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MERCES PROHIBITAE: THE ANGLO-OTTOMAN TRADE
IN WAR MATERIALS AND THE DEPENDENCE THEORY

According to common wisdom, established by a number of eminent scholars such as Carlo Cipolla, William McNeil, Paul Kennedy and Geoffrey Parker to name but a few, the European gunpowder revolution, along with the perfection of long-range ocean-going ships (generally called Atlantic sailing ships), gave the western world a decisive military advantage over non-European peoples. By the close of the 18th century Western Europe, relying on its superior naval technology and firepower, was clearly invulnerable to non-European armaments and was able to extend its hegemony both on sea and land. By the beginning of the 19th century this advantage led to western colonial domination becoming a reality.¹ In their quest outside the European continent, Westerners did not encounter any major opposition with the singular exception of the Ottomans, whose sultanate, by the beginning of the 16th century, had emerged as an Islamic Gunpowder empire both on sea and land.² In their success in withstanding the Western challenge (at least until the end of the 16th century on sea and until the end of the 17th century on land) the Ottomans’ willingness and ability to adopt western naval and gunpowder technology were of crucial importance.

In the transmission of western military technology, direct military conflicts and prohibited trade in weaponry and war materials both played an equally important role. Weapons obtained from captured ships and fortresses during naval battles and sieges as well as guns smuggled or imported from the West gave the opportunity to the Muslims to become ac-

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quainted with the new types of weapons and military technology. European renegades, military engineers and counsellors, gunners and technicians who served the sultans and taught the Ottomans the production and use of these new weapons, also helped military acculturation, which, together with the prohibited trade in weaponry and war materials, promoted the technological transfer and created similarity in weaponry and military technology, and hindered the victory of European hegemony.3

However, Ottoman gunpowder technology, as Geoffrey Parker argues in his influential monograph on the European military revolution, repeating the view expounded by Carlo Maria Cipolla more than a quarter of a century ago, was inferior to that of Europe. Cipolla was of the view that whereas their European enemies from the second half of the 15th century had «devoted great efforts to the production of light field artillery», the Ottomans failed to recognise the significance of the light field artillery and continued to cast and use outmoded giant guns4. Following Cipolla’s argumentation, Parker stated that one of the reasons for the technological backwardness of the Ottomans was their «difficulty in mass-producing and stock-piling manufactured items in order to build up a surplus».5 Consequently, the Ottomans, like other non-European empires, were dependent on European imports in weaponry and war materials in order to meet the European challenges and to avoid the political domination of the West. According to a recently published provocative monograph, this import of weaponry had more far-reaching socio-economic, cultural and institutional consequences in the countries concerned than had earlier been assumed.6

In the case of the Ottomans, the turning point is believed to have been the battle at Lepanto. After this battle the Ottomans, in order to replace their navy and artillery destroyed by the allied fleets of the Holy League, became dependent on western weaponry and war materials. The crippling and exhausting wars against Persia between 1578-1590 and 1603-1611, and against the Habsburgs and Hungarians on the Hungarian frontier in

4 – Cf. Cipolla, Guns and Sails, cit., p. 98. This view seems to be accepted even by the most recent scholarly monographs. See, for example, De Vries, Kelly, Medieval Military Technology, Peterborough, Ontario, 1992, p. 152. On the critique of this view cf. my “Ottoman artillery”, cit., p. 32-48.
5 – Parker, The Military Revolution, cit., p. 126.
1593-1606 significantly increased their needs for European armaments, metals and munitions.  

Although Vernon J. Parry has convincingly demonstrated, using mainly European published sources, that the Ottomans were largely self-sufficient in all the basic war materials, except tin, the Ottomans' dependence upon western, mainly English and Dutch, munitions and war supplies was emphasised again and again by European historians and Ottomanists alike. According to another hypothesis, the main reason for the Ottomans' military failures was their supply shortage and not their presumed inferiority in military technology or tactics which had formerly been stressed by traditional Eurocentric historiography. As the author of a pioneering work on Ottoman logistics and supply, Rhoads Murphey, with reason, criticised the old notion of the Ottomans' technological inferiority. He sought the explanation for their military failures in their supply problems rather than in cultural causes: «it was not only inferior technology nor inferior tactics which brought about the lessening in the Ottomans' ability to wage war, but their supply situation». He argued that the Ottomans were dependent on English and Dutch imports of gunpowder in order to supplement their own supply. However, by the end of the 17th century these channels of trade had become clogged up and the decline of Western ammunition imports was causing considerable difficulties in the supply of the Ottoman war machine.

Taking these views as a starting point, our purpose in this article is to suggest a revision of the dependence theory and some of the received views concerning the nature of and the reasons for the technological


backwardness and military failures of the Ottomans.

**Mutual export prohibitions**

Christian and Muslim states of the early modern period used every possible means in the fight against each other. They both made efforts to hide the newest technological and military developments, and forbade the export of weaponry and raw material necessary for warfare. Prohibition of the supply of weaponry and raw materials of military importance was not, of course, an invention of the early modern states. It was already a practice at the time of the Roman Empire, and had been formulated in the *Codex Justinianus*.\(^\text{12}\) Rival Christian and Muslim states in the Middle Ages also had such embargoes against each other. Embargoed goods, referred to as *merces prohibitae, merces inlicitae* in Latin, and *memnit\'at* in Arabic sources, included guns, metal, timber suitable for the building of fortresses and ships, canvas, horses and other draught animals, servants and food.\(^\text{13}\) Although the Popes and Christian rulers forbade the export of these commodities to Islamdom again and again, threatening those who broke the embargo with excommunication and anathema,\(^\text{14}\) there were always European merchants who were eager to make a profit by supplying prohibited goods to the infidels. Even during the period of the Crusades, Italian traders had provided the rulers of Egypt with war material.\(^\text{15}\) Further, when this prohibited trade declined considerably, it was not because of the efficiency of the interdict of the Popes or the Christian rulers, but because of the decay of the Muslim commercial and war fleets: the cause was lack of demand.\(^\text{16}\)

After the emergence of the Ottomans, it was their empire that was a new possible and tempting market for European merchants trading in

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such prohibited commodities. Prohibitions were repeated again and again, especially during major armed conflicts and engagements.\textsuperscript{17} Nevertheless, arms-trade and smuggling, as well as contraband trade in strategic goods, one of the most lucrative activities in human history, never ceased. There were always merchants and craftsmen, especially in frontier areas, who were eager to make a big profit by selling armaments and war materials to the Ottomans. In Hungary, for instance, the Ottoman saltpetre-inspector managed to buy 2,730 kantars (approximately 147 metric tons) of saltpetre from the Hungarian merchants in the vicinity of Gyula and Csanád over a period of three years and five months in the early seventies of the 16th century.\textsuperscript{18}

Trade in war materials and in strategic goods was also practised within the borders of the Ottoman empire despite the efforts of the Ottoman authorities who, like their European counterparts, were eager to control such a prohibited activity. Following medieval Islamic practice, the Ottomans also forbade the export of these commodities, declaring them 
\begin{itemize}
  \item \textit{memnu esya} or 
  \item \textit{memnu olan meta} (from the Arabic \textit{mamnû\'ät}).
\end{itemize}

In his well-known handbook on Islamic law, Molla Hüser, Mehmed the Conqueror’s famous Grand Mufti, regarded arms, horses and iron as prohibited goods even in peace-time, since these commodities could have been used for war against Muslims.\textsuperscript{19} Prohibitions were incorporated into the peace-treaties concluded with different Christian states, as well as into the passports issued to foreign travellers.\textsuperscript{20} Not even merchants of the vassal-

\textsuperscript{17} It is perhaps more than symptomatic that the Hungarian Diet had to repeat the prohibitions several times during the so called Long War (1593-1606). See Kolosvári, Sándor and Kelemen, Övári, \textit{Corpus Juris Hungarici.} 1526-1608. évi törvényezékek, Budapest, 1899, p. 802-803, 820-823, 864-865. Local authorities also issued several bans on \textit{merces prohibitae}, see, for example, the bans of Vas county from 1596 and 1598, Tóth, Péter, \textit{Vas vármegye közgyületi jegyzőkönyveinek regeszttái}, Miskolc, 1989, p. 53, nos. 144, 145, 141, 405.

\textsuperscript{18} – Istanbul, Başbakanlık Osmanlı Arşivi (Prime Minister’s Archives, henceforth BOA) Mühimme Defteri (henceforth MD) XXV, nos. 690, 751 and 789. Cf. also my “Ottoman gunpowder production in Hungary in the sixteenth century: the Baruthane of Buda”, in: Dávid, Géza and Pál Fodor (eds.), \textit{Hungarian-Ottoman Military and Diplomatic Relations in the Age of Süleyman the Magnificent}, Budapest, 1994, p. 151-152.


states of the empire were allowed to import prohibited goods from the empire.  

The list of such prohibited goods is quite lengthy and includes grain (tereke), arms (yarak), gunpowder (barut), saltpetre (güherçile) sulphur (kükürt), copper (nuhas), iron (demir), lead (kürşün), cotton (penbe), cotton yarn (rişte-i penbe), beeswax (balmumu), different kinds of leather, canvas (kırpas-i sefine), tallow (don yagi), pitch (zift) and horses (at). It is hardly surprising that the order containing one of the longest lists of prohibited goods dates from the end of the long Hungarian war of 1593-1606 when the empire's stores ran out of ammunition and foodstuffs, and when the empire needed all possible resources for the renewed Persian war of 1603-1611. It is also symptomatic that another decree, sent to the kadi of Salonica ordering the examination of the business of a certain Arslan Jew, who had been accused of trading in gunpowder, is from the same period, namely May 1603.

Judging from the number of decrees sent to different Ottoman officials during the seventies, eighties and nineties of the 16th century, it is obvious that the Ottoman authorities failed to suppress the contraband trade. It is especially striking that they failed to do so even at the entrance to the Gulf of Corinth and the Dardanelles, sites where they should have been able to ensure complete control of trade. One of the reasons for the Ottoman authorities' failure was, probably, the fact that some of those to whom such orders were addressed, kadıs and other Ottoman officials, were also involved in smuggling. It is also worth noting that smuggling was undertaken mainly in the winter months, i.e., after the season suitable for navigation (Turkish, derya mevsi) which lasted from Nevruz until

21 – Several orders concerning the Transylvanian ambassadors are to be found in the Mühimme Defteris. See, for example, Istanbul, BOA, MD XXVI. nos. 273, 291, 296.


23 – Istanbul, BOA, MD LXXV. no. 14.

24 – See the number of decrees on grain trade referred to by M. A. Cook in his Population Pressure in Rural Anatolia 1450-1600, London, 1972, p. 3-4.

25 – See, for example, the order quoted by Cook in Turkish: Cook, Population Pressure, cit., p. 5, footnote 1.
Kasım), 26 when the Ottoman fleet was at the Arsenal and not at sea. 27

Some of the capitulatory nations, however, were granted the right to import from the empire certain memnu meta such as cotton, cotton yarn, leather and beeswax, which at the time of the conclusion of their capitulation had been considered as non-strategic goods. The empire, on the other hand, was, in return, able to secure the import of lead, tin, iron and steel, strategic metals for their war industry, from these countries. 28

**English trade in weaponry and war materials in the Ottoman Empire**

In the 16th century one of the Ottomans’ most important suppliers was England. The beginnings of Anglo-Ottoman diplomatic and commercial relations have been discussed in detail by a number of scholars who have also pointed out the circumstances which promoted it, namely the deterioration of the relations between the Papacy and England. 29 In February 1570, Pope Pius V (7 January 1566-1 May 1572) excommunicated Queen Elizabeth I and her followers. As a result of this act, the English became even more isolated from the Catholic parts of Europe, and their merchants were free to harvest the huge profit from trade with Islamdom. 30

According to the report of Bernardino de Mendoza, the Spanish ambassador in England, the whole business started in 1580, at almost exactly the same time as William Harborne succeeded in concluding a commercial treaty with the Ottomans:

> Two years ago [1580] they [the English] opened up trade, which they still continue, to the Levant, which is extremely profitable to them, as they take great quantities of tin and lead thither, which the Turk buys of them almost for its weight in gold, the tin being vitally necessary for the casting of guns and the lead for purposes of war. It is double importance to the Turk now, in consequence of the excommunication pronounced ipso facto by the Pope upon any person who provides or sells to infidels such materials as these. 31

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26 – Istanbul, BOA, MD LXX. no. 165. Cf also Güçer, Lütfi, Osmanlı İmparatorluğunda Hububat Meselesi ve Hububattan Alınan Vergiler, Istanbul, 1964, p. 34.

27 – Cook, Population Pressure, cit., p. 4.


31 – Hume, Martin (ed.), *Calendar of Letters and State Papers Relating to English Affairs, Preserved Principally in the Archives of Simancas*, III, London, 1896, p. 366,
In May 1580, the Sultan issued a charter of privileges granted to the English merchants which formed the basis of Anglo-Ottoman trade relations for many centuries, and was almost the same as that given to the French traders in 1569. Anglo-Ottoman trade relations were strengthened by the work of the first English diplomatic mission, led by Harborne between 1583-1588, and by the English consulates founded in Egypt, Syria, Algeria, Chios and in Patras.32

During the Ottoman-Safavid war of 1578-1590 English ships sailed into the port of Constantinople several times, carrying tin, metal, guns and textile fabrics. On March 29, 1585, Giovanni Francesco Morosini, the Venetian ambassador in Constantinople, informed the Republic of an English ship which «arrived with a cargo of cloth, tin and other goods». He also reported that the Ottomans were pleased with the cargo as they had hardly any cloth in the city.33 A year later, on March 17, 1586, Lorenzo Bernardo, the Venetian ambassador in Constantinople, sent a report to the Doge and to the Senate, in which he informed them of an English ship which had entered port a few days earlier and unloaded tin and cloth. In all probability, the ship did not have any intention of hiding its cargo as «she made a great noise with her gun. In a few days she sold off her cargo and sailed away in ballast».34

Venetian and Spanish ambassadorial reports on Anglo-Ottoman trade in prohibited goods became more frequent during the Hungarian Wars of 1593-1606. On August 10, 1592, during the Ottoman preparations for the Hungarian campaigns, the Venetian ambassador, Matheo Zane, sent a message about an English shipment of linen and tin to the Ottomans.35 On February 10, 1596, during a critical period in the war, Marco Venier, Venetian ambassador to Constantinople, reported from Pera the great satisfaction of the Ottomans on the arrival of an English merchant ship carrying tin, tallow and a vast quantity of swords. He also reported on the arrival of another ship with a similar cargo.36 In his letter, dated April 25,
he reported that a ship, called Fontana, «has arrived with a cargo of twelve thousand yards of canvas for sails» from France since «it cannot be found of a good quality in Constantinople». On that very same night, while having dinner with his French colleague, he was informed that another English ship had brought a considerable quantity of swords.

After these reports, a few years of silence followed during which English traders were not mentioned. The next reference to them was made in the letter of Agostino Nani, Venetian ambassador in Constantinople, on January 7, 1601. In this report, he informs us about an English ship carrying tin and tallow. On December 1, another «English vessel has arrived with about three hundred bales of cloth and certain quantity of steel, the iron was discharged at Tunis».

The growing activity of English merchants in the Levant stirred the interest of the Venetians, who had played a significant role in the area in previous periods. On January 15, 1603, in a letter written to the Doge and Senate, Pietro Bondumier, Venetian Governor in Zante, made complaints about the predominance of the English traders who brought broad-cloth, cables, tallow, iron and arms, and took away, in exchange, silk, cotton, linen and carpets.

It was also during the Habsburg-Ottoman wars fought in Hungary between 1593 and 1606 that we first hear about an English shipment of gunpowder to the Ottomans. One English captive, imprisoned by the Ottomans between 1603 and 1605, wrote that the Janissaries had «not one corne of good powder but that whyche they get from overthrone Christians, or else is broughte them out of England». He also mentioned that the English «keep 3 open shoppes of armes and munition in Constantinople» and that «gunpowder is solde for 23 and 24 chikinoes the hundred; in England it costeth but 3 pounde. Tinne in Constantinople beareth the same price. Musketers are solde for 5 or 6 chikinos the peyce; in Englande they buy ordinary ones for 2 markes, the best for 18 shillings».

On January 15, 1606, Ottaviano Bon, Venetian ambassador in Constantinople, informed the Doge and the Senate that «the English are accustomed to bring into Constantinople at least five hundred barrels of powder every year; one of their ships did this successfully last year».

38 – CSPM, Venice, IX, p. 196. no. 427.
39 – CSPM, Venice, IX, p. 438. no. 941.
40 – CSPM, Venice, IX, p. 482. no. 1031.
41 – CSPM, Venice, IX, p. 516. no. 1119.
43 – CSPM, Venice, X, p. 312. no. 470.
These shipments were, of course, absolutely opposed by the other European countries. The English ambassador himself was in a rather difficult position when the Anglo-Ottoman prohibited trade was disclosed. According to Ottaviano Bon, his English colleague did not really know how to handle this problem: «The English ambassador is much confused, and does not know how to excuse this ugly business except by urging that gunpowder is a commodity in which England abounds, and that there is no harm in exporting it to friends like the Turks».44

European states showed their disapproval not only by words but also by deeds. As often as they could, they impeded and searched English ships and, in cases where they carried prohibited goods, such as guns or war materials, to the Ottomans, their cargo was confiscated. This is what happened in November 1605 when the ships of the Princes of Savoy and Malta held up an English vessel and tam-shipped its cargo to another ship, the Perastina, in order to transport it to Malta. They had good reason for this, as the cargo included English kersey cloth, English wool, 700 barrels of gunpowder, 1,000 barrels of arquebus, 500 arquebus for horsemen, 2,000 flat of the swords, and one barrel of good quality gold rod.45

English consignments continued to arrive in Constantinople during the renewed Ottoman-Safavid war. Continuous transportation was also secured through diplomatic efforts. Evidence for this includes the letter of Zorzi Giustiniani, Venetian ambassador in England, written on August 8, 1607. He reported that a certain Mustafa Caus «who left the Porte a few months ago and passed through France has arrived here. Yesterday he entered the city and is being entertained by the Company of Turkey Merchants. It seems that this mission is to deal with the question of the damage inflicted by the English bertons on shipping in the Levant and to secure the export of powder and arms for the Turks».46

There is no doubt that the usual trade of arms and war material continued during the seventeenth century, although references to it are not as frequent as at the turn of the century.47 During the Cretan war of 1645-1669, however, there is no lack of complaint on the Venetian side over the persistence of Anglo-Ottoman trade in prohibited goods. In December 1657, Francesco Giavarina, Venetian Resident in England, «moved by patriotic zeal», met Cromwell and «went on to speak of the injury to the most serene republic... through the assistance rendered to the Turks by English merchants» which consisted «not only of ships but of all manner of warlike supplies, such as iron, lead, bullets, powder, muskets, other

45 – CSPM, Venice, X, p. 525-6, no. 494.
46 – CSPM, Venice, XI, p. 22, no. 43.
47 – Alvise Valaresso, Venetian Ambassador in England reported on 19 August, 1622 to the Doge and Senate that “the usual trade with the Turks proceeds steadily”, CSPM, Venice, XVII, p. 393, no. 561.
arms, and all sorts of material required for war» which were taken from England «for the use of the Ottoman».48 It was again the trade in lead and tin that was considered the most flourishing business by the parties concerned. By 1636 the price of English tin had almost doubled: while it had sold earlier at 34 reals per ton (cantaro), it by now fetched 65.49 According to the report of Giovanni Battista Ballarino, Venetian Grand Chancellor at the Porte, dated April 3, 1662, even the King of England was «contemplating taking into his own hands the trade in lead and tin with the Porte taking it out of the hands of the merchants, in the certainty of deriving therefrom a large profit».50

No matter how interesting this prohibited trade in weaponry and war materials may be for the student of Ottoman history, we have to be very careful not to overestimate its significance. Regarding the import of firearms, it had some significance especially from a qualitative point of view. This prohibited trade helped keep the Ottomans abreast of the latest developments of western military technology at a time when other channels of Muslim-Christian military acculturation, such as those of direct conquest and of employment of renegades, seem to have become less important.51 By that time, the Ottomans had lost the opportunity of technology transfer through direct conquest, which in previous centuries had helped them to adopt Saxon and Serb ore mining technology and organisation,52 as well as Greek, Genoese, Slav and Hungarian shipbuilding and gun-casting technology, through the occupation of the ore mines, shipbuilding and gun-casting centres in the Eastern Mediterranean and in the Balkans. Thus, prohibited trade in weaponry was of crucial importance for the Ottomans in order to gain information on the latest developments

48 – CSPM, Venice, XXXI, p. 136, no. 111.
49 – CSPM, Venice, XXIII, p. 569, no. 665.
50 – CSPM, Venice, XXXIII, p. 126, no. 158. Ballarino gave some hint of the injurious consequences of this trade for the whole of Christendom, but he was of the opinion that his words were «without any success but rather with offence, because the private interests of the king and the (English) ambassador» were «too greatly concerned».
51 – It is obvious, however, that English, Flemish and French ships gave some assistance to the Ottomans during the Cretan war. For one such example, in 1657, during the critical period of the war, cf., CSPM, Venice, XXXI, p. 87, no. 65, p. 106, no. 82, p. 130, no. 103. This kind of co-operation certainly gave the Ottomans some opportunity to learn and adopt some of the newest European techniques of fighting. For further examples see CSPM, Venice, XXX, p. 70, no. 92, p. 74, no. 98.
of western military technology at a time when the quality of Ottoman weaponry was considered by their European contemporaries to be inferior.\textsuperscript{53} However, by this time, even with the help of this kind of military acculturation, it had become increasingly difficult, in an empire whose industry as a whole was underdeveloped and where industrial productivity and standards generally fell short of those of the European powers, to keep pace with the improvements and rising standards of the European armaments industry. While recognising the importance of military technology, we should not forget that, in a time when victories were gained «through a strategy of attrition»,\textsuperscript{54} \textit{i.e.}, «through the application of quantity rather than quality of the means of military violence»,\textsuperscript{55} temporary technological advantages seldom proved to be crucial in the long run. Since the Ottomans did posses almost all the required means of military violence in abundant quantity and had more human and economic resources at their disposal than any of their enemies, they did not care much about their technological inferiority.\textsuperscript{56}

As far as the \textit{war materials} and the \textit{quantity} of this prohibited trade are concerned, it is very doubtful that the Ottomans were as dependent on western import as is often stated in the related literature. According to Turkish archival sources, in the second part of the 16th century, the quantity of gunpowder produced annually in some of the main Ottoman gunpowder factories of Egypt, Baghdad, Istanbul, Buda and Temesvár varied from 18,000 to 20,300 \textit{kantars}, \textit{i.e.}, from approximately 1,000 to 1,300 metric tons.\textsuperscript{57} This does not include the production of the gunpowder

\begin{footnotesize}
\textsuperscript{53} – On this see the observation of one of the few practising contemporary artillerists, Luis Collado, the author of one of the most popular treatises on gunnery in the 16th and 17th centuries, \textit{Practica Manual de Arrietgleria}, Venice, 1586. Collado stated that cannon «founded by the Turks are usually poor and flawed, even though the alloy is good», quoted by Parker, \textit{Military Revolution}, \textit{cit.}, p. 206, note 40. See also Luigi Ferdinando Marsiglì’s similar observation quoted in my “Ottoman Artillery”, \textit{cit.}, p. 47. The supposed inferiority of Ottoman ordnance, however, should be studied in detail on the basis of Ottoman-Turkish archival sources and further chemical analyses of extant Ottoman guns.

\textsuperscript{54} – Parker, \textit{Military Revolution}, \textit{cit.}, p. 43.

\textsuperscript{55} – On this see Raudzens, George, “War-winning weapons: the measurement of technological determinism”, in: \textit{Journal of Military History} LIV (October 1990), p. 408.

\textsuperscript{56} – It is interesting that although Geoffrey Parker shares this view in one of his footnotes, \textit{Military Revolution}, \textit{cit.}, p. 206, footnote 40, he argues for the Ottomans’ «difficulty in mass-producing» in the main text, \textit{ibid.}, p. 126.

\textsuperscript{57} – Cf. Ágoston, Gábor, “Osmanlı İmparatorluğu’nda harp endüstrisi ve barut teknolojisi (1450-1700)”, in: Eren, Güler (ed.), \textit{Osmanlı, VI, Teşkilat}, Ankara, 2000, p. 621-632, especially, p. 625-628. Although the related literature concerning the calculation of the \textit{okka} and the \textit{kantar} follows Walter Hinz’s suggestion, based on the
\end{footnotesize}
works of, among other places, Belgrade, Yemen or Aleppo, which would clearly considerably increase the figure for domestic production.

It was during the long-lasting Hungarian campaigns of the Habsburg-Ottoman war of 1593-1606, which followed the exhausting wars against Safavid Persia (1578-1590), that the Ottomans faced a temporary lack of gunpowder and were in need of European powder. However, according to Venetian ambassadorial reports between 1579 and 1610, i.e., over a 32-year-long period of constant war, only 11 English ships reached the Ottoman capital. Further, it was only in 1605, that a ship was reported as actually carrying gunpowder. In this case, 700 barrels of English gunpowder were confiscated. Adding to this a similar quantity of Dutch powder, and counting the whole as an annual import, we still only get a modest quantity of imported powder in comparison with that obtained from domestic sources.

Although in Turkish archival documents from the end of the 17th century we frequently come across a certain type of gunpowder called English powder (İngiliz perdaht), this was not an imported powder from England but a specially refined powder produced locally in Ottoman powder-works under the new or so-called English custom (be ayar-i cedit or be ayar-i perdaht-i İngiliz respectively). This powder contained 75 per cent of saltpetre and 12.5 per cent of sulphur and charcoal, which was the most usual proportion in England and most European countries, even in the first half of the next century.

Judging from the available Turkish archival sources the Ottomans did possess enough powder even at the end of the 17th century. After the unsuccessful siege of Vienna, for example, facing a possible Christian assault, the governor of Buda urged the central government to send more ammunition and weaponry to this remote fortress. By the end of March 1684, an enormous amount of war materials had been sent to the fortress.

Rumi dirhem of 3,207 g., that 1 okka=1,2828 kg. and 1 kantar=56 kg., we should probably base our calculations for the period before the end of the 17th century on the Tebrizi dirhem of 3,072 g. Thus, one kantar would be 54 kg. For reasons of convenience, however, in this article I also follow the accepted 1 kantar=56 kg. calculation. On this see my “Gunpowder for the Sultan’s army: new sources on the supply of gunpowder for the Ottoman army in the Hungarian campaigns of the sixteenth and seventeenth centuries”, in: Turcica, XXV (1993), p. 80, footnote 24 and the literature quoted there.

58 – Istanbul, BOA, DBŞM 19085, p. 4 and MAD 7488, p. 10.
A detailed register mentions 10,000 kantars (540-560 metric tons) of gunpowder accumulated in Buda. 60 This abundant store of ammunition certainly helped the beleaguered Ottomans to withstand the three-and-a-half-month blockade and siege led by Charles of Lorraine. After the siege the Ottomans replenished their magazines. In 1685 and at the beginning of the following year a considerable amount of ammunition was delivered from the stores at Belgrade to Buda. A detailed register of shipments documents that, by the end of February 1686, almost 7,400 kantars (more than 400 metric tons) of gunpowder had been transported to Buda. 61 After a two-and-half-month-long siege, victorious Christian forces entering Buda on September 2, 1686 found that the Ottomans still had a further month’s supply of provisions and ammunition. 62

A more or less systematic survey of the Turkish archival sources concerning the income and expenditure of the Imperial Armoury (Cebehaneye-yi Amire) during the long war after the second siege of Vienna leads us to the same conclusion. Turkish archival sources at our disposal seem to suggest that even at the end of the 17th century, the empire possessed a sufficient amount of raw material to cast ordnance and to supply the artillery with cannonballs and gunpowder and was able to keep pace with ever-increasing requirements and could supply its military machine using mainly domestic sources and a native work force.

After having studied a series of the inventories of the incomes and expenditures of the Imperial Armory, I was able to trace very rare war materials that were purchased from European traders even during the long war against the joint forces of the Holy League.

In January and May 1688, after the exhausting campaigns of 1687 and 1688, the Armoury purchased a considerable amount of lead from a European merchant. In January, the Armoury bought 2,500 kantars of lead and in May a further consignment of 1,380 kantars of lead. Thus, these two consignments represented almost 90 per cent of the total supply of lead (4,380 kantars) to the Armoury in this period. 63 These data confirm our former understanding concerning the Ottomans’ need for European tin and lead.

The situation of gunpowder, however, seems to have been different. In February 1688, the Imperial Armoury bought 115 kantars of gunpowder from a European merchant, and two further consignments of 105 and 75 kantars from a certain Yorgos zimmi in April and in November 1688 respectively. In other words, the Armoury got only 295 kantars of pow-

61 – Istanbul, BOA, DBSM 489.
der from external sources whereas the total income of gunpowder was 6,003 kantars.\textsuperscript{64}

It is only in January 1700, after the conclusion of the peace treaty of Karlofiça (Karlowitz) which ended the Long War between the Ottomans and the members of the Holy League, that we come across a more considerable amount of gunpowder purchased from an English merchant. At that time, the income of the Imperial Armoury was 2,108 kantars of gunpowder, out of which 1,208 kantars were bought from an Englishman. After having spent 240 kantars of gunpowder the remaining amount in the Imperial Armoury was only 1,868 kantars.\textsuperscript{65} Although during such exhausting, long campaigns the import of weaponry and war materials may have been of some importance, it was insignificant both in comparison with the capacity of domestic production and with the needs and requirements of the imperial campaigns.

It follows, therefore, that shortages in ammunition supply were not caused by the lack of raw materials nor by the supposed decline of English and Dutch imports. Such factors as double front engagements and a lack of efficient means of transport and communications were obviously of greater significance in an empire where weaponry and ammunition manufacturing plants were scattered at different points across the empire and thousands of miles from the theatre of war.

What was more decisive for the supply situation occurred not in the empire but in Europe. In comparison with the European supply-system, the Ottoman system seems to have been more effective until the introduction of wide-ranging economic and administrative reforms in Europe. After these crucial administrative-bureaucratic reforms had taken place, however, most of the European states were able to supply their ever growing armies with the necessary weaponry and munitions. Further, those weapons were of higher quality than those of the Ottomans. The European states had by then outstripped their mighty rival not only in the field of the war industry, military technology and know-how, but also in such fields as finance, bureaucracy, scientific infrastructure and state-patronage, which were of considerable importance for promoting the development of the European military machine.

It follows, therefore, that it was neither the presumed inferiority of Ottoman military technology suggested by traditional Eurocentric historiography, nor the Ottomans' supposed difficulty in the supply of weaponry and munitions which caused the Ottomans' military failures. Instead the root causes of these weaknesses lay in the less efficient system in which these weapons and resources were mobilised, supplied and used. In other words, the backwardness was institutional rather than technological. It was not better guns that gave the advantage to the Europeans, but better

\textsuperscript{64} – Istanbul, BOA, Kepeci 4738, p. 1 and 6.

\textsuperscript{65} – Istanbul, BOA, MAD, 2730, p. 46.
drill, superior order, and a more efficient and sophisticated supply system. And behind this whole process we find the crucial scientific, bureaucratic, financial and military developments, commonly known as the "European military revolution", a term the precise meaning of which is, itself, increasingly in dispute.

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