

Obsolete Muskets, Lethal Remingtons: Heterogeneity and Firepower in Weapons of The Frontier War, Argentina, 1869–1877

JUAN B. LEONI

CONICET — Institute of Archaeology, University of Buenos Aires, Argentina

This paper deals with firearms that were employed by the Argentine army in frontier warfare between 1869 and 1877. Documentary information and archaeological assemblages from two contemporary military facilities — Fort General Paz and *Fortín Algarrobos* — are combined to characterize the armament in service during those years. This was a crucial period, during which a process of modernisation and standardisation of the army's armament started, centred on the incorporation of Remington single-shot breech-loading rifles and carbines. However, the archaeological record shows that this process was slow and that an astonishing variety of older firearms (flintlocks, percussion smoothbores and rifles) remained in service, causing logistic and operative problems, and reducing the army's combat effectiveness. The paper then discusses the impact of the incorporation of the Remington guns on frontier warfare, critiquing commonly held determinist characterisations, and placing the Remington's effect in a broader political and economic context.

KEYWORDS frontier warfare, Argentine army, Pampas, firearms, Remington

Introduction

Argentina underwent a process of territorial expansion throughout the nineteenth century. This expansion was meant to incorporate extensive tracts of land in the region known as the Pampas, which were controlled by diverse indigenous societies known collectively at the time as the 'Pampa Indians', or simply as 'Pampas'. These lands, particularly favourable for cattle herding and agriculture, were necessary for the building of an economy oriented toward the export of primary commodities to world markets. However, the expansion was an uneven process, one that was heavily dependent on the political and economic consolidation of Argentine society,

and especially on the building of a modern nation-state, which only began after 1861. Internal and external conflicts hampered the accomplishment of this territorial goal and affected the balance of power on the frontier, transforming the borderlands into the locus of a complex inter-ethnic dynamic, a ‘porous frontier’ (*sensu* Parker, 2006), in which relative peace alternated with open conflict.

Argentine military frontier emplacements began to attract archaeological interest in the 1990s, becoming a fruitful research field. Since then, not only has the number of sites being investigated increased, but so has the range of social, economic, and technological topics being dealt with by researchers (for a detailed overview see Gómez Romero and Spota, 2006). The study of firearms is one such topic and, while new in the context of Argentine archaeology, it is becoming the focus of an increasing number of works (e.g. Landa et al., 2010; Leoni, 2009; Tapia et al., 2009). As is true of all material culture, firearms can provide diverse types of information besides the purely functional: they can shed light on technological, economic, social, political, and ideological aspects of the past societies that used them. In this paper, I combine archaeological and historical information in order to characterize an assemblage of firearms-related materials from two frontier military facilities, Fort General Paz and *Fortín* Algarrobos, which were part of an integrated defensive system that operated between 1869 and 1877. This period was crucial for the Argentine army, as it was then that it started the modernization and standardization of its armament by acquiring increasing numbers of Remington Rolling Block single-shot breech-loading rifles and carbines. However, the archaeological record shows that this process was slow and that an astonishing variety of older firearms remained in service. In the pages that follow, I provide a brief historical overview of the frontier, concentrating on the section denominated ‘Buenos Aires Western Frontier’, and discuss historical and archaeological information relating to the two military sites. I then characterize the firearms assemblages from these sites, trying to determine the types of weapons that were used there, and discuss some evident differences between them. Next, I consider the impact that the introduction of the Remington had on frontier warfare, critiquing commonly held determinist interpretations and placing the Remington’s undeniable effect in a broader political and economic context.

Historical background: Buenos Aires Western Frontier between 1869 and 1877

Territorial expansion was carried out by means of the establishment of successive lines of military emplacements known at the time as ‘Frontier Lines’, which were meant to protect civilian rural settlements and towns. They also served as bases for offensive operations against indigenous groups. The Frontier Line was in turn subdivided into smaller (200–250 km long) sections, known as ‘frontiers’ or ‘divisions’, each of which had its own headquarters and military garrison. In Buenos Aires Province (the richest and most powerful of the Argentine provinces), these sections were respectively referred to as, going from north to south, the Northern Frontier, the Western or Central Frontier, the Southern Frontier and the Southern Coast Frontier (Figure 1). The line was planned as an integrated defensive system in which a series of small forward outposts, known as ‘fortines’, sounded the alarm on detecting raids by indigenous groups. This allowed the civilian population to get ready and

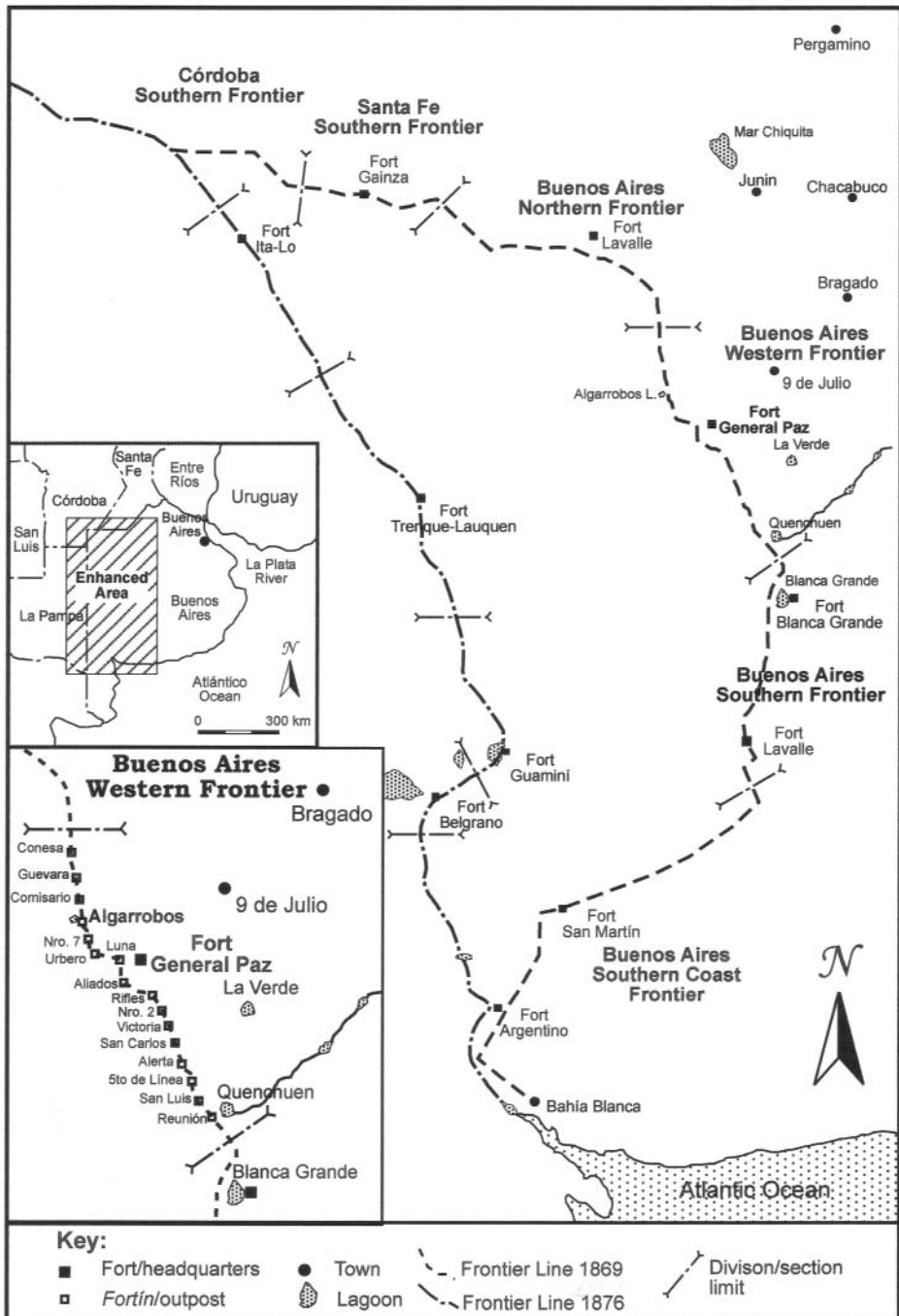


FIGURE 1 Map of the 1869 and 1876 frontier lines, with inset detailing Buenos Aires Western Frontier (redrawn from Raone 1969).

the larger military garrisons situated in forts behind the fortines to confront the raiders, either before they reached their targets or, more commonly, when they were trying to escape after having plundered settlements and towns. Budgetary and personnel restrictions, though, significantly limited the efficacy of this defensive system over time (Perry, 1972; Raone, 1969; Thill and Puigdomenech, 2003).

The Frontier Line gradually moved toward the southwest during the second half of the nineteenth century, placing more and more land under the effective control of the state. In 1858, the Buenos Aires Western Frontier had its command post in the town of Bragado, but this was soon moved westward in 1863 to what is today the town of Nueve de Julio (Figure 1). That move was part of an attempt to set up a new defensive line in order to protect settlers who had already established themselves well beyond the previous border (Sigwald Carioli, 1981: 5; Thill and Puigdomenech, 2003: 456–61). A new and more encompassing advance of the Frontier Line was planned during the presidency of Domingo F. Sarmiento (1868–74), taking place in 1869. Under the direction of Colonel Juan F. Czetz, a former Hungarian military engineer, yet another line was constructed. The sector corresponding to Buenos Aires' Western Frontier extended 200 km in a northwest-southeast direction, and consisted of an advanced line of 'fortines' constructed at intervals of about 10–15 km. The command post was located in Fort General Paz, 10 km behind the centre of the line (Figure 1) (*Ministerio de Guerra y Marina* [MGM], 1870: 149–79, 274–77; see also Leoni et al., 2013; Sigwald Carioli, 1981; Thill and Puigdomenech, 2003).

In March of 1876, War Minister Adolfo Alsina ordered a new westward advance of the Frontier Line (Figure 1). As part of this advance, the headquarters of the Buenos Aires Western Frontier was shifted to the place known as Guaminí, well inside what had been the territory of the Pampa people. Fort General Paz continued to serve for a time as the headquarters of the so-called Interior or Second Line, with a small garrison consisting mainly of provincial militiamen and allied indigenous auxiliaries, as the main units had departed for the new Frontier Line (MGM, 1877, 1878).

Fort General Paz: history and archaeology

Fort General Paz is situated about 24 km to the southeast of the town of Carlos Casares, seat of the county of the same name, in Buenos Aires Province. Its location, on private property, is marked by a small commemorative monolith erected for the fort's centennial. The construction of the fort was ordered by the War Ministry in 1869, as part of the westward movement described above. The composition of its garrison varied through the years, but normally consisted of a cavalry regiment and an infantry battalion. They were complemented by provincial militia (known as *Guardia Nacional* [National Guard]) and indigenous auxiliaries from the allied tribes led by chiefs Coliqueo, Manuel Grande, and Tripailaf. The fort included a considerable civilian population (soldiers' families, merchants, workers and employees, scouts, etc.; MGM, 1870–76). According to reports from the time, the fort consisted of a 150-m square with earthen walls and a surrounding ditch. It contained several brick and adobe buildings (a command post, a hospital, an ammunition depot, etc.), as well as tents and huts that housed the troops and their families (Figure 2). A star-shaped

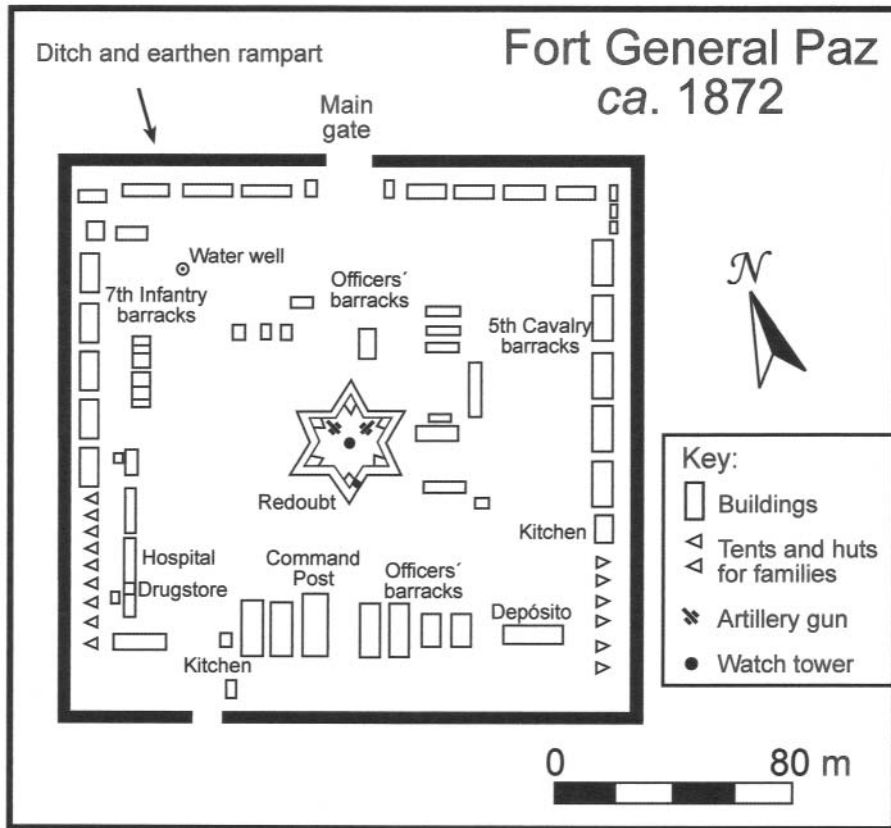


FIGURE 2 Layout of Fuerte General Paz (redrawn from original map by Federico Melchert (MGM 1873).

earthen redoubt, fitted with artillery pieces and a watch tower, was situated in the centre of the square. Corrals for cattle and horses, vegetable gardens, and civilian houses surrounded the military compound (MGM, 1870: 149–277).

Archaeological and historical investigations have enabled us to determine the precise location of the fort and of some of its main components. Archaeological research has included not only mapping, but excavations, systematic surface collections, and a geophysical survey, as well as the analysis of recovered artifacts in the laboratory (Leoni et al., 2007; 2008; 2013). The military artefacts include a variety of projectiles and firearm-parts, as well as uniform components such as buttons and belt buckles (Leoni, 2009). This assemblage is augmented by materials collected over the years by amateur researchers and collectors, some of which have been donated to the Municipal Museum of Carlos Casares, making them available for analysis.

Fortín Algarrobos: history and archaeology

This small forward outpost was built at the same time as Fort General Paz, and integrated the right side of the Western Frontier defensive line (Figure 1). It was

positioned on the eastern margin of the Algarrobos Lagoon, from which it took its name. Reports from the time describe it as a circular structure, 20 m in diameter, surrounded by a 1 m high earthen rampart and by a 3 m deep ditch. The structure housed two small huts for the garrison (consisting of one officer and from five to eight soldiers) and an eight-pounder gun, which was used to sound an alarm (firing the gun four times) upon detection of enemy incursions. A circular corral for horses was situated close to the outpost (MGM, 1873: 117; 120; Figure 3). Little is known about the outpost's history, except for the fact that it was burnt down in 1876, apparently with no casualties, during a Pampa raid (MGM, 1877: 246–47). Given that a new frontier advance was initiated that same year, the outpost does not appear to have been rebuilt. And unlike Fort General Paz, memory of its location was lost until recent research determined its precise location (Acedo, 1991; Leoni et al., 2008).

The initial archaeological investigation at *Fortín* Algarrobos consisted of the excavation of an exploratory trench (6.5 m long by 2 m wide) that cut through the edge of the central platform, the perimeter ditch and the rampart (Acedo, 1991). More recently, in 2012, excavations within the central structure were carried out, identifying the remnants of a brick floor. While these excavations produced few archaeological materials, numerous and diverse artefacts have been recovered over the years by the local inhabitants, from the outpost's surroundings and from the lagoon. Some of these materials have been donated to the Municipal Museum of Carlos Casares, while others have remained in private hands.

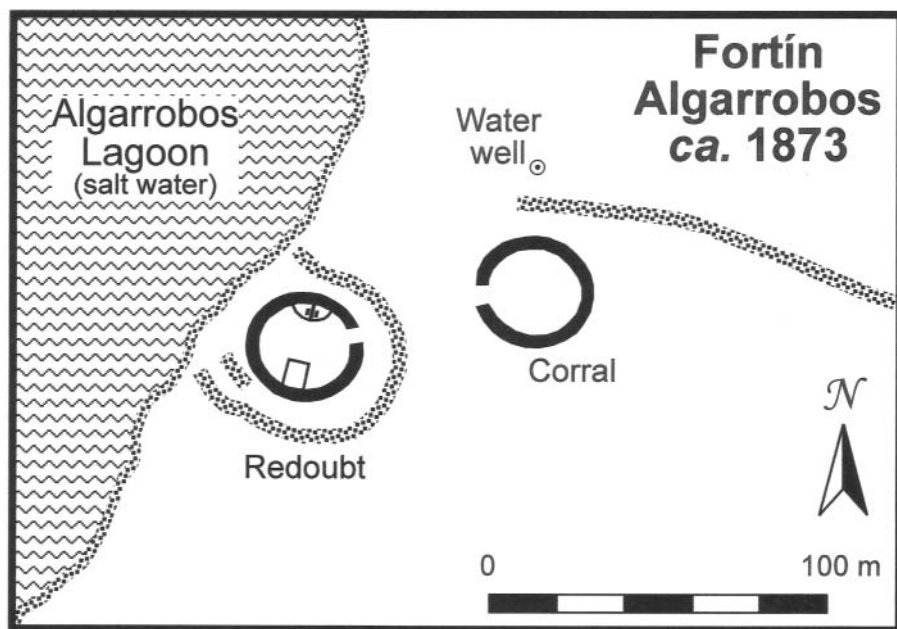


FIGURE 3 Layout of Fortín Algarrobos (redrawn from original map by Federico Melchert (MGM 1873).

Firearms in the Western Frontier, 1869 to 1877: historical background

Troops who served on the Western Frontier between 1869 and 1877 employed a wide variety of weaponry. A popular image, also reproduced in some academic work, typically portrays the frontier soldier wielding a Remington Rolling Block rifle or carbine, which gave him a decided edge over his indigenous foes. This lethal weapon, however, was only introduced in the final phases of the frontier war. During the period considered here, the army had not yet achieved a standardization of its firearms. Whereas the Remington guns started to enter service in 1873, gradually reaching the frontier in increasing numbers, they did not become the army's standard weapon until the late 1870s. Thus, frontier garrisons had to make do with a variety of older firearms.

According to historical sources, the Western Frontier troops fought several Pampa incursions, armed with percussion muzzle-loading muskets and carbines, as well as with lances and sabres. Such was the case at the battle of San Carlos (8 March 1872), in which the army managed to defeat the powerful Pampa chief Calfucurá in a pitched battle (Ramírez Juárez, 1968). Formal battles like this were rare events in frontier warfare, which was characterized more by hit-and-run raids and by small clashes. Muzzle-loaders were difficult to reload, especially on horseback. Hence, the Pampas took advantage by charging the army forces with their lances and bola stones (*boleadoras*) after the soldiers had fired and before they could reload. Clashes were then decided in hand-to-hand fighting with lances, sabres and knives (Perry, 1972: 54–55; Zeballos, [1884] 2007: 158). At San Carlos, though, the Pampas fought mostly on foot, which might have led them to lose the advantage they enjoyed when fighting on horseback.

Although the annihilation of Lieutenant Colonel Estanislao Heredia's detachment, part of Fort General Paz' garrison, on 27 June 1872, resulted mainly from a flagrant tactical command blunder (MGM, 1873: 131), it has also been argued that the poor performance of the percussion muzzle-loaders was a contributing factor. During this military disaster, the army lost twenty-one men dead and one prisoner. Eduardo Gutiérrez, a former military officer and folk writer, vividly described the event:

'Fire!' Heredia shouted again without losing his nerve. 'Fire by halves!', and the troopers cocked their guns and aimed, but only three or four detonations followed the commander's order. The line regiments still used the percussion carbines, infamous for firing only once out of every ten attempts (Gutiérrez, [1886] 2001: 187; my translation).

Although mechanical failure of the muzzle-loading carbines cannot be ruled out, and while their low rate of fire certainly put the soldiers at a disadvantage tactically, it seems more likely that Heredia's party was simply outmanoeuvred and overwhelmed by a superior force of Pampa warriors, who lured Heredia into a well-planned ambush.

Official government reports from the time recognized the obsolescence of the percussion muzzle-loaders and the need for a more modern replacement (MGM, 1877: 618). Likewise, it was openly acknowledged that the wide variety of firearms being used caused serious logistic, administrative, financial, and operative problems for the army and the national government. As early as 1872, the War Minister, Martín de Gainza, informed the national Parliament that:

Whereas our army is conveniently armed in terms of the number of firearms and the spare parts [that we have] in storage, the variety of systems and calibres of weapons hampers instruction and hinders the operations. . . [Therefore] it is necessary to change the armament of the army in its entirety, adopting any system, provided that it is a single, unified one (MGM, 1872: 18; my translation).

From 1873 on, the modernization and standardization of the army's weaponry was set in motion, with the single-shot breech-loading Remington Rolling Block guns becoming more and more common on the frontier (Tables 1 and 2). Archaeological research of Western Frontier's military emplacements, however, shows that a wide variety of firearms remained in use. This reflects both the disorderly manner in which the modernization programme was implemented, and the heterogeneous character of the troops who garrisoned the Western Frontier, which included not only regular units directly supplied by the national government, but also provincial militia, auxiliary Indians, and armed civilians, who made use of whatever weapons that they could acquire.

Firearms and ammunition in Fort General Paz

Most of the artefacts in Fort General Paz firearms assemblage come from the Municipal Museum of Carlos Casares, much of whose collection was donated by local collectors and amateur historians. The rest of the materials comprising the assemblage were recovered during the course of our archaeological investigations (Leoni et al., 2007; 2008). The assemblage is characterized by a heterogeneity of materials, representing a wide variety of firearms (Table 3; Figures 4 and 5).

Lead musket balls are the most abundant type of artefact ($n=59$) in the assemblage. They were used with smoothbore muzzle-loaders, both flintlock and percussion, which were characterized by their short effective range and lack of precision. According to government records (MGM, 1870–1877), these types of firearms remained in service until at least 1875 (Tables 1 and 2). Although their presence in this assemblage is not unexpected, it is surprising that they comprise such a large proportion of it.

Musket balls from Fort General Paz vary between 0.6 and 0.7 inches (15.25 and 17.8 mm) in diameter, although most of them fall within the 0.66–0.68 inch range (16.7–17.3 mm), with a minor peak around 0.61 inches (15.5 mm; Figure 5). A variety of firearms with slightly different calibres ranging between 0.67 and 0.75 inches (17 and 19 mm), were used by the army at the time. Several different models are currently being exhibited at the *Museo de Armas de la Nación* (National Museum of Firearms; hereafter referred to as MUAN) in Buenos Aires, including various French, Spanish, Belgian, German, Austro-Hungarian, Italian, and British muskets and carbines.¹ If the windage indispensable for easier loading is considered, it turns out that musket balls greater than 0.60 inch and smaller than 0.75 inch in diameter could have been used by most of these weapons, preventing a precise adscription of individual musket balls to specific firearm models. Those of a larger size (0.68–0.70 inches in diameter [17.3–17.8 mm]), on the other hand, could have been used by larger calibre firearms, such as the English 0.75 inch (19.05 mm) calibre Tower or Brown Bess musket, which fired balls between 0.66 and 0.69 inches (16.76–17.52 mm) in diameter (Sivilich, 2005: 8).

TABLE 1

INFANTRY FIREARMS USED BY THE ARGENTINE ARMY BETWEEN 1869 AND 1877, AS RECORDED IN THE INVENTORIES OF THE WAR MINISTRY (MGM 1870 TO 1878). ORIGINAL DENOMINATIONS HAVE BEEN RESPECTED, DESPITE EVIDENT OVERLAPPING BETWEEN SOME OF THE CATEGORIES. EACH PUBLISHED REPORT DESCRIBES THE SITUATION OF THE PREVIOUS YEAR. FLUCTUATIONS IN NUMBERS REFLECT INVOLVEMENT OF THE ARMY IN INTERNAL CONFLICTS (1870 AND 1873 FEDERALIST REBELLIONS IN ENTRE RÍOS PROVINCE; 1874 MITRE'S REVOLUTION)

INFANTRY WEAPONS:	MGM 1870	MGM 1871	MGM 1872	MGM 1873	MGM 1874	MGM 1875	MGM 1876	MGM 1877	Total
Remington rifles	-	-	-	-	2990	8828	1688	1054	14,560
Rifled muskets	1412	2810	-	353	240	7060	-	-	11,875
Enfield rifles	250	417	525	95	2462	5298	4	522	9573
14 <i>adarmes</i> muskets	-	-	123	300	5655	-	-	-	6078
Oberdorf rifles	-	-	-	-	-	3655	800	-	4455
Smoothbore percussion muskets	-	3615	-	-	-	-	-	-	3615
Smoothbore muskets	625	1713	-	-	-	1274	-	-	3612
Springfield rifles	-	-	-	-	-	1531	12	-	1543
Percussion muskets	-	-	-	-	-	-	455	-	455
Rifles	-	150	266	-	-	-	-	-	416
German rifles	-	100	-	-	200	28	-	-	328
American rifles	-	70	-	-	-	-	-	-	70
Robert rifles	-	-	-	-	-	30	12	-	42
French rifles	-	30	-	-	-	-	-	-	30
Muskets	-	30	-	-	-	-	-	-	30
Minié rifles	-	20	-	-	-	-	-	-	20
Vincennes carbines	66	276	222	200	24	3	-	-	791
TOTAL:	2353	9231	1136	948	11,571	27,707	2971	1576	57,493

TABLE 2
 CAVALRY FIREARMS USED BY THE ARGENTINE ARMY BETWEEN 1869 AND 1877, AS RECORDED IN THE INVENTORIES OF THE WAR MINISTRY (MGM 1870 TO 1878).
 ORIGINAL DENOMINATIONS HAVE BEEN RESPECTED, DESPITE EVIDENT OVERLAPPING BETWEEN SOME OF THE CATEGORIES

CAVALRY WEAPONS:	MGM 1870	MGM 1871	MGM 1872	MGM 1873	MGM 1874	MGM 1875	MGM 1876	MGM 1877	Total
Percussion carbines	994	1	-	-	-	12,107	2836	2204	18,142
Remington carbines	-	-	-	-	3263	3965	2520	1371	11,119
Rifled carbines	1500	3750	1663	1866	2258	-	-	-	11,037
Smoothbore carbines	-	100	1075	1299	5284	-	-	-	7758
Smith carbines	125	2102	375	110	264	-	-	-	2976
Smoothbore percussion carbines	-	2766	-	-	-	-	-	-	2766
Merrill carbines	1254	49	299	40	358	131	-	-	2131
Enfield carbines	-	50	539	-	-	-	-	-	589
Sharps carbines	156	-	225	-	-	8	70	-	459
Cavalry carbines	-	453	-	-	-	-	-	-	453
Spencer carbines	51	14	14	103	4	14	-	-	200
Minié carbines	-	15	-	-	-	-	-	-	15
Revolvers	126	-	-	-	6	294	161	-	587
Pistols	-	2	-	-	-	95	-	-	97
TOTAL:	4206	9302	4190	3418	11,437	16,614	5587	3575	58,329

TABLE 3

SUMMARY OF THE FIREARMS ASSEMBLAGES FROM FUERTE GENERAL PAZ AND *FORTÍN* ALGARROBOS

Fort General Paz	Surface	Midden	Municipal	Total
Artifact	collection	Excavation	Museum	
Musket balls	4	-	55	59
Conical projectiles	6	3	5	14
Remington casings	3	7	-	10
Percussion caps	2	-	-	2
Percussion hammer	1	-	-	1
Lock plate	-	-	2	2
Gun barrel fragment	-	-	1	1
Total:	16	10	63	89
Fortín Algarrobos	Excavation	Llorente	Municipal	Total
Artifact	2012	collection	Museum	
Musket balls	1	1	4	6
Conical projectiles	1	-	1	2
Remington casings	-	53	2	55
Remington bullets	-	-	3	3
Remington rifle	-	-	1	1
Lefauchaux casings	-	2	-	2
Vetterli casing	-	-	1	1
Percussion caps	-	2	-	2
Muzzle-loader spring	-	-	1	1
Total:	2	58	13	73

Conical-shaped bullets, on the other hand, correspond to more modern firearms, both to percussion rifled muzzle-loaders and to breech-loaders firing metallic cartridges. They provide greater accuracy and range due to their better aerodynamic qualities and to the spinning caused by the rifling of the gun barrels. The assemblage includes fourteen of them, which show great formal and size variability. With respect to diameter, they can be grouped into two well-defined clusters: larger bullets between 0.67 and 0.69 inches (17–17.52 mm); and smaller bullets between 0.50 and 0.56 inches (12.7–14.2 mm; Figure 5).

The former group includes two types, the first one being cone-shaped projectiles with an expandable base and a groove ($n=3$), generally referred to as Minié bullets (Figure 4). They vary between 0.671 and 0.688 inches (17.04–17.47 mm) in diameter. The second type is represented by a single bullet with expandable base and no grooves. Both types were fired by rifled guns with calibres of approximately 0.60–0.70 inches (15.24–17.78 mm), such as the French Thouvenin model 1853 (0.701 inch [17.8 mm] calibre) and German Suhl model 1861 (0.71 inch [18 mm]). Government inventories describe these firearms as part of the equipment issued to infantry battalions,



FIGURE 4 Ammunitions from Fort General Paz. Upper picture: top, Remington casings (with complete bullet for comparison); centre, carbine (left) and rifle (right) conical bullets; bottom, musket balls from muzzle-loading smoothbores. Lower picture: top, conical solid bullets; bottom Remington casings (with complete bullet for comparison).

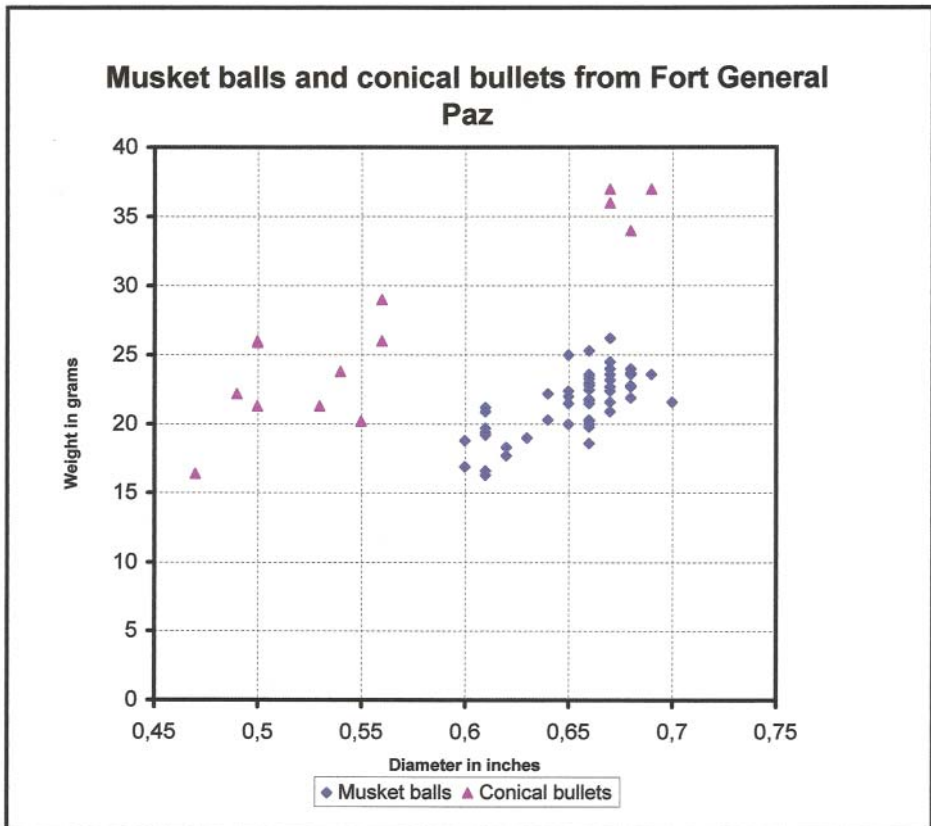


FIGURE 5 Scatterplot of musket balls and conical bullets from Fort General Paz in terms of weight and diameter.

referring to them as ‘French rifles’, ‘German rifles’, ‘rifled muskets’, or simply ‘rifles’ (MGM 1870–1877; Table 1).

The smaller conical bullets are more varied, comprising at least three different groups (Figure 4). The first group includes solid bullets with three grooves ($n=3$) and a diameter that ranges from 0.545 to 0.559 inches (13.6–14.2 mm). They most likely correspond to Merrill carbines (0.54 inch [13.7 mm] calibre) and/or to repeating action Spencer breech-loading carbines (0.56 inch [14.2 mm] calibre). The second group consists of a solid conical bullet with a single groove on its base and a diameter of 0.50 inch [12.7 mm]. It could belong to Sharps (0.52 inch [13.2 mm] calibre) or Smith (0.50 [12.7 mm] calibre) carbines. All these models of American-made carbines were acquired by the Argentine government for its cavalry regiments during the Triple Alliance War against Paraguay (1865–70), remaining in service through the period under consideration (Table 2). A third group of conical bullets is represented by six solid conical projectiles without grooves, with diameters ranging from 0.47 to 0.56 inches (11.9–14.2 mm). They probably correspond to revolvers and carbines. At least one of them could correspond to a Remington gun. The tip of one of these

bullets has been flattened from impact, a rare feature in the fort's assemblage (Figure 4).

Finally, the assemblage includes ten Remington metal cartridges in different states of preservation, most of them being broken and highly corroded. They represent the transition to more modern weaponry (Figure 4). Their rim bases have slight differences in shape, probably reflecting different manufacturers and/or dates of production. Since it was also common at the time to convert muzzle-loaders into breech-loaders, and since breech-loading firearms were available in civilian hands, it cannot be ruled out that other firearms are also represented in this assemblage.

Additionally, the firearm assemblage from Fort General Paz also includes two percussion caps (one fired and one unfired), two lock plates from unidentified muzzle-loaders, a percussion hammer, as well as the proximal part of a muzzle-loading gun barrel (Figure 6). The latter was inspected by experts of the MUAN, who determined that it belonged to a flintlock, which had been converted to the percussion system.

In sum, the assemblage stands out for its heterogeneity, with artefacts related to muzzle-loading guns predominating. More modern weapons are less well represented, indicating that the change in the army's weaponry was slow and gradual.

Firearms and ammunitions in *Fortín Algarrobos*

While a significant number of artefacts have been recovered from *Fortín Algarrobos* and its surroundings, few of them were found in systematic archaeological investigations (Acedo, 1991; Leoni et al., 2008). The vast majority was found by collectors and local inhabitants. And whereas some have been donated to the Municipal Museum of Carlos Casares, many of them still remain in private collections.

Limited archaeological excavations were carried out in 2012 on the top of the mound that stands where *Fortín Algarrobos* was emplaced. They revealed part of a brick floor, perhaps corresponding to the outpost's ground level or to the floor of one of the simple structures that housed its small garrison. Very few artifacts were found in association with this feature. Firearms-related examples include only a musket ball (16.7 mm [0.66 inch] in diameter and a weight of 26 g), and a solid conical projectile with a base groove (about 10.8 mm [0.43 inches] in diameter and weighting 24.8 g). The latter is curiously warped, perhaps as a result of heat (Figure 7). The ball is consistent with those that form the largest cluster in Fort General Paz' musket balls assemblage, while the solid bullet corresponds to an unidentified breech-loader, its deformation preventing a more precise classification.

Much more varied is the assemblage of firearms-related artefacts in Mr Rafael Llorente's private collection. As a local amateur historian, Llorente carried out unsystematic excavations at the site in the 1970s. Although I was only allowed to carry out a preliminary inspection of the collection, it is worth discussing its main characteristics in terms of firearms and ammunition represented. According to Mr Llorente, the materials in his collection (which also include metal objects, fragments of glass and ceramic wares, animal bones, etc.) were recovered from a single location, a concentration of artefacts that was eroding from the edge of the lagoon. His description suggests that the materials may have come from a garbage pit that was dug by the garrison outside the outpost's perimeter, and that was later exposed by wave-action.

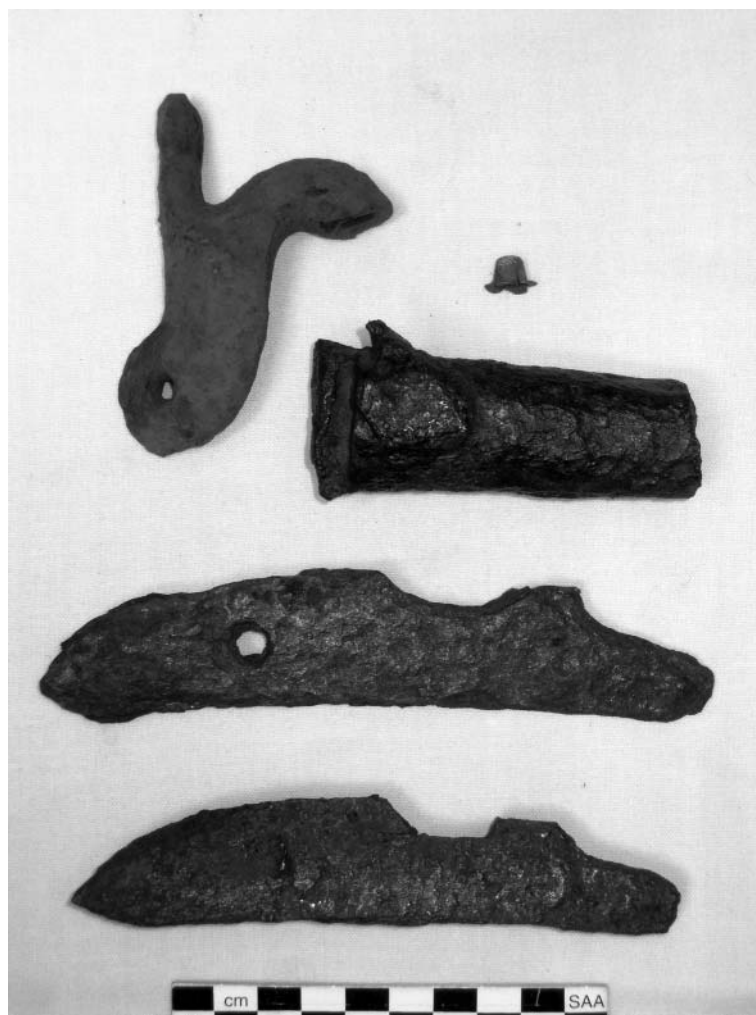


FIGURE 6 Parts of muzzle-loading firearms from Fort General Paz. From top to bottom: percussion hammer, unfired percussion cap, gun barrel fragment and lock plates.

Cartridges from fired metal cartridges predominate in this collection ($n=55$). Lead projectiles from these cartridges, on the other hand, are conspicuously absent. Most of the cartridges ($n=53$) belong to Remington weapons, thirty-three of which were almost complete. Two Lefauchaux cartridges complete the assemblage, belonging to Lefauchaux M1858 pinfire revolvers, which were widely used by army officers since the 1860s. Unlike the Fort General Paz assemblage, muzzle-loading firearms are poorly represented here, with only one musket ball (whose diameter and weight could not be determined) and two unfired percussion caps.

Other materials from the *Fortín* Algarrobos area have been donated by local inhabitants to the Municipal Museum of Carlos Casares over the years. They will be only briefly described here. Most of these finds were made when the nearby lagoon

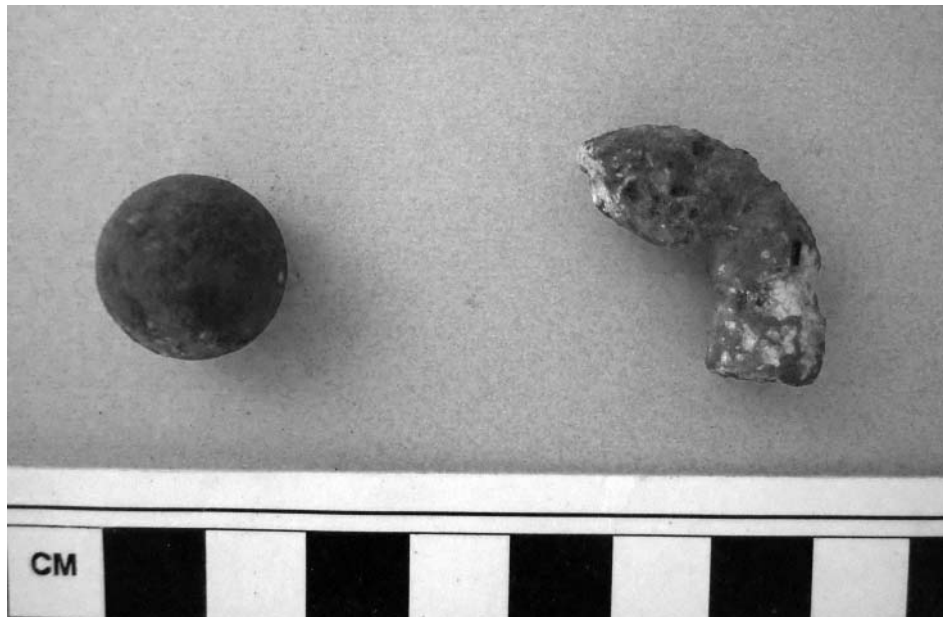


FIGURE 7 Bullets from *Fortín Algarrobos*. Left: musket ball. Right: bent conical solid bullet.

completely dried up in the 1960s, exposing its muddy bed. They include the following: four musket balls, one conically-shaped projectile, two fired Remington cartridges, three complete Remington bullets, one fired Vetterli rimfire casing (which is probably not related with the outpost); and the most impressive, a fairly complete Remington Rolling Block rifle, which lacks only the blocking system and most of the wooden parts (Acedo, 1991) (Figure 8). Thus, among the artifacts from *Fortín Algarrobos*, materials related to breech-loading weapons seem to predominate, in contrast with those from Fort General Paz.

Discussion: firearms and ammunition in the archaeological record

When considered together, the firearm assemblages from Fort General Paz and *Fortín Algarrobos* manifest a diversity of materials that is consistent with the period being discussed. They reflect both the heterogeneity of weapons being used by the army and auxiliary units, as well as the beginning of the standardization through the incorporation of Remington breech-loaders. However, when they are contrasted, it becomes evident that the set of materials from *Fortín Algarrobos* has a higher proportion of more modern weapons. Historical and archaeological factors can account for this difference.

As both military facilities were contemporary and part of the same defensive system, chronological reasons can safely be ruled out as explanations for such differences. Likewise, no historical sources indicate that the respective garrisons were equipped differently. In fact, the small detachments that garrisoned the outposts were part of the battalions and regiments that occupied the fort, so the former would have



FIGURE 8 Remington rifle found in the lagoon by *Fortín* Algarrobos. Inscription carved on the barrel reads: 104 11. ov E / LG / * (photograph Teresa Acedo).

had the same weapons and equipment as the latter. Additionally, it is inconceivable that the military would have issued modern firearms to the small detachments in the forward outposts (whose mission was to patrol the border and sound the alarm in case of incursions), while arming the larger bodies of troops in the fort (which had to engage the Pampa raiders in actual combat) with older and less effective weapons. On the contrary, the larger size and heterogeneity of the fort's garrison, composed of regular infantry and cavalry troops, complemented by provincial militias, auxiliary Indians, and armed civilians, can easily account for the variability seen in Fort General Paz' materials.

Besides historical factors, more specific archaeological ones can also explain the differences in the assemblages. Firearms-related artefacts can enter the archaeological record through three main processes: activities directly related to their use, intentional dumping, and loss (Ferguson, 1977: 59–60). Combat, shooting practice and other activities (such as hunting, firing arms out of boredom, or in celebration) could account for the presence of the projectiles. However, documentary sources indicate that Fort General Paz was never formally attacked by indigenous groups, but only raided for horses and cattle on at least two occasions (1872 and 1875), provoking the reaction of the garrison (MGM, 1873: 116; Sigwald Carioli, 1981: 82). While some of the musket balls and conical bullets might relate to these actions, the fact that most of them were found within the fort's main compound indicates that shooting practice is a more probable cause for their presence. However, a great proportion of the musket balls and conical projectiles show no evident signs of firing, indicating that dumping and loss are more likely factors to account for their inclusion in the archaeological record. On the other hand, intentional discarding of defective or broken guns can explain the presence of parts of firearms, such as lock plates, percussion hammer and gun barrel parts. The same applies for fired or damaged metal cartridge cartridges.

In the case of *Fortín* Algarrobos, similar factors apply. Documentary sources make no mention of combat actions. It remains unclear whether the burning of the outpost followed an attack, or if the Pampa raiders simply found the *fortín* empty and just sacked and burnt it. Since the official report indicates no casualties, the latter seems more plausible (MGM, 1877: 246–47). Thus, projectiles found in its surroundings could be better explained as resulting from shooting practice and/or hunting; those found in the excavations within the outpost could have been lost by its occupants. The smaller number of musket balls found in this site, on the other hand, could be accounted for by other processes such as recycling. They could have been melted by the garrison to make an implement used to hunt *ñandú* (a local non-flying bird, similar to an ostrich), akin to the indigenous bola stones but with lead balls in place of the stones. These instruments were locally known as *ñanduceras*, and two of them are part of Mr Llorente's collection.

The large number of Remington cartridges found by Mr Llorente in a rubbish pit is consistent with the recovery of most of the cartridges from a midden context at Fort General Paz. These cartridges presumably include both examples from bullets fired as part of training or other actions, as well as defective ones, a common well-documented occurrence with this kind of ammunition (Pichipil, et al., 2011; Tapia et al., 2009). It is surprising, nevertheless, that the cartridges, made of valuable brass, would not have been recovered for recycling at the government's armouries. Finally, the almost complete Remington rifle found in the lagoon's bed could have become unusable beyond repair, or thrown into the water to prevent its capture by the Pampas.

In sum, firearms assemblages cannot be taken straightforwardly as mirror images of the garrisons' weaponry. Consideration of pre- and post-depositional processes, and of historical and archaeological factors, becomes indispensable to correctly assess differences in assemblage composition, as well as potential biases in the representation of certain types of weapons.

Remington on the Pampas: firepower and technological determinism

As discussed above, the materials from two military sites of the Buenos Aires Western Frontier contradict the popular image, also reproduced in some academic work, of the frontier soldier as typically armed with a Remington carbine or rifle. Whereas the latter became increasingly common after the mid-1870s, other types of weapons remained in use, with percussion muzzle-loading muskets and carbines appearing in the army inventories as late as 1876 and 1877 (Tables 1 and 2).

The first batches of Remington guns (possibly American Model 1866/71 and Belgian Model 1866) were purchased in 1872, but as the War Minister Martín de Gainza stated in his report to the national Parliament:

The armament currently in service is good, but of the old system, because as the totality of the rifles and carbines requested from the United States and Europe has not arrived yet, the distribution of the Remington, which is the one adopted for the Army of the Republic, has not been started. (MGM, 1873: XXXVIII; my translation)

This situation would rapidly change in 1873, when, as a result of a federalist uprising in Entre Ríos Province led by Ricardo López Jordan, the national government was

forced to mobilize a large army. The new Remington rifles and carbines were primarily allocated to the troops fighting this rebellion. The first shipment of Remington guns to the army, formally recorded in government inventories, occurs on 17 July 1873. On that date, 798 Remington rifles, along with 798 barrel cleaners, 200 screw drivers and 236,000 cartridges were delivered to the War Minister, who was acting as field commander of the national army in Entre Ríos (MGM, 1874: 683). Other shipments followed, and as famous army officer Ignacio Fotheringham stated in his memoirs: ‘With such a weapon, success was ensured’ (quoted in Ruiz Moreno, 2008: 420; my translation). The first mass use of the Remington apparently took place at the battle of Don Gonzalo (9 December 1873), where the rebels were beaten by the national army. The rebel leader later acknowledged the decisive effect of these modern weapons on the outcome of the battle (Ruiz Moreno, 2008: 438). While these events were taking place, the government records show that the Buenos Aires Western Frontier troops were still receiving older percussion rifled and smoothbore carbines (MGM, 1874: 681, 687). However, as the war in Entre Ríos came to an end, some of the participating units returned to the Pampaean frontier, ‘coming back with their Remington, lethal weapons, destined to unbalance irreversibly the fight between Indians and soldiers’ (De Marco, 2010: 457; my translation).

In the years following, more Remington guns (including the newer American Model 1874) were delivered to army units, although not completely replacing the older percussion firearms (Tables 1 and 2). Their impact on frontier warfare was notable, as well as on the suppression of the 1874 revolution led by Bartolomé Mitre (Pichipil et al., 2011). The importance of the new weapons, and the edge that they bestowed on the army in the war against the Pampa warriors, was fully appreciated by frontier officers and soldiers. For instance, in a clash against Pampa raiders on October 1876, during the same incursion that produced the destruction of *Fortín Algarrobos*, Colonel José I. Garmendia reported to his superior officers: ‘When we started our march to Fort General Paz, we were only thirty men and we were forced to go by the Indian camp, [and] the Remington did its job’ (MGM, 1877: 242; my translation). He went on to mention that a detachment of only five soldiers and four civilians was able to defeat a party of thirty indigenous warriors that tried to prevent them from reaching the fort.

The power of the Remington was such that it allowed the army to successfully operate against its foes even in numerical inferiority. In his *Rules for Officers and Sergeants*, from 1 October 1876, the famous frontier officer Conrado Villegas stated:

Art. 8:- The soldier must have full confidence that on foot and with a Remington in his hands, he is equivalent to four Indians (quoted in Pichel, 1994: 138; my translation).

Estanislao Zeballos (a renowned lawyer, journalist, politician, and diplomat) graphically summarized the effects of the new weapon when he stated:

The Remington has taught the savages that a battalion of the Republic’s army can roam the Pampas unhindered, leaving behind a field littered with dead bodies (quoted in Bayer, 2002; my translation)

By the late 1870s, Remington guns gradually became the army’s main firearm, although the complete unification of the army’s weaponry would only take place in 1881, when the Remington Model 1879 (locally called *Patria* [Fatherland]) became the

standard firearm. Deliveries of different percussion guns continued until at least 1876, but by 1877, all the efforts of the Argentine *Parque de Artillería* (governmental department in charge of acquiring, distributing, and repairing arms and ammunition) were focused on the Remington. While paper cartridges for percussion firearms were still being manufactured, the department's workshops only carried out maintenance and repair for the Remington guns (MGM, 1877: 615–16). Domingo Viejobueno, head of the *Parque de Artillería*, stated in his report to the War Ministry:

In relation to the other percussion firearms, Your Excellency knows their value has diminished in such a way that it is my belief that those weapons in the hands of the soldier serve only to break his fighting spirit, such is their lack of prestige when compared to modern guns (MGM, 1877: 618; my translation).

Notwithstanding, while this might have officially signalled the end of the older weapons, it is highly possible that many of them remained in use, either in military or civilian hands.

The role of the Remington in the frontier war has been greatly emphasized by historians and military experts, becoming an iconic symbol of the process of subduing of the Pampa indigenous groups.² However, an excessive emphasis on the Remington's power has led to simplistic interpretations, which border on technological determinism. In these views, the Remington is seen, along with other technological innovations such as the telegraph and the railway, as the main material cause for the indigenous societies' final defeat. This reductionism has been persistently repeated not only in amateur and popular renditions of the frontier war,³ but also in academic works (e.g. Bayer, 2002; Mandrini, 1986; Sar, 2012; to quote just a few), sometimes even mistaking the Remington for a repeating-action gun (e.g. Bayer, 2002; Martínez, 2009: 146; Pigna, n.d.).

Nevertheless, it must not be forgotten that the Remington was only one among many concurrent factors that came together by the mid-1870s and allowed the Argentine state to achieve the long-desired territorial expansion. A contextualization of the Remington's incorporation by the army is necessary to reach a more nuanced assessment of its impact and its role in the broader process.

In effect, several aspects that materialized at this time allowed the army to obtain definitive military superiority over the Pampa peoples. First of all, the Argentine state and society were experiencing a marked consolidation, showing exponential economic and demographic growth. This, combined with the end of external and internal conflicts, allowed the national government to channel more resources to the frontier war and to supply the army more effectively. On a purely military level, the army had reached, by the mid-1870s, higher levels of efficiency. Its higher officers were all battle-hardened veterans of the civil and external wars. Many of them had served on the frontier for many years, achieving a unique grasp of the operative, tactical, and strategic implications of the war against the Pampas. Additionally, graduates from the recently created national military academy were joining the army as junior officers, providing previously unknown levels of professionalism. Less spectacular than the adoption of the Remington breech-loaders, but of an equal importance in the context of the frontier warfare, was the army's substantial effort to improve the quantity and quality of its horse herds. This was indispensable in the long distances of the frontier theatre of operations, as well as in countering the superior mobility of

the Pampa warriors (Perry, 1972: 55). Parallel to this, the successive advances of the frontier line, especially the one taking place in 1876 (Figure 1), had pushed the indigenous groups further east, to the more arid parts of the Pampa region. This had at least two critical tangible effects. First, it placed towns and civilian settlements at a greater distance beyond the military frontier. This forced the Pampa raiders to travel longer distances before reaching their targets, and made it easier for the army to intercept them. Second, it deprived the Pampa groups of areas rich in pastures and water, which they had previously occupied. This fact contributed to diminishing the quality of their horse herds, but also to weakening the indigenous society as whole (which also lacked a unified leadership after paramount chief Calfucura's death in 1873). Finally, the new technologies, such as the Remington and the telegraph, gave the army more flexibility and an uncontested firepower, as the indigenous groups never adopted firearms in significant numbers (unlike for instance, the North American Plains Indians). One can only wonder what would have happened if this set of conditions had been achieved before the introduction of the Remington. It does not seem unlikely that the army, supported by a strong state, could have prevailed, even if armed with muzzle-loaders or just lances and sabres. While this remains an exercise of pure speculation, any realistic characterization of the frontier war and its final outcome must inevitably take into account the whole picture, moving beyond iconic images and technological determinisms.

Final considerations

The archaeological and historical characterization of the firearms assemblages from two military frontier facilities used between 1869 and 1877 has shown that the Buenos Aires Western Frontier's troops employed a wide array of weapons, from older percussion (and perhaps even flintlock) smoothbores, to rifled percussion guns, to modern breech-loaders. This diversity reflected both the lack of standardization achieved by the Argentine army in those years, as well as the heterogeneity of the military units that guarded the frontier. It was also a source of logistic and operative problems for the army and the national government. With this assortment of firearms, and the ever-present lances and sabres, these troops faced the formidable Pampa warriors with varied outcomes. The Remington undoubtedly conferred on the army a technological and tactical edge that along with other no less important concurrent factors, made the final demise of the indigenous societies' rule over the Pampas inevitable. Finally, it has to be remarked that, whereas many aspects of this process have previously been studied by historians, the archaeological research of the military frontier facilities provides additional information and lines of evidence that certainly enrich the understanding of the past, making the archaeology of frontier forts and fortines a worthy and fruitful undertaking.

Acknowledgements

I am grateful to my colleagues Teresa Acedo, Diana Tamburini and Graciela Scarafia, member of the Fort Paz Archaeological Project, for their inestimable support and advice throughout all the stages of this research. My thanks also to Suboficial Mayor

Mecánico Armero Isidoro Vides and Mr Santiago Tavella Madariaga from the *Museo de Armas de la Nación*, for their help in weapons and ammunition identification; to Mr Rafael Llorente for allowing inspection of his personal collection; to the *Museo Municipal de Carlos Casares* for the access to its collections; and to Tom Besom for editing this manuscript. However, all mistakes are my own responsibility.

Notes

- ¹ Such as the Spanish musket model 1752 and derived variants (0.67 inch; 17.2 mm); French carbine model 1829, Italian musket model 1833, German carbine model 1840, French musket model 1847 and carbine model 1840, British carbine model 1848, Austrian carbine model 1850/60, German carbine model 1850 (0.689 inch; 17.5 mm); Italian musket model 1833; Spanish musket model 1853; French musket Charleville (0.69 inch; 17.5 mm); German musket model 1816 (0.70 inch; 17.8 mm); German musket model 1832 (0.71 inch; 18 mm); British percussion carbine model 1843 Belgian musket model 1854 (0.73 inch; 18.5 mm); British muskets model 1842 and 1848 (0.75 inch; 19 mm).
- ² This process, generically known as the ‘Conquest of the Desert’, reached its climax with the large-scale campaign commanded by General Julio A. Roca in 1878–1879, and continued the following years with the occupation of the Patagonia region.
- ³ As seen for instance in the following WebPages that discuss different aspects of the frontier war: <<http://normasoriano.blogspot.com.ar/2012/09/conquista-del-desierto-4.html>>; <http://cyt-ar.com.ar/cyt-ar/index.php/Culturas_ecuestres_de_Argentina>; <<http://geohistoricos.blogspot.com.ar/2010/11/la-guerra-por-el-desierto.html>>.

References

- Acedo, T. 1991. *Un Acercamiento al Fortín Algarrobos*. Unpublished manuscript. Carlos Casares, Argentina.
- Bayer, O. 2002. *Los Derechos Humanos en Argentina*. Cátedra Libre de Derechos Humanos, Facultad de Filosofía y Letras, Universidad de Buenos Aires [online] [accessed 5 September 2013]. Available at: <<http://www.filo.uba.ar/contenidos/secretarias/seube/catedras/ddhh/foros/2002/02-11-01.htm>>.
- De Marco, M. A. 2010. *La Guerra de la Frontera. Luchas Entre Indios y Blancos, 1536–1917*. Buenos Aires: Emecé.
- Ferguson, L. G. 1977. An Archaeological-Historical Analysis of Fort Watson: December 1780–April 1781. In: S. South, ed. *Research Strategies in Historical Archaeology*. New York: Academic Press, pp. 41–71.
- Gómez Romero, F. and Spota, J. C. 2006. Algunos Comentarios Críticos Acerca de 15 Años de Arqueología en los Fortines Pampeanos. *Relaciones de la Sociedad Argentina de Antropología*, XXXI:161–85.
- Gutiérrez, E. [1886] 2001. Croquis y Siluetas Militares. *Escenas Contemporáneas de Nuestros Campamentos*. Buenos Aires: Emecé.
- Landa, C., Montanari, G., Gómez Romero, F., De Rosa, H., Ciarlo, N. and Conte, I. 2010. Not All were Spears and Facones: Firearms from Otamendi Fortlet (1858–1869), Buenos Aires Province, Argentina. *Journal of Conflict Archaeology*, 5:183–200.
- Leoni, J. B. 2009. Armar y Vestir al Ejército de la Nación: los Artefactos Militares del Fuerte General Paz (Carlos Casares, Buenos Aires) en el Marco de la Construcción del Estado Nacional y la Guerra de Frontera. *Intersecciones en Antropología*, 10:167–82.
- Leoni, J. B., Tamburini, D., Acedo, T. and Scarafia, G. 2007. De Balas Perdidas y Vidrios Rotos: Distribución Espacial de Artefactos Superficiales en el Fuerte General Paz (1869–1876). *Revista de Arqueología Histórica Argentina y Latinoamericana*, 1: 29–64.
- Leoni, J. B., Tamburini, D., Acedo, T. and Scarafia, G. 2008. El Fuerte General Paz y el Fortín Algarrobos: Arqueología de Emplazamientos Militares en la Frontera Oeste de Buenos Aires (1869–1876). *Revista de la Escuela de Antropología (UNR)*, XIV:45–58.
- Leoni, J. B., Tamburini, D., Acedo, T. and Scarafia, G. 2013. Fortificando el Desierto: la Transformación del Paisaje Pampeano en el Territorio del actual Partido de Carlos Casares, 1869–1877. *Anuario de Arqueología (UNR)*, 5: 149–68.
- Mandrini, R. 1986. La Sociedad Indígena de las Pampas en el Siglo XIX. In: M. Lischetti, ed., *Antropología*. Buenos Aires: Eudeba, pp. 205–30.

- Ministerio de Guerra y Marina [MGM]. 1870–1878. *Memorias del Ministerio de Guerra y Marina*. Buenos Aires, Argentina
- Martínez, C. M. 2009. La Conquista de la Pampa y de los Andes en la Gestión de Gobierno del Presidente Nicolás Avellaneda. In: Academia Argentina de la Historia, ed. *La Campaña del Desierto*. Buenos Aires: Edivern, pp. 91–114.
- Parker, B. J. 2006. Towards an Understanding of Borderland Processes. *American Antiquity*, 71(1): 77–100.
- Perry, R. O. 1972. Warfare on the Pampas in the 1870s. *Military Affairs*, 36(2): 52–58.
- Pichel, V. 1994. *Las Cuarteleras: Cuatro Mil Mujeres en la Conquista del Desierto*. Buenos Aires: Planeta.
- Pichipil, M., De Rosa, H., Landa, C. and Montanari, E. 2011. *Las Vainas de Latón de Fusiles Remington: Testigos de una Época*. Paper presented at the 11 Congreso Binacional de Metalurgia y Materiales. Rosario, Argentina.
- Pigna, F. n.d. *Julio Argentino Roca (1843–1914)*. [online] [accessed 5 September 2013]. Available at: <<http://www.elhistoriador.com.ar/biografias/r/roca.php>>.
- Ramírez Juárez, E. 1968. *La Estupenda Conquista. La Epopeya del Desierto*. Buenos Aires: Plus Ultra.
- Raone, J. M. 1969. *Fortines del Desierto. Mojones de civilización, Tomo 1*. Buenos Aires: Biblioteca del Suboficial.
- Ruiz Moreno, I. J. 2008. *Campañas Militares Argentinas. La Política y la Guerra. Tomo 4. Guerra Exterior y Luchas Internas (1865–1874)*. Buenos Aires: Claridad.
- Sar, A. 2012. *La Introducción de las Telecomunicaciones Eléctricas en el Río de la Plata*. Paper presented at the XI Congreso Latinoamericano de Investigadores en Comunicación. Montevideo, Uruguay [online] [accessed 2 September 2013]. Available at: <http://www.rehime.com.ar/escritos/documentos/idxalfa/s/sar/Ariel_Sar%20-La%20introducci%C3%B3n_de_las_telecomunicaciones_electricas.pdf>.
- Sigwald Carioli, S. 1981. *Fuerte General Paz. Comandancia de la Frontera Oeste*. Centro Cultural José Ingenieros: Carlos Casares, Argentina.
- Sivilich, D. M. 2005. Revolutionary War Musket Ball Typology: An Analysis of Lead Artifacts Excavated at Monmouth Battlefield State Park. *Southern Campaigns of the American Revolution*, 2(1):7–19.
- Tapia, A. H., De Rosa, H. and Landa, C. 2009. Rastros de Uso, Reciclamiento y Vainas C 43 de Remington Patria (1879–1885, La Pampa). In A. Austral and M. Tamagnini, eds. *Problemáticas de la Arqueología Contemporánea, Tomo III*. Córdoba: Universidad Nacional de Río Cuarto, pp. 455–66.
- Thill, J. P. and Puigdomenech, J. A. 2003. Guardias, Fuertes y Fortines de la Frontera Sur. *Historia, Antecedentes y Ubicación Catastral*. Buenos Aires: Edivern.
- Zeballos, E. [1884]2007. *Callucurá. Painé. Relmu*. Buenos Aires: Elefante Blanco.

Notes on contributor

Juan Bautista Leoni is an Adjunct Researcher for CONICET (National Council for Scientific and Technological Investigations), Argentina. He also teaches archaeology at the Universidad Nacional de Rosario and was recently appointed director of its Archaeology Department. He obtained his undergraduate degree from Universidad Nacional de Rosario, Argentina, and his MA and PhD from Binghamton University-State University of New York, USA. His archaeological research includes both pre-historic archaeology in the Andean Area (central Peru and Northwest Argentina), and historical archaeology (Buenos Aires Province, Argentina), which led him to conflict archaeology, focusing on nineteenth-century military frontier outposts and a civil war battlefield.

Correspondence to Juan B. Leoni. Email: jbleoni@hotmail.com