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Case report

A new type of Early Iron Age stela from Tuva (Inner Asia)

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ABSTRACT

Here we present three stelae found on the surface of the Early Iron Age burial mound Tunnug 1 in Tuva Republic, Southern Siberia. An abstract pattern of arcs and lines and the focus on one side of the standing stone makes these stelae substantially different from other known cultural traditions of the Late Bronze Age steppe region. Traceological, petrographic, and geochemical analyses of the material were carried out. The comparison with standing stones of the Deer Stone Khirigsuur complex and the Slab Grave culture do not indicate a direct affiliation with either tradition. The deliberate placement of the stelae on the burial mound and their stratigraphic position indicate a role in funerary ritual activities of the Early Iron Age (9th c. BCE).

1. Introduction

Installing and incorporating vertical stone objects into a ritual context is a geographically and chronologically widespread cultural practice in Eurasia at least from the Neolithic onwards (c.f. Schmidt, 2000, Fitzhugh, 2017). Traditions of installing standing stones arise in different cultural and chronological contexts. In the eastern part of the Eurasian steppe belt first instances appear and flourish during the Early Bronze Age with the advent of the Chemurchek (Khemtseg, Qiemuerqieke) and Okunevo archaeological cultures (Bemmann and Brosseder, 2017), a possible earlier Afanasievo statuary tradition has been suggested (Esin, 2010). During the Late Bronze Age, deer stones are found in the context of khirigsuur monuments and slab graves. The origin of this tradition is associated with the Deer Stones Khirigsuur Complex widespread in Late Bronze Age Western and Central Mongolia (Fitzhugh, 2009; Fitzhugh and Bayarsaikhan, 2021). In the Early Iron Age, deer stones are found associated with sites of the "Scythian" cultural circle, including the early Scythian sites of the Uyuk Valley (Kilunovskaya and Semenov, 1998), where the site presented in this paper is located. Numerous Deer Stones are used as spolia in later sites were reused as building material (e.g. Chugunov et al., 2010: 126–127).

Volkov (1981, 102) first classified deer stones into three categories, distinguishing a general Eurasian deer stone without zoomorphic depictions, a Sayan-Altai type with animals being rendered in a natural realistic fashion, and a Mongol-Baikal type featuring highly stylized deer depictions. This initial classification was expanded by Savinov (1994) and Bayarsaikhan (2017, 2022) leading to more types and subclasses. Newer research shows that Volkov's types show significant geographic and chronological overlap (Fitzhugh and Bayarsaikhan, 2021). Recently, Erdenebaatar (2021) provided an alternative classification, interpreting previously differentiated classes as gendered representations of the same type of standing stone. Deer stones not only appear in the context of khirigsuurs monuments, but also as an element of slab graves which are partially contemporaneous with the khirigsuurs tradition (Fig. 1). The use of deer stones in the Slab Grave culture is, however, exclusively in the form of spolia (Tsybiktarov, 2016a). At the same time, a separate statuary tradition was singled out in the funeral ritual of the Slab Grave culture (Tsybiktarov, 2016b).

Deer stones, as well as stelae of the Slab Grave culture and many other traditions, are usually called anthropomorphic or rarely pseudo-anthropomorphic. In some cultural traditions, the anthropomorphism of the stelae is obvious (e.g. in the Chemurchek or Turkic standing stone traditions), but among the deer stones and slab grave stelae real resemblance to human form is rare. Gryaznov (1980: 54-55) and recently Esin (2018) present the idea that the stelae are not direct representations of a person's image but were derived from dressed and decorated wooden posts. Most deer stones, like all other stelae mentioned in this paper, do not actually reflect the form (greek μορφή)

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of a human (greek ἄνθρωπος). The perception of the standing stones as a human is invoked less by its form and more by the usage of signs (greek σῆμα). Deer stones feature individual elements of clothing and jewelry, weapons, and distinctive visual characteristics possibly of a particular person (perhaps tattoos or symbols associated with an individual). It could therefore be argued that a more precise term for stelae that are not sculptures or bas-reliefs, but unambiguously denote a person through a system of signs, could be anthropo-symbolic, anthropo-semantic or, simply, semanthropic.

The corpus of semanthropic stelae of the Slab Grave culture has neither been fully defined nor sufficiently studied (Tsybiktarov, 2016a; Bemmann and Brosseder, 2017). There is currently no consensus on its internal classification. Some elements of deer stones appear to have been taken over and integrated into the slab grave standing stone tradition (Tsybiktarov, 2016b). This is yet another example for the diversity and multidimensionality of Late Bronze Age semanthropic statuary tradition in the Eurasian steppes.

2. The stelae at Tunnug 1

Excavations of the Early Iron Age burial mound Tunnug 1 and its wide periphery have been going on since 2017 (Caspari et al., 2018). Up until now, about a third of the main burial mound and the majority of the periphery have been excavated (Fig. 2). Among the stones which cover the mound, worked stones and several petroglyphs have been found. Some were directly datable through their stratigraphic context and associated organics (Caspari et al., 2020). Most, however, appear to be not directly linked to the construction of the kurgan but rather find themselves in a secondary depositional context and as building material. The site is located in the Uyuk Valley in Tuva fitting well into the geographic distribution of the deer stone tradition (Fig. 1). A deer stone depicting boars and deer "on tiptoes" characteristic for the early Scythian animal style of southern Siberia was found in the Arzhan 1 burial mound (Gryaznov, 1980. fig. 29). While Arzhan 1 is the culturally and chronologically closest comparison to Tunnug 1, deer stones are known from other sites in the Uyuk Valley including several from the royal burial mound Arzhan 2 (Chugunov et al., 2010). All the more surprising was the discovery of a series of semanthropic stelae of a very different iconography at Tunnug 1 (Figs. 3–5).

All three stelae are of the same type. Four lines, a curved or straight top line, two shorter diagonally descending lines and a curved bottom line are the only carved features of the stelae. Their semanthropic character can only carefully be assumed through association with the deer stone tradition. Potentially similar to diagonal slashes on the top part of some deer stones, these could perhaps be interpreted as an abstract depiction of a face in accordance with similar interpretations of deer stones (c.f. Fitzhugh, 2009).

The stelae are relatively small. The length of stela 1 is 65 cm, its edges were worked on all sides. Stelae 2 and 3 are somewhat shorter, but their lower part may have been broken off. The stelae are one-sided, all lines are located on the "front" side. The shape of the stone is completely formed, all surfaces display traces of working. The width of the stelae is 17–22 cm, the thickness is 6–8 cm. On the surface of the stelae there are four distinct lines 1.5–2 cm wide and 7–13 cm long.

In recent years, it has become clearer that many deer stones on the steppes were indeed painted, indicating the existence of a tradition of using pigment on stone sculptures. A recent paper from Mongolia mentions 33 deer stones with traces of ochre which were identified visually (Turbat et al., 2021. 407). The presence of ochre was also recorded on the stelae of the Slab Grave culture (Esin et al., 2017. Fig. 8,9). The stelae from Tunnug were found in the upper layers of the site where frequently changing temperatures and humidity conditions make preservation of pigments unlikely. We were unable to visually identify traces of pigment (including under a stereomicroscope).

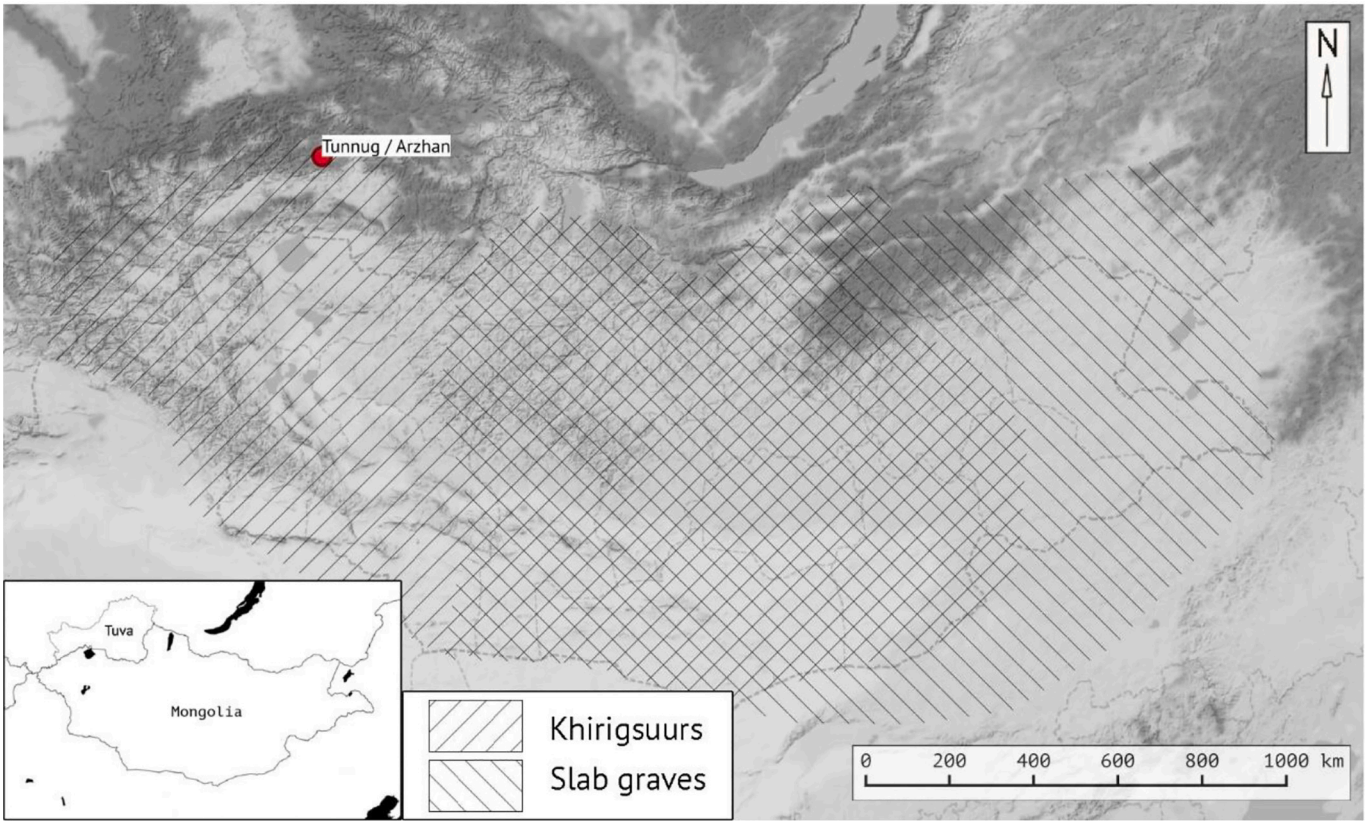

Fig. 1. Khirigsuur monuments and slab grave culture area (after Tsybiktarov, 2003) with the location of the Uyuk Valley indicated (red dot). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Fig. 2. Digital elevation model of the burial mound Tunnug 1, indicating the position of the three excavated stelae.

The context of the finds in all three cases is not entirely clear. Two fragments of stela 1 were found about 1 m apart among the stones of the uppermost layer covering the mound. Stela 2 was documented lying among the stones on the slope of a depression of the underlying clay structure. Stela 3 was found among the stones of the filling of a depression in the clay structure, but not clearly inside the pit. For more details about the architectural layout of the site we refer the reader to (Sadykov et al., 2020). While the stratigraphic deposition of the stelae do not indicate a particular intention, the worked stones are arranged in a line south of the center of the mound with a slight (18°) deviation to the east (Fig. 2). Stela 1 is located 13.5 m from the center, stela 2 is 9.5 m from stela 1, stela 3 is another 9.5 m from stela 2. This arrangement speaks against an arbitrary deposition as part of the construction activities, but rather indicates a deliberate placement. Stelae 2 and 3 were most likely moved during the natural decay of the site, since they were found in depressions. Stela 1 could have been moved and possibly broken during later anthropogenic activity, which affected a small area of the stone layer. The distribution pattern seems to indicate that the stelae are contemporaneous with the burial mound and formed a part of the funerary ritual activities of the site.

3. Methods

In addition to the typological categorization, the stelae were subjected to traceological, petrographic, and geochemical analysis. Analyses were carried out using an MBS-10 binocular microscope, with a magnification of up to 80 times, and an OLYMPUS metallographic microscope and Altami MET 6C, with a magnification of up to 500 times. Photographic documentation was carried out on the metallographic microscope using the Helicon Focus software, as well as a Canon 50D camera and an EF-S 60 mm f/2.8 Macro USM lens. The petrographic analyses were performed by analyzing transparent thin sections on a polarizing microscope. To obtain the major elementary composition of the stone stelae sample material was ground into a powder then put in solution and analyzed using ICP AES. The ICP AES analyses were performed using iCAP 7400 Duo (Termo Fisher Scientific, USA).

4. Traceology

The rocks used to create the stelae can be worked with both percussion and polishing techniques. Flint and quartz tools are too fragile to work on these types of stone, but granite and sandstone tools can be quite effective. Pure copper tools proved to be of little use due to the regular flattening of the sharp working edge. Tools made of modern bronze leave traces similar to the recorded ones and can be used longer than copper tools before the working edge is rendered blunt.

On stela 1 (tng21-HI-0020), in spite of the continuous nature of the pecking, rather regular traces were recorded (Fig. 6.1). It seems likely that an indirect percussion technique was used. This is also indicated by the clear outline of the arcs. The engraving on this stela was carried out with a metal tool, most likely a tool made from bronze which had an elongated shape with a pointed end.

On stela 3 (tng21-HI-0036) a similar engraving of a solid, ordered nature was observed; it can be assumed that the same bronze tool was used. One can see clear differences between the ancient percussion traces and a modern impact slightly touching the percussion area. The linear trace of a metal tool (probably a shovel) both in traces of pecking and in different patina on the stone (Fig. 6.2).

Stela 2 (tng21-HI-0132) has a slightly less deep relief; one can pay attention to individual single pecks, which have deep profiles of the

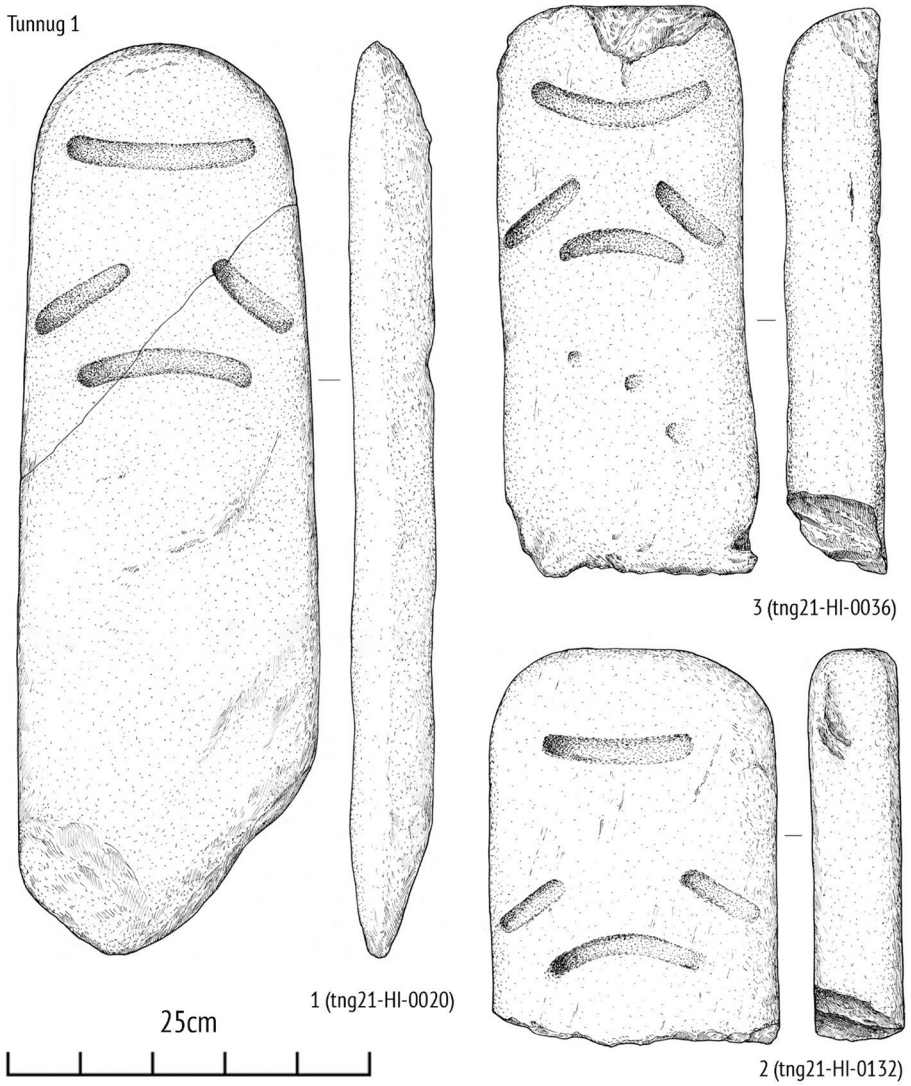

Fig. 3. Tunnug 1. Three stelae discovered at Tunnug 1.

same shape (Fig. 6.3). In this case, we are again dealing with a pointed bronze tool. The contour of the engraved image is somewhat different from the two previous stelae and is less clear (Fig. 6.4). The uneven contours and a rather unsystematic arrangement of the marks occur either with direct pecking or with blows from a stone tool. An uneven contour can also be explained by re-working, rectifying, or refreshing of the image after a short period of time.

The edges of all stelae are well formed, worn out, in some cases there are traces of grinding (Fig. 6.5, 6.6).

5. Petrography and geochemistry

The stone layer of Tunnug 1 is made up of many different types of stone. Our research program includes taking stone samples from different parts of the mound and from different structural elements. Differences in the types of stone used for some individual structures are already clear, but the research is still ongoing. A database is being assembled that will make it possible to identify all possible sources of stone. The stone the stelae are made from was compared with the types of stone among which they were found. To date, more than 80 samples have been taken from the mound, reflecting the majority of the rock types used in the construction of Tunnug 1. Fig. 7 shows the geological texture and Table 1 lists the chemical composition of the three different types of rock used as a base material for the creation of the stelae.

Stela 1 (tng21-HI-0020). Porphyry metadiorite (Fig. 7.1, 7.2) is a subvolcanic igneous rock of intermediate composition (SiO2–62.53%), normally alkaline (Na2O + K2O = 6.11%). The coloration is grey-green. The structure is porphyritic, the texture is dense. Under the microscope, a relic porphyritic structure with an intersertal structure of the groundmass is established. Porphyr-like segregations are represented by altered plagioclase; pyroxene grains are single. The groundmass consists of medium plagioclase (andesine–labradorite) (70–75%), orthopyroxene (5–7%), hornblende (15–20%), and ore mineral (2%). Quartz, biotite, and potassium feldspar occur as single grains; secondary minerals are represented by chlorite.

Stela 2 (tng21-HI-0132). Metarhyolite (Fig. 7.3, 7.4) is a volcanic igneous rock of acidic composition (SiO2–74.35%), low alkaline (Na2O + K2O = 3.65%). The coloration is dark. The structure is porphyritic, the texture is dense. Under the microscope, porphyry segregations (15–20%) are represented by quartz altered by acid plagioclase and rock fragments. The groundmass is heterogeneous, mostly felsic, rarely consists of a fine-grained aggregate (less than 0.05 mm) of quartz (35–40%), albite (20%), pelitized feldspar with an admixture of chlorite (10%), and devitrified volcanic glass (15–20%).

Stela 3 (tng21-HI-0036). Fine-grained sandstone (Fig. 7.5, 7.6). According to the petrographic composition, feldspar-quartz greywacke

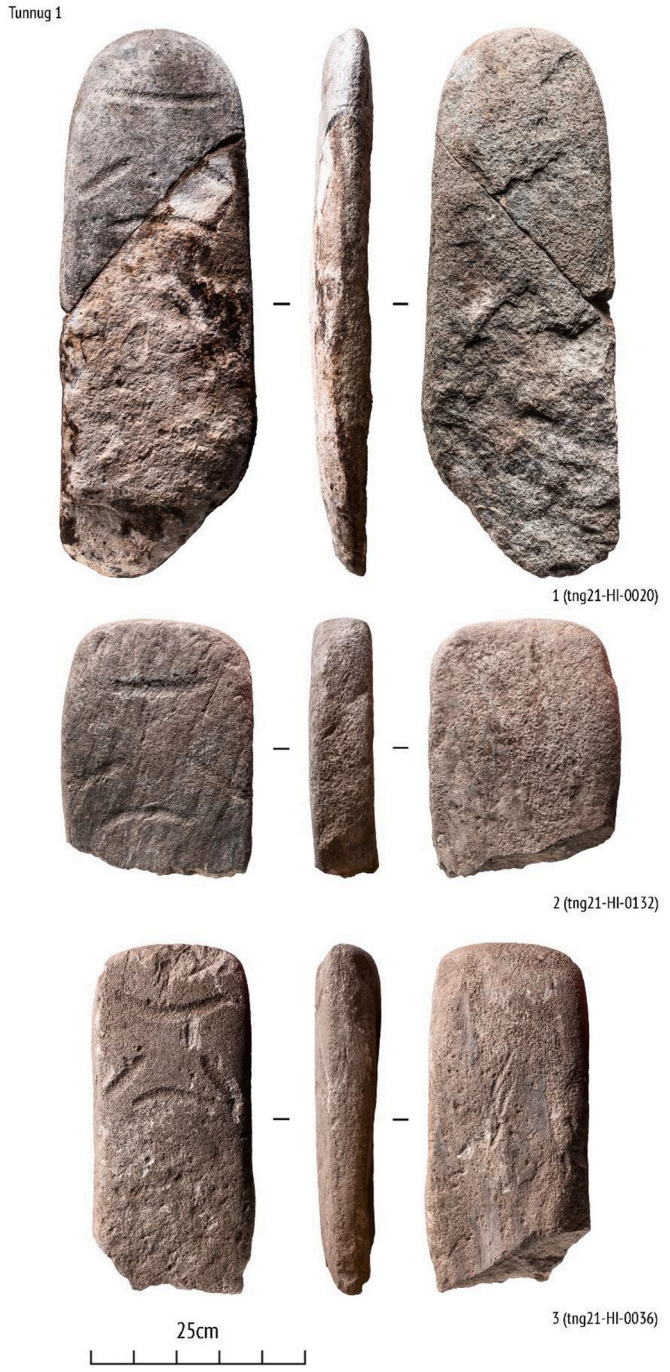

Fig. 4. Photographs of stelae 1–3 showing that only the front displays clear markings.

sandstones are composed of quartz (35–40%), feldspars (15–30%), and fragments of acid volcanics (up to 30%). Clastic material of medium and poor roundness, poorly sorted. The cement is porous ferruginous-carbonate, ferruginous of mixed type.

The types of stone used to make the stelae are different from the stones used to cover the mound and adjacent structures. We can assume that the stones for the stelae were carefully selected, perhaps the stelae were already completed before their transport to the site. The question of the exact identification of the quarry where the stone for the stelae was mined cannot yet be unambiguously resolved, but, taking into account the data obtained, it can be posed as a research task.

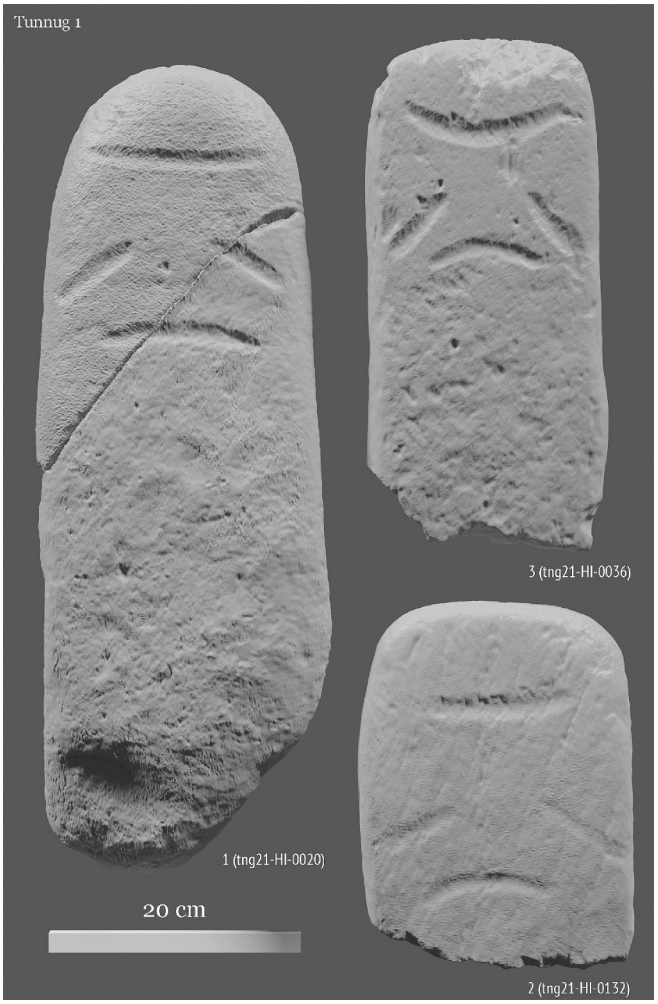

Fig. 5. Shaded 3D-models of stelae 1–3 at Tunnug 1.

6. Discussion

Direct analogies to the stelae from Tunnug are unknown to the authors. Deer stones of the Sayan-Altai and the Eurasian types (after Volkov's typology) seem to be reasonably close with the fundamental difference that often all surfaces of these standing stones are decorated. The distribution pattern suggests that the stelae were deliberately placed and not being used as building material. They are stratigraphically contemporaneous with the burial mound and form a part of the funerary or post-funerary rituals at the site. In accord with the deer stone tradition, we can carefully suggest two different interpretations. The stelae might have been buried as a substitute for the body of a deceased or they might have formed part of the installation of the burial site as petrified human representations. The deliberate burial of stelae as substitutes for the bodies of the dead is quite common for deer stones (Rukavishnikova and Gladchenkov, 2017; Kovalev, 2018), but seems rather unlikely given the superficial stratigraphic position of the stelae at Tunnug 1. Perhaps the stelae were installed on the surface of the burial mound (possibly on the original clay-wood surface) before they were covered with stone. At the same time, during or after the performance of the rituals, they could have been knocked down or deliberately broken. We cannot unequivocally determine whether the stelae remained in their position after the post-burial rituals were carried out on the surface of Tunnug 1.

At the present stage of the study, the closest analogy seems to be the stelae of the Slab Grave culture (Fig. 8: 1–7), which may have appeared under the influence of the Deer Stone Khirigsuur complex. We do,

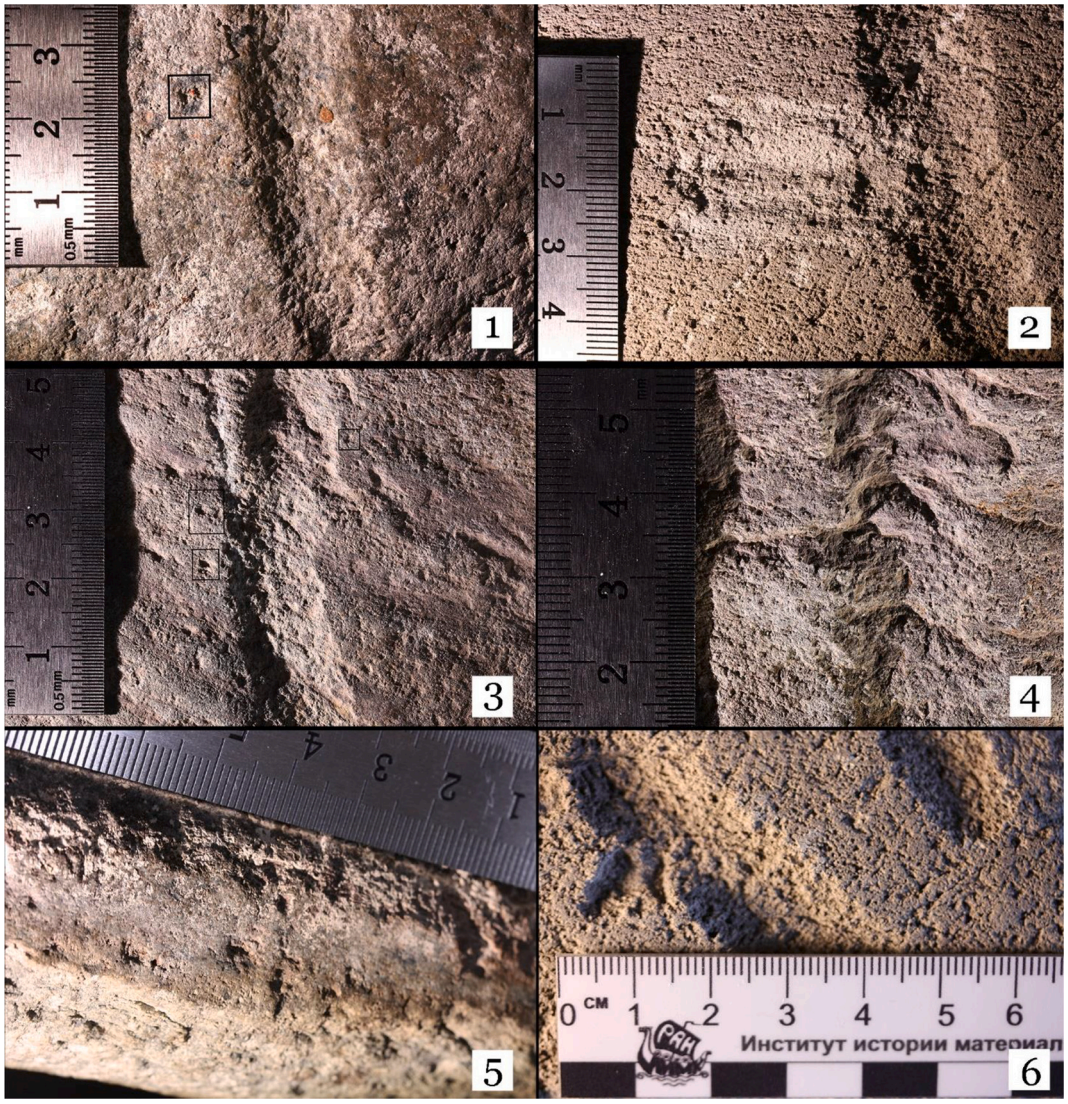

Fig. 6. Traceology. 1 - tng21-HI-0020, 2 - tng21-HI-0036, 3, 4 - tng21-HI-0132, 5, 6 - tng21-HI-0020.

however, not see a direct iconographic coincidence and the typology of these stelae has not yet been fully established. There are parallels in particular the small size, the frequent use of arcs and lines, and in some cases a focus on only one side of the standing stone. It should be noted that the appearance of tunnug-type stelae does not necessarily have to be the result of direct contact with the proponents of the Slab Grave culture. It seems more likely to us that the emergence of a new semanthropic statuary tradition is a consequence of a similar (convergent) impact of the deer stone tradition on the region of Tuva. As a distant analogy, one can also point to the stelae of the Ananyino archaeological culture (Fig. 8: 8,9; Khalikov, 1963), where a number of elements coincide with the deer stone iconography.

The Uyuk Valley is included in the distribution area of deer stones, however, almost all deer stones known there either directly correlate with the Early Scythian sites (Gryaznov, 1980: fig. 29; Chugunov, 2014) or stylistically refer specifically to the Early Scythian period, and not the Late Bronze Age (Kilunovskaya and Semenov Vl, 1998). In the Late Bronze Age, the Uyuk Valley is rather peripheral to the Mongolian Deer Stone Khirigsuur complex.

A possible direction to search for the origins of the iconography of Tunnug-type stelae could be petroglyphs, widespread in Tuva and beyond (Kilunovskaya, 2017). In the corpus of these images, both full anthropomorphs and faces or masks make up a fairly significant part of the images, but there are no direct analogies to the iconography of the Tunnug stelae. It can also be noted here that among the petroglyphs there are no signs that form the semanthropic nature of the deer stones. There are direct analogues of zoomorphic images represented on deer stones but no combinations of depictions that would allow for a semanthropic interpretation. It seems likely that the meaning of the signs is greatly influenced by their position on the standing stones.

Before the formation of the Early Scythian culture, sites of the Mongun-Taiga culture are common in Tuva, for which the installation of stelae is uncharacteristic. In Southern Tuva, the Mongun-Taiga sites coexist with khirigsuurs as well as with numerous deer stones. No clear spatial boundary has yet been drawn between these two groups and it is questionable if such a clear delineation is even reflective of Late Bronze Age cultural categories. Some researchers (e.g. Tsybiktarov, 2003) include the Mongun-Taiga sites within the sphere of khirigsuurs building tradition, while others, on the contrary, insist on their specificity (Chugunov, 2018). Burials in the Mongun-Taiga culture are without inventory, and in general, the sites do not provide any prerequisites for the appearance of the here considered stelae.

7. Conclusion

While the newly found stelae at Tunnug 1 open more questions than

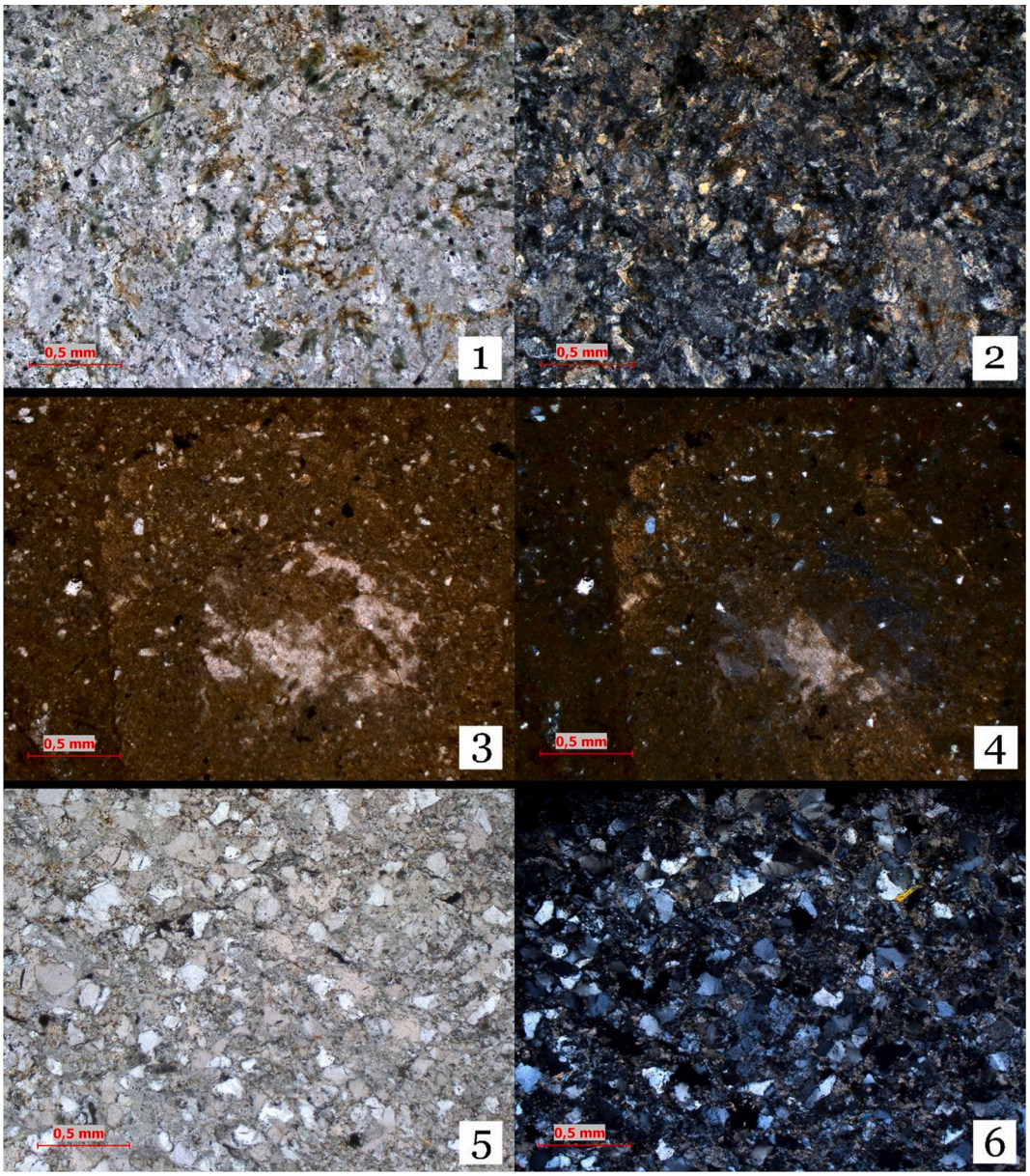

Fig. 7. 1, 2 - metadiorite-porphyrite (stela 1). 1 - Nicoli II, 2 - Nicoli X; 3, 4 - metarhyolite (stela 2). 3 - Nicoli II, 4 - Nicoli X; 5, 6 - fine-grained sandstone (stela 3) 5 - Nikoli II, 6 - Nikoli X.

Table 1
The chemical composition of stela 1–3.

	tng21-HI-0020 (1)	tng21-HI-0132 (2)	tng21-HI-0036 (3)
SiO_2,%	62,53	74,35	66,29
TiO_2	0,51	0,46	0,29
Al_2O_3	17,00	11,60	7,88
Fe_2O_{3tot}	4,07	2,84	18,57
MnO	0,09	0,09	0,21
MgO	2,62	1,94	1,34
CaO	1,81	1,54	1,35
Na_2O	4,38	2,43	2,87
K_2O	1,73	1,16	0,57
P_2O_5	0,13	0,12	0,10
S	0,01	0,01	0,02
LOI	**4,71**	**2,93**	**0,001**
Total	99,58	99,47	99,50

they provide answers, at least their publication creates a chronological reference point for items of a similar iconography. It is rare to find standing stones in a securely datable archaeological context. The Tunnug-type stelae remain unique at the moment, but the on-going and intensifying research into Eurasian prehistory will provide comparative material in due time.

CRediT authorship contribution statement

Timur Sadykov: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Jegor Blochin:** Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft. **Evgeniya Asochakova:** Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft. **Daria**

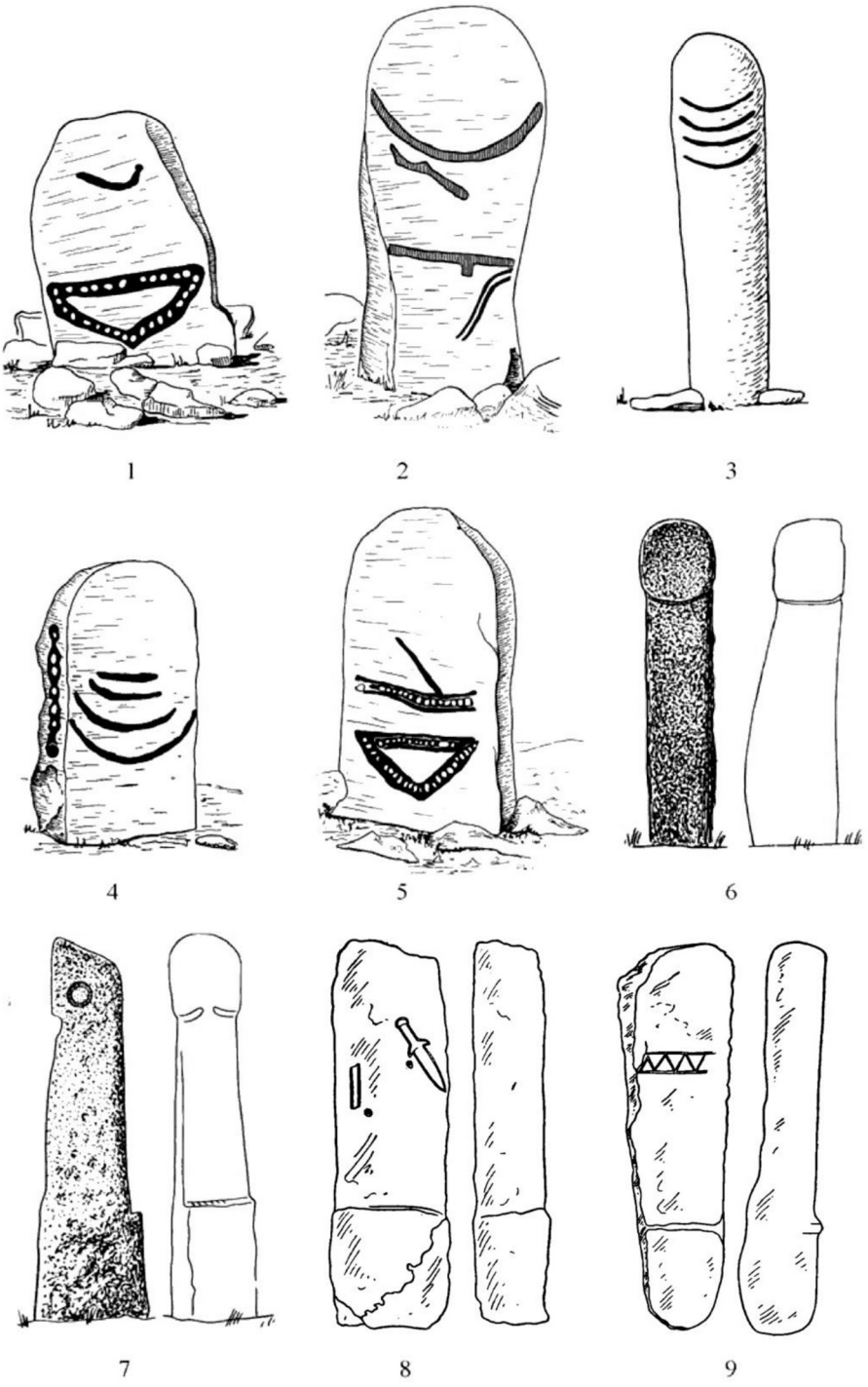

Fig. 8. Stelae of slab grave [1–7] and Ananyino [8–9] cultures (after Tsybiktarov, 2016b, Khalikov, 1963). 1, 2 – Khusotuy, 3–7 – Ul'ba, 8–9 – Novomordovo.

Fedorova: Data curation, Formal analysis, Investigation, Resources, Software, Validation, Visualization. **Gino Caspari:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

None.

Data availability

All 3D-models available via link https://skfb.ly/o9QoJ.

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Ministry of Culture (project No. 1205/12-20). Petrographic and geochemical studies were done using equipment of Tomsk Regional Core Shared Research Facilities Center of National Research Tomsk State University. The Center was supported by the Ministry of Science and Higher Education of the Russian Federation Grant no. 075-15-2021-693 (no. 13.RFC.21.0012). Post-excavation work by T. Sadykov, J. Blochin and D. Fedorova was carried out within the framework of the Program of Fundamental Scientific Research of the Russian Academy of Sciences, State Assignments No. FMZF-2022-0014, FMZF-2022-0016 and FMZF-2022-0019 respectively. We wish to thank Alexander Tsybiktarov (Ulan-Ude) and Ursula Brosseder (Bonn) for consultations, E.I. Nikitina for working with ICP AES, Katsiaryna Kuzina, Margarita Kirilenko and Valeria Makarova for drawings, Nikolay Kudin for terminological discussion and Daria Fomicheva for research assistance.

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