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The Textiles of Üzüür Gyalan: Towards the identification of a nomadic weaving tradition in the Mongolian Altai

Abstract

This paper presents the analysis of textiles from the tenth century Mongolian rock burial of Üzüür Gyalan. It is the only undisturbed rock burial discovered to date and presents a unique opportunity to examine a complete set of grave goods, both organic and inorganic, included in a Medieval horse-accompanied burial. The high degree of preservation and the prevalence of woven wool textiles set it apart from other rock burials where silk, sheepskin, and felt garments have been found. Certain features of the assemblage, including the abundance of the woven wools, their technical consistency, and evidence for household rather than specialised production, suggest the work of local weavers. Drawing comparisons with a living nomadic weaving tradition in Ladakh, Tibet, this paper relates aspects of the assemblage to production in a mobile pastoralist context.

Keywords: Mobile pastoralism, Mongolia, rock burials, Medieval Eurasia, household craft production

Introduction

Mongolian rock or cave burials (*hadnii orshyyлга*) represent a long-running mortuary tradition attested from the third to the 17th centuries CE in which individuals were laid to rest in natural mountain crevices. The rock burials that have survived are typically found at high elevations in niches deep enough to provide shelter from the elements. To date, more than 100 rock burials have been recorded in Mongolia, of which relatively few have been comprehensively analysed. This is due in large part to the constraints of recovery excavation and the expense involved in conserving organic objects and mummified human remains, which are typical rather than exceptional in these contexts. Notable publications gathering together evidence of multiple rock burials include the German and Mongolian language catalogues of special exhibitions held in Bonn, Germany (Bemmann 2012) and Ulaanbaatar, Mongolia (Төрбат & Эрдэнэбат 2014).

Rock burials are almost always discovered accidentally by the herders who pasture their animals and camp on the slopes below them. Their stories echo the circumstances in which ancient and medieval herders

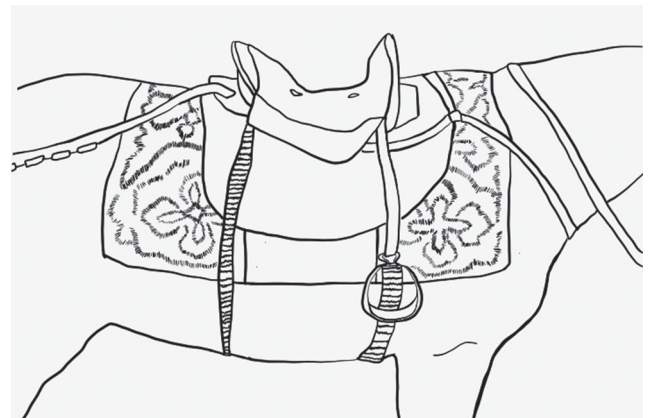


Fig. 1: Reconstruction of the tack, including saddle, embroidered saddle blanket, felt saddle pad, and girth as they may have appeared on the Üzüür Gyalan horse, based on the exhibition model constructed by the National Center for Cultural Heritage. The saddle is made from carefully fitted wooden components held together with rawhide thongs and covered with three layers of quilted felt. The heavy polish on the cantle of the saddle attests to its use over a long period of time. (Image: Kristen Pearson)



Fig. 2: Embroidered saddle blanket (detail). The embroidered designs that peek out from underneath the saddle at the front and back (fig. 1) are stitched on two separate panels of brown tabby fabric. One of the panels reveals a lack of forethought on the part of the craftsperson – the foliate shapes become distorted as they approach the cut edge of the fabric, showing that the embroidery was done after the fabric had been cut for the saddle blanket, that it was done freehand, and that the embroiderer miscalculated the space available. The designs on either panel match in terms of their motif but they vary in its execution. This may represent the work of two different people collaborating to produce a single object. (Image: Kristen Pearson)

may have interacted with the mountain landscape. In 2010, a group of herders on Mönkhkhairkhan mountain came upon a rock burial site when they had climbed up to the ridge to collect *baragshun*, a medicinal tar-like substance that seeps from the rocks in the ranges of Central Asia. The burial remained a secret until five years later, when two herders, D. Munkhtsooj and Ch. Alagaa reported the find to the local museum. The following April, a team from Khovd State University, along with members of the Mönkhairkhan Soum Cultural Center, went to investigate.

It was the unlooted grave of a middle-aged woman. She had been buried with a horse for riding and more than 40 artefacts, most of them organic (fig. 1 and fig. 2). The woman's body and that of her horse were naturally mummified, partially preserving their skin and hair. The site was named for a nearby spring camp, known locally as Üzüür Gyalan (bright corner), but a striking pair of embroidered boots quickly inspired a nickname: the "Adidas Boots" burial (fig. 3). The assemblage represents one of the largest collections of complete garments and textile objects ever found in Mongolia. This article presents a description of the Üzüür Gyalan textiles, particularly the woven wool fabrics, and evaluates their significance in the context of current understandings of textile production and consumption among ancient and medieval nomads.



Fig. 3: The "Adidas Boots" (photo/line drawing composite). Though the person who made these boots took care to conceal signs of reuse, all the decorative elements (the embroidered uppers and the straps with metal plaques) have been borrowed from other objects (see Pearson 2018) (Image: Kristen Pearson)



Fig. 4: Red *deel* (photo/line drawing composite). The Üzüür Gyalan woman was buried wearing her red *deel*, which stands out from the others not only because of its vibrant dyed colour, but also because of the polychrome silk applied to the collar, armpit gussets, and body (Image: Kristen Pearson)

Overview of the burial

An initial description of Üzüür Gyalan was published in a report shortly after it was excavated in 2016 (Мөнхбаяр et al. 2016). The woman was buried wearing a red wool *deel* (fig. 4), brown and tan wool trousers, and leather and felt boots with embroidered uppers – the “Adidas Boots” (fig. 3). Tucked inside the boots were a samite fragment ripped into three pieces and a small white felt bag containing a horn comb and the broken corner of a mirror. The woman wore a headdress of silk, with an ornamental strip of leather appliqué over the brow. Her face was covered with a piece of yellow silk, over which was tied a purple silk eye mask. She was wrapped in two large felt shrouds, one of which was decorated with painterly designs in red and blue wool applied in the initial stages of the felting process – a pressed felt technique still used to this day in Central Asia (Bunn 2010).

Close to her body inside the shroud were a steel knife in a wooden sheath and a leather pouch containing two steel sewing needles. A small felt and leather bag was also placed near the body. This was packed with coils of plied wool and sinew thread, scraps of felt and leather, rovings of combed wool ready for spinning, a tassel of red-dyed horsehair. The woman’s sewing kit evokes her work left unfinished when she died.

In addition to the garments she was wearing, the woman of Üzüür Gyalan was buried with additional sets of clothing: two pairs of wool trousers (fig. 7 and fig. 8), two wool *deel* (fig. 5 and fig. 6), an animal hide



Fig. 5: Tan *deel* (photo/line drawing composite). This *deel* is lined with skins, whereas the other two fabric *deel* are lined with felt. The gusset on the inner flap incorporates a small triangle of red fabric and a segment of more finely woven tan fabric, which would have been hidden when the *deel* was worn (Image: Kristen Pearson)

deel, a pair of plain leather boots with felt boot liners, a felt, fur and cotton hat, and a wool and silk hat. Small fragments of two poorly preserved garments were also found: one, lined with lambskin, may have been a third hat; the other is the sleeve of what may have been another *deel*. All of the clothing shows signs of wear and repair.

Other textiles included two wool saddle bags and one of felt, a soft, rectangular wool textile with pile loops (fig. 10 and fig. 11), two wool saddle blankets – one of which was embroidered (fig. 1 and fig. 2) – and a felt saddle pad. Two ovicaprid sacra were placed in the abovementioned felt bag, and additional ovicaprid elements, the remnants of a meal, were found inside the niche. Additional grave goods included two wooden trays, a wooden cup, a ceramic vessel encased in felt, a small iron cauldron, a large bag made from a case-skinned hide, a wooden rod, leather braided cords, and a forked tool made of wood. The woman was accompanied by a sacrificed horse with bridle, saddle, girths, and crupper, as well as the pelt – with head and legs attached – of a sheep. Both the horse and sheep had earmarks, an ancient form of animal identification still used on cattle and horses in Mongolia today. Zooarchaeological analysis has revealed biographical details of the horse, a chestnut gelding that – at 15 years of age when it was sacrificed – must have been a favoured riding animal (Onar et al. 2019).

A year after its discovery, the Üzüür Gyalan burial was featured in an exhibition at the Mongolian



National Museum along with an earlier male burial found in the same region. The objects were cleaned, conserved and photographed at the National Center for Cultural Heritage (Соёлын Өвийн Үндэсний Төв) under the direction of Ch. Enkhbat, and a Mongolian-language publication was prepared describing the burial, the finds, and the restoration process (Баярсайхан & Энхбат 2017). Radiocarbon C-14 analysis was conducted on nine samples with the support of the Turkish Cooperation and Coordination Agency (TIKA), returning a date in the tenth century CE (Баярсайхан & Энхбат 2017; Onar et al. 2019).

Though other rock burials and other textiles have been found in Mongolia, the finds from Üzüür Gyalan stand out for the degree of their preservation. The abundance of woven wool in the assemblage is also striking; so far, the few complete garments from the Medieval period found in Mongolia have been made of silk (Oka 2009), with the notable exception of a felt *deel* and fragments of a sheepskin deel from

the rock burial site of Dugui Tsakhir (Эрдэнэбат & Амартүвшин 2014). Incidentally, these *deel* have also been dated to the tenth century. Fragments of wool fabric are common in rock burials but they are seldom accessioned into institutional collections after recovery and have not yet been subject to systematic analysis. Naturally coloured striped wool textiles bearing at least superficial resemblance to some of the textiles from Üzüür Gyalan have been reported at other Medieval rock burial sites including Zavkhan Erdenekhairkhan (Баярсайхан & Түвшинжаргал 2016) and Tsagaan Khad (Ahrens et al. 2015). One of the major questions addressed here is whether or not the Üzüür Gyalan woven wool textiles were produced locally by nomadic pastoralists in the Altai (fig. 4).

Materials and methods

The inherent constraints on woven textile technology (there are only two directions in which to spin fibres into a single thread and only a handful of basic weaves)



Fig. 6: Brown *deel* (photo/line drawing composite). This is the most heavily patched of the fabric *deel*, with patches on the body and proper right sleeve that would have been visible when it was worn. The brown outer fabric, though it appears monochrome from any distance, actually incorporates subtle horizontal warp stripes. While it is conceivable that subtle *vertical* stripes could occur unintentionally if the warp thread was spun from variegated wool, horizontal stripes must be built into the warp deliberately by alternating dark and light threads (Image: Kristen Pearson)



can make the development of reliable typologies difficult, especially for technically simple fabrics. In order to overcome these difficulties, textile typologies must take into account a full reconstruction of the textile *chaîne opératoire*, the sequence of steps that go into producing an object. Textiles are particularly suited to this kind of analysis because every step in the production sequence is readily discernible in the final product. Peters (2012) refers to textiles as an “agglutinative” technology for this reason.

This study relies on standard techniques of textile analysis based on observation with the naked eye and a hand-held digital microscope at 50 x. Data such as thread count, spin direction and thread structure, thread diameter, weave structure, etc. were recorded for every unique piece of woven wool and cotton fabric in the assemblage: in total 80 pieces spread over 16 objects (table 1). Unique pieces were defined as demonstrably distinct instances of weaving: separate but adjacent pieces of fabric in one object which matched in thread count and appeared visually indistinguishable (most of the tailored components of the *deel*, for instance) were recorded only once to avoid skewing the data towards larger pieces (table 1, figs 5 to 8).

Consistency and variation in the assemblage

Nomadic weaving traditions are well documented in western Central Asia. These include the pile carpets of Iranian nomads (Huang 2014) and the flatweave rugs (kilims) of Turkic nomads (Krody et al. 2018). These traditions make it clear that weaving and pastoral nomadism are compatible activities, that sophisticated weaving can be accomplished on fully portable looms, and that weaving carried out in mobile pastoralist households is able to not only meet the domestic needs of a family, but also create surplus value. Despite all this, the possibility that weaving may have played an important role among ancient and Medieval nomads in Mongolia has not yet received serious consideration. The wool fabrics are the focus of this study including analyses of how fabrics were produced and how they were incorporated into other objects. First, it is helpful to establish a point of comparison with those materials whose origins are less controversial: local felt, fur, and leather on the one hand and non-local cotton and silk on the other.

Felt is the prototypical fabric produced by Eurasian mobile pastoralists and has been attested archaeologically as early as the Iron Age in the Pazyryk burials in the Altai (Bunn 2010; Rudenko 1970). Ethnographic studies conducted in Mongolia and southern Siberia all emphasise the communal nature of feltmaking (Vainshtein 1980; Kazato 2012;



Fig. 7: Patchwork trousers (photo/line drawing composite). These are constructed entirely from patchwork fabric of 23 different pieces applied to a lining of patchwork felt. Why did someone go to the trouble of stitching a garment from so many pieces and why did they do so in such an obviously haphazard way? A purely economic explanation is not satisfactory given the treatment of fabrics, scraps, and patches in the assemblage as a whole (Image: Kristen Pearson)

Portisch 2011). Unlike woven wool textiles, which can be produced by a single person and may require days, weeks, or even months of labour, felt requires the labour of many individuals over a short period of time. It is not a regular activity, but an annual or twice-yearly one, generally occurring over a period of a few days in the summer or early autumn. Felt is produced by rolling wool inside a piece of old felt, a reed mat, or a large dehaired animal hide, which determines the finished size and shape of the felt. The felt is then cut into other shapes as needed, as it will not fray. The long wool from animals sheared in the spring produces thick felt ideal for rugs and ger walls, while the shorter wool from an autumn shearing or from lambs produces fine, flexible felt that can be used in clothing. Both kinds of felt are present in the Üzüür Gyalan assemblage. The felt linings of the red, tan, and brown *deel* are stitched together from several pieces. This is necessary to create a flexible garment, but it also allows for the incorporation of cuttings from



Fig. 8: Red and tan trousers (photo/line drawing composite). These have been patched on both sides, reflecting their extensive use. The only pieces of clothing in the assemblage that do not have evident signs of repair are the red *deel* and the brown and tan trousers; the garments the deceased was wearing when buried (Image: Kristen Pearson)

felt sheets that are produced only occasionally, stored, and used as needed.

The significance of fur and leather in early nomadic pastoralist societies is also well established, with examples dating back to the Iron Age. One of the four Üzüür Gyalan *deel* is made from animal skins - sheep and probably goat. The tailoring is similar to that of the fabric *deel* (see below), with triangular gussets cut from hide. Comprehensive fibre analysis of the wools and furs in the assemblage and an ethnoarchaeological study of the skin *deel* are ongoing. Soft furs from small mammals are also represented. Pika (*Ochotona sp.*) fur has been identified in the lining of the felt and cotton hat and fox (*Vulpes sp.*) fur on the collar of the tan *deel* using transmitted light microscopy.

Symmetrical cut-outs of thin leather with teardrop and trefoil shapes were amongst the materials in the sewing kit. Their intended use is suggested by the leather appliqué decoration on the silk headdress: a row of four delicate palmate shapes, each element linking to the next in the manner of a paper doll chain. Similar leather appliqué, used to decorate a leather quiver, are known from the 14th century Tsagaan Khad burial mentioned earlier (Ahrens et al. 2015). Finally, leather appears in more utilitarian contexts such as on

the cuffs of the brown and tan *deel*, a treatment that would have reinforced the wear-prone sleeves.

Unlike wool or animal hides, silk and cotton cannot be cultivated or collected in the Altai or the surrounding steppe. Both of these materials occur in the Üzüür Gyalan assemblage, but they make up only a small fraction of the total fabric. Silk objects include the woman's veil, eye mask, and headdress, which is made of several squares of mismatched tabby and twill silk pieced together. Small pieces of complex polychrome silk were used for the collars and armpit gussets of the red *deel* and a fragment of samite (polychrome compound twill) with a Tang/Liao peony pattern had been ripped into three pieces and put inside the woman's boot. The samite piece is certainly from China, whereas the other silks could be from China or Central Asia.

There are six instances of cotton fabric in the assemblage, all used as patches except for one: a hat made from felt, pika fur and cotton. This hat has two layers, which can be completely separated from each other. The upper layer is of fine brown felt, shaped like a hood. The inner layer is made from two pika skins with the fur facing inwards, the skin side covered by cotton fabric. The fact that the inner layer is itself finished with fabric suggests that the hat was designed so it could be worn in three different ways (felt, fur and cotton, or both together) perhaps for different seasons. The cotton fabrics are notable for their balanced weaves, contrasting with the wool fabrics. They are all plain tabby weaves with tightly overspun warps and wefts and relatively low thread counts. Three have *s/s* spin, one *s/z*, and two *z/z*. Further study is necessary to determine the origin/s of cotton in Medieval Mongolia. By the tenth century, the Central Asia city states were cultivating cotton, but it was not yet grown in China (Dale 2009).

In abundance and a variety of applications, the woven wool fabrics in the Üzüür Gyalan assemblage more closely resemble felt and leather than silk and cotton. Woven wool fabric, often in combination with felt or animal hide, comprises the bulk of both clothing and non-clothing textiles, whereas cotton and silk are used as patches, trim, or for small items such as hats and headdresses. The sheer quantity of the woven wool textiles, with multiple sets of clothing included in a burial that would not otherwise be characterized as "rich", suggests that woven wool was an easily attainable material. Further, wool fabric is frequently used in redundant ways – to face a felt saddle blanket, for example – and for objects and clothing that could just as easily have been made of felt or leather, such as saddle bags.



As an assemblage, the wool textiles demonstrate a degree of consistency suggestive of production within a coherent tradition. However, without a substantial body of evidence with which to compare these materials, the geographical and temporal parameters of such a tradition and the factors responsible for variations within them cannot be established.

Fabric type

The wool fabrics are all in tabby weave, with the exception of two fragments in half basket weave. In all cases but two, singles are used for both warp and weft. Whenever both weft selvages are preserved, the fabric was woven in strips no more than 31 cm wide. This indicates the use of a narrow loom. Weaving errors, which occur at least once in most of the objects, indicate that the looms were equipped with heddles. There are no warp selvages, starting borders, corded edges, fringes, etc. Loose edges were enclosed in seams or hems. Most of the weaves are unbalanced or faced, with a dominant warp in every case where it is possible to distinguish between the two thread directions. Finer fabrics are generally more unbalanced than coarser fabrics. The threads in the dominant direction (warp/series 1 in table 1) are generally more tightly spun than the threads in series 2, so it is likely that the dominant direction does in fact correspond to the warp in most, if not all, the fabrics.

Spin directions

Sewing threads are z-spun, S-ply without exception. Embroidery threads are all loosely spun s. In woven fabrics, the spin-direction is conservative in the warp threads, which are z-spun singles with three exceptions, where warps are plied (two of these occur in a girth and one in the strap attached to the red and tan trousers, so the plied warps could be functional). Weft spin direction appears to be more complicated: in 38 cases the wefts are z-spun singles, while in 30 they are s-spun singles. One of the remaining fabrics in the girth has plied wefts in addition to its plied warps. Another is a checked fabric with z-spun brown wefts and s-spun white wefts, and three are fabrics with infrequent and apparently random alternation between z and s-wefts. These are instances where the weaver began using a differently spun skein of weft thread partway through the weaving process. This may actually be a more widespread practice than the data represent, since the majority of individual pieces of fabric, particularly the patches, are small and unlikely to capture alternations occurring over several metres of weaving. As all of these fabrics are warp dominant



Fig. 9: The white selvages of the brown deel. Note also the generous seam allowances, the consistent pairing of selvages with cut edges, and the rough hemming of cut edges with overcast stitching – all features of tailoring that are consistent throughout the assemblage. (Image: Kristen Pearson)

or faced, switching the weft spin would have no visual effect like that seen in spin-patterned twills.

Stitching

There are five types of stitch used in the assemblage, each exclusively in a specific context. Overhand stitch is used to join pieces of felt or leather, cross-knit looping stitch is used to reinforce felt edges and hem cut edges of fabric, running stitch is used to sew woven fabrics, and chain and loose satin stitch are used for embroidery.

Stripes and checks

While most of the fabrics are monochrome, there are a few examples where stripes or checks are created, taking advantage of natural variations in wool colours. One-row-wide horizontal stripes are formed in warp-faced fabrics by alternating colours in the warp, so that on one pass only warps of one colour are visible, and on the next, only warps of the other colour. Vertical stripes are also built into the warp with larger sets of differently coloured warp threads. Horizontal and vertical stripes can be combined in the same piece. A checked pattern is formed when weft stripes are combined with vertical warp stripes in a more balanced tabby. These patterning techniques can be very dramatic or very subtle depending on the range of colours used.

Double/triple warps

Random cases of thread doubling are usually considered a weaving flaw (and a useful one, because they can help distinguish warp and weft and indicate



the use of heddles). These weaving flaws do occur, as described above, but doubled or tripled threads also appear in sets (up to seven pairs of doubled threads in one weft pass) or in a repeating pattern. Sometimes they run the whole length of the fabric, indicating a variation encoded in the warp set-up, but in some cases the stripes occur for only five to ten weft passes. The sets of doubled or tripled warps create a subtle but noticeable variation in texture (fig. 11).

Selvedge marking

The fine fabrics of the brown and tan *deel* were woven with lighter coloured threads in the outermost warps, which has the effect of marking the selvages with a thin stripe (fig. 9). The selvages are not differentiated in any other way. In Medieval western Europe, the selvages of tabby fabrics were frequently reinforced with cords or a sequence of doubled warps in a different colour than the body of the fabric (Crowfoot et al. 2006, 48-49). Researchers have speculated about a possible meaning encoded in the number or colour of selvedge threads, such as fabric quality, workshop or origin, and selvedge marking is associated with workshop rather than household production. It is unclear what the purpose of a selvedge marking could be in the context of the Üzüür Gyalan assemblage. A scrap of plain tan fabric used as a patch on one of the striped bags has a similar white selvedge. It does not match the fabrics of the tan *deel* in thread count, so it is not an offcut of the same piece, but it may represent a scrap taken from a similar garment.

Thread count

Whenever decorative elements are incorporated into the weaving, the weaver set up the pattern entirely by eye, without counting threads. The thread diameter is somewhat inconsistent so this may have ensured a more regular appearance to the final pattern. Stripes and checks, for example, vary in thread count but are of consistent widths when measured.

Embroidery

Three objects feature colourful embroidery with loosely spun wool threads – the “Adidas Boots”, an embroidered saddle blanket, and a small leather bag. All embroidery threads are s-spun, which emphasises their contrast against fabrics faced with z-spun threads.

Colour

Natural variation in wool colour, which can range from white to dark brown or black in Mongolian sheep, goat and yak, was used for aesthetic effects as

described above. For the finest fabrics, wools were assiduously sorted for consistency in colour. Coarser fabrics generally contain threads with mixed light and dark fibres. Sometimes, fibres of different colours were purposefully spun or felted together to create a variegated pattern. The felt bag was made of mixed dark brown and black wools, with light wool scattered over the surface. Several fabrics were also dyed, and it is possible that some of the fabrics that now appear shades of brown were dyed with less stable compounds that have now faded. The most common surviving colour is light red/pink, which may have been more vibrant originally. The only other colour to occur on more than one object is a bright blue, which appears on two objects: the felt shroud and the embroidered saddle blanket. On the felt shroud, designs were applied to the surface primarily in red wool; blue appears as small, bright spots forming the centre bosses of the quatrefoil motifs. Not only was it applied in such a limited area, but it was applied very thinly compared to the red, indicating that it was a rare colour and had to be used sparingly. Dye analysis is ongoing.

Construction of the garments and other objects

Tailoring traditions are closely intertwined with the weaving traditions that produce the fabric to be tailored. In some traditions, woven garments were not tailored, but were used straight from the loom with only minimal modification (Rösel-Mautendorfer 2018). The choice to weave a certain length and width of fabric is made with reference to its intended use. In urban workshop settings in Roman Egypt, tunics were woven to a set of standard sizes for men and women (Morgan 2018). But in contexts where a weaver was producing clothing for her own household, the dimensions of the weaving may correspond to the measurements of known individuals. The loom used and the method of attaching the warp ends also puts limits on the dimensions of the fabric. Portable looms, whether body tensioned or fix tensioned, produce narrow widths of fabric. Garment traditions built around the products of such looms use the narrow strips in regular and efficient ways to construct articles of clothing. The textile tradition of the Rupshu pastoralists in Ladakh, Tibet, described in detail by Monisha Ahmed (2002), provides an excellent case study in a living, mobile pastoralist tradition. In Ladakh, outer garments, blankets, and saddlebags are all constructed from strips of fabric between 25 cm and 35 cm in width. The finer fabric for the outer garments is woven to the length required for a specific person, and garments are constructed using traditional



patterns that make use of the narrow loom-widths, where possible, as well as triangular pieces. Blankets and bags are all made from loom-widths stitched selvedge to selvedge, with three conventional sizes of bags defined by the number of loom-widths used in their construction (see below).

The Üzüür Gyalan wool *deel* and two of the three pairs of trousers (the third is made entirely from patchwork; fig. 7) are constructed from loom-widths and strips that are slightly tapered combined with triangular and trapezoidal pieces. Ahmed does not state whether the triangles used in Ladakhi tailoring are cut in such a way that one selvedge is preserved, but this is frequently the case in the Üzüür Gyalan material.

The three wool *deel* are tailored following the same basic pattern: the A-line body with right-over-left overlapping flaps is built from full and tapered loom-widths arranged vertically and inset with gussets. The triangular shape of the gusset can be pieced together in different ways in order to make use of the available fabric, including offcuts from other textiles. Mismatched offcuts are only used on the hidden inside flaps of the *deel*. Seam allowances are generous – at least 1 cm and up to 2.5 cm – another indication that woven wool fabrics were not of especially high value to the people making the garments. The sleeves are constructed from three tapered strips arranged vertically.

The red *deel* and the brown *deel* are lined in the centre with felt, while the tan *deel* is lined in the centre with sheepskin. Full and tapered loom-widths of coarse woollen fabric are used as a lining around the edges. In the red *deel* and brown *deel*, the loom-widths are arranged horizontally on the bottom edge and vertically along the flaps, which is the most efficient use of the fabric in terms of the sewing time. On the tan *deel*, where the central lining is limited in area by the size of the sheepskins, the lining on the bottom of the *deel* is made from ten rectangles of checked fabric applied vertically. This creates a lining that is 4 cm wider than it would have been if the original strip, which was 23 cm wide from selvedge to selvedge, had been used horizontally.

The trousers are constructed from a single loom-width arranged horizontally and attached to legs made from loom-widths and a crotch made from two triangles. They are perhaps more properly described as one-piece suits, as the top section is equipped with a strap that must have gone over the wearer's shoulder. Similar garments made from silk and described as "underwear" have been found in Khitan-Liao tombs in Inner Mongolia (Watt et al.



Fig. 10: Pile fabric. The function of this textile is unknown, although the plushiness imparted by the long pile suggests a blanket or shawl. The supplementary weft that forms the pile was spun in several segments rather than one continuous yarn, and in a few places the tail end of a segment has come loose and hangs off the selvedge edge (Image: Kristen Pearson)

1997). Experimental reconstruction may shed light on how this unusual garment was worn. Other wool textiles – the saddle bags, the saddle blankets, and the pile textile are made exclusively from loom-widths. In the case of the saddle blankets, the loom widths are stitched over a thick felt base, leaving a "window" for the saddle.

The woven wool fabrics in the Üzüür Gyalan burial appear to have been manufactured in a fairly consistent tradition and applied to the construction of objects in ways that demonstrate their abundance and their familiarity to those working at later stages in the *chaîne opératoire*. The people who constructed garments and other objects for use by the Üzüür Gyalan woman and her community seem to have had access to a regular supply of woven wool fabrics from a single or limited number of sources. They knew what to expect from these woven wool fabrics and created a garment and object crafting tradition around the reliability of those expected sources. Either the textiles were produced in a specialised setting which allowed them to be sold relatively cheaply and on a reliable basis to nomadic pastoralists who did not weave or they were produced in nomadic households.



Fig 11: Pile fabric (detail) (Image: Kristen Pearson)

Towards the identification of a nomadic tradition

While the distinction between household and workshop production of textiles is not always straightforward, certain criteria can be used to suggest one or the other alternative. Household production, whether assessed through the textiles themselves or the tools used to make them, is likely to involve a wide range of non-standardised fabric qualities woven for different functions (Brandenburgh 2010; Øye 2014). In addition, textiles produced in the household might show signs of imperfect planning, particularly if a weaver is attempting a new or only infrequently applied technique. A professional weaver, working on a standardised product, knows exactly how much material to prepare, how much space to leave for this or that motif, etc., whereas a household craftswoman might produce a weaving experimentally or expeditiously and keep the less-than-perfect results. The pile textile (fig. 10 and fig. 11) from Üzüür Gyalan points to this kind of imperfect planning. It was woven in one piece, with a z-spun warp of pink wool and wefts that are sometimes brown, sometimes pink, sometimes z-spun, sometimes s-spun in no discernible pattern. Because this textile is warp dominant, the result is a pink textile with subtle areas of pink-brown shading where the brown weft shows through. The pile is formed with a supplementary weft inserted at intervals between several rows of tabby. It is not knotted; loops are formed by pulling short lengths of the supplementary weft out of the woven matrix and allowing the overspun yarn to ply back on itself. The weaver pulled out rather generous lengths at first, creating a soft, thick pile but, as she approached the end of the weaving, she began to run out of yarn; the loops get smaller and smaller and

are spaced further and further apart. The last 15 cm were woven without any pile. The weaver removed the fabric from the loom, cut it into three equal sections, and stitched the sections together selvedge to selvedge with the last third of the weaving in the middle. Evidently, she was not troubled by her mistake – at least not enough to justify wasting the last 20 cm of warp (fig. 10 and fig. 11).

If the Üzüür Gyalan woven wool textiles were indeed produced in the context of nomadic households, what other evidence might be found? The ways in which mobility shapes a nomadic textile tradition in the present day are instructive as are comparisons drawn between ethnographic and archaeological material. Ahmed's study of Rupshu weaving, previously mentioned in the context of tailoring, provides one example of how a substantial investment in weaving can be integrated with a mobile pastoralist lifeway. A direct comparison between weaving in present-day Tibet and weaving in the Medieval Altai is not suggested here; rather, Ahmed's observations on labour investment, timing, and seasonality may help explain some of the features observed in the Üzüür Gyalan assemblage.

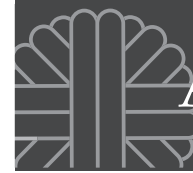
In Ladakh, men and women spin year-round during spare moments, but especially during the winter. In contrast, weaving can only be done in the summer when it is warm enough to work outside. Enough coarse fabric for two small bags or one medium-sized bag can be woven in a single day if the thread has already been spun, whereas larger bags or blankets will take two or three days to complete. The strips of fabric used to construct bags and blankets are always woven as one piece, a labour-saving strategy as it consolidates the process of laying out the warp. Ahmed stresses the fact that woven bags are constantly in demand, that they experience heavy wear requiring reinforcements of felt, and that they are woven quickly and as needed. The two woven saddle bags from Üzüür Gyalan are riddled with weaving errors and have been heavily and not very carefully patched (fig. 12).

In contrast to the coarse fabrics for bags and blankets, Ahmed tells us it takes two to three weeks of work to weave enough of the much finer *snam-bu* fabric for one person's robe. She does not give the exact dimensions but she states that the length of the warp required for a garment can range from 36 to 44 *mtho*, a unit described as the distance between the ends of the middle fingers and thumb when the thumb is outstretched. The width is about 30 cm. If the *mtho* is estimated at 20 cm, then between 7.2 m and 8.8 m of warp must be laid for one robe (2.16 to 2.64 square metres). She states further that the *snam-bu* is woven in lengths called *bubs*, and



Object	Function and location of fabric	Material	Binding	Thread count (weft or series 1/warp or series 2)	Thread structure (weft or series 1/warp or series 2)	Thread diameter (weft or series 1/warp or series 2)
Brown <i>Deel</i> (Figure 6)	Brown outer fabric	Wool	Tabby	10x20	z&s/z	0.2-0.3/0.2-0.3
	Brown outer fabric (inset: inner flap)	Wool	Tabby	6x9	s/z	0.4-0.6/0.7-0.9
	Brown outer fabric (inset: inner flap)	Wool	Tabby	7x12	s/z	0.4-0.6/0.4-0.6
	Brown outer fabric (inset: sleeve)	Wool	Tabby	7x20	s/z	0.4/0.4
	White lining	Wool	Tabby	6/9-13	s/z	0.5-1.2/0.5-1.2
	Checkered lining (inset)	Wool	Tabby	9x11	s/z	0.3-0.4/0.5-0.8
	Red lining (inset)/patch (sleeve)	Wool	Tabby	7/11-14	s/z	0.3-0.7/0.4-0.8
	Trim/patch (collar)	Cotton	Tabby	10x11	s/s	0.2-1.0/0.2-1.0
	Trim/patch (collar)	Wool	Tabby	12x16	s/z	0.2-0.3/0.2-0.3
	Patch (breast)	Wool	Tabby	7x11	s/z	0.2-0.9/0.2-0.9
	Patch (body)	Wool	Tabby	12x13	z/z	0.1-0.3/0.1-0.3
	Trim/patch (collar)	Cotton	Tabby	7x8	z/z	0.2-0.8/0.2-0.8
	Patch (lining, hem)	Wool	Tabby	10x23	s/z	0.3-0.4/0.3-0.4
Red <i>Deel</i> (Figure 4)	Red outer fabric	Wool	Tabby	13x34	s/z	0.1-0.2/0.2-0.3
	White lining	Wool	Tabby	6-8/16-20	s/z	0.5-0.7/0.5-0.7
Tan <i>Deel</i> (Figure 5)	Tan outer fabric	Wool	Tabby	7x21	s/z	0.2/0.3-0.4
	Checkered lining	Wool	Tabby	5x10	z&s/z	0.6-1.2/0.6-1.2
	Red trim (collar and sleeves)	Wool	Tabby	9x26	z/z	0.2/0.3
	White lining	Wool	Tabby	6x14	z/z	0.8-1.2/0.8-1.2
	Tan outer fabric (inset: body)	Wool	Tabby	11x33	z/z	0.2/0.2
	Patch (front)	Cotton	Tabby	10x12	s/s	0.3-1.2/0.3-1.0
	Patch (back hem)	Wool	Tabby	11x33	z/z	0.2-0.3
Hide <i>Deel</i>	Orange patch (body)	Wool	Tabby	5x9	z/z	0.5-0.8/0.5-0.8
	Orange patch (body)	Wool	Tabby	14x18	s/z	0.5/0.5-1.0
	Brown patch (body)	Wool	Tabby	6x7	s/z	0.4-0.6/0.4-0.6
	Tan patch (body)	Wool	Tabby	9x22	z/z	0.3-0.4/0.3-0.4
Embroidered Saddle Blanket (Figures 1, 2)	Red facing	Wool	Tabby	8x12	z/z	0.4-0.5/0.4-0.5
	Brown facing	Wool	Tabby	10x11	s/z	0.3-0.4/0.4-0.6
Saddle Blanket	Red facing	Wool	Tabby	7x13	z/z	0.4-0.5/0.5
	Red facing	Wool	Tabby	8x12	s/z	0.4-0.5/0.5
	White backing	Wool	Tabby	8x12	s/z	0.4-0.6/0.4-0.6
	(?) dark red associated fragment	Wool	Tabby	7x14	z/z	0.5/0.6
Pile Textile (Figures 10, 11)	--	Wool	Tabby w/pile	3x8	z&s/z	1.5-2.0/0.9-1.2
Striped Bag (1)	--	Wool	Tabby	5x18	z/z	0.7-1.3/0.4-0.6
	--	Wool	Tabby	7x22	z/z	0.4/0.4

Table 1: Technical data of the textiles from Üzüür Gyalan



Object	Function and location of fabric	Material	Binding	Thread count (weft or series 1/warp or series 2)	Thread structure (weft or series 1/warp or series 2)	Thread diameter (weft or series 1/warp or series 2)
Striped Bag (1)	--	Wool	Tabby	6x18	z/z	0.4/0.4
	--	Wool	Tabby	5x18	z/z	0.5-0.6/0.4-0.5
	Patch	Wool	Half-basket	3x12	z/z	1.0-1.1/0.6
	Patch	Wool	Tabby	6x17	s/z	0.4-0.6/0.4-0.6
Striped Bag (2)	--	Wool	Tabby	4x10	z/z	1.0-1.2/0.9-1.9
Red and Tan Trousers (Figure 8)	Tan outer fabric	Wool	Tabby	8x24	z/z	0.2/0.4
	Red outer fabric	Wool	Tabby	9x23	z/z	0.4-0.5/0.4/0.5
	Tan patch (leg)	Wool	Tabby	7x18	z/z	0.2/0.4
	Tan patch (leg)	Wool	Tabby	8x20	s/z	0.2/0.4
	Red patch (body)	Wool	Tabby	12x16	z/z	0.3-0.4/0.3-0.4
	Strap	Wool	Half-basket	8x11	Z(?) / S(2z)	0.4/0.5
	Strap	Wool	Tabby	7x14	z/z	0.5-0.8/0.5-0.8
Tan and Brown Trousers	Tan outer fabric (legs)	Wool	Tabby	10x18	z&s/z	0.4-0.5/0.4-0.5
	Brown outer fabric (body)	Wool	Tabby	10x31	s/z	0.2-0.3/0.2-0.3
Patchwork Trousers (Figure 7)	Patch	Wool	Tabby	9x24	z/z	0.2-0.4/0.2-0.4
	Patch	Wool	Tabby	9x19	z/z	0.3-0.4/0.3-0.4
	Patch	Wool	Tabby	8x19	z/z	0.2-0.4/0.2-0.4
	Patch	Wool	Tabby	8x10	s/z	0.3-0.4/0.3-0.4
	Patch	Wool	Tabby	10x27	s/z	0.3-0.6/0.3-0.6
	Patch	Wool	Tabby	10x23	s/z	0.2-0.3/0.2-0.3
	Patch	Wool	Tabby	9x21	z/z	0.2-0.4/0.2-0.4
	Patch	Wool	Tabby	7x10	s/z	0.3-0.6/0.3-0.6
	Patch	Wool	Tabby	9x26	z/z	0.3-0.5/0.3-0.5
	Patch	Wool	Tabby	9x22	z/z	0.2-0.4/0.2-0.4
	Patch	Wool	Tabby	5x11	s/z	0.9-1.2/0.9-1.2
	Patch	Wool	Tabby	9x20	z/z	0.4/0.4
	Patch	Wool	Tabby	7x10	z/z	0.5-0.8/0.5-0.8
	Patch	Wool	Tabby	5x11	s/z	0.8-1.2/0.8-1.2
	Patch	Wool	Tabby	7x14	z/z	0.3-0.4/0.3-0.4
	Patch	Wool	Tabby	9x20	z/z	0.4-0.6/0.4-0.6
	Patch	Wool	Tabby	5x19	z/z	0.3-0.4/0.3-0.4
	Patch	Wool	Tabby	9x23	z/z	0.3-0.4/0.3-0.4
	Patch	Wool	Tabby	8x21	z/z	0.3-0.4/0.3-0.4
		Patch	Wool	Tabby	8x12	s/z
	Patch	Wool	Tabby	17x18	s/z	0.4-0.7-0.4-0.7
	Patch	Wool	Tabby	10x28	s/z	0.3-0.4/0.3-0.4
	Patch	Wool	Tabby	8x14	z/z	0.7/0.7
Felt and Fur Hat	Lining	Cotton	Tabby	12/13	s/s	0.2-0.6/0.2-0.6
Girth (Figure 1)	--	Wool	Tabby	3x8	S(2z)/S(2z)	2.0/2.0
	--	Wool	Tabby	4x6	z/S(2z)	0.8/1.2-1.5
	--	Wool	Tabby	5x14	z/z	0.5/0.7-0.9
Headdress	--	Cotton	Tabby	8x8	z/z	0.2-0.6/0.2-0.6
Patchwork hat	Patch	Cotton	Tabby	15x15	s/z	0.5/0.5
	Patch	Wool	Tabby	18x21	z/z	0.2-0.3/-2-0.3

Table 1 (continued): Technical data of the textiles from Üzüür Gyalan



that two or more *bubs* may be necessary to produce a garment for a larger person. She does not record how the length of a *bub* is determined or if it can vary.

The tapering and gussets of the Üzüür Gyalan *deel* make it difficult to provide a precise measure of the length of the fabric strips involved (as with the trousers, experimental reconstructions would be a helpful next step) but it is estimated that about 10 m of 22 cm wide fabric (2.2 square meters) were used in the outer construction of the tan *deel*.

Ahmed does not give full thread counts for the *snam-bu*, but she tells us that 160 plied threads are used for the warp. This would correspond to 11.2 singles per cm, significantly coarser than the outer fabrics of the Üzüür Gyalan *deel*. Without experimental data and more accurate measurements of the quantity of fabric involved, it would be premature to speculate on the time required to weave the fabric for the *deel* but it can be assumed that it would take longer than the two to three weeks taken to weave the *snam-bu*. This provides a possible explanation for the use of *bubs*, that is, lengths of fabric that are shorter than that ultimately required for a single garment. As noted earlier in relation to the bags, it is more efficient to warp a loom once and weave a longer strip of fabric than to warp a loom twice and weave two shorter strips. This is why, in Rupshu, coarse fabrics are woven in maximally long units. What is not needed immediately might be stored for future use, just as felt is made all at once, stored, and used as needed. Indeed, woven fabric is far more efficient to store and transport than unprocessed wool. This might provide an additional incentive for mobile pastoralists to convert wool into coarse, multipurpose fabrics without first identifying a specific use for them. Note that a coarse checked fabric was used along with sheepskin to line the tan *deel* which was 4 cm short of the width required to complete the lining. It is clear that it had not been woven specifically for that *deel*. One can imagine the frustration of the craftswoman upon realising that the available fabric would not be sufficient. Rather than weave another length of fabric 27 cm wide – entailing at least a day's work if she had the thread on hand, and several days if not – she found a way to make do with what she already had even at a minor cost to efficiency.

Fine, time-consuming fabrics are woven not in maximally long units but in the minimally long unit required for a specific individual's garment. If this minimum unit is too long, the fabric is woven in the even smaller unit of a *bub*.

Üzüür Gyalan's brown *deel* was woven in less-than-maximal units with the outer fabric consisting of at least two, possibly three nearly identical fabrics. This

can be determined only because the damage to the lining permits a view of many of the selvages in the upper, more intensively tailored section of the *deel*. One selvedge is plain brown, while several others are marked with white stripes. Selvages with eight white threads and selvages with ten white threads are visible.

The bottom portion of the *deel*'s felt lining is intact, making it impossible to see both selvages on any full width of fabric. But the presence of three different selvedge patterns indicates that the fine, dark brown fabric could not have been woven in just one piece. To borrow the Rupshu terminology, it was woven in at least two *bubs*.

One possible explanation could be the need to fit weaving into mobile habitation cycles. Narrow body tensioned and fixed tension looms are portable in the sense that they are not bulky or heavy, and an unfinished weaving can be carefully rolled for storage overnight. However, transporting an unfinished weaving on the loom is likely to result in inconvenient tangles and snags at best and irreparable damage at worst. Huang (2014) gives an account of a Qash-qua'i nomad woman in Iran who had attempted to transport an unfinished weaving to a new campsite: "She wove half the carpet in winter pastures, dismantled the loom, rolled up the weaving still attached to the end beams and the heddle rod (*kujay*), and rebuilt the loom after migrating to summer pastures. 'I'll never make that mistake again' she reflected as she felt the ridges and uneven edges" (Huang 2014, 80).

The Üzüür Gyalan textiles and the Rupshu textiles are not very similar from a technical perspective. Rupshu threads for weaving are all plied, and the weave used is an extended tabby with doubled warps. *Snam-bu* is evidently coarser than the fabric used in the *deel* outer layers, and it is also fulled and napped. Apart from the use of narrow looms, the Üzüür Gyalan and Rupshu textiles bear only superficial resemblance to each other; rather, it is the way the fabrics are used in the construction of garments – and the decision-making processes surrounding what to weave and how much – that suggest an underlying similarity between the two traditions.

In this paper, we have argued that the wool textiles from Üzüür Gyalan represent a weaving tradition based in mobile households. Much work remains to develop this hypothesis further and to consider its ramifications for other time periods in the long history of the steppe. We hope that this study will encourage scholars working in the region to take a closer look at textile finds from old and new excavations alike. Archaeological research in Mongolia over the last



two decades has pushed back against essentialising narratives that described mobile pastoralism as a static and marginal way of life. Textiles have a role to play as these important arguments continue to unfold, deepening our understanding of nomadic lifeways, political trajectories, and the economies of the past because “mobile pastoralist” should also modify economies here.

Mongolian summary

Товчлол: Энэхүү өгүүлэлд Монгол улсын Алтайн уулсын Үзүүр гялаан хэмээх газраас олдсон 10 дугаар зууны үед хамаарах хадны оршуулгаас илрүүлсэн даавуу эдлэлүүдэд хийсэн судалгааны үр дүнг танилцуулж байна. Уг хадны оршуулгад бүрэн тоног хэрэгсэл бүхий адуу дагалдуулан тавьснаас гадна, огт хөндөгдөөгүй анхны байрлалаараа хадгалагдаж үлджээ. Тиймээс эндээс гарсан органик болон органик бус иж бүрэн олдворууд нь судалгааны өндөр ач холбогдолтой төдийгүй төрөл бүрийн нарийвчилсан судалгаа хийх ховор боломжийг судлаачдад олгож буй юм.

Маш сайн хадгалагдсан нэхмэл ноосон даавуу эдлэлийн баялаг цуглуулга нь бусад хадны оршуулгаас олдсоор байгаа торго, нэхий, эсгий хувцас хэрэглэлээс онцлог ялгаатай. Цуглуулгын тодорхой онцлог шинж чанарууд, тухайлбал, ноосон нэхмэлийн элбэг байдал, тэдгээрийн техникийн арга зохицол нь тусгай мэргэшсэн үйлдвэрлэл гэхээсээ илүү гэр ахуйн урлал, орон нутгийн үйлчдийн бүтээл болохыг харуулж байна. Бид бэлчээрийн мал аж ахуй эрхлэгчдийн үйлдвэрлэлийн цуглуулгын шинж төрхийнх нь хувьд өнөөгийн Түвэдийн Ладах мужийн нүүдэлчдийн нэхмэлийн уламжлалтай харьцуулан авч үзлээ.

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Bibliography

- Ahrens, B., Piezonka, H., & Nomguunsuren, G. (2015) Buried with His Bow and Arrows: The Exceptional Cave Burial of the 14th Century Warrior at Tsagaan Khad Mountain, Mongolia. *Ancient cultures of the northern area of China, Mongolia and Baikalian Siberia*, 3: *Historical Period*, 683-692.
- Ahmed, M. (2002) *Living fabric: Weaving among the nomads of Ladakh Himalaya*. Boulder: Shambhala Publications.
- Баярсайхан, Ж. & Энхбат Г. (2017) Хадан гэрийн соёл. Улаанбаатар хот.
- Баярсайхан Ж & Түвшинжаргал Т. (2016) Агуйт цахир уулын Ямаатын агуйн оршуулга. Музей судлал. Том XIV. Fasciculus - 14. Тал 113-124. УБ.
- Bemmann, J. (ed.) (2012) *Steppenkrieger – Reiternomaden des 7.-14. Jahrhunderts aus der Mongolei* [Steppe Warriors – Nomads on Horseback, 7th to 14th Century Mongolia]. Darmstadt.
- Brandenburgh, C. R. (2010). Early medieval textile remains from settlements in the Netherlands. An evaluation of textile production. *Journal of Archaeology in the Low Countries*, 2(1), 41-79.
- Buun, S. (2010) *Nomadic felts*. London: British Museum.
- Crowfoot, E., Pritchard, F., & Staniland, K. (2006) *Textiles and Clothing c. 1150–c. 1450, Medieval Finds from Excavations in London: 4*. Woodbridge: Boydell Press.
- Dale, S. F. (2009) Silk road, cotton road or.... Indo-Chinese trade in Pre-European times. *Modern Asian Studies*, 43, 1, 79-88.
- Эрдэнэбат, У. & Амартүвшин, Ч. (2014) дугуй цахирын хадны оршуулга. Талын морьтон дайчдын өв соёл. VII–XIV зууны Монголын хадны оршуулгын шилмэл хэрэглэгдэхүүн. Шинжлэх Ухааны Академи Археологийн хүрээлэн. Улаанбаатар.
- Huang, J. (2014) *Tribeswomen of Iran: Weaving memories among Qashqa'i nomads*. London: Taurus Academic Studies.
- Kazato, M. (2012) The Felt Making Process and Social Relationships in Mongolia Using The Ehe Esgii (Mother Felt) *Proceedings of the 10th International Congress of Mongolists, Volume III Mongolia's Economy and Politics*.
- Krody, S. B., Atlihan, S., Denny, W. B. & Hart, K. (2018) *A nomad's art: Kilims of Anatolia*. Washington D.C.: Textile Museum.
- Morgan, F. P. (2018) *Dress and Personal Appearance in Late Antiquity: The Clothing of the Middle and Lower Classes*. Leiden: Brill.
- Мөнхбаяр, Ч., Пүрэвдорж, Г., Бямбасүрэн, Х., Сүхбаатар, Б. “ Үзүүр Гялангийн Түрэг хадны оршуулгын малтлага судалгааны урьдчилсан үр дүнгээс. Мөнххайрхан, Булган гол - Их онгогийн байгалийн цогцолборт газар, // эрдэм



- шинжилгээний бага хурлын эмхэтгэл//, тал 164-187.
Ховд, Мөнххайрхан сум, 2016 он.
- Oka, I. (2009) Three Mongolian coats from the 13th–14th century grave at Bukhiin Khoshuu. *Current Archaeological Research in Mongolia*. Bonn: Bonn University Press, 486-503.
- Onar, V., Küçük, S., Olgun, E., Dilek, V., Enkhbat, G. & Taşağil, A. (2019) *Horse sacrifice in the Üzüür Gyalan Tomb: An Altai Mountain Kurgan*, *Art - Sanat*, 11, 275-298. <https://doi.org/10.26650/artsanat.2019.11.0013>
- Øye, I. (2015). *Technology and textile production from the Viking age and the Middle Ages: Norwegian cases*. In: A. Ling Huang and C. Jahnke (eds). *Textiles and the medieval economy: production, trade, and consumption of textiles, 8th–16th centuries*, Oxford: Oxbow Books, 41-63.
- Rösel-Mautendorfer, H. (2018) *Creativity in Bronze Age Tailoring: Women’s Blouses from Denmark*. *Creativity in the Bronze Age: Understanding Innovation in Pottery, Textile, and Metalwork Production*. Cambridge: Cambridge University Press, 153-160.
- Rudenko, S. I. (1970) *Frozen tombs of Siberia: the Pazyryk burials of Iron Age horsemen* (M.W. Thompson, Trans.) Berkeley: University of California Press.
- Pearson, K. (2018) Object Spotlight: The Adidas Boots of Uzuur Gyalan. *Nomadic Heritage Studies Museum Nationale Mongoli*. Tomus XIX-II, Fasc 1-24, 53-56.
- Peters, A. H. (2012) Identity, innovation and textile exchange practices at the Paracas Necropolis, 2000 BP. *Textiles and Politics: Textile Society of America 13th Biennial Symposium Proceedings*, Washington, DC, September 18 - September 22, 2012.
- Portisch, A.O. (2011) The Craft of Skillful Learning: Kazakh Women’s Everyday Craft Practices in Western Mongolia. *Making Knowledge: Explorations of the Indissoluble Relation Between Mind, Body and Environment*, 59-75.
- Төрбат Ц. & Эрдэнэбат У. (eds) (2014) Талын морьтон дайчдын өв соёл. VII–XIV зууны Монголын хадны оршуулгын шилмэл хэрэглэгдэхүүн. Шинжлэх Ухааны Академи Археологийн хүрээлэн. Улаанбаатар.
- Vainshtein, S. (1980) *Nomads of South Siberia. The pastoral economies of Tuva*. Cambridge: Cambridge University Press.
- Watt, J. C., Wardwell, A. E. & Rossabi, M. (1997) *When silk was gold: Central Asian and Chinese textiles*. New York: Metropolitan Museum of Art.
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