

## *Kremasmata, Kabadion, Klibanion:* Some aspects of middle Byzantine military equipment reconsidered

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The material aspect of the Byzantine army is a field which has always been the poor relation of scholarship on its organisation and logistics, and publications of the last decade have unfortunately confused the issue as much as elucidated it. Byzantium had a rich tradition of military literature, in unbroken continuity with the already sophisticated practice of the western empire of Rome. Manuals from late Antiquity to the tenth century provide considerable detail of the equipment a Byzantine soldier should ideally have, and in doing so show in the armed forces of the empire a pragmatic willingness to absorb useful equipment, as much as effective tactics, from its neighbours and enemies. The quality of its equipment must also have been a factor in the remarkable success of the army and navy in preserving the empire as much as they did against so many foes for a thousand years. In view of this, the relationship between the ideals of the manuals and the reality is an important issue, one which demands a laborious search for evidence beyond literary sources. Economic conditions impinged on more than the amount of manpower to be mobilised. They also influenced the quantity and even the very type of equipment that could be supplied to the troops. We shall look here at three items of armour which were essential elements of middle period panoply, the *kremasmata*, the *kabadion* and the *klibanion* with the aim of establishing their nature more precisely.

The major work of the last decade is Taxiarchis Kolias' *Byzantinische Waffen*. Although based upon a compendious reading of Byzantine literature, its conclusions have been undermined by a deficiency of comparative material and insufficient grasp of the practicalities of the subject. Unfortunately the position of *Byzantinische Waffen* as the largest and most accessible publication in the field has led to its

problematical propositions being disseminated and perpetuated by later authors. One difficulty in the volume is the nature of the *kremasmata* and *kabadion* and their relation to each other. It must be accepted that *kremasmata* is a padded and quilted skirt hanging below a soldier's cuirass to protect his legs. An arrangement of this type is unmistakably illustrated in many detailed pictorial sources of the middle period.<sup>1</sup> At one point Kolias proposes that the *kabadion* is the same thing as *kremasmata*.<sup>2</sup> His basis for this conclusion is that both are made of the same materials. This is nothing like sufficient evidence. Anvils and fish-hooks are both made of iron, but few fish are caught with anvils. Later he decides that it is a variety of garment, since it is recommended by Nikephoros Phokas in his *Praecepta Militaria*, as the sole protection for archers.<sup>3</sup> Contemporaneous with that source, *De Cerimoniis* also mentions *kabadia*, describing them as 'the ethnic habit' of certain nationalities visiting Constantinople.<sup>4</sup>

To find the *kabadion* appearing prominently again in Byzantine sources we must move onto the fourteenth century. In the treatise on the court offices of Pseudo-Kodinos it is stipulated as the primary garment of most courtiers. Here it comes in diverse colours, brocades and bearing opulent decoration,<sup>5</sup> quite unlike the 'coarse silk or cotton as thick as can be stitched together' and furnished with *zabai* (interpreted as strips of mail<sup>6</sup>) as the tenth-century description of *kresmasmata* goes,<sup>7</sup> but certainly in accord with its being a garment.

Reiske's commentary on *De Cerimoniis* points us towards a cognate

1. Cf the Joshua Roll, Harbaville Triptych, a triptych in the Shuvalov Collection (Hermitage inv. no. ω 266: Alice V. Bank, *Byzantine Art in the collections of Soviet Museums* [Leningrad 1985] plate 123 and pp. 292-3) and many other such pieces of the tenth century; and an eleventh-century icon of Saint Theodore in the Vatican: Ioli Kalavrezou-Maxeiner, *Byzantine Icons in Steatite* (Vienna 1985) plate 7 and pp. 99-100.

2. Taxiarchis Kolias, *Byzantinische Waffen* (Vienna 1988) 47.

3. Kolias, *Byzantinische Waffen*, 55-57.

4. Constantine Porphyrogenitus, *De Cerimoniis aulae Byzantinae*, ed. J.J. Reiske (Bonn 1829) 749. 15-16.

5. Pseudo-Kodinos, *Le Traité des Offices de Pseudo-Kodinos*, tr. Jean Vepeaux (Paris 1976) 146 etc.

6. This interpretation is also problematic, but is a matter for another article.

7. Eric McGeer, *Sowing the Dragon's Teeth* (Washington 1995) 35.



term in Arabic, transliterated in various sources *'aba*,<sup>8</sup> *kabâ* and *qabâ*, which is often mentioned in the compendious Arabic literature on textiles and dress.<sup>9</sup> It is to an Arabic source that we turn to find the precise nature of the *kabadion*. In the ninth century, al-Aghani explained that 'when a man tears his *qamis* (shirt or tunic) from the opening below the neck to the foot it becomes a *qabâ*'.<sup>10</sup> Hence the *kabadion/kabâ* is a coat opening down the centre front, traceable to the well illustrated Persian garment mentioned in Herodotos by the earlier Hellenised name *kandys*<sup>11</sup> perhaps with *kabadês* as an intermediate form.<sup>12</sup> Garments of this type were already ubiquitous throughout the Mediterranean world by the fifth century,<sup>13</sup> and several fine complete, or largely complete, examples dated to the tenth century were found in the Buyid cemetery at Rayy.<sup>14</sup> The description in the

8. Reiske, *De Cer.*, 2, 880-1.

9. See R.B. Serjeant, *Islamic Textiles* (Beirut 1972) 18 and passim.

10. Reuben Levy, 'Notes of Costume from Arabic Sources', *Journal of the Royal Asiatic Society* (1935) 324 n. 2.

11. Veronika Gervers-Molnar, *The Hungarian Szür: an Archaic Mantle of Eurasian Origin*, R.O.M. monograph (Toronto 1973) 5 ff.

12. Although this term is in use in the twelfth century, and may prove on further investigation to be applied to the double-breasted type of coat best known from Seljuk and Mongol use but already established in the region at the beginning of the tenth century. See, for example, the reliefs of the Church of the Holy Cross at Aght'amar, and the Bodleian as-Sufi, ms Marsh 144, pp. 61, 185, 223 and others.

13. Several were found in the great mausoleum complex at Achmim/Antinoe in Egypt and are variously held in the Netherlands, Berlin and Lyons. See, for example, Dominique Bénazeth and Patricia Dal-pra, 'Quelques remarques à propos d'un ensemble de vêtements de cavaliers découverts dans tombes égyptiennes', in *L'Armée romaine et les Barbares du troisième au quatrième siècle* (Saint-Germain-en-laye 1993) 367-377. Together with an ivory plaque in the Bargello Museum, Florence, these make it clear that they were common wear amongst the Lombards.

14. A most exquisite example is held in the Textile Museum, Washington D.C. (inv. no. 3.166), although I am told it was disassembled in 1948 in order to allow the way it was woven as a single piece of cloth to be exhibited. See Dorothy G. Shepherd, 'Medieval Persian Silks in fact and fancy', *Bulletin de Liaison de C.I.E.T.A.* no. 39/40 (Lyon 1974). Another survives intact in the Cleveland Museum of Art (CMA 85.59). See Sheila Blair, Jonathan M. Bloom and Anne E. Wardwell, 'Re-evaluating the date of the "Buyid" silks by epigraphic and radiocarbon analysis', *Ars Orientalis* 22 (1992) 1-41. CMA 85.59 is illustrated on p. 40.

There are also several thirteenth-century examples held in the Mevlana Museum in Konya, Turkey: Mehmet Önder, 'Mevlâna müsesinde bulunan Mevlâna'nın elbiseleri üzerinde bir araştırma', *Türk Etnografya Dergisi* 14 (Ankara 1974) 5-14.

*Praecepta* of knee-length *kabadia* as 'short'<sup>15</sup> is a clear indication that something close to the floor sweeping garments familiar from the fourteenth century portraits of Theodore Metochitês<sup>16</sup> and Grand Admiral Apokaukos<sup>17</sup> and others<sup>18</sup> were already established in civilian dress by the middle of the tenth century. The length of Byzantine men's garments was an element in Luitprand of Cremona's diatribe against them in the wake of his visit of 968-9.<sup>19</sup>

Eric McGeer's translation of the *Praecepta Militaria* and a portion of the *Taktika* of Nikephoros Ouranos, necessarily depended heavily on Kolias' work, with consequent inaccuracies in the translation. In the light of a better understanding of *kabadion* the passage of the *Praecepta* III.8:

εἰς δὲ τὰς ζώνας αὐτῶν φορεῖτωσαν οἱ τοξόται καβάδια πρὸς τὸ σκέπεσθαι μέρος τι τῶν ἰππῶν αὐτῶν, φυλάττεσθαι δὲ αὐτοὺς ἀπὸ τῆς ζώσεως καὶ κάτω.

should be read thus:

Let the archers wear *kabadia* at their belts to cover part of their horses and to protect themselves from the waist down.

This is still more subtly informative about the nature of these *kabadia*. They must not be split up the back,<sup>20</sup> for if they were, the skirts would simply fall either side of the horse and give it little protection, as can be seen in Fatimid ivories in Berlin,<sup>21</sup> and commonly in the surcoats of European knights.<sup>22</sup> It is clear this variety of *kabadion* was not similar to the Persian and Lombard forms already mentioned,

15. McGeer, *Sowing the Dragon's Teeth*, 185.

16. Church of the Holy Saviour in the Fields, Constantinople. 17. B.N. Paris Grecque 2144 f. 11<sup>r</sup>.

18. Bodleian Library Lincoln ms 35 ff. 7<sup>r</sup> and 12<sup>r</sup>, B.L. Additional ms 39627 f. 3<sup>r</sup>.

19. Luitprand of Cremona, *Embassy to Constantinople*, chapter 37 (translated by F.A. Wright [London 1993]).

20. This pattern of a split only up the front of a long garment is well evidenced in civilian dress. The clearest depiction is the Forty Martyrs of the Serpent Church in Göreme. See Nicolle and Michael Thierry, *Nouvelles églises rupestres de Cappadoce* (Paris 1963) plate 45.

21. Museum für islamische Kunst, Michael Brett and Werner Forman, *The Moors: Islam in the West* (London 1985) 82.

22. See, for example, the 'Maciejowski Bible' extensively and many other European pictorial sources of the late twelfth and thirteenth centuries.



which are constructed as a quite straight tube with little or no extra volume in the skirt, but made in the manner of an eighth to ninth century example found at Mochtchevaya-Balka in the Caucasus.<sup>23</sup> This has a panelled skirt attached by a horizontal seam at the waist, allowing for greater fullness and the skirt is also split on either side.<sup>24</sup> With such an arrangement the two front panels would hang over the rider's legs while the back panel would lay along the horse's spine.

The *klibanion* demands some careful attention. While it has largely gone unquestioned that the short, usually sleeveless cuirass shown in so many pictorial sources is the whole story, both the texts of the tenth century manuals and some lesser-known pictures of a little later tell another story.

The manuals do not define the form of the *klibanion* explicitly. Several mentions make it clear that this is because the term had several meanings. At II.3, and III.8 the author of the *Praecepta* writes of skirmishers and archers equipped only with *klibania* and stress at the first point the lightness and mobility of such armour. This is echoed by Ouranos. In contrast, at III.4 of the *Praecepta*, Phokas stipulates that the *klibania* of the *kataphraktoi* should have sleeves and *kremasmata*, a specification again repeated by Ouranos. In this contrast we have the clarification of the dream of Achmet mentioned by Koliass. *Klibanion* might refer to as little as the breast and back, but could also mean a full harness consisting of breast and back, shoulder guards, sleeves and skirt. The fewer of these pieces it had, the greater the danger to the wearer, as Achmet observed.<sup>25</sup>

23. Anna Jeroussalimskaia, 'Le cafetan aux simourghs du tombeau de Mochtchevaja Balka (Caucase Septentrional)', *Studia Iranica* 7 (1978) 183-211; Krishna Riboud 'A newly excavated Caftan from the North Caucasus', *Textile Museum Journal* IV.3 (1976) 21-42. This coat is very long, and said to be for a man about six feet or 185 cm tall.

24. The coat with the skirts spread and the cutting layout appear at Jeroussalimskaia, 'Le cafetan aux simourghs', plate XII figure 15, and plate XIII figure 17 respectively.

25. Koliass *Byzantinische Waffen* p. 46 n. 71 . . . ὅτι ἐνεδύσατο τὸ λεγόμενον κλιβάνιον μονομερές, εὐρήσει στένωσιν ἕκαστος ἐν τῷ ἐπιτηδεύματι αὐτοῦ, εἰ δὲ πολυμερές καὶ πολύτμητον, εὐρήσει πλοῦτον ἀνάλογον τῶν τμημάτων καὶ ἀμεριμνίαν ἐχθρῶν. ' . . that wearing the so-called unitary *klibanion* each will find himself in straightened circumstances, whereas if it is the multi-part and much-segmented sort, he will find value in proportion to the sections and freedom from the wounds of his enemies'.

Beyond these uses, *klibanion* referred to anything made of lamellar, such as horse armour. (Phokas III.5, Ouranos 60.5) This brings me to the matter of construction. In 1988 I embarked upon a project to construct a functioning metal *klibanion*. Drawing on the limited material published to that date<sup>26</sup> and some pioneering work by colleagues Steven and Martin Baker on the reconstruction of Near Eastern and Central Asian style leather lamellar,<sup>27</sup> I had gone ahead with the assumption that the Byzantines used the same sort of assembly methods as other peoples of the Near East and Central Asia. By 1991 I had produced an effective solid-laced thorax closely approximating the overall style of the pictorial sources after much trial and error. A problem I encountered rapidly was that in the athletic activity of combat the rows of plates would separate within minutes. In solid-laced lamellar each row of plates is tied directly to those above and below to form a virtually rigid cuirass, one which, contrary to Haldon, is very much more rigid than common scale armour.<sup>28</sup> The flexing of my torso pushed the rows past each other and, with the metal to metal contact where the laces passed through, the plates sheared the laces like scissors. I returned to an observation that I had passed over up to that point. Byzantine lamellar, and some Islamic, is depicted with narrow bands spacing the rows. I surmised that this may have been a strip of leather laced between the rows to cushion them and eliminate the scissoring effect, and it did prove so in practice.<sup>29</sup>

Nonetheless, I was not completely satisfied with this result. Through the process of construction, re-construction and use, a germ of doubt about the overall form of the *klibanion* as depicted in the more commonly reproduced pictorial sources had grown into full blown

26. Bengt Thordeman, *Armour from the Battle of Wisby, 1361* (Stockholm 1939); Ian Heath, *Early Medieval Armies* (London 1980) and *idem*, *Byzantine Armies 886-1118* (Osprey Men-at-Arms Series, London 1979); Robert Elgood (ed.), *Islamic Arms and Armour* (London 1979).

27. Working in Australia within a re-enactment society. See, for example, M. Baker, 'Seljuk Arms and Armour', *Varangian Voice* 23 (July 1992) 9-15 and for other comparable re-constructive material C. Sitch, 'A sleeve and shoulder arrangement for Eastern hanging lamellar', *Varangian Voice* 33 (July 1994) 17-19.

28. 'Some Aspects of Byzantine Military Technology from the Sixth to the Tenth Centuries', *BMGS* 1 (1975) 14. See note below.

29. T. Dawson, 'Banded Lamellar — A Solution', *Varangian Voice* 23 (July 1992) 16.

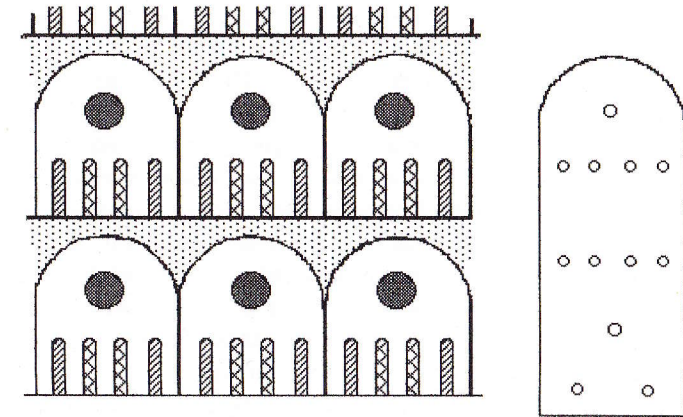


scepticism, essentially on account of how little it protected. The skirts and sleeves sometimes shown resembled *pteruges*, an antiquated and rather ineffective armour, too much to be immediately plausible. The explanation given by the tenth century literary sources dispels this scepticism well enough, yet the searching out of less well known pictures and re-assessing familiar ones prompted by that scepticism yielded valuable observations.

The patternings on Byzantine depictions of lamellar, when clear, show striking differences from other depictions and reconstructions from archaeological finds. Across the corpus of pictorial sources there are also remarkable consistencies which led me to conjecture that these differences were not just artistic distortions. The construction of lamellar as commonly understood (I shall use the term 'generic' henceforth) has each plate overlapping the adjacent plate and laced firmly to it. If the tops of the plates are rounded (as they rarely are in generic lamellars) this results in a pattern where the visible vertical edges of the plates do not align with the lowest points of the row of arcs at the tops. In all Byzantine pictures I have seen to date this is not so; the entirety of every plate is visible and there is no overlap. This is viable if the banding is not merely a narrow strip at the top of the plates as I previously conjectured, but backs the whole row of plates which are fixed to it side by side. Such a construction method produces a fabric which is much more horizontally flexible than the generic method and easier in the labour of execution. Other benefits are a saving of fifteen to twenty percent in materials, and concomitantly weight; which is a significant consideration in the case of metal lamellar, and less exacting requirements for hole placement. Further ease of manufacture was afforded by the practice of riveting the plates to the backing rather than lacing them on. It is indicated by the plates showing a round dot or circle at the top in place of the short stripe that represents a lace. This development appears to have been introduced in the eleventh century and becomes the method most commonly illustrated in the twelfth century.<sup>30</sup> In addition, I concluded

30. See for some examples Kalavrezou-Maxeiner, *Byzantine Icons in Steatite*, pl. 7, no. 6 and pl. 15 nos. 24a, 25 & 26; and the Cherson Steatite of three saints (inv. no. 84/36 445, in Bank, *Byzantine Art in the collections of Soviet Museums*, plate 147).

that the assembly of these rows was not solid, but of the hanging form. In hanging lamellar the rows are suspended from a loose lace that allows them to move up and down considerably. The most common genus of eleventh and twelfth century lamellar looks like this:



Lamellars of this type are depicted with from two to five suspension laces, although in practice even numbers of laces would work best, and since the bottom holes are likely to have been used also to tie rows together on the inside, any more than two exposed laces is rather extravagant redundancy. Hanging lamellar plates often have a vertical overlap of approximately half, which means that any weapon has to penetrate two spaced layers of armour. The great benefits of spaced armour against artillery was re-discovered in the twentieth century and applied to tanks. My own tests confirm that the same benefits apply to medieval use. My reconstructed *klibania* have proven to be completely resistant to thrown and thrust spears, to swords and even proof against arrows.<sup>31</sup> By comparison mail is proof against none of these attacks, unless they are light or glancing, and scale armour is little better. Kolias proposes the superiority of the *lorikion*

31. These weapons were all sharp reproductions of types in use at the same time as the armour. The arrows were tipped with typical Near Eastern pattern conical armour-piercing points of hardened steel, and fired at 20 metres from a composite recurve style bow peaking at 82 lbs at full 33 inch draw.



over the *klibanion* and its use by officers solely on the basis of their fewer numbers in the ship complements specified in *De Cerimoniis*.<sup>32</sup> He overlooks the fact that the author states that the light form of *lorikion* is for the use of men who do not participate in hand to hand combat; siphon crews, helmsmen and lookouts.<sup>33</sup> This is significant. Even if the unattributed 'common' *lorikia* are for officers, it does not imply their superiority. On the contrary there could be advantages in supplying officers with an inferior armour. The Byzantine army was not an ancient or European war-band. The job of its officers was to command, not to lead. Inferior armour might discourage officers from heroic excesses. The imperviousness of the *klibanion* explains the anecdote recounted by Anna Comnena when Alexios took two charges from Frankish cavalry and was merely pushed partly off, then back onto his horse without sustaining any injury.<sup>34</sup> Backed by a thick *kabadion*, and mail in the case of someone of status, and covered by an *epilorikion*, an iron lamellar corselet would be almost impenetrable.

Other developments occur in the eleventh and twelfth centuries in addition to riveting. *Kremasmata* continue to be shown, yet the surface patterning on them looks less and less like quilting and becomes increasingly suggestive of some form of lamellar. On a spectacular fresco of Saint Nestor in the Church of Saint Nikolas at Kastoria,<sup>35</sup> these hints at another reality become explicit. The sleeves and skirt of the saint's *klibanion* are made of an identical lamellar to the chest, but hung upside down. Long lamellar corselets are well known in the Levant from the early middle ages, however generic styles are consistently homogenous: the lamellar overlaps the same way from neck to knee.<sup>36</sup> Inverted lamellar limb pieces have major advantages.

32. Kolias, *Byzantinische Waffen*, 49.

33. *De Cer.*, 669.

34. Anna Comnena, *Alexiad*, IV, 7.

35. Published in *Istoria tou Ellenikou Ethnous* (Athens 1980) IX, 406.

36. An eighth-century stucco statuette from Mingoi near Sorcuk, in the British Museum, and the tenth century Goliath of Aght'amar, and many warriors in the various mss. of Rashid ad-Din's *World History*, all wear long lamellar corselets, and there is a fine Mongolian iron lamellar harness in the armoury of the Tower of London. For collected examples see Michael Gorelik, 'Oriental Armour in the Near and Middle East from the eighth to the fifteenth centuries as shown in works of art', and David Nicolle, 'An introduction to Arms and Warfare in Classical Islam', both in Robert Elgood (ed.) *Islamic Arms and Armour*, 30-63 and 162-186 respectively.

Blows striking those areas are invariably travelling downwards. In the case of cuts to the thighs the angle is steep and the swing has had a longer arc to develop momentum. Such cuts strike the edges of the tops of the rows in generic lamellar facilitating penetration, while inverted lamellar sheds them, as scale also would.<sup>37</sup> Inverted lamellar sleeves also appear on a fresco in the Serpent Church at Göreme.<sup>38</sup> It appears to be a distinctively Romano-Byzantine practice albeit of uncertain prevalence, for the only unquestionable precursor to this picture I have found to date is a thigh-guard of inverted leather lamellar of the third or fourth century found at Dura Europos.<sup>39</sup> Possibly it was re-introduced in the late tenth or the eleventh century, having fallen out of use in late antiquity as lamellar itself appears to have done. The absence of any mention of lamellar in Procopius and the *Strategikon* attributed to Maurice is striking, and it is by no means certain that the author of the anonymous treatise on strategy is writing of anything more solid than mail.<sup>40</sup> In a period when the resources of the empire had been, and were still being, stretched by war on several fronts the disappearance of lamellar in favour of mail is hardly surprising, its effectiveness notwithstanding. It occurred for the same reason it recurred in later Byzantium; the expense and complexity of its manufacture. Mail (and scale) is made of small, identical components. The origins of wire drawing are lost in the mists of time. Wire was wound onto a bar then cut into rings. The most exacting part of the operation was to overlap, flatten and punch the ends of each ring to allow it to be riveted shut; a necessity due to the weakness of wrought iron and the fineness of the wire. Mail making was a cottage industry which was not uncommonly practised

37. A *klibanion* with scale sleeves is clearly shown in a thirteenth-century Syriac gospel in the Vatican (Vat. Syr. 559) see Gorelik, 'Oriental Armour in the Near and Middle East from the eighth to the fifteenth centuries as shown in works of art', in Elgood (ed.) *Islamic Arms and Armour*, 52-3 no. 19, and another in the 10-11th century Smyrna Octateuch (Vat. Gr. 746f. 455<sup>v</sup>). See David Nicolle, *Arms and Armour of the Crusading Era* (New York 1988) 36 and 650, no. 85f.

38. Illustrated in Nicolle, 'An introduction to Arms and Warfare in Classical Islam', in Elgood (ed.) *Islamic Arms and Armour*, 178.

39. H. Russel Robinson and Ronald Embleton, *The Armour of the Roman Legions* (Newcastle-Upon-Tyne undated).

40. George T. Dennis, *Three Byzantine Military Treatises* (Washington 1985) 52-4.



by women in medieval Europe and the same may have been true in Byzantium.<sup>41</sup> Producing scales is only a little more complicated, and the assembly of corselets of mail or scale is a simple, repetitive operation which requires little or no modification of the components to produce a comprehensive garment. On the other hand, to make lamellar one must forge out the metal, trim the plates to shape whatever the material and punch or drill them with at least seven, and often more, holes. Individual plates must then be assembled into horizontal rows and those rows linked vertically to make the *klibanion*. Since lamellar plates are larger than scales,<sup>42</sup> and the finished fabric is less flexible, the neck and arm openings of the chest piece must be made with specially shaped plates in order to achieve a harness which gives the best possible protection while allowing the necessary freedom of movement and some degree of comfort.

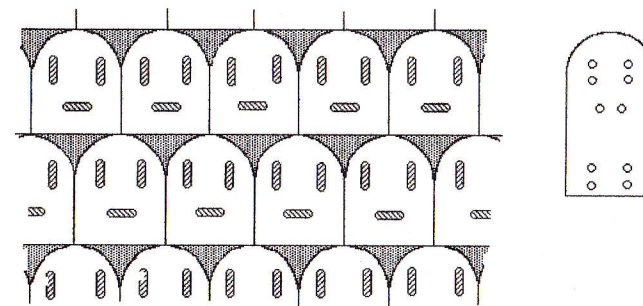
The Nestor icon mentioned already shows other points of detail which are thought-provoking. The backing strip does not show beyond the tops of the plates, which are themselves not rounded at the top. The first characteristic would be a small saving of materials, while the second would be a large saving of labour which otherwise produces a purely cosmetic effect. We should not be surprised to find such short cuts employed in the borderlands. The skirt on Nestor's *klibanion* has no split in the front and so is that of an infantryman. The earlier manuals hardly ever mention the equipment of the infantry (the various authors all seem to regard them as of little importance) and when they do nothing as solid as lamellar is hinted at. Several conclusions might be drawn from the icon. One is that the artist wanted to make the saint accessible by showing him as a common soldier, which is

41. A carving of a woman assisting a smith suggests female involvement in at least lighter forms of metalwork. Tamara Talbot-Rice, *Everyday Life in Byzantium* (London 1967) 185.

42. In his otherwise helpful article 'Some Aspects of Byzantine Military Technology from the Sixth to the Tenth Centuries', John Haldon profoundly misconceives the constructional and functional differences between scale and lamellar (14-15). The degree of flexibility of both scale and lamellar varies dramatically depending upon which construction method is used, but the commonest form of scale is very much more flexible than any form of lamellar. For a wide selection of scales and lamellae see Thordeman, *Armour From the Battle of Wisby 1361*, 243-8.

a prevalent theme in Byzantine iconography, and so deviated from his high standard of realism. More plausible is the conclusion that, at least by the twelfth century, there were infantry more heavily armoured than in the tenth century, a possibility consistent with the suggestion of that era being a time of economic improvement.<sup>43</sup> A third possibility, which my experiments confirm in practice, is that with the skirts being separate from the chest piece, it is possible to build them in such a way that the same pieces can be assembled with the splits front and back for cavalry use, or at the sides for infantry. This possibility would have benefits for both equipment supply and troop deployment.

One fine illustration provides a valuable contrast to the paradigm set out above. It is the triumphal portrait of Basil II in the Psalter in Saint Mark's Library, Venice. The Emperor wears a *klibanion* constructed thus:



This armour is unique in that it is the only unmistakable depiction of a solid-laced example I have found to date. Two factors indicate its solidity. One is the brick-work pattern, the plates offset horizontally from one row to another. The other is the lack of any laces crossing the boundaries of the rows. The horizontal lace is the one that initially fixes the plates to the backing band and the other lace passes through the top holes of the lower row of plates and the lower holes of the

43. A.P. Kazhdan and Ann Wharton Epstein, *Change in Byzantine Culture in the Eleventh and Twelfth Centuries* (Berkeley 1985) 25-6 and 46-50.

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upper row to tie the whole rigidly together. This armour could be used; as I have written earlier, my first cuirass was solid-laced, however its rigidity does make such an armour notably awkward for any activity which requires flexibility. Yet being an imperial parade armour made for symbolic display rather than practicality and protection, such was not a great consideration. Rather it was made for opulence, and necessarily to resemble the classicising artistic convention that we can see in so many works of the tenth century.<sup>44</sup> Consider the neo-classical excesses of similar European Renaissance armours.

A combination of casting a wider net for evidence and a practical approach to interpreting and testing that evidence can yield a more accurate picture of Byzantine military equipment, a picture which matches a sophistication of equipment to the sophistication of strategic and tactical theory which is found in the literary sources.

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44. See manuscripts such as Vat. Reg. Gr. 1B and its counterpart in Paris, B.N.P. Gr. 139, the 'Veroli Casket' in the Victoria and Albert Museum, and sources cited in note 1 above.