

## THE NOMADS' ARMAMENT: HOME-MADE WEAPONRY

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Our understanding of Inner Asian nomads' practices may often be improved by examining those of the imperial Mongols, on whom the sources report more directly and fully than on any other premodern Inner Asians. Moreover, given the imperial Mongols' extraordinary performance, it can be argued that theirs represented the 'best practice' of Inner Asian nomadism. Let us look, accordingly, at Mongol military technology both for itself and as a guide to understanding that of other groups.

Perhaps surprisingly—and *pace* some older interpretations of Mongol warfare<sup>1</sup>—the weaponry of the Mongols was for the most part unremarkable. Consider the account of Mongol arms by John of Plano Carpini.

They all have to possess the following arms at least: two or three bows, or at least one good one, three large quivers full of arrows, an axe and ropes for hauling engines of war. As for the wealthy, they have swords . . . and . . . a horse with armor; their legs are covered and they have helmets and cuirasses . . . Some of them have lances. (Plano Carpini, 1966, 33)

This description may be buttressed by reports from William of Rubruck and Marco Polo. William relates that when his party, returning from Mongolia, traveled along the Caspian coast past the Caucasus mountains, the local Mongol garrison provided them with an armed escort to protect them against hostile mountaineers.

I was delighted, for I was hoping I should see . . . armed [Mongols], for I had never managed to have a look at their weapons although I had been most anxious to do so. When we reached this dangerous stretch, of the twenty [soldiers of the escort] there were two who had habergeons [coats of mail]. I asked how they had come by these; they said they had procured them from the [Alans of the Caucasus mountains], who are fine artificers of such things and excellent smiths. This makes me think [the Mongols] have few arms apart from their bows and arrows and leather garments. I saw them being presented with iron plates and helmets from Persia, and I also saw two men who appeared

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1. See Martin (1971, 19–20) for an overestimation, based on Mongol disinformation, of the drawing weight and effective range of the Mongols' bows. Cf. Rubruck (1966, 159), "Then Mangu had a very strong bow made, which two men could hardly draw, and two arrows with heads of silver . . . And he gave the following instructions to the Mongol he was sending with Theodolus [an unofficial member of the 1249 French embassy to Möngke]: 'You will go to that French King to whom this man will take you, and you will present him with these things on my behalf . . . telling him that with such bows we shoot far and strike hard.'"

before Mangu [Möngke Khan] armed with tunics made of curved pieces of stiff leather, which were very clumsy and cumbersome. (Rubruck, 1966, 210–211)<sup>2</sup>

In Marco Polo's description,

[The Mongols'] weapons are bows and swords and clubs; but they rely mainly on their bows, for they are excellent archers. On their backs [meaning bodies, I think] they wear an armor of buffalo hide or some other leather which is very tough. (Polo, 1980, 99)

And,

Every [Mongol] soldier is ordered to carry into battle sixty arrows, thirty smaller ones for piercing and thirty larger with broad heads for discharging at close quarters. With these latter they wound one another in the face or arms and cut through bow-strings and inflict heavy losses. When they have shot away all their arrows, they lay hold of sword or club and deal mighty blows. (Polo, 1980, 314)

These accounts show that the Mongols relied principally on archery, that many—probably most—were armed for hand-to-hand fighting only with a club (a term which probably stood for the mace frequently depicted as part of the Mongol armament—the axe on Plano Carpini's list is never pictured), and that only the wealthy had armor, swords, and lances.<sup>3</sup> The only hint at a sophisticated weapon in general use is provided by Plano Carpini's mention of "ropes for hauling engines of war". "Hauling" here probably meant "shooting", as the ropes were probably intended, not for dragging artillery from place to place, but for powering traction trebuchets, where a number of men simultaneously pulled on ropes attached to the short end of a pivoting pole, the long end of which propelled a sling-shot (see *Figure 1*).

Reliance on archery was determined in part by the large numbers of nomad warriors. The pastoral economy of Inner Asian nomadism is not labor-intensive. The subsistence animals—sheep and goats, and various bovids—can be herded and milked by women and children, who can accomplish most of the camp chores as well, leaving adult male labor free for other employment. This situation, and an important sort of 'other employment', are widely recognized in the sources, usually in a remark such as "in time of peace the men have nothing to do". Actually, the men kept themselves quite busy, although at work mostly of military relevance: raising, herding, and training horses, and making weapons, for instance. But since the subsistence economy did not require their help, all the physically-able men, from sturdy

2. Rubruck (1966, 136) also mentions a colony of German slaves established at the town of "Bolac" near Talas to mine gold and make weapons for the Mongols.

3. Reid (1992) comments that the *Secret History* rarely mentions lances or swords.

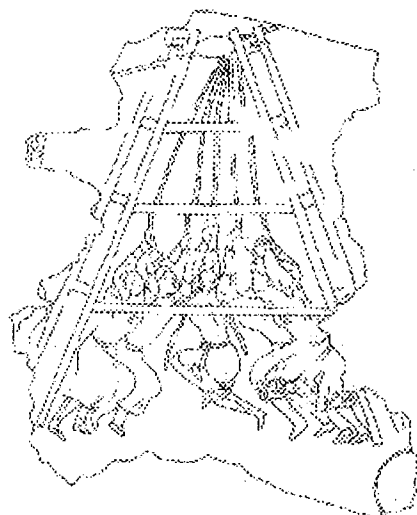


Figure 1 *Traction trebuchet, eighth century, Pyanjikent*<sup>4</sup>

adolescents through vigorous ancients, were potential soldiers, and could be actual recruits if provided with the necessities of war.

The numbers of this potential soldiery were large, even though the nomad populations, by comparison with those of sedentary societies, were small. The adult male component in populations is around 20 percent, and so Outer Mongolia, for instance, which had about half-a-million people, almost all nomads, at the time of the 1918 census, should have had a potential army of 100,000 men. In Chinggis Khan's time, Outer Mongolia's actual army approached this number. Chinggis organized about 135 regiments of, nominally, 1,000 men each; it seems to have been expected that only about 70 percent of the men—thus about 95,000—would be able to report for duty. Following the expansion of the Mongol empire, all the nomads of Inner Asia came under Mongol control and became a potential army of some 850,000 men—an army, moreover, consisting almost entirely of cavalry. Compare the armed manpower of the First Crusade, estimated at about 35,000 men, only 15 percent of whom were cavalry.<sup>5</sup> Moreover, the nomads could field all their soldiery, at least where grazing or fodder was available: the horses ate grass and the soldiers rode—and ate—the horses. This large number of soldiers required a correspondingly large quantity of weapons.

The small, mobile communities of Inner Asian nomads, however, could only support some itinerant blacksmiths, not a specialized arms industry that could meet this demand, as we can see from Rubruck's observations.<sup>6</sup> So the

4. Nicolle (1988), no. 24.

5. Runciman (1964, 339). Sedentary societies have found very large cavalry forces (especially of heavy cavalry) too costly to mount, feed, equip, and pay.

6. Rashîd al-Dîn (1940, 336–37) describes the inability of Persian armories to meet Mongol demands until Ghazan's reform of arms procurement. For blacksmiths among nomads in more recent times, see Barth (1961, chapter 6).

nomads had either to import weapons—which, if the large potential clientele were to be served, meant importing from a major arms-producing sedentary society—or make what they could for themselves.

Of the weapons that the nomads could make, bows and arrows best accommodated their resources, skills, and needs. Most of the trees of Mongolia are conifers (90 percent), mostly unsuitable as bow-woods. However, cedar (12 percent) and birch (9 percent), if less than ideal, can be made into bows, and also arrows, which can even be fashioned from pine. The indifferent quality of the bow-woods was in any case offset by reinforcement. Sinew glued on the outer side or 'back' of the bow, and horn or bone on the inner, 'belly' side, improved not only the flexibility of the bow's limbs, but their strength, far beyond that of plain wood staves of similar size, whatever their quality—the favorable comparisons of Asian compound bows with English longbows are well known. Making bows from these materials—all of them available in Mongolian forests, or in nomad camps as by-products of livestock-raising—required only simple tools and modest skills in whittling, glue-making, and the like. It has been said of the American Indians, whose archery had many similarities with that of Inner Asia, "any man was capable of making a usable bow".<sup>7</sup> The resources and skills of arrow-making were as accessible as those of bow-production. The available woods were adequate for arrow-shafts; feathers from local birds provided fletching for the shafts; and arrowheads could be cast or hammered out of metal scraps (which were probably common trade goods, or, if embargoed, easily smuggled). American Indians used to cut arrowheads from thin iron frying-pans or wagon-hoops,<sup>8</sup> and the Mongols could likewise have cut up iron utensils. Points could be fashioned out of stone or bone as last resorts.

The Mongols' home-made, compound bows reflected not only the limitations of resources and technology in nomad society, but also the talents of archer-designers who had, over many millennia, overcome these limitations. The bows were not only compound, but re-flexed and re-curved according to a design that rendered them powerful for their small size and weight, and, because of their small size, handy to carry and use, on horseback or afoot. Although, since every man made his own, some bows were better than others, as Plano Carpini's comment indicates, many were among the finest exemplars of perhaps the deadliest of premodern weapons.<sup>9</sup>

The club, the Mongols' other basic weapon, could also be manufactured at home, and more easily than bows and arrows. Even its enhanced form, the mace—shown in illustrations as an approximately two- to two-and-a-half-foot wooden

7. Laubin (1980, 24). The construction of bows of Inner Asian type is discussed from primary sources in Klopsteg (1947) and Latham and Paterson (1970).

8. Laubin (1980, 116). The Mongol wagons that Michael Gervers saw constructed in 1997 did not have iron-bound wheels (personal communication).

9. De Rachewiltz (1976) discusses a Mongol stele of the thirteenth century commemorating a shot in a flight-shooting competition of 335 *alda* [fathoms].

shaft with a plain or fluted cylindrical metal head socketed onto it—required only simple fashioning, and a head of stone could be used instead of metal.

The nomads could also make their own armor, as Plano Carpini informs us.

[T]hey take strips of ox-hide, or of the skin of another animal, a hand's breadth wide and cover three or four together with pitch, and they fasten them with leather thongs or cord; in the upper strip they put the lace at one end, in the next they put it in the middle and so on to the end; consequently, when they bend, the lower strips come up over the upper ones and thus there is a double or triple thickness over the body. (Plano Carpini, 1966, 33)<sup>10</sup>

This too was gear made from animal and forest products by simple procedures, although the resultant armor was, in Rubruck's words, "very clumsy and cumbersome" (Rubruck, 1966, 211). Such armor was thus available, in theory, to the average nomad, but in practice, according to Plano Carpini, it was limited to the wealthy. This was a limitation, I believe, not of technology but of utility, as I shall argue later.

Some Mongol armor was made of metal, and it is easy to see why the rich alone could afford it. Plano Carpini describes its construction, and his description fits the pictorial evidence.

[T]hey make a number of thin plates of [iron], a finger's breadth wide and a hand's breadth in length, piercing eight little holes in each plate; as a foundation they put three strong narrow straps; they then place the plates one on top of the other so that they overlap, and they tie them to the straps by narrow thongs which they thread through the afore-mentioned holes; at the top they attach a thong, so that the metal plates hold together firmly and well. They make a strap out of these plates and then join them together to make sections of armor . . . for horses as well as men. (Plano Carpini, 1966, 34)

Blacksmithing of a simple order would have sufficed to produce these armor platelets—as with arrowheads. Obtaining sufficient iron stock, whether in utensil form or as metal blanks or scraps, to craft into the considerable number of platelets required, would have been more difficult. A Han-period scale cuirass found near Huhehot provided neck to thigh coverage with about 500 platelets weighing around 22 lbs., or about 0.7 oz./platelet on average (Dien, 1981–82, 13, and fig. 15 [48]). Using platelets of this weight to provide the fuller coverage of what we might call the 'lamellar duster' of the Mongols might have brought the weight up to as much as 64 lbs.<sup>11</sup> Lewis and Clark

10. Mongol horse armor is not illustrated until the fourteenth century.

11. Working from the illustrations in Rashīd al-Dīn (1976), and assuming that the 'duster' extended about three feet from armpit beyond the knee, had a 40-inch circumference, and was augmented with arm-covers of about 12 x 16 inches, for a total coverage of 1,824 square inches, then, allowing for overlapping, about 1,460 platelets would be needed. Producing 64 lbs. of iron for the platelets might require 400 lbs. of iron ore and 320 lbs. of charcoal (or around 1,300 lbs. of wood to make charcoal)—plus a furnace for the smelting: see Healy (1978, 196).

sold four-inch squares of sheet iron to Indians who, like the Mongols, lacked easy access to metal stocks, for seven or eight gallons of corn each (Laubin, 1980, 116). This suggests one reason why it was the wealthy Mongols who possessed armor. And it suggests that, as Rubruck implies, the armor most of them possessed was made of leather, not metal.



**Figure 2** *Mongol armor, beginning of the fourteenth century, Iran*<sup>12</sup>

Difficulty in obtaining adequate supplies of iron would also have affected the production of swords, and the need, I imagine, for more than ordinary blacksmithing skills constituted a further problem. Swords do not appear as common Mongol weapons in the pictorial record until the 1330s, more than a century after the start of Mongol expansion, even though that record concentrates on heavy-armed soldiery starting from the beginning of the fourteenth century (Grabar and Blair, 1980, plates *passim*).

The uses to which this home-made weaponry was put may be discerned by examination of more texts from Plano Carpini that describe Mongol cavalry tactics.

[W]hen [the Mongols] come in sight of the enemy they attack at once, each one shooting three or four arrows at their adversaries; if they see that they are not going to be able to defeat them, they retire, going back to their own line . . . [I]t should be known that, if they can avoid it, the [Mongols] do not like to fight hand to hand but they wound and kill men and horses with their arrows; they only come to close quarters when men and horses have been weakened by arrows. (Plano Carpini, 1966, 36–37)

When the skirmishing Mongol archers retired “to their own line”, and ceased to flee, they avoided hand to hand combat with their pursuing enemies by

12. Nicolle (1988, no. 386P); from Rashīd al-Dīn (1976, pl. 57).

sheltering and shooting from behind their armored fellow-soldiers who had formed and held this line while the archers attacked, as we see from another comment by Plano Carpini.

Whoever wishes to fight against the [Mongols] ought to have the following arms: [a considerable list follows: bows, crossbows, battle-axes, swords, lances with hooks, and (returning to the quotation)] cuirasses of a double thickness, for the [Mongol] arrows do not easily pierce such; a helmet and armor and other things to protect the body and the horses from their weapons and arrows. If there are any men not as well armed as we have described, they ought to do as the [Mongols] and go behind the others [who are armored] and shoot at the enemy. (Plano Carpini, 1966, 46)

The attacking and retiring Mongols in the quotation above were, as I see it, the unarmored archers who constituted the great majority of the cavalry; the armored Mongols played a relatively passive part backing up these skirmishers by providing them with a refuge into which they could run to escape pursuers.

These tactics and the different roles they required of the armored and unarmored soldiery did not reflect the technological shortcomings of nomadic weapons manufacturing alone; they were also shaped by the limitations of pastoral horse-raising. Horses supported by pasture alone, as is usual in nomadic practice, do not grow as large as they can with supplementary or alternative provisions, such as they typically receive in a settled society. The average modern Mongolian horse is only a pony, weighing about 600 lbs. (Epstein, 1969, 100), as no doubt were the horses of the time of Chinggis Khan, raised and maintained in the same way. Modern horses that you see at pasture or in stables weigh on average 1,000 lbs. or somewhat more. Since horses should not be required to do sustained work laden with more than 17 percent of their body weight (Engels, 1978, 128, n. 26), the Mongolian pony's proper burden should be 102 lbs. Its rider, assuming his weight to be 150 lbs., therefore overloads it by about half. The imperial Mongol cavalry compensated for this to some extent by requiring each soldier to campaign with five ponies and ride a different one each day. A panoplied rider, however, might weigh twice as much as the pony should bear, and armor for the pony might weigh more than the rider's. This weight, added to that of the rider, which already overburdened the pony, constituted an additional handicap that would significantly impair the pony's performance in competition with the mount of a lightly armed, unarmored warrior. Most nomads could have afforded, if not the cost of metal armor, at least the effort of making it from leather, but they could not afford to wear it in combat (except, perhaps, in push-and-shove struggle against infantry unsupported—like Sung's, for instance—by cavalry).

This review of Mongol weaponry and its technology suggests, I submit, the basic armament, not only of the Mongols, but of Inner Asian nomads in

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general. Some of these nomads, whom we see from pictorial and archaeological information possessed more than just the basic weapons, we should suspect, not of atypical technological virtuosity (considering the problem of metal supplies), but of special arrangements for importation of 'strategic goods'. Scythians (Rolle, 1989, pl. 13), Sarmatians (Sulimirski, 1970, pl. 4), and even Kirgiz<sup>13</sup> wore metal armor, which they doubtless bought from the Greeks, Romans, or Iranians, or ordered from their sedentary subjects. On the other hand, the Crimean Tatars, with an indigenous, sedentary, and fairly high-tech arms industry—capable of manufacturing cannon, for instance—remained, clearly by choice, armed about like Plano Carpini's Mongols, only with more swords (Collins, 1975, 262). Moreover, the pictorial and archaeological sources probably distort our view of their weaponry by transmitting commissioned depictions of the rich and ignoring the commoners, and by reporting the durable grave-goods of wealthy warriors, while the wooden bows, arrows, and clubs of the average man would of course have decomposed. We have depictions and finds of Mongol heavy weaponry too, and, were it not for the eye-witness accounts to the contrary, could imagine a Mongol heavy cavalry as dominant as the Sarmatians' is usually considered to have been. (Indeed, some scholars do give what I consider undue importance to Mongol heavy weaponry, disregarding the lateness of its evidence and of Plano Carpini's report.)

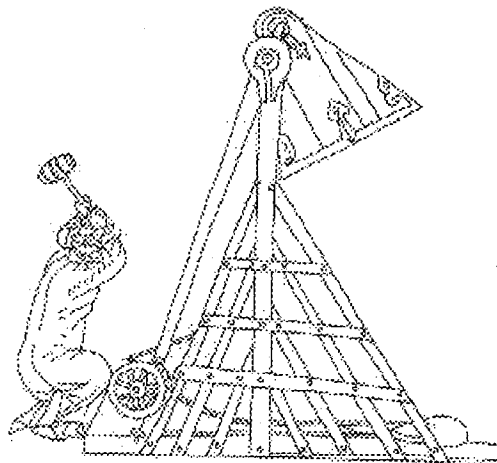
The nomads did depend on their sedentary neighbors for many goods, but in the military field these were luxury goods, not the basic necessities of nomad warfare. (I would argue likewise—but not here—that while nomads depended on settled, agrarian society for grain and other plant foods, these were, for them, convenience foods, not necessities.)

As David Morgan has pointed out, the Mongols' military methods and equipment were mostly traditional—bows, clubs, and leather armor—or borrowed. In one case, the Mongols seem to have assimilated, at least partially, a borrowed weapon. They took artillery from the Chinese, the Middle Easterners, and, if you believe Marco Polo (whom few do in this particular case), the Europeans (Polo, 1980, 207–208; cf. 14). From China, they obtained, among other weapons, the traction trebuchet, illustrated above, with a pivoting pole and attached sling-shot powered by men pulling ropes. From the Middle East, the Mongols acquired the counterweighted catapult, a similar sort of pivoting-pole, sling-shot device (called catapult rather than trebuchet here merely for alliteration), but powered by a heavy weight in place of ropes and men (Rashîd al-Dîn, 1976, pls. 7, 54, 59). The counterweight improved on traction-power by supplying a consistent propulsive force; the pole of the engine produced for the Middle Eastern Mongols at the beginning of the fourteenth century pivoted on metal bearings,

13. Nicolle (1988, no. 25A–C [Kirghiz petroglyphs], vol. 1: 8; vol. 2: 635).



unlike others of this and of the traction type that I have seen depicted, and thereby provided directional consistency; the weapon could thus shoot with the same power in the same direction and hit the same target in the same place again and again.



**Figure 3** Mongol counterweighted catapult, beginning of the fourteenth century, Iran.<sup>14</sup>

Assimilation of the traction trebuchet, at least, may be suspected because Plano Carpini, as mentioned, listed “ropes for hauling engines of war” as part of every Mongol’s military equipment. That the assimilation was partial (or perhaps ‘unenthusiastic’, considering the risks of operating the weapons in the face of enemy counter-bombardment), may follow from the facts that Hülegü thought it necessary to bring Chinese artilleryists with him to the Middle East, and that the Ilkhan Ghazan employed Persian artilleryists to shoot his counter-weighted catapults.

In another case, the Mongols may have been inventive, and in a high-tech area at that. It is probable that the Mongols developed a military vehicle: the “iron cart/*temür telege*” mentioned in the *Secret History of the Mongols* (sections 199 and 236). Igor de Rachewiltz views this as a “cart reinforced with an iron frame and with iron [covered] wheels” (in the note to section 199 of his translation of the *Secret History*). But I believe that, rather than an extra-sturdy cart, it was an armored vehicle, such as is described in (I think the early Ming version of) the Chinese epic *Three Kingdoms* (Roberts, 1991, 721). Called a “war chariot” in the translation, it was protected with iron armor, drawn by camels or mules, used to transport food and equipment, and linked together with others to form a protective barrier around a camp. Such wagons enhanced the traditional Mongol *küriyen*, or ‘wagon-laager’, a

14. Nicolle (1988, no. 386M); from Rashīd al-Dīn (1976, pl. 59).