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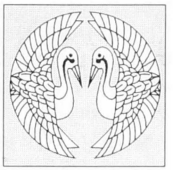

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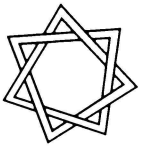

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ORIENTAL MANUSCRIPTS AND NEW INFORMATION TECHNOLOGIES

A. S. Matveev

VISUAL ARTS AND COMPUTING. WORKS OF ART AS A SOURCE FOR THE HISTORY OF WARFARE: A DATABASE PROJECT*

This article is dedicated to a database project, which has been started in connection with the study of *Early Persian miniatures as a source for the history of Mongol warfare*. The main goal was to elaborate a computer processable means of describing the military equipment represented in works of medieval art. Then the information from these works could be entered into a database, making it possible to link this data to the scanned images of the warriors and arms depicted. It is hoped that it will be a first step towards establishing a large-scale database of comparable data from medieval Middle Eastern works of art in general. At present the main task is to produce a *conception* of such a database.

As this approach to the study of military history is relatively new, and such databases seem to have never been attempted before, some introductory remarks are required, — both on the "compatibility" of works of art with database specifics and the possibility of applying a computer approach to visual materials, as well as on ways of using "the visual" in historical reconstruction.

* * *

The past decade has witnessed a boom in the development of computing in the humanities, one of the main forms of its application being the *database*. Emerging first of all as a linguistic tool, such databases gradually spread to other fields. In the early 90s the solving of most of the problems, caused by the technical difficulties of writing systems inherent to Oriental languages, has allowed, e. g., the creation of a number of complicated Arabic and Arabic-English databases. The diversity of such databases, however, cannot hide their common feature: all of them are dealing with *text* par excellence — literature, treatises, periodicals, even colloquial speech recorded and transcribed. It is, of course, not surprising, as the text can be *directly* converted in to the computer form and entered in a database, then easily processed and used for a subsequent research.

The same situation can be seen not only in computing, where it is quite natural, but also in the field of general history, which is concerned, almost exclusively, with the *text*. The text itself, however, is not the only source of information; the *visual* is quite significant as well. Despite the obvious importance of the *visual* in history, the approach to visual materials characteristic of works on general history tends to be basically inappropriate. In most of these works the *visual* enjoys a minor role as "illustration" to the "main" theme. Half a dozen miniatures or drawings are tacitly supposed to help a reader to "understand better" the subject in question, but one can hardly find any trace of the author himself using this kind of material. It is even odd how little attention is paid by "pure" historians to the miniatures in manuscripts in comparison to their texts. Moreover, critical editions of medieval sources are usually not provided with *any* visual material, and most of the miniatures from the manuscripts are not published at all — or published *separately* in books on art history. For the original readers, however, *both* were important, being two sides of one coin. Thus it is not a good idea to separate them now, especially when we are dealing with the medieval period, for which sources are not so abundant.

Though such questions, related to the basic features of artistic materials, are obvious and familiar for an art historian, it is not the case when general historians are involved. How many specialists, while using the medieval chronicles, bothered to look at their miniatures, published in books of another "domain" of historical knowledge? Even taking into account a characteristic ignorance of the right hand about deeds of the left one, it is still rather difficult to understand

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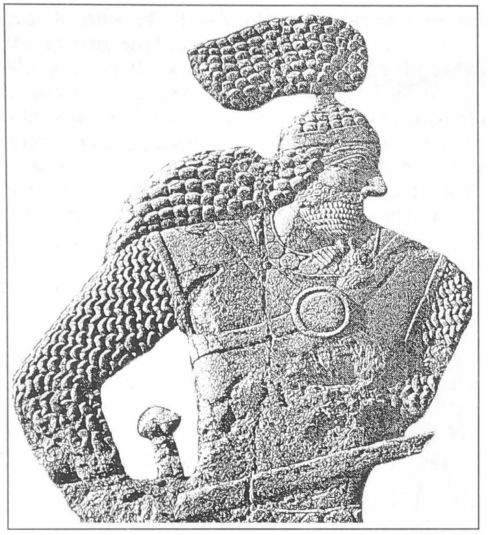


Fig. 1, a

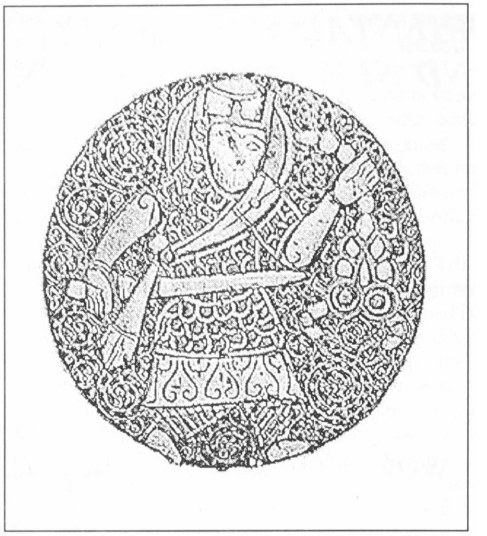


Fig. 1, b

Fig. 1, c

Fig. 1, d

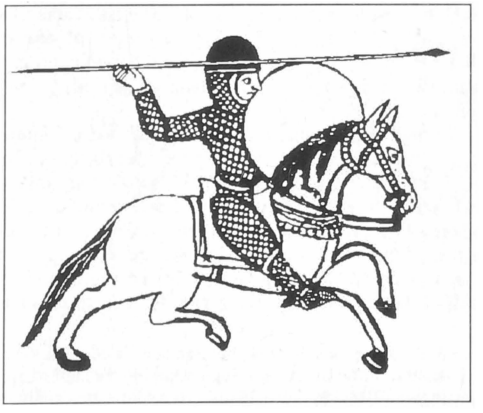


Fig. 1, e

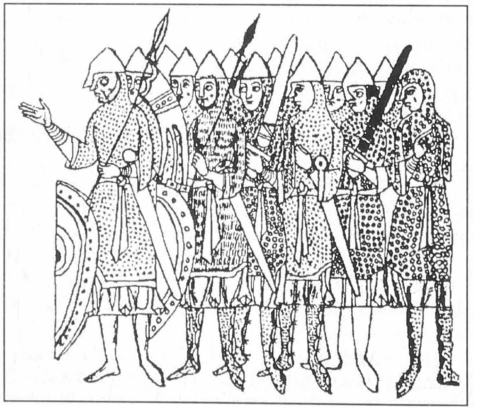


Fig. 1, f

how such valuable material seems to be carefully avoided by historians. Moreover, even military historians and archaeologists who study medieval arms tend to be reluctant to accept information from art sources, generally considering it unreliable.

Of course, the visual has its own "language", differing from the verbal one, and it requires a special approach. It is not, however, something specific of the visual, but rather a common feature of *any* text. A literary text, for example, has a great number of conventions — even in modern fiction, let alone in the medieval literature. All written sources have their own language. They cannot be understood "directly" and require knowledge of the rules, codes and conventions of the particular genre, as well as peculiarities of perception of the outer world by their creators. The facts filtered through the conventions of the genre and the medieval consciousness of the author become amalgamated with standard patterns and ideas inherent in his culture, thus resulting in something more akin to subjective "virtual reality". The latter, however, has little to do with the "historical reality" that a historian is looking for. Thus, verbal sources require a very specific approach to break through all the levels of "garbling" — which is not less difficult than coming to understanding the message produced by visual materials.

* * *

Considering the visual as a sort of a *text* to be understood and interpreted, we have to pay, first, a special attention to its language and its *conventions* — as we have to do when analysing every specific genre of the verbal text. Such conventions can be seen on all levels of both verbal text and visual image structure. In modern literature, for instance, we accept without even noticing such conventional things as rendering the characters' thoughts by grammatically com-

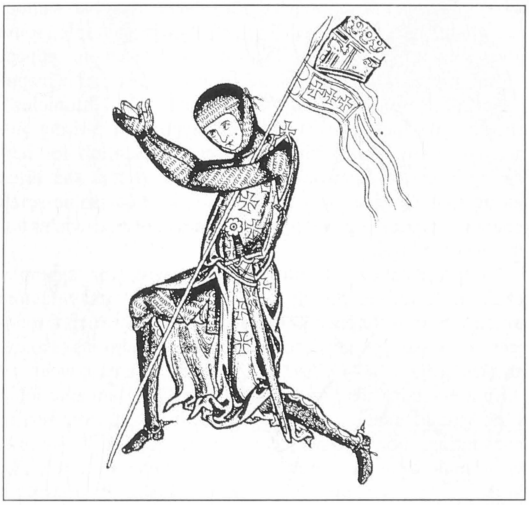


Fig. 1, g

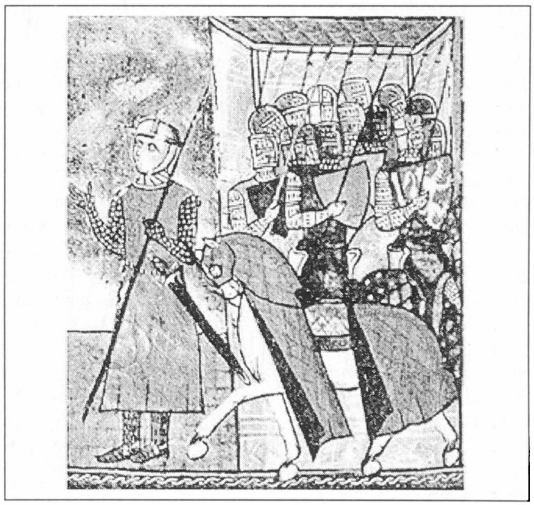


Fig. 1, h

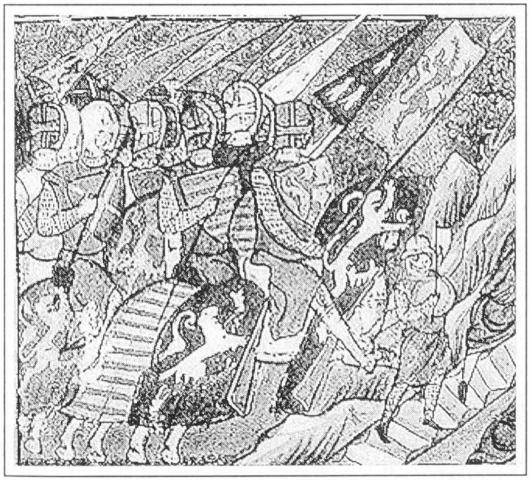


Fig. 1, i

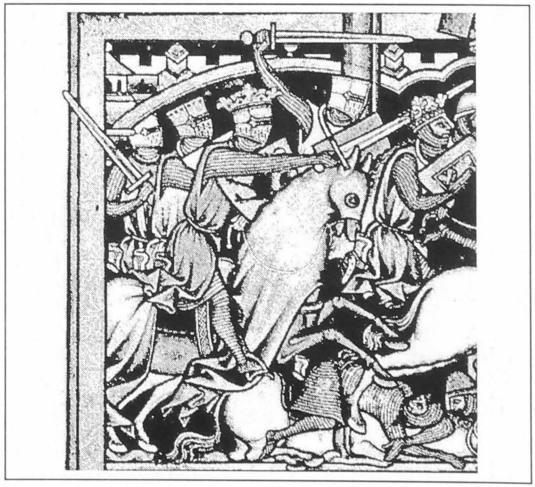


Fig. 1, j

Fig. 1, k

pleted sentences, though in reality no human thought has a fixed grammatical shape. The conventions are even more important for the way visual arts represent their objects, as even realistic painting differs considerably from photographic images, let alone the real life. As for a deeply traditional medieval art, the relationship between image and reality is much more complicated, especially in miniature painting that is heavily dependent on the text illustrated. Its hierarchic and symbolic world cannot be understood without knowledge of its specific rules. For instance, if the presence of a pet in a modern portrait can be merely a way of making a more vivid image, in medieval pictures it carried some important message. Thus, the squirrel, for instance, indicated the faithfulness of a portrayed European lady while the rabbit in an Islamic miniature showed the good fortune of the hero [1]. Similarly, famous hunting scenes on Sasanian silver dishes [2] by no means were just "sporting". An animal hunted by a king was not merely some poor doe bound to be killed, but a personification of king's luck, *farn*, a symbol of his good fortune and kingship. Failing to catch such a game meant loosing his kingly position, and even his life.

On the level of practical means of representation, the stylistic and other conventions involved are even more strict, especially when we are dealing with medieval miniatures. The level of stylisation is extremely high, so it is not always possible to apprehend the object depicted without knowledge of such conventions. Thus, for example, some blue semicircles with dark brown enhancement appear on the top right of a miniature from the Edinburgh manuscript of Rashīd al-Dīn's "Compendium of Chronicles", showing al-Muntaṣir traversing the Jayḥūn [3]. Taking into account a similar traditional Chinese convention for rendering water, it is possible to understand that the artist meant that the river was frozen — except for some small opening of "running water", thus indicating mid-winter for the event referred.

Fig. 2

Representation of military equipment, for example, chain-mail, differs greatly and depends on many factors ranging from difference in the material, from which the object of art was produced, to local cultural traditions (see examples in *fig. 1, a—k*). It is an extremely rare case when we have iron chains clearly shown, like on the Sasanian relief at Fīrūzābād [4] (see *fig. 1, a*), normally it is just some sort of convention. For instance, the Bayeux Tapestry warriors wear mail coats rendered as a square-like or circle-like holed net [5] (see *fig. 1, d*). Medieval Western European miniatures often show them as dotted strips or strips with short perpendicular lines (see *fig. 1, f, h, i*), sometimes even as simple squared surface (see *fig. 1, e*), while on the miniatures of fourteenth-century Shīrāz school they appear as scale-like tunics [6] (see *fig. 1, c*). Even modern reconstruction are bound to adopt some conventions for rendering mail texture — usually criss-crossed steel-like greyish lines sprinkled with white sparks indicating reflecting light (as it is, anyhow, virtually impossible to portray every link — at least it is a labour-consuming and pointless procedure).

Unawareness of such conventions can result in serious mistakes. Thus, dotted strips covering warriors on two inlay scenes of the early thirteenth century gates of the Suzdal cathedral (Russia) can be easily misunderstood as rendering rivets of nomadic lamellar armour (a variant similar to later European coat-of-plates) — as has been done, for instance, by Arendt and followed by Thordeman [7] (see *fig. 1, k*). A comparison with contemporary West European materials, where there is no doubts about the nature of the armour depicted, helps to avoid such misinterpretation.

The difficulty of penetrating such conventions can be seen on another characteristic example. Describing one of the types of Mongol "soft-armour" — *khatangku dehel* —

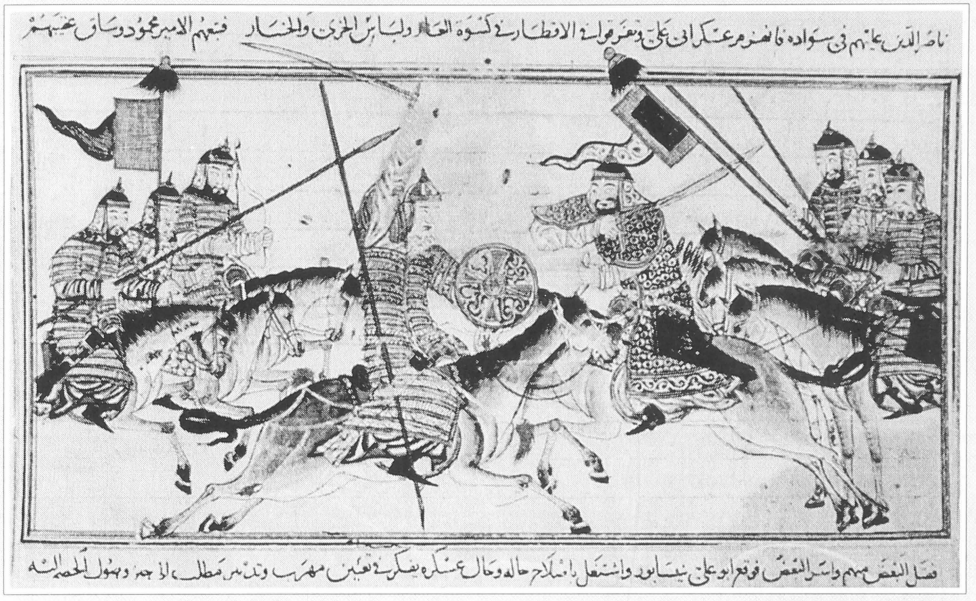


Fig. 3

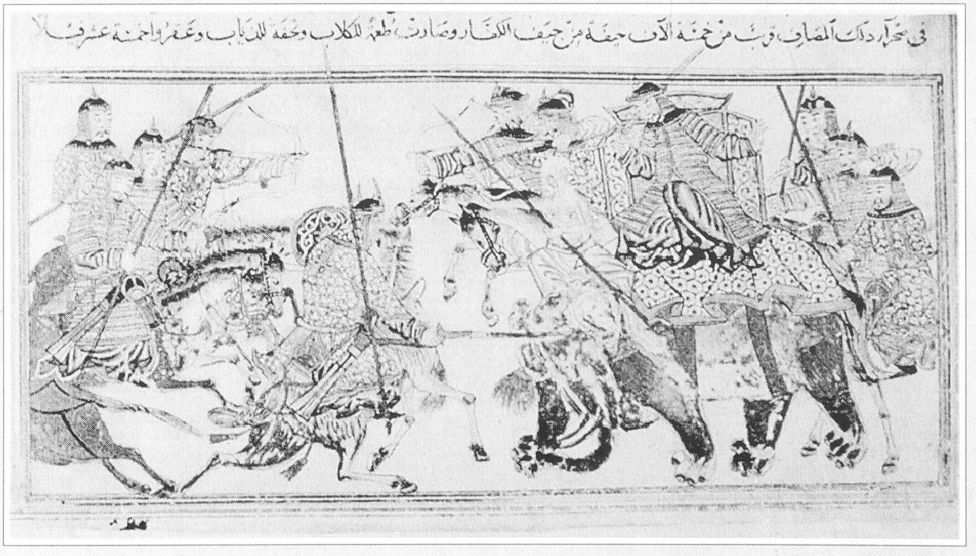


Fig. 4

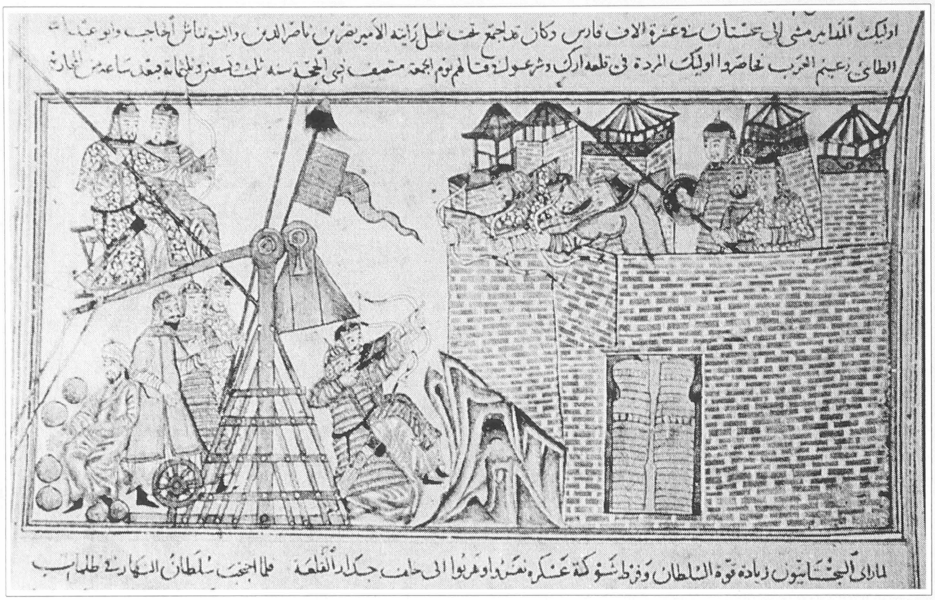


Fig. 5

Fig. 6

Michael Gorelik believed he had discovered its strengthened variant on the basis of a miniature from Rashīd al-Dīn's manuscript [8] (see *figs. 2* and *3*). It depicts a warrior in a coat ornamented by hexagons with a dot in the middle of each. The scholar understood it as rendering of hexagonal iron plates "with a securing pin or knot in the middle of each hexagon, placed between two layers of soft material which was stitched around the plates" [9]. The analysis of the other Rashīd al-Dīn's manuscripts miniatures show, however, that it was merely one of the typical patterns of Chinese *textiles* used both for garments and furniture [10], such as covering of thrones, or an elephant "saddle cloth" as shown on *fig. 4*.

All this explains the difficulties faced by a historian who attempts to use such materials for a historical reconstruction — and, to some extent, justifies his reluctance to do so. Unlike photographic pictures, a *direct* use of medieval visual images is seldom possible, a special study of such conventions being required in order to understand their meaning. For the history of military equipment this can be done through comparison of rendering similar objects in different traditions of the visual arts, different styles and even cultures. Persian miniatures, for instance, can be more easily deciphered if compared with Chinese or Japanese drawings, which are often more neat and clear. To cite an example, one can mention a quiver in an earlier Chinese drawing [11], where some features of Rashīd al-Dīn's manuscripts large deep quivers (tube-like in form) — obviously of a similar type — are represented more clearly. The quiver is open, and one can observe the construction of its covering, which can only be guessed on the basis of Persian miniatures [12] (see *fig. 5*), and the position of the arrows inside with feathers up. The late thirteenth-century Japanese "Mongol Invasion Scroll", contemporary to the event depicted, gives some examples of heavily armoured Mongol cavalrymen [13], who are quite similar to those appeared in the above 1306 Rashīd al-Dīn's manuscript from Edinburgh and other manuscripts belonged to the early fourteenth-century *Rashīdiyya* miniature school of Tabrīz. The importance of this scroll is due not only to some additional detail concerning helmets and lamellar "aventail" construction, but first of all because it is one of the major parallel evidences which *prove* the authenticity of the image of Mongol army shown in the Tabrīz miniatures.

Visual material from later periods can also be helpful, as such later pictures, because of different reasons such as another approach to rendering objects depicted, stylistic features, technique, or merely a size of the image, can show some specific details more clearly. Thus, for instance, if one tries to reconstruct the open-type quivers represented in Rashīd al-Dīn's manuscript, one can only make more or less plausible guesses, because of the small size of the objects in question and the technique involved. The clearest image of such a quiver can be found on fol. 15b (see *fig. 6*). However, if we compare them with other materials, such as later Persian miniatures or even a line drawing by Herberschtein, the mid-sixteenth-century German traveller who depicted weaponry in an armoury in Russia, where the same quiver pattern was borrowed from the Mongol or other nomadic neighbours, the construction of these quivers will become obvious (see *fig. 7, a, b*). Both a rather strange front "window" and a no less surprising furry tail were designed to prevent arrows from slipping from the quiver and, simultaneously, to separate them, as this made them easier to grasp while galloping.

A comparison of pictures with written sources, giving verbal descriptions of military equipment, helps a great deal in their understanding. Thus, for instance, a detailed description of the Mongol lamellar armour given in the "History of the Mongols" by the Papal ambassador Plano Carpini, who visited the Great Khān in Mongolia in 1246, provides a good basis for interpretation of contemporary artistic material. A Chinese scroll of the Mongol period (late Sung or Yuan) depicting the story of Lady Wen Ch'i [14] captured by nomads in the Han period, not only shows the same lamellar cuirasses of the warriors as described by Plano Carpini, but also depicts their horse armour the construction of which closely follows Carpini's description. Two different ways of describing the same object complement each other, adding some new details and clarifying others.

Archaeological finds are even more important, as they provide real prototypes for the arms and armour depicted in miniatures, meanwhile the miniatures help us understand the usage of the inevitably dissembled equipment found in an archaeological context. For example, a late thirteenth-century Mongol armour found in Tuva, includes several slightly curved narrow (*ca.* 1.5 cm) iron strips, 12—15 cm

Fig. 7, a

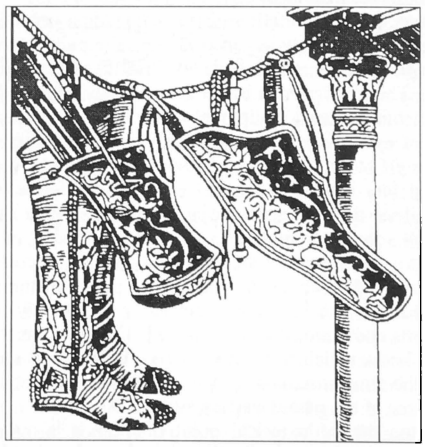


Fig. 7, b

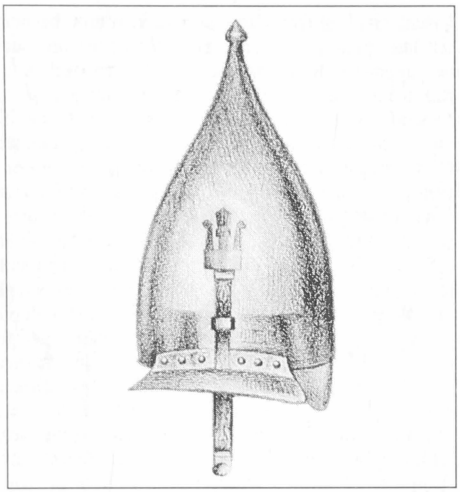


Fig. 8

long, with small holes on their edges. These puzzled me when I started the study of this armour. An assumption of Dr. Gorelik that they were used as shoulder-protection [15] is implausible, as their curvature is so insignificant that no shoulder can match it. They would have had to be curved much more acutely to follow the shape of a human arm. A comparison of these pieces with the visual material, however, shows that they were parts of a "lamellar aventail" similar to those represented in Rashīd al-Dīn's manuscript [16] (see *fig. 4*), which explains their unusual shape (they were curved just enough to follow a large semicircle of the helmet edge). On the other hand, these finds clarify construction of this kind of neck-protection depicted in the miniatures, as the pictures themselves, being in some respects rather schematic, did not give all the details necessary for the reconstruction.

Museum collections of later period arms and armour are also very helpful. Thus, a helmet of the Sulṭān Barsbāy from Louvre [17] (see *fig. 8*) perfectly explains an extremely strange trapezium-like shape of the helmet peaks of the *Rashīdiyya* miniatures, which is very difficult to interpret on its own. Even if we take into consideration the existing convention of showing an object perpendicular to the surface of the picture as going up, not forward, these peaks still look quite strange as they are broader to their end whereas one would expect them being semicircular. The example of the above helmet shows that it was indeed the shape of such iron peaks. As for the dots above these peaks they were clearly meant to represent rivets fastening the peak to the cupola of the helmet.

The above comparisons make possible not only the creation of a more reliable reconstruction of the equipment in question, but also helps explain the images in the miniatures themselves, such as details of the construction of armour, which are rarely completely comprehensible in the works of art alone.

* * *

Even the above few examples show how wide is the spectrum of the sources involved. Such a study requires collecting together a huge amount of different materials, handling of which is an extremely difficult task. Besides, the pictures in question, as well as applied arts objects, are dispersed among many manuscripts and collections, some of them not easily accessible. Thus, using a computer tool such as a database remains the only practical way to accomplish the task of collecting, storing and handling the information provided by works of arts. In the case of the present research, it entails using works of art of the Mongol period as a source for the history of contemporary warfare.

Work on the interpretation of the information provided by miniatures has already begun (see, e.g., the publications of Dr. David Nicolle, where huge material has been gathered [18]). Thus, a first step towards understanding the development of military equipment — namely, selecting a number of *examples* of arms and armour — has already been made. Of course, work in this direction should be continued, and the database form of storing this information would facilitate the process, making it possible to add new materials as soon as they appear. On the other hand, it is now time to make another step, namely to try to acquire some *statistical* data about the weaponry of each historical period and area. The latter can help not only identify the types of arms and armour which *existed* in the given period, but also to know which of them were *typical* for it, thus establishing the army *standard equipment*, which was, in turn, a major factor of the whole warfare system.

From the purely historical point of view it is not of great importance what sort of military equipment *existed* in the area under consideration, but only which of them were in a *wide use*. Unfortunately, the difference between an *occasional* application of some weapon and its real *importance* in warfare of the period is not always understood by historians. Thus, for example, in a recent article concerning the military technology aspect of the First Crusade, John France states that the Muslims possessed virtually the same equipment as Franks [19]. A real abyss, however, lies between a certain familiarity with and an occasional use of, for example, large kite-shaped shields in the Middle East, and the *actual use* of them in large numbers on the battlefield. The fact that the Arabs and Turks of the Middle East also *possessed* some heavy equipment does not mean its equivalent *application* on the battlefield against Frankish *par excellence* heavy cavalry.

In order to understand this aspect of the problem, knowledge of the *frequency* of depicting of various types of arms and armour is indispensable, and to achieve this goal a database is an extremely helpful tool. To what extent this statistical material reflects reality is another matter: the question of *reliability* of this *image* requires additional historical analysis, which would include comparison of this image with archaeological data, written sources, other artistic materials, and the like.

Thus, the miniature painting of the Crusading states, for instance, depended greatly on Byzantine patterns until the second half of the thirteenth century, thus reflecting the features of the Byzantine — or even late Roman — army, rather than the realities of the Crusaders' own troops. For the Īlkhānid Persia, on the other hand, the miniature painting seems to indicate a general tendency. It would be

strange to assume that in the case of *Rashīdiyya* miniatures court artists had depicted something quite different from the reality. There was no single reason to do it this way: no influential tradition to follow (as opposite to the case of the Crusading states), as a new artistic *tradition* was being established under the *īlkhāns*. Both pre-Mongol Middle Eastern and Far Eastern miniature schools are stylistically quite different from *Rashīdiyya* painting, and represent *different* type of warriors and arms.

Here it is worth mentioning, that the amount of pre-Mongol Middle Eastern visual materials relevant for military history is often underestimated, and is substantial enough to produce a comprehensive picture of the military equipment of the first half—mid-thirteenth century. In addition to a number of scattered materials of applied and fine arts, there are two major artistic sources for the period, namely a bulk of illustrations to the *Maqāmāt* of al-Ḥarīrī and, no less important but sometimes overlooked because they belong to a Christian tradition, the miniatures from Syriac gospel books [20], which also show soldiers and military equipment. These sources give a general picture of warriors wearing mostly mail-coats and bearing straight swords — though lamellar armour and sometimes curved sabres appear as well. This image is, obviously, quite different from that of *Rashīdiyya* warriors, who have no mail and no straight swords *at all*. Thus, as in this particular case we have no indication that the miniatures in question show something different from the Īlkhānid army, we have no choice but to give them a "benefit of doubt", accepting them as a genuine *attempt* of the artists to represent a current situation. This opinion is also supported by other historical and archaeological data, which further indicate the reliability of these visual sources.

I have to stress, however, that there is no question that an army represented in works of art — even if it was *meant* to be a contemporary army — is the *same* as it was in a given historical period. The relationship between the art and reality was much more complicated, and requires a special analysis in *every* particular case.

In any event, these statistics would prevent us from making such groundless suggestions as that "the pictorial record confirms this lack of shock weaponry" by Mongols [21]. The basis for such a statement was, evidently, a random selection of miniatures in the book of Philips [22], the latter being also generally praised in historical literature for its "excellent black and white illustrations" [23]. This selection, excellent as it is, by no means reflects the real situation in the visual arts of the period in question. Moreover, *all* the Persian miniatures given in this edition — though being good *illustrations* to *a* book — are practically irrelevant as regards the study of the realities of the Mongol period itself. Most of the pictures are from two relatively late manuscripts of "Compendium of Chronicles" by Rashīd al-Dīn: Supplément Persan 1113 from the Bibliothèque Nationale, Paris, and Ms. D 31 of Asiatic Society of Bengal, Calcutta [24], both copied early in the second quarter of the fifteenth century, i.e. a century after the collapse of the Īlkhānid power in Iran. One can argue that the miniatures, though quite Tīmūrid in style, are seemingly copied from older manuscripts, but they are, nevertheless, heavily influenced by contemporary Tīmūrid art [25]. All this makes it impossible to rely on image of the Mongol army represented by these miniatures. Other pictures — three from the Diez A Album, Berlin [26], and one from Hazine 1654 [27], Topkapı Sarayı, Istanbul, though earlier, still belong to the second half of the fourteenth century, thus by no means being particularly reliable sources. The only one *contemporary* material in the Philips' book is originated from the above Japanese "Mongol Invasion Scroll", but the sections selected represent Korean auxiliary infantry, not Mongols. Thus, how can one rely on such materials at all? The only reason of using this selection is, obviously, the total lack of a collection of the *adequate* material.

* * *

The database of the Mongol arms and armour represented in the Edinburgh manuscript of Rashīd al-Dīn is intended to be a first draft of a full-scale database of military equipment shown in works of art of the Mongol period, and is being used for an evaluation of the proposed approach to the subject (see below an example of the typical "list" of warriors' description on *Table*).

It takes the form of a questionnaire — a list of "questions" for the image of every warrior depicted, thus producing a computer processable (in a simplified "Yes-No" form) description of his weapons and armour. It will also be linked to a linear drawing of such a warrior. Thus clicking on any single "cell" of the table will allow the user to jump immediately to a relevant drawing. And *vice versa*, it will be possible, for example, to click on the first warrior on a miniature and be switched to the relevant database page with the description of his arms and armour.

The second line of connection will link such a "one-warrior table" with general tables containing information about all persons depicted on a single miniature and, then, in all the miniatures of the manuscript. The next level of generalisation includes cross-linked general tables for a series of manuscripts, e.g. from one miniature school (like the *Rashīdiyya* of Tabrīz, of which the above Rashīd al-Dīn's manuscript is the best example, or the Īnjū school in Shīrāz of the second quarter of the fourteenth century), then of all the manuscripts of a single historical period, for example, the Mongol period.

Another set of links will join the miniature database with those dealing with ceramics, metalwork, textiles, and also with an archaeological database, including museum objects (see *Scheme*). The creation of such applied arts and especially non-pictorial databases is, of course, a future task; and a generalised method of description of those objects needs be developed in due course. The general concept of a database system, however, has to be elaborated now — in order to provide the miniature database with all the necessary hyperlinks — disabled for the time being — to be used later. The flexibility of such "hypertext" edition allows providing the database with a set of links which can be activated when a new material becomes available.

Another important facility of the database will be a set of "filters" allowing a user to select a level of generalisation. The description of every individual warrior — i.e. a set of questions to answer — from one manuscript and even from the series of manuscripts belonged to one *school of painting* should be the same. Despite the difference in artistic level, taste, and personal preferences — or variance in

the customers' requirements — there was always much more in common than was different in the works of artists from the same school, including their attitude towards the material portrayed. This makes it possible to use the same questionnaire for the miniatures of one school, though the level of completeness of the answers would vary from manuscript to manuscript, as it is merely a general tendency. Besides, in some cases, we have the miniatures added to a manuscript in different periods of time [28]; thus it may happen that miniatures from one manuscript have to be described separately, according to their stylistic affiliation.

My work with this database showed that it is virtually impossible to elaborate a set of questions equally suited all miniature schools — let alone works of applied arts and archaeological data — unless they are only very general questions. Thus, e.g., the level of detail shown on early fourteenth-century *Rashīdiyya* school and 1330s Shīrāz school miniatures is so different, that half the articles in the questionnaire specific for the Rashīd al-Dīn's database will remain "blank" if we apply them directly to Shīrāz manuscripts. The solution, to my mind, lies in the creation of at least 3 levels of generalisation, which will be possible to choose from the database Menu.

1st level. General information about military equipment:

(a) type of warrior (cavalrymen/infantrymen, etc.);
(b) offensive arms (bow, spear, sword, mace, etc.);
(c) defensive arms:

— general (armoured/unarmoured; with/without helmet; carrying shield/without shield, etc.);
— type of armour (lamellar, coat-of-plates, mail, etc.);
— type of shield (small or large), and the like.

It will be possible to compare this information on all levels of database connections, as the difference in style or material used by various arts cannot seriously affect these *general* characteristics. On the other hand, this type of filtering will allow the acquisition of general statistics about the composition of the army depicted and the weaponry used in some particular period.

2nd level. More detailed description of military equipment, including particular types of arms and armour involved, e.g. the exact shape of the shield (kite-shaped or round, or oval; with or without umbone, etc.) or helmet (composite or one-piece, with or without nose-guard, spike, feather decoration, etc.).

This information can be compared on a "one miniature school" level, and in most cases on the level of the "miniatures of one historical period" as well. It gives a good basis for comparison of particular types of arms and armour used in the epoch. To some extent the comparison can be attempted on the level of miniatures of different periods, as the difference in ways of depicting military equipment is not overwhelming. In the latter case, however, some parts of the descriptions will not coincide, as some difference in the questionnaire will inevitably occur.

3rd level. Particular features of military equipment characteristic of miniatures from *one school of painting*, such as *Rashīdiyya*, for example.

This sort of information concerns the peculiarities of the period or the area depicted, e.g. types of armour decoration, construction of helmet or particular forms of face protection, etc. This data is more detailed, more specific and deals mostly with a "fashion" of the equipment used, not with its "essence". For instance, a type of helmet decoration, though quite interesting in itself, is not particularly important from a general military point of view, as it does not enhance the protective abilities of this piece of equipment. These details are quite important, however, for the studying of military and cultural cross-influences, as they indicate the migration of "fashions", types of weaponry in general and, in some cases, of military élite as well.

Besides, there are other problems that make it necessary to apply a high level of detail. First, it is not always clear what exactly the artist meant by some feature depicted (as in the case of the above Mongol-Mamlūk helmets), so it should be noted and entered into the database, with a view to understanding it later, while comparing it with other information. On the other hand, in some cases, especially when the armour is involved, we will inevitably have a section of "unclear" cases. Secondly, even in the case of some obvious details it is not always possible to decide whether it is important or not. Some small details of decoration, for instance, may turn to be of technical significance, such as the above "window" on the quiver, which in many other miniatures may look like merely a sort of ornamental decoration. Or alternatively, they might indicate some feature that can help identify the origins or dating of the equipment depicted. Consequently, it is safer to include more information than less, but to apply filters for general analysis.

It is worth mentioning that although the proposed example of a questionnaire was designed for *Rashīdiyya* miniatures, it also includes some general features which are not completely relevant to them (e.g. there are no face-protection depicted in these miniatures at all, but it is still mentioned among the "questions"). The reason behind it is an attempt to produce something more general, which could be used as a *basis* for further database development — in view of applying it to other similar materials such as the "Demotte" *Shāh-nāma* of the 1330s.

An important advantage of such a database is the possibility of searching through all levels — and subsequently of retrieving the required information. For example, if one is interested in sword development, one can look through all occurrences of swords in the works of art of some period — or throughout the whole period covered by the database. Consequently, one can retrieve the data needed — whether the percentage of swordsmen in the army of Īlkhāns "as depicted in works of art", or a list of drawings of swords used in the same period, even information concerning the shape of the blade or hilt. The question of the historical reliability of such statistics, as already mentioned, is another matter. The purpose of the database is merely to give an *easy access* to the material in question, and provide guidance, not to generate ultimate "answers".

Table

I. General information about the manuscript:	
1. Shelf mark of Ms.	Or. Ms. 20 (or Arab 20)
2. Library/Collection	Edinburgh University Library
3. Author	Rashīd al-Dīn
4. Title	*Jāmi' al-Tawārīkh* ("Compendium of Chronicles" or "World History")
5. Date	A.H. 706/A.D. 1306—07
6. Place	Tabrīz, Rashīd al-Dīn's scriptorium in Rab'i-Rashīdī
7. Style/Miniature school	Tabrīz School (*Rashīdiyya*)
8. Number of miniatures	70
9. Number of battle/ march scenes	23

II. The miniature (A – general information):			
1. Location of the miniature		Or. Ms. 20, fol. 19 R	
2. Artist (if known)		attributed by Race to the "Master of the Battle Scenes", though it is rather uncertain (besides, the very attempt to identify a single author in *Rashīdiyya* atelier seems to be basically irrelevant)	
3. Author of outline drawing		Aleksey Fedorovsky; edited by Alexander Matveev	
4. Subject of the miniature	a. Battle scene		
	b. Army on march	×	Alexander the Great (al-Iskandar) extends his realm into northern regions perpetually shrouded in fog
	c. Hunting scene		
	d. Court life		
	e. Others		

(B — Description)

			Total	**1**	**2**	**3**	**4**
5. Warriors & others	cavalrymen	light					
		heavily-armoured	**4**	×	×	×	×
		senior officer					
		"prince"	**1**	×			
	dismounted cavalrymen	light					
		heavily-armoured					
		senior officer					
		"prince"					
	elephant-rider	senior officer					
		"prince"					
	infantrymen	light					
		heavy					
	Bedouin						
	mahout (elephant-driver)						
	engineer						
	prisoner						

Continuation of the ***Table***

	court noblemen								
	"king"								
	civilian								
	elephant								
	manjanīq (mangonel, trebuchet)	"pulling" type							
		counterweight type							
	other								
	composition of opposite armies	1st army			**4**	×	×	×	×
		2nd army							
6. Armour	armoured				**4**	×	×	×	×
	unarmoured								
a. ***Shape***	**long**				**4**	×	×	×	×
		coat-like	with front opening	straight					
				volute-shaped					
				with clasps					
			with non-front opening	back opening	straight				?
					volute-shaped on the top half				
				sides opening					
				unclear	**3**	×	×	×	
			unclear		**1**				×
			(sewing line on the back)		**1**				×
		poncho-like with sides-openings							
		cuirass with side-openings and attached leg-pieces							
		others							
	short								
		with sleeves							
		without sleeves							
		others							
b. ***Sleeves***	**long**								
	middle				**4**	×	×	×	×
		leaf-shaped, mid-forearm long							
		rectangular/ trapezium, elbow long			**4**	×	×	×	×
		non-visible							
	short								
	hem decoration	"plumes" (Chinese type)			**1**	×			
		last strip covered by silk	curves						
			squares		**1**				×
			others						

Continuation of the ***Table***

c.: Type of armour				**4**	×	×	×	×
1.Lamellar	not covered by cloth			**2**	×			×
	mixed type:							
	composed of	1 covered/1 uncovered in turn						
	covered by silk/	2 covered/2 uncovered in turn		**2**		×	×	
	not covered strips	others						
	hem decoration	last strip covered by ornamented silk	curves	**1**	×			
			squares	**1**				×
			others					
		others						
2. Coat of plates								
3.Covered by cloth (coat of plates?)	monochrome	plain						
		with golden curves over the cloth						
	ornamented	type 1: leaves						
		type 2: leaves & flowers						
		type 3: curves						
		others						
	chequered-like structured material							
	with some rows of small circles (rivets?)	on the sleeves						
		on the waist						
		on the lap						
4. Leather coat								
	plain							
	decorated							
	others							
5. Made of leather strips								
	plain							
	decorated							
	others							
6. "Soft armour" (padded or quilted)								
	plain							
	decorated							
	others							
7.Unclear								
d. Armour-supporting shoulder-belts	buchle shape	square/ rectangular		**1**	×			
		oval						
		flower-shaped						
		others						
		without buchle (with rivets?)						
7. Garments	"tunic" (shirt-like long-sleeved undergarment)			**2+2**?	×	×?	×?	
	surcoat with lapel folded over the chest							
	ghalabiya							
	cloak							
	ankle-long skirt-like robe							

Continuation of the ***Table***

	kilt-like short skirt (*fūta*)							
	trousers							
	other							
8. Shoes	boots			**2+2**?	×	×?	×?	
	"slippers"							
	leg wrappings							
	bare-footed							
9. Helmet				**4**	×	×	×	×
	one-piece			**4**	×	×	×	×
		plain						
		with small round plates (rivets?)	around top	**1**			×	
			along rim	**1**		×		
			above pick					
			1 plate in the centre					
			3 plates in the centre					
			others					
		covered by silk (or painted?)	curves					
			others					
	composite							
		4 pieces						
		6 pieces						
		8 pieces						
		multi-pieces						
	leather							
	unclear							
Front-edge	peak (upturned front-edge)	decoration	plain					
			ornamented					
		location	above helmet rim					
			overlapping helmet rim	plain				
				with narrow rim				
	arches cut over eyes		without rim					
			narrow rim	**1**			×	
			volute-ended narrow rim					
			narrow rim with decorated band above it	**1**		×		
			broad rim with decorated band					
	straight rim		broad	plain				
				decorated				
				with dots (rivets?)	**1**	×		
			narrow					
			volute-ended narrow					
	leaves above the narrow rim			**1**				×
	reinforced/ decorated centre of the rim							
	others							
Top	spike-base	round						
		flower-shaped		**4**	×	×	×	×
		fleur-de-lis shaped						

Continuation of the ***Table***

		single-voluted						
		double-voluted						
		without base						
	spike	curved backwards	in the centre	**4**	×	×	×	×
			on the front					
		upright						
		plumes						
	without spike							
	sides-plumes (Chinese type)			**1**	×			
10. Face-protection	protected							
	unprotected			**4**	×	×	×	×
	mask							
	half-mask							
	half-mask with mail aventail							
	nose-guard							
	others							
11. "Aventail"				**1**	×			
	mail							
	lamellar							
	plates							
	laminar			**1?**	?			
	leather							
	cloth							
	covered by cloth (silk)	plain						
		ornamented	curves					
			leaves					
	brim	single-brimmed						
		double-brimmed						
	shape	open, semi-circle	open on the front	**1**	×			
			open on the back(?)					
		closed, circle	short and tight					
			long and broad					
12. Ear-guards				**1**				×
	rectangle/ trapezium	one-piece						
		lamellar						
		plates						
		leather						
		covered by cloth/	plain	**1**				×
			curves					
			leaves/ flowers					
			others					
	round	plain leather						
		leather with small round metal plates						
	others							
	non-visible			**2**		×	×	

Continuation of the ***Table***

13. Gorget				**4**	×	×	×	×
	material	mail						
		lamellar						
		plates						
		leather						
		cloth						
		covered		**4**	×	×	×	×
		by	plain	**2**			×	×
		cloth	plain with a row of small round plates or rivets	**2**	×	×		
		(silk)	curves					
			leaves/ flowers					
		unclear						
	shape	circle		**2+1?**	×?	×		×
		trapezium-like (i.e. convention for semi-circle)		**1**			×	
14. Head dress	"Seljuk" crown							
	'imāma							
	cap	Mongol cap with turned-up brim (type A)						
		double-brimmed (type B)						
		fur-brimmed (type D)						
		dome-like cap (type C, "beehive" type)						
		fur-brimmed with feathers (type F)						
		flat-topped hat, Chinese type (type E)						
		others						
	head kerchief							
	bare-headed							
15. Shield				**1+2?**		?	?	×
	visible side	outer		**1**				×
		inner						
	round	umbon	with umbon					
			without umbon					
			not visible					
		decoration	plain					
			ornamented					
	kite-shaped			**1**				×
	triangular							
	others							
	with a heraldic emblem	"heraldic lion"		**1**				×
		others						
	location	in hand						
		attached to the back		**1**				×
	non-visible			**2?**		?	?	
16. Belt	with belt			**1**	×			
	without belt			**2**			×	×
	not visible			**1**		×		
	leather	very broad		**1**				×

Continuation of the ***Table***

		broad							
		narrow							
		with boucle							
	twisted cloth								
	others								
17. **Straps**	straps pending from belt	type of attachment to the belt	riveted						
			forked						
		one (for bow-case)							
		pair (for quiver)	both – plain leather straps						
			2nd – leather strap with attached rope						
	belt extension strap								
18. **Sword**					**4**	×	×	×	×
	straight sword								
	straight sword with upturned handle								
	sabre	slightly curved			**4**	×	×	×	×
		curved							
	location	in hand			**3**		×	×	×
		in scabbard			**1**	×			
19. **Scabbard**	rectangular-ended				**2+2?**	×	?	?	×
	semi-circle ended								
	others								
20. **Mace**					**1**	×			
	shape	trapezium-like			**1**	×			
		rectangular							
		round							
		oval							
		bull-headed							
		others							
	pin	with a pin			**1**	×			
		without a pin							
	edges	6 edges							
		8 edges			**1**	×			
	non-visible								
21. **Spear**									
	length	long (4 m)							
		middle (3—3,5 m)							
		short (2—2,5 m)							
	spear-head	broad	leaf-shaped						
			oval-like						
			others						
		small (armour-piercing)	oval-like/	plain					
				with 1 "band"					
				with 2 "bands"					
			triangle-like						
			others						

Continuation of the ***Table***

		non-visible							
		with a "loop"							
	with an elephant-guiding hook								
	with a tassel in the middle								
	location	in hand							
		hung (upright)							
		dropped (on the ground)							
22. Standard/ banner									
	rectangle banner + triangle pennant								
	rectangle banner + 3 triangle pennants								
	plain								
	with a heraldic symbol	"heraldic lion"							
		others							
	with an inscription								
	on the shaft with end-tassel								
	on the spear								
	not visible								
23. Bow	with bow					**1**+2?		?	?	×
	without bow					**1**	×			
	not clear					**2**		×	×	
	bow	in hand								
		in bow-case								
		in bow-case, but not visible				**1**				×
24. Bow-case	plain									
	ornamented	golden flower with leaves								
		others								
25. Quiver										
	type	closed	long tube-like	plain (vertical lines only)						
				with short perpendicular lines		**1**	×			
				ornamented						
				with a loop for pending	plain					
					ornamented					
			others							
			open (shooting position)							
			closed (transporting position)			**1**	×			
		open	plain							
			decorated							
			with a "window"							
			with a furry tail							
			non-visible							
	number of arrows in quiver		4							
			5							
			6							
			7							

Continuation of the ***Table***

		unclear (for closed type)		**1**	×			
Arrow	arrow in hand	shooting						
		carrying						
	arrow-head	broad						
		small armour-piercing						
26. Saddle	pommel	plain		**3**	×		×	×
		ornamented						
		one-piece		**2**	×			×
		composite	2 sectors	**1**			×	
			3 sectors					
	cantle	plain						
		ornamented						
	back-turned saddle			**1**				×
27. Saddle cloth	plain	with plain fringe						
		with round plates on the fringe		**2**	×			×
	ornamented	with ornamented fringe						
		curves						
		leaves						
		waves						
28. Saddle flap	plain	with plain fringe		**2**	×			×
		with round plates on the fringe						
	ornamented	curves						
		leaves						
29. Reins	in hand			**3** +1?	×	?	×	×
	dropped							
	not visible			**1**		×		
30. Horse-harness	leather strips	plain		**3**		×	×	× *
		decorated with small round plates		**1**	×			
	tassels	on the front		**1**	×			
		pendant under the neck						
		on the back	on the top	**1**	×			
			on the sides					
31. Others	(pendant ribbons attached to the warrior's neck or back)			**1**				×

* With several plates on the back straps.

* * *

The database will encompass 2 major sections linked together: database of scanned images and textual database, the latter mostly in the form of tables (see *Scheme* — the "General scheme of the Database project").

I. Scanned images.

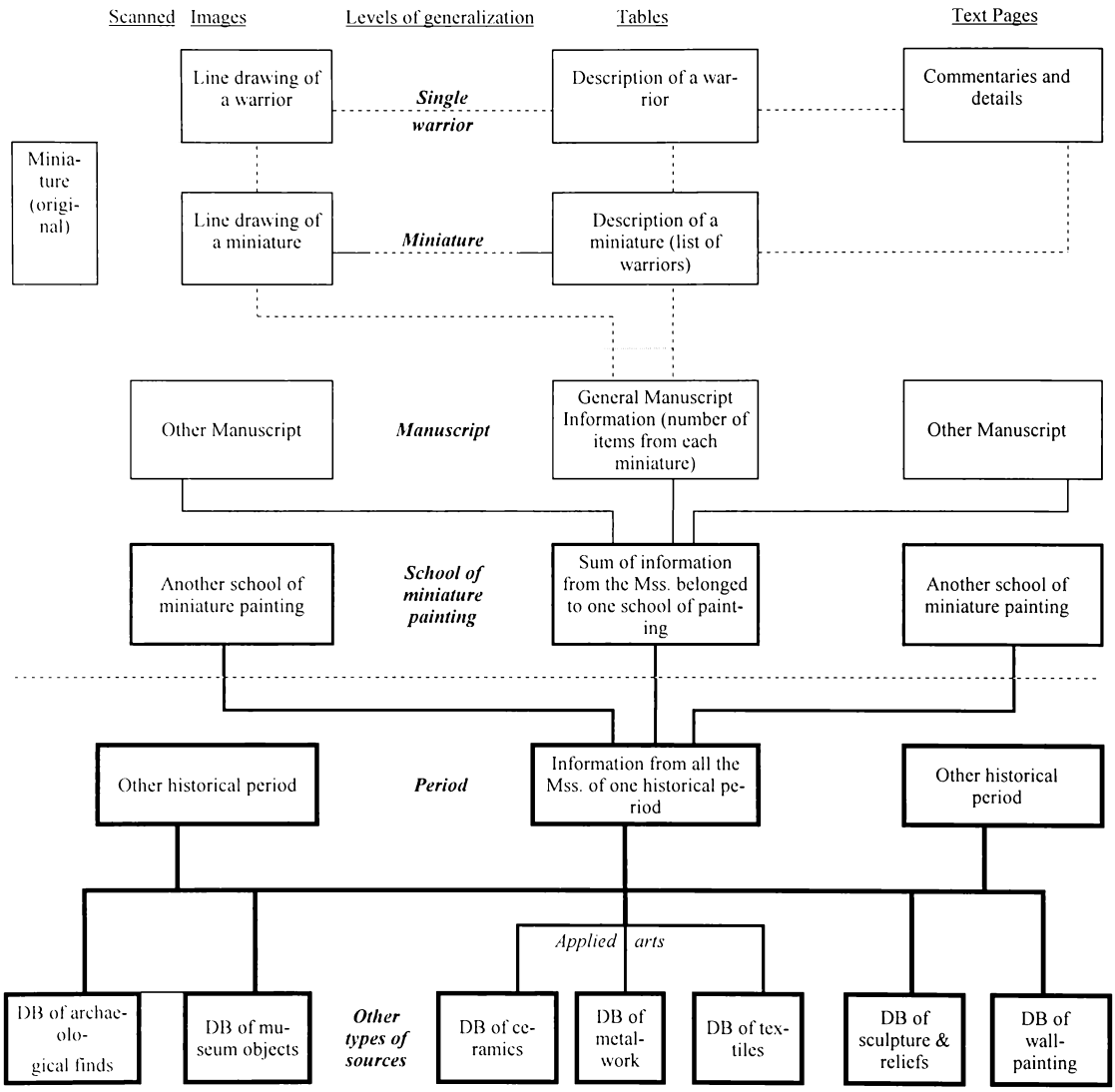
The basis of the whole database is an image of a warrior depicted in a miniature. It takes a form of a scanned line drawing made on the basis of miniature, cross-linked to the line drawing of the whole miniature.

A scanned image of the miniature itself — whether coloured or black-and-white — is, of course, quite helpful, but it is seldom available in reality. Thus, if possible, it will be provided, and gradually more will be adding when such material becomes available. On the other hand, linear drawings can be even more helpful from the point of view of the history of weaponry, as they represent an analysis (a "deciphering") of the "raw material" provided by the image [29]. Besides, they are much easier to deal with on the computer, being more legible than images of the miniatures themselves, especially on the screen.

One should not forget, however, that these line drawings are a sort of "translation" of miniature material, thus — as all translations! — being only one of the possible interpretations, and, by definition, they can not be 100 % reliable. Thus, in some cases the original *must* be consulted,

Scheme

General scheme of the Database project



which means that theoretically all the originals, in due course, should be included in the database [30]. It is also vital to indicate the name of the author/maker of such a drawing-interpretation, exactly as in the case of a literary translation.

The difference and similarities of such "interpretations" can be seen on *fig. 9, a, b* where different renderings of the same miniature (see *fig. 9, c*) are represented. Despite all the differences, however, the interpretations are quite close to each other — and to the original — thus showing a basic possibility of their use for the proposed database. On the other hand, the difference in authors' approaches and interpretation can also be noted. Besides, one can see the difference of the amount of information provided by different variants of reproducing basic material: outline — colour reproduction. (Note that all the drawings and black-and-white pictures were in computer form (as scanned images) being taken from the computer database, and their quality is almost as good as if reproduced from the original drawings or photographs.)

II. Textual database.

The textual part of the database consists of several levels of tables and some textual descriptions associated with them. All these tables will be cross-linked and connected to the database of scanned images.

The basic unit is the description of a single warrior in the form of a table connected to the scanned image of this warrior, and also to the full miniature description, and to the

Fig. 9, a

Fig. 9, b

Fig. 9, c

whole miniature image. Besides, relevant "cells" of the table will also be linked to some text-pages (like ordinary footnotes) with necessary comments and verbal descriptions of some particular features. For example, in the case of describing the helmet of the 3rd warrior to the left on fol. 114b of Rashīd al-Dīn's manuscript (see *fig. 3*) some additional information about its colour and that it was initially erased by the artist before being re-painted, will be enclosed. All this information, though not particularly significant from a general historical point of view, must be noted, as it is important for the miniature painting itself.

* * *

The last remark concerns the question of accessibility of such a database. On the one hand, it can be stored and distributed in the CD-ROM form. On the other hand, as the database is planned to be based on principles of a hypertext edition, it will be easier to connect it, in due course, to the World Web, thus making it also available on-line.

Notes

1. See, e.g., Hazine 841, fol. 19b from *Warqa wa Gulshāh* manuscript, showing Gulshāh escaping from the citadel of Rabī'. The rabbit depicted in the miniature indicates the good luck of the heroine — A. Daneshvari, *Animal Symbolism in Warqa wa Gulshah* (Oxford, 1986), p. 17, fig. 10.

2. See, e.g., *Sasanian Silver: Late Antique and Early Medieval Arts of Luxury from Iran*: August-September 1967, the University of Michigan Museum of Art. Text prepared by Oleg Grabar (Ann Arbor, 1967), pls. 1 — 10.

3. Or. Ms. 20, fol. 122b (lower) — pl. 52 in the Rice-Gray edition; see also D. T. Rice, *The Illustrations to the "World History" by Rashid al-Din*, ed. Basil Gray (Edinburgh, 1976).

4. See, e.g., *Arts of Persia*, ed. R. W. Ferrier (New Haven, London, 1989), pls. 8—9, where the knights wear clearly carved chain-mail shirts.

5. *The Bayeux Tapestry: the Complete Tapestry in Colour*, with introduction, description and commentary by David M. Wilson (London, 1985).

6. See, e.g., Ms. Dorn 329 in the National Library of Russia: A. T. Adamova, L. T. Guzalyan, *Miniatiury rukopisi poėmy "Shah-name" 1333 goda* (The Miniatures of the Poem *Shāh-nāma* of 1333) (Leningrad, 1985), pl. 13 (fol. 77b), pl. 15 (fol. 97a), pl. 18 (fol. 123b), pl. 21 (fol. 152a), pl. 23 (fol. 152b, upper), pl. 24 (fol. 152b, lower), pl. 25 (fol. 153a, upper), pl. 26 (fol. 153a, lower), pl. 27 (fol. 153b, upper), pl. 29 (fol. 154a, upper), pl. 31 (fol. 154b), pl. 42 (fol. 274a), pl. 50 (fol. 363b).

7. W. B. Thordeman, *The Armour from the Battle of Wisby: 1361* (Stockholm, 1939—40), i, pp. 288—9, figs. 291—2 (the figures are based on line drawings made by Prof. Arendt in his "Zur Geschichte des Lamellenharnischs im XII – XIV Jahrhundert in Russland", *Zeitschrift für Historische Waffen- und Kostümkunde*, NF 5 (1936), fig. 2, p. 149). See also A. N. Kirpichnikov, *Drevnerusskoe oruzhie* (Old Russian Arms), fasc. 3 (Leningrad, 1971), fig. 22. — Arkheologiia SSSR: Svod arkheologicheskikh istochnikov, vypusk E1-36). Cf. *fig. 1, k* of the current paper.

8. Or. Ms. 20, fol. 114b (Rice-Gray, pl. 43). Cf. *fig. 3* of the current paper. Dr. M. Gorelik in his "Oriental armour of the Near and Middle East from the 8th to the 15th centuries as shown in works of art", *Islamic Arms and Armour*, pp. 58—9, fig. 122, however, indicates in error that this miniature belonged to the 1314 Royal Asiatic Society manuscript of Rashīd al-Dīn, now in Nasser Khalili's collection. This manuscript was recently published by The Nour Foundation in its series *Nasser D. Khalili's Collection of Islamic Art*, vol. 27, see Sheila S. Blair, *Rashid al-Din's Illustrated History of the World* (London, 1995). One can only dream that a much more important Edinburgh manuscript of Rashīd al-Dīn would appear some time in such a wonderful edition.

9. Gorelik, *op. cit.*, p. 38.

10. See Or. Ms. 20, fol. 115b, fol. 116b, fol. 126b, etc.

11. W. Watson, *The Arts of China to AD 900* (Yale University Press, 1995), p. 197, fig. 315.

12. See, e.g., Ms. Or. 20 fol. 124b (cf. *fig. 5* of the current paper), which is a rare example when the quiver is open and even the arrows can be seen inside it. However, the picture is so schematic in this respect that one can hardly realise what it was meant to be.

13. "Mongol Invasion Scroll", Tokyo National Museum. See, e.g., publication of this fragment in B. Smith, *Japan. History in Art* (London, 1971), pp. 106—7. Note that this particular piece of the scroll was not represented in the quite often cited Philips' book about Mongol empire, see his *The Mongols* (London, 1969).

14. Metropolitan Museum of Art, Gift of the Dillon Fund, 1973 (1973.120.3). This is a famous scroll published in various books, see, e.g., B. Smith, Wan-go Weng, *China. A History in Art*, rev. ed. (New York, 1979), pp. 176—7.

15. M. V. Gorelik, "Mongolo-tatarskoe oboronitel'noe vooruzhenie vtoroĭ poloviny XIV — nachala XV vv." ("Mongol-Tatar defensive arms in the second half of the fourteenth — early fifteenth centuries"), *Kulikovskaia bitva v istorii i kul'ture nasheĭ Rodiny* (Moscow, 1983), p. 253, pl. 4.

16. Or. Ms. 20, fol. 123b, 1st and 4th cavalrymen on the left; 5th and 6th cavalrymen on the right (cf. *fig. 4* of the current paper); fol. 127b, last cavalryman on the right, also infantryman; possibly, fol. 19a, 1st cavalryman (cf. *fig. 9, c* of the current paper).

17. No. 6130 (on the exposition). From the arsenal of the St. Irène Church, Topkapı.

18. Esp. his *Early Medieval Islamic Arms and Armour* (Madrid, 1976); *Arms and Armour of the Crusading Era, 1050-1350* (New York, 1988), 2 vols.; *Medieval Warfare Source Book* (London, 1995—96), 2 vols.; "Arms of the Umayyad era: military technology in a time of Change", *War and Society in the Eastern Mediterranean, 7th-15th centuries*, ed. Yaacov Lev (Leiden, 1997), pp. 9—100.

19. J. France, "Technology and success of the first Crusade", *War and Society in the Eastern Mediterranean*, pp. 163—76.

20. See, e.g., British Museum Add. 7170; Vat. Syr. 559, fol. 135, Biblioteca Apostolica, Vatican.

21. J. M. Smith, "'Ayn Jalut: Mamluk success or Mongol failure?", *HJAS*, 44/2 (1984), pp. 319—20.

22. *Ibid.*, p. 320, n. 36. E. D. Philips, *The Mongols* (London, 1969).

23. D. Morgan, *The Mongols* (Oxford, 1986), p. 207.

24. Though it is virtually unavailable in Calcutta, one still can see black-and-white photographs of its miniatures in the Warburg Institute, University of London.

25. The depiction of the warriors — with a notable absence of typical one-piece arm-guards (*bazuband*) invented in the last quarter of the fourteenth century — differs from ordinary Tīmūrid manuscripts. Nevertheless, a serious influence of a later tradition can be seen — for instance, from the comparison of the scene of the siege of Baghdad with its prototype, fortunately, known to us in this particular case, see Album Diez A, Staatsbibliothek Preussischer Kulturbesitz, Berlin, fol. 70.

26. Album Diez A, Staatsbibliothek Preussischer Kulturbesitz, Berlin.

27. This manuscript of Rashīd al-Dīn was copied in 717/1317, but the miniatures were added much later.

28. It happened far too often that the miniatures were added some time after the manuscript itself was copied — or even much later, as in the above case with 707/1317 Rashīd al-Dīn's manuscript from Istanbul. On the other hand, the later miniatures can be copied from an older manuscript, thus making the question of dating them — and particularly the realities represented — even more complicated.

29. See, e.g., the line drawing from a Shīrāz school miniature (*fig. 1, c*). The original is slightly damaged and basically not so easy to "read".

30. However, one has to be realistic: any reproduction of the miniatures themselves is not an easy problem to solve, because of both a copyrights question and high expenses of their reproducing. It means that in reality the full-colour scanned images will be seldom available for including into the database, at least in the near future.

Illustrations

Fig. 1. Examples of rendering the chain mail.

a — A warrior from the Sasanian relief at Fīrūzābād — after *Arts of Persia*, ed. R. W. Ferrier (New Haven—London, 1989), pl. 8; ***b*** — An allegorical figure of Scorpio from a medallion on an inlaid brass writing box, Mosul, *ca.* A.D. 1200—50 (Franks Bequest, British Museum); ***c*** — A warrior from a miniature in *Shāh-nāma* (Ms. Dorn-329 of the State Public Library, St. Petersburg, fol. 153 a lower — line drawing by Aleksey Fedorovsky; ***d*** — A typical Norman cavalryman from the Bayeux Tapestry; ***e*** — A cavalryman from a miniature in the "Beatus of Liebana" manuscript, Spain, *ca.* 1220 (Pierpoint Morgan Library, New York, Ms. 429); ***f*** — Warriors of Nabuchadnezzar from a late twelfth-century miniature from William of Auxerre's "Commentaries" on the "Lamentations" of Jeremiah; Austria, possibly copied at Seitenstetten (Walters Art Gallery, Ms. W. 30, Baltimore). It is a good example showing different ways of rendering chain mail on one miniature (dots, parallel rows of short lines, and circles); ***g*** — A knight from a miniature in the "Westminster Psalter", *ca.* 1250 (British Library, Royal MS 2A XXII, fol. 220): one of the most typical Western medieval conventions for rendering chain mail; ***h*** — Some warriors from the miniature "Holofernes before Nebuchadnezzar" ("Histoire Universelle", London, British Museum, Add. 15268, fol. 179 b): another typical variant of rendering chain-mail in West European miniatures; ***i*** — Some warriors from the miniature "The siege and capture of Antioch", from "The History" of William of Tyre (Bibliothèque Nationale, Paris, fr. 9084, fol. 53 a); ***j*** — Some warriors from the miniature "Saul destroys Nahash and the Ammonites", Maciejowski Bible, France, *ca.* 1240—50 (The Pierpont Morgan Library, New York, M. 638, fol. 23 b): an attempt of actual "portraying" the mail texture; ***k*** — Outline of two inlay scenes from the early thirteenth-century gates of the Suzdal cathedral, Russia (drawings by Prof. W. Arendt, — from W. Bengt Thordeman, *The Armour from the Battle of Wisby: 1361* (Stockholm, 1939—40), i, p. 290, figs. 291—292).

Fig. 2. A line drawing of a warrior wearing a coat (perhaps, a sort of coat-of-plates) covered by patterned cloth (silk?) — from a miniature of Rashīd al-Dīn's "Compendium of Chronicles", Edinburgh University Library, Or. Ms. 20, fol. 114 b (from M. Gorelik, "Oriental armour of the Near and Middle East from the 8th to the 15th centuries as shown in works of art", *Islamic Arms and Armour*, pp. 58—9, fig. 122). See pl. VII for the original.

Fig. 3. Rashīd al-Dīn's "Compendium of Chronicles", Edinburgh University Library, Ms. Or. 20, fol. 114 b.

Fig. 4. Rashīd al-Dīn's "Compendium of Chronicles", Edinburgh University Library, Or. Ms. 20, fol. 123 b.

Fig. 5. Rashīd al-Dīn's "Compendium of Chronicles", Edinburgh University Library, Ms. Or. 20, fol. 124 b.

Fig. 6. Rashīd al-Dīn's "Compendium of Chronicles", Edinburgh University Library, Or. Ms. 20, fol. 15 b.

Fig. 7. Some examples of rendering the open-type quiver.

a — After a later fifteenth-century brush drawing from Tabrīz (?); ink on paper, 22.4 × 28.3 cm; Album Diez A, Staatsbibliothek Preussischer Kulturbesitz, Berlin, fol. 72 Seite 13 — see, e.g., publication in J. M. Rogers, "Siyah Qalam", *Persian Masters: 5 Centuries of Painting*, ed. Sheila R. Canby (Bombay, 1990), p. 22, pl. 2; ***b*** — S. Herberschtein, *Moscoviter wunderbare Historien* (Basle, 1567), p. 173 (a fragment from the engraving "Arms and armour of Muscovites").

Fig. 8. Helmet of the Sultan Barsbāy, Louvre, No. 6130 (drawing by Alexey Fedorovsky).

Fig. 9. Outlines of cavalrymen from a miniature in Rashīd al-Dīn's "Compendium of Chronicles" (Edinburgh University Library, Or. Ms. 20, fol. 19 a).

a — An outline of the 4th cavalryman made by David Talbot Rice (from David T. Rice, *The Illustrations to the "World History" by Rashīd al-Dīn*, ed. Basil Gray (Edinburgh, 1976), p. 14, fig. 8); ***b*** — An outline of the 4th cavalryman made by David Nicolle, see *Arms and Armour of the Crusading Era, 1050—1350* (New York, 1988), i, p. 708, fig. 386 AJ); ***c*** — An outline of the cavalrymen made for the database (by Aleksey Fedorofsky, edited by Alexander Matveev) *.

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* Note, that the 2nd variant is being reproduced after the original drawing provided by the author, as its reproduction in the above mentioned paper edition is too small to be used for our purposes. An attempt to convert it — by scanning — into a computer form appropriate for the database led to disappearing of all the tiny details, because the resolution of the scanner — and also the screen — is limited, being lower than that of a good quality paper edition. It means that the outline drawings made in view of entering them into a computer database should not possess too small details — especially, too fine lines with a small space between them. Two parallel web-like lines with a hairbreadth gap between them will inevitably be stuck together by scanner, though they may come out in a paper edition. These limitations, obviously, should be taken into account when working on a computer database. For a drawing which size is some half of a standard A4 page, however, this problem is normally non-existent, as the image is already large enough to be scanned properly.

Otherwise, the differences between those examples are quite limited, which shows a basic possibility to rely on them in many cases. The only one important thing should be mentioned here. On the 3rd drawing the lamellar structure of the armour is slightly "stressed" — in comparison to other two variants. There are some reasons behind this decision. The upper level of the pigment on the actual miniature is slightly damaged, and the original "ladder-like" structure cannot be seen now on the whole surface of the armour (how it looks now can be seen best on the 1st drawing). Nevertheless, one can trace this structure when looking close at the original, as the white pigment background of the short vertical lines shown in the 3rd drawing is still preserved (i.e. those vertical lines are still legible, but they are white now). Unfortunately, white colour lines practically disappear on the reproductions of this miniature, and only thin black horizontal lines remain clear.

Though the last judge, obviously, is an actual manuscript page, it is still possible to use such outlines as its substitution, at least for general purposes.