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Observation of the Role of Climate and Geography in the War Planning of the Sasanian *Spāh* (Army)

Kaveh Farrokh
(Langara College)

Abstract: The Sasanian *spāh* (army) is well known for its application of war doctrines and tactics, military architecture and logistics; however, there have been no academic analyses as to the role of geography, climate and the weaponization of the elements in warfare. This article examines (1) the spāh's utilization of geographical elements in the planning of battles (2) consideration of climactic factors for battle planning, and (3) weaponization of water against enemy forces. The article concludes with the observation of the seminal role of environmental elements in impacting Sasanian military performance in set-piece battles and siege operations.

Keywords: War Planning, Sasanian Army, Spāh, Climate, Geography

Introduction

Sasanian military doctrine of the *spāh* (army), like its Parthian predecessor *spād* (army), factored environmental elements into its battle planning operations. More specifically, the Sasanians and their Parthian predecessors were known to have factored terrain features into their battle planning with the Sasanians (and possibly the Parthians) having also determined the impact of climactic factors such as wind and temperature on battlefield military performance. The Sasanians were to be more sophisticated in their factoring of environmental elements (Inostransev 1926, 14, 16) notably in siege operations against cities and fortresses (Pazouki 1996, 44-47), a type of warfare in which they were highly proficient at (*Maurice's Strategikon* 11.1; see also analyses by Lukonin 1993, 94, and

Pazouki 1996, 42-55), in contrast to the Parthians who lacked expertise in siege warfare (Tacitus, *Annals* 15.4; Justin, *Epitome* 41.2.7).

Battle Planning and the Factoring of Terrain Elements

Prior to battle, the Sasanian *sardār* (commander) and his staff took geographical factors into consideration for battle planning. This involved the selection and control of terrain in a manner best suited to enhance the battle performance of the field army (*gund*) for the upcoming battle. Consideration of terrain factors for battle strategy is seen with the *spād* (army) of the Parthian dynasty (247 BCE - 224 CE) before the Sasanians during the battle of Carrhae against the invading Roman forces of Marcus Lucinius Crassus in 53 BCE. The titular commander of the Parthian field forces, Surena, had utilized the local hilly terrain to successfully conceal a large portion of his *asbārān* armored cavalry lancers in order to deceive the Romans as to the battle location, intentions, composition and size of the Parthian forces (Overtoom 2020, 53). Cassius Dio reports of the efficacy of this tactic in contributing to the destruction of a large proportion of Roman forces during the Battle (Cassius Dio, *Roman History* 40, 21.2-3):

> The Parthians confronted the Romans with most of their army hidden; for the ground was uneven in spots and wooded. Upon seeing them [Publius] Crassus … felt scornful of them, since he supposed them to be alone, and so led out his cavalry against them, and when they turned purposely to flight, pursued them, thinking the victory was his; thus he was drawn far away from the main army, and was then surrounded and cut down.

Cassius Dio outlines how the use of local terrain by the Parthians misled the Romans as to the true strength and location of their opponents. This in turn led Roman cavalry forces to engage in pursuit of a small Parthian force (feigning retreat) and "fled" before the Romans, leading them into a deadly hidden trap where the armored asbārān lancers waited for their arrival. The asbārān then drew their lances and destroyed the Roman cavalry force in cooperation with the Parthian horse archers (Bivar 1983, 53; Anderson 2016, 50; Overtoom 2020, 60).

The paradigm of incorporating terrain factors into battle planning was to be continued by the Sasanian spāh. Specifically, the spāh's doctrine entailed the selection and control of the terrain. An indication of the importance of terrain selection and control is provided by Dinawari writing in the Islamic era who notes that the Sasanians endeavored to prevent their adversaries from accessing forested areas and zones endowed with water supplies, notably rivers (Dinawari, *Ayoon al-Akhbar*, 195). Instead, the Sasanians' efforts were towards confining the enemy in the open plains (Inostransev 1926, 16). The flat terrain enhanced the spāh's battlefield performance in two key domains:

1) Cavalry warfare: as the primary battlefield strike force, the Sasanian *savārān* cavalry, would be able to deliver their lance charges against enemy lines with augmented

effectiveness on even and open landscapes. In this type of terrain, shock lance charges would be more likely versus uneven, heavily forested or hilly terrain.

2) Archery: open and flat terrain maximized the effects of massed archery volleys which would be launched in successive waves by the foot archers. Sasanian horse archers would also be able to deliver their missiles with more effectiveness against enemy targets on level ground.

One of the factors that contributed to the Romans' defeats at the hands of the spāh in the third century CE pertained to the Sasanians' having battled on flat and open territories. The defeat of Roman Emperor Alexander Severus (r. 222-235 CE) by Ardashir I (r. 224-242 CE) at the Battle of Ctesiphon (233 CE) was achieved primarily by the savārān cavalry who engaged in (horse) archery against their opponents (Herodian, *History of the Empire* 6.5.5-10) in the open terrain of the Mesopotamian plains. The defeat of Roman Emperor Gordian III (r. 238-249 CE) in 244 CE (Battle of Misiche) against Shapur I (r. 240-270 CE)[1] was due to his strategic error of choosing to fight in the open and flat terrain of Misiche, allowing the spāh to deploy the savārān cavalry with maximum effectiveness against the Roman forces in this theatre (Loriot 1975, 773). Shapur I and the spāh defeated the Roman armies eight years later at the Battle of Barballisos in 252 CE (Frye 1985, 125; Dignas and Winter 2007, 80) in modern-day Syria's Qalʿat al-Bālis which is characterized by terrain conductive to Sasanian cavalry and archery warfare. Emperor Valerian's (r. 253-260 CE) defeat and capture by the forces of Shapur I at Edessa-Carrhae in 260 CE was (as in 233 CE, 244 CE and 252 CE) due to the Romans' decision to fight their Sasanian opponents in the flat and open terrain of Edessa-Carrhae (Dodgeon and Lieu 1991, 367fn46) again allowing the spāh to maximize the efficacy of its archery corps and the savārān. Notably the Edessa-Carrhae region is where Rome suffered its first major defeat from the armies of (Arsacid) Iran at the (aforementioned) battle of Carrhae in 53 BCE. Another Roman military leader, Galerius (fighting on behalf of Emperor Diolectian (r. 284-305 CE)) later in the third century CE during the reign of Sasanian king Narseh I (r. 293-301 CE) was to be defeated by the Sasanians in 295 CE (Barnes 1981, 17) due to combat on the flat and open terrain of al-Raqqah (Farrokh 2017, 159) in the Callinicum and Carrhae region. In the overall sense, the flat and even terrain of Mesopotamia and Syria provided the Sasanian war planners with the opportunity to maximize the efficacy of their war doctrine based upon their cavalry and archery. In this regard, a rare Greek language papyrus fragment (believed to have been composed during the reign of Emperor Diolectian in reference to Galerius' 295 CE defeat) provides an indication of the interplay

[1] Shapur I had been co-ruler with his father Ardashir I from 240-242 CE. Shapur I then became sole ruler of the Sasanian Kingdom in 242 CE upon the death of his father (Ardashir I) that same year.

between Sasanian battle doctrine and adaptive terrain in reference to (see *Zwei Religionsgeschichtliche Fragen* 2. frag. 1)[2]:

> … arrow-holding quivers…each held bow and spear in his hands…the whole Nisean cavalry that fights on the plains was gathered together.

While lacking details on specific battle tactics, the above report provides a broader reference to the Sasanians' archery and cavalry combat *on the plains*. Uneven or forested terrain could also prove maladaptive to the demonstrations of Iranian cavalry. More specifically, the dangers to Iranian cavalry charging towards the enemy ensconced on uneven and/or hilly terrain was amply demonstrated during the Parthian era in 40 BCE at the Battle of the Cilician Gates which took place in modern-day Turkey's Tarsus Mountain range. In this battle, armored Parthian asbārān lancers charged uphill against Roman legionnaires led by their general Ventidius (Cassius Dio, *Roman History* 48.40.2). As the asbārān continued their charge, the momentum and combined striking power of their advance was progressively reduced in proportion to the distance they travelled uphill (Farrokh 2007, 142). The Roman slingers then struck the Parthians with pellets, striking them with the approximate strength of contemporary (revolver-propelled) bullets (Dohrenwend 2002, 39, and table 3)[3], throwing the Parthian cavalry into disarray, allowing the legionnaires to close in and defeat their opponents in close quarter combat (Anderson 2016, 54). The Parthians were then defeated and forced to retreat to Syria (Alston 2015, 184-185). Centuries later in 298 CE the armies of Narseh I committed a major strategic blunder in their choice of terrain in their second major battle against Galerius whom they had defeated just two years past. In this deployment, the spāh chose to confront their Roman opponents in the hilly and forested areas of Armenia which notably compromised the efficacy of their cavalry, thus providing a contributing factor in their defeat against Galerius in 298 CE (Battle of Satala).

The spāh could also exploit uneven terrain to their own advantage when faced with enemy cavalry forces who bore similar and well-equipped armored cavalry. In this regard, Maurice's report in the *Strategikon* (11.1) of the spāh's tactics against Byzantine "pike men" is of interest:

> When they [the Sasanians] are in battle against pike men it is their practice to place their main line in the roughest landscape and to use their bows in order that the attacks of the pike men against them are dispersed and easily dissolved by the difficult terrain.

As noted in the *Strategikon*, the Sasanians could essentially use the same terrain unfavorable to their own cavalry as a platform to defeat the actions of similarly armed and

[2] Reitzenstein discovered this fragment in the University of Strassburg's Papyri Collection (see his preface to *Zwei Religionsgeschichtliche Fragen*, pp. VII-VIII; also Dodgeon and Lieu 1991, 376fn33).
[3] Note the statistical comparisons between pellets and modern kinetic projectiles such as revolvers, etc.

equipped cavalry. In summary, terrain features played a key role in the spāh's battle planning.

Battle Planning and the Factoring of Climactic Elements

Writing in the post-Sasanian Islamic era, Dinawari reports of Sasanian commanders factoring climactic elements in their battle planning prior to beginning the battle. More specifically, the recommendation is for the military leadership to have the wind and/or sun located to the backs of Sasanian troops versus to their front (Dinawari, *Ayoon al-Akhbar*, 193). This is remarkably consistent with Romano-Byzantine tactics as outlined in *Maurice's Strategikon* which also advises their forces to have the sun and wind situated to their rear when they engage in combat (*Maurice's Strategikon* 8.2). There is, however, one available reference to Iranian armies prior to the Sasanians having stood opposite to the sun in order to engage in psychological warfare against the enemy. In the aforementioned battle of Carrhae (53 BCE), Plutarch reports that Surena had ordered his armored asbārān lancers to "conceal the gleam of their armor" with coverings such as robes (Plutarch, *Crassus* 23.6) in order to deceive the Romans into believing that they were facing a disheveled, disorganized and unprofessional cavalry force (Sheppard 2020, 36).

> While the Romans were in consternation at this din [the distressing sounds of Parthian martial drums], suddenly their enemies [the asbārān] dropped the coverings of their armour, and were seen to be themselves blazing in helmets and breastplates, their Margianian steel glittering keen and bright, and their horses clad in plates of bronze and steel (Plutarch, *Crassus* 21.1).

This would indicate that Surena had positioned his Parthian lancers to face the sun (Farrokh 2007, 137) in order for the (sun) rays to visually amplify "glittering keen and bright" the "… plates of bronze and steel" (Plutarch, *Crassus* 24.1) to surprise and demoralize the Romans just prior to the Parthian attack (Sheppard 2020, 36).

Maurice (*Strategikon* 11.1) has provided further information on Sasanian climactic preferences for battle scenarios by reporting that:

> the summer they like to make their attacks at the hottest hour, in order that through the boiling heat of the sun and the delay in time the courage and spirit of those lined up against them slackens.

The above report would indicate that the Sasanian strategy was to utilize the impact of elevated temperatures (notably during the summer season) on enemy troops, especially armored personnel wearing metallic protection such as scale, lamellar, iron helmets, etc. This in turn appears to have been factored into a psychological element (induced by climate heat fatigue) endeavoring to undermine the morale of enemy troops prior to the Sasanian attack on the battlefield.

In addition to temperature, wind (and windstorm) propulsion factors were especially important to the performance of Sasanian arms, notably archery. More specifically, wind

direction was critical for arrow propulsion: if the wind was behind the Sasanian archers, their arrows would be propelled with more power and speed towards the enemy. Conversely, if the wind blew against (or towards) the Sasanian archers, the flight of their arrows (flying in the opposite direction) would lose power and speed. The latter scenario is what occurred at the Battle of Dara in 530 CE, which, as noted by Procopius, (*History of the Wars* 1.13), the wind:

> … blew from their [Romano-Byzantine] side against the barbarians [the Sasanians], and checked to a considerable degree the force of their arrows …

Given the critical role of archery barrages in Sasanian battle doctrine, the undermining of the archery element provided a contributing factor to the Romano-Byzantine victory in this battle.[4] More than two centuries later at the fatal Battle of Qadissiyah (636 CE) Sasanian troops were reportedly confronted with a violent sandstorm blowing against their lines just as a gap had opened in their lines, as reported by Tabari (*The History of al-Tabari*, 123):

> a gap was opened in the center [of the Sasanian spāh] and dust covered them. A violent westerly wind blew … The dust blew against the Persians.

The sandstorm disordered the Sasanian positions (Matufi 2003, 188), degraded the combat capabilities of the Sasanian troops, allowing their opponents to exploit the gap in their ranks to win the battle and kill the Sasanian commander Rustam Farrokhzad (Matufi 2003, 188; Ward 2009, 37). Sasanian archers in particular would have had two challenges against the sandstorm in their direction: (1) their abilities to observe and fire accurately against their enemies had been considerably degraded and (2) the power and velocity of their arrows would have been degraded due to the sandstorm blowing against the missiles in flight.

Water as a Weapon of War

The weaponization of water by the Sasanian spāh was seen with respect to two distinct domains: (1) securing of local water supplies for battlefield operations, and (2) harnessing the potential and kinetic energy of local waterways for use as a weapon in siege warfare against fortified cities. As per Dinawari's *Ayoonol Akhbar*, the securing of water supplies in the local battlefield is not simply a case of denying this to the enemy (Dinawari, *Ayoon al-Akhbar*, 192) but actually allowing this to be secured by the enemy without resistance by local Sasanian forces (Inostransev 1926, 14). While seemingly counterintuitive with respect to war strategy, the objectives of this appear to be psychological. The rationale for this strategy (before the onset of the set-piece battle) was based on the notion that the

[4] As noted by Lillington-Martin (2007, 307), "… arrows being exchanged with the Persian advantage in numbers and rotating fresh troops compensated by the Romans having a steady wind blowing in their favour."

Sasanians would suffer higher losses fighting against an enemy afflicted by thirstiness as these would be fighting more formidably (for their survival) in order to secure local water supplies. In this doctrine, the antagonist is permitted to quench the thirst of its troops, horses and beasts of burden – the Sasanians would attack only when the thirst of the enemy army had been satiated. The logic behind this rationale is that an enemy satiated from thirst would combat with less stamina and resilience versus the desperate (for scarce water supplies) opponent fighting for his survival (Inostransev 1926, 14). Contrariwise, it is inferred that Sasanian troops, afflicted by thirst, would be more prone to fight with greater strength against a slaked enemy. The follow-up to such a development would be the increased likelihood of Sasanian troops seizing and holding the hankered water resource.

The second category in which water was weaponized by the Sasanian spāh was in siege warfare. While the weaponization of water by Iranian armies may be traced back to the *spādā* of the Achaemenid era (Pazouki 1996, 44) the first documented case of the Sasanian spāh's usage of water as a battlefield weapon is in Shapur II's (r. 309-379 CE) war against the Romans during his first siege of Nisibis (Nusaybin, Mardin province, Turkey) in 337 or 338 CE. In the endeavor to shatter the walls and gates of Nisibis, Sasanian engineers channeled the waters of the Mygdonius River (today's Jagh-Jagh River, a tributary of the Khabur River in Turkey and Syria) by building a system of dams and/or dykes. The engineers then ensured that the maximum levels had been stored to the highest level of potential energy to be afterward released (or driven) as (kinetic) energy against Nisibis' fortified walls (Pazouki 1996, 44-47). Theodoret (*Historia Religiosa* 1.11-12) provides a synopsis of the spāh's expertise in hydro-engineering:

> Shapur stopped up the course of the river which flowed past the city and when as vast an amount as possible of the accumulating water had piled up behind the dam, he [Shapur II] released it all at once against the walls, using it like a tremendously powerful battering-ram. The wall could not withstand the force of the water, and indeed, badly shaken by the flood, the whole stretch of that side of the city collapsed.

Put simply, the Sasanian forces at Nisibis in 337 CE or 338 CE were using (or weaponizing) the waters of the Mygdonius as a battering ram, much as a traditional (wheeled or land) battering ram would. Sasanian military engineering was to again weaponize the Mygdonius River over a decade later in c. 350 CE (approximately 12-13 years later) during Shapur II's second siege of Nisibis. Sasanian engineers again channeled the waters of the Mygdonius (as in 337 or 338 CE) but this time the waters were routed into a very large ditch already excavated by the Sasanians around Nisibis. While this prevented Nisibis' defenders from dispatching raiding forces to attack the Sasanians besieging the city, there was a second strategic intent with regards to the water that had been pumped around the city. In this operation, the waters of the Mygdonius were channeled into the already excavated ditch which prevented the defenders from sending out raiding parties to attack the Sasanian forces. The actual intent of the Sasanian spāh was to

again utilize the water of the Mygdonius, albeit in an unexpected fashion, against Nisibis. Julian (*L'Empereur* 11-13.30) describes the ensuing Sasanian operation as follows:

> … he [Shapur II] besieged it [Nisibis] by bringing up ships with engines on board. This was not the work of day, but I believe of almost four months.

Indeed, in this operation the waters in the surrounding ditch were used as a platform in which the spāh launched specifically designed battleships mounted with siege artillery systems (most likely catapults, scorpions and ballistae) which were used to assault Nisibis' fortified walls, towers, gates, etc. Questions remain as to how the spāh would have transported the vessels to the Nisibis theatre. A hypothesis that may be proposed is that the ships had been (a) bought forward as pre-assembled kits (or sections) in order to alleviate the transportation process to the environs of Nisibis; (b) the kits were then fully assembled into ships with (c) the siege machinery then installed onto the ships which were subsequently (d) launched onto the water-ditch surrounding the city. Apart from descriptions of Nisibis' successful defense against the Sasanian battleships (*L'Empereur* 11-13.30), Julian does not provide statistical data as to the size and water displacement of the vessels. What is clear is that a local natural element (water) was a mainstay of the military planning of Sasanian forces in c. 350 as had been earlier in 337 or 338 CE.

Concluding Observations

Sasanian military planning factored terrain, climate (notably the direction of wind) and temperature into its battle strategies for the maximization of military performance against enemy forces in set-piece or open battlefield engagements. Factors not considered such as windstorms as well as wind blowing against Sasanian archers, could prove detrimental to Sasanian military performance and result in defeats against enemy forces. The spāh could also weaponize water in siege operations as occurred during Shapur II's sieges against Nisibis. In conclusion, environmental factors played an important role in Sasanian military operations.

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