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The Etymology of Some Classical Persian Words

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In this paper I would like to discuss a few interesting words which occur in the classical Persian texts.[1] Neither of these words are attested in the Persian reputable lexicons.

1. ***āsurda*** (آسرده) "plastered": ***qidr^{un} muwaqqahat^{un}***: ***dēg-ē āsurda*** (*Mohaḍḍab-ol-'asmā'* 336/8) "qidrun^{un} muwaqqahat^{un}: a plastered pot". ***Āsurda*** may be derived from OIr. *ā-sṛtaka- from base sṛ-/sar- "to cover, to conceal" < IE. 4. *k̑el- "bergen, verhüllen" (*IEW* 553). Cf. Skt. śárma- "Schirm, Schutzdach, Decke, usw." (*KEWA* III 310) Oss. (ir.): säryn (särdyn) (dig.): isärun (isärdun) "to rub, to plaster" (*IEO* III 81, 89f).

2. ***rafna*** (رفنه) "old, worn out": ***ō milk na-dārad juz gilīm-hā-yē x^{v}ad ka rafna ast*** (*Maqāmāt-e Ḥarīrī* 287/6) "He hasn't any possessions except his

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1. Abbreviations of the Persian Texts:
'Ajā'eb-ol-maxlūqāt: *'Ajā'eb-ol-maxlūqāt wa gharā'eb-ol-maojūdāt*, M. Sotūde, ed., Tehran 1345 A.H.; *Maqāmāt-e Ḥarīrī* (Persian trans.), A. Ravāqī, ed., Tehran, 1365 A.H.; *Maṣāder-ol-logha*: *Maṣāder-ol-logha*, A. Jowainī, ed., Tehran, 1377 A.H.; *Mohaḍḍab-ol-'asmā'*: *Mohaḍḍab-ol-'asmā' fī morattab-el-ḥorūf-e wa-l-'ašyā'*, Vol. I, M.H. Mostafawī, ed., Tehran, 1364 A.H; *Molaxxaṣ-ol-loghāt*: *Molaxxaṣ-ol-loghāt*, M. Dabīr-sīyāqī and Gh. Yūsofī, eds., Tehran, 1362 A.H.; *Tark-ol-'eṭnāb*: *Tark-ol-'eṭnāb fī šarḥ-e-šše hāb*, M. Šīrwānī, ed., Tehran, 1343 A.H.

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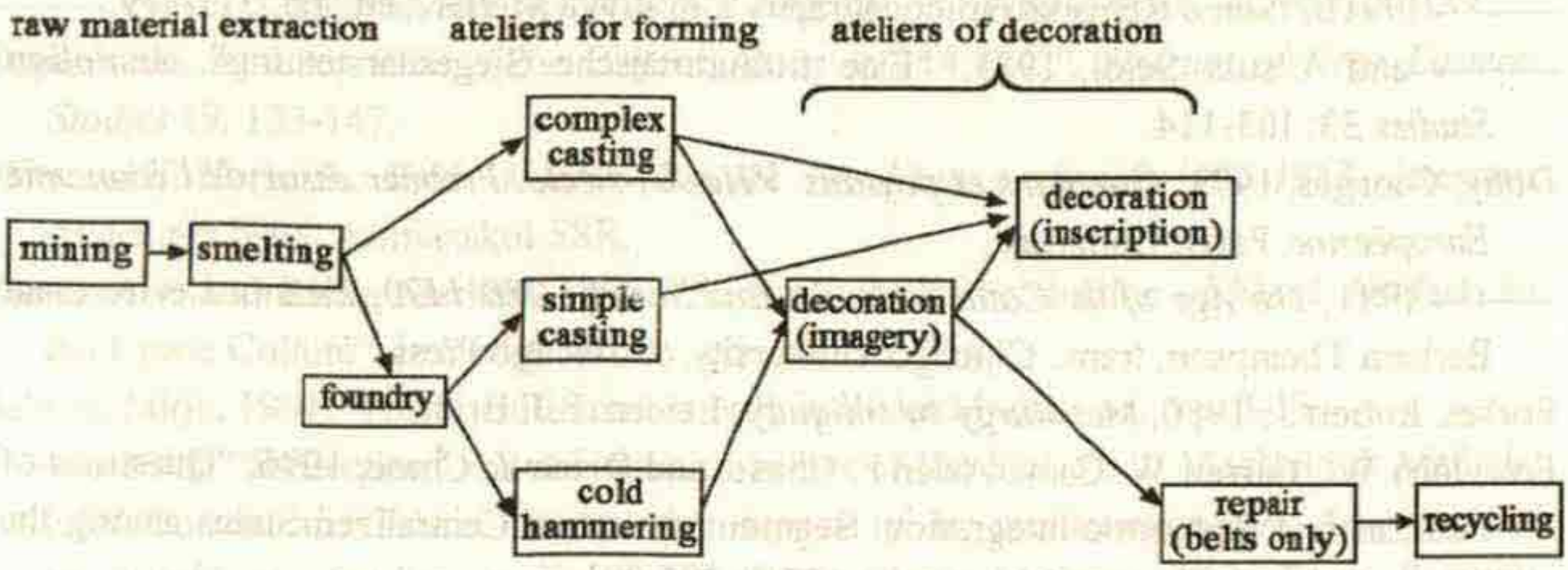

Fig. 7. Different Kinds of bronze working ateliers in Urartu

their production was not driven by royal demand, even though they may have been made in ateliers otherwise attached to the court.

How can different workshops be recognized in archaeological excavations? Since any metal was a scarce and expensive raw material, the rate of recycling cannot be overestimated. I suspect that many workshops are archaeologically visible only by the presence of tools and installations that are not made out of metal. Anvils, hammers and the like are not likely to be found. But furnaces and broken molds could be preserved. Also, bits of bitumen used for embossing could be identified in trash deposits. Such finds can only be expected in major Urartian settlements and fortresses. Village working of bronze, mainly restricted to the production of votive plaques, does not need enough tools or raw materials to make a workshop of this kind archaeologically identifiable. Here, the only indicator of production are the objects themselves.

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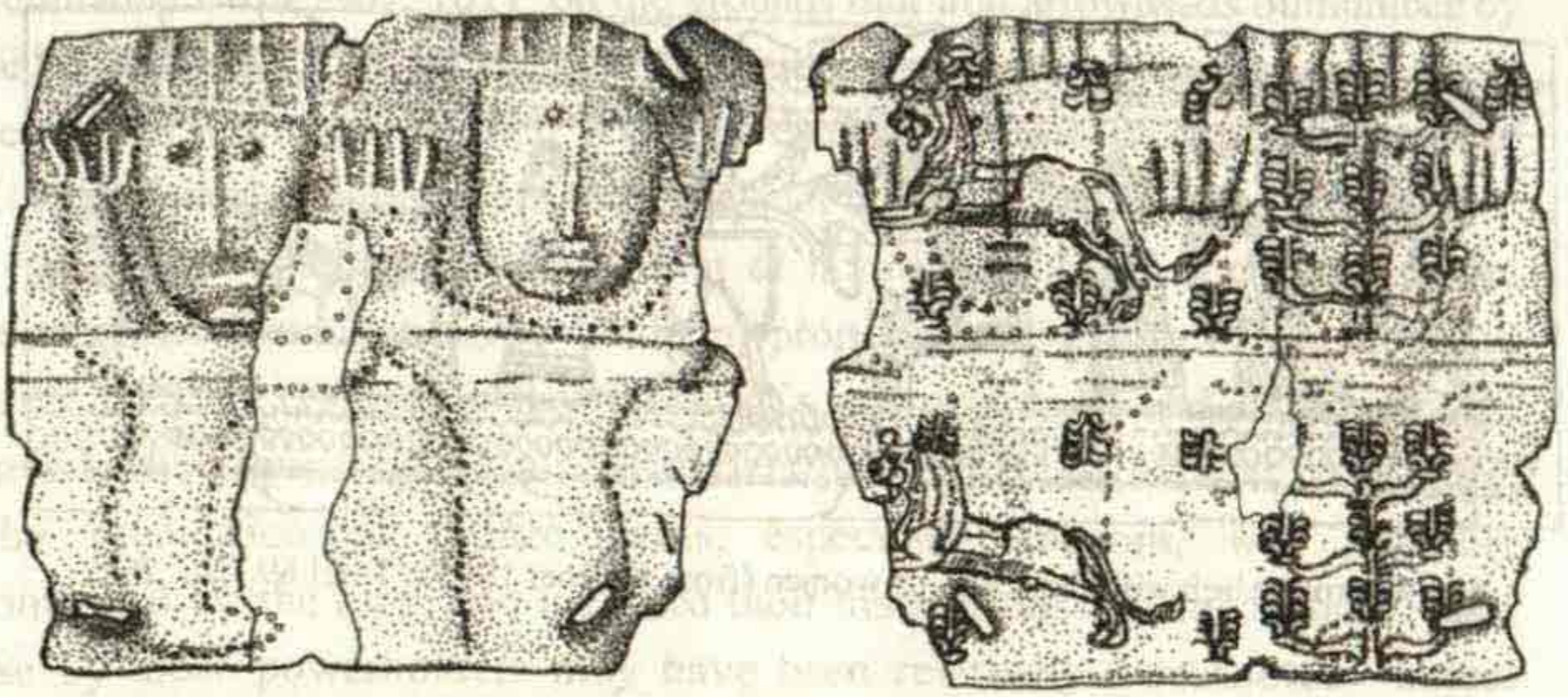

Fig. 6. Bronze belt turned into a votive plaque; Left = Votive decoration; Right = Remains of old belt decoration, visible on the back of the plaque (from Kellner 1991a: Abb. 13)

Conclusion

In this reconstruction of the organization of Urartian bronzeworking, I have tried to show that the organization of bronze production in Urartu was quite complex. Apart from mining and smelting sites, there seem to have been a number of different kinds of "forming ateliers" as well as two kinds of ateliers occupied with the decoration of bronze items. All of these ateliers were, as far as we can know, under royal control (Fig. 7). It seems that this production in Urartu was driven to a large extent by the needs of the political system. As stated at the beginning, the king had specific interests to assure the loyalty of a class of local powerholders or "vassals". One of the means to achieve such control was the distribution of bronze weaponry and other items to loyal local powerholders. The value of such a distribution by the royal court was greatly increased by the religious connotations of bronze weaponry.[10] However, those ateliers which worked with relatively simple tools, i.e. those using cold hammering as the principal technology, also produced items for another clientele than the court and elite. Repair and recycling patterns of bronze belts as well as their decoration suggest that

10. It is important to note that the weapons itemized in Sargon II's booty list stem almost entirely from the temple of Khaldi, not the local palace. Furthermore, property inscriptions which invariably mention a king, not any other functionary, should only be taken as an indication for *nominal*, not *actual* property.

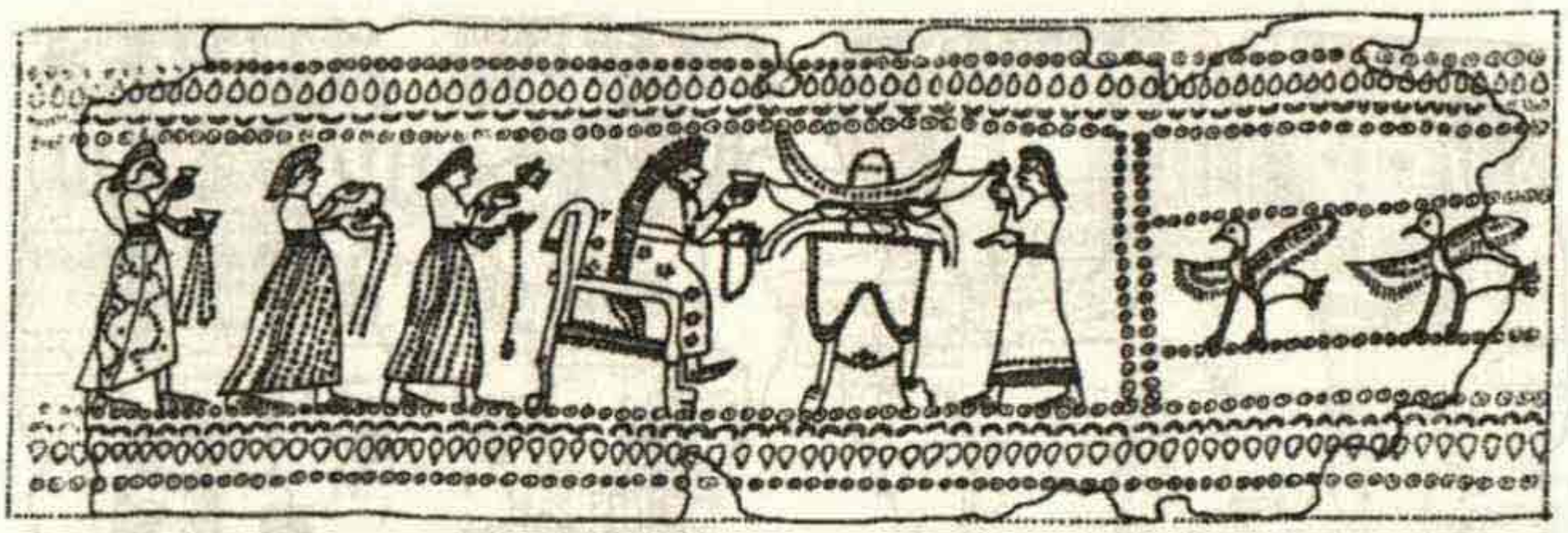

Fig. 4. Bronze belt with depiction of women (from Kellner 1991a: Tafel 69, No. 262)

Fig. 5. Piece of a belt with fantastic beings (from Kellner 1991a: Tafel 13, No. 51)

The link between belts and votives as well as the difference in decoration of both these categories compared to all others implies that this was a separate branch in the production of metal in Urartu. It could be that the preforms of belts were made in the ateliers specializing in cold-hammered objects. Superfluous bands of sheet bronze were turned into belts in a process that was outside of the king's control. This would explain why it is belts which were then turned into votive plaques used in "folk religion" (as opposed to the state religion with the god Khaldi). In this reconstruction, one and the same cold-hammering atelier would be partly attached to a royal court and partly independent, working for local demand.

Lehmann-Haupt 1907: 101)[9] on the grounds that iron arrowheads outnumber by far bronze ones. This fits the idea that in the Urartian state, warfare was closely tied to the main god, Khaldi. Weapons could have been an important asset of Khaldi's temples, and some of them may not have been destined for use at all.

Weapons with simple decoration or none at all were, according to the inscriptions found on some of them, property of the king. This seems to contradict my contention that the king's power was limited. However, we have to distinguish between control over bronze *production* and bronze *use*. The production of bronze items, especially weapons, was probably controlled by the king, and included their inscriptions and decoration. Their use by local powerholders may have been relatively unrestricted – unless they were turned against the king himself.

This account of the organization of Urartian bronze working would be incomplete without the mention of two further items, belts and votive plaques. Belts consisted of broad bands of sheet bronze and were produced in a cold hammering technique. The decoration of belts deviates in many cases from other objects: they contain depictions of women, fantastic animals, monsters, frontal views of fortresses, etc. (Figs. 4 and 5; see Kellner 1991a). These items differ from other bronze objects in two further respects. First, repairs occur much more often on belts, especially at the edges, where patches were riveted. Second, belts which could no longer be repaired were not necessarily remelt but cut in pieces. Some were used without further modification as votive plaques; for others, the belt decoration was hammered flat and a new decoration was produced (Fig. 6). The Giyimli hoard of bronze votives contained some of these recycled belts (Kellner 1991a: 27). Votive plaque decorations differ clearly from most other kinds; they are simpler, human faces are often shown frontally and not in profile, and the number of different punches necessary to produce the imagery was low. An interesting link to the belts is the frequent depiction of scenes with women. From the few findspots known, it appears that the distribution of votive plaques was concentrated in rural areas. All of this seems to imply that these objects were made in a few separate ateliers next to sanctuaries, and that the producers used scrap bronze as raw material (see Kellner 1976: 54-56).

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9. However, at Karmir Blur, bronze arrows were also found stuck in the outside and inner walls of the building, testimonials to the attack responsible for the destruction of the fortress (Piotrovskij 1955: 40-41).

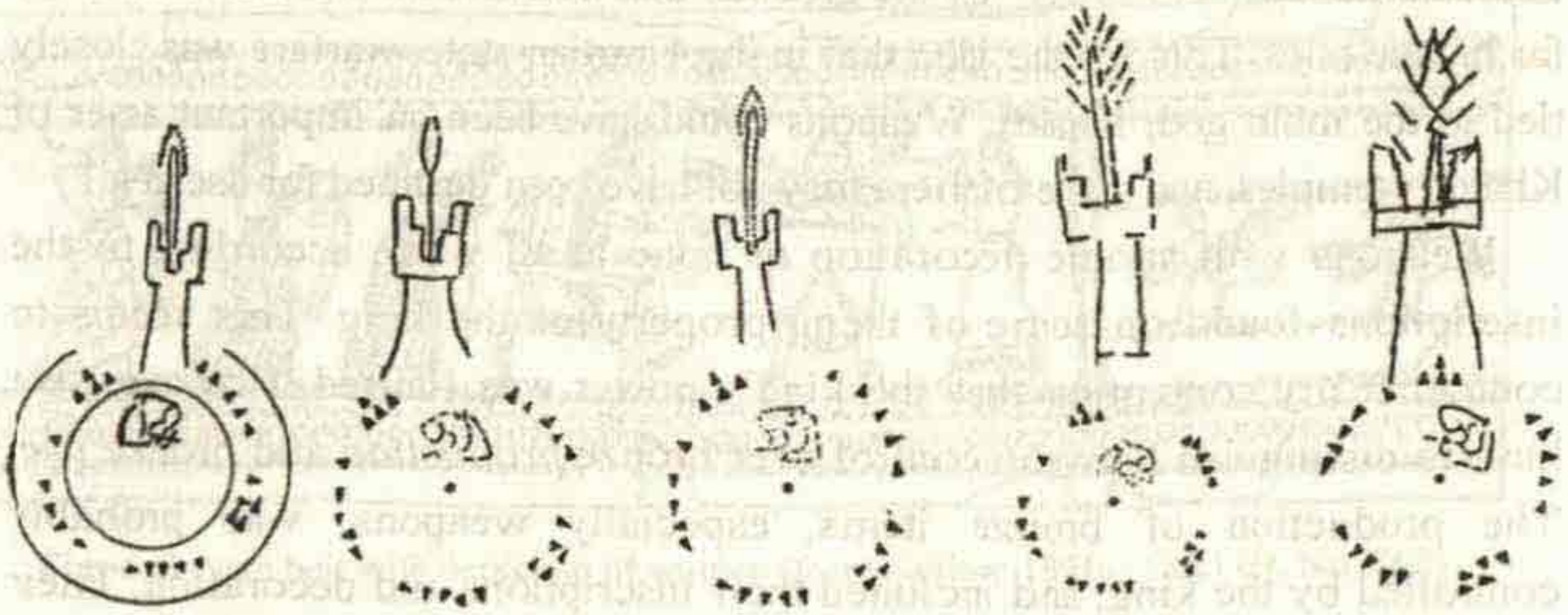

Fig. 3. Urartian "hieroglyphs" on metal objects (after Calmeyer 1991b: 319, Fig. 8)

bronze production. There are two types of inscriptions: long dedications to the god Khaldi and shorter ones just mentioning "from the storehouse (Urartian: "urishe") of king X", or "belonging to king X" (Seidl 1988b: 170-171; Belli 1991b). While the short inscriptions occur on a large number of different kinds of objects, from belts to helmets, horse fittings, chariot parts, and a candelabrum, the longer dedications to Khaldi are only found on arrowheads, helmets, quivers, large shields and candelabra (Belli 1991b: 48).

Generally, items with long inscriptions are elaborately decorated, with military and/or religious scenes. Both kinds of scenes are clearly derived from Assyrian imagery (Calmeyer and Seidl 1983). For some bronze objects, the two kinds of inscriptions are linked to specific imagery. For example, helmets with "crooks" and religious scenes often carry a long inscription, whereas helmets with a "lightning symbol" are either uninscribed or carry the short inscription (Calmeyer 1991a: 124-125). Undecorated shields can have the short inscription, whereas the long one occurs only on shields with complex military or religious imagery.

Because of their impractical form, Merhav (1991c: 136) thinks that the large shields with a dedicatory inscription to Khaldi were not meant to be used in war but were part of votive sets (see also Calmeyer 1991a: 125). They may have been items of a "cult of arms". The same argument was made for bronze arrowheads found at Karmir Blur and Toprakkale (van Loon 1966: 114-115;

such as belts, design templates of either whole animals or parts thereof were used to trace outlines of similar size and shape.

The actual decoration was done in two ways, chasing and engraving. Chasing does not remove material from the object, while engraving does. Almost all the animal and floral designs as well as abstract ornaments were produced through chasing (Kellner 1991a: 23). However, inscriptions were engraved in the metal, often with special tools such as compasses (Ruder and Merhav 1991: 350; see also Belli 1991b: 46-47).

For the chasing of the metal surface, a hammer and punches of various shapes were used.[7] Through a close inspection of the designs on belts, Kellner (1991a: 22) concluded that they were carried out with a large number of different punches with specific design elements, ranging from pointed to simple geometric shapes to palmettes (see also Kellner 1991a: Abb. 15, p. 57). A systematic analysis of punches used for chasing might render possible the identification of specific ateliers which used sets of these tools. Again, this remains a task for the future.

The making of inscriptions involves not only an additional technology with its specific tools, i.e. engraving, but also cooperation with other specialists, namely scribes. Thus, it seems possible that such kinds of decoration were not produced in all ateliers, but only in some able to carry out such work. This assumption gains further support by the "hieroglyphs" added to some of the cuneiform inscriptions, which Merhav (1991b: 202) interprets as ideograms for royal workshops (Fig. 3; but see Salvini 1995: 203-206).[8]

The technology of inscribing objects is not limited to complex casts. Instead, some simple casts as well as cold-hammered objects were also inscribed. Therefore, the step of decoration does not correlate with the foregoing shaping process. As mentioned, this supports the hypothesis that there were special ateliers of decoration which were independent from those which carried out the foregoing production step, namely the shaping of an object.

Inscriptions give important information concerning royal involvement in

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7. Some of the working processes can even be gleaned from a close inspection of high quality photographs such as that of a belt in Kellner 1991b: 157, where the individual punch marks which created the legs of the Pegasus figures are clearly visible.

8. There are also objects with such "hieroglyphs" which do not carry cuneiform inscriptions. Therefore, an atelier able to produce inscriptions sometimes produced uninscribed objects as well.

Overall, in the case of Urartian bronze production, we find three kinds of ateliers (complex casting, simple casting, cold hammering) working on different scales and producing a number of functionally specific objects. The correlation of scale of production and technology results from an analysis of the available evidence. However, a large part of the model of metal production is derived from textual evidence from Assyria and should be investigated in archaeological projects. An important aspect of production, namely, under whose control it was carried out, remains unaccounted for. To answer this question, I propose to rely on the process of decorating these bronze artifacts.

Technologies of Decoration

Many, but by far not all, Urartian bronze objects were decorated. Decoration, whether in the form of chasing or engraving, needed a completely different set of tools and materials than those used for any kind of casting or cold hammering. There is no strict correspondence between ways of decorating objects and the casting or hammering techniques. Therefore, it is unlikely that decoration was carried out in the ateliers producing the casts or cold-hammered raw shapes. The following short account of the techniques used for decorating the bronzes focuses on secondary materials used in the process of embossing, as well as on the tools needed to carry out decorations.

As for secondary materials, most important was a pitch-like material consisting of bitumen, sand and loam (Amandry 1958). This material was firm but had a certain plasticity, so that it would give way when the bronze was driven back by chisel and hammer. It could be used as a fill in hollow items, or could be spread on a wooden support, and thus used as a background for the decoration of flat items (Wulff 1966: 35-36).[6] The patterns to be applied were certainly somehow marked on the surface of the object before it was actually decorated. A technique similar to one used in present-day Iran may have been employed: embossers spread a material, consisting of chalk and glue from the plant *sereshk*, on the surface and then draw with a pencil the design on this background (Wulff 1966: 36). Without a similar step in the decoration, it would have been impossible to produce the strong symmetry evident on many Urartian bronzes. It also seems that for the almost endless repetition of animals and fantastic creatures on items

6. This technique can be observed up to this day in the bazars of Isfahan.

seemingly produced in huge amounts, weapons of defense (mainly cold-hammered) in much lesser numbers, and complex cast items were quite rare.

While the quantitative relationship between complex cast bronze items and other bronzes in Sargon's list is largely borne out by archaeological evidence from a number of large scale excavations, it is more difficult to estimate whether the relationship between simple casts and cold-hammered objects in the archaeological record reflects the Assyrian account. For two reasons, I think that Sargon's text is more reliable than an overview one gets from the extant archaeological finds. First, the large majority of Urartian bronzes comes from unknown contexts.[5] Second, metal objects were at all times subject to the process of recycling. To take this phenomenon into account, one has to consider not only the use value of objects, but also their recycling value. I contend that the weight of a metal object is a good indicator of its recycling value, but not necessarily of its use value. In this sense, daggers, spearheads and swords have a higher recycling value than, for example, helmets or quivers, which consist of relatively thin sheet bronze. Therefore, the more massive, heavy items were more valuable in terms of recycling, and are less often encountered in archaeological contexts.

There is one additional element in this system of several kinds of ateliers which should be mentioned. In Sargon's booty list, "3600 raw bronze talents" are mentioned (Salvini 1991: 12). The existence of such bronze ingots seems to contradict the results of Ruder's and Merhav's analysis (1991), which concluded that alloys were made just prior to the production of an item. However, it should be kept in mind that the object analyzed by Ruder and Merhav, a candelabrum, was a complex cast. This could imply that there was a large scale production of ingots only for those manufactures which did not need to include other metals such as lead or zinc in their production, i.e. for both ateliers working with simple casts and cold hammering. This point needs further clarification through archaeometallurgical analyses.

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5. For example, for only 50 of the 449 belts and belt fragments listed by Kellner (1991b) is a site of origin known; and even of these 50, the 17 from Giyimli lack a documented archaeological context (see Taşyürek 1979).

could also have performed simpler bronze production technologies, such as cold hammering.

Simple casts and cold-hammered objects required a different organization of production. For simple casts, such as arrowheads or daggers, stone moulds with two halves could be used. Such moulds were simple enough in shape to permit casting without the addition of a further metal component such as lead to increase the fluidity of the alloy. Furthermore, they could be used many times before being worn out. Cold-hammering and annealing techniques would have needed an entirely different and less complex set of tools than casting. An assortment of hammers and anvils to stretch, planish and flange the material as well as an open forge and soldering material are sufficient for this kind of metal working (for a recent example, see Wulff 1966: 24-28).

A quantitative analysis of the text in which the Assyrian king Sargon II mentions all the booty of bronze objects from the Khaldi temple at Musasir seems to indicate that Urartian items classified as simple casts and cold-hammered objects were not produced in the same ateliers. Table 4 is a breakdown of the list,[4] assuming that all furniture, statues and cauldrons needed complex casting, whereas spearheads, arrowheads, lances and daggers were done with simple casting. Bronze shields, helmets and quivers were cold-hammered (see also van Loon 1966: 84).

The difference in amounts between these three categories of artifacts is so extraordinary that each one seems to have had its own scale of production. Weapons of attack, all in the category of simple casts, were

Table 4. Sargon's booty list from the Khaldi temple at Musasir; items categorized by technology of production

Technique	Absolute Number	Percentage
Complex Casts	620	ca. .02
Simple Casts	306,926 (max.)	92.2 (max.)
Cold-hammered Items	25,212 (min.)	7.6 (min.)

4. Based on Mayer 1983. It is often assumed that these figures are inflated for propaganda purposes (on the general character of the account, see Oppenheim 1960). However, the fact that Sargon looted systematically, documenting the booty, and the close parallel between the visual depiction of the booty and its description could well suggest that the figures are reliable (Salvini 1991: 13).

Table 3. Categories of Urartian bronzes and technology of production

Category of Items	Complex Casts	Simple Casts	Cold-hammered Items
Religious Items	Statues of Deities		
Furniture	Furniture Legs, Candelabra		Bowls, (Cauldrons)
Chariot and Horse Equipment		Bells, Horse-bits	Blinkers, Frontlets, Chariot Decorations
Offensive Weapons		Arrowheads, Daggers	Quivers
Defensive Weapons			Shields, Helmets
Clothing	Jewelry, Fibulae		Belts

least the case for one analyzed item (Ruder and Merhav 1991: 339-342). Here again, the alloy was in all probability produced just before the casting of the object, and in one and the same manufacture that carried out the casting. In some cast bronze objects, such as linchpins for axle caps, structural parts were made out of carburized iron (Ruder and Merhav 1991: 347-348). Since the properties of iron are quite different from those of copper-tin alloys, a special knowledge can be assumed for those ateliers responsible for the production of such items.

For some of the cast items, such as several lions which functioned as embellishments for a candelabrum, no standard patterns existed. Instead, each lion was formed separately in wax, as evidenced by slight differences in measurements, and the pattern was used only once (Ruder and Merhav 1991: 339). For other items, a master pattern consisting of several parts was used which could reproduce the same objects over and over. The production of many complex casts, such as the leg elements of furniture, required cooperation with woodworkers, since only some structural parts of the furniture were made out of bronze and the remainder of wood (see Merhav 1991a: 261).

In general, it seems that complex casts required a knowledge of the properties of a number of metals other than just copper and tin, such as lead, zinc and iron. These metals also had to be acquired from a number of different places. Furthermore, wax and clay were needed to produce the moulds in which the casts were made. When moulds were used only once, as seems to be the case for the lions of the candelabrum mentioned, mould production must have been one important activity within ateliers performing complex casting. These considerations lead me to the assumption that complex casting was done in a few specialized ateliers, which of course

The Organization of Artifact Production

Bronze objects were produced using two different techniques, casting and cold hammering. For casting, I propose to distinguish between complex and simple casting. Complex casts consist of objects with elaborate shapes, where a simple two-part mould would not be able to produce the desired object, or where special alloys had to be made to assure sufficient fluidity of the metal to fill all parts of the mould. A number of items, such as cauldrons, were cold-hammered, but had cast parts attached to them. In general, complex casts were restricted to a few categories of items, such as statues, candelabra (Fig. 2) or furniture legs, objects mostly associated with the royal court and temples (Table 3). In the following, I will present evidence for the existence of three different kinds of Urartian bronze making ateliers, one specializing on small numbers of complex casts, another on large scale casting of simple items, and a third on cold hammered items.

An analysis by Ruder and Merhav (1991: 342-343) of complex casts provides important insights into their production. It suggests that copper-tin alloys were produced close to the final production stage. The presence of nuclei of pure copper in the artifacts indicates that there were no separate foundries where specialists produced sheet bronzes, ingots or other rough preforms of bronze which were then further worked by coppersmiths. For the casting in lost wax technique for complex shapes, lead was added to the alloy to enhance the fluidity of the metal, so that it would fill the mould completely and produce a "sound cast" without external blemishes. This is at

Fig. 2. Urartian bronze candelabrum, top missing, from Karmir Blur (after Merhav 1991a: 265, Fig. 12)

Table 2. Grouping of sites from Table 1 according to distance from Tushpa

	Region Near Tushpa	Western Periphery
Relation Cluster: Isolated Sites	3 : 2	4 : 3
No. of Mines without Slag Sites	6	6
No. of Slag Sites without Mines	0	5
No. of Combined Mine / Slag Sites	7	7
Relation of Slag Deposits: Mines	.54	.92

This analysis of Belli's map leads me to two preliminary conclusions. First, the organization of the primary steps in metal production near the political center of the kingdom was different from regions further away. This hypothesis should be tested by doing further regional surveys with the aim of identifying mining and smelting sites in Iranian Azerbaidjan as well as in the region southeast of Lake Van. Second, the comparatively low number of copper smelting places in the center of Urartu can be interpreted as evidence for a stricter control of copper production than in the west, where local needs may have led to a pattern in which a larger number of facilities carried out secondary, tertiary, etc. steps of production. Thus, the localization of copper mining and smelting points towards a production in the center of the kingdom under the control of the court, whereas in the periphery such control was either absent or more limited.

Tin was an important metal for the production of bronze alloys. It is known that there is a tin source at mount Sahand near Tabriz (Forbes 1950: 302-303), in a region which was formerly part of the Urartian kingdom. Whether this was exploited in the past is unknown. So far, it seems that tin had to be imported to Urartu. A potential source named in the literature is Afghanistan (Belli 1991a: 24), but sometimes the region of Ergani-Maden in the southwest is cited as well (van Loon 1966: 85). Zinc, a metal used to produce brass, was perhaps intentionally added to alloys by the Urartians for special objects. It is thought that the "bright copper", mentioned in the Assyrian king Sargon II's list of booty from Musasir, refers to zinc-rich metal (Belli 1991a: 28-29). Whether the zinc was added intentionally or was naturally included in sulphur-rich bronze remains unknown (Ruder and Merhav 1991: 347). According to the booty list, brass-like items were restricted to a small number of objects, namely royal candelabra and metal vessels.

territory as under Urartian influence, mining and smelting sites within this territory show an interesting pattern (Fig. 1). In this area, there are seven clusters of smelting/mining sites (with no more than five sites per cluster) and five isolated places for which either ore extraction or copper smelting is attested (Table 1). Listing these places roughly according to increasing distance from Tushpa, two regions with different spatial organizations of metalworking emerge (Table 2). One is located relatively near to the Urartian capital Tushpa, including clusters southwest of Lake Van and isolated mining sites to the north, as well as a smaller cluster south of Kars (Fig. 1). The other region is the western periphery of the Urartian sphere of influence, including the region west of Bitlis and east of the Euphrates. Here, four clusters of metalworking places and three isolated places were found.

There are a number of parallels between these two regions. First, in both regions, clusters have a size between three and five sites. Second, in both areas, the number of mining sites without smelting as opposed to sites where both mining and smelting were carried out is approximately 1 : 1 (Tables 1, 2). But there are also two important differences. Taking the two regions as a whole, the average number of smelting sites per mining site is much lower in the area around the Urartian capital than in the west (7 : 13 or 0.54 in the center of the kingdom, as opposed to 12 : 13 or 0.92 in the western periphery). Furthermore, there are five sites in the western region where *only* smelting was carried out, whereas in the more central area, no such sites were identified (Fig. 1; Belli 1991a: Map 2).

Table 1. Relation of copper mines to slag sites in Urartu
(C = Cluster of sites; I = Isolated site)

Rank (Distance from Tushpa)	1	2	3	4	5	6	7	8	9	10	11	12
Cluster/Isolated	I	C	I	C	C	C	I	C	C	I	I	C
No. of Mines without Slag Sites	1	1	1	2	1	1	-	3	-	-	-	2
No. of Slag Sites without Mines	-	-	-	-	-	1	-	-	1	1	1	1
No. of Combined Mines/ Slag Sites	-	3	-	3	1	2	1	2	2	-	-	-
Relation of Slag Deposits: Mines	0	.75	0	.6	.5	1.0	1.0	.4	1.5	1.0	1.0	.5

century A.D., royal power of the Carolingians became weak, and local lords reigned from their castles more or less at their own will, although formally accepting the sovereignty of king and church. The king remained a vague and unknown entity to most of the peasantry, somewhat similar to a god – present but invisible (Duby 1973: 184-200, 1981: 30-33; Mann 1986: 399-416). Many of these same elements characterize Urartu as well. "Vassals" in various parts of the kingdom, especially at the edge of the royal sphere of influence, could relatively easily have detached themselves from the Urartian king and tried to become independent or to forge alliances with neighboring powers. Integration and loyalty of local powerholders was therefore of utmost importance to the survival of the Urartian state, and probably underwent constant change.

In the following, I will propose a model which describes how Urartian metal production and use fit these political constraints. I restrict myself here to a consideration of bronze objects. I contend that bronze items were used by the royal power to bind local powerholders to the court. To make this argument, I will consider three major steps of bronze production and its organization: mining and smelting copper, the casting and hammering of basic shapes, and the decoration of bronze artifacts.

The Production of Urartian Bronze Objects

Mining and Smelting

Archaeological surveys with the aim of locating mines and smelting sites in Urartian territory are in their beginning stages only. Therefore, the following discussion is meant to provide some ideas that should be tested through further research. Belli (1991a: 23-30) gives a brief account on copper mining and smelting sites in Eastern Anatolia. His interpretation of the finds, however, is hampered by the fact that he does not take into account the geographical extension of Urartu but considers basically all Eastern Anatolian mining sites from the Iron Age II as Urartian.

If one follows Zimansky's argumentation about the approximate extent of the Urartian kingdom (Zimansky 1985: 9-12), and takes a more limited

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pointing towards a decentralized structure that may have become somewhat more centralized in the first millennium B.C., but which never reached the level of integration of the Assyrian state.

religion was one of the main integrating factors for Urartu. The unifying power of Khaldi was enhanced by the highly standardized architecture of his temples, which were present in many of the major cities and fortified towns (Kleiss 1983). These tower temples were probably a widely visible symbol signifying that a certain place belonged to the Urartian political realm. Khaldi also played an essential role in military expeditions. All royal accounts of such expeditions begin with the phrase "Khaldi drove out with his weapon" (Salvini 1995: 57, 185). Thus, war was depicted as the will of a god and not as the king's decision. Not taking part in the war would have amounted to disobedience towards the main god.

Urartian kings also used stone monuments to manifest their power. Most of these monuments consisted of stelae or rock inscriptions at passes and other politically, strategically or ideologically important sites (Salvini 1993). Contrary to surrounding political entities, such as Assyria or Phrygia, these monuments almost never depict any figures of deities or human beings. Instead, they carry cuneiform inscriptions, often of considerable length. The content of these inscriptions is either religious or political. Again, the stelae and other rock cut monuments symbolized the sphere of Urartian power, to those who were able to read them as well as to those for whom writing was a mysterious ability of the royal officials.

Unlike most other ancient oriental kings, the Urartian kings were depicted very rarely, if at all. When such depictions occur, they are small and are found on objects which, even if displayed, were not visible to a large public – for example, seals (Seidl 1979, 1988a). I do not know of large scale royal statues or reliefs other than those bronze statues mentioned in Sargon II's booty from Musasir. In contrast to contemporary Assyrian or neo-Hittite states, this means that royal power must have been rather depersonalized and abstract.

Taken together, these characteristics of the Urartian state reveal a certain similarity to feudal states of early medieval Europe.[3] In the 10th

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3. Zimansky argues that Urartu was an empire, and bases his contention on four criteria which he considers as necessary conditions for any empire and which he sees as present in the Urartian state (Zimansky 1995: 104). At least one of these criteria, central control, does not seem to me to be present in the Urartian case. Rather, sporadic, situational loyalty seems to prevail. The earliest Assyrian accounts from the times before the establishment of the Urartian state (Tukulti-Ninurta I, 1233-1197) mention "40 kings of the lands of Nairi" (Salvini 1995: 21),

attack.[1] It seems that many of these fortresses had large surfaces devoid of buildings, and should thus be considered to have had a primary function as refuges. In a political situation of centralized power, one would expect such installations only at the perimeter of a kingdom, where external threats would be felt most immediately. The relatively even distribution all over the Urartian territory points rather to a high frequency of political conflict *within* the kingdom, probably made possible by a weak central power of the Urartian kings. The kings themselves tried to remain as independent as possible from agricultural tribute from areas beyond the immediate confines of the capital Tushpa. I interpret the large scale and technologically highly sophisticated irrigation works around Tushpa as an indication for this tendency (Belli 1995; Garbrecht 1980).[2]

How then could such a kingdom survive for ca. four centuries, and at times even expand to the north, east and west? First, there were powerful and threatening neighbors, such as the Assyrian empire, which periodically attacked the Urartian state (Salvini 1995: 34-108). Paradoxically, these attacks helped the integration of the kingdom. Local powerholders who were living under a relatively lax Urartian rule (see Zimansky 1985: 84) could only lose by coming under Assyrian rule which was, as far as we know, much tighter. Such a change would have resulted in higher tribute payments and other services. Therefore, in times of external threat, local powerholders may have volunteered to help defend the kingdom. However, in times of external peace, small scale conflicts within the Urartian region may have been very common, such as those known in segmentary states (Southall 1988; see also Stein 1994; Fox *et al.* 1996).

However, Urartian kings developed also active politics of integration. Ishpuini, the second (or third) Urartian king known by name, instituted a state religion with Khaldi as the major god, whose main temple was in the city of Musasir in the Zagros mountains (Salvini 1995: 39-40). A unified

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1. This idea of distinguishing "Fluchtburgen" (refuge fortresses) from "Zwingburgen" (strongholds) was first expressed by Kroll (1976: 174). Its explanatory potential remains largely unexplored. This is due to two often encountered assumptions in the writings on Urartian architecture: first, that all fortresses were erected by the Urartian central political power; and second, that the function of a stronghold always prevailed over that of a refuge (Salvini 1991: 6).

2. The Aras river plain may have been an exception to this pattern: there were important royal fortresses (Smith 2003: 156-190) and investments in irrigation.

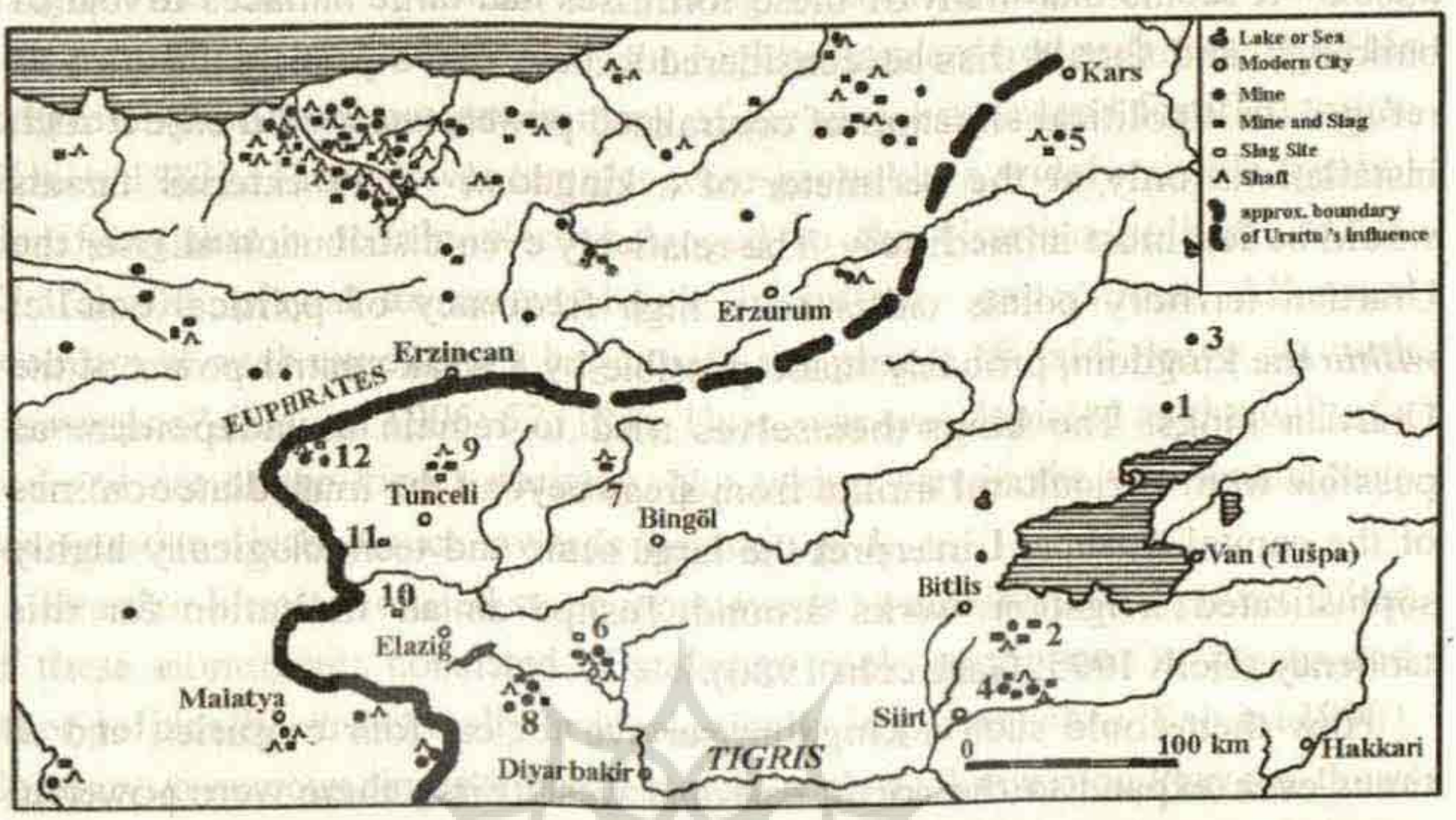

Fig. 1. Map of copper mining and smelting sites in Urartu (after Belli 1991a:24-25)

difficult by high mountains, deeply entrenched valleys, and very cold winters. Urartu was composed of a number of larger and smaller settled pockets in valleys. These settlement enclaves were isolated from each other during a relatively long portion of the year, when passes were closed by large amounts of snow. Like today, such winters often lasted up to six months. These ecological conditions made it imperative for each valley to be able to subsist on its own resources (Zimansky 1985: 28-31). This applies to peripheral regions as well as to the center of the kingdom around the capital Tushpa on the eastern shore of Lake Van.

Such ecological circumstances produced a precarious power basis for the Urartian kings. Archaeological finds corroborate this suspicion. There are no indications for a centralized administration of the kingdom or for a stable hierarchy of functionaries. In the detailed account of Sargon II's campaign against Rusa II, no pattern of provincial centers and lower order settlements is apparent (Zimansky 1985: 45). Instead, archaeological surveys indicate an unusually high number of fortified hilltops all over the Urartian territory (Kleiss und Hauptmann 1976). These fortresses could have had two functions: either they were local strongholds from where a peasant population was kept in check, or they were points of refuge in times of

classify metal objects with the aim of identifying "workshops". However, the assumption that the style of objects, that is, their shape, dimensions, and decor, is the primary indicator for a workshop, is as problematic as the archaeometallurgical approach with its overwhelming emphasis on technology. This is so because the stylistic approach assumes that the numerous stages of metal working after the initial ore extraction and smelting are carried out in one and the same atelier.

In this paper, I argue that the organization of production of metal objects cannot be properly understood unless external preconditions for such production and use are known. The study of ancient mining and metalwork always needs a larger historical and/or anthropological framework.

I will use the case of the Iron Age state of Urartu to illustrate the benefits of such an approach. A diversity of high quality metal objects were produced in the territory of this state, and they were used by different groups of people. There are some scientific analyses of Urartian metal objects (Wartke 1990; Ruder and Merhav 1991), as well as archaeological field research which gives some hints at the organization of mining and the use of metal objects. As well, art historical and typological studies (van Loon 1966; Kellner 1991a) have tried to identify different "workshops". However, all these attempts to understand Urartian metal production and use lack a wider sociopolitical perspective which could elucidate the organization of production through consideration of intentions and goals of producers and users of the items.

Here, I will give a brief account of this larger framework through a use of ecological, material and textual data, which will serve to describe some essential characteristics of Urartian political and economic structures. On the basis of this general framework, it is possible to advance a hypothesis about the organization of production and distribution of metal objects in Urartu. Such a hypothesis is able to generate specific questions which should be tested by further archaeometallurgical and archaeological research.

Structural Problems of the Urartian State

The Urartian kingdom existed from the 9th to the 6th century B.C.E. in the region of today's Iranian Azerbaidjan and Eastern Turkey (Fig. 1). This geographical area is and was ecologically a region of extremes. Communication between different parts of the kingdom was rendered