

in 1453, and Jörg of Nuremberg, who served the sultan between 1460 and 1480. But there were hundreds more, unknown to us by name, who forged wrought iron guns, cast bronze cannons, manufactured gunpowder for the sultans, and operated cannons and guns in Ottoman fortresses. Yet, the majority of founders in the Ottoman foundries were Muslim Turks, as were the artillerymen (*topçu*) and gunners (*tüfekçi/tüfenkçi, tüfenk-endaz*) in Ottoman fortresses and armies.<sup>2</sup>

Most of the artillerymen were members of the artillery corps (*topçu ocağı*), which the Ottomans established as part of the sultan's standing army in the early fifteenth century, well before their opponents in Europe and Asia. By the beginning in the second half of the fifteenth century, the Ottomans had organized the corps of gun carriage drivers (*top arabacı*), who manufactured, repaired and operated the war wagons in campaigns, and set up the wagon laager or *tabur*. Firearms and gunpowder used by the Ottomans were largely manufactured domestically. The empire possessed the necessary raw materials, and the government established weapons and ammunition industries, which until the mid-eighteenth century were capable of meeting the need of the armies, navies and fortresses. The resulting Ottoman firepower superiority in turn forced the sultans' adversaries to employ firearms in ever-larger numbers and to reform their militaries accordingly. The following essay offers new evidence and consideration regarding the Ottomans' impact on the diffusion of gunpowder technology in Safavid Iran and the Indian subcontinent in the sixteenth century.<sup>3</sup>

## CHALDIRAN AND SAFAVID RESPONSES

One stunning example of the efficacy of Ottoman firepower was the Battle of Chaldiran. In the battle, fought on 23 August 1514, at a site northeast of Lake

2 Gábor Ágoston, 'Firearms and Military Adaptation: The Ottomans and the European Military Revolution, 1450–1800', *Journal of World History* 25:1 (2014) 88–90, 94, Table 2; Salim Aydıız, *Tophâne-i Âmire ve Top Döküm Teknolojisi*. Ankara, 2006, 136–148.

3 For earlier studies see Halil İnalcık, 'The Socio-Political Effects of the Diffusion of Firearms in the Middle East', in V. J. Parry and M. E. Yapp (eds.), *War, Technology and Society in the Middle East*. London, 1975, 195–217; Salih Özbaran, 'The Ottomans' Role in the Diffusion of Fire-arms and Military Technology in Asia and Africa in the Sixteenth Century', in Idem, *The Ottoman Response to European Expansion*. Istanbul, 1994, 61–66 (originally published in 1986).

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Van in present-day northwest Iran, the Sunni Ottoman Sultan Selim (1512–1520) defeated his Shia Safavid rival, Shah Ismail (1501–1524). While Ottoman numerical superiority and Safavid tactical errors also contributed to Ottoman victory, Ottoman firepower and the use of the wagon laager proved decisive factors against an enemy which did not deploy firearms in the battle. At Chaldiran, Sultan Selim, "as was the Anatolian manner, surrounded his encampment with shields and caissons, linking the caissons together with chains. The twelve thousand matchlockmen he always had with him were stationed in front of the lines."<sup>4</sup> When the Safavid cavalry pushed the Ottomans back, they retired to their wagon laager, which the Ottomans had learnt from the Hungarians in the 1440s, calling it *tabur* after the Hungarian name of the wagon laager (*szekértábor*). From behind their defensive wagon laager, which Safavid chroniclers described as an impenetrable "strong fortress", janissary gunners drove back multiple charges of the Kizilbash cavalry, the backbone of the Safavid army.<sup>5</sup>

The lack of firearms in the Safavid army at the battle is puzzling, as the Safavids had been familiar with the weapon well before the battle. Scholars have long discredited the Sherley myth, which claimed that two English soldiers of fortune, Anthony and Robert Sherley, introduced firearms into Iran in the late 1590s. Contemporary sources demonstrate that the Ak Koyunlu Turkmens – the Safavids' predecessors in Azerbaijan and Iran – had used firearms in the 1470s, under their most capable ruler, Uzun Hasan (1453–1478). In 1501, Ismail, the grandson of Uzun Hasan and the leader of the militant Safaviyya Sufi movement, entered Tabriz, the seat of his grandfather Uzun Hasan, and declared himself shah of Persia and Twelver Shiism the official religion of his realm. In successive battles, Shah Ismail eliminated the

See also Salih Özbaran, *Ottoman Expansion Towards the Indian Ocean in the 16th Century*. Istanbul, 2009, 273–282.

4 Ghiyās al-Dīn ibn Humām al-Dīn Khvānd Mīr, *Habībū's-Siyar*. Translated and edited by Wheeler M. Thackston. Cambridge, Mass., 1994, 546–605, 606. Although several contemporary narrative sources put the numbers of the elite infantry janissaries with handguns at 12,000 or more, archival sources show that only 10,065 janissaries were paid before the battle, and only about half of them were armed with guns.

5 Gábor Ágoston, 'War-Winning Weapons? On the Decisiveness of Ottoman Firearms from the Siege of Constantinople (1453) to the Battle of Mohács (1526)', *Journal of Turkish Studies* 39 (2013) 129–143, particularly 134–137.

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