

dokumentieren. Nicht selten haben Promovenden auch frischere Ideen, neue Perspektiven und den Anspruch, Neues für das untersuchte Material und den betreffenden Ort zu schaffen.

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HOLGER RIESCH, Pfeil und Bogen in der römischen Kaiserzeit. Originäre und überkulturelle Aspekte der Bogenwaffe während der Antike und Spätantike. Verlag Angelika Hörnig, Ludwigshafen 2017. € 49.80. ISBN 978-3-938921-50-0. 299 pages with 200 illustrations.

With this well-documented and richly illustrated work, Holger Riesch, a specialist and practical researcher in the history of bows and arrows, tries to close a gap in the study of Roman military weaponry and equipment – a field which, in general, has made tremendous progress since the 1970s. Up until today, the only major attempt to present a summary of the neglected material aspects of archery is the ground-breaking work of Jonathan C. COULSTON (Roman archery equipment. In: M. C. Bishop [ed.], *The Production and Distribution of Roman Military Equipment. Proceedings of the Second Roman Military Equipment Research Seminar. BAR Internat. Ser. 275* [Oxford 1985] 220–366), which is 34 years old by now. Of course, lots of publications on special topics exist, and each of the countless overviews of the Roman Army contains some rudimentary remarks on the *sagittarii* and their arms and equipment, and occasionally even on their tactics. Thus, Thomas FISCHER devotes less than one page of the 415 pages of his magisterial work “Die Armee der Caesaren. Archäologie und Geschichte” (Regensburg² 2014) to bows and arrows. This may be seen as a consequence of the Romans’ own contempt for missile weapons. They were pragmatic enough to recognise their potential and to incorporate units of bowmen into their armies, especially those which were confronted with the Parthians, the Persians, the Sarmatians, and other eastern adversaries using large numbers of formidable horse-archers, but the true Roman closed in with the enemy and fought with sword and spear. Most of the bowmen recruited by the Romans were auxiliaries of Pontic or oriental, especially Syrian, origin, a popular assumption confirmed by Riesch, although he mentions some Gallic and, in growing numbers in late antiquity, Germanic archers. There is even proof that individuals skilled in the use of the bow existed in the legions themselves (pp. 15; 251). It is little wonder that the weaponry and tactics were dominated by eastern influences, with the Romans reacting as recipients practicing a “passive opportunism” in these matters (p. 15).

Riesch’s book is therefore highly welcome. The introduction (pp. 12–16) is followed by five chapters on Roman and Hunnic reflex bows and solid wooden self-bows (pp. 17–99), three chapters on arrowheads and arrow shafts in the Roman Empire (pp. 100–161), one chapter each on quivers and containers for bows (pp. 209–235) and on accessories for bowmen (pp. 236–249) as well as chapters on the efficiency of bows (pp. 162–175), experiments on the effects of arrows (pp. 176–198), and the treatment of arrow wounds (pp. 199–208).

The material and written sources on bows are scarce. Not a single Roman bow or at least substantial parts of it have survived within the borders of the Empire. The same holds true for quivers, and so we have to take refuge in finds made as far away as China and Korea in order to analyse the material composition and methods of construction of bow-types. Artefacts and pictorial evidence prove to an astonishing degree that those types obviously followed common designs in the whole of Eurasia, but some doubts about the details always remain, as Riesch admits when he emphasises the hypothetical character of many assumptions writing that all “the conclusions at which

we can arrive in theory and praxis are based on academic comparisons of finds and experimental archaeology” (pp. 7; 14). Even the pictorial representations which Imperial Rome has left behind in impressive numbers are often of questionable reliability since the manner in which bows and quivers are represented is very much influenced by the conventions of Classical art. Thus, the *Scythicus arcus*, the famous Scythian bow, remains the exemplary weapon for Roman artists centuries after the original had fallen out of practical use.

The only original Roman material we possess are the thousands of arrowheads of different standardised shapes and, starting in the time of Augustus, the laths made of bone or antler with which the tips of the bows and, later, also their grips were stiffened. These demonstrate that the Roman composite bows followed the lead of certain eastern types which are better documented by finds and pictorial evidence from the lands of their origin than in Roman contexts. In all relevant chapters the author presents detailed descriptions and pictures of the excavated objects as drawings or photographs.

No doubt, most of the bows used by the Roman army were of composite construction and worked as recurve or reflex bows. It is strange that Riesch tells us (p. 13) that a composite bow, by which is meant a laminated bow made of different materials – usually wood, horn, sinew, and, eventually, bone or antler glued together –, is called a recurve bow when strung and a reflex bow when unstrung, as if they were different weapons. Indeed, the terms are used as synonyms for one and the same type of bow using two different states of the weapon as criterion. The limbs of a recurve or reflex bow curve away from the archer when unstrung. This means that they are already “preloaded”, enforcing the tension after being strung. Additionally, they have the advantage that the limbs are shorter and lighter than those of a self-bow – made entirely of wood – so that they absorb less energy. This gives the recurve bow a superior mechanical efficiency. It therefore transmits a higher velocity to the arrow than a self-bow. Certainly, a self-bow is able to hurl its missile with the same force as a recurve bow, but it needs a higher draw-weight and is more exhausting for the archer (compare C. A. BERGMAN et al., *Experimental archery: Projectile velocities and comparison of bow performances*. *Antiquity* 62, 1988, 658–670. doi: <https://doi.org/10.1017/S0003598X00075050>, and A. KARPOWICZ, *Ottoman bows – an assessment of draw weight, performance and tactical use*. *Antiquity* 81, 2007, 675–685. doi: <https://doi.org/10.1017/S0003598X0009565X>). Riesch obscures these facts a little when he qualifies the superiority of the recurve bow (pp. 177 f.).

There is general agreement about the other kind of advantage with which the recurve bow is attributed in comparison to the self-bow, namely its much greater flexibility, which allowed bending it to a degree that would have broken every wooden bow. Therefore, the recurve bow could be much shorter without reducing the draw-length and thereby the power of the shot. Such a handy weapon with a large sphere of action was ideal for use on horseback.

The Romans did not exclusively avail themselves of the use of recurve bows. There is some evidence that they employed foot-archers with self-bows as well, at least north of the Alps (pp. 90–97). The much more complicated and time-consuming manufacture of recurve bows was not really worthwhile for infantry combat, especially in a wet climate, which was obstructive for recurve bows. However, this does not mean that recurve bows were not used by foot-archers (p. 51).

Riesch rightly contradicts technical determinism and sees no continuous progress leading to an absolute optimum of functional design in the development of the Roman bow (p. 250) but interprets the different types as pragmatic answers to changing situations and challenges. Nevertheless, he categorises the development as the succession of three main types, the Scythian, the Yrzi, and the Qum-Darya or Hunnish bow. Lacking bone or antler laths, the extremely short and not very

powerful Scythian bow with its rounded wooden tips has left no traces in the archaeological material of the Roman army. Since it went out of use around the turn from Republic to Empire, it does not fall into the scope of Riesch's work; he refers to it only because of its lasting influence on how Romans thought what bows should look like.

The Yrzi bow takes its name from a necropole near Baghouze on the Syrian bank of the Euphrates, where an almost complete example was excavated during the 1930s. Riesch (pp. 25–28) ascribes a Parthian provenance to the object dating from early Imperial times, which seems plausible. He calls the Yrzi bow an “index fossil” of the 1st and 2nd centuries AD. The laths for the tips are like those found on Roman sites of the same period. Viewed from the front, the bow with its elegant limbs has the form of a propeller. The grip, without bone or antler stiffening, is integrated in the horn and sinew construction.

During the 3rd century AD, the Yrzi bow is superseded by a new type, the Qum-Darya bow, named after a site in eastern China, and also known as the Hunnish bow (pp. 33–35). The laths for the tips have been considerably lengthened which means that the stiff parts at the ends of the limbs become longer, enforcing their leverage and giving a longer draw. In consequence, the flexible parts of the limbs are much shorter now and are exposed to even more extreme bending when the bow is drawn. To withstand the resulting high tension, the flat flexible parts are broadened to 6 cm and more. This gives the bow from the front the shape of a paddle instead of a propeller. The recessed grip is no longer integral but remains static during action. It is now provided with four laths, whose presence, as at Straubing or Rainau-Buch in Germany, is a clear hint that we are dealing with a Hunnish bow. In late antiquity, the laths at the tips become more compact (p. 83 f.).

As is the case with most recurve bows, the Romans preferred rather light arrows flying with a high velocity. Many of the shafts of these missiles were made of two materials. About two thirds of the length of the shaft consisted of the tube of a reed-like Spanish Reed (*Arundo donax*) into which a wooden fore-shaft was inserted and, in turn, on which the iron head was fixed. Into the other end of the tube, a nock made of bone or wood was placed. Several shafts have survived in sites like Dura Europos in Syria or Masada in Israel. They were fletched with three feathers to stabilise the missile. The heads were almost always made of iron and could be three-bladed (trilobite), square in the form of a slender pyramid, flat leaf-shaped, or flat triangular with barbs. The trilobites could also be barbed and were in most instances fixed to the shaft with the help of a thorn, while with the square and flat ones, sockets were used more often. The square heads, combined with a homogenous wooden shaft, had the highest penetration power against (light) armour, whereas an iron plate with a thickness of 1.5 mm could be regarded as almost shotproof. Maybe this is the reason why Riesch calls them “tactical” heads (p. 108); anyway, it is an unfortunate misnomer, as the other types were also used in combat. Only those which are broader than 25 mm belonged exclusively to hunting arrows (p. 125). The trilobite and flat heads had little impact on shields and armour and were not intended to have a stunning impact but rather to be driven into the flesh causing large, heavily bleeding wounds in unarmoured parts of the body. Especially trilobite heads, which were difficult to remove and could cut in several directions, were really “malicious” (“tückisch”, p. 205). It is sometimes difficult to distinguish heavy arrowheads from those of light javelins. Riesch thinks that a shaft diameter of more than twelve millimetres excludes an arrow (p. 124).

The maximum effective range for aimed shots at isolated targets lay, in Riesch's opinion, at 60 m, while ballistic shooting to wear down dense formations was possible at ranges up to at least 175 m (p. 168 f.). Both assumptions seem realistic, as is proven by analogies with better documented medieval examples and by experiments. In this connection, Riesch is using the term “strategic shooting”, confusing strategy with tactics as many authors do. Units of archers achieved the

greatest tactical effect by the enormous mass of arrows that they could rain down on an enemy within a short space of time. This made the provision of enormous numbers of arrows essential. Riesch thinks that every archer had 20–30 arrows in his quiver for immediate use. Together with reserve ammunition transported on pack-animals, a 500 men strong unit of archers should possess at least 20–30 000 arrows. Experiments show that one blacksmith together with two assistants could manufacture 30–40 trilobite heads or 60–70 square heads in 10 hours (p. 136f.). Thus, the military archery presented a considerable logistic challenge.

Contrary to wide-spread opinion, Riesch sees little evidence that, before the introduction of the Hunnish bow, the Roman archers used any form of release other than the “Mediterranean”, which means drawing the string with the three middle fingers. There are no hints in the written sources, no clear pictorial representations, and no thumb-rings as used in the Mongolian release. Even after that date, they do not seem to have exclusively used the “Mongolian” release (handling the string with the thumb) (p. 244).

Riesch’s admirable work has a few minor flaws, some of which fall to the responsibility of the publisher: the inner margins are so narrow that it is impossible to read the inner columns of the text without constantly pressing down the back of the book. As the book covers a huge geographical area from Britain to Korea, it is unfortunate that it contains not a single map except one of the *limes* on the Rhine and the Upper Danube. Sadly, almost every object, regardless if reproduced alone or together with other pieces, is described as “not to scale”, and the author does not clarify the measure of the objects.

To emphasise the scholarly nature of his work, the author indulges in an overkill of foreign words, unnecessary technical terms, sometimes of his own making, and all too often in a stilted style, considerably aggravating the very awarding reading. One example must suffice: “Es wird ansonsten generalisiert zutreffen, dass trotz aller Progressionen basale Aspekte der Bogenwaffe bei der Jagd und im Krieg persistierten” (p. 251). Further mistakes are irritating; e.g.: Kate Gilliver is not a male author (p. 16); the cult of Mithras was not invented in Rome in the 1st century AD (p. 30); the word *paseng* for the *bezoar* goat is not Latin but Iranian.

All in all, Riesch has done an outstanding work in synthesising the current state of affairs of the many different aspects of a wide, multi-faceted, not very well-documented field and discussing the numerous problems on the basis of a solid mastery of the literature and a vast practical experience. His goal to present the badly needed standard reference on Roman archery equipment is well achieved.

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HANS-PETER KUHNEN, Wüstengrenze des Imperium Romanum. Der römische Limes in Israel und Jordanien. Mit Beiträgen von Johanna Ritter-Burkert und Stefan F. Pfahl. Archäologischer Führer zum Nahen Osten 2. Nünnerich-Asmus Verlag, Mainz 2018. € 24.90. ISBN 978-3-96176-010-7. 224 pages with 213 illustrations and one map.

This is a welcome if rather unconventional monograph, extending even to its physical shape (21 × 21 cm), intended as both a semi-popular history of this topic as well as a guidebook. The title is something of a misnomer because the book contains much more than a mere treatment of the Roman frontier in Israel and Jordan; it in fact encompasses the entire eastern frontier of the