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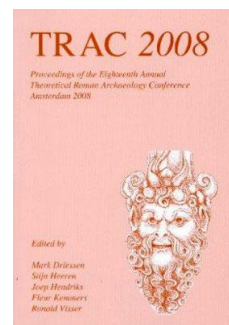
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The Way to a Roman Soldier's Heart: A Post-Medieval Model for Cattle Droving to the Hadrian's Wall Area

Sue Stallibrass

Introduction

'The way to a man's heart is through his stomach' is a traditional English saying and 'An army marches on its stomach' probably derives from Vegetius' *Ars Militaris*. How did food reach the stomachs of several thousand soldiers garrisoned in northern Britain? Large quantities needed to be produced and reliably delivered and this required highly competent organisation. Excavations at several military and military-related sites have produced vast quantities of butchered animal bones, and the persistent dominance of cattle bones implies that regular large-scale supplies of beef reached the troops throughout three centuries. At the moment, there is almost no evidence from rural sites in the region regarding where or how these cattle were produced. Some authors have suggested that large scale transport of commodities was required to sustain the troops and some have assumed that the military demands for staple foodstuffs exceeded local production capacity.

This paper considers the well-documented post-Medieval droving system in northern Britain as a potential model for Roman methods of livestock production and supply. It focuses on cattle but could equally be applied to other species such as horses and sheep. Similarly, it concentrates on the high demand for animals as food for the soldiers although the military also required large numbers of animals (alive or dead) for a range of other resources such as traction and transport, dairy products, wool, skins and textiles. All these production and procurement systems would have been inextricably linked.

Where was the frontier area?

Whittaker (1994) has emphasised the fluid and complex nature of frontier zones as areas of interaction (political, ethnic, social and economic as well as military). Northern Britain exemplifies this: Hadrian's Wall was within a frontier zone not, itself, a permanent delimiter of 'civilised Roman Empire' and 'anarchic barbarian lands'. Figure 1 presents the general distribution of military garrisons in Britain, reaching far up the east coast of Scotland during two campaigns, with consolidated occupation of southern Scotland in the Antonine period.

For three centuries, troop movements and military garrisons were the norm in northern England and southern Scotland, with consequent interactions between the occupying forces and the local people. This paper considers the area between the two Walls as well as the land to the south of Hadrian's Wall to be 'the frontier zone' throughout the later first to later fourth centuries.

Population increase in the frontier area during the Roman period

We have recovered little evidence for later Iron Age settlements and agricultural systems in the western region of Hadrian's Wall, due to a variety of factors such as lack of relevant fieldwork,



Figure 1: Generic map of Roman Britain (not valid for any specific date) showing locations mentioned in the text and the geographical distributions of main Roman roads, forts and towns.

poor preservation of organic remains and a paucity of dating evidence (Hodgson and Brennand 2006: 51–55). More data are available for the eastern part of the country but these are still affected by poor chronologies and preservation (Huntley *et al.* forthcoming). Some late Iron Age hillforts are attested in Northumberland (Haselgrove *et al.* 2006: 39) which suggests a form of

settlement hierarchy. Although the precise numbers of people living in the area that became the frontier zone are unknown, it is clear from the archaeology and other sources that there was a major influx of military personnel into the region (Mason and Symonds forthcoming).

It is difficult to assess the precise numbers of troops stationed here at any particular time but estimates and observations by Breeze (2006a), Carrington (2008) and Haynes (1999), indicate that tens of thousands of people lived in the forts and associated extramural settlements. Perhaps one third to one half of these comprised troops who moved into the area. It is not clear how many of the civilian population were resettled locals, retired military personnel or other immigrants to the region. Whatever the balance, it does seem clear that the population was much more densely concentrated in large centres than it had been prior to the Roman invasion, and that there was a considerable net increase in the total number of people inhabiting the region. Most importantly, large numbers of the inhabitants now required other people to produce their food for them. Who were these other people and where did they live?

The primary evidence for (production and) supply

Ideally, we would have evidence of production from rural sites and evidence of consumption from the military and military-related sites. But the shallow rural sites, where soils are often quite acidic, have usually produced no bone at all (Stallibrass 1995): direct evidence of livestock production is missing for the frontier zone.

Supplies are better represented. The military and military-related sites in the Hadrian's Wall area (forts, annexes, *vici* and towns) have received much more attention and have deeper stratigraphy with better preservation (Symonds and Mason forthcoming). Bone assemblages are dominated by the three main domestic food animals: cattle, sheep and pigs, plus a few chickens and goats. Skeletal parts and butchery marks indicate that their carcasses were all utilised for food. Wild mammals, birds, fish and shellfish are very poorly represented at all sites. Horses and dogs were usually present but not eaten (Stallibrass 1995; Huntley *et al.* forthcoming).

Typically, cattle bones comprise sixty percent or more of the total identified cattle, sheep and pig bones. The lack of sieving at most excavations has led to an overemphasis on cattle, but the larger carcass size of a cow more than compensates for this bias: beef was the major provider of meat at all of these sites. The cattle died at various ages, indicating a range of uses during life, and substantial numbers of mature individuals are always present. In contrast, sheep and pigs were usually slaughtered at prime meat-production ages.

The paucity or total lack of neonatal bones at the military and military-related sites indicates that they were not producing their own livestock: most farmers can expect to lose ten percent or more of their stock due to perinatal deaths (Dahl and Hjort 1976: 37–38).

Where and how could the cattle have been produced?

Apart from a twenty year period on the Antonine Wall, the military frontier of the Roman Empire in Britain was based on the Solway-Tyne isthmus from c A.D. 100–400. The immediate hinterland, particularly in the western and central areas, is better suited to livestock farming than to arable cultivation. Did this area supply *all* of the cattle consumed in the forts and military-related establishments? More data are required before this can be investigated.

If not, did additional animals arrive still alive or as processed carcasses? The skeletal element distributions indicate whole animals, which implies that they were alive since carcasses are usually processed to reduce transport costs. If live animals were brought in from elsewhere, was this region of production within the empire or beyond the frontier, and were the animals shipped or did they walk? For large-scale deliveries, shipping is more suited to processed products such as barrels of salt beef although smaller numbers of live animals can be transported by ship. Live animals have the advantage that they can transport themselves overland and can, given time, travel long distances. The area south of the frontier was probably already involved in producing and supplying food and manufactured products to their local military establishments. If additional surplus livestock were raised elsewhere in Britain to supply the concentrations of population in the frontier zone, where were they likely to be produced? Southern and eastern England is more suited to the growth of arable crops but still contains some good pasture land. It is also the area that was more densely settled (Jones and Mattingly 2002; Taylor 2007) and it may not have been able to produce sustainably large surpluses of livestock to be sent away to the frontier zone. Ideally, a surplus livestock production area would have good pasture but a relatively sparse human population.

The area between the two Walls is an area of upland that is well suited to cattle and sheep farming. Could this have been an additional production area for military meat supplies? Wells (1996: 3) has highlighted the major roles of external and indigenous production systems to the provincial economies of the Roman Empire using the World Systems model. Mattingly's (2007: 221) definition of an 'imperial economic system' includes the consumption of resources or commodities produced outside of the empire. Both draw on evidence from sites immediately beyond the frontier in north west Europe such as Feddersen Wierde. Reichstein (1991) suggests major developments there in cattle production (based on a substantial increase in the total number of livestock stalls) and Johnstone (2008) suggests increased horse breeding (based on animal remains). The presence of Roman artefacts and other commodities is used as evidence that animals were traded rather than sent as tribute or tax (Reichstein 1991). Were people living in Scotland similarly able to engage in mutually beneficial transactions (Cunliffe 1988: 167 *re* Traprain Law; Hunter 2007); were they forced to provide animals for the Roman army as tax or tribute, or were they completely independent and self-sufficient? First, we need to consider whether or not surplus cattle could have been produced in Scotland and supplied to the military.

Long distance movements of livestock: a model based on 17th–19th century Britain

In many ways, the developments in Britain during the post-medieval and early modern periods were very similar to those in the Roman period. Active military organisations (armies and navies) contained large numbers of people who required food but who were unable to produce it. Intensification of industrial production and urbanisation further increased the demand. Both periods saw major developments in the quality and quantity of communication and transport systems, often involving considerable investment in infrastructure projects such as roads, canals, ships and traction facilities (often animal-based).

Quite large numbers of domestic livestock had been moved around the country during the medieval period (if not earlier), both for personal benefit and for reasons of state. Besides stock movements between the estates of wealthy landowners, animals sold at markets and fairs included

some that had been driven long distances. By the mid thirteenth century the weekly cattle market in Gloucester regularly sold animals driven on the hoof from Wales (Bonser 1970: 19-20) and livestock were also sent into England from Scotland throughout the medieval period. In the fourteenth century, King Edward II of England ordered Welsh cattle to be collected to support his soldiers fighting in Wales: a situation potentially similar to that of the Roman invasion forces in England, Wales and Scotland in the first century. By A.D. 1400 large numbers of cattle were collected in Wales and sent to the Cinque Ports (close to the late Roman 'Saxon shore forts' in Kent and Sussex (Fig. 1)) to supply the armies fighting overseas in France (Bonser 1970: 42). Fresh meat was required on land for the troops and the sailors when in harbour, but salt meat was needed for provisions out at sea and, sometimes, for the army. In A.D. 1338 the English King Edward III required provisions for his army and navy including one hundred oxen and ten quarters (nearly 3,000 litres) of salt. A major increase in demand came during the late 17th and early 18th centuries and continued through to the early 20th century, to feed not only the persistently active military forces but also the increasing industrial urban populations. Haldane (1973: 3) notes how the administrative Union of the Parliaments (A.D. 1707) enmeshed Scotland within England's economic and military empire.

Britain has areas of uplands that are good livestock producing areas, whilst the urban settlements tend to be in more lowland situations, surrounded by land that is good for arable production. This is a gross over-simplification, but population maps for c. A.D. 1701 and A.D. 1911 (Muir 1920: Plates 44a and 44b) clearly show dense settlement and high ground as almost mutually exclusive. In Britain, most of the upland areas are in the north and west.

In the post-medieval period, these rural areas of high ground were used for stock rearing and the surplus animals were sent long distances to the urban and military markets. The livestock were often produced in relatively low numbers by individual farmers or tenants, but were gathered together into large 'droves' to be driven *en masse* by a few men. The production areas tended to be in the north and west of Britain, and routes led into the English Midlands and south and east England. Many of the animals were eventually destined for the enormous livestock markets in London such as the famous Smithfield market. Although the western grazings were renowned for producing small hardy cattle who were good mothers and milkers, they were less good for fattening livestock. Gibson (1988: 168) calculated that the average carcass weight of Scottish post-medieval cattle was approximately 310 lb (140 kg), very similar to modern Dexter cattle whose skeletons are similar to Romano-British material. Colyer (1976: 30) also emphasises the continuing small size of Welsh cattle despite contemporary development of larger types in lowland England. Large or fat cattle are not suited to long distance droving as they tend to have high nutritional requirements and lose much of their weight and value during the walk. Mass movements of fattened livestock did not occur until railway transport was available in the mid nineteenth century (Perren 1978: 23).

Scotland produced cattle, sheep and ponies; Wales produced cattle and sheep; and Ireland produced cattle which were transported in boats across from northern Ireland to south west Scotland. This paper concentrates on cattle droving from Scotland to the Hadrian's Wall zone. The model can also be applied to ponies, sheep, pigs and geese, and to the possibility that Welsh livestock supplied the Roman military garrisons in Wales, Chester and Wroxeter and towns in central and southern England.

Scotland had two main areas of surplus livestock production which were separated by the more densely-settled southern lowlands. In the west and north of Scotland livestock were raised

in the islands and highlands (cattle could swim short distances or be transported in boats to the mainland). The hills and coastal areas of southwest Scotland (Dumfries and Galloway) were another important livestock area.

There were two systems of payment for droving: the drovers could purchase the cattle and bear the cost if animals died before they could be sold at market, but it was more common for the Scottish drovers to collect the cattle and then to pass on the payment when they returned. Many of them were trusted people: they were also used for administrative purposes such as tax collections, to carry letters to and fro, and to bring back goods purchased at market. In many areas of the Scottish Highlands, small tenant farmers paid their rent to their landowners in kind, that is to say, in head of cattle rather than in coin (Haldane 1973: 45–46): a system that has been suggested for the Roman period by Shotter (2004) and which was standard practice for Welsh livestock farmers for many centuries (Bonser 1970: 43). The drovers would then collect these cattle and sell them on behalf of the landowner. The animals for sale ranged in age but tended to be at least four years old. They included elderly females who were no longer good breeding stock, and oxen (castrated male cattle) that had been used for traction for up to four years. The animals could be sold at market for immediate slaughter or for resale after fattening on the lush lowland pastures.

Although each small farmer might only send a handful of animals to market, the droves often comprised two hundred head of cattle. They would travel at about two miles per hour (3.2 km ph) and travel 14 – 16 miles (22 – 26 km) per day. The distances covered often totalled several hundred miles or kilometres. For instance, it is more than 500 miles (800 kilometres) from the major fair at Falkirk in southern Scotland to London via the fattening area of East Anglia.

The routes followed by the drovers required a few key attributes including easy walking for the livestock. Paved road surfaces can injure animals' feet and many of the drovers' routes followed old Roman roads directly across the landscape. Roads needed wide verges where the cattle could graze as they passed, and areas where they could be sheltered overnight with grazing and water; they tended to avoid densely settled areas and areas of arable fields. Droving usually took place after the harvest before winter weather created frozen or soft wet ground.

Most routes through Scotland converged south of Edinburgh and passed through Falkirk (near Camelton and the Antonine Wall) where trysts (major fairs) were held. Routes south from here diverged, with a major route running south west to Carlisle. To the east side of the Pennine hills there were more choices topographically but the most-used route passed through the site of a major fair at Stagshaw Bank at Corbridge (Haldane 1973). Others passed through Bewcastle and close to the Roman forts at Housesteads and Birdoswald (Fig. 1).

The numbers of livestock reared in Scotland and driven to England are recorded in documents relating to sales and toll receipts. The rapid development of the trade can be seen in the Carlisle records. Between August 1662 and August 1663, toll was paid for 18,574 head of cattle to pass through Carlisle. By 1675 there were 20,000 to 30,000 cattle passing through the town from Galloway alone. These numbers are very similar to those calculated for the Roman garrison in England in the early second century which would equate to one cow (about 140 kg of beef) per soldier per annum. In the late eighteenth century, Carlisle saw an average of nearly 11,000 Irish cattle passing through in addition to the Scottish beasts (Bonser 1970: 90).

The rate of population increase in the post-medieval period was very high, and yet the production levels of livestock managed to keep pace. Between A.D. 1801 and 1851 the population of Britain more than doubled from 10.5 million to nearly 29 million people, by which time

the annual production of meat (beef plus mutton plus pork) had risen to 910,000 tons (925,000 tonnes) per year. This increase was achieved through three main developments: more intensive farming methods, more 'rational' systems of cultivation (e.g. amalgamating small plots of land) and the cultivation of wide areas of land previously considered 'waste' or common land (Burnett 1966). Improvements in the same three areas: technological developments, intensification and extensification have been suggested for agriculture in Roman Britain (Van der Veen and O'Connor 1998; Murphy *et al.* 2000).

There are other parallels between the post-medieval and Romano-British periods with regard to the quantities and organisation of meat supplies to the military services. In A.D. 1700 the Navy's daily allowance of meat per person was one to two pounds (c 1kg) of salt beef, bacon or salt pork. In A.D. 1653 the Victualling Department supplied seven and a half million pounds (3.4 million kg) of beef and pork to the Navy (Anon 1896 cited by Bonser 1970: 106). It had several centres for meat processing including buildings at Chatham dockyard for slaughtering animals, for pickling and salting the meat, and for packing the products into casks and barrels to go to ships at three different harbours. Similar buildings and facilities existed on Tower Hill in London alongside storebuildings for biscuits, beer and fish, and these were all distributed to smaller victualling ports at London, Dover, Portsmouth, Plymouth, Dublin and, later, Liverpool.

All of these figures emphasise the huge numbers of livestock destined for consumption by people such as military personnel and urban dwellers who could not raise their own animals during the post-medieval period. They also highlight the fact that most of the cattle were not bred for meat *per se* and were small hardy types raised in rural upland areas. In addition, they imply the industrial scale of related processing activities coupled with major requirements for salt. The long distances travelled by so many animals indicate that supply and demand systems encompassed the entire country of Britain, with north-west Britain producing surpluses for consumption further south and east.

Could Roman Britain have had a similar system of supply and demand?

There are some circumstantial lines of evidence that suggest that the military garrisons in Britain could have been supplied in a similar manner to that seen in the post-medieval period. These include a reference to droving, documentation of administrative systems for the production, collection and transportation of agricultural produce, and the network of Roman roads. Pliny (*Natural History II* Chapter 27: 499) mentions geese being driven to Rome from northern Gaul: a distance of c. 780 miles (1,256 km) (*cf.* 675 miles (1,087 km) from northern Scotland to London). Epigraphic evidence from northern Africa records how local leaders organised the collection of grain produced by individual villagers. The total contribution from the village would then be taken to a designated transfer location from whence the military would ship it in bulk across the Mediterranean Sea to Rome (Adams 1999). The Roman army improved upon the existing network of tracks and roads in Britain, providing suitable routeways for long distance over-land transport.

The model seems to be appropriate: the Roman military organisation required a large amount of meat to be supplied to a relatively dense population in the frontier region (i.e. the demand existed), they had an administrative system that could organise the accumulation and delivery of large quantities of resources produced in small units by multiple individuals, and they had

established a transport and communication network that facilitated long distance movement of people and livestock.

Is there any direct evidence that the Roman army were supplied with cattle brought over long distances?

The short answer at the moment is ‘no’, but this may be due to a lack of specific enquiries.

What evidence could be looked for?

A range of different types of evidence to be explored includes the administrative systems, the logistical implications of a droving network and the animals themselves. A tablet from Tolsum, The Netherlands, documents the purchase by Romans of cattle from native sellers but it is not stated where the cattle came from (Boeles 1951: 129-130 cited in Wells 1996: 9). Tablets from British sites such as Vindolanda and Carlisle might yield relevant references although none have yet been found. If livestock were moved in large numbers long distances, then there may be landscape features such as holding areas. These might be located at nodal points or on the outskirts of Roman settlements (including forts). It may be highly significant that important fairs and markets on the two major droving routes from Scotland into England are located at the two Roman towns on the frontier: Carlisle and Corbridge. Just outside the Roman fortress at Chester, recent excavations beside a roadway leading into its Welsh hinterland revealed paddocks with evidence for livestock occupation (Lightfoot in prep.). It is not possible, however, to tell if these enclosures were used to raise locally indigenous animals or to hold imported livestock on their way to sale or slaughter.

Three forts: Birrens, Netherby and Bewcastle lie to the north of the western end of Hadrian’s Wall, and they are linked to it by roadways: (Breeze 2006b: 97) (Fig. 1). The first two of these project into Dumfriess and Galloway and could have been used as collection points of tax and tribute as well as for military surveillance. This part of Hadrian’s Wall is thought to have bisected the homeland of the Carvetii (Higham and Jones 1985), who probably had a similar relationship with the military whichever side of the Wall they lived (Wilson 2001, 2003). Of course, when the Antonine Wall was built, they were all ‘within’ the frontier zone. The third site, Bewcastle, is directly on the post-medieval drovers’ route south from the Falkirk tryst and could have performed similar functions in the Roman period, collecting highland cattle on their route south. The fort at Bewcastle has an esoteric polygonal layout which does not conform to any standard Roman fort design (Breeze, 2006b). Could it have been used as a livestock enclosure? Hanson (2007: 669) argues that the fort and annexe at Elginhaugh were used as a collection centre for animals after the fort was abandoned. Other evidence could indicate the economic system involved. Halliday (2002) has drawn attention to the landscapes of south western Scotland that appear to contain large estates with hierarchical centres that he suggests might have been based on wealth measured in land and livestock. If Halliday and Hanson are correct, then there appears to be a landuse pattern in southern Scotland based on large-scale animal husbandry (or animal ownership) both preceding and post-dating the Roman military occupation. Groot’s (2008a; 2008b) research in the Netherlands indicates that the Roman economy in the frontier zone did not superimpose new systems of agricultural exploitation but emphasised pre-existing landuse patterns. It seems quite likely that a similar situation existed in Scotland, although we do not have sufficient animal bone assemblages to compare.

Any large-scale movements of livestock have logistical implications (Stallibrass and Thomas 2008). If droving is a seasonal occupation, then it is likely that some locations would receive large quantities all at once. What to do with them? If they are all slaughtered on arrival, then the huge quantities of meat would have to be preserved by salting, smoking, pickling or drying. Several military and urban sites including Carlisle (Stallibrass 1991) and Lincoln (Dobney *et al.* 1995) have produced dense concentrations of processed cattle scapulae, interpreted as evidence of smoked shoulders of beef. But can this be evidence of droving rather than seasonal culling of local livestock?

Some methods can be used to investigate whether or not livestock come from single or multiple sources. Grant (1982) suggested that a diversity of tooth wear patterns can indicate animals kept in different locations or management systems. The nature and prevalence of various metric and (particularly) non-metric traits can be used to indicate genetic affinities of livestock. Again, diversity might indicate that animals are coming in from different sources, but these methods cannot investigate where those sources might be located. Isotope analyses can sometimes indicate geographical origins of livestock. Sykes *et al.* (2006) were able to differentiate between fallow deer born in Roman Britain and those born elsewhere: teeth retain the isotope ratios incorporated when they form (at a very young age). There are problems with the method since some areas have non-distinctive isotopes. Oxygen isotope ratios are related to ambient temperatures and in Britain there tends to be a gradient west-east. Animals raised in southwestern Scotland might have very similar oxygen isotopes to those raised in north-west England, but animals moved to the eastern side of Britain e.g. Housesteads or Wallsend, York or Lincoln, would have noticeably 'non-local' isotopic ratios. Many of the upland regions have geological bedrocks that have distinctive strontium or lead isotopes, so it may be possible to differentiate animals raised in parts of Scotland, for instance, from those in Cumbria or the Yorkshire lowlands. Montgomery *et al.* (2007) demonstrated that the cattle jaws at Ferry Fryston, North Yorkshire were of disparate and non-local origins, some from quite distant areas. The author is currently proposing a PhD research project using isotope analysis to investigate the possibility of Roman cattle droving to sites in northern Britain. Carlisle and Chester are particularly significant as they are known from post-medieval documentary evidence to have imported cattle from Scotland and Wales and provide excavated material for both periods.

Summary

This paper started with the premise that the influx of military personnel and the redistribution of civilians during the Roman occupation of northern Britain led to a sharp increase in demand for food production and supply. It notes the lack of evidence available from rural sites in the Hadrian's Wall zone, which hampers investigations of local meat production systems. It demonstrates the persistent evidence for large-scale consumption of beef at military and military-related sites and suggests that long distance droving of livestock from Scotland in the post-Medieval period can provide a model for Romano-British systems. There are many parallels: increased demand requiring large-scale production, small, hardy and mature cattle used for other purposes during life, and developments in infrastructure such as transport and administrative facilities. The paper concludes with suggestions for how this model can be tested.

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