The Newstead ‘lorica segmentata’

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INTRODUCTION
The first scholar to see the Newstead type of ‘lorica segmentata’ as a later form of the armour than that typified by the cuirasses discovered in the Corbridge Hoard was H. Russell Robinson. He viewed it as a natural evolutionary step for segmental body armour from the over-elaborate and fragile earlier type. His conclusions were largely based upon examination of the remains from Newstead (Scottish Borders) itself, with some missing details supplied by the Zugmantel (Germany) find. At the time, he appears not to have been aware of the discovery at Eining (Germany) of pieces of this kind of ‘lorica segmentata’. New finds have subsequently come to light, notably a single backplate from Carlisle, Cumbria. All in all, it might seem that the time is right for a reconsideration of the Newstead type of armour. However, that is not the prime purpose of this paper, for it is the Newstead find itself that must bear reconsideration before any wider conclusions about the development of ‘lorica segmentata’ can be outlined.

THE CIRCUMSTANCES OF THE FIND
James Curle began excavating the Roman castra and its annexes at Newstead in 1905 and continued until 1910, rapidly publishing his exemplary monumental report A Roman Frontier Post and Its People in 1911. A large number of pits were excavated, many of them being Flavian in date. Although a considerable number of Antonine artefacts were also recovered, most of them came from excavations within the fort and were generally much less well-preserved than the finds from the pits.

PIT I
Pit I (as it was termed by Curle) was the well within the courtyard of the Antonine headquarters building. It was 25.5ft (7.8m) deep and tapered from 20ft (6.1m) in diameter at the surface to 6.5ft (1.98m) at the bottom. When excavated in September 1905, it was found to have a variety of contents (Table 1), which appear to have been deposited at the time of the abandonment of Newstead.

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near surface</td>
<td>twisted silver wire, penannular brooch, 2 bronze rings, small bronze chain</td>
</tr>
<tr>
<td>1.52m (5ft)</td>
<td>inscribed altar, coin of Hadrian</td>
</tr>
<tr>
<td>2.44m (8ft)</td>
<td>human skeleton, penannular brooch, ?brooch</td>
</tr>
<tr>
<td>3.66m (12ft)</td>
<td>4.27–5.49m (14–18ft) animal bones, shoe soles, leather fragments, antlers</td>
</tr>
<tr>
<td>4.49m (18ft)</td>
<td>animal bones, shoe soles, leather fragments, antlers</td>
</tr>
<tr>
<td>4.64m (16ft)</td>
<td>fragments of stone moulding, sherds of amphora and samian, antler iron bar</td>
</tr>
<tr>
<td>6.4m (21ft)</td>
<td>human skulls, brass scale armour, amphora and samian sherds</td>
</tr>
<tr>
<td>6.71m (22ft)</td>
<td>quern stone, iron knives, linch pin, iron bar, sickle, ‘lorica segmentata’, parts of a wooden bucket, 2 sculpted stone blocks, 5 iron arrowheads, iron mail armour fragments, iron shield boss, brass fragments, Flavian brass coin, iron holdfast, wall plaster, and amphora sherds</td>
</tr>
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The pits and their fills have been subject to varying interpretations, ranging from disaster, to ritual, to rubbish, and back to ritual again. The purpose of the deposits is not central to the matter of this paper, however, since it sheds little light upon the functional considerations in reconstructing this type of armour.

THE SURVIVING COMPONENTS OF THE CUIRASS
Not all of what Curle identified as belonging to the cuirass can actually have been part of it. Amongst the items included within the finds groups associated with the armour now in the National Museums of Scotland there are fragments of iron cavalry helmets, pieces of scrap iron, and (most significantly) portions of laminated iron armguard (manica). Some pieces of the last were even included amongst Curle’s published drawings of what he took to be the components of the cuirass.

In 1997, the present writer had the opportunity to examine the various components of finds groups FRA 117 and FRA 121 in the company of Peter Connolly, and this proved a most instructive process. Broadly, it was readily apparent that the iron breastplate, mid-collar plate, backplate, and one set of shoulder guards had been included, but that no indisputable fragments of girth hoops were present within the assemblage, nor did there appear to be anything that could be identified as even part of an upper shoulder guard. Moreover, the degree of damage to the armour rendered some of Robinson’s conclusions untenable.

The results of this detailed examination are as follows:

The Breastplate (Fig.2)
Curle’s published photograph shows two large fragments of this plate (BrPa-b), but it is clear that other pieces belonging to it are included within the find. The exact location of the
COLLAR PLATES    UPPER SHOULDERGUARD    LESSER SHOULDERGUARDS

Fig.1: Newstead 'Lorica segmentata' shoulder unit terminology.

outside bottom corner cannot be fixed with certainty, but the original overall width of the plate was probably close to 180mm wide. The plate is 1.5mm thick in most places and has a total surviving height of 200mm (probably not far from its original dimension). The central rectangular opening in the inner vertical edge (6 x 16mm) is surrounded by a rectangular copper alloy plate (27 x 35mm) on both faces, secured in place by four copper alloy rivets and folded inwards around the vertical edges of the opening. These copper alloy components all display a brassy patina. The upper edge of the breastplate - the neck opening - has been turned out (and thinned to 1.1mm), rather than rolled, and pierced by a single small, circular hole, close to the inner vertical edge and directly above the rectangular aperture. Crucially, the area where the breastplate would have joined to the collar plate is heavily damaged, although a small fragment (BrPc: 45 x 50mm and 1.2mm thick) containing three rivet holes may have belonged here.

The Backplate (Fig.3)
Curle published' the one main fragment of this slightly dished plate (BaPa), but another piece almost certainly belongs with it (BaPb), although it 'floats' somewhere on the outer vertical edge. The plate is 1.6mm thick, 225mm high and probably originally about 175mm wide (assuming the pair of vertical fastenings are centrally located). The upper edge, the neck opening, is turned outwards, in a similar fashion to the breast- and collar plates. The inner vertical edge is not straight, apparently being rather carelessly finished. As on the breastplate, there is a small circular hole in line with and above the rectangular apertures, but in this instance below the neck flange. There are two rectangular apertures on the inner edge (7 x 18mm upper, 7 x 16mm lower), each bound in copper alloy like their counterpart on the breastplate (the intact upper fitting being 28 x 39mm). At the bottom of the plate are two truncated elliptical copper alloy mounts (65mm high, 29 and 31mm wide), pierced by oval holes which pass through the iron of the plate. Each is attached by a rivet towards its top, and then folded under the lower edge of the underlying plate. Again, the important area of the junction with the collar plate is missing.
Fig.2: The Newstead breastplate, scale 1:2 (source photos courtesy of the Trustees of the National Museums of Scotland).
Fig. 3: The Newstead backplate, scale 1:2 (source photos courtesy of the Trustees of the National Museums of Scotland).
The Mid-Collar Plate (Fig.4)
Identifiable by its turned-out neck edging and by its outer straight edge, both of which survive, this plate (McPa-b) nevertheless lacks its front and back ends, where it would join with the breast- and backplates. There are two rivets on this plate, one of which retains a square leathering washer on the underside and it is not clear whether one is the replacement for the other or they were both used at the same time, but a crude repair may be a reasonable interpretation. The plate is 1.7mm thick, 80mm wide at its narrowest point, and survives to 130mm in length.

The Shoulderguards (Fig.5)
Fragments of at least two of the four lesser shoulderguards were included in the assemblage, identifiable as such by their having leathering rivets (with square washers) near the inner edge (whereas upper shoulderguards have them mounted centrally). These have been tentatively numbered from the innermost outwards, on the assumption that they will have resembled the Corbridge type of cuirass in having the largest plates nearest the neck of the wearer. Their edges are as crudely finished as those of the breast- and backplates. The larger plate (LsG1a–c) was c.75mm wide and c.440mm long, whilst the smaller (LsG2a–d) was c.65mm wide and more than 340mm long. The thickness of the plates varied between 1mm and 1.2mm and some pieces still had their leathering washers and rivets. Other fragments 55mm and 50mm wide may possibly come from LsG3 and LsG4, but certainty is not possible here.

No identifiable remains of an upper shoulderguard are included in the assemblage and it is difficult to escape the conclusion that no such plate was found by Curle.

Other fragments (Fig.6)
As has already been mentioned, a number of fragments (such as small pieces of helmet and armguard plates) that are now associated with the cuirass quite clearly were not originally part of it. However, there are some iron and copper alloy fragments that may, conceivably, have belonged to the armour. Some of these are crucial to understanding the various reconstructions that have been presented in the past, so it is worth considering these in some detail. It should be remembered that none of these need necessarily have been part of the ‘lorica segmentata’.

1. The breast fastening
In 1969, Robinson believed the back- and breastplates were fastened by means of buckles passing through the rectangular apertures (Fig.8a). By 1975, however, he had decided upon a small, tubular, copper alloy fitting (Frag1) fastened to a portion of iron plate as the more likely method of securing these plates (Fig.8b). This item, which appears to have been slightly flattened prior to deposition, measures 20mm by 12mm and the 1.2mm-thick fragment of iron plate to which it is attached is only 45 × 30mm.

2. The girth hoop
Robinson’s proposed method of fastening the girth hoops on the Newstead type of cuirass depends upon one piece of iron plate with a tubular fitting attached to it (Frag2). This is the only possible example of a girth hoop recovered from the Pit 1 material. The fitting is 13mm wide (including the folded-back ‘wings’ inserted through the iron plate), 7mm high, and 7mm deep, whilst the 1mm-thick iron plate itself to which the fitting is attached is 100mm long and 45mm high.

3. The cast loop
Another small fitting that is noteworthy is a cast loop fitting (Frag3). It appears to have been overlooked by earlier scholars but, as with the other fittings, there is no guarantee that it originally belonged with the cuirass. It passes through an iron plate that is also riveted and has some sort of folded-over edging attached. This whole group appears to be a repair of some kind and measures 43mm high and 80mm wide, whilst the cast loop fitting is 2.4mm thick, 10mm wide, and c.14mm long.

The pieces of segmental armguard (Fig.7)
As many as 11 fragments (AGa–k) of iron laminated armguard are included with the assemblage and some of these have in the
Fig.5: The Newstead lesser shouldeguards, scale 1:2 (source photos courtesy of the Trustees of the National Museums of Scotland).
past been confused with the set of body armour.\textsuperscript{15} They are easily distinguished by their characteristic width (about 35mm: no plates in any form of ‘lorica segmentata’ are as narrow as these) and by the copper alloy leathering rivets close to their lower edges (unlike body armour, laminated armguards overlapped upwards, so the straps were attached at the inside, or lower, edge). None of the pieces is instantly recognisable as the end of a plate (with both a leathering rivet and a perforation allowing the plate to be sewn to a backing), although one fragment (1) may be. Comparable copper alloy plates of at least one such armguard are already known from Newstead,\textsuperscript{16} thus it is not particularly surprising to find iron plates included with the present find. Iron armguard fragments were included amongst the Carnuntum (Austria) Waffenmagazin deposit.\textsuperscript{17} Evidence for the widespread use of the manica is accumulating from the Western empire, and its direct association with segmental body armour in a military context is provided by a statue from Alba Iulia (Romania).\textsuperscript{18}

**PROBLEMS IN RECONSTRUCTING THE NEWSTEAD ARMOUR**

**Curle’s attempt**

Curle, for all his archaeological virtues, did not possess an innate understanding of Roman military equipment. He misinterpreted the orientation of the main Newstead fragments, thinking the backplate was a breastplate and that it sat with the two rectangular slits on the lower edge.\textsuperscript{19} Given the
contemporary understanding of segmental body armour, this is hardly surprising. Although Curle was aware of von Groller’s discoveries in the Waffenmagazin at Carnuntum, as published the fragments do not provide sufficient information to allow a (to our eyes, at least) more accurate reconstruction.

Robinson’s Reconstruction

Robinson’s working reconstruction of the Newstead cuirass, together with Peter Connolly’s line drawing (first published in Robinson’s The Armour of Imperial Rome), have become familiar as the first systematic attempt to reconstruct the Newstead find in its own right, rather than amalgamating it with inappropriate Corbridge elements. Nevertheless, Robinson seemed only too aware of the shortcomings of his reconstruction, albeit fairly certain of a general trend towards simplification in the overall design.

There are a number of problems with this that require addressing. Some have attempted to approach these before, but it is fair to say that no completely satisfactory solution to all the problems has yet been produced.

Problem 1: The Breast- and Backplate Fastenings

Robinson’s solution to the fastening of the breast- and backplates – using a tube attached to one plate passing through the rectangular opening on its twin, secured with a
locking pin (Fig. 8b) – was not universally accepted. In 1988, Andrew Poulter reverted to Robinson’s original method of fastening, using buckles and straps (Fig. 8c). His reasoning was based on the observation that it would not have been practical for a soldier to fasten his own cuirass using Robinson’s preferred system. He also suggested that the small hole near the top in each of the back- and breastplate were used for fastening a copper alloy edging strip around the neck opening.

There are problems with Poulter’s reconstruction, however, the greatest of which is the complete absence of any signs of wear around the apertures on both the Newstead and Eining cuirasses. A more plausible means of fastening the plates was already known in a different context, for turning pins were known from examples of ‘sports’ and combat armour breastplates.

With the small holes below the neck opening once again unexplained, it can be seen that the turning pin method of fastening is not only the best supported by the evidence, but also the most logical. The final piece of evidence may be provided by one of the Zugmantel fragments. Identifiable as part of a backplate, it possesses what looks like the companion fitting to the rectangular aperture found on the Newstead, Eining, and Carlisle plates. This consisted of a rectangular (albeit with clipped corners, making it almost hexagonal) copper alloy plate with a central hole for another, possibly rotating, fitting.

This does not mean that Robinson’s proposed method of joining the breastplates of scale or mail shirts can be adopted for fastening the breast- and backplates of ‘lorica segmentata’ without further question. The system he suggests for securing the turning pins – a long pin that passes through both and is attached to the collar by a thong – would certainly work for the backplate with two horizontal fastenings, but for the breastplate with only one it would prove more cumbersome. Moreover, no such pins are readily identifiable in the archaeological record. It might therefore make more sense to see each turning pin (one on the front and two to the rear) held in place with its own split pin (examples of which are known from Roman military sites), still attached to the collar by means of a thong.

No examples of the Newstead type of armour have revealed indisputable traces of copper alloy binding of the neck opening, although ironically this is a feature of the Augustan Kalkriese type of ‘lorica segmentata’.

Problem 2: The Girth Fastenings

Robinson used the fragment of plate that he thought represented a girth hoop to provide his proposed method of fastening the lower halves of the cuirass. There is no guarantee that the plate concerned – which has a tubular fitting protruding – is actually a girth hoop, and it is quite clear that the main deposit of armour is a shoulder element consisting of back-, collar-, and breastplates, together with lesser shoulder guards. Moreover, Robinson’s preference for the tubular fitting was without published archaeological parallel.

Finds from the Waffenmagazin at Carnuntum (Fig. 9) had included an alternative method of fastening girth hoops, using cast copper alloy loops (which are comparatively common finds), although doubt has been cast upon the efficacy of these objects for such a role. If Robinson was indeed correct in identifying the tubular fitting as a girth hoop fastening, it seems highly likely that the cast hoops were in use at the same time and may even have been the most common method of fastening (see below). There is at least one example of such a loop from Newstead. Stratified examples from Caerleon (Monmouthshire) mostly came from Phase IV (c. AD 160–c. 275–) at the Roman Gates site, although some finds come from the earlier Phase III (c. AD 100–160).

In her discussion of the Caerleon finds, Janet Webster has identified four categories of such rings, and noted that they either have short or long shanks. She suggested that those with a longer shank may be explained by the girth hoop leathering having been rearranged to be located closer to the ends, so that it could be pierced and secured by these items. This was clearly not the case on the published Carnuntum plates, as pairs of leather rivets were still in place on plates fastened with cast rings; moreover, ‘lorica segmentata’ requires internal leathers to be attached near the upper edge of its girth hoops in order for it to function, and the loops are attached half way up the plate. Nevertheless, Webster would appear to be correct in her assertion that the fittings with the longer shanks had been used and subsequently distorted by extraction, as the fragmentary piece discussed above would appear to provide evidence for this.

The best solution to this whole problem may lie in assuming that – if it does indeed belong to a girth hoop – the tubular fitting is a temporary repair inserted through a hole intended for one of these cast loops. Similar tubular fittings are also used on the Eining backplate – almost certainly as a temporary repair – to receive the vertical fastening hooks. The frequency with which cast loops are found, and the rarity of comparable tubular fittings, must argue against the latter being the normal mode of fastening girth hoops, but rather as convenient and swift means of repair.
Problem 3: Riveted Plates?
As part of the trend toward simplification that Robinson thought he could detect, he believed the Newstead cuirass employed single-plate, not hinged, upper shoulder guards, and that the breast-, collar-, and backplate were riveted together and not articulated. He felt that this was understandable, given the number of repairs to such hinges evident in the Corbridge Hoard armour (including the riveting together of plates) and because these hinges were not strictly necessary to the successful functioning of the armour.31 Careful inspection of the Newstead armour cannot support his interpretation, as all of the key areas that would carry evidence of such riveting have been damaged, although there is one possible exception (on the breastplate). Here, a plate of appropriate thickness can be restored as belonging to the upper part of the object, but it is equally open to interpretation as the rivet holes for a lobate hinge as it is for the riveting together of mid-collar- and breastplate. Thus it adds little to the debate. Similar damage to this area is also present on the Eining cuirass and only the Carlisle armour preserves this region, and that will be discussed below. Since no upper shoulder guards have been identified, Robinson’s suggestion on this remains unproven.

THE NEWSTEAD TYPE ‘LORICA SEGMENTATA’
Since the Newstead find is far from being a complete cuirass, it is important to consider it in the light of other finds of this type of armour and an intriguing piece of iconographic evidence. Whilst the Eining deposit appears to parallel the Newstead find in terms of its constituent parts, those from Carlisle and Zugmantel may (or – arguably – may not) supply crucial missing details relating to the girth plates and the collar plate junctions.

Eining
Although the find of ‘lorica segmentata’ from the Weinberg was excavated as long ago as 1917–18 and mentioned in the publication soon afterwards,32 it does not appear to have been known to Robinson or any of his contemporaries working on the interpretation of Roman segmental armour. Consisting of a backplate (245mm high and 170mm), mid-collar plate, and lesser shoulder guards (as well as a few possible fragments of armguard), the find was in good condition when recovered, in many ways comparable to that of the Newstead armour. Apart from slight differences in size, the two sets of armour are remarkably similar, not only in form but also in content.33

Carlisle
The discovery of a plate of the Newstead type from Carlisle in a 4th-century context near Tullie House Museum occasioned some interest, not least because it bore a large lobate hinge of the same type found in the Waffenmagazin at Carnuntum.34 Identifying the object as a backplate, Caruana suggested that it had originally been riveted and then subsequently fitted with the lobate hinge it still retains.

Zugmantel
A series of fragments of segmental body armour was excavated from a burnt deposit near the praetorium at Zugmantel in 1906 and subsequently published, albeit cursorily.35 This material was known to Robinson and provided his evidence for the deepening of the lowest girth hoop, since this is the only find so far to include indisputable remains of this type of plate. The broadest of these, 110mm high, has a rolled edge and thus almost certainly represents a lowermost plate. The deposit included not only portions of overlapping girth hoops, but also part of what was probably a backplate. Instead of the more usual copper-alloy-lined rectangular aperture, this had a hexagonal mount (or, more correctly, sub-rectangular) near one edge, secured by four rivets and with a hole punched through both the fitting and the underlying iron plate, as well as a large (35mm diameter) flat-headed copper alloy stud. A length of the rolled edge of the neck-opening survives at the top of the backplate.

Carnuntum (Fig.9)
Von Groll’s excavations in the legionary base at Carnuntum uncovered a rampart-back building that appeared to have been destroyed at some point.36 It contained a complex of rooms that were found to have been used for storing military equipment, a significant deposit of which was recovered from within. Although there has been much debate about the nature and date of the assemblage, it has many characteristics of the Antonine period, not least the presence of both Corbridge and Newstead type cuirasses (although the identification of the Newstead components was unclear until the Carlisle plate was found). Convincing arguments as to the date of the find must depend upon a) the assumption that the integrity of the deposit was largely intact and b) external reference to comparable well-dated objects. The Newstead type cuirasses are represented by large lobate hinges and girth hoops fastened by cast copper alloy loops. A large floral boss, 28mm in diameter and mounted on an iron plate, may also represent the decorative head of a leathering washer.37

Great Chesters
A single unattached lobate hinge of the kind found at Carnuntum was recovered during one of the various excavations at Great Chesters (Northumberland) between 1894 and 1952.38

Alba Iulia
There is very little provincial iconographic evidence depicting segmental body armour (although it is of course quite common in Rome itself39), but the 2nd- or 3rd-century relief from Alba Iulia already mentioned appears to show what may be a related form of cuirass to the Newstead type. Whilst it is damaged in certain crucial areas, it seems clear enough that there are only four or (at most, allowing for damage) five girth hoops shown, and the lowest of these looks broader than the rest.40 The precise number of girth hoops should probably not be interpreted too literally, not least because the armguard contains far fewer plates than excavated examples suggest would be used. Moreover, instead of large breastplates made of iron plate, scale armour collar pieces and smaller breast closures of the type familiar from many sites seem to have been used (the area of the shoulder guards is too heavily damaged to permit interpretation). This is not, therefore, a Newstead type cuirass, but would nevertheless seem to be quite closely related to the form. That being said, this sculpture appears to confirm the archaeological evidence that the lowest girth hoop was the deepest.
**DISCUSSION**

**Dating the Find**

The Newstead find, as Poulter has already observed, dates to the Antonine period. Robinson had believed it to belong to the Trajanic period, but there seems little doubt that the infilling of Pit 1 – the well in the principia courtyard – occurred at the time of the Antonine abandonment of the site. It has been pointed out more than once that the dating evidence from Newstead indicates a Commodan, or possibly, Severan re-occupation of the site (or at least a later presence in the area), but this does not appear to have any bearing upon the date of our find of segmental armour. The Zugmantel and Eining finds date to approximately the first half of the 3rd century, whilst the Carlisle plate is, to judge from its 4th century context, probably residual. The Carnuntum material, although undated, might be interpreted as being transitional between the first and second halves of the 2nd century, since it contains both types of segmental armour, but this must remain speculation.

Thus the date range for this type of cuirass would appear to be something of the order of 100 years, from around the middle of the 2nd to around the middle of the 3rd centuries AD.

**Variants or One Type?**

Once Robinson had succeeded in differentiating the Newstead type of cuirass from the Corbridge type, he sought further evidence for its form and clearly thought that he had found it. Understandably, he drew upon the Zugmantel find to provide information on the deepening of the girth hoops. In the same way, Caruana made the logical assumption that the piece from Carlisle likewise belonged to the Newstead type of cuirass. Nevertheless, the question must be asked: was there one Newstead type of armour, or was there instead a range of variants that have become confused due to their incompleteness?

In order to answer this, it will be necessary to re-assess the various finds. The Newstead and Eining cuirasses are clearly of the same type of armour. The Carlisle plate has the same type of rectangular aperture as these two examples, and so might arguably belong with them, were it not for the lobate hinge. Caruana argued that the plate had originally been riveted to its mid-collar plate and had subsequently been repaired with the hinge, but this runs counter to the trend that Robinson had already noted on the Corbridge armour: plates that were originally hinged were repaired by riveting, not the other way round. Caruana had naturally assumed Robinson was correct in

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*Fig.9: The Carnuntum girth hoops, lobate hinges, and boss, scale 1:2 (after VON GROLLER, 1901).*
his original assertion that the collar units of the Newstead type were riveted together, but if Robinson was wrong, the Carlisle piece can be viewed in a new light. As has been demonstrated above, only the Carlisle piece retains the all-important diagnostic area of a breast- or backplate, so Robinson’s assertion cannot be supported. There is no reason, therefore, that the Carlisle plate may not have seen an earlier hinge removed and a replacement attached; moreover, it could well be that this piece represents the norm for Newstead cuirasses. If this is indeed the case, then we would have to begin to think of Newstead cuirasses customarily being fitted with lobate hinges at the junctions of the breast-, collar-, and backplates.

The Zügmantel fragments, on the other hand, cannot be directly linked with the other pieces, other than by their date. The subrectangular fitting on the backplate conveniently corresponds with the type of fitting found on the Newstead, Eining, and Carlisle backplates, and as has been explained above, provides a useful solution to the problem of fastening breast- or backplates. It would not be unreasonable to assume that this fragment at least could have belonged to the Newstead type. The girth hoops, however, lack any such means of associating them with the other finds, except by virtue of their contemporaneity and their having been deposited with the backplate.

The Waffenmagazin assemblage from Carnuntum supplies some links with these various disparate elements. The same large lobate hinges as that on the Carlisle plate are the first noteworthy component. Then there are the girth hoops that retain the sort of cast copper alloy loops found in many 2nd and 3rd century contexts.

It might seem, therefore, that an equally plausible case can be made for at least two different types of ‘Newstead’ cuirass as can for there being just one. If two, then one has riveted collar units, the other hinged; one of those two types may have had the deep lower girth hoops found at Zügmantel, although these could equally belong to a third type again. In reality, the slow pace of development of the Corbridge type of armour (which we can now see as the successor to the Kalkriese type), and its essential homogeneity over a long period, makes a variety of contemporary types of segmental body armour seem very unlikely. For the same reasons that the Corbridge type looked so similar from one end of the empire to the other, we should expect corresponding similarities between the various finds of 2nd/3rd century armour.

So it is that the most acceptable explanation of all the finds that have been identified as belonging to the Newstead type is that they are all from one type of cuirass with a well-defined series of characteristics.

A new reconstruction (Fig.10)

Based on the assumption that the various finds outlined above do indeed represent the same type of cuirass, it is possible to offer a tentative revised reconstruction of the likely form of the Newstead ‘lorica segmentata’.

The collar unit consists of three plates on either side of the neck: the breastplate, the mid-collar plate, and the backplate. The first two fulfil much the same function as their predecessors on the Corbridge type, but the backplate replaces the earlier three backplates articulated on leathers. All three plates have an out-turned or, occasionally, a rolled edge at the neck opening.

One breastplate has a single rectangular aperture (surrounded by copper alloy edging secured by four rivets) in the centre of the edge facing its neighbour, whilst its twin has a subrectangular copper alloy plate (also held in place by four rivets) around a turning-pin. At the base of each breastplate is an elongated copper alloy fitting with a rounded top rivetted in place and its bottom wrapped under the lower edge of the iron plate. Both this and the underlying iron plate are pierced once to receive the front girth hoop attachment hook. A leathering rivet, possibly in the form of a large flat-headed stud, will be present near the centre of each breastplate and a large lobate hinge near the top, next to the neck opening. The neck opening is pierced on one plate near the front, above the rectangular aperture.

The inner edge of the mid-collar plate is shaped to the neck, whilst the outer is, to all intents and purposes, straight. The plate will thus be broader at the ends than in the middle. A single leathering rivet is located near the centre of the plate, towards the outer edge. At either end are the lobate hinges that join the plate to the breast- and backplates.

The backplate is higher than the breastplate and has two rectangular apertures with copper alloy edging near the side facing its neighbour. Its twin has two subrectangular copper alloy plates, each around a turning-pin. At the base of each backplate are two elongated copper alloy fittings, each with a rounded top rivetted in place and its bottom once again wrapped under the lower edge of the iron plate, pierced to receive two rear girth hoop attachment hooks. A leathering rivet will be present near
Fig. 11: Patterns for the surviving components of the Newstead cuirass.
the centre of each backplate and a large lobate hinge near the top, next to the neck opening. The neck opening is pierced on one plate near the rear edge, above the rectangular aperture.

There are four lesser shoulder guards in each shoulder assembly, two inner larger ones, and two outer smaller ones, each with three leathering rivets near its inner edge (again in imitation of the Corbridge B/C). The one completely unknown element in the cuirass is the upper shoulderguard. For the purposes of this reconstruction, it is assumed that – as on Corbridge cuirasses – the upper shoulderguard is formed from three plates, not one as Robinson surmised, and that they resembled the Corbridge examples in that the central plate was broader than its neighbours to the front and rear. Moreover, if the Corbridge analogy is pursued to its logical conclusion, these three plates will have been joined by lobate hinges, with leathering rivets in the middle of each plate.

The lower assembly consists of the girth hoops, in two halves. Robinson believed there to have been five or six girth hoops on the Newstead cuirass and the latter seems to be the most likely.44 Each of the girth hoops (except the lowest, which is the deepest) has a cast copper alloy loop at the front and the back for attaching it to its twin in the other half. The girth hoops will have been carried on three internal leathers, attached to them by pairs of rivets near the top of each plate. The topmost girth hoop is attached to the backplate by one fastening hook, and to the backplate by two.45

<table>
<thead>
<tr>
<th>Table 2: Summary of the components of the Newstead type of segmental body armour</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breastplate</strong></td>
</tr>
<tr>
<td>Attached to the mid-collar plate with a large lobate hinge</td>
</tr>
<tr>
<td>Fastened laterally by a turning pin attached to one plate passing through a rectangular opening on its twin</td>
</tr>
<tr>
<td>Fastened vertically to the girth hoops by one hole enclosed within a decorative copper alloy fitting (similar to that found on the Corbridge B/C cuirass)</td>
</tr>
<tr>
<td><strong>Mid-collar plate</strong></td>
</tr>
<tr>
<td>Attached to the back- and breastplate with large lobate hinges</td>
</tr>
<tr>
<td><strong>Backplate</strong></td>
</tr>
<tr>
<td>Attached to the mid-collar plate with a large lobate hinge</td>
</tr>
<tr>
<td>Fastened laterally by two turning pins attached to one plate passing through rectangular openings on its twin</td>
</tr>
<tr>
<td>Fastened vertically to the girth hoops by two holes enclosed within decorative copper alloy fittings (similar to those found on the Corbridge B/C cuirass)</td>
</tr>
<tr>
<td><strong>Upper shoulderguard</strong></td>
</tr>
<tr>
<td><strong>Lower shouderguards</strong></td>
</tr>
<tr>
<td><strong>Girth hoops</strong></td>
</tr>
<tr>
<td>Ranging from 50–65mm to 110mm, deepest at the bottom</td>
</tr>
<tr>
<td>Upper 5 fastened by cast copper alloy loops, lowest left free to be secured by belt</td>
</tr>
<tr>
<td>Uppermost hoops fasten to back- and breastplates by means of two and one hooks respectively</td>
</tr>
<tr>
<td>Three leathers running vertically on each half (front, side, back)</td>
</tr>
</tbody>
</table>

**Evolution or revolution?**

The reconstruction proposed here is clearly very different to that favoured by Robinson. By not following his suggestions of riveted collar sections and single-plate upper shoulderguards, there is a much clearer ancestral link for the Newstead armour with the Corbridge type. It might be suggested that the Newstead type is as close to the Corbridge cuirass, as that is to the Kalkriese model. If improvements were to be made to the Corbridge type (and it should be remembered that it remained almost unchanged for over 100 years), then it would make sense to have tackled at least some of the main problems that are plain even now, and must have been even more apparent to the users of the armour.

The hinged fittings were an obvious weakness of the Corbridge type of cuirass, a fact highlighted by the large numbers of these items found in the archaeological record. The turning-pin breast and back fastenings will have obviated the need for one set of hinged fittings, the vertical fastening hooks another. The use of enlarged, and therefore stronger, lobate hinges to join plates may have reduced the attrition rate for these fittings, but the very fact of their recovery from sites like Carnuntum and Great Chesters – together with evidence that one may have been replaced on the Carlisle plate – may indicate that this was not a very successful modification. If the cast girth hoop tie loops were also intended as an improvement over the older Corbridge type of fitting, then the numbers recovered from the archaeological record suggests that this too was a failure.

**How common was the Newstead type of armour?**

Corbridge type ‘lorica segmentata’ has a high profile – probably a disproportionately high one – in the archaeological record due to the easily recognisable nature of its fittings.46 The Newstead type, by virtue of the abolition of hinged strap and buckle fittings, has fewer pieces that can become so easily detached. The only remaining weak points were clearly the cast copper alloy tie loops from the girth hoops and, to a lesser extent, the large lobate hinges.

Thus, whilst a Corbridge type A cuirass has 24 tie hooks, up to 10 decorated bosses for leathering rivets, eight lobate hinge pairs, four hinged buckles, and four hinged straps – all of which are instantly identifiable – a Newstead cuirass had just 24 vulnerable tie loops. It is these loops, then, that are the most likely common indicators of the presence of the Newstead type of cuirass. A number of sites in Britain alone have produced such fittings (Table 3).

Another question that needs to be asked is whether fragments of an Alba Iulia type of cuirass would be recognised as such in the archaeological record, or whether they might be interpreted as elements of two separate types of body armour: Newstead-type
segmental and scale. Clearly it will take an exceptional find of the components in situ in order to prove this convincingly. How many excavated cast tie loops in fact belonged to Alba Iulia - rather than Newstead-type cuirasses?

**Table 3: Finds of cast Newstead-type tie loops from Britain**

<table>
<thead>
<tr>
<th>Location</th>
<th>Source</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldborough</td>
<td>BISHOP, 1996, Fig.37.417-19</td>
<td></td>
</tr>
<tr>
<td>Brough</td>
<td>Unpublished, BM 74.12-28.28</td>
<td></td>
</tr>
<tr>
<td>Caerleon</td>
<td>EVANS &amp; METCALF, 1992, 118 figure, Nos.45-68 (with further references)</td>
<td></td>
</tr>
<tr>
<td>Carlisle</td>
<td>McCARTHY, 1990, Fig.109.48</td>
<td></td>
</tr>
<tr>
<td>Chester</td>
<td>DROOP &amp; NEWSTEAD, 1931, PL48.105</td>
<td></td>
</tr>
<tr>
<td>Chichester</td>
<td>DOWN, 1978, Fig.10.35.81</td>
<td></td>
</tr>
<tr>
<td>Corbridge</td>
<td>Unpublished, CO23479 and CO23499</td>
<td></td>
</tr>
<tr>
<td>Great Chesters</td>
<td>Unpublished, Chesters Museum 2466, 2970 (Hall nos.)</td>
<td></td>
</tr>
<tr>
<td>Newstead</td>
<td>Unpublished, FRA 3453</td>
<td></td>
</tr>
<tr>
<td>South Shields</td>
<td>ALLASON-JONES &amp; MIKET, 1984, 3.689 &amp; 3.691</td>
<td></td>
</tr>
</tbody>
</table>

**CONCLUSIONS**

The deposit of segmental body armour in Pit I at Newstead comprised a back-, mid-collar-, and breastplate, along with at least two lesser shoulder guards, from one cuirass. It was accompanied by a range of other material, including what appears to be other pieces of *lorica segmentata*, such as two fragments of girth hoop, laminated armguard plates, pieces of helment and other scrap material. As such, it presents a tantalising amount of information about how later forms of this type of armour functioned, but - unlike the Corbridge Hoard - there is not sufficient material present to allow a more complete understanding. This has to come by reference to other comparable finds. As more material comes to light, so our understanding will improve.

Nevertheless, we now know enough to see that the Newstead type of cuirass is less radical in its differences to the Corbridge type than was originally thought. In fact, the sequence of development from the Kalkriese to the Corbridge type, and then on to the Newstead form seems more logical, although it remains obvious that the pace of development was agonisingly slow. Indeed, it is remarkable that what to modern eyes appears to be a major weakness - the joining of plates with lobate hinges - was not only kept but actually modified. If nothing else, attempting to reconstruct the Newstead cuirass is an object lesson in the pitfalls of trying to second-guess the thought processes of Roman armourers.

**EPILOGUE**

Since a new reconstruction of a type of Roman body armour has such profound implications for those in the Roman re-enactment community who construct replica cuirasses - and specifically to promote its rapid dissemination - a set of idealised patterns derived from the Newstead plates will be posted on the JRMEs website (www.jrmes.org), together with a VRML version of the three-dimensional model illustrated in Figure 10.

**ACKNOWLEDGEMENTS**

I am particularly grateful to Fraser Hunter of the National Museums of Scotland, who made it possible to examine the Newstead armour and provided the scale photographs of all the fragments that have been used to compose the reconstructions presented here (and which are reproduced courtesy of the Trustees of the National Museums of Scotland). Peter Connolly was especially helpful when we looked at the material and provided much useful discussion, as well as producing swift working sketches of the objects we were examining. Prof Dr Thomas Fischer of the University of Köln rendered every assistance (including his hospitality) in enabling me to examine the Eining find at the Prähistorische Staatssammlung in München, where Dr Christof Flügel allowed me to inspect it. Prof Dr Egon Schallmayer kindly made the Zugmantel fragments available for detailed examination and permitted me to stay at the Saalburg whilst doing so. This inspection of the important comparanda in Germany would not have been possible without the award of the Gunning Jubilee Gift by the Society of Antiquaries of Scotland. Martha Andrews, Peter Connolly, Jon Coulston, Fraser Hunter, and Thom Richardson were all good enough to read and comment upon preliminary drafts of this paper, while Mike Thomas corrected errors in my Welsh geography. Whilst I wish to thank all of these, I should point out that any errors contained within are solely my responsibility.

**NOTES**

1. ROBINSON, 1975, 180-1, 184. On the later history of segmental body armour, see COULSTON, 1990, 147.
2. He mistakenly refers to this armour as coming from the Saalburg (ibid. 184), where it is now kept in the museum there (ZM1425), but there is no doubting that he means the material published in ORL 8, both from his unpublished notes and his published description of the items concerned, as well as by inspection of the original fragments.
4. Measurements are given in the original imperial form used by Curle, with metric equivalents in parentheses.
6. CURLE, 1911, Figs.11,8 and 13.
7. CURLE, 1911, PI.XXXII, bottom.
8. _Loc. cit. top._
9. Robinson’s reconstruction drawings are reproduced in WEBSTER, 1969, Figs.15-16, although the source is only clear from the illustration acknowledgements (ibid. 11). At this point, he was clearly still trying to combine the Corbridge and Newstead types of cuirass.
10. ROBINSON, 1975, 180: ‘... the connection of the breast and back plates is made by slotting the right-hand sections and attaching bronze ribbon loops to the edges of the left half so that they may be passed through the slots and held fast with a pin’.
11. ROBINSON, 1975, 181: ‘Loop fastenings riveted at front and back for tying the girdle plates are not used, their place having been taken by loops of ribbon bronze secured like paper fasteners, their ends being pushed through slots cut in the ends of the plates and bent outwards at the back.’
12. CURLE, 1911, Fig.11, 4 and 4a.
FRA 121. CURLE, 1911; ROBINSON, 1975; POULTER, 1988
15 CURLE, 1911, Fig.11.13.
16 As many as 100 fragments, according to Curle, found in the head-
17 quarters building (CURLE, 1911, 159, Pl.XXIII). Robinson
18 (1975, 185–6, Pls.503–4) mistakenly identified and reconstructed
19 the pieces as a cuisse, or thigh defence.
VON GROLGER, 1901, Taf.XX,6–10.
20 Further finds of this type of armour are known from Corbridge
21 (copper alloy: unpublished), Richborough (iron: M. Lyne, pers.
22 comm.), and Ulpia Traiana Sarmizegetusa (iron: unpublished).
Alba Iulia: COULSTON, 1995. On the armguard in general, see
SIMKINS, 1990.
23 CURLE, 1911, 156.
ROBINSON, 1975, 180, Pl.I.
24 POULTER, 1988, 37.
ROBINSON, 1975, 161. Objections to this method of securing
25 turning pins are, of course, equally applicable to scale (and mail)
breastplates, although it has generally been adopted without fur-
26 ther question (cf. GARBSCH, 1978, Abb.2; JUNKELMANN,
27 1996, 140).
28 E.g., GUEDA, 1989, PLCCXL,39–52.
29 BISHOP, 1998, 10. The Eining backplate does have a piece of cop-
30 per alloy sheet riveted to the corner of the neck flange, but this
31 appears to be part of a repair to the upper rectangular apertu-
32 re, which is located unusually high on this particular plate.
ROBINSON, 1975, 181.
VON GROLGER, 1901, Taf.XVIII,27–8.
33 In a well-argued paper presented by Peter Price to the Second
34 Roman Military Equipment Seminar in 1984, which was not, unfor-
35 tunately, subsequently published.
36 Newstead: FR3453 cited in ALLASON-JONES & MIKET, 1984,
37 208. Caerleon: EVANS & METCALF, 1992, 118 Figure
38 (Nos.45–68).
39 Cf a tubular fastening on a breastplate in the Guttmann Collection
JUNKELMANN, 2000, Abb.109). Whatever method of closure
40 is used, the Newstead girth hoops differ from their Corbridge pre-
41 cedecessors in one very important aspect: their ends have to be
42 pierced by more than just a pair of small rivet holes in order to take
43 the fitting. This has the advantage that, if the tie mechanism
44 should break, it would still be possible (although not very prac-
45 tical) to secure two neighbouring plates by tying them through this
46 aperture.
ALLASON-JONES & BISHOP, 1988, 102.
REINECKE, 1927, 161.
I am grateful to Prof Dr Thomas Fischer for making photographs
of this cuirass available and for discussion on the subject, and to
Dr Christof Flügel for his help during my visit to München to ex-
amine the armour.
CARUANA, 1993.
ZM1425. Cf. Saalfeld Jahresbericht 1906, 7; ORL B8, Taf. XIV,50.
The pieces were found together with fragments of a tinned copper
alloy greave and a complete mail shirt, ZM 1424. A more detailed
publication of the Zugmantel ‘lorica segmentata’ will appear in due
course (BISHOP in preparation).
VON GROLGER, 1901, 39–45.
Lobate hinges: VON GROLGER, 1901, Taf.XIX,57–9. Girth
ALLASON-JONES, 1996, Fig.12.50.
41 The metropolitan evidence will not be discussed here since, as
42 Robinson (1975, 183–4) has pointed out, it is derivative and of lit-
43 tle use in understanding the Newstead type of cuirass.
44 None of the surviving breastplates has its vertical fastening fitting
in place, but comparison with the Corbridge type B/C cuirasses
suggests that only one such fastening will have been used at the
front. The fragments from Zugmantel include one section of six plates,
one of which is clearly the lowermost, and another with five, which
does not include a similar plate
45 The Zugmantel find does not include any vertical fastening hooks
nor any cast tie loops, but the latter were present in the
46 Carnuntum deposit (VON GROLGER, 1901, Taf.XVIII,27–31).
BIBLIOGRAPHY
ALLASON-JONES 1996: Allason-Jones, L., ‘Roman military and
domestic artefacts from Great Chesters’, Archaeologia Aeliana
ser.5, 24, 187–214
ALLASON-JONES & BISHOP 1988: Allason-Jones, L. and Bishop,
M.C., Excavations at Roman Corbridge: the Hoard, HBMCE
Archaeological Report No.7, London
ALLASON-JONES & MIKET 1984: Allason-Jones, L. and Miket, R.,
The Catalogue of Small Finds from South Shields Fort, Newcastle
upon Tyne
BISHOP 1989: Bishop, M.C., ‘O Fortuna: a sideways look at the
archaeological record and Roman military equipment’, in
Driel-Murray, C. van (ed.), Roman Military Equipment: the
Sources of Evidence. Proceedings of the Fifth Roman Military
Equipment Conference, BAR Int. Ser. 476, Oxford, 1–11
BISHOP 1996: Bishop, M.C., Finds from Roman Aldborough. A
Catalogue of Small Finds from the Romano-British Town of Isurium
Brigantium, Oxbow Monograph 65, Oxford
BISHOP in preparation: The Zugmantel ‘lorica segmentata’
back-plate from Carlisle’, Arma 5, 15–18
JRMES 8, 109–24
centuries AD’, JRMES 1, 139–60
COULSTON 1995: Coulston, J.C.N., ‘The sculpture of an armoured
figure at Alba Iulia, Romania’, Arma 7, 13–17
CURLE 1911: Curle, J., A Roman Frontier Post and its People. The Fort at
Newstead, Glasgow
DONW 1978: Down, A., Chichester Excavations 3, Chichester
DROOP & NEWSTEAD 1931: Droop, J.P. and Newstead, R.,
‘Excavations in the Deanery Field, Chester 1928. Part 2: the finds’,
Liverpool University Annals of Archaeology and Anthropology 18,
113–56
Gates Caerleon, Oxbow Monograph 15, Oxford
GARBSCH 1978: Garbsch, J., Römische Paraderüstungen, München
GUEDA 1989: Gudea, N., Porolissum. Un complex arheologic dac-roman
la marginea de nord a Imperiul-Roman, Zalau
VON GROLGER 1901: Groller, M. von, ‘Römische Waffen’, Der
Römische Linien in Österreich 2, 85–132
JUNKELMANN 1996: Junkelmann, M., Reiter wie Statuen aus Erz,
Mainz
JUNKELMANN 2000: Römische Helme, Sammlung Axel Guttman
Bd.8, Mainz

McCARTHY 1990: McCarthy, M., A Roman, Anglian and Medieval Site
at Blackfriars Street, Carlisle, Cumberland and Westmorland
Antiquarian and Archaeological Society Research Series Number
4, Kendal

MANNING 1972: Manning, W.H., ‘Ironwork hoards in Iron Age and
Roman Britain’, Britannia 3, 224–50

POULTER 1988: Poulter, A.G., ‘Certain doubts and doubtful
conclusions: the lorica segmentata from Newstead and the
and the Identity of Roman Soldiers. Proceedings of the Fourth
Roman Military Equipment Conference, BAR International Series
394, Oxford, 31–49

REINECKE 1927: Reinecke, P., ‘Römische und frühmittelalterliche
Denkmäler vom Weinberg bei Eining a.d. Donau’, in Festschrift zur
Feier des fünfundsiebzigjährigen Bestehens des Römisch-
Germanischen Central-Museums zu Mainz, Mainz, 157–70

ROBINSON 1975: Robinson, H.R., The Armour of Imperial Rome,
London

ROSS & FEACHEM 1976: Ross, A. & Feachem, R., ‘Ritual rubbish?
The Newstead pits’, in Megaw, J.V.S. (ed.), To Illustrate the
Monuments, London


WEBSTER 1969: G. Webster, The Roman Imperial Army of the First and
Second Centuries AD, London