110: 45–48.

Ubilla, M. 1999. Dataciones radiocarbónicas (^{14}C) para la Fm. Dolores (Río Santa Lucía, dpto. De Canelones y A° Gutierrez Chico, dpto. de Río Negro) y comentarios sobre la fauna de vertebrados asociada. *Revista de la Sociedad Uruguaya de Geología* 3(6):48–54.

Willey, K. L., W. C. Johnson, and J. S. Isaacson. 1998. Preservation of the Paleoindian record in alluvial fill, northeastern Kansas. *Current Research in the Pleistocene* 15: 68–70.