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Archaeology

Textiles of Early Kurgan Culture in Georgia

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The Georgian National Museum preserves ancient textiles samples, which date back to the 3rd millennium BC and are found in the Kurgans of Bedeni Culture. The paper presents the results of microscopic examination of five tissues found in the Bedeni Kurgans N5, N10 and Ananauri N3, the technique of their production and the characteristics of the textile production related tools discovered on the sites of the same period. It seems that the 3rd millennium BC was a period of great innovations. Natural conditions and the development of sheep farming contributed the development of the textile production. Samples of woolen cloth found in the Bedeni and Ananauri Kurgans make us think that the society of that time was quite familiar with the technology of making woolen cloth. During a period both thin good quality as well as coarser textiles were produced and used. For the research of the ancient textile production it is important to study the Bronze Age artifacts, found in the South Caucasus, in particular in Georgia. Many issues still deserve in-depth research, but one thing is clear: among a number of large regions of ancient world, Georgia undoubtedly occupied an honorary place as one of the oldest spots of textile production. © *2022 Bull. Georg. Natl. Acad. Sci.*

Textile, fiber

Prehistoric fabric and a large part of knitting tools related to textile activities, due to their organic nature, are among the rarest of finds. Archaeological fabric can boldly be considered as evidence of one of the most important industrial activities in ancient society. It is safe to say that fabric is a clear indicator of cultural tradition [1]. By studying the ancient fabric, we can get an idea of the various traditions or trends established over a period of time, as well as the development in the fields of everyday life and domestic industry such as production of fabrics. The Georgian National Museum preserves ancient fabric specimens dating back to the second half of the 3rd millennium BC, which are found in the Kurgans of Bedeni Culture. The article presents the results of microscopic examination of 5 tissues found in the Bedeni Kurgans N5, N10 and Ananauri N3, the technique of their production and the characteristics of the tools.

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Textile-Related Tools

Many prehistoric tools related to textile activities have been found on the territory of Georgia. The discovery of such a large number of fabric-making tools suggests that fabric production must have been quite diverse and highly productive. Of interest in this regard are the Eneolithic bone needles and large needles found on the Arukhlo settlement, the bone needles, large needles, scapulas found on the Khramis Didi Gora [2], large number of clay whorls, awls, needles, large needles at Samele Klde and Berikldeebi [3: 61-75]. The whorls found in Samshvilde [4: 83-91], the whorls found in the Eneolithic layers of Kvemo Kartli monuments [5:21-54], as well as the whorls, needles, large needles found in tombs [6; 7:36-42]. The Early Bronze Age is represented on the territory of Georgia by the Kura-Araxes or referred as Transcaucasian Archeological Culture, and at its final stage - the so-called Early Kurgan Culture, which is divided into two groups based on material obtained from Kurgan tombs: Early Martkopi and late Bedeni. The date of appearance of the earliest tombs can be determined by dating to the middle of the 3rd millennium BC. The Bedeni stage dates back to the second half of the same millennium and may date back to the beginning of the 2nd millennium BC. Interestingly, before the Bronze Age, remnants of ancient fabric were mostly found in the form of individual fragments. In the hills of Bedeni Culture, the situation has changed dramatically, and the amount of fabric and the size (large pieces of fabric) has increased dramatically. For example, 12 units of fabric fragments were found in the Ananauri N3 Kurgan (Inv.No.10-2016:24, artistic embroidery was revealed on the discovered fabric, 5 units of yarn fragments [8:7-8]. Various types of cloth and rope were found in Bedeni N5 Kurgan, pieces of land with imprints of cloth and fabric, remains of cloth in Bedeni N10 Kurgan were dark burgundy, gray and white, a large bundle of woolen cloth (tool) woven on a loom, placed in a wicker basket [9:32-133].

In order to determine the fibrous composition of fabrics found in Bedeni N5, N10 and Ananauri N3 Kurgan tombs, five examples were examined with a polarizing microscope. The results of examination show that fragments of the studied fabrics are wool woven from natural wool yarn. The thickness/diameter of wool fiber in the studied units varies from 0.001-0.3 mm, and the thickness/ diameter of yarn up to 0.3-1 mm. S-weaving of yarn twisting was observed in all studied tissues. Fabrics are distinguished from each other by color; they are beige-brown, blackish, brownish and brownish-radish.

Steps for Creating Textile Product

It is generally known that weaving and related activities took longer than food preparation and pottery combined. Various studies have shown that 60 kilograms of wool fibers take about 2 hours to make, and fine wool fabric – up to 94 hours [10]. The stages of fabric production are confirmed by the remains of wood spindles and spindle whorls found in Bedeni burial site [11:13-22]. Unfortunately, spindles (due to the poor durability of wood material) have not reached us, but we find a fairly large number of spindle whorls that have different shapes, sizes and weights. Interestingly, the spindle whorl determines the quality of the yarn. The spindle whorl weight activates the circulation of the spindle and vice versa. The weight of the spindle whorl determines the quality of the yarn and its thickness. Depending on the spindle whorl, the circulation of the spindle is active or passive. With a heavy whorl, the yarn on the thimble is tightened and called more active, while light spinning is the opposite. If it is heavy, the spin is more active and the twist is heavy, while if it is light and small it is vice versa. The characteristics of the attached thread depend on the size of the whorl, the diameter of the spindle and the whorl. A lighter spindle (less than 10 gm) can spin a very thin thread; a thicker thread is obtained with a heavier spindle [12]. Also important is the

fact that the thinner the thread, the lighter the spindle on it and the longer it takes to spin it. We have studied the whorls (size, weight) found in the Berikldeebi and Kvatskhela settlements, calculated the approximate circumference of the thickened part of the spindle and the possible thickness/ diameter of the thread. The thickness/diameter of all six fabric yarns we studied is consistent with the spindles found at the Berikldeebi settlement of the contemporaneous period of fabric formation.

It is also worth mentioning the fact that from knitting tools mainly the spindle, loom weight and scapula can be unconditionally attributed to fabric making tools. Considering needles, large needles, awls, and points as fabric tools requires further study [13:149]. It is noteworthy here that loom weights are not found much in the Enelolithic, Early Bronze Age settlements and tombs found on the territory of Georgia.

The fact that there are no loom weights can be explained in different ways.

Targeted fundamental studies of textile activities do not exist to date; no relevant research on archaeologically proven textiles has taken place, so it may not have been possible to correctly identify the loom weights.

Different method of weaving, for example, the weaving hook may have been used.

Spindles may have been used with a double function, used for both weaving and as loom weights. The spindles we have studied suggest that they could freely function as loom weights. In this case as well (like whorls) there is a connection between the diameter of the thread and the weight of the loom weights. For example, for stretching ≤0.3 mm yarn requires 10 gm of loom weight, 0.3-0.4 mm yarn requires 15-20 gm of loom weight, 0.4-0.6 mm thread requires 26-28 gm of loom weight, and 0.8-1.0 mm yarn requires 40 gm loom weight [14;15:222]. According to the data (dimensions, weight), the spindles could freely perform the function of loom weights, their weights are in accordance with the thickness/diameter of the yarn used to make all five fabrics we studied.

Conclusion

The fragments of the fabric we studied are made from wool woven from natural yarn. In the studied items, the thickness/diameter of the yarn varies from 0.001-0.3 mm, and the thickness/diameter of the thread is 0.2-1.0 mm. The fabrics have only S-weaving of thread spinning. Fabrics are distinguished from each other by color. It seems that the 3rd millennium BC is a period of great innovation in textiles production. Natural conditions and the development of cattle breeding contributed to the spread of herding, which in turn allowed the development of the textile production. Samples of woolen cloth found in the Bedeni and Ananauri Kurgans make us think that the society of that time was quite familiar with the technology of making woolen cloth. During this period, both thin good-quality as well as coarser fabric were produced and used. It should be noted that in the territory of Georgia, in Ananauri N3 Kurgan, we found decorative fabrics for the first time: additional weaving threads, top decoration of net threads, a piece of fabric woven and dyed on a weaving loom (Ananauri N3 Big Kurgan. Inv.N10-2016:24). Early Bronze Age settlements were found to contain bone spindle whorls weighing less than 10 gm, indicating the high development of weaving techniques in the early Bronze Age.

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არქეოლოგია

ადრეული ყორღანების კულტურის ქსოვილები საქართველოში

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საქართველოს ეროვნულ მუზეუმში დაცულია უძველესი ქსოვილის ნიმუშები, რომლებიც ძვ.წ. III ათასწლეულით თარიღდება და ბედენური კულტურის ყორღანულ სამარხებშია აღმოჩენილი. სტატიაში წარმოდგენილია ბედენის N5, N10 და ანანაურის N3 ყორღანულ სამარხებში აღმოჩენილი 5 ქსოვილის მიკროსკოპული კვლევის შედეგები, მათი დამზადების ტექნიკა და ამ პერიოდის სხვადასხვა ძეგლზე გამოვლენილი საფეიქრო საქმიანობასთან დაკავშირებული ხელსაწყოების მახასიათებლები. როგორც ჩანს, ძვ.წ. III ათასწლეული არის პერიოდი, როდესაც აღინიშნება დიდი ინოვაციები. ბუნებრივმა პირობებმა და მეცხვარეობის გავრცელებამ ხელი შეუწყო საფეიქრო საქმის განვითარებას. ბედენის და ანანაურის ყორღანებში აღმოჩენილი შალის ქსოვილის ნიმუშები გვაფიქრებინებს, რომ იმდროინდელი საზოგადოება საკმაოდ კარგად იცნობდა მატყლიდან შალის ქსოვილის დამზადების ტექნოლოგიას. ამ პერიოდში იწარმოებოდა და იხმარებოდა როგორც თხელი კარგი ხარისხის, ასევე უფრო უხეში ქსოვილიც. უძველესი საფეიქრო საქმიანობის შესწავლისათვის მნიშვნელოვანია სამხრეთ კავკასიაში, კერძოდ კი, საქართველოს ტერიტორიაზე აღმოჩენილი ბრინჯაოს ხანის არტეფაქტების კვლევა. მართალია, ბევრი საკითხი ჯერ კიდევ საჭიროებს სიღრმისეულ შესწავლას, მაგრამ ერთი რამ აშკარაა – საქართველო უთუოდ იკავებს საპატიო ადგილს, როგორც ქსოვილის წარმოების ერთ-ერთი უძველესი კერა.

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