The history of the soldier's load

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MILITARY HISTORY

THE HISTORY OF THE SOLDIER’S LOAD

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ABSTRACT

From the loads carried by the armies of antiquity to today’s modern forces, this article explores and critically analyses soldier load carriage over two millennia. Historical misconceptions appearing in some military documents and literature regarding the context and weight of the soldier’s load are also discussed. The author looks at how, even with changes in logistic practices, technology and the very nature of warfare, the soldier is still a beast of burden and suggests that relying on improved load carriage logistical aides and changes to equipment may not be the answer to this age-old problem.

INTRODUCTION

Throughout history there has been a complex relationship between the loads carried by soldiers and the requirements of their mission. Today, as in the distant past and the foreseeable future, the soldier is required to carry arms, ammunition, clothing and sustenance—the basic tools of their trade. In addition, the diversity and complexity of military operations often requires the soldier to carry mission-specific equipment and move, on foot, through various climates and terrains for long and continuous periods. While the equipment is
often crucial for mission success and survival, its weight, when in excess, has led to combat deaths.\(^1\)

The history of soldier load carriage provides the means of learning lessons from the past in order to avoid making the same mistakes in the future. This premise only holds true, however, if the history, and its interpretation, is accurate. A detailed review of the loads carried by soldiers throughout history identified several misconceptions found in both unclassified\(^2\) and classified papers and journal articles—misconceptions which create and perpetuate erroneous beliefs regarding the soldier’s load. These misconceptions, due possibly to the restrictions of article size and focus, include: the use of animals and carts to carry soldiers’ loads; that soldiers’ loads did not exceed 15 kilograms until the last 200 years; the loads carried by soldiers in Somalia and Grenada; and that modern soldiers’ loads have increased in recent years.

The aim of this article is to provide an accurate and detailed history of the soldier’s load to correct and prevent misconceptions by examining the context in which these loads were carried and thereby allow historical lessons to guide positive changes to load carriage practices.

**CONSIDERATIONS WHEN REVIEWING LOADS**

Before reviewing the soldier’s load, several considerations need to be taken into account. First, these loads are the estimated ‘dry’ loads and may change in a given environment. In the trenches of the Great War, for example, the 3.2 kilogram British coat could absorb up to an additional 9 kilograms of water.\(^3\) British soldiers, who would start a march with 27.5 kilograms, could well finish with loads in excess of 43.5 kilograms when water saturation and mud were taken into account.\(^4\) The American overcoat in the Second World War would likewise increase in weight by around 3.6 kilograms.\(^5\)

In most cases the loads carried by soldiers described in this article are based on an average. This may dilute the true appreciation of loads carried by individual soldiers, most notably those who had specific roles within their unit; a machine gunner or signal operator, for example, would usually carry a load noticeably heavier than a rifleman.\(^6\)

**LOADS CARRIED BY PRE-MUSKET SOLDIERS (700 BC – 1651 AD)**

The first iron army was created by the Assyrian King, Sargon II in the seventh century BC.\(^7\) Dressed in iron scale armour, helmet, iron shinned boots, shield, sword and spear, the Assyrian spearman was thought to bear a load of between 27.5 and 36.5 kilograms.\(^8\)
A century later, the Greek infantry soldier, the Hoplite, was thought to carry a load of between 22.5 and 32 kilograms when dressed in a complete panoply of breastplate, greaves, helmet, shield, spear and sword. For the Hoplites, who themselves may not have weighed more than 68 kilograms, this equated to a load of between 33–47 per cent of their body weight.

The heavy Hoplite shield (6–8 kilograms) was often discarded when fleeing the battlefield, the action attributed to the saying of Spartan mothers: ‘Come back with your shield or upon it’. The Hoplites may not have carried this complete load while on the march as each soldier had one or more slaves. These skeuphoroi, or baggage carriers, carried the soldier’s provisions, bedding and personal kit and, when no threat was imminent, may have carried the soldier’s shield, handing it to the soldier mere moments prior to a battle.

In preparation for his war against the Greek Hoplites and the Persians, King Philip II of Macedon aimed to increase the mobility and speed of his army. Philip gave orders that all soldiers were to carry their own equipment and that wheeled vehicles were not to be used, replacing them with pack mule and horse—an order later echoed by his son Alexander. This action reduced the number of camp followers by as much as two thirds, consequently decreasing the army’s logistical load and increased its march speed. The result was a Macedonian soldier who was a beast of burden, carrying 13.5 kilograms of grain (ten days’ rations), plus their 22.5 kilograms of battle equipment and arms: a total load of 36 kilograms.

Fortunately, in an attempt to reduce costs by enabling more Macedonian soldiers with the ability to purchase their own equipment, the more expensive components of the Hoplite armour were replaced with cheaper composite materials or simply abandoned altogether, lightening the soldier’s load.

While the equipment is often crucial for mission success and survival, its weight, when in excess, has led to combat deaths.

For the Macedonian soldier to effectively carry this load and yet still be able to function in combat, they needed to be physically conditioned. This was accomplished by vigorous battle hardening drills, which included marching 55–64 kilometres per day while carrying armour, weapons, equipment and food at a pace of
8 kilometres per hour.\textsuperscript{21} The combined results of these changes was the creation of the fastest army the world had ever seen, with the entire army capable of covering 21 kilometres a day carrying a load of between 27.5 and 36.5 kilograms.\textsuperscript{22}

In around 100 BC, following the King Philip II trend, Gaius Marius introduced sweeping reforms to the Roman army, which included the reduction of pack animals in the baggage train to one mule per fifty soldiers.\textsuperscript{23} With the maximum load a mule can carry over distance being around 113.5 kilograms, each soldier could only unload around 2.5 kilograms onto the mule.\textsuperscript{24} This was of course, under the supposition that the mule was not carrying its own food or any additional supplies. The reform, aimed at increasing the logistical efficiency of the Roman army, led to the labelling of the Roman infantryman as \textit{Muli Mariani}, or 'Marius mules.'\textsuperscript{25}

Now carrying their personal possessions and some food and drink, the Roman soldier hauled a load of up to 45.5 kilograms.\textsuperscript{26} NV Lothian argues that the load was around 22.5 kilograms, with Legionnaires rarely carrying these loads themselves.\textsuperscript{27} To support his argument, Lothian cites depictions of the Roman army in sculptures and reliefs. Depictions of carts hauled by beasts, carrying shields and warlike equipment, for example, were used to argue that the beasts may have carried these stores for the Roman Legionnaires. Alternatively, these beasts may have been hauling stores and spare equipment, needed when marching into foreign lands where future stores were in doubt or, as probable in the Arch of Severus relief, the baggage trains may have been hauling loot from captured cities along with Legionnaire equipment. Furthermore, a review by the author of Trajan’s Column and the Column of Marcus Aurelius in Rome revealed ‘Roman Legionnaires on the march’ dressed in armour and carrying arms. Further supporting the view that these baggage trains did little to reduce the Legionnaire’s load, Beth F Scott states that even with a baggage train of 520 pack animals, the Roman soldier still carried a load of up to 38.5 kilograms.\textsuperscript{28}

With regard to human baggage carriers, Lothian labels a fragment at the Louvre as ‘Calo bearing his master’s load’,\textsuperscript{29} yet inspection of this fragment shows the Roman soldier likewise carrying a slung sack (as well as his own shield). Was the slave carrying his master’s load or perhaps his own food and water supplies?

Samuel Marshall, while quoting a Legionnaire’s load of 36.5 kilograms, cites Cole who suggests a lighter load based on operational requirements. Cole, using terms similar to those in use by the US military today, describes a ‘road marching load’ of 26 kilograms; an ‘approach marching load’ of 20 kilograms; and a ‘tactical combat load’ of 14 kilograms.\textsuperscript{30} To effectively carry this load and yet still be able to function in combat, they needed to be physically conditioned.
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... with which the Legionnaires could engage the enemy in physical contact for an entire day, of 15 kilograms.30

While there are understandable variations in the estimations of the Roman Legionnaire’s load, most references agree with a load of around 36.5 kilograms.31 Based on specimen samples from Pompeii and Herculaneum, which estimate the average Roman male body weight of the era as 66 kilograms, the average Roman soldier would have carried a load of around 55 per cent of their body weight.32

As the Roman Legionnaires could be expected to march up to 32 kilometres per day and then fortify their night camp, they needed to be physically conditioned for such a task.33 To prepare the Roman soldier to carry such loads and march long distances, Flavius Vegetius, in his work *Epitoma rei militaris* (Epitome of Military Science), recommended that recruits carry a load of up to 60 Roman pounds (19.6 kilograms), route marching at the ‘military step’ of 32 kilometres for five hours (a pace of 6.4 kilometres per hour) or at the ‘full step’ of 39 kilometres in the same time (a pace of 7.7 kilometres per hour).34 This load did not include the soldier’s clothing and weapons, and was designed to condition the soldier to carry rations as well as arms during campaigns.35

Defeat of the Roman Legion at the Battle of Adrianople in 378 AD by the Gothic rebels saw a re-emergence of cavalry dominance on the battlefield.36 Where the Roman infantry failed, the Roman cavalry became the answer to combat the dual threat of fast mounted assaults and missile weapons.37 Thus the horse archer replaced the Legionnaire as the principal soldier of the Eastern Roman (or Byzantine) Empire.38 However, the infantry soldier did still serve. The Byzantine *scutati*, or heavy infantrymen, wore a mail shirt or armour weighing 16 kilograms, with or without greaves and gauntlets, and carried a spear or lance, sword and spiked axe—an approximate total load of between 19.5 and 36.5 kilograms.39 Following the Roman army trend, each soldier was required to carry their own equipment of warcraft, personal necessities and several days’ food.40 Although baggage trains did still accompany the army, they carried the equipment and supplies needed for sustained operations and siege craft and did little to reduce the individual soldier’s load.41 With the infantry unable to provide the rapid shock action of the cavalry, infantry forces and marching soldiers became a subsidiary arm and the armoured mounted knight became the centre point on the battlefield.42

It was the longbow, crossbow and invention of powdered weapons that were to lead to the return of the foot soldier.43 Initially, these missile-based infantry could not withstand the shock attack of mounted cavalry, thus pikemen were used to
provide protection, especially during the vulnerable period needed to rearm.\(^\text{44}\) Also paving the way for a return of the infantry armies was the cheaper cost to train and arm a soldier with a pike compared to that of a mounted knight.\(^\text{45}\) Hence, it was not only the advancing weaponry but the sheer numbers of infantry soldiers that led to the re-emergence of the infantry as the dominant land force.\(^\text{46}\)

During the English Civil War (1638–51), the English pikemen took to the field. Typically dressed in Corselet armour,\(^\text{47}\) which together with helmets and leg guards weighed around 11 kilograms, these foot soldiers carried a knapsack containing food and spare clothing that brought their carried load to between 22.5 to 27.5 kilograms—this excluded the weight of their pike and other melee weapons (sword or axe).\(^\text{48}\) With the shorter seven foot pike (as opposed to the traditional 16.5–18 foot pike\(^\text{49}\)) weighing between 1.8 and 2.3 kilograms, the total load carried by the pikemen is considered to be at least 29.5 kilograms.\(^\text{50}\)

**LOADS CARRIED BY MUSKETEERS (1651–1865 AD)**

By the start of the Spanish War of Succession (1702–14), the pike was replaced by Flintlock muskets and socket bayonets.\(^\text{51}\) Armed with muskets, shot and powder, the British Redcoats carried a load of around 36.5 kilograms through the American War of Independence and into the French Revolutionary wars.\(^\text{52}\) During the Napoleonic wars, the Redcoat's loads fluctuated between 22.5 and 36.5 kilograms with the load at the landmark Battle of Waterloo in 1815 being between 27.5 and 32 kilograms.\(^\text{53}\)

The Redcoat's counterparts, the French, carried a slightly lighter load of around 27.5 kilograms during the French Revolutionary wars and similar loads into the Napoleonic wars, before loads dropped slightly to around 25 kilograms during the decisive Battle of Waterloo.\(^\text{54}\) Under the command of Napoleon, French troops routinely marched 16–43 kilometres per day and were expected to be fit for fighting at the end of the march.\(^\text{55}\) Marshal Davoust, a French Marshal under Napoleon, generally expected his men to march in column at a pace of 4 kilometres per hour for up to ten hours a day.\(^\text{56}\) In a sixteen-day period, Marshal Davoust marched his soldiers 280 kilometres in order to engage the Prussians.\(^\text{57}\) Likewise, to win the Battle of Dresden, Napoleon reportedly marched his army a staggering 144 kilometres in 72 hours.\(^\text{58}\) With these long continuous marches, it is of little wonder that the French soldiers quipped that ‘Our emperor makes war not with our arms but with our legs.’\(^\text{59}\)
The British loads during the Crimean War (1853–56) remained similar to those at Waterloo, ranging from 26–31 kilograms. The French loads, however, increased to between 33–36.5 kilograms. A few years later, in 1861, the American Civil War began. Armed with shoulder arms, sixty rounds of ammunition, a piece of shelter tent and 7–11.5 kilograms in their knapsack, the soldiers of the Union Army of the Potomac carried a total load of between 20.5 and 22.5 kilograms. In addition to this load, each eight-man section also had to carry additional stores of picks, kettle, axes and various other tools. However Union Army loads were not universal; the 24th Wisconsin Volunteer Infantry Regiment of the Union Army’s Middle Military Division, for example, were noted as carrying around 22.5 kilograms in their knapsacks plus their 4.5 kilogram musket: a total load of around 27.5 kilograms. Union Army soldiers were known to discard equipment throughout the conflict in order to lighten their loads.

The load of the Confederate army’s infantry soldier varied greatly, ranging between 13.5–36.5 kilograms. The 21st Virginia Infantry F Company, for example, were claimed to carry loads of 13.5–18 kilograms, and in some cases up to 22.5 kilograms, in their knapsacks. However, limited supplies and laxer regulations meant that the Confederate soldier often carried less weight than his Union counterpart, and their 7–11.5 kilogram knapsacks vanished early in the war. With the average weight of the American soldier in the Civil War being around 62 kilograms the average Confederate soldier’s load ranged between 22–59 per cent of their body weight, while the Union Army soldier’s load ranged between 33–44 per cent of their body weight.

**LOADS CARRIED THROUGH THE WORLD WARS (1914 – 1945 AD)**

In the Great War, heavy loading reduced the marching ability of the average soldier and was claimed to have altered the tactics of war. The Battles of Cambrai and Amiens provide examples in which forward movement, limited by physical exertion, was reduced to 9–12 kilometres per day.

During this conflict, German troops carried loads ranging 25–45.5 kilograms, although a load of around 32 kilograms was considered average. Hauling this load, the German Fusiliers were said to have marched for twenty-seven consecutive days, covering a distance of 656 kilometres, averaging 24 kilometres per day. French soldiers, meanwhile, carried heavier loads of up to 38.5 kilograms, with the French 6th Army once marching 70 kilometres with only a single three-hour halt. During...
their North African campaign, the specialised French Foreign Legion were required to carry loads even greater, around 45.5 kilograms, for up to 40 kilometres per day.\(^{75}\) Both of these forces carried not only heavy loads but had to traverse substantial distances under this weight.

The loads carried by American troops were claimed to leave soldiers exhausted during the short distance assaults between trenches, even before contact with the enemy.\(^{76}\) With the average American soldier weighing around 64.5 kilograms, and carrying a load between 22 and 32 kilograms, these soldiers carried a load between 34–50 per cent of their body weight.\(^{77}\) The British soldiers in 1914 started off with similar loads (20.5–27 kilograms)\(^{78}\) but soon found their loads increasing to 30–40 kilograms.\(^{79}\) With British recruits of the era weighing an average of 60 kilograms,\(^{80}\) these soldiers were carrying a load equal to around 50–57.5 per cent of their body weight.

The Australians and Canadians carried equivalent loads. Moving to Quinn’s Post, the Australian soldiers at Gallipoli carried a load of 33.5 kilograms while the Canadian soldiers carried a load of 30–36 kilograms.\(^{81}\) For the Australian soldiers of the 6th Australian Infantry Division assaulting Mont St Quentin, loads were a little lighter, ranging between an estimated 27 and 28.5 kilograms.\(^{82}\)

Little changed leading into the Second World War. During the D-Day landings at Omaha Beach the American troops landed with a load of around 27.5–41 kilograms—a load attributed with causing deaths in the water.\(^{83}\) The Canadian and British soldiers carried similar loads.\(^{84}\) Even if the soldiers made it to the beach, they faced another problem: getting across the beach quickly and under intense enemy fire. Again, weight was against the soldiers as “The GI’s were so laden with ammunition and equipment that every step was a strain.”\(^{85}\) With an average body weight of 65.5 kilograms,\(^{86}\) the American soldier carried a load between 41.6–62.5 per cent of their body weight, while charging through chest deep water and then across sands, all while exposed to heavy enemy fire.

On the Eastern Front, Russian soldiers carried loads of 28–35.5 kilograms, while in the North African desert, Australian troops carried loads of between 22 and 32 kilograms into the battles at Bardia and El Alamein (1941–42).\(^{87}\) In the Pacific theatre, the loads carried by Australian soldiers were similar: 20.5–41 kilograms in Papua New Guinea (1942) and up to 37.5 kilograms in Borneo (1945).\(^{88}\) Operating behind the lines in Burma, the British ‘Chindits’ likewise carried loads of between 32 to 41 kilograms.\(^{89}\)
The opposing forces in the Pacific theatre, the Japanese soldiers, also carried heavy loads, ranging from the standard 28 kilograms up to 56 kilograms for machine gun units. With the average Japanese soldier weighing around 53 kilograms this equated to a load of between 52 per cent and a staggering 105 per cent of their body weight.

Of interest, after viewing a Canadian Exercise conducted in May 1942, Field Marshal Montgomery, in a letter to General Crerar (a Canadian General), recommended a load that would not have an impact on the soldier’s fighting ability—a maximum 22.5 kilograms. For the Canadians, with an average body weight below 72 kilograms, this would suggest a load of around 31 per cent of their body weight. The Canadians were to carry precisely that recommended load, a maximum of 22.5 kilograms, into the Korean War in 1950.

**LOADS CARRIED THROUGH MODERN CONFLICTS (1950 AD – PRESENT)**

When, in the Korean War, the American soldier’s load rose from 18 to 22.5 kilograms, the straggler effect was noticed, with soldiers falling behind the main column of march. Infantry troops arrived at their march destination in a state of fatigue, with men complaining that they straggled as a result of carrying things they never used in combat. Even so, the loads kept climbing, with claims that American soldiers had to carry 37.5 kilograms at a speed of around 4 kilometres per hour (during the day when on roads) for a distance of 19–32 kilometres per day. Moreover, in December 1950, the American 7th Marines of the 1st Battalion were reportedly required to carry loads of around 54.5 kilograms through the snows and steep slopes of Toktong Ridge.

While the South Koreans of the Republic of Korea’s army carried heavy loads of over 36.5 kilograms, the North Korean People’s Army (NKPA) and the Chinese Communist Forces (CCF) carried lighter loads of around 18.5 kilograms. With these lighter loads the NKPA and CCF were able to move faster and further per day than their American counterparts—4.8 kilometres per hour for 35–40 kilometres per day. There was an exception to the lighter Chinese loads, with the Chinese People’s Volunteers Force (CPVF) having to carry loads of around 27.5–32 kilograms when their logistic support let them down.

During the Vietnam War (1959–75), just as the Roman Legionnaires had adopted the term ‘Marius Mules’, the American soldiers adopted the term ‘grunt’.
The typical load for the American infantry soldier patrolling through the jungles of Vietnam was 27.5–32 kilograms. For the Marines, loads were in excess of 22.5 kilograms and more likely 36.5 to 45.5 kilograms. Australian troops generally carried heavier loads of 32–32.5 kilograms and in some cases more. Several members from the 8th Battalion, Royal Australian Regiment (RAR) weighed their packs and found they carried loads of between 36.5 and 54 kilograms. Interestingly, even when their mission changed from reconnaissance to pacification, and the content of the loads changed, the overall load weight remained the same. As such, Australian soldiers were constantly taking measures to lighten their loads by removing non-essential stores. These loads were similar for the soldiers of the 4th Battalion, RAR, who likewise carried loads of 30–40 kilograms for a rifleman and up to 47.5–56 kilograms for the radio operators.

The native Viet Cong were not so encumbered. Unlike the heavy loads carried by soldiers from foreign forces, the Viet Cong reportedly carried noticeably lighter loads of around 12 kilograms. These loads are perhaps indicative of the advantages of fighting on ‘own’ soil.

During the Falklands conflict in 1982, the British infantry and Royal Marines carried loads between 32–36.5 kilograms in Fighting Order (essential fighting stores) and 45.5–54.5 kilograms in Marching Order (short duration sustainment stores together with fighting stores). In a well known ‘yomp’, the 45 Royal Commando Marines, carrying a load between 54.5–66 kilograms, marched a distance of 129 kilometres, crossing terrain that ranged from marshland to rocky scree, in a period of just three days.

A year later, carrying loads of up to 54.5 kilograms, American troops in Grenada landed, for Operation URGENT FURY. One of the assaulting soldiers described the assault on the airhead: ‘There were all those guys sitting on the side of the road with IV tubes in them. There’s no way the guys could [have gone on].’ During the same operation, American Army Rangers parachuted onto the runway at Salinas airfield, carrying even heavier loads of around 76 kilograms.

In Somalia, during Operation UNITED SHIELD, American Army infantry soldiers came ashore with a load of around 49.5 kilograms. Weighing an average of 75 kilograms, these soldiers were carrying a load of around 70 per cent of their body weight. Little has changed in the more recent conflicts. In East Timor, on Operation CITADEL, Australian soldiers carried loads in excess of 45 kilograms, with gunners...
and signallers carrying loads in excess of 50 kilograms. During Operation DESERT SHIELD and DESERT STORM, American soldiers carried loads up to 45.5 kilograms and today continue to carry loads between 45.5–54.5 kilograms in Afghanistan and Iraq, and ‘march’ around 10–15 kilometres per day.\textsuperscript{117}

A recent comprehensive study of the 82nd Airborne Division, on Operation ENDURING FREEDOM III in Afghanistan, found that the soldiers carried a ‘fighting load’ of 29 kilograms, an ‘approach march load’ of 43.5 kilograms, and an ‘emergence approach march load’ of 57.5 kilograms.\textsuperscript{118} With the average weight of the soldiers in this study being 79.5 kilograms, this equated to loads of 36 per cent, 55 per cent and 73 per cent of body weight respectively.

**ENCAPSULATION**

As encapsulated in Figure 1, the soldier’s load, for most but not all countries, appears to have remained generally unchanged for over two millennia, until increasing noticeably after the Vietnam War. It should be noted, however, that several of these later load measurements may be somewhat misleading. The loads found for Grenada and Somalia, for example, are for forces coming ashore and not necessarily for the duration of the campaign. These loads are therefore more than likely ‘emergency approach march loads’, which is defined by the US Army Manual FM 21-18 Foot Marches as loads carried by soldiers acting as porters for several days over distances of 20 kilometres a day.\textsuperscript{119}

Furthermore, in the context of relative loads, it can be seen that the Roman loads of around 36.5 kilograms or 55 per cent of their body weight is very similar to the ‘approach march loads’ of the 82nd Airborne Division in Afghanistan, where the soldiers carried loads of 43.5 kilograms or 55 per cent of their body weight. This example shows how absolute loads may have increased in recent times, while the relative loads carried by the soldier may have in fact stayed the same.

Finally, although logistical aides (like carts, mules, motorised vehicles and aircraft) have changed through history, the soldier’s load has not reduced noticeably. A plausible reason for this lack of load reduction may be due to the fact that these logistical aides did little to unload the soldier in the first instance and were used primarily to carry other logistical stores.

Addressing the aforementioned misconceptions, it can be seen that soldiers’ loads may have indeed exceeded 15 kilograms prior to the last 200 years; absolute...
Figure 1. An encapsulation of the means and ranges of loads carried by soldiers through history as found in this article.
loads may have increased recently, while some relative loads are similar to those carried by soldiers two millennia ago; animals and carts, which may have been used extensively by the armies of antiquity, may not have reduced the soldier’s load noticeably; and the presented loads carried on some recent operations (for example, Somalia and Grenada) may have not been the loads carried for the duration of the campaign.

CONCLUSION

The soldier’s load has not reduced noticeably in the last two millennia. Where the soldier’s protective and lethality equipment and sustainment stores have changed through necessity and technology, the soldier’s load has not reduced. Where logistical and technological transport aides have changed over the last two millennia, the soldier’s load has not reduced. Even where the nature of warfare has changed, from converging phalanxes and trench warfare to today’s complex battlefield, the soldier’s load has not reduced. History therefore suggests that relying on improved load carriage logistical aides and changes to equipment may not be the answer to this age-old problem, and that perhaps the military answer to the problem of the soldier’s load may lie elsewhere; for example, within the mindset and decision-making process of military commanders.

ENDNOTES


10 Hanson, *The Western Way of War: Infantry Battles in Classical Greece*, p. 56.


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16 Ibid., pp. 97–98.
23 Addington, The Patterns of War through the Eighteenth Century, p. 33.
29 Lothian, ‘The Load Carried by the Soldier’, Figure 2, p. 262.
30 Marshall, *The Soldier's Load and the Mobility of a Nation*, p. 27.
41 Ibid.; Ezell, ‘Battlefield Mobility and the Soldier’s Load’.
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57 Rothenberg, *The Art of War in the Age of Napoleon*, p. 84.

58 Montross, *War through the Ages*, p. 539.

59 Rothenberg, *The Art of War in the Age of Napoleon*, p. 84.

60 Lothian, ‘The Load Carried by the Soldier’, p. 9.


70 Lothian, ‘The Load Carried by the Soldier’, p. 12.


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74 Ellis, Eye-Deep in Hell Trench Warfare in World War I, p. 33; Ezell, ‘Battlefield Mobility and the Soldier’s Load’.
75 Ezell, ‘Battlefield Mobility and the Soldier’s Load’.
80 Ellis, Eye-Deep in Hell Trench Warfare in World War I, p. 33.
89 Ezell, ‘Battlefield Mobility and the Soldier’s Load’.
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106 Ibid.

107 Ibid.


114 Ibid.

115 Ezell, ‘Battlefield Mobility and the Soldier’s Load’.


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