Foundation for Science Technology and Civilisation

Artillery Trade of the Ottoman Empire

Author: Dr. S. Ayduz
Chief Editor: Prof. M. Gomati
Production: Mr. A. Nazir

Release Date: July 2006
Publication ID: 610

FSTC Limited
9 Conyngham Road, Victoria Park, Manchester, M14 5DX, United Kingdom
Web: http://www.fstc.co.uk Email: info@fstc.co.uk

ARTILLERY TRADE OF THE OTTOMAN EMPIRE

Introduction

The Ottoman State emerged at the beginning of the fourteenth century in North Western Anatolian lands on former Byzantine territory and expanded through the Balkan Peninsula and South-East Europe. The Ottomans were extending their hegemony towards Europe at approximately the same time as the use of firearms took root in some European countries. Towards the middle of the fourteenth century, firearms expanded through the European states as a new military technology but still proved largely ineffective in military campaigns. They became effective mainly in the second half of the fourteenth century. Most rulers including the Pope, prohibited firearms trade with the Ottomans in addition to the already banned materials such as cereals and munitions. A clause of the papal proclamation (In Cena Domini) of Pope Gregory XI on 15th May 1373 concerning the prohibition of trading with Turks, some other Muslim states and with Romania demonstrates the existence of a vast trade of firearms. Other items also banned as a result of this prohibition included horses, weapons, iron, copper, tin, sulphur, saltpetre and similar war materials as well as certain types of rope and timber which were used for ship building[1]. Some Christian rulers through their support of the papal prohibition announced legislation to prevent such trade[2]. These prohibitions, often renewed, had little effect – the flow of munitions into the Ottoman Empire and other Muslim countries continued unabated despite all that Austria could do and despite the efforts of Spain, the Pope and the Knights of Saint John of Malta to seize the well-armed vessels which took the contraband materials through the Mediterranean to the harbours of the Levant[3]. On the other hand, this kind of trade was encouraged and supported by the Ottoman rulers who granted commercial privileges to such traders[4].

Hence, in spite of the prohibitions and many obstacles and numerous attempts to stop this trade between European Christians and Muslim powers there still existed a great degree of cross Mediterranean traffic during the fourteenth and fifteenth centuries.[5] Such trade was simply too profitable to traders to be discouraged by the rulers. It was very difficult for Christians due to papal support for the ban but, in considering the question of how the Ottomans obtained firearms in the second half of the fourteenth century, one can find that Western merchants continued trading these goods even at the risk of outraging the Roman Catholic Church.[6] Thus, the Ottomans were buying various metals and munitions which they needed for their armies especially from Dubrovnik, Florence, Venice and Genoa in the fourteenth and sixteenth centuries from Europeans.[7] The active arms trade which persisted throughout the Middle Ages

1. Halil İnalcık, "Osmanlılarda Ateşli Silahlar", TTK Belleten, 83 (1957), p. 509; V. J. Parry, "Materials of War in the Ottoman Empire", Studies in the Economic History of the Middle East from the Rise of Islam to the Present Day (ed. M. A. Cook), London: Oxford University Press, 1970, pp. 220-227.
2. For example, "a decree emanating in 1544 from the Archduke Ferdinand of Austria declares all traffic with the Ottomans in victuals, firearms, gunpowder, saltpetre, lances, armour, cuirasses, iron, tin, and lead to be illegal. See: Parry, "Materials of War", pp. 225-6.
3. D. Petrovic, "Fire-arms in the Balkans on the eve of and after the Ottoman Conquests of the Fourteenth and Fifteenth Centuries", War, Technology and Society in the Middle East (ed. V. J. Parry-M. E. Yapp), London 1975, p. 176; Gabor Agoston. "Ottoman Artillery and European Technology in the Fifteenth and Seventeenth Centuries". Acta Orientalia Academiae Scientiarum Hungaria, XLII/1-2 (Budapest 1994), p. 23; Parry. "Materials of War". pp. 225-227.
4. For published formal documents in the Dubrovnik archives about those merchants, who could trade in the Ottoman territories freely see: Ciro Truhelka, "Dubrovnik Arşivinde Türk-İslâv Vesîkaları", İstanbul Enstitüsü Dergisi, I (1955), pp. 39-65.
5. Kelly Devries, "Gunpowder Weapons at the Siege of Constantinople, 1453", War and Society in the Eastern Mediterranean, 7th-15th Centuries (ed. Y. Lev), Leiden 1997, pp. 343-362.
6. Petrovic. "Fire-arms in the Balkans". p. 176.
7. İnalcık, "Osmanlılarda Ateşli Silahlar", p. 509; for more information about the trade between the Ottomans and the Raguza Republic during the reign of Sultan Murad I see: T. Gökbilgin. Osmanlı Müesseseleri Teşkilâtı ve Medeniyeti Tarihine Genel Bakış. İstanbul: İstanbul

continued. This can be seen not only in the large number of weapons, but also in the late medieval documents that establish the existence of an extensive arms trade. Towns, such as fourteenth-century Avignon and Dubrovnik, for instance, served often as markets for weapons and gunpowder. The aim of this article is to provide evidence which demonstrates sales of firearms, metals[8] and munitions between the Ottoman Empire and Europe from the fourteenth and sixteenth centuries.

Metal Trade

Before delving deeper into the arms-trade I would like to discuss the trade of metals between countries. Any economic history of the late Middle Ages is handicapped by the nature, and shortage of original sources. This problem is highlighted when dealing with the Ottomans in the fourteenth and first half of the fifteenth centuries by the absence of Turkish archival and written materials for that period.[9] Any study of the firearms and munitions trade with the Ottoman State in the early Ottoman centuries is severely hampered by the lack of records due not only to the haphazard survival of documents, something which affects research into all aspects of this area and period, but also because of the prohibitions by the Pope and various governments of trading metals with the Muslims and other nations. The illicit nature of firearms and munitions makes trade even more difficult to trace. According to some archival documents and other manuscripts, firearms were used by the Ottomans in the last decade of the fourteenth century, and were plentifully and effectively used in the time of both the Sultans Murad II (1421-1451) and Mehmed II (1451-1481).[10]

During the thirteenth century merchants from the Italian maritime states met the caravans from the Far East and Iran not only in the North but also hinterland to Anatolia's cities. Before the Ottomans, the principal items of East-West trade were the fine cloths of Flanders and Florence, worn in the East mainly by the upper class, and Chinese silks. In the thirteenth century Anatolia not only linked Europe with the East but was also a crossing point for North-South trade between the Khanate of the Golden Horde in Eastern Europe, and the Arab lands. Spices, sugar and various fabrics from the South were exchanged for furs and slaves from the North. Italian merchants transported these goods by sea, while Muslim traders also carried them overland from various Anatolian cities.[11]

Italian Cities on the Trade

In the fourteenth and fifteenth centuries two states, in particular Venice and Genoa, were alike in that they lived by trade and both had a republican form of government. However, these states were not alike in many other ways.[12] In addition, such states as the Netherlands[13], Florence, Dubrovnik and Bosnia, and later

Üniversitesi Ed. Fak., 1977, p. 26.
8. See: Kate Fleet, European and Islamic Trade in the Early Ottoman State, the Merchants of Genoa and Turkey. Cambridge: Cambridge University Press, 1999.
9. Ottoman archives begin to provide substantial information from the sixteenth century on.
10. For more information on when the Ottomans began to use firearms see: Salim Aydüz. Osmanlı Devleti'nde Tophâne-i Âmire ve Top Döküm Teknolojisi, unpublished Ph.D Dissertation, University of Istanbul, 1998; İdris Bostan. "La Fonte de Canons À la Fonderie Impériale D'Istanbul Au Début du XVIe Siècle". Anatolia Moderna/Yeni Anadolu, IX, Paris 2000, pp. 171-182.
11. H. İnalcık. The Ottoman Empire the Classical Age. Trans. Norman Itzkowitz, Colin Imber. London: Weidenfeld and Nicolson, 1973, p. 121.
12. Susan Rose. Medieval Naval Warfare, 1000-1500. London: Routledge, 2001, pp. 100-101.
13.M. Schmautz. "Artillerie", Encyclopædia Universalis. Paris 1980, II, p. 526.

England and France did a considerable amount of trade in the Levant especially firearms, cannons as well as other goods and grains.[14] The Genoese and the Venetians were known to be importing large quantities of arms into the Levant. These traders without concern for religious and national differences were selling arms and aiming to create a market.[15] With regards to Ottoman commercial relations with the West in the fourteenth and fifteenth centuries, so far no reference to arms trading with the Turks has been found in the Genoese and Venetian sources for this period.[16]

Nevertheless, there clearly existed a metal trade between Western merchants and Muslim powers as is exemplified by the constant papal prohibitions against the export of certain commodities to the infidels, such as food and war materials/metals. Such repetitious prohibitions indicate a persistent trade, conducted in defiance of papal prohibition and, one must assume, therefore profitable.[17]

It will be evident that this trade in defensive and offensive weapons included fire-arms of smaller dimensions, which would secure higher profits. On the other hand, increasingly close trade connections were maintained with the Turkish territories in Asia Minor and especially with two major corn-handling ports, Altoluogo (Ayasoluk) and Palatia (Balat), during the last decades of the fourteenth century. For instance, Dubrovnik ships calling at these ports to load corn were armed with bombards. This must have provided a further opportunity for the Ottomans to become acquainted with fire-arms.[18]

Even if future research finds additional evidence for the existence of firearms in the central Ottoman forces at the end of the fourteenth century, it will be necessary still to regard the Balkans and the Italian merchant towns as possible conveyors of such weapons to the Turks.[19]

According to Fynes Moryson (1566 - February 12, 1630), the Ottomans had in former victories taken a great store of brass ordinance from the Christians, in Hungary, Cyprus and in Galata. It is manifested by the sieges and assaults often made by them, and with much fury, that either at home or brought by merchants, they had a stock of artillery, bullets and gunpowder.[20]

Bartolomeo de Giano who lived in Istanbul in 1438, wrote a letter to the Venetian authorities complaining that some Venetian, Genoese and other Italian and Western merchants went on selling "strategic materials" to the Ottomans despite papal excommunications and prohibitions. He continued:

> *"From Italy—Latin, Venetian, Genoese, and other merchants bring galleys and ships there loaded not with iron but with steel in such great abundance that I can scarcely believe that steel would be found in any Italian city at such a good price and in such great quantities as it is found in Gallipoli, Pera, and Adrianople! I am a liar if I have not seen it with my own eyes and in the galleys on which it came. But hear how they excuse themselves—they do not sell it to the Turks but only to the Jews*

14. See: Nimet Kurat. Türk-İngiliz Münasebetlerinin Başlangıcı ve Gelişmesi (1553-1610), Ankara: Ankara Üniversitesi Dil ve Tarih Coğrafya Fakültesi, 1953, p. 38; R. Davis. "English Imports from the Middle East, 1580-1780". Studies in the Economic History of the Middle East from the Rise of Islam to the Present Day (ed. M. A. Cook), London: Oxford University Press, 1970, pp. 193-206; Parry, "Materials of War". p. 225.
15. İnalcık. "Osmanlılarda Ateşli Silahlar". s. 509.
16. Fleet. Ibid, pp. 112-121.
17. Fleet, ibid, p. 112.
18. Petrovic, ibid, p. 177.
19. Petrovic, ibid, p. 177.
20. Fynes Moryson. Shakespeare's Europe Fynes Moryson's Itinerary. By. C. Hughes. Manchester: Sherratt and Hughes, 1902, p. 47.

and the Greeks. It is they, therefore, who later give the steel to the Turks with their own hands. And this, so that the Turks may make sharper swords to spill the guts of Christians! … Indeed, over the last forty days we have seen mules loaded with steel led from this city to Adrianople where the Turks themselves foully mock the Christians, saying openly: Look at your blindness, you wretches: you offer us arms so that we may compete."[21]

After the conquest of both Bursa and later Constantinople by the Ottomans, these two cities soon became the most important centres of Levant trade. Thus merchants could journey in safety from Arabia and Iran to Bursa, and for European, especially Italian traders such as the Venetian, Genoese and Florentine merchants, to Constantinople and Galata. Bursa was the closest market in which to purchase Eastern goods and sell European woollens.[22] Both the Ottoman lands Rumelia and Anatolia were the main trading centres for the Italian merchants subsequent to the Ottoman occupation of these territories.[23]

In 1416 a Venetian fleet defeated the Ottoman navy at Gallipoli, but in general, in spite of enormous hostility, the Republic of San Marco, primarily interested in smooth commercial relations, managed to stay at peace most of the time with the Ottomans. Genoa held a similar position since her colonies on the Crimean Peninsula, near Constantinople, on the coast of Asia Minor, and among the Aegean islands made her especially vulnerable. Treaties were frequently concluded between the Ottomans and the Italian republics. On some occasions, the Turkish rulers were even actively supported in their military expeditions by Genoese ships. The stronger the Turkish fleet at Gallipoli became, the more effective was its threat to cut off all foreign access to the Black Sea. Soon after Mehmed II became the Ottoman ruler (1451), he took Constantinople and the Genoese colony of Galata on the opposite side of the Golden Horn.[24] Even after the conquest of Constantinople, which became the capital for the Ottoman Empire as Istanbul, Bursa continued for another century as one of the empire's main commercial centres, although mainly trading in silk[25]

Firearms Trade in the Balkan Peninsula

It was as a consequence of the instability in the Balkans during the fifteenth century that all the remaining free and semi-free Balkan states and also the colonies of Venice and Genoa became equipped with firearms. During this century the main suppliers of cannons were Venice and Dubrovnik (Ragusa). One of the outstanding states in the matter of trading arms to the Ottomans was Dubrovnik. As early as 1301, a prohibition was imposed in Dubrovnik on the export of arms to the Levant. Such prohibitions imposed sometimes both heavy fines and the forfeiture of the bought or sold arms. All the measures designed to stop the trade in arms testify to the continuance of this traffic. There are archival records to confirm this statement.[26] In Dubrovnik itself, early in the century, the production of firearms underwent a change with the setting up of a cannon foundry in 1410, the first such foundry to be established in the Balkans.[27] An

21. Bartolomeo de Giano, O.F.M. A Letter on the Cruelty of the Turks. Translated by W.L. North from the edition of the letter in J.P. Migne (ed.) Patrologia Graeca 158, cols. 1055-1068. This edition was based on MS 1130 in the Bibliotheca S. Michele, Venice.
22. Halil İnalcık. "The Ottoman Economic Mind and Aspects of the Ottoman Economy", Studies in the Economic History of the Middle East from the Rise of Islam to the Present Day (ed. M. A. Cook). London: Oxford University Press, 1970, pp. 207-218; H. İnalcık, The Ottoman Empire: the Classical Age, p. 124.
23. F. Babinger. "Fatih Sultan Mehmed ve İtalya". TTK Belleten, XVII, 65, (January 1953), pp. 42-45.
24. Henry & Renée Kahane, Andreas Tietze. The lingua franca in the Levant: Turkish nautical terms of Italian and Greek origin. Urbana: University of Illinois Press, 1958, pp. 11-12.
25. İnalcık, The Ottoman Empire: The Classical Age, p. 124.
26. Petrovic, ibid, pp. 176-177.
27. Petrovic, ibid, p. 179.

awareness of firearms and of their effectiveness was undoubtedly present in the Balkans, and especially in the regions under the control of Venice and Genoa and in towns and districts which maintained commercial, business, friendly, and family ties with the Italian cities.[28] According to the sources known thus far, Venice and Dubrovnik were the main suppliers of firearms to the Balkan lands at the end of the fourteenth century. Venice provided cannons for the North-Western area of the Balkans and for its own lands in Albania and in Romania Veneta. On the other hand, most of the Central and Southern Balkans looked to Dubrovnik for their supplies. Thus, Venice and Dubrovnik were at the same time places where firearms were made.[29] According to G. Skrivanic, the Ottoman army's cannons that were used in the Kosovo Battle of 1389 against Christians were bought from Dubrovnik[30].

Gunpowder was prepared in Dubrovnik itself by a simple method of mixing crushed sulphur, saltpetre, and charcoal.[31] Documents preserved in the Dubrovnik Archives show that the Balkan hinterland acquired cannons, gunpowder, saltpetre, and sulphur in three ways: through Dubrovnik merchants; through rulers and feudal lords; and through representatives in Dubrovnik, consisting of individual princes and feudal lords. Firearms and gunpowder were either sold or given away as a gift or on loan. Cannons and gunpowder were sent to the Balkan rulers, princes as well as the Ottomans. When Mahmud Pasha (1455-1468), the grand vizier of Mehmed II, arrived at the walls of Jajce in Central Bosnia, he asked Dubrovnik in 1463 to send him 9000 dinar, two kantars (108 kg.) of saltpetre and sulphur to prepare gunpowder for his army.[32] Further, in 1498 Bâyezid II requested Dubrovnik to acquire and dispatch to Istanbul a consignment of tin and iron for 'the making of bombards'.[33]

Most of the demands for cannons and gunpowder or sulphur and saltpetre came to Bosnia, a centre of production, well equipped with cannons and gunpowder. Besides the Ottoman state and Bosnian tycoons, minor noblemen also, and even historically unknown persons turned to Dubrovnik with such demands. There is hardly any mention in the Dubrovnik archives of the procurement of gunpowder for the Kings of Bosnia.[34] There are far more documents referring to deliveries of gunpowder, saltpetre, and sulphur than of cannons. This may mean that those who bought gunpowder were already in possession of bombards which they either made themselves or obtained from another source.

Venice and Genoa had a large share in the trade of the Mediterranean. They enjoyed commercial privileges granted to them by the Byzantine Emperors[35] and later by the Ottoman Sultans, obtaining licences from the Pope allowing them to trade with non-Christians. These licences however, contained a ban on the sale of metals and weapons. It is difficult to determine the amount of this trade, but we know that the Genoese sold arms and Milan-made coats of mail. Moreover, the measures introduced by Venice, for instance in 1372, against the malpractices of their merchants in exporting metal to the Levant, testify to the existence of such trafficking. Also to the list of gun-runners should be added Ancona and Florence—both accused in the fifteenth century of shipping arms to the Ottoman Empire.[36]

28. Petrovic, ibid, p. 169.
29. Petrovic, ibid, p. 172.
30. For Skrivani's book Kosovska bitka (Centinje 1956, s. 28-30): Eric McGeer. "Firearms", the Oxford Dictionary of Byzantium, New York-Oxford 1991, II, p. 786.
31. Petrovic, ibid, p. 181.
32. Şerafettin Turan, "Dubrovnik", Diyanet Islam Ansiklopedisi, IX, s. 543.
33. Petrovic, ibid, p. 182.
34. Petrovic, ibid, pp. 182-184.
35. The Venetians had first acquired extensive privileges in Constantinople by making a crucial bargain with the Byzantine Emperor in 1082. Rose. Medieval Naval Warfare. p. 101.
36. Petrovic, ibid, p. 176.

From the early beginnings of the Ottoman state to the capture of Constantinople in 1453, Anatolia was an area of intense commerce, one facet of which was the trading activity of the Western merchants, among whom, as we mentioned above, the Genoese and Venetians held a dominant position. The Genoese were extremely active in Anatolian trade, not merely coming into the coastal ports from which the goods were exported but placing their own agents in commercial centres.[37]

After the conquest of Constantinople, Galata remained the warehouse for most Turkish foreign trade, whereas the Muslim quarter became merely the end point of the commerce. The Genoese, however, never regained the extensive privileges they had enjoyed under the Byzantines. Whereas Galata had formerly enjoyed a semi-autonomous status, the quarter and its inhabitants were now subsumed into the *Magnifica Communità di Peyra,* an entity that, in the course of time, became something more than a *millet* and less than an independent colony. All Latins (i.e., Roman Catholics) were placed under the civil authority of this body. Yet, although its jurisdiction was restricted to the internal affairs of the Latin's and the administration of the churches, the *Magnifica Communità*, by binding the Catholic community together, enabled the quarter to long retain its distinctive character.[38]

Until 1569 the Italian states, primarily Venice, handled Ottoman trade with the Western Christian world, and so long as Venice was the main sea-power in the Mediterranean neither other Christian states nor the Ottomans could change the situation. The Ottomans cooperated with Venice's rival, Genoa, granting the Genoese a capitulation as early as 1352 and also providing a long-term monopoly over alum production in Manisa, the main source of alum for the European textile industry. The Genoese colonies in Western Anatolia – Foça and the island of Chios – became ports of entry for Anatolian trade. In return for this preferential treatment, Genoese ships assisted the Ottoman armies at crucial moments, notably in 1421 and 1444, when they transported troops across the Dardanelles, then under Venetian control.[39]

While the trade in alum was largely in the hands of the Genoese, Turks also traded in this commodity. Anatolia was one of the principal alum-producing areas, exporting alum to Egypt and Syria. Turkish alum also travelled to the West, into Northern Europe, even reaching as far as England.[40]

The Ottomans employed various economic tactics against Venice. By renewing their commercial privileges and permitting them to trade in wheat, they persuaded the Venetians to make concessions and to relax their war effort.

During the second half of the fifteenth century, political tensions in Mora and Albania led Mehmed II into a long war with Venice, lasting from 1463-1479, and forced him to take economic reprisals. At the same time he sought to maintain trade with the West, by encouraging Florence and Dubrovnik to take Venice's place. In 1469 he granted new trade privileges to Florence and also maintained good terms with Florence by, for example, attending Florentine banquets. By capturing Bosnia and Herzegovina in 1463, Mehmed opened a new and direct trade route with Florence, through Dubrovnik.[41]

37. Fleet, ibid, pp. 22-23.
38. Louis Mitler. "The Genoese in Galata: 1453–1682". International Journal of Middle East Studies, vol. 10, No. 1. (Feb. 1979), pp. 75-76.
39. İnalcık. The Ottoman Empire: the Classical Age, p. 134.
40. Fleet. ibid, pp. 80-82.
41. İnalcık. The Ottoman Empire: the Classical Age, p. 135.

Due to the strategic importance and rare availability of firearms, related metals and munitions, such trade was banned by government and also religious authorities through the centuries. Understandably, rulers attempted to restrict the flow of these materials and products to other lands of possible opposition. This was an obvious disadvantage for the Ottomans at that time. When the Ottomans required firearms and the materials of war in the fourteenth and fifteenth centuries, the Pope and other states forbade this trade and also implemented hefty fines. After the Ottomans grew in strength and wealth, they also enacted similar measures to prevent the trade of firearms to Christian states and neighbours such as the Safawi's, Austria and other rival states.[42] The Ottomans announced the banned materials as a "*memnu' emtia*" (banned objects).[43] Thus, the Ottomans implemented new legislation to prevent prohibited materials from leaving their own soils and took some strict measures in this respect.[44]

In the second half of the sixteenth century France very quickly became a commercial rival of Venice on the Ottoman land trade and after the Ottoman-Venetian war of 1570-73, France began to displace Venice in the Levant. At the beginning of the seventeenth century there were approximately a thousand French vessels active in the commerce of the Levant, and the volume of trade rose to thirty million livres, half of France's total trade. Other European merchants, especially the English and the Dutch, traded under the French flag.[45]

The English in particular, and later the Dutch, also created for themselves a lucrative trade with the Ottomans in materials for warfare. An English ship is mentioned as being at Livorno in 1573 with a cargo of tin, broken bells and ingots of lead. The French ambassador in Istanbul, de Germigny, notes that in 1580 the English brought to the Porte much steel, broken images, bronze and brass for the casting of guns. The broken bells and images came, of course, from the churches despoiled in England during the course of the Reformation.[46] After two years, Parry quotes the Spanish Ambassador to England as saying, in 1582, that the English sent large amounts of broken bells and images, tin and lead which the Ottomans bought "almost for its weight in gold, the tin being vitally necessary for the casting of guns and the lead for purposes of war."[47] The Ottoman Sultan granted the English a capitulation in 1580 and a more extensive one in 1583. On 11 September 1581 the Levant Company was founded by royal charter. The Ottoman government lowered the customs rate for the English to 3 percent, while the French and other foreigners were paying 5 percent until 1673, when they succeeded in having the custom rate lowered to 3 percent also. The English competed fiercely with the French and Venetians, the former monopolists of the Levant trade. The English were selling fine quality woollens at low prices, and imports of English tin and steel were vitally important for the Ottoman arms industry.[48] Bernardino de Mendoza, the Spanish ambassador in London, informed his Master Philip II in 1579 of an English vessel bearing 20,000 crowns' worth of bar tin to the Levant. Again,

42. See: Jalâlzâde Mustafa Calabi. Tabakât al-Mamâlik wa Darajât al-Masâlik. (By P. Kappert), Wiesbaden: Franz Steiner Verlag, 1981, pp. 27a-27b; Agoston, "Ottoman Artillery", pp. 16-17.
43. According to the Ottoman trade rules the most important banned objects were listed as: cereals, cotton, gunpowder, horses, weapons, leather, wax and raw materials. See: Zeki Arıkan. "Osmanlı İmparatorluğu'nda İhracı Yasak Mallar (Memnu Meta)". Prof. Dr. Bekir Kütükoğlu'na Armağan, İstanbul: İstanbul Üniversitesi Edebiyat Fakültesi Tarih Araştırma Merkezi, 1991, pp. 279-306.
44. For more information on the proclamations announced by the High Porte, the prohibitions regarding the trade of food and military equipment towards the "Dar al-Harb" i.e. Iran and other countries towards the East of the Ottomans see: Basbakanlik Arsivi, Mühimme Defteri (MD), nr. 5, 25/67, 10 Muharram 973 (7 August 1565). MD, nr. 5, 94/217, 12 Safar 973 (10 September 1565); MD, nr. 22, 238/460, 14 Rabi' al-Akhir 981 (14 August 1573); MD, nr. 7, 483/1396, 13 Dhu Al-Hajjah 975 (11 May 1568); 725/1988, 3 Rabi' al-awwal 976 (27 August 1568); MD, nr. 35, 296/750, 14 Rabi' al-Akhir 981 (14 August 1573).
45. İnalcık, the Ottoman Empire: the Classical Age, p. 137.
46. Parry, "Materials of War", p. 226.
47. Alan Williams. "Ottoman Military Technology: The Metallurgy of Turkish Armour". War and Society in the Eastern Mediterranean, 7th - 15th Centuries (ed. Y. Lev). E. J. Brill, Leiden-NewYork-Köln, 1977. pp. 363-364.
48. İnalcık, the Ottoman Empire: the Classical Age, p. 138.

in 1582, de Mendoza told Philip II that the English sent large amounts of tin and lead which the Ottomans bought 'almost for its weight in gold'.[49]

Documents from the archives at Marseilles give some information about the movement to the Levant (under royal licence - of copper and steel) to Tripoli and Beirut in Syria in 1572, and also of tin (English, acquired at Rouen, and German obtained at Lyons) between 1553 and 1591.[50]

Raw Metals Trade

By about 1500 the Mediterranean, Europe's classical trading area, was a world of its own, with lively interaction between its various regions. Within the area, trade cut across the division between Christendom and Islam. From the area, routes went Northwards and Eastwards by land and sea and by river or mountain passes to Central and Western Europe.[51] Among the metals, copper, tin and lead were old-established items of trade. Copper came largely overland from central Europe and was exported in Venetian ships. England was the main source of lead and tin. The Ottomans were constantly in need of tin, which was imported from Europe, either overtly or as contraband (smuggled goods). It could be combined with copper to form bronze – and bronze was used to make cannons. Some tin came into Muslim hands; it would seem, from Transylvania through the town Szolnok during the sixteenth and seventeenth centuries.[52] The Mediterranean area itself supplied one mineral that was in international demand - alum - which was used in the textile industry.[53]

Iron

Iron was employed to make weapons and a broader range of necessities such as anchors, horseshoes, nails, picks, shovels and the like. It was to be found in numerous areas of the Ottoman Empire; in the Balkans and Anatolia. Therefore the Ottomans had no lack of it.[54] Iron was also imported from the West however, and goods made from it were the most important merchandise traded by the Genoese. Western merchants seem to have been largely unconcerned by religious hesitation over this commerce. Pope Gregory XI was obliged, in 1373, to direct a threat of excommunication against those Christians who were selling iron to the Turks. Papal permission, granted in 1363, to the Hospitallers of St. John of Jerusalem (Knights of Malta) to import foodstuffs from the Turks, contained the proviso that the Hospitallers should not, in return, trade war materials, including iron. It is unlikely that the Hospitallers supplied their enemies with weapons, this passage being probably a stock phrase used by the Popes when granting such permission. Regardless of papal sentiment, iron and other metals like lead, tin and copper was sold throughout the Levant, including in Anatolia, Antalya and Bursa by Genoese and Venetian traders. Iron was not the only metal brought into the eastern Mediterranean, for lead too came in from the West, traded from Ragusa to Alexandria, to the Levant, some Mediterranean islands and other markets in the East. It was sold also in Anatolia and the Genoese traded lead in Balat around the end of the fourteenth and beginning of

49. Parry, "Materials of War", p. 226.
50. Parry, "Materials of War", p. 227.
51. Kristof Glamann. "European Trade 1500-1750". The Fontana Economic History of Europe: the Sixteenth and Seventeenth Centuries. (ed. C. M. Cipolla). Glasgow: William Collins Sons and Co Ltd, 1974, p. 434.
52. Parry, "Materials of War", p. 225.
53. Glamann, ibid, p. 437.
54. Fleet, ibid, pp. 112-115; Parry, "Materials of War", pp. 224-225.

the fifteenth centuries.[55] Through expansion, the Ottomans had already gained established iron mines. After the conquest of the Balkan area, especially Bulgaria and Serbian territories, the Ottomans became rich with iron. The Ottomans also captured the Kratova iron mines just after the Kosovo Battle (1389) and iron mines which belonged to the King Georges Brankovic (1427–1456) family in 1392 and Gluhavica mines in 1396.[56]

Copper

Besides being in demand for cast bronze cannons, copper was used to manufacture domestic utensils (plated with tin). However our focus here is on bronze for manufacture of cannons. Bronze cannon founding flourished from the middle of the fifteenth century to the beginning of the seventeenth. This was the era of the new nation-states with their large armies, their fleets and theirs wars; these, together with geographical expansion, all added to the demand for cannons, copper and tin. Cast-bronze artillery reached a high state of perfection, especially the German and Flemish pieces, in which there was an extensive trade, while Italian and French production went for local use.[57]

A wide market for copper existed between European states. Sweden produced and possibly exported copper in the late middle ages, but only in negligible quantities. Gustavus Adolphus, the champion of Protestantism, sold copper to Catholic Spain via middlemen in Amsterdam. Thus, despite prohibitions without number, a substantial proportion of the Hungarian copper production reached Turkey, the principal antagonist of Christendom. The 'copper purchase,' as it was called, could mean that a fair proportion of the output of an area might fall into relatively few hands. Normally what interested merchants most was trading in copper.[58] Still around 1500 England was importing copper from Saxony (Mansfield), Bohemia, Hungary and Tyrol. Swedish copper production and exports rapidly grew after 1570 and remained on a very high level throughout the seventeenth century. Norwegian copper mines were not exploited to any important extent before the 1640's. Spain received supplies of copper mostly from Hungary until the middle of the sixteenth century when Spain began to import copper in increasing quantities from Mexico, Peru and Cuba. In 1646 the Marquis de Loriana complained that the quality of American copper had deteriorated, "While at the beginning it was as good as that of Hungary." In 1578 it was said that Spain paid five times as much for copper from Hungary as it did for copper from Cuba. The Dutch exported much copper from Japan in the course of the sixteenth and seventeenth centuries but they mostly sold it in other parts of Asia and only occasionally imported this copper to Europe.[59]

It has been assumed that the trade in metals from the West into the Ottoman lands was of greater significance or volume than the sources appear to show, which one would argue is due to its illegality and consequent concealment combined with the haphazard surviving data. Anatolia does not appear always to have been a market for metals, for on occasion imported metals remained unsold there, indicating that Anatolia was not suffering from a lack of metals, such as would have attracted a large run of imports. Anatolia was after all a metal-producing and exporting country in its own right. It had metal resources, copper, iron and silver in particular. Deposits of copper ore existed in the Balkans and especially Anatolian

55. Fleet, ibid, pp. 112-114.
56. Petrovic, ibid, p. 174; Parry, "Materials of War", p. 224; Mücteba İlgürel. "Osmanlı Topçuluğunun ilk Devirleri". Prof. Dr. Hakkı Dursun Yıldız'a Armağan, İstanbul: Marmara Üniversitesi Fen-Edebiyat Fakültesi, 1995, pp. 285-293.
57. Glamann, ibid, p. 492.
58. Glamann, ibid, pp. 490–491.
59. Carlo M. Cipolla, Guns and Sails in the Early Phase of European Expansion 1400-1700, London: St James's Place 1965, pp. 24-25.

territory.[60] Copper was mined in North-East Anatolia in the region of Kastomonu, Sinop, Samsun and Osmancık and was of high quality.

The Ottomans, although appearing by name much less often in the sources, were also active. At the end of the fourteenth century, Turks themselves traded in copper with the Venetians and Genoese; for example, the İsfendiyaroğlu ruler Süleyman Paşa was selling Kastamonu copper to Genoese merchants. At the same time a Turkish trader sold alum to a Genoese official in Chios. At the beginning of the next century, Hajji Mustafa traded copper in Chios.[61]

Anatolia was a producer and exporter of copper which the Italian merchants bought in large quantities. Most of the copper trade was under the control of Venetians, even in Ottoman lands. But in 1461, the Venetians lost their positions to Florentine merchants and all trade changed hands. Mehmed II stopped trade with the Venetians and exiled them from the Ottoman territories and settled Florentines in their place. Before that time, the Venetians also had mints in the Ottoman Empire.[62]

Skilled Cannon Makers

The absence of references to a large volume of metal trade from the West into the Ottoman Empire may be due not only to its illegality and gaps in extant data, but to the reality that there was no great volume. The Ottomans did not necessarily need to import large quantities of metal, or at least not those it produced itself. In the case of the arms trade, perhaps weapons were not traded in concealed quantities but what was imported, was technology and expertise.[63] Besides implementing a number of military treaties (as will be mentioned below) to improve, develop and obtain new European military firearm technology, the Ottomans employed a certain degree of European military expertise also. There were many ways by which European military technicians, craftsmen and soldiers ended up in the Ottoman foundries, naval arsenals and in the army. Certain military experts and adventurers from Europe offered their services to the Sultans hoping for a better salary and advancement in their social status.[64] In the second half of the fifteenth century the Ottoman administration employed experts in large-scale enterprises, such as ambitious construction projects and modernization of artillery. Some of the huge guns under Mehmed II that fired so effectively at the walls of Constantinople were cast by a Hungarian (or German) gun master Urban.[65]

The complicated techniques for building and equipping large ships had also to be acquired from non-Ottoman lands. Experts were provided by the Italian sea powers, as in the case of two large battleships that were constructed by a shipbuilder trained in Venice.[66] The records for the sixteenth century show that all types of artisans among the Italian captives were employed in the dockyards and paid according to their technical skills, and that the warships were manned, in part, by hired specialists, Greeks and Italians. The military organisation of the navy was, of course, directed by the Turks, but there were many Christian renegades even among the highest ranks.[67] Sources show that there were many experts working at the

60. Parry. "Materials of War", pp. 224–225.
61. Fleet. ibid, pp. 22-23.
62. Babinger. "Fatih Sultan Mehmed ve İtalya". pp. 66-68.
63. Fleet. ibid, p. 119.
64. G. Agoston. Guns for the Sultan: Military Power and the Weapons Industry in the Ottoman Empire. Cambridge Studies in Islamic Civilisation. Cambridge: Cambridge University Press, 2005, pp. 42–43.
65. Fleet. ibid, p. 119.
66. Henry & Renée Kahane, Andreas Tietze, p. 15.
67. Kahane-Tietze, p. 15.

Imperial Cannon Foundry or Tophâne-i Âmire from different nations of Europe, and that Jews also existed as a minority. The French traveller Jérôme Maurand, who visited Istanbul in 1544, reported that at the foundry there were forty or fifty Germans, employed by the Sultan to cast cannons.[68] The French ambassador to Istanbul, *Monsieur d'Aramon*, added that in 1547-48, several French, Venetian, Genoese, Spanish and Sicilian experts worked at the Tophâne.[69]

Beside the Hungarian cannon master Urban, there were some European gun masters working for Mehmed II, such as Jörg of Nuremberg and George of Frankfurt. Jörg of Nuremberg, the author of '*Ayn Tractat von der Türcken',* seems to have been sent to the Herzog in 1456 by Count Ulrich de Cilly. According to his own account, he stayed in Bosnia until 1461, cast several cannons there and was taken prisoner, together with his wife and children, during an attack on the Herzog Stjepan by the forces of his son Vladislav and the Ottomans. Until 1480, he remained in the service of Mehmed II and cast cannons for him.[70] In 1463, during the siege of Bobovats castle in the Balkans peninsula he cast cannons which were 5 meters long and 60 cm in diameter. In 1480, he escaped to the service of Pope Sixtus IV in Rome and then went to Frankfurt his native city.[71] According to J. Needham, when he got back to Germany, he brought with him a new cannon casting technology which he had learnt when he was in service of the Ottomans. In Frankfurt in 1486 he melted and cast cannons in a "wind-pot" or kiln; that is, he was able to cast his pieces without contact between metal and fuel. The invention is significant for "it was ancestral to all the reverberatory furnaces (puddling, open heart, etc.) of European siderurgy." As we mentioned he also worked for a long time in the Ottoman Empire as a cannon founder, and thus it is strongly assumed that he may have learned the technique in the imperial cannon foundry.[72]

The other cannon maker, Master George from Germany, was living on the island of Rhodes and went into the service of Mehmed II as a volunteer. When the Sultan besieged Rhodes he worked for the Ottomans for a while and gave them the secret maps of the castle, but during the siege he was sent by the Sultan to the Knights' service as a spy. He cast huge cannons for them but when they understood his secret task they hanged him.[73] Through these cannon masters and others workers, some technological information was transferred from one side to the other during the fifteenth and sixteenth centuries. These technicians sold their skills to the lords and Sultans with mutual agreements.[74]

The Muslims had gun-founders of their own but, whenever the possibility arose, they always tried to acquire Western technicians. In many cases, they did not have to "capture" the craftsmen. Then, as always, there were many ready to sell their skills to rivals, if the salary was high enough. Many European technicians and skilled masters entered the service of the Muslims, and Western merchants went on selling

68. Itineraire de Jerome Maurand d'Antibes a Constantinople (1544) (Ed by L. Dorez), Paris 1901, pp. 201-204. A German traveller, Hans Dernschwam, who visited Istanbul in the middle of the sixteenth century, mentions that the Ottomans employ slaves to make some weapons. See. Hans Dernschwam (1494-1568), İstanbul ve Anadolu'ya Seyahat Günlüğü (trans., Y. Önen), Ankara 1992, pp. 166-169.
69. See: J. Chesneau, Le Voyage de Monsieur d'Aramon (published by M. Ch. Schefer), Paris 1887.
70 A. Vasiliev, "Jorg of Nuremberg", A Writer Contemporary with the fall of Constantinople (1453)", Byzantion 10 (1935), pp. 205-209; Petrovic. ibid, p. 184.
71. F. Babinger. Mehmed the Conqueror and his Time (trans. R. Manheim, ed. W. C. Hickman), Princeton: Princeton University, 1978, pp. 138-139, 335, 396-397; Petrovic. ibid., p. 184; V. J. Parry, "Barud", Encyclopaedia of Islam, Second Edition, E. J. Brill, I, p. 1062; Agoston, "Ottoman Artillery..", pp. 28-29; S. Yerasimos, Les Voyageurs Dans L'Empire Ottoman, Ankara: Türk Tarih Kurumu, 1991, p. 111; Feridun Dirimtekin. "Belgrad'ın İki Muhâsarası". Istanbul Enstitüsü Dergisi, 2 (1956), p. 61. A. Vasiliev, "Jörg of Nuremberg, A Writer Contemporary with the fall of Constantinople (1453)", Byzantion 10 (1935), pp. 205-209.
72. Joseph Needham, the Development of Iron and Steel Technology in China, London: the Newcomen Society, 1964, p. 22.
73. Babinger, Mehmed the Conqueror, s. 396-398; Ali Cengiz. "Fatih'in Top Döküm Ustası Georgius". Askeri Tarih Bülteni, 34 (1993), pp. 42-45.
74. Aydüz. Tophâne-i Âmire, pp. 140-160.

"strategic materials" to the Turks despite papal excommunications and prohibitions of all kinds. "Our Christians supply the Turks with all warlike munitions," a sixteenth-century Christian writer sadly remarked.[75]

The rulers themselves became personally interested in the matter of ordnance, and as in the case of Duke Alfonso d'Este, King John II of Portugal, King James IV of Scotland, the Emperor Maximilian and Mehmed II, they developed not only enthusiasm but real, technical expertise in the "art of gunnery." They patronised gunners and gun-founders and devoted a good deal of their resources to the building and the improvement of arsenals and artillery trains. Mehmed II, for example, gave the plans to cast huge cannons to his master during the siege of Constantinople and gave some directions on how to shoot ships at the Golden Horn via newly designed mortars.[76] The trade in raw copper and in bronze ordnance became one of the flourishing and profitable activities of the day moving mainly around the markets of Nuremberg, the main centre of German metallurgy; Lyon, through which France bought her provisions; Bolzano, on the way from the Tyrol to Northern Italy; and Antwerp where the flow of commodities from West Africa and later the spice islands met the flow of metallurgical products from Germany and Flanders. Much of the European "Früh-Kapitalismus" had it origins firmly rooted in this very fertile trade: the Fugger, to quote the most conspicuous example, were great merchants of copper and had a prosperous gun foundry at Fuggerau, near Willbach (Carinthia).[77]

The Records of the Imperial Cannon Foundry: *Tophâne-I Âmire*

As mentioned previously, the study of firearms / metals trade with the Ottoman State in early centuries is severely hampered by a lack of various records. There are very limited documents in the Ottoman archives about this trade. Iron and copper requirements for the cannon arsenal were obtained mostly from the Anatolian and Balkan ores of the Empire. More iron came from Anatolia where there were both iron and copper workings. Apart from the mines in North-East Anatolia, the Ottomans also came to control the metal resources of the Balkans. After the battle of Kosovo in 1389, for example, the mines of that region fell into Ottoman hands. The most important source for the supply of iron parts was Samokov in Bulgaria, where there were both iron mines and iron workshops.[78] When we check the imperial cannon foundry account book records, we can find some useful information about the firearms and munitions trade between the Ottomans and European states.

The Ottoman authorities in the capital city Adrianople (Edirne) developed cannon-foundries at the beginning of the fifteenth century. During these attempts mobile and fixed cannons were produced. The oldest arsenal was produced during the Murad II period in Adrianople. Even before this time, there had been mobile cannon foundries around castles to facilitate any attack against them. However it is well known that during the reign of Mehmed II, cannon founding attempts peaked due to his continuing plans to capture Constantinople. These works were organised by his master artilleryman Saruca Usta and architect

75. Cipolla. Guns and Sails. pp. 94-95.
76. Kritovulos, Tarih-i Sultan Mehmed Hân-ı Sânî (trans. Karolidi), İstanbul 1328, pp. 60–61; Tâcizâde Cafer Celebi. Mahrûse-i İstanbul Fetihnâmesi, İstanbul: Tarih-i Osmani Encümeni Mecmuası, 1331, p. 13; Zorzo Dolfin. "1453 Yılında İstanbul'un Muhasara ve Zaptı". (trans. Samim-Suat Sinanoğlu). Fâtih ve İstanbul, I, İstanbul: İstanbul Fethi Derneği, 1953, pp. 19–62.
77. Cipolla, Guns and Sails. pp. 26–27.
78. Colin Imber. "The Navy of Süleyman the Magnificient". Archivum Ottomanicum, IV, 1980, pp. 234-235.

Muslihuddin, although Mehmed II constantly controlled these works even attending to the design of a range of cannon sizes.[79]

Mehmed II gave much attention to the production of firearms[80] even after the conquest of Constantinople; in the 1470's, he constructed a central imperial cannon casting foundry (i.e., Tophâne-i Âmire), the biggest casting centre of the day, which included both the indigenous and foreign gunners. Even though there is not much specific knowledge about this cannon foundry during the reign of Mehmed II, it is known that large calibre cannons were cast.[81]

The personal interest of Mehmed II in military affairs especially in giant cannons was commonly known in Europe so that authors of military treaties dedicated their works to him and rulers who wanted to gain his support or simply desired to preserve good relations with him dispatched their own military experts to the Sultan. A manuscript copy of Roberto Valturio's (1413-84) *De re Militari* was sent to the Sultan by Sigismundo Malatesta in 1461, despite recurring attempts at prohibiting the transfer of up to date military knowledge to the "infidels," mainly by the Papacy and by countries at war with the Ottomans.[82]

The period of Mehmed II is well known as the golden age of Ottoman bronze foundry work. It is known that the Ottomans produced many types and quantities of cannons during the time of Mehmed II.[83] Some military sources indicate that the enemy had seized two hundred cannons during the siege of Belgrade in 1456, which were carried away to the palace of the Hungarian King in due course. These cannons received much attention according to both native and foreign sources which note that the extraordinary precision and size of them created such great excitement in Europe that people from different countries came to see the cannons: it is evident that the fame of the Ottoman-made-cannons had reached all Europe.[84]

The Ottoman State archive records provide us with very important information about the cannon founding industry. Especially the Tophâne-i Âmire account books, which contain significant information about firearms' metals and their origin. The organization of Tophâne as a large-scale state industrial enterprise appears to have been similar to that of other Ottoman activities in e.g. mining or agriculture or shipbuilding which, utilising in part free craftsmen and in part forced or slave labour, served the needs of the state. The Tophâne-i Âmire accounts books enable us to examine two of the chief aspects of the organisation and its activities; procurement of raw material for foundry work and the production of cannons and other objects. Before considering further the information within these account books I would like to mention the imperial cannon foundry (i.e., Tophâne-i Âmire) and a short history of firearms in the Ottoman State. Firearms came into use at the beginning of the fourteenth century but became a more effectual type of weaponry during

79. Gabor, "Ottoman Artillery". pp. 25–35.
80. Babinger, Mehmed the Conqueror. p. 139.
81. Aydüz. Tophâne-i Âmire ve Top Döküm Teknolojisi.
82. The Topkapi Palace Library in Istanbul owned a copy of the book's 1472 edition, (Hazine 2699). J. R. Partington, A History of Greek fire and Gunpowder, Cambridge: W. Heffer and Sons, Ltd., 1960, s. 164-166; Babinger, Mehmed the Conqueror. p. 201. Adnan Adıvar. Osmanlı Türklerinde İlim (ed. by A. Kazancıgil- S. Tekeli), Istanbul: Remzi Kitabevi, 1982, p. 40; Halil İnalcık, "Mehmed II", İslam Ansiklopedisi, Ankara: Milli Eğitim Bakanlığı Yayınevi, VII, p. 535; İnalcık. The Ottoman Empire: the Classical Age. p. 181; Agoston. "Ottoman Artillery". p. 25; Aydüz. Tophâne-i Âmire. pp. 12-15.
83. Gazavat-i Sultan Murad b. Mehemmed Han (ed. Halil İnalcık-M. Oguz). Ankara: Türk Tarih Kurumu, 1978; J. H. Lefroy. "The Great Cannon of Muhammad II (A.D. 1464)". The Archaeological Journal, 25 (London 1868), pp. 263-264; Ffoulkes. "The 'Dardanelles' Gun at the Tower". The Antiquaries Journal. X (July 1930), pp. 217-227; J. Piaskowski. "The Technology of Gun Casting in the Army of Muhammad II Early 15th Century". I. International Congress the History of Turkish-Islamic Science and Technology, İTÜ, 14-18 September 1981, Istanbul, 1981, III, s. 164; A. N. Kennard. Gun founding and Gun founders A Dictionary of Cannon Founders from earliest times to 1800. London: Arms and Armour Press, 1986.
84. Bain, R. Nisbet. "The Siege of Belgrade by Muhammad II, July 1–23, 1456". The English Historical Review, 7 (26) (April 1892), pp. 235–

the late fourteenth century. Firearms, which were used at first by Andalusian Muslim armies then by Western armies, started to be used by Ottoman armies during Murad II's reign (1421-1451). But such weapons become widespread throughout the Ottoman domains after the first quarter of the fifteenth century to the extent that the Ottoman trading companies exported new weapons from their own weapon plants. Progress in technology and production during Murad II's reign, reached a high level during the period 1451-81.[85]

The two metals which, in the early centuries, were required by the Tophâne for its cannon casting activities were copper and tin, the major and minor ingredients of bronze, which alone the Ottoman Empire made use of for casting cannons. Unlike many of their opponents, the Ottomans were fortunate to have had abundant ore deposits within the borders of their Empire to establish strong ammunition and ordnance industries. The only ore they lacked was tin which they imported from Europe.[86] The needs of the foundry were met in two ways: by the procurement of copper and tin; and by an elaborate recovery-system which brought to Tophâne from many parts of the Empire large quantities of scrap bronze cannons. Supplies of copper were plentiful in the Ottoman Empire, as we mentioned before, particularly in the area of Kastamonu. The Tophâne appears not to have drawn its supplies of the refined metal directly from the region of production, but from the imperial warehouses like Bağçe-i Âmire. Tin, however, was less accessible to the Ottomans, who were obliged in part to seek supplies from outside the Empire and in particular from Europeans such as the Venetians and Genoese and later the English. Tin, like copper, was not supplied from the mines to the foundry. Stores of the metal were maintained in Galata in the so-called *mahzen-i kule* and were released to the foundry on the authority of the *Kadi* of Galata or one of his deputies.[87]

After Mehmed II, his son Bayezid II ascended to the Ottoman throne. We have one official account book about the cannon casting during this time. This book is dated 1500 and mentions the cannon casting in Volana (Avlonya) and Preveza for the Ottoman navy. It gives an account of copper and tin and iron wire sent to Volana and Preveza from 4 Jumaada al-ûlâ 905 to the 18 Jumaada al-Akhir 905 i.e., 7 December 1499 to 20 January 1500 by the order of the Sultan. This account pertains to the new cannon casting in Volana and Preveza for the Ottoman Navy due to the Modon campaign. In this account book we find that the Ottomans bought copper, tin and iron wires for the cannons to be cast there. Most of these materials came from the imperial canon foundry warehouses and stores, although, most of the tin materials were provided by European merchants. Cannon Manufacturers in Volana and Preveza used a total of 530 kilograms of tin for the cannons. 46 kilograms of the tin was bought from Yakom Frenk and 326 kilograms from Felim and David Frank to the Ottomans. We cannot find any information about their nationalities but it is obvious that they were European merchants according to their names. There is also no information regarding the actual details of sale.[88]

The illicit traffic was not confined to the raw materials of war and other metals. It embraced also the sale of arms, e.g., guns, arquebuses, pistols, and muskets. One Ottoman document refers to a *muhtasib* of Safad

252; Feridun Ditimtekin. "Belgrad'in iki muhasarası". Istanbul Enstitüsü Dergisi", (Istanbul 1956), II, p. 61.
85. V. J. Parry. "Barud", Encyclopaedia of Islam, Second Edition. E. J. Brill. I, p. 1062.
86. Agoston. Guns for the Sultan: pp. 186-188.
87. Colin Heywood. "The Activities of the State Cannon-Foundry (Tophâne-i Âmire) at Istanbul in the Early Sixteenth Century According to an Unpublished Turkish Source". Prilozi, 30 (1980), s. 209–217.
88. Başbakanlık Arşivi, Ali Emiri, Bayezid II, Nr. 41, p. 12.

in Palestine who obtained fire-arms from the *Dâr al-Harb* and sold them to the Arab tribesmen.[89] One document contains a record dealing with the cannon trade via the Tophâne-i Âmire account books which belonged to Selim I reign (1512-1520). According to the record, the Ottomans bought some *darbzen* type cannons from Nikola Bayloz who was the Venetian ambassador to the Sublime Porte at that time[90] and was paid 20000 akcas for them by Ayas Aga, who was the chief gunner of the army. This account book shows the Tophâne's accounts between 1517 and 1518 during the reign of the Egyptian, Selim I. This record provides the only available information about the cannon trade between the Ottomans and Venetians at that time.[91] It is probable that the *darbzen* type of cannons were primarily used by the Ottomans in the second half of the fifteen century. Such cannons were being produced only by the Ottoman foundries. Those cannons that Nikola sold to them had to be produced in the Venetian foundry. Most probably they were casting those cannons after the Ottoman influence.[92]

Again during Selim I's reign, another Tophâne account book shows that the Ottomans bought 82 kilograms of Frankish steel,[93] to cast new cannons, for which they paid 13329 akcas. Hence, per kilogram, steel was sold for 162 akcas at that time. There is no more information about where this steel came from or who sold it to the Tophâne.[94]

There are more records about the Frankish steel trade in another Tophâne account book for 1524 to 1525, during the Suleyman I reign (1520-1566). At that time the Ottomans bought 84 kilograms of Frankish steel to cast different sizes of cannons in the Tophâne-i Âmire. They paid 13521 akcas which means the price was almost the same as the previous record. In addition to the steel, there is another item in this book worthy of mention. Some Frankish brass was bought for the same purpose. Apparently they bought 77 kilograms of brass and paid 12135 akcas. Thus, per kilogram, brass was sold at 157 akcas.[95]

Besides the Tophâne account books, there is some information in other documents about this trade which shows that the Ottoman traders were importing metals and other munitions from Europe to the home land. For example, Selim II sent an imperial decree (Name-i Hûmâyun) to the Doge of Venice about a Muslim traders problem in Rabi' al-Akhir 977 (13-22 September 1569). The Sultan stated that Mehmed Reis bought in Venice 2400 sword blades (kurde) and 260 lodra (140 kg.) of iron wire and 120 kantar (6480 kg) of Frankish steel (frengi çelik). He paid the customs, but the Venetian state confiscated the goods because they could not be exported. In addition Mehmed Reis was not refunded the money he gave to the customs although traditionally if a merchant paid the customs this meant that he could export the goods. The Sultan asked justice for him.[96]

Another example during the reign of Selim II is a request to the Doge of Venice for some affaires from the Venetians. A document dated in Jamaz al-awwal 977 (21-30 November 1569) states: "Since in Egypt they

89. Parry, "Materials of War", p. 227.
90. B. Spuler "Balyos". The Encyclopaedia of Islam, CD-Rom Edition, 1999, Koninklijke Brill NV, Leiden, The Netherlands.
91. "minhâ an bahâ–i darbzen ki an Nikola Bayloz harîde–est ber mûceb–i hükm–i şerîf–i âlî ki an ma'rifet–i Ayas Bey ser–cemâ'at–i topçıyân, 20000", Başbakanlık Osmanlı Arşivi, Kamil Kepeci, nr. 4726, pp. 12-50.
92. For the darbzen style cannons see: Aydüz. Tophâne-i Âmire.
93. Although it is not certain that this steel came from Europe, as far as we understand this material is only mentioned as "Frankish". Agoston also agrees that it most probably came from Europe or was taken from a European ship. See. Agoston, Guns for Sultan, p. 176.
94. Başbakanlık Osmanlı Arşivi, Kamil Kepeci, nr. 4726, pp. 18–19.
95. Başbakanlık Osmanlı Arşivi, D. BŞM. 9, pp. 2–8.
96. Venetian State Archives, Lettere e scritture turchesche, filza II, c. 280. Document published by Maria Pia Pedani, Dalla Frontiera al Confine, Quaderni di Studi Arabi. Studi e testi, 5, Roma, Herder, 2002, p. 62. I would like to convey my thanks to Pedani for kindly sending me these documents from her book.

need iron (çelik) for some affaires (muhimmat), when the Tercüman (dragoman) Mahmud arrives in Venice, please send 1000 kantar (54000 kg) of it on a Venetian ship going to Egypt". The Sultan had already given orders to the Beylerbeyi (governor) of Egypt Iskender to pay for the transport.[97]

At the end of the sixteenth century we find one more record about buying Frankish steel for the imperial foundry. According to the Tophâne-i Âmire account book, dated 1597, the Ottomans bought 2 kantars (108 kilogram) of Frankish steel from a Jewish merchant David Yahudi paying 4000 akças per kantar. They bought another 8.8 kantar of Frankish steel from him, but this time they paid 4400 akcas per kantar which made it about 12 akcas cheaper than in the previous records.[98]

In addition to these materials the Ottomans bought some other products for the Tophâne-i Âmire. According to the other account book of the Tophâne, dated between 26 March 1525 and 14 March 1526, the Ottomans bought 500 pieces "Frankish clay roofing tile" for Tophâne-i Âmire building and 500 coils of Frankish iron wire to use for cannon casting mouldings.[99] There is no more information about these materials here.

The last piece of information found in the Tophâne-i Âmire account book is related again to the tin trade. It provides an account of copper and bronze and tin for the casting of new cannons at the imperial cannon foundry from 29 Safar 928 to the end of Jumaada al-Akhir 932, i.e., from 28 January 1522 to 12 April 1526. It was recorded during Suleyman I's reign, that between 1523 and 1526, 200 kantars (10800 kg) of tin were delivered to the Tophâne from *mahzen-i kule* (Galata's Tin warehouse). A further 299 kantars 78 lodra of tin[100] (16180 kg.) was obtained from a "Frankish" supplier. In the early years of Süleyman I's reign, the main supplier of tin was Lodovico (Luigi, Alvise) Gritti, the natural son of the Venetian Doge Andrea Gritti[101], the Venetian *home d'affaires* and confidante of the Ottoman grand vizier İbrahim Paşa. Between September 1524 and February 1526 eight separate consignments of tin were supplied to the Tophâne directly from this source. This tin was bought for the casting of new cannons at the Tophâne-i Âmire but there is no more information regarding the money that was paid for it or where it came from.

As records of the firearms and munitions trade between the Ottoman Empire and European states, or those traders from European states, are limited, it can only be assumed from the remaining records that there was considerable trade relating to various war commodities and knowledge. It is hoped that future research and discoveries will shed further light on the history or war related trade between the Ottoman Empire and Christian Europe.

97. Venetian State Archives, Lettere e scritture turchesche, filza II, c. 283. Document published by Pedani, ibid, p. 62.
98. Başbakanlık Osmanlı Arşivi, Maliyeden Müdevver Defterler. No. 6760, pp. 2-8.
99. Başbakanlık Osmanlı Arşivi, D. BŞM. TPH. 1/1, pp. 2-8.
100. Başbakanlık Osmanlı Arşivi, Maliyeden Müdevver Defterler, No. 7668, pp. 1-27.
101. See: M. Tayyib Gökbilgin. "Kanuni Sultan Süleyman'ın Macaristan Siyaseti". Kanuni Armağanı, Ankara: Türk Tarih Kurumu, 1970. pp. 16, 177. He was known as a "Beyoglu (i.e., Son of Lord)".