CHAPTER 1

The Cave at the End of the World

Cueva del Medio and the Early Colonization of Southern South America

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The early history of the human exploration and colonization of Fuego-Patagonia is based on evidence obtained from four different and widely separated regions: the Central Plateau (Miotti 1998), the Pali Aike Lava Field (Bird 1988), Ultima Esperanza (Nami 1987; Prieto 1991; Jackson and Prieto 2005), and northern Tierra del Fuego (Massone 2004). In this chapter we will review the data from one of the sites that produced crucial evidence for our understanding of this process: Cueva del Medio. This is a large exogenous cave located in Ultima Esperanza, Chile, at the Cerro Benítez (51°34.209 S, 72°36.161 W), oriented toward the southwest (Figure 1.1). Cueva del Milodón and several other caves and rockshelters containing Late Pleistocene faunas are situated within a radius of 4 km around Cueva del Medio (Jackson 2007), all formed in the Upper Cretaceous conglomerates of the Cerro Toro Formation (CTF; Hubbard et al. 2008).

Hugo Nami studied Cueva del Medio intensively. His archaeological discoveries firmly established its importance for the Late Pleistocene peopling of southern Patagonia (Nami 1987). In this chapter, we present results of new excavations at the cave and also discuss some previous interpretations. Nami noted the presence of Late Pleistocene carnivore remains (1987, 1993), and recent chronological results show that *Smilodon* and Felidae cf. *Panthera* were deposited by the time of human arrival (Prieto et al. 2010; Martin 2008, 2013). This information, together with the chronological range of herbivore remains recovered by Nami, dictated a taphonomic approach. Accordingly, we discuss the different agents involved in the accumulation of the bone assemblages at the end of the Pleistocene. This presentation will focus on geoarchaeological and chronological issues, with an emphasis on Nami's distinction of two early archaeological components. The existence of a Late Holocene component is also relevant. Finally, the archaeological evidence will be evaluated and compared with nearby sites.

The presence of carnivore and herbivore remains not associated with the human occupations (Nami 1987, 1993, 1994a; Prieto et al. 2010; Martin 2013) makes it necessary to discuss in more detail which bones are behaviorally associated with humans. Recent taphonomic developments in the study of Fuego-Patagonian cave assemblages suggest caution in attributing agency to the different materials found in physical association, particularly bones (Borrero 2009; Martin 2013). There are many ways in which bones accumulates, not all necessarily implying human agency. Under these conditions, it is no easy task to separate which of the available radiocarbon dates are relevant for the study of early human occupation and which are not (Martin 2012). Many radiocarbon dates were considered relevant on the exclusive basis of physical association with archaeological remains (Borrero 2009). However, this is not sufficient

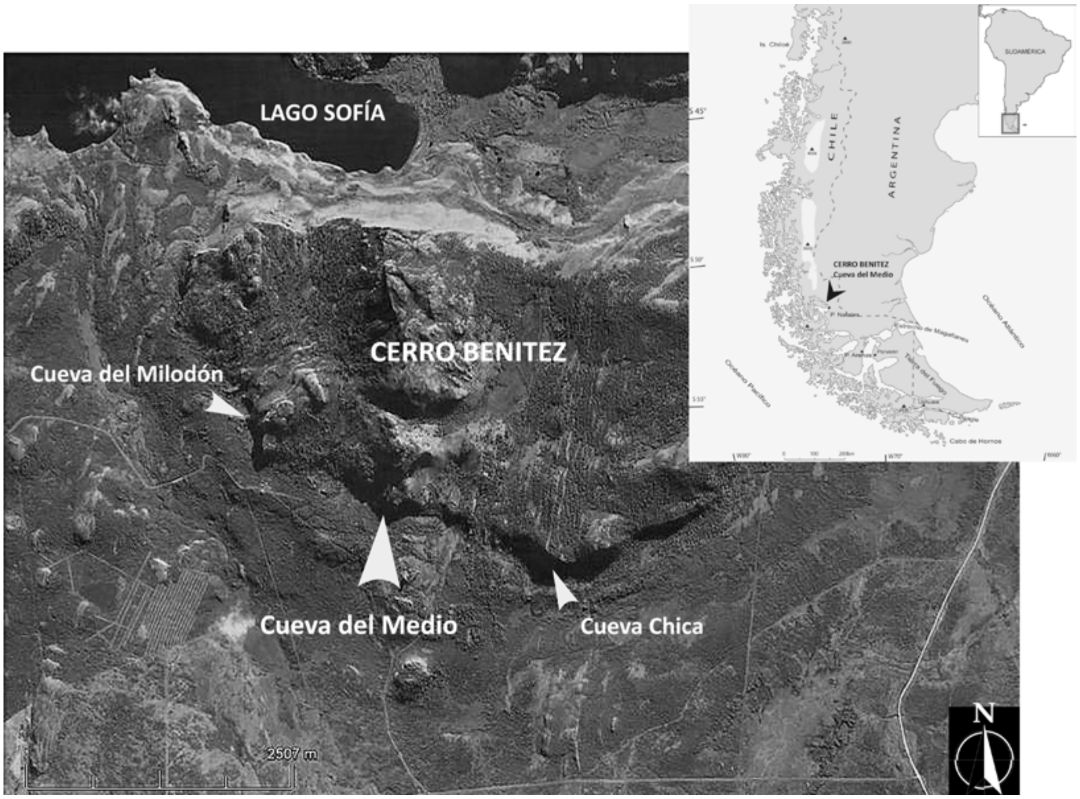

Figure 1.1a. Cueva del Medio. Location map.

Figure 1.1b. Cueva del Medio. View of the cave entrance.

FIGURE 1.2. Fell Cave projectile point recovered in deposits below the rockfall near the western wall.

to justify contemporaneity. Our criteria for chronological evidence of human presence are radiocarbon dates from bones with cut marks or charcoal from hearths (Martin 2012).

Antecedents

A surface sample was initially recovered in the 1980s in a disturbed area of the cave. This sample indicated the presence of extinct Late Pleistocene fauna there (Nami 1987; Borrero et al. 1988). Nami was able to find sediments not perturbed by the activities of amateurs, which he separated into five stratigraphic units. His excavations displayed a short but important sequence on the upper 40 cm of the sediment pile that comprised the full Late Pleistocene occupation series (Nami 1985–1986:106). Importantly, he defined what he called the Fell III component in Unit 3, a brown-reddish sand with clasts found only in the central squares of his excavation grid. Unit 4, below, formed by sand, contains his Fell I component (Nami 1993:126). A thin layer of clastic material resulting from the disintegration of the conglomerate of the roof separates both components.

Recovered faunal remains include rodents, Rheidae, camelids (*Lama* morphotype *Lama owenii*, *Lama guanicoe*, and *Lama gracilis*), Cervidae, *Hippidion saldiasi*, *Mylodon*, *Smilodon*, and Felidae cf. *Panthera* (Nami 1987; Nami and Menegaz 1991; Nami 1994a, 1994b; Prieto et al. 2010). Remains of *Lycalopex culpaeus* were also found on the modern cave surface (Borrero et al. 1988:140). The fauna found associated with his Fell III component is not abundant but limited to eight elements (Table 1.1). In contrast, 76 *Lama* sp., 27 *Hippidion*, and five *Mylodon* elements were assigned to his Fell I component (Nami and Menegaz 1991:121). Most of the extinct fauna bones from Nami's collection were recovered from the surface on the west side of the cave. Among his important Late Pleistocene findings were Fishtail (or Fell Cave) projectile points (Figure 1.2), which are widely accepted as markers for early populations in South America (Flegenheimer et al. 2013). These points were stratigraphically associated with hearths and both extinct and modern fauna that produced Late Pleistocene radiocarbon dates (Table 1.2; Nami and Menegaz 1991; Nami and Nakamura 1995). Those points and other tools were found exclusively within his Fell I component.

TABLE 1.1. Cueva del Medio. Bones recovered in the Fell III component (Nami and Menegaz 1991:121).

Species	Elements
Lama sp.	Phalanx I, Phalanx II
Lama guanicoe	Metapodial epyphysis, rib*
Hippidion	M3 sup. right
Mylodon	Unguial phalanx, two osteoderms

*Nami and Nakamura 1995

The Fell III component, on the other hand, is characterized by stemless triangular projectile points and other tools that Nami compares with the so-called Toldense industry (Nami 1987:102; Gradín et al. 1979). These points are also associated with extinct and modern fauna (Nami 1987:87). It is this distinction between both components that we want to discuss, together with the character of its association with the bone assemblage.

In conclusion, Nami's stratigraphic work between 1986 and 1993 recovered excellent archaeological and chronological information (Nami 1987, 1989–1990; Nami and Menegaz 1991; Nami 1992) and was unanimously recognized

Table 1.2. Cueva del Medio. Radiocarbon dates attributed to Fell I component (Nami and Nakamura 1995; Martinic 1996). Calibration curve: IntCal13 (Reimer et al. 2013).

Dated material	RCYBP	cal BP (2σ)	Lab no.
Charcoal (Hearth)	9595 ± 115	10,595–11,215	PITT 0344
Averaged sample (bones several spp.) (Nami 1989–1990: 127)	9770 ± 70	10,809–11,329	Beta 40281
Charcoal (hearth)	10,310 ± 70	11,825–12,404	Gr-N 14913
Undetermined burned bone (hearth)	10,350 ± 130	11,647–12,592	Beta 58105
Charcoal (hearth)	10,430 ± 80	12,039–12,564	Beta 52522
cf. *Lama owenii,* Fg. Metapodial (hearth)	10,430 ± 100	11,988–12,619	NUTA- 1734
Undetermined burned bone (hearth)	10,550 ± 120	12,099–12,709	Gr-N 14911
H. saldiasi, vertebra	10,710 ± 100	12,421–12,767	NUTA- 1811
H. saldiasi, tibia (hearth)	10,860 ± 160	12,432–13,084	NUTA- 2331
Undetermined bone (Martinic 1996)	10,885 ± 90	12,672–12,996	(A-7242) AA-13018
Charcoal (hearth)	10,930 ± 230	12,240–13,300	Beta 39081
cf. *Lama owenii,* phalanx	10,960 ± 150	12,639–13,114	NUTA- 2330
cf. *Lama owenii,* undetermined diaphysis (hearth)	11,040 ± 250	12,430–13,432	NUTA- 2197
cf. *Lama owenii.* Metapodial epiphysis	11,120 ± 130	12,726–13,206	NUTA-1737
Undetermined bone (Martinic 1996)	11,570 ± 100	13,187–13,585	(A-7421) AA-12578
Undetermined bone (Martinic 1996)	11,990 ± 100	13,579–14,083	(A-7240) AA-12577
Undetermined burned bone (hearth) [rejected by Nami]	12,390 ± 230	13,778–15,239	PITT 0343

as a proof for Late Pleistocene occupation of the south of the continent (Dillehay 2000; Borrero 2012). Nami's research also produced evidence for Late Holocene occupations at the site, basically at the back of the cave.

Results

The Geomorphological Context of the Cave

Geoarchaeological research was an integral component of our project and offered a better understanding of the formation processes acting at Cueva del Medio and the other caves (Martin et al. 2013). The landscape underwent Late Pleistocene glaciation, paraglacial/periglacial conditions, and finally interglacial (Holocene) environmental dynamics. Consequently, the cave can be viewed as a specific underground geomorphological system whose formation and evolution were influenced by different physical forces during the Last Glacial Period. Processes including both karstic and nonkarstic (especially glacial) dynamics, probably acting at different spatial and temporal scales, were involved.

Cueva del Medio is located on the south side of Cerro Benitez, on the lee side of the Andes, southeast of the South Patagonian Ice Field (Figure 1.1). During the Last Glacial Maximum (LGM), outlet glaciers from the Patagonian Ice Sheet coalesced and nourished the Ultima Esperanza piedmont lobe, which flowed eastward toward the extra-Andean plains in Argentina. This ice lobe overrode Cerro Benitez sometime during or prior to the local LGM, as suggested by ice modeling of its summits (Sagredo et al. 2011). In the Puerto Natales region, at least two major LGM advances are documented between about 17,500 and 40,000 cal BP (calendar yr BP), the most recent of which corresponds to the Dos Lagunas moraines and the Arauco Moraine Complex (Sagredo et al. 2011). The Last Glacial Termination in the Ultima Esperanza area started shortly before ca. 17,500 cal BP, when the piedmont lobe abandoned these moraines. A near-minimum age for ice recession from the final local LGM advance is given by the chronology from Vega Benitez, suggesting enough ice thinning/recession in Cerro Benitez just prior to 17,500 cal BP (Sagredo et al. 2011).

Glacial recession gave rise to the develop-

Table 1.3. Cueva del Medio. Paleontological samples recovered by Nami (Nami and Nakamura 1995; Prieto et al. 2010). Calibration curve: IntCal13 (Reimer et al. 2013)

Dated material	RCYBP	cal BP (2σ)	Lab no.
Smilodon, incisor	11,100 ± 80	12,770–13,101	Ua-37622
Mylodon sp., bone.	12,720 ± 300	14,050–15,991	NUTA 2341

ment of an ice-dammed proglacial lake, the Lago Puerto Consuelo. This lake reached elevations between 125 and 150 meters above sea level (m a.s.l.), with its highest level dated between about 16,200 and 16,900 cal BP. A regressive phase occurred after the Ultima Esperanza ice lobe abandoned its stabilized position, exposing sectors with elevations below 125 m a.s.l. (Sagredo et al. 2011; Stern et al. 2011; García et al. 2014).

The local paleoecological information obtained by Moreno and colleagues (2012) marks changes in deglacial climate conditions. The analysis of two columns (Pantano Dumestre and Eberhard) indicates that southwesterly winds (SWW) drove changes in hydrologic balance and precipitation throughout the Last Glacial Termination. Such changes may have affected water circulation in the karst network and amounts and pattern of rain/snow precipitation on Cerro Benitez, with consequences for cave sedimentation. Another factor that may have influenced cave sedimentation and affected stratigraphy is the evolution of glacial cryogenic conditions in relation to past temperature fluctuations. It is hypothesized that permafrost may have formed on the recently deglaciated land of Cerro Benitez and then in cave sediments. During periods of warmer climate (paraperiglacial), permafrost thaw-degradation may have provided water or enhanced water infiltration and circulation in the karst network, therefore influencing cave sedimentation.

Excavations

The limits of Nami's excavations were identified as a basis for our main excavations. We dug a surface of 15 m² in the central part of the cave. Approximately the first meter was already excavated by Nami, and we reached a maximal depth of about 5 m. Two squares adjacent to Nami's main excavation were completely excavated, including the archaeological layers, and used as a comparative reference between our work and that of Nami. Also, on the basis of the previously recorded presence of megafaunal remains on the surface and on a profile (Table 1.3), a new locus was selected for excavation near the west wall of the cave. Rocks fallen from the ceiling were sealing those deposits and had to be destroyed with a jackhammer. This excavation proceeded toward a maximal depth of 2 m, uncovering archaeological and paleontological deposits.

Our excavations at the center of the cave revealed a stratigraphy that partially covers the Last Glacial Termination. The archaeological information that we recovered in the upper part of the sequence is basically comparable to that obtained by Nami, including a *Hippidion* astragalus dated to ca. 10,860 RCYBP, which displays cut marks (Table 1.4), and a baciform hearth dated to 10,410 ± 50 RCYBP [Beta 39538]. This falls well within the range of the hearths previously dated by Nami (Table 1.2). A much more recent hearth, dated to 2970 ± 30 RCYBP, was found nearby. Also, two camelid bones—one with cut marks—were dated as 3820 ± 30 and 3830 ± 30 RCYBP, respectively. They may have belonged to the same individual but confirm the presence of Late Holocene occupations in the area. An important conclusion here is that both Late Pleistocene and Late Holocene components are found in physical contact.

The deepest part of the excavation revealed large weathered rocks, covering *Mylodon* bones, which were dated to 13,790 ± 60 and 13,670 ± 50 RCYBP (Table 1.4), the oldest ages for the site. These rocks are interpreted as the result of debris fall and were included within a clay matrix linked to water movement. Above that layer, there was a postglacial clayey sediment. With abundant *Mylodon* remains, this stratum

TABLE 1.4. Cueva del Medio. Radiocarbon dates Project FONDECYT 1100822. Calibration curve: IntCal13 (Reimer et al. 2013).

Dated Taxon/element	RCYBP	cal BP (2σ)	Lab no.	Observations
Charcoal(hearth)	2,970 ± 30	3007–3229	Beta 344433	
Camelidae, metapodial	3,820 ± 30	4093–4397	Beta 344431	
Camelidae, rib	3,830 ± 30	4101–4405	Beta 344432	
L. guanicoe, rib	3,900 ± 30	4247–4418	Beta 341900	West Wall; cut marks
Camelidae, rib	4,230 ± 30	4649–4856	Beta 344429	West wall
Charcoal (hearth)	10,410 ± 50	12,073–12,524	Beta 319538	Center of cave
Hippidion, first phalanx	10,680 ± 40	12,571–12,711	Beta 344428	West wall
Canidae, tibia	10,710 ± 50	12,577–12,724	Beta 341903	West wall
Felidae cf., *Panthera*	10,860 ± 40	12,692–12,798	Beta 344430	West wall
H. saldiasi, astragalus	10,860 ± 110	12,595–13,008	AA 100235	Center of cave; cut marks
P. o. mesembrina, mandible	11,410 ± 80	13,096–13,415	Ua-24687 AMS	Center of cave; coll. Nami (Martin 2008)
Mylodon, scapula	11,830 ± 130	13,416–13,997	AA 100228	Center of cave; carnivore marks
Felidae, rib	12,490 ± 50	14,301–15,041	Beta 344434	Center of cave
Mylodon, vertebra	12,760 ± 140	14,586–15,725	AA 100232	Center of cave
Mylodon, mandible	12,990 ± 50	15,307–15,751	Beta 344435	Center of cave; brown clay
Mylodon, bone frag.	13,100 ± 50	15,466–15,953	Beta 319539	Center of cave; clays
Mylodon, rib	13,670 ± 50	16,264–16,737	Beta 344436	Center of cave; brown-reddish clay
Mammalia, frag.	13,670 ± 50	16,264–16,737	Beta 341901	Center of cave; weathered blocks, bottom
Mylodon, osteoderm	13,790 ± 60	16,413–16,946	Beta 341902	Center of cave; weathered blocks, bottom

*Prevosti and Martin 2013

can be defined as a matrix-supported diamicton. The diamicton showed evidences of waterlogged conditions of sedimentation. This layer was overlain by irregularly stratified autochthonous and allochthonous sediments, mostly water-laid local sands and pyroclastic airfall deposits (tephra), with bedrock-derived coarse materials including debris fall deposits. Irregularly stratified sediments revealed reworked medium sand and diffuse tephra; color variations suggest that tephra is more or less mixed with local sand. The stratigraphy is characterized by: (a) sandy beds more or less rich in coarse elements (pebbles, cobbles); (b) clast-supported materials (reworked conglomerate slabs); (c) fine-textured thin laminations mostly dipping northward and westward; (d) microchannels suggesting westward paleoflows; (e) deformed structures with reworked tephra/sand; and (f) diffuse redoximorphic features (Fe/Mn concentrations).

Geochemical studies indicate that the tephra derives from the large late-glacial explosive R1 eruption of the Reclus volcano and corresponds to an event dated to 12,670 ± 240 RCYBP (Stern 2008; Stern et al. 2011; Sagredo et al. 2011). Following that event, the deposition of sand/reworked tephra would have begun at or shortly after 12,500 RCYBP and seems to have continued until the beginning of the Holocene. A *Mylodon* vertebra embedded in the tephra but lying on the clays was dated 12,760 ± 140 RCYBP, which is in line with the age for the tephra. Scarce mammal remains were retrieved in stratified reworked sand/tephra sediments above the diamicton, whereas archaeological deposits were only present in the upper part of the stratigraphy.

Figure 1.3. *Mylodon* scapula with scoring and crenelated marks, recovered by Nami.

Figure 1.4. *Mylodon* vertebra with carnivore marks, recovered by Nami.

Figure 1.5a. *Hippidion saldiasi* astragalus with cut marks.

Figure 1.5b. Detail of Figure 1.5a.

The presence of human occupations in the sands of Nami's layer 4 was confirmed by our excavations both in the central part and near the west wall of the cave. Late Holocene occupations were also identified.

Discussion

Carnivores

Nami noted the presence of carnivores, and some herbivore bones (mostly *Mylodon*) present carnivore punctures and pits (Figures 1.3, 1.4). The evidence suggests a complex taphonomic panorama. Remains of *Felidae* and *Cervidae* are found only in sediments deposited before the human occupation (Nami and Menegaz 1991: 126). In contrast, bones corresponding to *Lama* and *Lama guanicoe* are found only in archaeological assemblages or physically associated with them. However, they do not always display marks of human exploitation. Bones of *Hippidion* (horse) also appear in cultural contexts, and at least one of them, dated to 10,860 ± 110 RCYBP (Table 1.4), displays cut marks (Figure 1.5). The range of radiocarbon dates for *Hippidion* at Cueva del Medio is 10,860–10,680 RCYBP.

We must recall that two radiocarbon dates of ca. 11,990 and 11,570 RCYBP, published by Martinic (1996), are older than those informed by Nami and Nakamura (1995) for the early human occupations of the cave. Nami does not include those results in a recent list of archaeological dates for Cueva del Medio (Nami 2007). Also, Nami recovered a panther mandible below the archaeological (Nami 1985–1986:106–7; Nami and Menegaz 1991:126) that we dated to 11,410 RCYBP (Martin 2008). This date overlaps both dates published by Martinic, and we think that these ages should all be treated as unrelated to humans (Tables 1.2, 1.3). We also have an age of 11,830 RCYBP for a juvenile *Mylodon* scapula with carnivore marks recovered by Nami, who ascribed it to his Fell I component (Nami and Menegaz 1991:121; Table 1.4). Other bones with similar ages are physically associated with the archaeological remains but without published evidence of human exploitation (Martinic 1996). In this context, the existence of another depositional agent—carnivores—is an invitation to caution.

Using all the available radiocarbon ages, a range between 10,930–9535 RCYBP is evident for the Late Pleistocene occupation of the cave. Alternatively, if we only used AMS radiocarbon dates, the chronological range would shorten to 10,860–10,410 RCYBP. The second alternative appears to be preferred, since not only is it difficult to assess the cultural meaning of some of the standard dates, but at least one of the most recent radiocarbon values (9770 ± 70 RCYBP) had resulted from dating splinters and fragments of *Mylodon* sp., *Hippidion* sp., and *Lama* (Nami 1989–1990:127). In other words, this is an averaged date.

In conclusion, indicators of use of the cave by both carnivores and humans are concentrated within a short period. There are three Late Pleistocene radiocarbon dates on bones of horse, panther, and canid obtained below the blocks near the western wall. The horse remains were close to a fragment of a Fell Cave projectile point and other tools. The panther and canid bones were found some 30 and 66 cm below the archaeological evidence. Panthers and canids are potential accumulating and bone-modifying agents, while horse is the only extinct animal for which we have evidence of human exploitation in the form of cut marks. The date of the panther at 10,860 RCYBP (Table 1.4) suggests that humans and carnivores may have alternated use of the cave. Thus, using both Nami's and our own data, the best evidence for human occupations lies in radiocarbon dates obtained on charcoal recovered from hearths and cut-marked bones (Tables 1.2, 1.4).

The Fell I and III Components

Bird describes Fell I and Fell III as two separate and nonoverlapping periods at the Pali Aike Lava Field (Bird 1946; Nami 1987). Nami recognizes the presence of both components at Cueva del Medio. According to Nami and Menegaz (1991), the Fell III component was found above the Fell I component in the north sector of the excavation, confined to a few squares. The limited distribution of tools attributed to this component was confirmed, since our work in other parts of the cave failed to recover any other tools ascribed to Fell III. In contrast, the Fell I component was found all over the surface excavated by Nami, as well as in our excavations. It is characterized by the presence of hearths, fishtail projectile points, sidescrapers, endscrapers, knives, debitage, and faunal remains (Nami and Menegaz 1991). Anthropic marks on bones are mentioned, including cut marks, fracture patterns, and burning (Nami and Menegaz 1991:119, 122; Nami 1994a:150), but the evidence was not published (Nami and Nakamura 1995:132; Menegaz et al. 1994:35). A horse skull fractured on a sagittal plane is mentioned (Nami and Menegaz 1991:120), as well as a pile of *Hippidion* bones (Nami 1994a:123; Nami 2013).

According to Bird, his Fell I component was associated with extinct fauna, while Fell III was only found associated with modern animals (Bird 1946, 1988). However, at Cueva del Medio both components were physically associated with modern and extinct fauna. Nami explains that his use of Bird's nomenclature is only nominal (Nami 1987:83), but he immediately asks if humans were synchronic with megamammals during the early Holocene and makes stratigraphic and chronological comparisons with Pali Aike (Nami 1987:88). In some cases, the characterization of his Fell I or III components was based on chronology (Nami 1989–1990:127;

TABLE 1.5. Cueva del Medio. Radiocarbon dates attributed to Fell III component (Nami and Nakamura 1995). Calibration curve: IntCal13 (Reimer et al. 2013).

Taxa	Dated element	RCYBP	cal BP (2σ)	Lab no.
Lama guanicoe	phalanx	10,450 ± 100	12,020–12,637	NUTA- 1735
Lama guanicoe	rib	10,710 ± 190	12,077–13,017	NUTA- 2332
Lama guanicoe	phalanx	10,850 ± 130	12,560–13,037	NUTA- 1812

Nami and Nakamura 1995:130) or directly on the shape of the projectile points (Nami 1993:127). Nami considered the possibility of Holocene survival of extinct fauna (Nami 1987; Nami and Menegaz 1991:126), or that the bones migrated due to postdepositional processes (Nami and Menegaz 1991:126). Results of his NUTA radiocarbon series support the second alternative (Nami and Nakamura 1995:126, 130; Table 1.5). Effectively, three of the bones recovered at the Fell III component, two *Lama* sp. phalanges—now attributed to *Lama guanicoe*—and a *Lama guanicoe* rib, were dated and produced results indistinguishable from those of Fell I (Table 1.5). The distinction made by Nami, then, is not temporally clear cut, since all radiocarbon dates assigned to both components were associated with Pleistocene faunas and temporally overlapping (Martin 2013). Either the bones associated with the Fell III component were differentially destroyed—a situation very difficult to substantiate—or there is basically only one bone assemblage associated with the remains attributed to both components.

It is clear that the bone assemblage assigned to Fell III cannot be separated from the bones assigned to Fell I. Since it is a fact that triangular projectile points were found segregated from the earlier levels, even though one of the points was recovered on the surface (Nami 1987:84), it must be said that their chronology at the cave is still unknown. If the chronological sequence recorded by Bird in the Pali Aike region is reproduced here, then those points may belong to the Early Holocene. However, there isn't a shred of chronological evidence supporting this. If the association between the dated specimens and the triangular projectile points is correct, then these might be the oldest triangular points in the whole of Patagonia (cf. Gradín et al. 1979), even inviting the idea that it was a southern innovation. The existence of a long depositional gap between the Late Holocene occupations and the Late Pleistocene layers at the cave implies that a much later date cannot be excluded. Even when the differences in the shape of projectile points are clear, the limited distribution of Nami's Fell III component and the lack of chronological differentiation make it preferable not to separate these occupations. Indeed, this was done in the study of the lithic tools (Huidobro 2016). The existence of depositional gaps of the magnitude noted in this chapter indicates that it is better to treat both early components as part of a continuum of short human visits to the cave.

Conclusion

We are interested in an occupational gap of at least 6,000 radiocarbon years between ca. 4200 and 10,400 RCYBP in both excavation loci at Cueva del Medio. What is extremely important from a formational point of view is that the older occupations are recorded in very close vertical and horizontal proximity to the late Holocene occupations. Obviously, occupational gaps affect our interpretation of the human use of the cave. Thus, the different human occupations are not clearly segregated and constitute palimpsests very difficult to disentangle. It is hard to separate tools and debris corresponding to different human visits. This is the reason why we are so exacting in accepting or rejecting associations between faunal remains and human evidences.

Regardless, the Late Pleistocene archaeological signal at the site is strong. It includes projectile points and other stone tools widely recognized as old and bones of extinct faunas—at least one of them with cut marks and basin-shaped hearths. However, we lack the means to establish a precise list of tools or bones associated with the Late Pleistocene or Late Holocene occupations. We strongly believe that this is also the case at many other archaeological sites, but only when time and efforts are devoted to understanding the involved formation processes and palimpsests are recognized as such (i.e., Politis et al. 2014).

There is no evidence of the exploitation of *Mylodon* nor even a temporal overlap between them and humans at the cave. The *Mylodon* remains were deposited before the arrival of humans. Although ground sloths were living in the region at the same time as humans (Borrero and Martin 2012), they were not recorded in the cave during the period of human occupation. As noted, there is limited evidence for the exploitation of horse at Cueva del Medio, which confirms data already obtained at Cueva Lago Sofía 1 and Cueva del Milodón (Alberdi and Prieto 2000; Martin 2013). It was earlier postulated that horses were quantitatively important as subsistence items at Cueva del Medio (Nami 1993: 131), but our observations do not support this.

Three different problems for the interpretation of the evidence at Cueva del Medio were discussed. First, the difficulties in separating the activities of carnivores and humans. Second, the difficulties in separating Nami's components Fell I and Fell III, and finally the difficulties in telling Late Pleistocene from Late Holocene occupations.

The most important conclusion is that it is no longer useful to maintain the separation in two components suggested by Nami. All the available indicators suggest that it is better to treat them as a single component. Moreover, not all physically associated remains within that component can be securely ascribed to the Late Pleistocene human occupation. Some of the bones result from carnivore activity, and some could even be the product of Late Holocene human activity. But the presence of averaged samples at Cueva del Medio is a reality that does not affect the fact that a strong Late Pleistocene human occupation was recovered.

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