Military Integration in Mongol Warfare: The development of Combined Arms Warfare in the Mongol Empire[1]

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Abstract: Armies of the Mongol Empire are typically imagined as vast armies of nomadic horse archers. While this is true and horse archers always remained the core component of the Mongol military in any part of the empire, the Mongol military used a variety of different units based on the operational theater and the availability of different units. Early in the Mongol conquests, the Mongols adopted siege warfare and developed a corps of engineers and artillery. Additionally, large units of infantry were used not only in China but also in other regions. The conquest of the Song Empire necessitated the development of a navy. Despite the disasters during the invasions of Japan, the Mongols actually became quite adept at naval warfare, particularly riverine warfare, not only using local methods, but also adopting tactics from steppe warfare to riverine combat. Finally, special units developed. Some of which were elite units, but other emerged for different types of warfare while still others, such as shamans, were embedded with armies but were only used when necessary. This discussion will examine the incorporation of sedentary troops into a nomadic military as well as how the Mongol military commanders learned to use them together.

Key words: horse archers; naval warfare; navy; shamans; engineers; artillery; cavalry

Combined arms warfare is the cooperation and combination of different military units (such as infantry, artillery, and cavalry) in a military operation. Today this can be even more complex with the development of mechanized infantry and air power. The basic idea behind combined arms warfare is "that different arms and weapons systems must be used in concert to maximize the survival and combat effectiveness of each other. The strengths of one system must be used to compensate for the weaknesses of others".[2]

In conquering an empire that stretched from the Sea of Japan to the Mediterranean Sea, the typical image of the Mongols is a literal horde of leather-clad warriors sweeping across the steppes bringing death and destruction. The sources from the period of the Mongol army describe their conquests with an apocalyptic anxiety. For

[1] This paper originated out of a lecture given at the University of North Carolina-Chapel Hill (September 18, 2018) and then the American Center for Mongolian Studies (April 10, 2019).

[2] Captain Jonathan M. House, *Towards Combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and Organization* . Combat Studies Institute. Research Survey, No. 2. (Fort Leavenworth , KS: U. S. Army Command and General Staff College, 1985), 2.

instance, we have Ibn al-Athīr, who wrote his chronicle from the safety of Mosul in northern Iraq. According to him,

> For several years I continued to avoid mention of this disaster as it horrified me and I was unwilling to recount it. I was taking one step towards it and then another back. Who is there who would find it easy to write the obituary of Islam and the Muslims? For whom would it be a trifling matter to give an account of this? Oh, would that my mother had not given me birth! Oh, would that I had died before it occurred and had been a thing forgotten, quite forgotten!....If anyone were to say that since God (glory and power be His) created Adam until this present time mankind has not had a comparable affliction, he would be speaking the truth. History books do not contain anything similar or anything that comes close to it.[3]

Ibn al-Athīr had a flair for the dramatic, but he was not finished.

> As for the Antichrist, he will spare those who follow him and destroy those who oppose him, but these did not spare anyone. On the contrary, they slew women, men and children. They split open the bellies of pregnant women and killed the fetuses….In about a year these men conquered most of the known earth, its fairest part and the most civilized and populated and of its inhabitants the most equitable in manners and conduct. In the lands they did not reach there was nobody who was not in fearful expectation of them, watching for their arrival.[4]

The sense of fear and dread in his writings is palpable. The Mongols were unknown, little understood, and viewed more as a supernatural power or force of nature rather than as men.

Twentieth century popular writers did little to dissipate the aura of shock and awe that accompanied the Mongol armies. Indeed, the Mongols armies are referred to as the Storm from the East, the Hurricane from Mongolia, and so forth.[5] These comparisons that transform the Mongols into a force of nature are based on the destruction left in their wake.

Yet, for all the hyperbole, the ability or destruction of the Mongol military machine should not be diminished. There has never been an army so feared nor one that has

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[3] Ibn al-Athīr, *The Chronicle of Ibn al-Athīr for the Crusading Period from al-Kāmil fī'l-ta'rīkh,* Part 3, trans. Richards, Crusade Texts in Translation 17 (Burlington, VT: Ashgate, 2008), 202; Ibn al-Athīr, *al-Kāmil fī al-ta'rīkh,* vol. 12 (Beirut: Dār Ṣadir, 1979), 358. Henceforth Ibn al-Athīr/Richard and Ibn al-Athīr respectively.

[4] Ibn al-Athīr/Richards, 203; Ibn al-Athīr, 359.

[5] Robert Marshall, *Storm from the East* (Los Angeles: University of California Press, 1993), *passim.*; Trevor N. Dupuy, *The Evolution of Weapons and Warfare* (Indianapolis: Bobbs-Merrill, 1980), *passim.*

lived up to its reputation. Certainly, other steppe or "barbarian" armies existed. The Huns are still referenced as a byword for bad behavior, the Vandals became a word for intentional destruction, and the Avars became the root for unmitigated greed. Yet, none had the same military impact. The Mongols established an empire that never truly fell, but faded away largely due to internal conflict. Their armies of horse-archers proved to be the dominant military force on the battlefield well into the fifteenth century. Only with the advent of cannon did the horse archer recede in importance.

While all of these motifs are fitting for the Mongols, it should not be forgotten that the Mongol military was a multifaceted organization. While units of horse-archers remained the core component of the Mongols, from the very start, the Mongol military quickly developed other units ranging from heavy cavalry, a corps of engineers, artillerists, and even infantry. Initially many of these were simply auxiliary units, but gradually the Mongols developed what should be considered a doctrine of combined arms warfare.

The development of artillery is not surprising as it was something that everyone needed in siege warfare. Early Mongol efforts at siege warfare proved somewhat desultory and clearly demonstrated the need for more effective siege weapons. At the siege of Zhongxing in Xi Xia (1209-1210), the Mongols diverted a river to flood the city. It was successful, but in the process, the Mongols also almost drowned themselves.[6] I suspect the city surrendered not only because of the damage from the flood, but also because they determined that the Mongols proved sufficiently unpredictable that peace was preferable.

Yet, from encounters in the Jin Empire, the Mongols gained their own artillerists to build and direct the operation of trebuchets and other siege weapons. These were acquired not only through prisoners, but also through active recruitment. During the war with the Jin Empire, many joined out of disaffection with the Jin Empire as well as believing that Chinggis Khan was a better leader.[7] As the Mongols siege ability expanded, so did the possibilities. Field artillery was a rare circumstance in the medieval period. Trebuchets, mangonels, and ballistae were bulky and needed to be assembled—something that swift moving Mongols columns did not allow. Certainly,

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[6] Song Lian, "The History of the Yuan, Chapter 1", tr. Christopher P. Atwood, *Mongolian Studies* 39 (2017): 24-25; Rashīd al-Dīn, *Jāmī' al-tawārīkh*, ed. B. Karimī (Tehran: Iqbal, 1983), 427; Rashiddun Fazlullah, *Jami'u't-tawarikh: Compendium of Chronicles,* tr. W. M. Thackston (Cambridge, Ma: Harvard University, Department of Near Eastern Languages and Civilizations, 1998), 289-290; H. D. Martin, *The Rise of Chinggis Khan* (New York: Octagon Books, 1981), 118-19. The Rashīd al-Dīn will be henceforth RD/Karīmī; RD/Thackston 1998 respectively.

[7] Song Lian, *Yuan Shih* 98, tr. Ch'i-ch'ing Hsiao, in Ch'i-ch'ing Hsiao, *The Military Establishment of the Yuan Dynasty* (Cambridge, MA: Harvard University Press), 74; Song Lian, *Yuan Ulsin Sudar* 98, vol. 9., tr. G. Akim, M. Bayarsaikhan (Ulaanbaatar: Soyombo Printing, 2016), 560-98; Timothy May, *The Mongol Art of War* (Barnsley: Pen & Sword, 2016), 30, 38-39; Thomas Th. Allsen, "The Circulation of Military Technology in the Mongolian Empire", in *Warfare in Inner Asian History*, 500-1800, ed. Nicola Di Cosmo (Leiden: Brill, 2002), 269.

a siege train followed the Mongols, but camels move slower than horses.[8] Still, there were occasional set piece battles where the Mongols had time to assemble their trebuchets. At the battle of Mohi in Hungary (1241), the Mongols seized a bridge across the Sajo River by using a rolling barrage from their trebuchets.[9]

Elsewhere, other forms of combined arms warfare took place. As the Mongols campaigned against the Jin Empire in northern China, they acquired new units such as heavy cavalry, infantry, and the *paojun* or catapult artillerists.[10] The infantry was primarily used in siege warfare, but they also saw combat in field engagements. It is often cited that the Mongols had an army of 60% light cavalry and 40% heavy and their units of 100 and 1000 reflected these proportions. This is inaccurate and based on description of the army of the Liao (907-1125) and Jin Dynasties (1125-1234).[11] The Liao were Khitans and related to the Mongols. The description from the Liao Shih has often been applied to the Mongols, particularly in terms of equipment, but it is not based on contemporary sources.[12] The Mongols did not try to fit non-nomadic units into their existing structure. Rather, they allowed them to remain their own discrete units and continue to fight in the same mode as before. For Chinggis Khan, there was no sense in trying to fit square pegs into round holes. Those that could fit in the Mongol, or rather nomadic, style could do so, but for those who could not, they remained in their standard units, but decimally organized. The key to success, however, was learning how to apply them effectively on the battlefield.

This came quickly. The core of the Mongol military remained the nomadic horse-archer, but medium and heavy cavalry increased with acquisition of Khitans and Jurchens. Additionally, the recruitment and creation of armies of Han Chinese infantry because increasing useful as the Mongols pushed into the mountainous terrain of south China in the 1250s. Yet, this was not the only region that the Mongols used mixed forces.

After the conquest of Armenia and Georgia, the Mongols began using Georgian and Armenian troops. The Georgians quickly became a favorite unit of the Mongols in the west. They participated in various campaigns against Muslim powers such as the Seljuk Sultanate of Rum. If we trust the sources, Baiju's deployment of the

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[8] Bat-Ochir Bold, *Mongolian Nomadic Society: A Reconstruction of the 'Medieval' History of* Mongolia (New York: St. Martin's Press, 1999), 38.

[9] Thomas of Spalato, *Istoriye Arxiyepsikov Saloni i Splita,* tr. A. I. Solopov, ed. O. A. Akumovoi (Moscow: Indrik, 1997), 106-110; 292-95; Thomas of Split, *Historia Salonitanorum atque Spalatinorum pontificum,* ed.and tran. Damir Karbic, Mirjana Matijevic Sokol, and James Ross Sweeney (New York: Central European University Press, 2006), 262-263.

[10] Allsen, "Circulation of Military Technology", 276-278; Song Lian, *Yuan Shih* 98, 74.

[11] Martin, *Chingis Khan and the Conquest of North China,* 33-34;

[12] See H. D. Martin, *Chingis Khan and the Conquest of North China,* Karl A. Wittfogel and Feng Chia-Sheng, *History of Chinese Society: Liao (907-1125)* (Philadelphia: The American Philosophical Society, 1949), 531-36; 559-60.

Georgians was crucial to the Mongol victory.[13] These were also deployed at the siege of Baghdad, as were Muslim troops, and then again with the invasion of Syria in 1260.[14] It was not unusual for the Mongols to take advantage of rivalries and past grievances among their enemies, thus the use of Christian soldiers against Muslims (and vice-versa) made sense on many levels.

Yet, the Mongols did not have to depend on religious rivalries alone. In the events leading up to the siege of Baghdad and the resulting destruction of the Abbasid Caliphate in 1258, Caliph Mutʿasim warned Hülegü that all of Islam would rise up against the Mongols and rush to his aid. Imagine his surprise when the armies of numerous Muslim potentates from across Iran joined the Mongols.[15] These armies brought not only more cavalry, both medium and light, but also infantry and their own siege artillery including counter-weight trebuchets, far superior to the traction trebuchets the Mongols had previously used. It can be certain that counter-weight trebuchets were used as Shīrāzī informs us that these *Borj-i ʿAjamī* (Persian Towers) launched missiles weighing up to 100 *mann* (1 *mann* = 3 kg = 6.6 pounds), exceeding what normal traction trebuchet could launch at the Aleppo Gate and Triumphant Gate.[16]

Before the fall of Baghdad, however, the Mongols also dealt with the branch of Shi'ism known as the Nizārī Ismāʿīlīs, more popularly known as the Assassins.[17] No field battles were fought in this campaign. The Ismāʿīlīs had long learned in their dealings with the Seljuks and then the Khwarazmians that they lacked the ability and numbers to win on the battlefield, hence why they turned so frequently to the assassination of leaders to extend their influence. While the Nizārīs had been Mongols

[13] Bar Hebraeus, *The Chronography of Gregory Abu'l-Faraj,* tr. Ernest A. Wallis Budge (Amsterdam: APA-Philo-Press, 1932), 407-409; Minhāj Sirāj Jūzjānī, *Ṭabaqāt-i-Naṣirī*, vol. 1, ed. ʿAbd al-Ḥayy Ḥabībī (Kābul: Anjuman-i Tārīkh-i Afghānistān, 1964-65), 313; Minhāj Sirāj Jūzjānī, *Tabaḳat-i-Naṣirī* (*A general history of the Muḥammadan dynasties of Asia),* tr. Major H. G. Raverty (New Delhi: Oriental Books Reprint Corp, 1970), 162; Grigor of Akanc, "The History of the Nation of the Archers by Grigor of Akanc," translated by R. P. and Frye Blake, R. N, *Harvard Journal of Asian Studies* 12 (1949): 307-309; Marie Félicité Brosset and David Iessevich Chubinov, *Histoire de la Géorgie. Jusqu'au Xixe Siècle,* Tr. Brosset. 2 Pt. [in 4 Vols.] (St.-Pétersbourg, 1849), 518.

[14] Grigor, 337; Hayton, "La Flor des Estoires de la Terre D'Orient", *Recueil des Historiens des Croisades: Documents Armeniens, Tome Second.* (Paris: Imprimerie Nationale, 1906), 170; Bar Hebraeus, 435; Ahmad Ibn ʿAli al-Maqrizi, *Histoire des Sultan Mamlouks de L'Egypte*, vol. 1, tr. Etienne Quatremere (Paris: Oriental Translation Fund of Great Britain and Ireland, 1837, 1845), 88; RD/Karîmî, 719-20; RD/Thackston 1999, vol. 2, 502-3; Aḥmad ibn ʿAbd al-Waḥḥāb al-Nuwayrī, *Nihāyat al-Arab fī Funūn al-Adab*, ed. Sʿaīd ʿAshūr (Cairo: al-Hayāt al Misriyyat al-ʿāmmat lil-kitāb, 1975), 389-390

[15] Quṭb al-Dīn Shīrāzī, *Akhbār-i Mughūlān dar Anbāneh-ye Quṭb,* ed. Īraj Afshār (Qom: Library of Ayatollah Mar'ashī, 2010), 30, 71; Quṭb al-Dīn Shīrāzī, "*Akhbār-i Mughūlān"* tr. George Lane, in *The Mongols in Iran: Qutb Al-Dīn Shīrāzī's Akhbār-i Moghūlān,* ed. George Lane (London: Routledge, 2018), 53. Hence forth Shīrāzī refers to the Persian text and Shīrāzī/Lane refers to the translation.

[16] Shīrāzī, 32; Shīrāzī/Lane, 54. Also see George Lane, "Mongol News: *Akhbār-i Mughulān dar Anbāneh-ye Quṭb* by Qub al-Dīn Mamūd ibn Mas'ūd Shīrāzī", *Journal of the Royal Asiatic Society* 22 (2012): 550.

[17] For a description of their faith, see Farhad Daftary, *The Ismāʿīlīs: Their History and Doctrines,* 2nd ed. (Cambridge: Cambridge University Press, 2007), 301-400.

allies in the 1230s, relations turned sour after 1240.[18] After an alleged attempt on the life the fourth Mongol Khaghan, Möngke, the Mongols determined they could no longer tolerate the Nizārīs' presence.[19] Thus, Möngke dispatched his brother Hülegü to deal with them, as well as with any other recalcitrant group. The Nizārīs however, had maintained their autonomy if not independence through a series of fortresses in the mountains of northern and central Iran, where cavalry were less effective. To counter this, Hülegü brought 1000 Chinese artillerists or *ustādān-i manjanīq* (mangonels or catapult experts), *Khitāi manjanīqi* (catapult crews from Khitai) and *nafṭ andāzān* (naphtha throwers).[20] Although some scholars have interpreted this to mean that Hülegü brought experts in gunpowder weapons, there is no evidence to support this.[21] It did mean, however, that he brought a few new weapons with him. While the primary siege weapon, as I indicated, had been the traction trebuchet, access to counter-weight trebuchets from the Middle East increasingly rendered the traction trebuchets as obsolete. The Chinese, however, did have ballistae, known as the *kamān-i gav* (ox bow in Persian) that was far superior to what was used in the west. With its triple bow design, it could launch a missile at a greater range (2500 paces).[22]

Additionally, Hülegü brought some specialists known as *qayachi* for mountain warfare in the Middle East. In the late 13th century, they were used specifically to deal with Kurdish rebels and bandits. Ethnically known as Bakrin or Makrin, they originated from the Tianshan Mountains in Uyghurstan. Their exact identity, however, remains vague, but it is certain they neither Mongols nor Uyghurs. In the Middle East, they remained a distinct unit into the late 14th century, stationed around Irbil in Iraq.[23]

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[18] Timothy May, "A Mongol-Ismā'īlī Alliance?: Thoughts on the Mongols and Assassins", *Journal of the Royal Asiatic Society* 14, no. 3 (2004): 231-239.

[19] Guillemus de Rubruc, "Itinerarium Willelmi di Rubruc", in *Sinica Franciscana: Itinera et Relationes Fratrum Minorum Saeculi XIII et XIV,* ed. P. Anastasius Van Den Wyngaert (Firenze: Apud Collegium S. Bonaventurae, 1929), 287; Rubruck, William of Rubruck, *The Mission of Friar William of Rubruck: His Journey to the Court of the Great Khan Möngke,* (Indianapolis: Hackett, 2009), 222; William of Rubruck, "The Journey of William of Rubruck", tr. A Nun of Stanbrook Abbey, in *Mission to Asia*, ed. Christopher Dawson (Toronto: University of Toronto Press, 1980), 184

[20] ʿAla-ad-Din ʿAta-Malik Juvaini, *The History of the World-Conqueror,* tr. J. A. Boyle (Seattle: University of Washington Press, 1997), 608; ʿAla' al-Dīn ʿAṭa Malik ibn Muḥammad Juwaynī, *Ta'rīkh-i Jahān-Gusha,* vol. 3, ed. Mīrzā Muḥammad Qazvīnī (Leiden: Brill, 1937), 93. Henceforth Juvaini/Boyle and Juwaynī/Qazvīnī respectively.

[21] Thomas T. Allsen, "The Circulation of Military Technology in the Mongolian Empire", in Nicola Di Cosmo (ed.), *Warfare in Inner Asian History (500-1800)* (Leiden: Brill, 2002), 278-283; Joseph Needham, et al., *Science and Civilization in China*. Vol. 5. *Chemistry and Chemical Technology.* Pt. 7. *Military Technology: The Gunpowder Epic.* (Cambridge: Cambridge University Press, 1986), 325, note F; Stephen G. Haw, "Cathayan Arrows and Meteors: the Origins of Chinese Rocketry", *Journal of Chinese Military History* 2 (2013): 35-38; Iqtidar Alam Khan, *Gunpowder and Firearms: Warfare in Medieval India* (New York: Oxford University Press), 3.

[22] Juwaynī/Qazwini, 128-129; Juwayni/Boyle, 631; Shīrāzī, 22-3; Shīrāzī/Lane, 48-50.

[23] Pier Giorgio Borbone, "Hülegü's rock-climbers: a short-lived Turkic word in 13th-14th century Syriac historical writing", in *Studies in Turkic Philology: Festschrift in honour of the 80th birthday of Professor Geng Shimin*, ed. Zhang Dinjing and Abdurishid Yakup (Beijing: Minzu University Press, 2009), 286-88.

Another type of specialist was the *jadachi* or weather shaman. While shamans' duties included divination for determining dates for campaigns and even battles, the Mongols also deployed shamans tactically. One such use of shamanism was the employment of *jadachin* or specialists who could use *jada* stones (*bezoars*) to raise storms of rain and presumably lightning, hail, or snow. These storms were directed against the enemy with variable results. Perhaps the most notable occasion was when Tolui, the fourth son of Chinggis Khan, used rain stones against the Jin during July in 1231.[24] The sources do not indicate that Tolui himself used them, but rather that the *jada* stones were employed in warfare by a specialist. Thus, Tolui was accompanied by *Jadachi*, which the Islamic sources do not explicitly mention as a shaman. The *jadachi* in this instance was a Qangli Turk, a point that will have significance later.[25]

In this particular instance, a superior Jin army forced Tolui to retreat. Tolui planned it to be a feigned retreat, but the Jin followed his army too closely and constantly harassed the rearguard commanded by Toluqu Cherbi, preventing the Mongols from setting a proper ambush.[26] It is possible that he risked being encircled as well.[27] Tolui's employment of the *jadachi* was a tactic to cover his retreat. Through the *jadachi'*s weather magic, it rained for three days behind him and even snowed on the fourth day while an icy wind blew. Although the resulting weather occurred primarily behind his retreating troops, it also affected his army. Tolui, however, was able to retreat to shelter and take refuge before the blizzard hit in the middle of summer.[28] Furthermore, Tolui's men had been equipped with raincoats and felt coats to combat the cold.[29] After the blizzard ceased, Tolui then advanced upon the bewildered and weakened Jin army and destroyed them.

This event is significant, yet *jadachin* were present in other battles such as when Temüjin and Toghril Ong-Qan fought the Gur-khanid confederation of Jamuqa. Gur-khanid *jadachin,* Buyiruq Qan of the Naiman and Quduqa Beki of the Oirat, attempted to raise a storm but it backfired, and actually knocked the Naiman into the ravines.[30] Apparently, the storm did sufficient damage to the Gur-khanid forces

[24] Khwandamir, *Habibu's-Siyar: The History of the Mongols and Genghis Khan*, tr. Wheeler M. Thackston (Londong: I. B. Tauris, 2012): 27; Rashīd al-Dīn, *The Successors of Genghis Khan,* tr. J. A. Boyle (New York: Columbia University Press, 1971), 37; Rashiduddin, 314-315; Juvaini/Boyle, 192-194; Juwaynī/Qazvīnī, 152; Bar Hebraeus, 397. Bar Hebraeus states that Ögödei used them. Most likely, this is not a separate instance, but rather the instance where Tolui used it as the other details are the same. Henceforth, the Boyle translation of Rashīd al-Dīn will be RD/Boyle.

[25] J. A. Boyle, "Turkish and Mongolian Shamanism in the Middle Ages", *Folklore* 83 (1972), 190. Also see Juwaynī/Qazvīnī, 152; Juvaini/Boyle 193; RD/Boyle, 36-37.

[26] Rashiduddin, 314-315; RD/Karīmī, 457-58.

[27] JuJuvaini/Boyle, 192-194.

[28] RD/Boyle, 37; Rashiduddin, 315; RD/Karīmī, 458.

[29] RD/Boyle, 36; Rashiduddin, 1998, 315; RD/Karīmī, 458.

[30] *Secret History of the Mongols,* tr. Igor de Rachewiltz (Leiden: Brill, 2004), §143. As there are numerous translations and editions, citations will follow the section number so that any may be consulted. Henceforth, SHM.

and their position that the Naiman and the Oirat then scattered and did not take any further part in the battle of Köyiten.[31]

The Mongol use of shamans was not new, as *jadachi* were known to have existed in steppe warfare during the Ruruan period (fifth century) and perhaps earlier. The Uighurs also used the *jada* stones against the Tibetans in 765.[32] It was not, however, a Mongol practice. The Mongols do not appear to have actually used it until they had defeated a number of Turkic tribes, most importantly, the Naiman in 1204. Thus, it appears that the Mongols adopted the use of this form of supernatural and meteorological warfare from the Turks as evinced by the presence of a Qangli Turk with Tolui's army.

The *jadachin* were also used in Mongol armies across the empire and even after the end of the empire. The use of the *jadachin* continued long after the Mongols ceased to be primarily shamanistic in faith. Boyle notes that a son of the last Mongol Yuan emperor, Toghon-Temur (1335-1370), used them against the Ming. The stones were also used in the Battle of the Mire (1365) in which Amir Tīmūr was defeated by the Chaghatayids of Moghulistan. The Timurid Abu Sa'id also deployed *Jadachin* in 1451, not in battle put to produce rain in a desolate area.[33] Other evidence suggests that the use of the *jada* became prevalent throughout Central Eurasia after the Mongol Empire, demonstrating once again the cross-cultural importance of the Mongol Empire. We also see an increase in references to uses of the *jada* stones during the Mongol Empire period compared to previous periods, suggesting an increased use.

How effective were these *jadachin*? Much like modern meteorologists, accuracy varied. Many of the accounts indicate that the storm back-fired and affected the summoning army more so than the intended target. We must keep in mind however, that many of the accounts are written by Muslims and Confucians who had little tolerance for any aspect of shamanism. For the Muslims, when the stones malfunctioned it was demonstration of God's will against pagan activities. Yet, the question is if these were unpredictable, then why did the Mongols and their successors continue to use them? Indeed, nomadic armies only seem to have ceased to use them was after 1528 when the Safavids crushed the Uzbeks in the battle of Jām in Khurāsān. This also happens to be when Shah Ṭahmāsp effectively used his cannons against the Uzbek horse-archers, perhaps demonstrating the superiority of gunpowder over storm stones, which failed in this battle.[34]

The Mongol campaigns in the east, however is where we find a greater emphasis on combined arms warfare. This terrain and weather played a major role in this

[31] *SHM* §143.

[32] Adam Molnar, *Weather Magic in Inner Asia* (Bloomington: Research Institute for Inner Asian Studies, 1994), 1, 8-9.

[33] Boyle, "Turkic and Mongolian Shamanism", 191; Molnar, 51-52.

[34] Molnar, *Weather Magic*, 53.

change. In the steppes, cavalry of all sorts could be used, but the standard Mongol horse archer remained supreme. In the west, Köse Dagh in 1243 was the last major field battle the Mongols fought until ʿAyn Jalut in 1260. Afterward the dissolution of the Mongol Empire, the battles between the Ilkhanate and the Jochids (more popularly known as the Golden Horde) continued to be dominated by the horse archers.

In China, as mentioned previously, the Mongols assembled large armies of Chinese infantry. Additionally, they used Khitans and Jurchen as heavy cavalry. As the Mongols penetrated further south, infantry played an increasing role. The mountainous terrain, terraced fields, rice paddies, and the hot and humid weather of south China all limited the effectiveness of the Mongol cavalry. Not only did the terrain limit the Mongols ability to effectively deploy armies of horse archers, and thus constrain their mobility, the weather did not agree with their horses. Furthermore, the humidity wreaked havoc with the Mongols' bows. While they still functioned, the humidity penetrated the materials of the composite bow, hindering its effectiveness.[35]

Thus other types of troops were necessary. With the manpower of China, infantry was a natural choice. Yet, another obstacle were the many rivers of the Song Empire. Without a naval component the Mongols would be hard pressed to conquer the Song. During sieges, the Song continued to supply and reinforce strongholds and cities by water. Although the Mongols advanced it was slow as they failed to prevent the river supply route. This only changed when the renegade Song general Liu Zheng advised the Mongols on developing a riverine navy.[36]

While a former Song general advised the Mongols, a Mongol general implemented the riverine navy with great effect. Aju Noyan, the famed grandson of Sübedei, implemented the navy in raids and blockades, as well as the occasional naval battle. Aju's tactics were instrumental at the sieges of Xiangyang and Fancheng. He also developed earth works along the Han River from which his forces could attack the Song navy. From these bases, he captured additional ships and augmented his own fleet, thus allowing Aju to then then engage the Song navy. He also used his ships to transport troops up and down the river, often using paddle wheel ships. Also at the siege of Xiangyang and Fancheng, Aju's navy broke the floating bridge, which not only blocked river but also allowed the troops from one city to come to the aid of the other. With the destruction of the bridge, Fancheng fell shortly thereafter.[37]

At the battle of Yangluo Fort at the mouth of the Han River in 1275, Aju's brilliance was amply demonstrated. Keeping half of his ships ready to defend against

[35] Molnar, *Weather Magic*, 142; Charles R. Bowlus, "Tactical and strategic weaknesses of horse archers on the eve of the First Crusade", in *Autour de la Premiere Croisade*, ed. Michel Balard (Paris: Publications de la Sorbonne, 1996), 161.

[36] Morris Rossabi, "The Reign of Khubilai Khan", in *Cambridge History of China,* vol. 6, *Alien Regimes and Border States, 907-1368,* eds. Herbert Franke and Denis Twitchett (New York: Cambridge University Press, 1994), 431.

[37] Song Lian, *Yuan Shi,* 128, "Aju", (Beijing: Zhong Hua Book Co., 1976). Translated by Paul D. Buell.

the Song navy, he used the other ships as landing craft, allowing his infantry to establish a beachhead. His cavalry then landed and cleared the battlefield. With the Song navy and their efforts to hold the riverbank defeated, the Song fortress could now be surrounded. The Song commander Xia Gui retreated, abandoning Yangluo. Aju's armies then quickly sailed upstream to attack cities they had previously bypassed, while also destroying the Song's naval capacity.[38]

Other examples of Aju's ingenuity exist as well, such as the naval battle near Jiao Mountain in 1274 where he encountered the Song navy in floating fortress formations. This formation consisted of ten ships chained together. While it limited the Song's mobility, it also was intended to prevent the Mongols from having room to maneuver. The Song commanders Zhang Shijie and Sun Huchen had determined this strategy as an act of desperation in an effort to stop the Mongols. Unfortunately for the Song, it also prevented the Song ships from fleeing. When Aju observed the Song strategy from a vantage point on Shigong Mountain, he quickly assessed the situation and developed his strategy, saying "we can burn them and go".[39] Combining Mongol steppe tactics with naval warfare, he deployed his naval in three large units, a center with two wings. He placed units of archers in well-fortified ships on the wings. While his ships advanced up the middle, the archers on the wings shot fire arrows on the stationary Song ships. Rather than attempting to breakthrough, the Mongols simply set the floating fortress on fire, and then continued through to pursue any ships that did manage to break free of their units.[40] This was essentially steppe strategy applied to water as the Mongols frequently bypassed fortresses to attack field armies.

From riverine warfare, the Mongols advanced to oceanic adventures. The most notable was the invasion of Japan. Their initial attack in 1274 was limited and primarily focused on destruction of the port of Hakata, which did significant trade with the Song Empire. Although the Mongols largely succeeded in this task, their fleet suffered significant damage from an untimely typhoon. Ships that survived were then vulnerable to Japanese counter attack. While this was a combined arms venture, the second invasion in 1281 is a better example.

Although the Mongols ultimately failed in their endeavors to conquer Japan, it is an excellent demonstration of the potential of Mongol combined arms warfare. In this endeavor, the Mongol armies consisted not only of Mongols, including cavalry, but also Chinese infantry, Korean and Chinese naval ships and marines. If the sources are to believed, the Mongols sailed with 4400 ships—an effort only surpassed by D-Day in World War II. Additionally, the Mongols utilized gunpowder bombs launched by trebuchets. Although the invasion of 1281 was stymied not only by a typhoon, but

[38] *Yuan Shi,* 128.
[39] *Yuan Shi,* 128.
[40] *Yuan Shi,* 128.

also a well-coordinated Japanese defense, the invasion demonstrated the advances in combined arms warfare by the Mongols.[41]

Finally, we should examine Mongol efforts in Vietnam. In 1282 and 1283, the Mongol general Sögetü received orders from Khubilai Khan to invade Champa, or southern Vietnam. He allegedly sailed with a 1000 ships. Vietnam at this time consisted of two kingdoms, Dai Viet in the north and Champa in the south. Sögetü's invasion thus bypassed Dai Viet, thus the Mongols intentionally chose to utilize their fleet for an invasion instead of taking a land route. Sögetü successfully landed and defeated opposing forces in a handful of battles. In 1284 and 1285, he then joined in a pincer attack on Dai Viet. This invasion, however, ultimately failed. Not only did the Vietnamese put up stiff resistance, but the invasion seems to have been called off mid-way. The northern army withdrew, leaving Sögetü in a lurch. He died in battle. Nonetheless, we see again an impressive use of naval forces that delivered a combined arms force of Mongol cavalry and infantry into a hostile environment - hostile not only in terms of invading but also in terms of terrain (jungle and mountains) as well climate. Nonetheless, the Mongols persevered and successfully conquered Champa and made inroads into Dai Viet.[42] Their hold was ephemeral. The Vietnamese would use the same tactics in the twentieth century to against Japanese, French, and American encroachment.

Although the image of the Mongols remains fixed in the popular mind as the leather clad horse-archer, the Mongols art of war advanced considerably as their empire expanded. After the dissolution of the empire in 1260, territorial conquest became rare, but nonetheless, the Mongol military continued to evolve to meet changing conditions and enemies. Although the victories were less frequent, the innovation on the part of the Mongol military remained impressive and sufficiently destructive that many neighbors preferred to pay tribute rather than to risk engagement.

[41] See Thomas D. Conlan, *In Little Need of Divine Intervention* (Ithaca: East Asia Program, Cornell University, 2001)*;* James P. Delgado, *Khubilai Khan's Lost Fleet* (Berkeley: University of California Press, 2008); Randall J. Sasaki, *The Origins of the Lost Fleet of the Mongol Empire* (College Station, Texas: Texas A & M University Press, 2015) for in depth discussion of these events.

[42] Song Lian, *Yuan Shi,* 129, tr. Paul D. Buell; Paul D. Buell, "Indochina, Vietnamese Nationalism and the Mongols", in *The Early Mongols: Language, Culture, and History*, ed. Volker Rybatzki, Alessandra Pozzi, Peter W. Geier, and John R. Krueger (Bloomington: The Denis Sinor Institute for Inner Asian Studies, Indiana University, 2009), 21-30.