THE VALUE OF TRAJAN'S COLUMN AS A SOURCE FOR MILITARY EQUIPMENT

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This short study of Trajan's Column is not intended to be a listing of those items of military equipment which are accurately or reliably depicted versus those which are not. Rather it seeks to make and illustrate two points which must be understood if the frieze is to be profitably employed as a source of information for any aspect of Roman army studies.¹ Firstly, an examination must be made of the sculptural processes and practices inherent in the creation of the monument. Secondly, and more briefly, the information input from the frontiers and the 'war zone' may be shown to have been potentially minimal compared with that from sources available in Rome itself. Examination of the spiral relief in the utmost detail has been made possible by the erection of scaffolding around the shaft to protect it from acid rain erosion.² Reference has also been made to the set of casts in the Museo della Civiltà Romana (Rome) because much detail has been lost from the marble since the casts were manufactured in the 1860s.³ A clay wash has been applied to the column, perhaps in the 16th century, and where this survives so do the most minute tool-marks. Where it has gone the marble surface is gritty, eroded and pitted. This wash is particularly important for the observation of the zig-zag chisel markings employed to indicate mail armour.4

The spiral reliefs were carved from the bottom of the shaft to the top and it is clear that the spiral dividing-band was not laid out much ahead of this work.⁵ The sculptors probably did not proceed upwards spirally but several groups may have moved vertically up the shaft in parallel fashion. There is a framework of vertically corresponding scenes, such as the bridge and arch scenes which initiate each phase of the two wars, but within this framework the sculptors probably had a free hand in composition.⁶ With the exception, perhaps, of some of the largest set-piece scenes, these people were probably not working from detailed cartoons. The vertically corresponding scenes created ripples of confusion around them because they were fixed-points which had to be accommodated as work progressed and they caused the sculptors to make mistakes in the posing of figures and scenery.⁷

The sculptors were after all faced with the unprecedented task of sculpting a 200m. long frieze covering 284 square metres of shaft surface. In the process they created no less than 2,639 human figures, and just from the shear scale of the enterprise it should be expected that some compromises were necessarily made. One key to present understanding of the depiction of these figures may have been the formulation of 'figure types' by the Roman designers at an early stage of the work. These may be categorised as follows: armoured officers (including Trajan), soldiers wearing the 'lorica segmentata', infantry and cavalry in the lorica hamata, standard bearers, musicians, unarmoured soldiers, archers, slingers, barbarian <u>symmachiarii</u>, Moorish cavalry, <u>lictores</u> and sacrificial attendants, Dacians, Germans, Sarmatians, Roman civilians, barbarian civilians and deities. The

second and third categories make up the majority of the figures and are central to the monument's propoganda programme.

The identification of the 'segmentata'-wearers as citizen troops is clear from their technical role, their use of the curved, rectangular shield and by their close association with signa which may be identified as either legionary or praetorian (Fig. 2, 4).⁸ Of 182 figures on the column engaged in construction work only 3 are not in 'segmentatae'.⁹ The figure type has a 'lorica segmentata', tunic, caligae, bare legs, cingulum and apron, baldric and sword, helmet and the rectangular shield. This is the maximum combination of details applied, many items being omitted as a result of laxity in the sculptural process.

The hamata-wearers may be identified as auxiliary peregrini because of their fighting and ancillary roles (Fig. 1, 3). Of 161 Roman figures in fighting poses, 118 are in hamatae, 26 are symmachiarii and only 17 are in 'segmentatae'. The hamata figure type is equipped with tunic, breeches, caligae, sword, baldric, helmet and flat, oval shield.

These identifications appear to be straightforward but complications are caused by commentators who attempt to go further and distinguish praetorians from legionaries, on the basis of signa types and the proximity of troops to the emperor. Some have gone even further to identify equites singulares Augusti and exploratores amongst the auxiliaries. The most 'elite' classifications were put forward by Gauer who saw the 'segmentata'-wearers as legionaries and praetorians, and the men in mail as members of guard units or as legionaries in some form of 'camp dress'.11 This view is vitiated by the inclusion of irregular troops on the column of a lower status than the auxilia (Fig. 3, 4). Furthermore, even the distinguishing of legionaries from praetorians is probably anachronistic. Many groups of 'segmentata'-wearers, it is true, are accompanied by all-legionary or all-praetorian signa, but over the whole frieze there is much mixing of standard types.¹² On two occasions signa even appear with men in mail¹³ and it is clear that standards were not intended by the frieze designers to be a guide for troop identification. Their role is different and two-fold. Firstly, at the heads of marching columns they denote movement, 14 and, secondly, clustered in sacrifice, adlocutio and battle scenes, they serve to visually locate the emperor's position on the frieze.15

It would, therefore, be best to consider the men in 'loricae segmentatae' generically as citizen troops and the hamata-wearers simply as auxiliaries. This division forms a major part of the column's propoganda programme, glorifying the army's technical skills, Trajan's generalship and the victories won without the loss of citizen blood.¹⁶ The stylisation inherent in forming visually distinguishable citizen/non-citizen figure types provides a simple explanation for the differences between citizen troops on the column and those on the contemporaneous Adamklissi metopes. Significantly, the auxiliary infantry are identical on both monuments.¹⁷ The citizen distinction was important to the sculptors of the column and presumably to the viewing audience in the capital. The fact that not all legionarii in reality wore the 'lorica segmentata' was unimportant to them. Only the fact that all citizen troops on the column wore it mattered. Similarly, the

non-depiction of scale armour for the auxiliaries was not through ignorance but for reasons of visual clarity because scale appears on the contemporary Great Trajanic Frieze.¹⁸

When changes were introduced into the details of the citizen and auxiliary figure types or in their comparitive roles, it is logical to suspect that the sculptor concerned was mistaken, rather than necessarily to conclude that a particular detail or action reflected practices current within the Roman army. This is the only safe method of proceeding, to take a minimalist view based on the sculptural processes rather than on acceptance of the subject matter alone. If this approach is adopted then many of the wilder modern hypotheses evaporate. For example, out of 638 citizen troops on the column, 2 have oval, not rectangular shields (Fig. 4).19 Of 524 auxiliaries only one has a rectangular shield.²⁰ In scene XXXVI a group of auxiliaries wear animal skins over their heads (Fig. 1), a feature usually confined to standard bearers and musicians, and in scene L some soldiers even wear skins and 'loricae segmentatae' (Fig.2). In a couple of scenes two or even four cingula appear instead of the customary one.²¹ In only one battle scene (CXII) auxiliaries fight bare-headed whilst in only two construction scenes (LXVI, LXXVII) citizen troops work wearing helmets. Scene LXXII is full of confusion with scallopped-sleeved citizen troops, a slinger who throws his stone instead of slinging it (Fig. 4), two Dacians who seem to be fighting their own side and the two citizens with oval shields. In fact the latter and one of the Dacians look as if they have changed figure type during the course of sculpting, all three having originally been intended as auxiliaries. The appearance of three auxiliaries in building scenes and the combination of signa with a men in mail may be classed with these figure type group of contraventions, also resulting from sculptural inattention and lassitude.

Moreover, within each figure type there are variations in the smallest features. For example, the zig-zag chiselling convention for mail is very arbitrary in its application.²² Its distribution is best seen on the casts because the loss of detail through acid rain erosion on the column itself is considerable. Of 588 cases where the surface is preserved well enough to be sure, only 239 torsos were chiselled. This chiselling may have been a separate process following on from the main scene sculpting, which would explain the uneven and, at times, mistaken coverage. In scene XXIV the chest plates of some 'loricae segmentatae' are zig-zag chiselled and in two other scenes (one including the skins-'segmentata' combination) cuirassed officers have chiselled torsos.²³

Shield sizes, shapes and patterns have attracted comment since Cichorius first recorded them.²⁴ Rectangular shields vary randomly in size but their shapes cluster significantly on the shaft. Truly rectangular forms appear on spirals 10 to 16 whilst above and below this zone the tops and bottoms of citizen shields are curved, forming a sub-oval shape.²⁵ The variety of forms is a function of the problems experienced by Roman artists in perspective rendition. Some attempts have been made to attribute shield 'blazons' to specific units.²⁶ This anachronistic notion may be swiftly dismissed with reference to scene LXX where a <u>symmachiarius</u> has the same pattern as auxiliaries alongside him (Fig. 3). Moreover, a number of 'Roman' devices appear on Dacian shields, whilst the wreath pattern on rectangular shields occurs at various inconsequential stages without following a discernable plan.²⁷ What may be significant, on the other hand, is that in many cases shields are held in an unnatural manner intended to display the face to the viewer.²⁸ This was not to identify particular units but very likely citizen, auxiliary and Dacian shields were colour-coded in the painting scheme in order to make the action clearer to the viewer.²⁹

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Trajan's Dacian triumphs would have provided all the necessary models for the barbarians and their equipment, and for Roman military standards at least.³⁰ The column's pedestal reliefs are clearly a still-life study in stone of captured weaponry.³¹ In addition, a great number of experienced informants versed in military architecture, in the events of the wars and in army life in general were present in Rome temporarily for the triumph or on a longer-term basis in the various castra of the capital. Architects working on the Forum Traiani complex would have been conversant with fortifications, naval architecture, engines of war and bridging techniques.³² Some involvement of of Damascus in the column work has been plausibly Apollodorus suggested.³³ The praetorians used artillery in public displays, having their own technicians, and the troops present in Rome could easily have been employed as models for the citizen and auxiliary figure types. Significantly, praetorian signa are depicted in greater numbers than all classes of legionary standards (60 to 47), the reverse of reality in a field army situation, and this is explicable by the sculptors' familiarity with the standards commonly seen in Rome.³⁵

Much of the military architecture is in fact generalised and unconvincing, and the Dacian fortifications have little to recommend their accuracy.³⁶ Building activities also incorporate elements which suggest the influence of contemporary construction practices in Rome, rather than those on the frontiers.³⁷ The artistic koine within which the sculptors were working provided traditional models for the natural and architectural scenary, the composition of genre scenes and many of the figure poses.³⁸ The Hellenistic background governed the presentation of the human form which was not allowed to be seriously obscured by buildings, or by large shields, cheek-pieces, horses or vehicles. Thus the sources available in Rome to the designers and sculptors of the column were quite adequate for the execution of the frieze without resort to 'campaign sketches' or the presence of artists in Dacia.39

Depictions of citizen and auxiliary troops on the column are of a most generalised form and they add very little information now that late 1st to 2nd century helmet and body armour finds are available. Other figure types are of some interest but no specific identification can be made of the bare-chested <u>symmachiarii</u>, for example,⁴⁰ and the archers, who are unquestioningly labelled by scholars as 'Levantines', are a mélange of equipment of the kind seen on the pedestal reliefs.⁴¹ Like the armoured Sarmatian cavalry of scenes XXXI and XXXVII, they are an artificial creation, perhaps based on verbal information. The column is useful in the cases where equipment types generally do not survive (standards, tents, artillery) and perhaps in at least suggesting the variety of irregular troops employed in the wars, but it cannot be



Fig.1: Trajan's Column, Scene XXXVI,2, 4-6, 8-11. Auxiliaries wearing animal skins. Photo: the author.



Fig.2: Trajan's Column, Scene L,1-6. Citizen troops wearing animal skins. Photo: the author.



Fig.3: Trajan's Column, Scene LXX,6, 9, 12, 14. Three auxiliaries and a bare-chested irregular with a common shield blazon. Photo: the author.



Fig.4: Trajan's Column, Scene LXXII,14-15, 17, 20. Two citizen troops with oval shields; slinger throwing a stone; bare-chested irregular. Photo: the author.

employed as an independent source for military equipment. Nevertheless, the temptation is very strong to illustrate general works on the Roman army with scenes from Trajan's Column but this is often done without an understanding of the context or of the sculptural forces at work.⁴² One could liken this, for example, to quoting uncritically from the Historia Augusta without an awareness of its pitfalls and limitations.

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When completed, the shaft would have been garishly painted and gilded, principally to help the viewer locate the emperor, but even from the highest view-points most of the sculpted detail would have been invisible.⁴³ Ironically, the latter feature is rather magnificent because Trajan's Column was not merely the first attempt at such a massive sculptural monument, it was the largest piece of Roman sculpture ever to have been undertaken in such amazing detail. With Trajan's Column in front of them, sculptors working on later columns and arches were far more pragmatic with regard to the observer's interests, making these monuments far poorer fields for modern study.

NOTES

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For bibliographies of Trajan's Column see FLORESCU, 1971; KOEPPEL, 1982, 491-3. Military equipment on the Column reliefs has never been comprehensively examined (COUISSIN, 1926, <u>passim</u> 385-464; RICHMOND, 1935; ALFS, 1941, 73-4, 100-1, 112-16; GAMBER, 1964; ROBINSON, 1975, 63-4, 82, 85, 93, 143, 170, 183; WAURICK, 1983, 293-6).

- 2. Scaffolding has been erected as part of a restoration and study programme involving a number of monuments in Rome. Overall, Trajan's Column has been as severely affected by erosion as other monuments with higher relief sculpture because its relief details are so fine (MARTINES, 1980; ARMSTRONG, 1983; COLONNA, 1988, 281-94). However, the effects of earthquakes have been less severe on Trajan's Column than on the Marcus Column (MARTINES, 1983, 60-1).
- 3. Casts were made for three French rulers, François I, Louis XIV and Louis Napoléon III. The matrices of the series made for the latter have been used to produce all the major sets of casts in the Museo della Civiltà Romana, Rome; The Victoria and Albert Museum, London; The Casts Museum, Berlin; The National Museum, Bucarest; and the Musée des Antiquités Nationales, Saint Germaine-en-Laye (part only) (FROEHNER, 1872-74, xx; REINACH, 1886, 15-20, 23-5; CICHORIUS, 1896, 3; RICHMOND, 1935, 1; FLORESCU, 1971, 207; MOSTRA, 1983, 109, 156; COLONNA, 1988, 261-73).

- ROBINSON, 1975, 170. The identification of mail was made as long ago as FROEHNER, 1872-74, 13. The exact date of the clay wash is unknown but it is likely to belong to the 16th century (COLONNA, 1988, 295-8).
- Very little detailed work has been carried out on the sculptural techniques (LEHMANN-HARTLEBEN, 1926, 146-9; GAUER, 1977, 78; SCHEIPER, 1984, 247-8; ROCKWELL, 1985).
- 6. LEHMANN-HARTLEBEN, 1926, 111-14, 145-6; GAUER, 1977, 45-8, 78-86; FARINELLA, 1981; SCHEIPER, 1982, 252-4; HANNESTAD, 1986, 167.
- 7. LEHMANN-HARTLEBEN, 1926, 146; RICHMOND, 1935, 5; GAUER, 1977, 78-9. The writer would see the great number of mistakes and the multifarious variations in equipment details (helmet types, belts, 'lorica segmentata' details, shield-patterns etc) as evidence for individuality in composition as work on the shaft progressed, rather than as mistakes made in following detailed, pre-prepared cartoons. The division of the spiral into wars and campaigns could have been worked out beforehand on a model, together with the vertical correspondence framework.
- For standards see VON DOMASZEWSKI, 1885, 28-69, 78-89; RENEL, 1903, 26-8, 200-3, 262-7. The role of citizen troops and identification of specific equipment types is discussed by COULSTON, 1988. For the distinction of figure types by equipment see ROSSI, 1971a, 59; GAUER, 1977, 55-6.
- 9. XII,10; CXXIX,5, 6. A system has been devised by the writer whereby human heads in each scene are numbered from left to right, and, when they coincide vertically, from bottom to top. Thus every human figure may be referred to by a Latin scene number (scrupulously following the text of CICHORIUS, 1896, 1900) and an individual number for purposes of computer data sorting. PETERSEN <u>et al.</u>, 1896 numbered figures on the Marcus Column, but rather arbitrarily within scenes.
- 10. 'Segmentata'-wearers fight in only one battle proper (XL,36, 37, 39, 43, 59, 65). Two men in Scene LXXII (14, 15) are problematical and sieges are a different category of action with a technical element (LXXI, XCVI, CXIII, CXV). Usually these men stand in reserve in battle scenes as observers.
- FROEHNER, 1872-74, 4, 16; CICHORIUS, 1896, 90, 118, 131, 136, 158-9, 164, 178, 202-3, 205-6, 209, 227-8, 243, 250, 278, 284, 291, 354, 368-9; 1900, 56, 79, 90, 119, 130, 132, 165-6, 171-2, 181-2, 193, 222, 276, 284; PETERSEN, 1899, 9-11, 15-16, 55, 69; PARIBENI, 1926, 259; RICHMOND, 1935, 7-8; SPEIDEL, 1965, 84-5; 1978, 16, 47-8; 1984, 33; ROSSI, 1971a, 105-8; GAUER, 1977, 56-60.
- 12. Mixed standards: IV-V, VIII, XXIV, LI, LIII, LXIII, CIV.
- 13. LXXV, LXXVII.
- 14. IV-V, VII, XXII, XXVI, XLVIII, CVI, CVIII.

- 15. VIII, X, XXIV, XXVII, XXXIII, XL, XLII, XLVI, LI, LIII, LIV, LXI, LXIII, LXXV, LXXVII, LXXXVI, LXXXVII, XCVIII, CII, CIV, CV, CXVIII, CXXIII, CXXV, CXXXVII.
- 16. This follows senatorial ideals of victory as contemporaneously expressed by Tacitus, <u>Agricola</u>, 35. For the propaganda content of the spiral see RICHMOND, 1935, 3; GAUER, 1977, 6, 55; SCHEIPER, 1982, 186-204; HANNESTAD, 1986, 158-9.
- 17. Legionary troops on the Adamklissi metopes are identifiable by their standards, <u>pila</u> and curved shields (Inv.no.12-13, 16-23, 28-9, 31, 33, 35, 38, 43); auxiliaries by their flat shields, and lack of <u>cingula</u> and <u>pteruges</u> (Inv.no.14, 32, 34, 36). Metope numbers follow G. Tocilescu's inventory (FLORESCU, 1965, Fig.51).
- 18. KOEPPEL, 1985, No.9, Fig.No.17, 24, 31-4, 45, 56, 65.
- 19. LXXII,14, 15.
- 20. XXXVIII,5.
- 21. IV, 3, 4, 8, 14; XXI, 6, 7.
- 22. For example, mail chiselling appears in Scenes X-XI but not before, and not again till XXIV.
- 23. Segmentatae XXIV, 11, 12, 13, 15; officers X, 2; L,8.
- 24. For a straight description FLORESCU, 1969, 66, 69-85. See also n.26 for interpretation.
- 25. Rectangular: LXVI, LXXII, LXXIII, XCVIII, CII, CIV, CVI, CVIII, CXIV, CXV. Sub-oval: IV, X, XIII, XXI, XXII, XXIV, XXVI, XXVII, XXXIII, XXXVIII, XL, XLVIII, L, LV, LXII, CVI, CXXIII, CXLVII.
- 26. Early commentators were very literal in the interpretation of such detail (CICHORIUS, 1896, 34, 90, 142, 164, 184, 191-2, 205-6, 255, 281, 284, 288, 308, 338, 344-5; 1900, 56, 162, 165, 175, 181-2, 193; PARIBENI, 1926, 233-4). Attribution of shield-blazons has been revived by ROSSI, 1966; 1971a, 108-18. See also STROBEL, 1984, 135.
- 27. Dacians with Roman type blazons: XLI,4; XCIII,21; CXVI,1. Roman scuta with wreaths: IV,4, 6, 8, 14; X,25; XXVI,12; XXXVIII,5; LV,8; LXII,10, 12; LXXII,7; LXXXV,24; CII,23.
- 28. XXIV,62, 69; XXXVII,3-5; XLII,1; LVIII,1; LXXII,24; XCIV,14, 20, 22; CVII,4; CVIII,18; CXIII,7; CXV,17; CXLII,2-3, 5; CXLIII,1, 3-4; CXLIV,1-4; CXLV,1, 4, 8; CXLVIII,1; CLI,5.
- 29. This is clear in such scenes as XXXII, XXXVIII, XL, XLII, LXVI, XCV, XCVI, CXV, CXXXIV, CXLVIII, CLI. Colour was necessary to classify complex scenes and traces of paint have been recognised on the shaft (FROEHNER, 1872-74, xviii; LEHMANN-HARTLEBEN, 1926, 147; REUTERSWARD, 1960, 229-30; SCHEIPER, 1982, 248-52.

- 30. Dio LXVIII,10,15; Pliny, Epistulae VIII,4. For the dating of one Trajanic triumph see MAZZARINO, 1978. The influence of triumphal processions and painted placards on sculpture is discussed by LEHMANN-HARTLEBEN, 1926, 2; HAMBERG, 1945, 125-9.
- 31. They may be highly rated because the objects are corroborated by small-finds and other pictorial sources (GAMBER, 1964).
- 32. Vitruvius, de Architectura, I,i, iii, v; X,x-xvi. See MACDONALD, 1982, 137-42.
- 33. On the grounds that the Column has an integral position in his forum complex, that the carving of a spiral frieze on a column was an unprecedented device worthy of him, and that his bridge (XCIX) and, perhaps, one of his war-machines (CXIV), appear on the spiral (LEHMANN-HARTLEBEN, 1926, 144-5; BANDINELLI, 1958; GAUER, 1977, 76-8; SCHEIPER, 1982, 152-4).
- 34. For artillery in Rome see MARSDEN, 1969, 193-4. Large numbers of troops were usually present in Rome including praetoriani, <u>urbaniciani</u>, <u>equites singulares Augusti</u>, <u>classiari</u> and soldiers in the castra peregrinorum (KENNEDY, 1978).
- 35. 14 aquilae, 1 imago and 32 legionary signa compare with no less than 60 praetorian signa. By association and by details of depiction (V), most of the vexilla may be praetorian as well (for praetorian infantry vexillarii see DE AZEVEDO, 1951, No.119). For praetorian troops in the Dacian Wars see STROBEL, 1984, 103-4.
- 36. Problems with fort walls were identified by RICHMOND, 1935, 5, 18-20. For making paper or full-size reconstructions scholars have been optimistic about using representations of Roman architecture (TURCAN-DÉLÉANI, 1958; HANSON, 1982) and Dacian fortifications (ROSSI, 1971b) on the Column.
- 37. Whether the fort walls on the Column were thought by the sculptors to be made of turf or of cut stone, men should not be mixing mortar for their construction in Scenes XVIII and XCVII (see ADAM, 1984, 78-9).
- Genre scenes and figure poses have been extensively discussed by LEHMANN-HARTLEBEN, 1926.
- RICHMOND, 1935, 3. Recently repeated by TOYNBEE & WILKINS, 1982, 246.
- FROEHNER, 1872-74, 16; REINACH, 1886, 45; CICHORIUS, 1896, 177-8; PARIBENI, 1926, 216; ROSSI, 1971a, 96, 103-4; CISEK, 1983, 294; STROBEL, 1984, 152. The general concensus is that they represent Germanic allies, possibly Marcomanni and Quadi.
- 41. FROEHNER, 1872-74, 16; CICHORIUS, 1896, 328-9; 1900, 193, 238; PARIBENI, 1926, 216; RICHMOND, 1935, 15-16; FLORESCU, 1969, 62; ROSSI, 1971a, 102; CISEK, 1983, 294; STROBEL, 1984, 150; COULSTON, 1985, 279-80; HANNESTAD, 1986, 160. In actuality the archers are quite likely to have been Syrian but the sculptors certainly did

not depict them as such.

- KEPPIE, 1984, 12 rightly makes a point of not using Trajan's Column out of period.
- 43. For reconstructions of colonnades and balconies for a viewing audience around the Column see AMICI, 1982, Fig.125-6, 146-8.

BIBLIOGRAPHY

- ADAM, J.P., 1984: La construction romaine: materiaux et techniques, (Paris 1984)
- ALFS, J., 1941: 'Der bewegliche Metallpanzer im römischen Heer', Zeitschrift für historischen Waffen und Kostumkunde, 3-4, 1941, 69-126
- AMICI, A.M., 1982: Foro <u>di</u> <u>Traiano:</u> <u>Basilica</u> <u>Ulpia e</u> <u>Biblioteche</u> (Ripartizione antichità e belle arti e problemi di cultura. Studi e materiali dei Musei e Monumenti Comunali di Roma 10), (Rome 1982)
- ARMSTRONG, G., 1983: 'Trajan's Column in the Wars', <u>Sunday Times</u> Magazine, February 20, 1983, 32-4
- DE AZEVEDO, M.C., 1951: Le Antichità de Villa Medici, (Rome 1951)
- BANDINELLI, R.B., 1958: 'Appollodorus di Damasco', <u>Enciclopedia</u> dell'Arte Antica I, (Rome 1958), 476-80
- CICHORIUS, C., 1896, 1900: <u>Die</u> <u>Reliefs</u> <u>der Traianssäule</u> II & III, (Berlin 1896, 1900)
- CISEK, E., 1983: L'époque de Trajan. Circonstances politiques et problèmes idéologiques, (Bucarest 1983)
- COLONNA, 1988: La Colonna Traiana e gli artisti Francesi da Luigi XIV a Napoleone I, (Rome 1988)
- COUISSIN, P., 1926: Les armes romaines, (Paris 1926)
- COULSTON, J.C., 1985: 'Roman archery equipment', in M.C. Bishop (ed.), <u>The Production and Distribution of</u> <u>Roman Military Equipment.</u> <u>Proceedings of the Second Roman Military Equipment Research</u> <u>Seminar</u> (BAR International Series 275), (Oxford 1985), 220-366
- COULSTON, J.C., 1988: 'Three legionaries at Croy Hill (Strathclyde)', in J.C. Coulston (ed.), <u>Military Equipment and the Identity of</u> <u>Roman Soldiers. Proceedings of the Fourth Roman Military</u> <u>Equipment Conference</u> (BAR International Series 394), (Oxford 1988), 1-29
- VON DOMASZEWSKI, A., 1885: 'Die Fahnen im römischen Heere', <u>Archäologisch-epigraphischen Seminares</u> der Universität Wien, V, 1885, 1-80

- FARINELLA, V., 1981: 'La colonna Traiana: un esempio di lettura verticale', Prospettiva, 26, 1981, 2-9
- FLORESCU, F.B., 1965: Das Siegesdenkmal von Adamklissi, (Bonn 1965)
- FLORESCU, F.B., 1969: Die Trajanssäule, (Bucarest 1969)
- FLORESCU, F.B., 1971: 'Study and archaeological commentary', in I. Miclea (ed.), <u>The Column</u>, (Cluj 1971), 207-19
- FROEHNER, W., 1872-74: La colonne Trajane d'apres le surmoulage executé a Rome en 1861-62, (Paris 1872-74)
- GAMBER, V., 1964: 'Dakische und sarmatische Waffen auf den Reliefs der Traianssäule', Jahrbuch des kunsthistorischen Sammlung, Wien, 60, 1964, 7-34
- GAUER, W., 1977: <u>Untersuchungen</u> <u>zur</u> <u>Traianssäule</u> (Monumenta Artis Romanae XIII), (Berlin 1977)
- HAMBERG, P.G., 1945: <u>Studies in Roman Imperial Art with Special</u> <u>Reference to the State Reliefs of the Second Century</u>, (Copenhagen 1945)
- HANNESTAD, N., 1986: Roman Art and Imperial Policy, (Aarhus 1986)
- HANSON, W.S., 1982: 'Roman military timber buildings: construction and reconstruction', in S. McGrail (ed.), <u>Woodworking Techniques</u> <u>Before A.D.1500</u> (BAR International Series 129), (Oxford 1982), 169-86
- KENNEDY, D.L., 1978: 'Some observations on the Praetorian Guard', Ancient Society, 9, 1978, 275-301
- KEPPIE, L.J.F., 1984: The Making of the Roman Army from Republic to Empire, (London 1984)
- KOEPPEL, G., 1982: 'Official state reliefs of the city of Rome in the imperial age. A bibliography', <u>Aufstieg</u> und <u>Niedergang</u> der römischen Welt II, 12.1, 1982, 477-506
- KOEPPEL, G., 1985: 'Die historischen Reliefs der römischen Kaiserzeit, III, stadtrömisches Denkmäler unbekannter Bauzugehörigkeit aus trajanischer Zeit', Bonner Jahrbücher, 185, 1985, 143-213
- LEHMANN-HARTLEBEN, K., 1926: <u>Die Traianssäule.</u> <u>Ein römisches Kunstwerk</u> zu Beginn der Spätantike, (Berlin 1926)
- MACDONALD, W.L., 1982: The Architecture of the Roman Empire, I, An Introductory Study, (New Haven 1982)
- MARSDEN, E.W., 1969: Greek and Roman Artillery. Historical Developments, (Oxford 1969)

MARTINES, G., 1980: 'Appunuti sulla Colonna Traiana: guasti e patine',

Ricerche di Storia dell'arte, 11, 1980, 56-62

- MARTINES, G., 1983: 'La struttura della Colonna Traiana: un'esercitazione di meccanica alessandrina', <u>Prospettiva</u>, 32, 1983, 60-71
- MOSTRA 1983: <u>Dalla mostra al museo.</u> <u>Dalla Mostra archeologica dal 1911</u> <u>al Museo della civiltà romana</u>, exhibition catalogue, (Rome 1983)
- MAZZARINO, S., 1978: 'I Fasti Ostienses e il primo trionfo dacico di Traiano', Epigraphica, 40, 1978, 241-6
- PARIBENI, R., 1926: Optimus Princeps I, (Messina 1926)
- PETERSEN, E., 1899: Trajans dakische Kriege, I, der erste Krieg, (Leipzig 1899)
- PETERSEN, E., VON DOMASZEWSKI, A., & CALDERINI, G., 1896: <u>Die</u> <u>Marcus-Säule auf der Piazza Colonna in Rom</u>, (Monaco 1896)
- REINACH, S., 1886: La Colonne Trajane au Musée de Saint-Germain, (Paris 1886)
- RENEL, C., 1903: Cultes militaires de Rome. Les enseignes, (Paris 1903)
- REUTERSWÄRD, P., 1960: <u>Studien zu</u> <u>Polychromie der Plastik</u> <u>Griechenland</u> <u>und Rom</u>, (Stockholm 1960)
- RICHMOND, I.A., 1935: 'Trajan's army on Trajan's Column', Papers of the British School at Rome, XIII, 1935, 1-40
- ROBINSON, H.R., 1975: The Armour of Imperial Rome, (London 1975)
- ROCKWELL, P., 1985: 'Preliminary study of the carving techniques on the Column of Trajan', Studi Miscellanei, 26, 1985, 101-11
- ROSSI, L., 1971a: Trajan's Column and the Dacian Wars, (London 1971)
- ROSSI, L., 1971b: 'Dacian fortifications on Trajan's Column', Antiquaries Journal, LI, 1971, 30-5
- SCHEIPER, R., 1982: Bildpropaganda der römischen Kaiserzeit unter besonderer Berücksichtigung der Trajanssäule in Rom und korrespondierenden Munzen, (Bonn 1982)
- SPEIDEL, M., 1965: <u>Die Equites Singulares Augusti.</u> <u>Begleittruppe der</u> <u>römischen Kaiser des zweiten und dritten Jahrhunderts</u>, (Bonn 1965)
- SPEIDEL, M.P., 1978: <u>Guards of the Roman Armies.</u> An <u>Essay on the</u> <u>Singulares of the Provinces</u>, (Bonn 1978)
- SPEIDEL, M.P., 1984: 'Germani corporis custodes', <u>Germania</u>, 62, 1984, 31-45

- STROBEL, K., 1984: Untersuchungen zu den Dakerkriegen Trajans. Studien zur Geschichte des mittleren und unteren Donauraumes in der Hohen Kaiserzeit, (Bonn 1984)
- TOYNBEE, J.M.C., & WILKINS, A., 1982: 'The Vindolanda horse', Britannia, XIII, 1982, 245-51
- TURCAN-DÉLÉANI, M., 1958: 'Les monuments représentés sur la Colonne Trajanne. Schématisme et réalisme', <u>Mélanges</u> <u>d'archéologie</u> <u>et</u> <u>d'histoire de l'Ecole</u> Francais <u>de</u> Rome, 70, 1958, 149-76
- WAURICK, G., 1983: 'Untersuchungen zur historisierenden Rüstung in der römischen Kunst', Jahrbuch des römisch-germanischen Zentralmuseum Mainz, 30, 1983, 265-301