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Unreviewed Mixed Matters Article:

The 2,500th Anniversary of the Battle of Plataea, 26-31 July 2022. Recreating the Cavalry

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In 479 BC, Plataea was the site of the final battle that repelled the second Persian invasion of Greece. The major source of information is Herodotus, who describes how the Spartan general Pausanias led an allied Greek army to expel Mardonius' Persian forces. The battle saw the largest Greek cavalry force assembled in the period, most of it fighting for the Persians. Although they were outnumbered, the Greeks were able to kill Mardonius precipitating a route resulting in the capture of the Persian camp.

> … But perhaps the true value of reconstruction lies in understanding how the item was used, which often involves learning a skill or discipline such as bareback riding or horse archery.

Introduction

Delayed by the pandemic, the 2022 event was organised with the support of the local community, the Ephorate of Antiquities, and the re-enactment group 'Hoplologia' lead by Christian Cameron. Using re-enactors to commemorate their Classical history was, for a variety of political and religious reasons, an important step for the Greek authorities to take. Christian gathered around ninety very experienced and passionate re-enactors and reconstructors in Plataea from at least eight different counties, at their own expense. The majority chose to portray hoplites, the close order heavy infantry who perhaps a little fortuitously won the land battles of the Persian wars. Hoplites came to represent and dominate Greek warfare, until given a rude awakening by the combined use of cavalry, light and heavy infantry during the Peloponnesian Wars (See Figure 1)

Hoplites, the Armed Man

The armour and equipment from this time is open to interpretation, and our equipment reflected this. Hoplites generally wore what is often called a tube and yoke armour, the tube wrapping around the body with the yoke passing over the shoulders to be fastened in a variety of ways in the front. Based on the work of Peter Connolly this is often reconstructed from layers of glued linen, although the type of glue used is open to question (Connolly, 1981, p.58; Aldrete, Bartell and Aldrete, 2013). Aldrete's recent study has reinforced the idea of using glued laminated linen, suggesting that thick leather armour would be difficult to produce and relatively expensive. However, he does not consider relatively low cost vegetable tanned thin leather skins, either sewn or glued together, and current reconstructions are based on a leather construction. Various types of leather have been proposed, and many years ago my contribution was to suggest layers of vegetable tanned leather could be glued and laminated together naturally by soaking it in milk, or cheese and water, allowing the natural gelatines to "glue" the leather together. But in truth the composition of the armour is still unknown, although it could be re-enforced using copper-alloy scales (Everson, 2004, pp.145-159; Aldrete, Bartell and Aldrete, 2013, pp.57-72).

The cavalry class of Classical Greece were the social elite and could afford relatively expensive copper alloy armour (van Wees, 2009, p.56). Xenophon writes that the thorax must fit perfectly with the weight evenly distributed over the body, or else it rubs and weighs the wearer down (*On Horsemanship*, 12.1; *Memorabilia*, 3.10.9-15). The breastplate should also be shaped in such a way as to allow the wearer to sit down or stoop (*On Horsemanship,* 12.3; Everson, 2004, pp.140-145). Most examples come from Southern Italy and are either belled at the waist or made short so the rider can sit down on his horse (Connolly, 1981, pp.56-58). The

thorax needs to mirror the torso in a sitting position, so the belly button displayed on the breast plate is unusually high. The breast and back plate are fastened by hinges, rings, or a combination of the two. If the rider falls off their mount upon impact with the ground the hinges will come under great strain and may break but can be perhaps strengthened by ring fastenings. Certainly, ring closure allows for movement between the front and back plate if the rider should fall off or experience a heavy blow. Rather than a cheap easy alternative to hinge fastenings, ring closures should be considered a logical choice for cavalrymen (Conyard, 2018, pp.199-200).

My thorax is based on the example from Ruvo in the British Museum[1] , a short thorax made in casting bronze by David Hewitt of White Rose Armoury (See Figure 2). Modern copper alloys do not mirror those from the Classical past, although some are closer than others. However, the shape and form of the armour is more important than the exact composition of the alloy used in terms of ascertaining how the armour was used. Regular fittings are needed to allow the master armourer to hammer the armour to the shape of the wearer. The hammering process hardens the bronze, and the thickness of the armour varies depending on the importance of the area of the body it covers. The armour must fit the wearer like a second skin, allowing them to vault on the horse stationary and on the move. The original armour weighs just over 2.5kg, while the reconstruction is larger and thicker and weighs 4.6kg. A *chitoneskis*, probably of wool, is worn under the armour, pulled up and over a waist belt producing a fold of material over the waist and hips. These overfolds of material are visible on figures from the Parthenon, and act as a form of padding, cushioning the body against the armour, especially over the hips.[2]

We must acknowledge that modern re-enactors are generally the wrong size and shape to fit surviving examples of armour. Most re-enactors are considerably older than the troops who fought at Plataea, and our modern western diet is very different to their barley based daily ration. This means little can be extrapolated in terms of calorie or water consumption during the 2022 event, but most of us lost weight while eating and drinking everything that came our way. The event was held during a period of intense heat, the countryside was tinder dry and fires were not allowed. Few participants felt like eating hot food, but fires would have served to keep the flying insects away. The surrounding wind turbines re-enforced the message that global warming was now a serious issue. Around half the attendees camped in mess groups on the battlefield, gently acclimatising to extreme weather conditions over the course of the event. A variety of styles of tent were on display, including two goat skin leather tarpaulins. When needed doors could be constructed using baskets, shields, and leather skins.

I am sure that in time others will write about the activities of the hoplites. They set about learning the basics of drill, spacings, facings, the doubling of files, wheeling and counter marching, although of course any such recreation of drill is speculative. Individual weapons skill was fostered using a series of competitions involving spear fighting and javelin throwing.

The actual use of spears against other re-enactors in combat meant they had to be capped for safety reasons and were generally the size of hunting javelins. Perhaps most involved were interested in the mechanics of hoplite combat, especially the *othismos*, the act of pushing behind the shield to drive your opponent backwards. Indeed, the hoplite shield, the aspis, seems specially designed for the push. Paul Bardunias designed and used device to measure the pressure involved when two groups of hoplites started pushing against each other. This is a new approach pioneered by Paul and I am sure it will add greatly to the understanding of hoplite combat (See Figure 3)

The author enjoyed taking part in some of these experiments, but as chair of Comitatus was tasked with organising cavalry at the event. Comitatus are a reconstruction group from the UK who are well known for their Greek and Roman cavalry displays.

Ponies and Horses, Size Matters.

The study of Greek and Hellenistic cavalry is sadly all too often hypothetical, based on written and iconographic evidence. At Plataea we aimed at demonstrating as many different types of horsemen as possible within our financial constraints and the horseflesh available. We chose two mounts to represent Greek ponies based loosely on the modern Pindos and Skyrian breeds, and two mounts to represent larger Nisean horses available to some high-status Persians. To accurately recreate the cavalry of Xenophon the correct size of horse is needed to ensure the correct speed of manoeuvre and tightness of turn.[3] Skeletal evidence suggests the average hight for a Greek horse was 13.1 hands, or 132.5 cm, or what we would call a pony today (Greer, 2015, pp.42-54). If we agree that the average size for a 5th century Greek male was 5 feet 6 inches or around 168 cm. then iconography seems to show ponies of comparably similar size (See Figure 4).

The Pindos comes from the traditional horse-breeding areas of Thessaly and Epirus, and is probably descended from the old Thessalonian strain described by the Roman poet Oppian. The modern breed has little of the beauty described by the poet, standing at around 13 hands at the shoulder. The type is tough, enduring, and capable of living on very little food. The narrow boxy feet are a characteristic of horses from hot dry countries, are very hard and seldom need to be shod. It is not a beautiful breed with a course head, narrow back, little muscle development, long back seemingly short of a rib, and with weak looking quarters. Our mount was stubborn and had a pronounced bony spine and was very uncomfortable to ride bareback.

The Skyrian pony is called a horse by breeders and has the proportions of a horse perhaps linking it to the old Thessalian breed (See Figure 5). Possibly originating from the island of Skyros, it is a utility animal of generally just 11 hands but is strong enough to be ridden. Our mount was strong, with good stamina and temperament. It is probable that the breed has been improved and now has a compact body and a fine good-looking head. The ability of our

Greek ponies to live off practically nothing was a constant surprise. They would eat anything that was green for the moisture but required relatively very little water. Plataea was named after the Naiad-nymph of the fresh-water springs on the flanks of Mount Kithairon, and springs still dot the battlefield despite modern drainage channels. But we had a plentiful supply of drinking water via hosepipe direct to the site. The horses appreciated shade but were a climatised to the 38-42 degree heat and intense sun. Importantly they both had very hard feet.

Herodotus (*Histories,* 9.63 and 9.20) describes the Persian commander Mardonius riding a grey Nisean, and his cavalry commander Masistius riding a Nisean with a golden bit (See Figure 6). This is an extinct breed, but it is described as been of unusual size and highly prized. We used two 16 hand hot bloods, which needed more food, water, and care than our tough Greek ponies. Special care had to be taken of their feet in the hard rocky conditions. We only cantered the horses in good going, a gently sloping “drill” field, or along existing paths. Horseshoes as we know them were unknown at the time (Greer, 2015, pp.118-122). Xenophon (*On Horsemanship,* IV.7) suggests that horses' hoofs could be hardened by getting them to stamp on a bed of hard round stones. "No foot, no horse" as the old maxim goes. I suspect a Persian cavalry commander would use his small ponies to scout and for routine activities like carrying messages, fodder and water. But the larger mounts would be saved and kept in good condition for parades and battle. We used our Greek ponies far more than the larger mounts.

To make our lives more difficult, one of our large horses, while officially a gelding, turned out to be a rig, full of testosterone and with all the behaviour of a stallion (See Figure 7). He had to be separated and kept away from the other horses. The other horse had experience of bareback horse archery, if not our equipment. The rig and the small ponies had no experience of historical riding. We were in effect starting from the beginning.

Mounting, Sitting and Tack

Athenaeus gives us a fragment from Mnesimachos’s *Horse Breeders* mentioning Pheidon, a trainer in mounting and dismounting (*The Deipnosophists*, 9.402f). Xenophon (*On Horsemanship,* VII.8) mentions learning to mount from either side of the horse, stationary and on the move. Influenced by Persian horsemanship Xenophon suggests that the groom should know how to give his master a leg-up in the Persian fashion if the master was old or infirm (*On Horsemanship*, VI7). But two mounting blocks are shown on the west frieze from the Parthenon (Jenkins, 1994, West Frieze VI, figure 12; XV, figure 29), and mounting blocks were common along Roman roads.

Xenophon describes how the rider should mount, taking the rein loosely in his left hand either gripping the mane near the ears or using his spear while with his right hand hold reins and mane at the point of the shoulder. He would draw himself up with his left hand, while

also using his right to lift himself, throwing his right leg across the horse without resting his knees on the back of the horse (*On Horsemanship*, VII.1-7). Xenophon's description perfectly describes how riders are taught to vault on stationary horses today.

But it is far easier to vault at the trot, and easier still at the canter. The rider almost skips alongside the horse's shoulders, facing forward, with their shoulders at a right angle to the horse. The riders left hand grips the reins and mane at the withers. At the right moment the rider jumps forward with both feet and as the horse comes alongside its motion rising upwards at the shoulders the rider uses the horse's momentum to swing up on to the horse's back.

A simple alternative is to use the carrying strap on your long spear. The strap is used to carry the spear when mounted, and when both hands are needed for other purposes such as horse archery. When mounting the horse, the left foot can be placed in the leather loop of the carrying strap and it is used as a step to gain the extra height to mount the horse. This is a very easy method and seems to be shown on an unreferenced intaglio (Schlieben, 1867). It is not unlike using a stirrup since the rider starts in the same position. The butt spike on the bottom of the weapon helps to anchor the spear, while the left hand braces the spear and keeps it vertical. If you twist the spear, you may weaken the join where the butt spike is socketed into the spear. The spear needs to be held vertically since holding the spear at an angle will place more strain upon the joint between shaft and butt spike. When mounting on the left side of the horse the rider holds the spear in the left hand, with a good handful of mane, pulling themselves up into the saddle as their left leg straightens in the leather carrying loop. Generally, the shafts of long weapons were tapered, becoming thinner towards the tip. The tapering and weight of the rider help to hold the leather carrying strap at the given point on the spear shaft and stops the leather sliding downwards.

A thick quilted saddlecloth could help protect a horse's back and prevent sores (See Figure 8). A pad could also make horses with a protruding bony spine more comfortable for their riders. Xenophon recommends a horse with a "double back", a recessed backbone with enough muscle either side to support the rider's pelvic bone (*On Horsemanship*, 1.23). Squadrons may have adopted a saddle cloth of uniform colour, and officers liked leopard skin. Both are useful for keeping horse sweat from the rider. A broad comfortable back would have made for a comfortable ride and a good weapons platform. On horseback from a very early age the steppe tribes adopted the saddle for comfort and to help protect their horses' backs. Scythians used pad saddles consisting of felt, hair and leather, and several examples have amazingly survived in the famous burial mounds of the Altai mountains (Simpson and Pankova, 2017, p.241). Two simple pads were held in place either side of the horses spine with simple wooden or leather cantles, mirroring the "double-back" recommended by Xenophon. A decorated felt cloth was placed over the construction. These rudimentary saddles were the forerunner of the wooden steppe saddles and many other saddle designs in

history. When sitting on a new mount for the first time the author prefers to ride bare-back to fully appreciate the movement of the horse, and feel the tensing of muscle before any unexpected equine reaction.

Xenophon (*On Horsemanship*, VII.12) states that reins should match the leather of the bridle and not be weak, slippery or too thick. Cavalrymen would march on foot as much as possible to save their mounts, and the health of their horses would be their prime concern. Our mounts were new to historical riding and rather than introducing them to new historically accurate bridles and bits, we used the modern bridles and bits that they were used to.

Xenophon makes no mentions of riding schools but does advise regular exercise over all types of terrain and on the use of training javelins against opponents with buttons on the points. In Greek and Hellenistic cities there would have been public cavalry displays, tournaments and equestrian displays. He clearly believes in working with the horse in a balanced and collected manner, without jerking the horse in the mouth or kicking him in the belly. Iconography shows horses that were collected, seemingly ready to respond instantly to aids or signals from the rider. But Xenophon does not emphasise the use of the legs and his understanding of collection seems different to ours. There are shades of methods of natural horse training in his work, allowing the rider and horse to become willing partners in a relationship of trust and understanding.

Riders and Clothing

The size of the mount dictates the size of the rider used to recreate Greek cavalry. Ideally riders should be around 150-175cm and of light build, around 65-70kg (Schwartz, 2009, pp.98-101). Greek riders were probably relatively young and were generally shown as clean shaven, although generally older officers may be denoted by beards (Spence, 1993, pp.198-202). The relative size of horse and rider mean that the rider's feet will generally hang bellow the horses belly making the use of spurs less easy than is often the case today. This perhaps explains in the part the lack of spurs found from the Classical period (Anderson, 1978, p.46).

We used a core team of riders, while giving as many people as possible the chance to feel what it was like to ride bareback on the site of the actual battle. The riders were generally up well before sun rise to get their mounts ready for the day, and the last ones back to their tents in the evening. The smell of the horse blankets soaked in horse sweat and hung out to dry around our campsite became a constant backdrop. Iconography shows Scythian riders using both tight fitting and very loose baggy trousers, and I very quickly moved to wearing tight trousers covered in thin baggy "overall" trousers. The "overalls" helped keep the under trousers clean and could be easily removed at the end of the day. We slept in our clothes and could be sitting fully equipped on horseback within 20 minutes of waking. While riding as a Scythian or Persian, tall or low riding boots were the norm. When riding as a Greek, sandals were sometimes adopted. However, the large number of sharp and spiney plants meant that

woollen, felt and leather foot coverings were worn under the sandal, and tall laced up riding boots were very useful.

Greek riders use wool or linen clothing, and sometimes a cloak and broad petasos to keep off the sun. I initially believed thin loose weave wool be the sensible choice, wicking away sweat and drying speedily. But the high temperatures meant linen was everybody's material of choice. Our Scythian riders used some silk, and lots of hemp some of which was very light. Our Persian rider used linen in colours from the Abdalonymus Sarcophagus from a later period. Wet head coverings allowing the water to evaporate cooling the head became very useful. All hats were routinely wetted before use.

Cavalry troopers through the ages have been taught to ride bare back before progressing to their military saddle (See Figure 9). Xenophon describes how riders should not sit on the horse's rump as if in a chair with bent legs, but should sit forward with the lower leg and foot hanging lax and easy from the knee downwards. The body above the hips was kept as loose as possible to help the rider withstand tiredness and be less likely to be pulled or pushed off in combat (*On Horsemanship*, VII.10).

Many modern riders perceive riding bareback as a challenge, especially while neck reining controlling the horse with the left hand while using sharp weapons with the right. A good starting point is to ride in a western cowboy style which teaches them to neck rein and relax more into the saddle. Without a saddle the rider's backside wants to stay in contact with the horses back, whilst relaxing the stomach to insure they do not bounce up and down on the horse's spine. The more nervous the rider the more tense they become and the more they bounce. They also tend to raise and grip with their legs encouraging their mount to speed up, generally not what the rider wants. They must relax into the horse, and rather than looking like a sack of potatoes keep in mind the posture of the riders on the Parthenon frieze, sitting on the imaginary back pockets of your imaginary jeans and keeping the horse well collected (Conyard, 2018, p.197).

Stirrups allow the rider to step up on to the horse and give them more stability. A saddle gives the rider more security and allows for more equipment to be carried. But riding bareback gives the rider more contact with the horse and allows them to develop into a horseman. You cannot lean out as far from the horse to use weapons as you can in a Roman four-horned saddle horns or with stirrups, and it is easier to become unseated. But it is still possible to be an effective cavalryman, and you would be fighting opponents who would be riding bareback as well.

Water and the Equipment of War

Generally, a man needs two litres of water a day, often picked up on route. One cold spring became our favourite watering hole, but at 1 kg per litre liquid is heavy to carry, and we would

try and consume as much cold water as possible carrying it in our bellies. Classical soldiers given time would mix wine with water before consumption, in part to counter any impurities, but this normally involved many specialist vessels perhaps only available to generals. There is some suggestion that armies had to get used to life without wine, drinking only water, but this led to binge drinking when the opportunity arose. We found that the heat made alcohol generally unwelcome, while a cold drink was a treat. We used a mixture of leather, pottery, and gourd water bottles of varying sizes. They all worked well except that the pitch used to waterproof some bottles melted in the extreme heat. The amount of water needed for so many men and horses 2,500 years ago made controlling the natural water supply a vital consideration for both armies.

At various times we recreated a standard Greek horsemen armed with a tapered light 3m lance with a small head and generally no butt spike, Xenophon describes the Greeks as using a *kamax*, literally a reed or pole, used to pig stick an enemy (Sekunda, 1986, p.16). Long weapons certainly need to be carefully tapered and balanced not unlike a snooker cue, and a tapered *kamax* can be seen on an Athenian funerary relief of Panaitios from around the 390's (Sekunda, 1986, p.60). My version is easy to use from horseback and is a well-balanced 1.2kg.

We also displayed a high-status Greek cavalryman wearing high riding boots, a copper-alloy thorax and helmet (See Figure 10). It was a simple step to take things further and display a rider from the 4th century in Boeotian helmet and with a heavier cavalry lance and *kopis*, a cutting sword recommended by Xenophon (*On Horsemanship,* XII.9). The classic form of Boeotian helmet is perhaps best represented by the example in the Ashmolean museum, developed from the felt or leather travelling hat, the petasos, a typical part of Thessalian riding dress (Sekunda, 2000, p.59). Indeed a copper alloy helmet with the same form as the petasos was found in the Athenian Agora (Sekunda, 1986, p.19), and by the 360's BC the type had fully developed with the rim becoming more down turned, possibly hammered over stone formers (Waurick, 1988, p.16). From iconography it is possible to see how a petasos was fastened under the chin and at the rear of the orbital ridge, and two pairs holes can be seen on the Ashmolean Boeotian to allow it to be fastened the same way. The helmet design does not cover the ears or face, allowing the rider to hear, eat and drink easily. And it offers protection against the sun, wind and rain just like a petasos. Some existing helmets have a series of holes partially along their edge, mirroring the holes on late Roman helmets which allowed leather edging to be sewn on. Indeed, unlike earlier helmets it seems likely that the Pilos and Boeotian were mass produced and not made to fit a specific individual. The rear rim of a large Boeotian helmet will rub the wearers neck or back plate of the thorax, and this can be eased by edging the rear of the rim in leather (Conyard, 2018, p.200).

Horses were expensive, and it was sensible to fight at a distance, but Thessalians and Macedonians were trained to engage other cavalry and sometimes infantry in hand-to-hand combat. The cavalry lance or *xyston* typically would have a small head, a large buttspike which

could be used as a secondary weapon and would be tapered to give balance point one-third down the 2.4-3m shaft. This is Xenophon's *doratus kamakinou* (*On Horsemanship*, 12.12), a thrusting weapon, possibly of Thessalian origin, which began to augment or replace javelins as the primary weapon of Greek cavalry from the last quarter of the 5th century BC. The Macedonian *xyston* is probably a slightly heavier version weapon, my versions weigh 1.3kg to 1.7kg, with the balance point still towards the rear of the weapon, optimised for hand-to-hand combat (Sekunda, 2012, p.68). Vases from the National Museum in Athens and some Tarentine coins seem to show a butt door knob rather than spike, probably weighted, which could be rested on your foot when riding while holding the spear vertically. Such a weapon is generally used one handed, but a two-handed strike allows for a greater force to be delivered to the target.

Swords are either described as a *xiphos,* or *machaira* sometimes known as a *kopis* (Sekunda, 2000, p.16). They generally have hollow or organic handle plates riveted on the tang and are worn high up in the left armpit to hold them securely while riding. The blades were generally iron, with the edges lightly hammered to harden them.

The *xiphos* was a double-edged, single-hand sword with blade of around 50-60 cm long, widest at about two-thirds of its length. The *machaira* or *kopis* had a single-edged blade that pitched forward towards the point. The edge was concave on the part of the sword nearest the hilt but swelling to convexity towards the tip, giving it a recurved shape. Some have a blade length up to 65cm making it ideal for a rider to reach opponents lying on the ground.

Many writers state that the *kopis* is a heavy chopping weapon (Sekunda, 2000, p.16), while the *xiphos* was made for stabbing. But the shape and cross section of the blade dictates how it is used. Therefore, a short heavy *xiphos* with heavily curved blade would be good at chopping rather than stabbing. My *kopis* with hollow iron handle plates is a well-balanced, light weapon of 725g, able to cut or thrust.

On the large horses we displayed Scythian riders, primarily horse archers, and a well armoured scaled Persian carrying two dual purpose heavy javelins, around 2m long with heads in iron and copper alloy and no butt spike (See Figure 11). These are probably the *longche*, a general-purpose weapon for war and the hunt. Xenophon recommended that two Persian javelins be carried made of cornel wood, which is naturally dense and heavy (*On Horsemanship*, 12.12). The wood's association with weaponry was so well known that the Greek name for it was used as a synonym for "spear" in poetry during the fourth and third centuries BC. Ash is generally used to reconstruct shafted weapons; it is much lighter and easier to source. One would be thrown while one would be retained for hand-to-hand combat (*On Horsemanship*, 12.12). The leaf shaped heads would be made or iron or copper alloy, with long cutting edges that can be ground down and re sharpened if damaged upon impact. Copper alloy heads have a central spine to strengthen them, and to allow air bubbles to

escape the mould when casting. My versions of this weapon weigh around 1 kg. It can be thrown or used as a short spear although open order skirmishing suits this weapon, since while one weapon is held in the right hand the second is held across the body in the bridle hand making riding in close order difficult.

Iconography does seem to show riders using the shorter *palton* or *akon* against shields on poles used as targets. A prize amphora in the British Museum dated to 420-400 BC shows an older man leading a younger man through a javelin throwing run.[4] These are easy to carry at around 1150mm long and with a weight of 325-350g.

A javelin thrown at speed from the height of the horse will outrange one thrown on foot. The rider must aim at the base of the target and allow the momentum of the horse to carry the weapon into the face of the target. While a Roman rider would instinctively throw to their shielded side, a Greek carries no shield and has no such considerations (Conyard, 2018, p.201).

Persian and Scythian Horse Archery

Classical Greeks interacted their neighbours, Xenophon seems to have been influenced by the cavalryman of the Persian Empire and wrote about the mercenary Scythian horse archers employed by Athens (*Memorabilia*, 3.3.1). Archaeological evidence again suggests Scythians used relatively small horses, and that even their large horses were under 15 hands, and generally gelded to help promote growth in the leg to make them taller (Gaebel, 2002, pp.52-53). We generally had to mount our Scythian rider on one of our tall horses out of necessity.

Their bow was a short symmetrical recurve weapon made of sinew, wood, and horn with a sinew string (See Figure 12). Arrows were of reed, reinforced with wooden nocks and footings upon which were attached copper alloy heads. These were carried with the bow, string upwards pointing forwards, in a case called a *gorytos* hung from the belt on the left-hand side of the archer. The combined arrow and bow case could contain up to 200 arrows and could be made from the skins of their enemies, and decorated in human hair, or covered in gold sheet decoration (Simpson and Pankova, 2017, p.208). When fighting, iconography shows how the bow case could be switched to the right-hand side of the body to make reaching arrows easier.

Modern horse archers are stabilised by stirrups, cushioning the movement of the horse. They shoot relatively low poundage bows of 30-45lb pull, in an eastern fashion with a thumb ring and with the arrow to the right of the bow, held on to the string with a plastic knock. And their horses run along on a set fenced course or even trench so the rider can concentrate on speed shooting without having to worry about giving the horse clear directions.

In comparison, without stirrups the Scythian rider must wait for the right moment when the horse is at the height of its movement to release the arrow. No complete Scythian bows have survived, although Scythian style bows have been discovered in Xinjiang, China and are in Urumqi museum. A Parthian bow has been reconstructed from its partial remains, which were found at Baghouz (Coulston, 1985, p.239). Known as the Yrzi bow after the area of the cemetery where it was found, the reconstruction had a draw weight of approximately 60-70lb (Coulston, 1985, p.240; James, 2004, p.191 gives a measurement of 80lb). I used a 67lb Grozer biocomposite, consisting of a wooden core glued to a layer of horn on the inside the bow, and a layer of dried sinew glued to the face of the bow. The horn resists compression, while the outer layer of sinew soaks up some of the energy released when the arrow is shot. This is a modern laminated bow, but one that uses accurate materials. It has an excellent cast, is easy to shoot and beautiful to look at. It easily outsides my 90lb American yew self-bow, what the Tudors called a long bow, without a trace of recoil. It is of course just an approximation of the bows from the period. Since the arrow is perhaps the most expensive and labour-intensive missile weapon in history while speed shooting can be important, accuracy is more so. But before archery the rider must concentrate on the riding the horse to the targets, around and over obstacles, keeping the horse collected and in balance holding the reins in their right hand, the bow in the left. While bracers would be the exception, a scrap of leather wrapped around the left thumb and wrist does protect the hand from abrasion caused by the fletching's of the arrow when released from the bow.

Using reconstructed artefacts involves learning skills, and bareback horse archery is a skill but one based on practice. Horse archery is not seen as traditionally Greek, yet paintings on pots do show us Greek cavalry using bows on horseback, perhaps the Athenian officers of their Scythian cavalry unit, or young men copying the Scythian scouts.[5]

In Conclusion

We had a day to get used to the horses, and for them to get used to their environment and historical riding. We then had to get our mounts used to our weapons and equipment, and the sight and smell of hoplites and peltasts. On the second day we were up early in the dark and were scouting in front of the hoplites during their early morning march to the probable second Spartan position. As ever, cavalry must be up earlier than infantry to get themselves and their mounts fed, watered and ready. The battle probably involved in the region of 200,000 combatants, with a frontage of up to 7,000 meters, making it larger than the battle fields of Waterloo or Gettysburg. But our mounts allowed us to move around the battlefield quickly, at times following the trail of water bottle tops and leather straps lost or thrown away by the infantry. It was a special privilege to be able to move from ridge to ridge across the battlefield, in a fraction of the time it took the hoplites. On the third day we took part as infantry in a hoplite engagement in the morning, before working hard on weapon skills all

afternoon and evening. On the final day we put on a simple display alongside the infantry for a large and receptive crowd at the Church of Saint Demetrios.

Modern writers, like their Classical counterparts, tend to concentrate on hoplites, and the debatable mechanics of hoplite warfare (See Figure 13). But Greek cavalry do seem to have an enviable record of success especially when operating in good cavalry country (Gaebel, 2002, pp.277-311). And in terms of reconstruction, working with the cavalry allows us to go further, metaphorically, and literally, because of the skills needed. Reconstructing a weapon or helmet may teach us about the production process and the skills needed. Wearing the equipment of a hoplite can teach us how they moved and fire the imagination of an audience. But perhaps the true value of reconstruction lies in understanding how the item was used, which often involves learning a skill or discipline such as bareback riding or horse archery. Our riders not only needed to know how to make, source and repair their equipment, they needed to make it fit for purpose and learn how to use it "in the field," on horseback, at speed, safely, while entertaining and educating the public. And while using an assemblage of reconstructed Roman artefacts to recreate a cavalryman is always open to question (James, 2004, pp.256-259), not least the actual construction of the saddle (Conyard, 2013, pp.551-558), we require less reconstructed artefacts to recreate a Greek cavalryman. Logically we can get closer to understanding our subject and need less interpretation along the way.

It was a pleasure and a privilege to ride on the site of the actual battle, and we hope to return to Greece in 2024. We put fourteen people on the horses over the five days, in 38-42 degree heat, in baked fields and stony terrain, in different locations, on cross country marches, with horse archery and sharp weapons, with a range of impressions, with inexperienced challenging mounts, and not a single person fell off. Time was always in short supply, but horses were fed and watered, lessons were given, and equipment was repaired and adjusted. This would not have been possible without the skill and experience of the riders.

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I would like to thank Elizabeth Usher and Tom Conyard for their hard work and patience, and especially to Adonis S. Diagoupis who sourced the horses, and whose enthusiasm and honesty were plain for all to see.

1 Museum number 1873,0820.223

2 Parthenon frieze IV figure 7

3 The English-speaking world measures the height of horses in hands, measured at the highest point of an animal's withers where the neck meets the back, chosen as a stable point of the anatomy, unlike the head or neck, which move up and down. One hand is 4 inches (10 cm). Intermediate heights are defined by hands and inches, rounding to the lower measurement in hands, followed by a decimal point and the number of additional inches between 1 and 3. Thus a horse described as 13 hands is 130cm.

4 Museum number GR 1903,0217.1.

5 An Athenian red figure cup , the Pistoxenos Painter. Vulci dated to around 470 B.C. Berlin, Antikensammlung 4982.19.

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FIG 1. PART OF THE BATTLEFIELD AND CAMPSITE AT SUNSET. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 2. AN INTERPRETATION THE THORAX FROM RUVO, AND THE THRACIAN HELMET FROM LAKE COPAIS IN BOEOTIA, THE ORIGINALS NOW BOTH IN THE BRITISH MUSEUM. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 3. THE OTHISMOS, A CONTROLLED EXPERIMENT OF TWO BODIES OF HOPLITES PUSHING AGAINST EACH OTHER. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 4. GREEK RIDERS AND MOUNTS IN THE FOREGROUND, PERSIAN AND SCYTHIANS IN THE REAR. WE ENDEAVOURED TO DISPLAY A RANGE OF RIDERS AND THEIR EQUIPMENT. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 5. A STANDARD GREEK HORSEMEN ARMED WITH A TAPERED LIGHT LANCE WITH A SMALL HEAD, A KAMAX. THE BATTLE SAW THE LARGEST CONCENTRATION OF GREEK CAVALRY IN THE PERSIAN WARS, NEARLY ALL OF IT FIGHTING FOR MARDONIUS. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 6. THE CONTRAST BETWEEN OUR GREEK SCOUT AND THE SCYTHIAN IN THE FOREGROUND IS SELF-EVIDENT. THE GREEK ON A RELATIVELY SMALL PONY RELIES ON A LONG SLENDER LANCE, WHILE THE SCYTHIAN HORSE ARCHER CAN KILL AT DISTANCE. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 7. ON AN EXCITABLE MOUNT THIS ARMOURED SCYTHIAN WEARS A SO-CALLED ILLYRIAN IV HELMET WHICH LEAVES THE FACE AND EARS UNCOVERED. THE GORYTOS, THE COMBINED BOW AND ARROW CASE IS GENERALLY CARRIED HUNG FROM THE BELT ON THE LEFT-HAND SIDE OF THE ARCHER. IT CAN BE MOVED TO THE RIGHT-HAND SIDE DURING USE TO MAKE IT EASIER TO REACH THE ARROWS. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 8. GREEK SCOUTS ON THE ASOPUS RIDGE, WITH A GOOD VIEW OF THE CITHAERON RANGE. THE SUN HAS JUST COME UP AND THE WOOL CLOAK PROVIDES A LITTLE WARMTH. THE WATER IN THE LARGE GOURD CONTAINER WILL STILL BE COOL. THE THICK LAYERED FELT SADDLE CLOTH IS BASED ON ONE FROM THE DOME OF THE THRACIAN KAZANLUK TOMB, EARLY 4TH CENTURY. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 9. A WELL ARMOURED SCALED PERSIAN CARRYING TWO DUAL PURPOSE HEAVY JAVELINS, WITH HEADS IN IRON AND COPPER ALLOY, THE GREEK LONGCHE AS LATER RECOMMENDED BY XENOPHON WRITING IN THE MID FOURTH CENTURY B.C. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 10. A THESSALIAN CAVALRYMAN, PERHAPS IN THE SERVICE OF ALEXANDER. HE IS EQUIPPED WITH A BOEOTIAN HELMET, A CAVALRY LANCE OR XYSTON, AND A KOPIS WITH THE HILT TURNED THE OPPOSITE WAY TO MOST ARTISTIC DEPICTIONS. A MATTER OF PERSON PREFERENCE. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 11. A SCYTHIAN SCOUT WATCHES HOPLITES CROSS A MUDDY STRETCH OF ROAD CAUSED BY ONE OF THE MANY STREAMS ACROSS THE BATTLEFIELD. THE GORYTOS, THE COMBINED BOW AND ARROW CASE CAN BE CLEARLY SEEN, AS CAN A SHORT SWORD, AN AKINAKES. THIS EXAMPLE IS BASED ON A FIND FROM ROZBÓRZ IN PODKARPACIE, POLAND. MADE OF ONE PIECE OF IRON IT WEIGHS 743 GRAMS. THE HORSE TACK AND SADDLE PAD ARE DECORATED WITH BONES AND HAIR FROM PREVIOUS VICTIMS. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 12. THE SHORT SYMMETRICAL SCYTHIAN BOW CAN BE CLEARLY SEEN. THE AKINAKES IS AN EARLIER EXAMPLE THAN THE PREVIOUS VERSION, WITH A ZOOMORPHIC HILT AND LONG THIN BLADE WEIGHING JUST 410G. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET

FIG 13. THE CAVALRY SHIELDING THE HOPLITES, AS IS GENERALLY THE CASE. SOME OF THOSE ATTENDING THE ANNIVERSARY EVENT. PHOTO BY JOHN CONYARD WWW.COMITATUS.NET