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The impact of the Iberian Union on artillery

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Brice Cossart

Introduction

The historiography about the concept of military revolution has produced a huge array of studies focusing on different states and territories. Michael Roberts's work, which originated the concept, associated the main shift of early modern warfare to the crucial military innovations brought by seventeenth-century Dutch and Swedish armies.² One generation later, Geoffrey Parker identified the artillery train with which King Charles VIII of France invaded Italy in 1494 as the key element which sparked the transformation of early modern warfare in Europe.³ The success of his narrative generated a long debate among military historians about the chronology and the significance of the different military innovations, but their studies remained in the same fertile crescent established by Roberts and Parker: mainly England, France, Italy, the Netherlands, and the lands of the Habsburgs.⁴ More recently, the debate has shifted towards global history as some scholars have proposed focusing on military innovations in Asia and thus re-examining Parker's thesis on the "rise of the West."⁵ Meanwhile, until recently, Portugal and its empire have remained on the margin of this prolific historiography. The present book pleads for a reassessment of the role of Portugal in the narratives of the military revolution, while this chapter argues more specifically that the Iberian Union (1580–1640) of Portugal with Habsburg Spain had a decisive impact on the development of Portuguese military technology.

In 1580, King Philipp II of Spain launched a vast military operation to support his dynastic rights to the vacant Portuguese throne. The following annexation of Portugal and its empire by the monarchy of the Spanish Habsburgs marked the beginning of an association between the two Iberian powers. Whereas the Portuguese monarchy has raised little interest among historians of the Military Revolution, its Spanish neighbour has been under the spotlights since Geoffrey Parker

identified it as a pioneer state at the forefront of “radical military change.”⁶ The Kingdom of Portugal remained under Habsburg governing for six decades, until the revolt of 1640, which put an end to the union.⁷ It is thus legitimate to ask the following question: to what extent did the Iberian Union impact the military technology used in Portugal?

The purpose of this chapter is not to assert that early modern Portuguese military technology developed only under Spanish government. Several studies have shown that the Portuguese army and navy resorted to innovations such as embarked artillery, bronze cannons, and bastion fortifications long before the Iberian Union.⁸ During the sixteenth century, the construction of the Portuguese Empire relied on this military technology as much as it constituted a vector of these innovations towards Asia.⁹ Nevertheless, in contrast to the blossoming effervescence characterizing the decades of exploration and empire building, the period of Habsburg domination often tends to appear as a dark time in Portuguese history. This chapter aims to show that, far from this negative image, the Iberian Union gave a new impulse to the evolution of military technology in Portugal. In this regard, not only does it constitute a period worth studying for the specialists of Portugal, but it is also a particularly interesting moment for those who might be interested in the circulation of military technology.

In addition, the question of the Spanish connection with Portuguese military affairs during the Iberian Union remains unsettled. On one hand, the dominant paradigm of the “composite monarchy,” coined by John Elliott to describe the political organization of the Spanish monarchy, emphasizes the political, juridical, and fiscal fragmentations.¹⁰ The political entity under the Habsburgs’ authority is thus considered a mere association of smaller states bound together by the fact that they shared the same sovereign. This vision is exemplified by the agreement taken by King Philip II at the *Cortes* of Tomar (1581) to respect the independence of the Portuguese Crown.¹¹ On the other hand, the rising scale of warfare required common military efforts beyond the fragmented nature of this composite monarchy. In this perspective, some historians have shown that when it came to military matters, Castilian-dominated institutions (the Council of State and the Council of War, the *juntas de guerra*) were often involved in the government of military affairs regarding Portugal and its empire.¹² While the historiography has focused mostly on the tensions generated inside the composite monarchy by the use of fiscal and military resources from one state to another, my aim is to shed light on one aspect which stemmed from this shared use of military resources but which has been little studied: the transfer of military technology through key individuals.

The chapter proposes to tackle this issue only from the point of view of artillery. Despite the apparent narrowness of the topic, artillery is a particularly relevant element to grasp the transformations at the core of the elastic concept of military revolution. In Parker’s narrative, bronze cannons brought fundamental changes in fortification and in naval combat, and they constituted an important lever for the growth of armies.¹³ Instead of participating in the debate on which innovations were the most significant to induce a radical change in warfare, the chosen method

follows the experts who served the artillery in Portugal as officers, gunmakers, engineers, or simple gunners. Therefore, the purpose is to prove that under the Iberian Union, Portugal was a key territory for the circulation of European military expertise, and as a result, it cannot be separated from the wider movement of transformation of warfare which affected most of Western Europe in that time.

First, the chapter shows how the Council of War, in Madrid, took over the control of artillery in Portugal. Second, it sheds light on the dynamic circulation of experts which was generated as Portugal became a strategic territory in the wide network of the Habsburg Monarchy. Third, it reveals the emergence of some institutional innovations by focusing on the new schools which opened in Lisbon in order to provide formal training for gunners. Finally, it tackles the circulation of military expertise in both Spanish colonial structures and Portuguese colonial structures.

I The Castilian lead over Portuguese artillery

By the time of the conquest of Portugal, the management of artillery had become one of the most centralized administrative branches of the Spanish monarchy. All the weaponry of the realms of Castile and Aragon – including Sardinia, the Balearic islands, and the Spanish African *presidios* – was placed under the authority of one individual, the captain general of artillery.¹⁴ This position was a highly political one as it came with a seat at the king's Council of War, in charge of governing all military matters.¹⁵ The captain general of artillery was the head of a vast administration which had gained a certain independence from the rest of the military apparatus and included its own account managers, officers, and troops.¹⁶ Similar structures were put under direct supervision of the viceroys and governors in the various Habsburg states in Italy and Flanders.¹⁷ In other words, in all territories, the monarchy of the Spanish Habsburgs tended to keep artillery under close reach of the executive powers and in tight connection with the central government.

Portugal was no exception. The management of artillery was given to the captain general of artillery, as his authority already extended to all other territories of the Iberian Peninsula.¹⁸ After the royal court left from Portugal in 1583, two lieutenantancies of artillery were created, one in Lisbon and the other one in the Azores.¹⁹ Like in Burgos, Barcelona, Malaga, Pamplona, and Majorca, the lieutenants of artillery were locally in charge of the daily management of artillery and kept a constant communication with the captain general of artillery and the Council of War in Madrid.²⁰ They were always chosen among Castilian captains who had proven their loyalty to the members of the Habsburg government through years, or even decades, of service. In 1583, the lieutenantancy in Lisbon was given to Alonso de Céspedes, a seasoned soldier who had worked for Philipp II for eighteen years in Italy and Flanders, rising from the ranks of simple infantry to the high status of *sargento mayor*, the second in command of a three-thousand-person *tercio*.²¹ After his death in 1589, he was replaced by Hernando de Acosta, a man who had already been in the same office in Cartagena for several years.²² In 1595, his successor was

Alonso Alfaro de Narvaez, an infantry captain who had served the king for thirty years in Italy, Spain, and Portugal.²³

Thus, Philippe II's government decided to build its own structure for the management of artillery in Portugal and put it under the control of trustworthy Castilian captains. The will to ensure the authority over this strategic weaponry also appears in the choice of individuals in charge of other key positions, such as the accountancy of artillery. The holder of this office had important financial responsibilities: he had to keep count of all cannons, cannonballs, and gunpowder stocks in Portugal and of every expense for the production of artillery and payment of artillery employees. In 1587, the office was given to a Castilian veteran, Francisco Sánchez de Moya, who had served as infantry soldier in Naples for several years, before becoming the chief gunner of Pamplona.²⁴ One source identified him as *criado* of the captain general of artillery, which meant that these two men were bound by patronage.²⁵

From the point of view of the Spanish Habsburgs, this reliable Castilian structure for the management of artillery was all the more necessary given that Portugal soon became one of the most strategic military spaces in the empire. The Portuguese squadron of galleons inherited from the Aviz dynasty was administratively integrated into the Armada del Mar Océano, the main naval force of Castile, while a small group of Spanish galleys was attached to Lisbon to patrol along the coast of Portugal.²⁶ More importantly, the harbour of Lisbon was turned into the main platform for the preparation of huge naval operations like the armada of 1588 against England. The size of this fleet, which gathered 130 ships, 2,431 cannons, and 123,790 cannonballs, required a convergence of war material from all Iberian, Italian, and Flemish territories of King Philipp II.²⁷ Eight years later, in 1596, a comparable fleet was again assembled in Lisbon under the command of Martín de Padilla, to invade Ireland.²⁸ The artillery staff of Portugal was thus regularly involved in the large-scale deployment of firepower. The mobilization and coordination of such a massive amount of weaponry was hardly compatible with the respect of Portuguese independence from the Castilian government. In this sense, having one structure at the scale of the whole Iberian Peninsula, piloted by one person, the captain general of artillery, was an efficient way to ensure the transversal power necessary to bridge over the political fragmentation of the monarchy. This organization supposed that multiple circulations of material and staff occurred between the different states of the Spanish Habsburgs and Portugal.

II New dynamics for the circulation of experts

The presence of the Spanish monarchy in various areas of Europe, especially in Italy and Flanders, facilitated the recruitment of international military experts who were attracted by a career under the patronage of the king of Spain. Therefore, many specialists of artillery and fortification who served the Spanish Habsburgs moved to Portugal through the cross-border network of the captain general of artillery.

The new design of fortification, called *trace italienne*, which is at the core of Parker's concept of military revolution, was implemented by a handful of specialists, among which the most renowned were Italian engineers. Before the Iberian Union, King Sebastião of Portugal hired such an Italian expert, Filippo Terzi, who later passed to the service of the Spanish Habsburgs.²⁹ However, after 1580, the circulation of Italian engineers in Portugal was enhanced by the fact that many of them were already on the Spanish artillery payrolls and just moved inside the Iberian Peninsula through the authority of the captain general of artillery.³⁰ Thus, after a long experience in designing fortresses for the Spanish Habsburgs in Milan, Pamplona, Sardinia, the Balearic islands, and Alicante, Italian engineer Giovan Giacomo Paleari Fratino (called *El Fratin* by the Spaniards) and his brother Giorgio, supervised the fortification of Porto Viana do Castelo, São Julião da Barra (near Lisbon), and Setúbal.³¹ In the early 1590s, a Florentine artist and engineer, Brother Giovanni Vincenzo Casale, worked on the forts protecting the entrance of the Tagus river in front of Lisbon.³² In 1590, he realized firing tests with heavy artillery in order to check the defence of the bay of Lisbon. He did so with the lieutenant of artillery and Tiburzio Spannocchi, a Sienese engineer who was considered by the Council of War the best reference in fortification after he designed fortresses in many territories including Sicily, the Basque country, Cadiz and Galicia.³³ After the death of Casale in 1593, his works were completed by Leonardo Torriani, an engineer from Lombardy who had fortified the Canary Islands and some Spanish citadels in North Africa before making a long career in the fortifications of Portugal.³⁴

Similar dynamics happened in the manufacturing of cannons. Gun-manufacturing facilities already existed in Lisbon before the Iberian Union, but they became especially productive when the demand for large bronze cannons rose as a result of the organization of huge armadas.³⁵ Thus, in 1587, four Spanish master gun founders were transferred from Castile to Lisbon to participate in the production of cannons for the armada against England.³⁶ There they worked together with Luis Cesar, a local master gun founder, and Bartolomeo Sommariva, an Italian master who had been serving King Philipp II for a decade.³⁷ The supervision and control of this production was assigned to Diego de Prado, a Castilian officer who later wrote two manuscripts on gunnery and cannon-making techniques.³⁸ In 1589, a German gun founder from Aachen, Jan Vantrier, was hired by the Duke of Parma in the Low Countries under orders to join Lisbon, where he produced cannons until his death, in 1603.³⁹ In other words, Lisbon converted into a point of encounter for gun founders coming from various areas of Europe, and this situation certainly stimulated the exchange of knowledge and techniques from different manufacturing traditions.

From the beginning of sixteenth century, gunners, who were specialists in the use of cannons, were traditionally either Portuguese or recruited by Portuguese agents in Flanders and Germany.⁴⁰ After 1580, this recruitment was reshaped by the international networks of the Spanish Habsburgs. A document of the Portuguese squadron of the Armada del Mar Océano in 1602 shows only a small proportion of Portuguese among a crew of forty-five gunners (Figure 7.1).⁴¹ Flemish artillerists

FIGURE 7.1 Origins of forty-five gunners from the Portuguese squadron of the Armada del Mar Océano (1602).

were still present, coming essentially from the lands loyal to the Habsburgs, while Germans came predominantly from Hamburg, certainly because of the strong diplomatic and commercial ties this Hanseatic city kept with Spain.⁴² Spaniards amounted to only about 25 per cent of this group of gunners and were in majority from northern Spain. However, the most striking characteristic is the massive presence of Italian gunners, who constituted almost one-third of the group. Most of them were subjects of the Spanish Habsburgs from Lombardy, Sicily, and especially Naples, but some had also been recruited in the neighbouring territories such as Venice, the Papal States, and Genoa. The Mediterranean emphasis on the recruitment was perceptible in the presence of one Ragusan, two Greeks, and even one man from Kazan, identified as a Turk. This international crew was completed by a French person and a handful of Scots who might have been Catholics seeking the protection of the Spanish Habsburgs.

This gathering of technicians who had learnt their art in so many places and who must have had as many different work experiences was undoubtedly favourable to the circulation of the most up-to-date knowledge and techniques. In addition, the Spanish monarchy fostered the exchange of technical knowledge by creating new teaching institutions.

III New institutions for the teaching of gunnery

During the second half of the sixteenth century, the Spanish monarchy experienced a huge increase in its needs for gunners to handle a fast-growing number of

cannons.⁴³ This led to the emergence of a new type of institutions. In the 1560s, a first school of gunners opened in Milan, following the model of the Venetian neighbour.⁴⁴ In the next decade, similar schools were created in Sicily and Andalusia.⁴⁵ The abundant documentation about the school created in Seville in 1576 shows that the teaching included a practical component on a shooting ground and a more theoretical component in the form of lectures given by a mathematician.⁴⁶ The training was validated by a formal examination through questions which were asked of the apprentice by veteran gunners in front of royal officers. Such an institution represented an important innovation in a society where the vast majority of technical knowledge was transmitted informally, from the master's hands to the apprentice's.⁴⁷ Compared to the traditional system of apprenticeship, where one master trained a handful of apprentices over his whole career, the schools of gunners multiplied the transfer of skills, enabling one master gunner to teach his art to dozens of individuals per year.⁴⁸ Because they massively supplied the state with skilled labour necessary for the large-scale deployment of artillery, these new institutions directly strengthened the transformations at the core of Parker's concept of military revolution.⁴⁹

After the losses of the Invincible Armada in 1588, the Council of War launched a programme to reinforce the teaching of gunnery in the Iberian Peninsula. By the end of the century, the Spanish monarchy boasted a vast network of schools of gunnery in places such as Burgos, Hondarribia, San Sebastian, Pamplona, Cartagena, Malaga, Cadiz, Ferrol, A Coruña, and Barcelona.⁵⁰ Portugal was not left aside. In August 1588, right after the departure of the Invincible Armada from Lisbon, the Council of War asked a certain Bartolomé de Andrada "to teach in school" in the castle of São Jorge.⁵¹ Andrada had served the king as a master gunner in Sicily, where he was teaching his art in one of the four schools on the island.⁵² He had come all the way to Portugal to join the armada against England but eventually did not embark, because he fell sick just before departure. After his recovery some weeks later, the Council of War decided to make fruitful use of his special teaching skills and his ability to speak several languages – particularly relevant given the fact that gunners converged on Lisbon from all over Europe – and thus opened the first school of gunners in Portugal. Several years later, the same role was performed by Juan Carlos, a veteran soldier whom the Council of War considered "the best expert in gunnery, artificial fires, explosive mines and night shots."⁵³

By that time, the teaching of gunnery had increased in Portugal. In 1590, the captain general of artillery, don Juan de Acuña Vela, claimed that several master gunners were in charge of teaching their art in the castles of São Jorge and São Julião in Lisbon and in the fort of San Felipe in Setúbal.⁵⁴ According to his words, their lectures were public and intended for anyone who might be interested in learning how to use cannons.⁵⁵ Nevertheless, this allegation did not mean that attendance to the lessons was not filtered. Exactly the same set of vocabulary was used to describe the lectures in the Seville school, but only subjects of the Spanish Habsburgs were allowed to sign up for the lessons, and foreigners with even decades of residence in Spain had to struggle with the royal administration to be

admitted.⁵⁶ What the captain general of artillery probably meant by “public” lectures was mostly that they were free of charge for students, the cost being covered by the monarchy.

Besides these schools created in the fortresses of Lisbon and Setúbal, lectures on artillery were also implemented in naval settings. In 1589, Lazaro de la Isla, chief gunner of the royal squadron of galleys stationed in Portugal, started his own school of gunners.⁵⁷ A year after, his personal initiative received the official approval of the Council of War “to teach the art of gunnery, geometry and artificial fires.”⁵⁸ Being the son of a gunner and having fought in the battle of Lepanto (1571), the capture of Tunis (1573), and the conquest of the Azores (1583), Lazaro de la Isla was undoubtedly an expert in artillery.⁵⁹ In 1595, he published a famous artillery treatise in Madrid, later re-edited in Valladolid (1603) and Lisbon (1609).⁶⁰ After several years of artillery lectures on board the galleys, he pursued his teaching career in the schools of gunners in Burgos (1597) and Cadiz (1604).⁶¹ The trajectory of this expert from one training centre of the Iberian Peninsula to another strengthened the idea that the teaching of gunnery implemented in Portugal was fully inserted into the wider network of schools which was built by the government of the Habsburgs in the last decades of the sixteenth century.

IV Cross-imperial circulation of military technicians

This chapter has so far focused on phenomena circumscribed to the Iberian Peninsula. The main argument has been that the transversal structure under the authority of the captain general of artillery fostered the cross-border circulation of military experts and institutional models between Portugal and the European territories of the Spanish Habsburgs. However, the authority of the captain general of artillery did not reach further than Madeira and the Azores. Given the importance of overseas territories for both Spain and Portugal, the chapter looks into the extent to which these circulations expanded to the Iberian colonial territories. This question involves the rising interest of historians in the study of the connections and entanglements between the Spanish and Portuguese empires during the Iberian Union.⁶² The topic deserves thorough archival work, but this chapter wishes only to superficially remark on the cross-imperial circulations of military experts between the two Iberian empires.

The first remark is that the artillery of the *Estado da Índia* and of the annual convoys travelling through the Cape route to Portuguese India (*Carreira da Índia*) stood aside the authority of the Council of War. This administrative divide appears clearly in 1608, when almost two hundred cannons were sold by the Council of War to “the Portuguese Crown, in order to equip the galleons going to the Eastern Indies.”⁶³ Throughout the Iberian Union, the armament of these ships remained essentially a topic of local government which was discussed and negotiated by the Council of Finance and the Council of State in Lisbon, in connection with the royal Council of Portugal in Madrid.⁶⁴ These Portuguese-dominated institutions proved to be quite reluctant to hire individuals belonging to the patronage

network of the captain general of artillery; for instance, in 1593, when the galleons San Simon and San Pablo, initially part of the Armada del Mar Océano – under the management of the Council of War – were sold to the Crown of Portugal, several veteran gunners were dismissed and had to beg for new positions under the protection of the captain general of artillery.⁶⁵ From a military point of view, such dismissals were counterproductive, insofar as Portuguese ships and fortresses in India suffered from a chronic dearth of gunners.⁶⁶ They can only be understood as a resentful reaction to Castilian involvement in Portuguese military affairs, which was perceived as a violation of the formal administrative separation agreed in Tomar in 1581.

In the overseas territories, Portuguese colonial authorities were unwilling to resort to Castilian support, because they feared it might lead Castilians to make claims to Portuguese possessions.⁶⁷ This, however, did not totally prevent the cross-imperial circulation of military experts. After many years at the service of the Spanish monarchy, the Milanese engineer Giovanni Battista Cairati finished his career in Portuguese Africa and India, building bastion fortresses in Mombasa, Bassein, and Daman in the 1590s.⁶⁸ In 1629, two Spanish veterans of the wars in Flanders accompanied the Count of Linhares when he was sent as viceroy in Goa with a strong agenda for military reforms, in order to face the rising Dutch threat in Asia.⁶⁹ Nevertheless, another example highlights the kind of tensions that could result from the direct involvement of Spanish military experts in Portuguese colonial territories. In its first years of activity, the gun foundry in Portuguese Macao resorted to two Spanish gun founders hired in Manila.⁷⁰ Their replacement by the Portuguese gun founder Manuel Tavares Bocarro in 1626, under the pretext of their lack of abilities, was seemingly motivated by political reasons, given that some Portuguese sources called them “the Spanish enemies who came from Manila.”⁷¹ Although more research is needed on this issue, these few elements show that the circulation of military experts from the Spanish colonial empire to the Portuguese colonial empire was less fluid than from Spain to Portugal.

The circulation operated slightly better in the opposite way, from Portugal to the Spanish Empire. Certainly, the grasp of the Council of War over the artillery of Portugal limited the opportunities for Portuguese military experts to find jobs in their home country insofar as they suffered from the concurrence of many foreigners who were often better inserted into the administrative structure and patronage network of the court in Madrid. For these individuals, one strong option must have been to work for the Portuguese colonial administration, because it tended to favour its own compatriots. Another one was to join the Spanish colonial administration, which was in constant need of artillery specialists. Statistics on the origins of crewmembers on board transatlantic ships (Spanish *Carrera de Indias*) reveal that about 5 per cent of gunners came from Portugal.⁷² The records of examinations passed in the Seville school of gunners in the years 1600–6 registered eight Portuguese candidates.⁷³ Even though these were small contingents, they nonetheless demonstrate that the Iberian Union offered new career prospects to a few Portuguese military technicians willing to get involved in the Spanish colonial structures.

The dynamics underlying the involvement of Portuguese technicians in the Spanish colonial administration can be better understood from an example. In the last decades of the sixteenth century, the multiple attacks of English corsairs on the American settlements of the Spanish monarchy increased the necessity to provide them with heavy weaponry.⁷⁴ Among the various projects to create gun foundries in colonial settings, one proposition aimed to take advantage of the discovery, in Cuba, of copper pits and build a manufacture of bronze guns next to this source of metal supply.⁷⁵ The man chosen to lead this project was Francisco Sánchez de Moya, previously mentioned in this text as a Castilian gunner who had become account manager of the artillery in Portugal.⁷⁶ As said before, this officer had strong ties with Juan de Acuña Vela, the Spanish captain general of artillery, and he successfully turned the gun foundry project of Cuba into a reality.⁷⁷

The composition of the team that he was asked to gather for this project gives some insights on the bonds this officer had created with other military technicians during his stay in Lisbon, between 1587 and 1597. As for the gun founders, Sánchez de Moya chose Hernando and Francisco Ballesteros.⁷⁸ Originally from Ubeda in Andalusia, these two brothers worked for several years as assistants of the German master Jan Vantrier, in the gun foundry of Lisbon.⁷⁹ With them came four gun founder assistants, among whom three were Castilians and one, called Ambrosio Golbin, was from Lisbon.⁸⁰ Besides this nucleus of gun founders dominated by Castilians, the team sent to Cuba included mostly Portuguese technicians: a master blacksmith called Pedro Alvares, from Guimarães; a master carpenter (to make gun carriages) called Gonzalo de la Rocha, from Braga; and a cannonball maker, Salvador Gonzales, and his son, both from Lisbon.⁸¹ Apparently, for this expertise on cannonball making, the first choice of Sánchez de Moya had fallen upon a mulatto named Acosta who finally preferred to stay in Lisbon for a higher salary.⁸²

All the Portuguese technicians chosen by Sánchez de Moya to accompany him to the new gun manufacture in Cuba must have been previously working for the artillery of Portugal. In this sense, the circulation of military experts fostered by the transnational networks of the Spanish Habsburgs generated new daily contacts between Portuguese technicians and individuals such as the German founder Vantrier and his Castilian disciples, the Ballesteros brothers. These interactions undoubtedly favoured the circulation of technical knowledge. They also allowed some Portuguese technicians to develop personal bonds with Spanish officers (e.g., Sánchez de Moya), who through their connections with the highest spheres of the Habsburg military apparatus had the capacity to turn those personal ties into new career opportunities. In other words, this example confirms that military knowledge circulated in the Iberian empires through an articulation between state structures and informal networks.⁸³

Conclusion

This collective volume addresses the key question of whether Portugal and its empire experienced a military revolution in the early modern period. Naturally,

the main problem is that there is no consensus among historians on what the Military Revolution actually was or on if it even ever happened. To overcome this difficulty, this chapter has focused on the circulation of military technicians to prove that at least under the Iberian Union, if not before, Portugal was a significant node attracting gunners, gun founders, engineers, and other military technicians from various places in Europe, including Italy, Germany, the Low Countries, Spain, Greece, Great Britain, and France. These multiple movements of individuals constituted as many channels for the circulation of military knowledge and technology. Therefore, it seems unconceivable to accept the idea that Portugal might have remained on the margin of the major transformations in warfare which occurred in other parts of Europe.

This chapter also argues that the association of Portugal with the Spanish Habsburgs between 1580 and 1640 was beneficial from the point of view of the circulation of military technology. The dispersion of the Habsburg territories in Europe and the attractiveness of Spanish patronage favoured the hiring of artillery experts coming from all over the continent. In addition, in spite of the formal political separation between Castile and Portugal which was agreed in Tomar in 1581, the circulation of this international pool of experts was permitted by the implementation of a cross-border administrative structure under the authority of the captain general of artillery and the royal Council of War. In this period, the area of Lisbon became a particularly important military hub, frequented by many technicians who brought together their knowledge and experience of warfare. To facilitate the transfer of skills, the Council of War implemented in Portugal an institutional model, the school of gunners, already operational in other territories ruled by the Habsburgs. These teaching centres were resolutely a modern feature of armies, in a time when England boasted only one of such schools, in London, while France only acquired them under the reign of Louis XIV (1643–1715).⁸⁴

This structural organization generated new personal bonds among military experts which, in some cases, produced movements of Portuguese technicians outside Portugal, through the military apparatus of the Spanish Empire. In contrast, foreign experts belonging to the patronage network of the royal court in Madrid experienced more difficulties in penetrating Portuguese imperial structures. Paradoxically, these structures were the most in need of military expertise because they were in charge of defending the territories which most suffered from the growing concurrence of other European powers. Such impediments probably resulted from the rising tensions between Lisbon and Madrid, as a consequence of structural issues stemming from the divergent interests of Portuguese elites and the Habsburg government regarding the use of shared resources inside the composite monarchy.⁸⁵

In this regard, the relatively fluid movement of war material and military experts between Castile and Portugal came at a cost. The cross-border administrative network implemented by the Council of War threatened the principle of the composite monarchy which presided over the association between the two Iberian powers: the independence of Portugal vis-à-vis Castilian government. It certainly contributed to the rising Portuguese resentment against Habsburg rule which culminated

in the Portuguese revolt of 1640 and the end of the Iberian Union.⁸⁶ Despite this outcome, the impact of the Habsburg government on the transformation of Portuguese military technology should not be neglected. During six decades, as this chapter has shown, Portuguese military technicians had many opportunities to collaborate with the experts of the Spanish Habsburgs and learn from their different knowledge and experience. When the two monarchies took separate paths, this stock of skills and competence must have been of some value to Portugal in its struggle for independence.

Notes

- 1 This chapter presents research that was carried out at two institutions. Part of it is based on my doctoral research on gunners which took place at the European University Institute in Florence, Italy. But it displays also some preliminary results of my current research project “GLOBALGUNS” implemented at the University Pablo de Olavide, Seville, Spain. This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 845675, which is titled “Guns for a Global Empire: Deployment of Artillery Technology in the Iberian Colonial Space (1580–1640).” I am therefore grateful to these institutions for providing me with a fruitful environment to develop this research. Also, I thank Professor Bartolome Yun-Casalilla for his comments and suggestions. Any mistakes in this chapter are my responsibility.
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