

THIN THREADS of Pre-Columbian Connections between the Old and New Worlds

N. V. POLOSMAK

Material objects can travel around the world from their places of origin in ways beyond our comprehension. It is not given to us to understand the logic of these migrations when it comes to individual unique objects, e.g., a sword from the Carolingian era found in the Baraba forest-steppe or a silver emblem of the Pergamon school discovered in a Xiongnu tomb in the north of Mongolia. There is an unsolved mystery behind each of these finds. One such mystery is associated with fragments of black fabric found in an ancient royal burial of the Pazyryk culture in the Altai Mountains. The dye used to color this textile is obtained from a plant growing in the other hemisphere, i.e., in South and Central America.

"A new and correct map of the world laid down according to the newest discoveries and from the most exact observations." Adapted from: H. Moll, cartographer. London, 1732. <https://www.loc.gov/item/2017585674/>

On the left is a Phoenician ship carved into the front of a sarcophagus from Sidon, 2nd century AD. © CC BY-SA 3.0/NMB

On the right is a flowering campeachy tree. © CC BY-NC-SA 2.0/Karen

Natalia V. POLOSMAK, Corresponding Member of the Russian Academy of Sciences, Dr. Sci. (History); Chief Researcher, Department of Paleometal Archaeology, Institute of Archaeology and Ethnography, Siberian Branch, Russian Academy of Sciences (Novosibirsk). Winner of the State Prize of the Russian Federation (2004), National Heritage Award (2006), and Second Shanghai Archaeological Forum in the nomination "Archaeological Discoveries" (2015). Author and coauthor of over 300 research papers

Key words: Pazyryk culture, Gorny Altai, the Second Bashadar mound, textiles, dyes, hematein, Central and South America, Phoenicians

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Fragment of a woolen skirt from the Second Pazyryk Mound. Collection no. 1684-244, 245. Hermitage

Felt mirror cover and woven cord-like woolen belt from Ak-Alakha-3 mound 1. Museum of the Institute of Archaeology and Ethnography, SB RAS

The mystery of blue sandalwood

The objects of research were samples of well-preserved textiles from intact burials of the Ukok Plateau in the Altai Mountains, discovered by Novosibirsk archaeologists in the 1990s (from the Novosibirsk Museum of the History and Culture of the Peoples of Siberia and the Far East, Institute of Archaeology and Ethnography, Siberian Branch, Russian Academy of Sciences (IAET SB RAS)), and from the compromised Pazyryk and Bashadar burial mounds, looted in ancient times, also in the Altai Mountains (from the collection of the St. Petersburg State Hermitage Museum), which were studied in the mid-20th century.

The Pazyryk textiles included clothing items (skirts and trousers), numerous fragments of woolen fabric, cord-like belts and braids woven from woolen threads, and felt items (helmets, headdresses, leggings, thigh-boots, saddle covers, etc.). The beautiful examples of clothing found in the Pazyryk burial mounds were sewn mainly from imported fabrics.

A study of the combinations of dyes showed that these fabrics could have been manufactured in the Eastern Mediterranean.

The ethnographic collection of the IAET SB RAS included ready-made clothes as well as various local textile items made for religious purposes from imported fabrics, which the Khanty and Mansi received in exchange for furs. Among these items, there were a cloth caftan found in a Mansi sacred chest of Mir-susne-hum, an intermediary between the living and the dead, and miniature trousers of a Khanty patron spirit, which were made from imported woolen fabric.

Since the study involved ethnographic material, researchers decided to expand the list of dyes for analysis as well as their geography. After all, in the 18th century, people used much more of different natural dyes than in antiquity, and the Russian Empire imported them extensively from England, Holland, and Germany (Zakharov, 2005). So the textile samples were analyzed at the Laboratory of Physical Research Methods, Institute of Organic Chemistry, SB RAS (Novosibirsk), for the presence of all known natural organic

dyes that were widely used before the invention of synthetic ones (Karpova, 2007).

One of the dyes found in the textile samples from the ethnographic collection turned out to be hematein, a dye known in Europe since the times of the conquistadors and still popular today. Its origin is associated with Central and South America. There was nothing surprising about it. What indeed was stunning is that it proved to be fully identical to a previously unidentified dye on a fragment of woolen fabric from the Second Bashadar Mound, which is attributed to the Pazyryk culture. One would not even have considered hematein, a dye from the *campeachy tree* (*Haematoxylum campechianum*), which grows in South and Central America, for such an ancient sample.

“Daring course”*

The Pazyryk culture never ceases to amaze us: How could a burial on a Eurasian territory, i.e., in the Altai Mountains, a burial dating back to the 5th century BC, contain fabric dyed with a substance that had originated in the American continent?

It is believed that the dyeing properties of the campeachy tree (or logwood tree) were discovered by the conquistadors during the takeover of America. However, it was the local people who had known about the dyeing properties of this plant and from whom the Spaniards learned about the valuable wood.

The people of South America used a variety of dyes of animal, plant, and mineral origin, including for dyeing textiles. This is evidenced by ancient colored textiles, of which the most magnificent ones were discovered in the south of the Peruvian coast. Thus, on the coast of Paracas, in a necropolis at a site attributed to the Chavin culture site (400–100 BC), archaeologists found unparalleled masterpieces crafted by local weavers. In the production of textiles, they used an extraordinarily wide range of colors, comprising 150 primary colors and secondary shades (Galich, 1990)

This caftan, dyed with indigo and hematein, played the role of clothing for a patron spirit of the Mansi. Early 18th century. Collected by I. N. Gemuyev and A. V. Baulo. Museum of the Institute of Archaeology and Ethnography, SB RAS

Trousers of a patron spirit of the Khanty. The bright red half is dyed with carminic acid; the black one, with hematein. Second half of the 19th century. Collected by A. V. Baulo. Museum of the Institute of Archaeology and Ethnography, SB RAS

* From the poem *The Captains* by Nilolay Gumilev



It would be a ridiculous and unwarranted presumption on our part if we imagined that we were more energetic or more intelligent than the men of the past – our material knowledge has increased, but not our intelligence.

Carl Jung. *Wandlungen und Symbole der Libido*. 1912

Archaeology is remarkable in that the results of many studies could have never been predicted. Sometimes a discovery is due to a mere coincidence, leading to an event that could not have happened before.

Such a happy coincidence was an integrative interdisciplinary project during which, in addition to studying the dyes on ancient textiles discovered in the “frozen” Pazyryk burials (5th-3rd centuries BC), researchers also examined some fabrics attributed to the West Siberian peoples *Khanty* and *Mansi* (second half of the 18th – early 19th centuries).

The hematein dye (blue sandalwood) is produced by oxidizing the organic compound hematoxylin, which is obtained from the heartwood of the campeachy tree (*Haematoxylum campechianum*). This is a legume tree native to the Yucatan Peninsula and adjacent well-watered lands, where it is the dominant species of local woods.

Campeachy wood was exported mainly as logs to be ground subsequently into shavings, sawdust, or fine powder. The shavings or sawdust were mainly used to dye wool in fleeces (so that one could rinse them out more easily), and the fine powder was used for dyeing pieces of fabric. Campeachy wood was popular with European dyers because of the color range they could obtain from it by conventional methods. This wood gave one of the most varied color ranges among all plant dyes. The beautiful and durable hematein blacks remain unsurpassed to this day (Cardon, 2003)

This is how we suddenly encountered a problem seemingly unrelated to our region, i.e., pre-Columbian connections between the Old and New Worlds. Today, historians admit possible contacts between the populations of these continents, beginning from the first centuries AD; these claims are supported by evidence, both written and archaeological. However, when it comes to more ancient periods, no direct evidence is available. There are only assumptions and groundless statements, often based on falsified material, which do more harm than good for the quite reasonable hypothesis about the possible early voyages of the Phoenicians or other ancient seafarers, e.g., the Greeks, to the American coast.

Thus, the famous Russian archaeologist and historian Valery I. Gulyaev, who returned again and again to this problem in his books, wrote: “If today, trans-Pacific contacts between America and Asia in the pre-Columbian era are unlikely to cause any doubts, the situation with the eastern, trans-Atlantic connections is completely different. We believe that in ancient times, there were hardly any conscious, let alone regular, voyages across the Atlantic. In the meantime, accidental or forced connections of this kind were likely. Succumbing to sea currents and winds, individual ships could have gone far to the west, as far as the American coast. It is clear that we are talking here

Campeachy tree, or blue sandalwood (top left). Belize, Yucatan Peninsula. © CC BY-SA 4.0/ Cephas

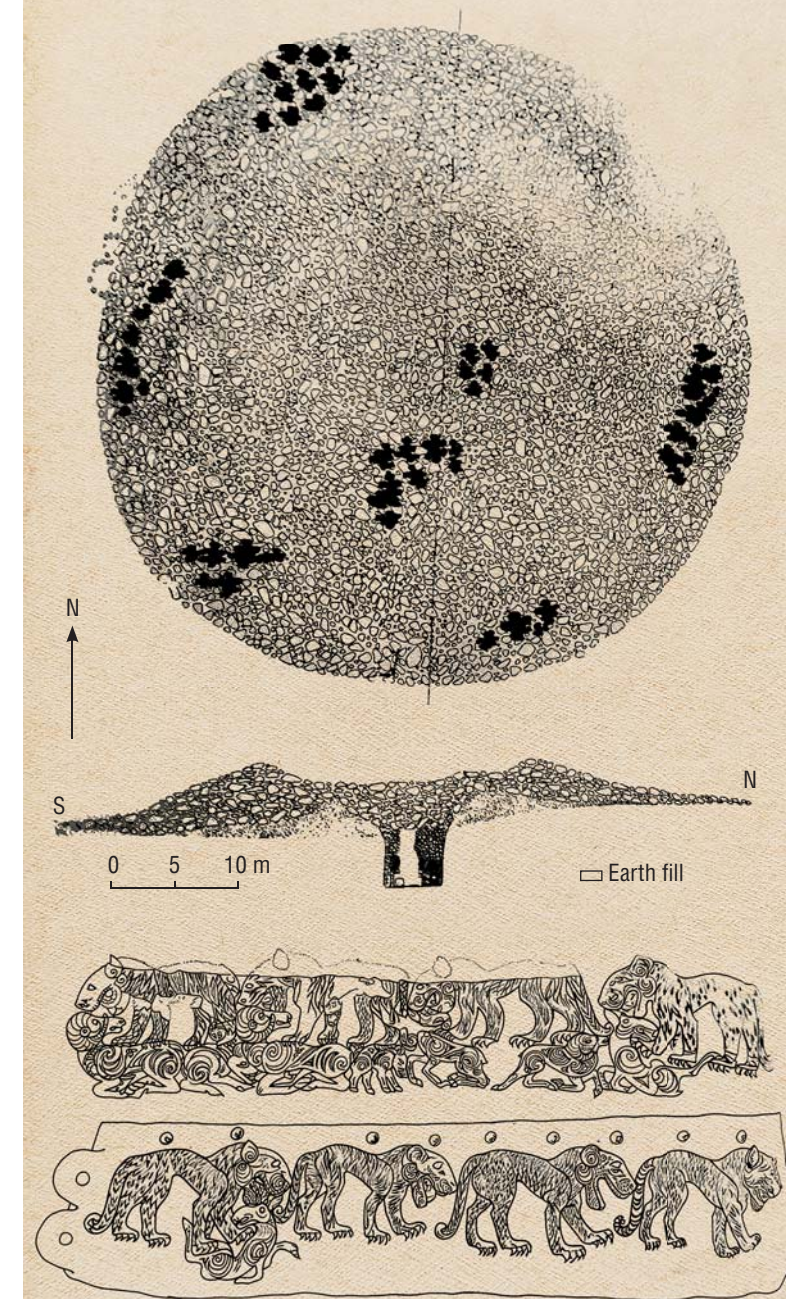
On the left is an illustration from *Flore medicale des Antilles...* (1821–1829). Public Domain

TREASURES OF THE SECOND BASHADAR MOUND

In Bashadar, a locality in the Karakol Valley of Central Altai, there is a vast burial field with hundreds of monuments dating back to different periods. These include two large burial mounds of the Pazyryk culture, which were studied in 1950 by an expedition organized by the Institute of History of Material Culture, USSR Academy of Sciences, under the leadership of the famous archaeologist and anthropologist Sergey I. Rudenko.

The Second Bashadar Mound is one of the so-called royal burial mounds with a “frozen” grave. This is a much larger structure than the famous Pazyryk mounds from the Pazyryk locality. It is about 58 m in diameter and 3 m in height. Looted in antiquity, like all the other mounds, it became famous largely due to an utterly unusual burial sarcophagus, i.e., a wooden deck that contained a buried man. The deck was made of cedar rather than larch, as in all the other known Pazyryk burials. Its three-meter front wall and lid were decorated with masterfully carved images of a tiger procession, combined with elk, goat, and wild boar harrowing scenes. The main character – the extinct Turanian tiger (Transcaucasian or Caspian) – differs from its Indian counterpart in its bright red fur and in the shape of its stripes. The upper boundary of its permanent range stretched as far northward as Balkhash Lake in Kazakhstan; evidence exists that this tiger reached eastern Kazakhstan and Altai in pursuit of migrating wild boars. Thus, the Pazyryk artists depicted this animal “from life.”

In this burial mound, archaeologists found a fragment of a woolen pile carpet, which served as a cover for a horse saddle. It was an exceptionally fine piece of work: “On average, it has about 7000 knots per 1 dm², almost twice as many as the well-known felt carpet from the Fifth Pazyryk Mound” (Rudenko, 1960). This unique object represents yet another testimony that the Pazyryk nobility had connections with Western Asia



Plan and profile of the Second Bashadar Mound (top).

Images of animals on the lid and wall of the sarcophagus from the Second Bashadar Mound (bottom). Excavations by S. I. Rudenko, late 1950s. Adapted from: (Rudenko, 1960; Barkova, 1984)





Wall relief depicting an Assyrian warship (bireme), built and manned by the Phoenicians. 7th century BC. Nineveh, Mesopotamia (modern-day Iraq). *British Museum, London.*
© CC BY-SA 3.0/ World Imaging

Ancient model of a boat, 17.5 cm long, discovered in Baalbek, Lebanon. C. a. 5th century BC. *Department of Near Eastern Antiquities, Louvre Museum, Paris.* © CC BY-SA 2.0 FR/ Rama

way inferior to those fragile vessels on which the Spaniards set out to the distant Indies at the end of the 16th century. All these are generally recognized facts, evidenced by both written and archaeological sources.

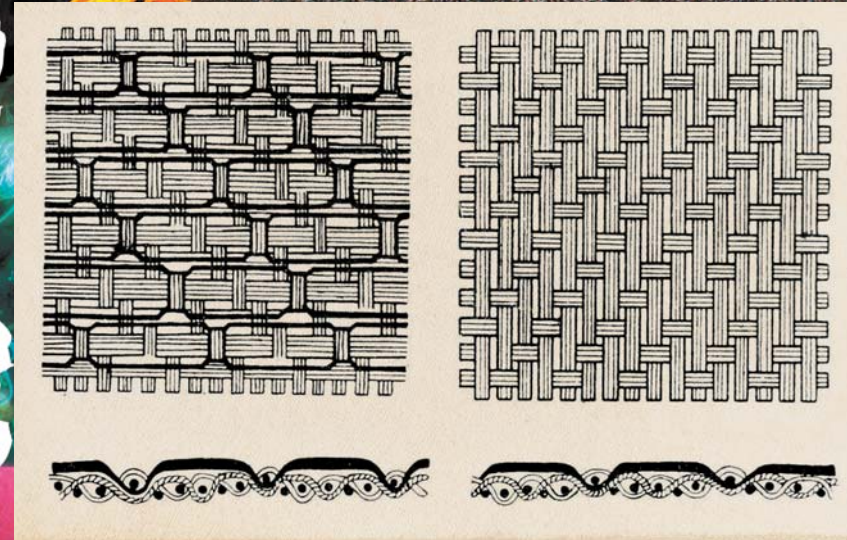
All researchers admit that the Phoenicians had a theoretical possibility of transatlantic voyages. But did it actualize in practice?

“It should be noted that, speaking of the coastal maritime trade run by Phoenician cities, we cannot reject the possibility of their more distant maritime connections, but written texts stay silent about them since even a thousand years later, Phoenician sailors kept their sea routes deeply secret, and the archaeological evidence we possess is insufficient” (Dyakonov, Ardzinba, and Yankovskaya, 1988). “Like all seafarers of antiquity, they would have never moved on their own free will away from the shore beyond its visibility, never sailed in winter and at night” (Magidovich and Magidovich, 1982).

However, the Phoenicians could have sailed, “cutting across open sea,” as did Homer’s Odysseus, who, at the behest of Zeus, left all land and set off to sail straight across the sea, which was the height of audacity and risk in those days. This is the question that still remains unanswered.

Fragment of woolen fabric that was found to contain the hematein dye: complex twill weave, from the Second Bashadar Mound. B-2, collection no. 1793-12. *Hermitage. Adapted from: (Textiles from the “Frozen” Burials..., 2006)*

Weave pattern on the front and back sides of the complex twill, woven from two threads, from the Second Bashadar Mound.
Adapted from: (Rudenko, 1968)



The black fabric from the Second Bashadar Mound is represented by seven small fragments, all from one piece. Even the first researchers who studied the textiles from the Bashadar mounds, A. S. Verkhovskaya and A. A. Gavrilova, drew attention to this fabric: “Of great interest is the complex twill with a double weft, woven from two types of black yarn: thin (0.3–0.5 mm) single yarn for the warp and lower weft and very thick (1.5–2.0 mm) yarn for the upper weft” (quoted from [Rudenko, 1960, pp. 54–55]).

Rudenko’s book (1960) contains a full technological description and a weave pattern for this unique find in the Pazyryk collection: a complex twill fabric, similar to corduroy. Subsequently, this fabric was also examined by a textile expert E. G. Tsareva, who described it as thick, soft, and different from all the other fabrics with twill weave found in the burial mounds of the Pazyryk culture. The storage conditions for the Pazyryk collection at the Hermitage rule out the possibility of this fabric coming into contact with materials from other eras and cultures

“That’s not true because it can never be true!”

The unexpected find from the “frozen” grave of Pazyryk nobility in the Altai Mountains may serve as an important piece of evidence of early contacts with the New World.

We should not be surprised that this fabric was found so far from the places where ancient merchants and seafarers set off and returned from their voyages. Textiles very rarely reach archaeologists because these are short-lived, transient items. Therefore, it is quite possible that we may not find so ancient samples in the places where they were weaved and dyed (in this case, the Eastern Mediterranean) and from where they spread throughout the oecumene. These items survived only where there were enabling natural and climatic conditions, e.g., in the Altai Mountains, whose “frozen graves” still hold many mysteries.

Moreover, we know from our own experience how difficult it is to identify dyes in those tiny samples of archaeological material that are taken for analysis. This especially concerns those dyes whose presence seems utterly impossible. If it had not been for the discovery of hematein in several textiles of the 18th–19th centuries, the mysterious spectrum of blue sandalwood would have hardly been identified in the Pazyryk sample – because researchers were fully convinced that its presence was absolutely impossible in so ancient a sample.

The evidence of presence of blue sandalwood in the woolen fabric fragment from the Second Bashadar Mound should be considered reliable since it was confirmed by a verification check on another sample from the same fabric. Moreover, the fragment from the Second Bashadar Mound is most likely not the only one dyed with this substance among the surviving ancient textiles. Judging by the color of some Mediterranean tapestries discovered in Palmyra and Xinjiang, the threads used to create them could also have been dyed with hematein.



Thus, there is reason to suppose that blue sandalwood, a dye of American origin, became known in the Eastern Mediterranean no later than the 5th century BC. It is quite possible that this was a one-time delivery. It is unlikely that ancient seafarers made so challenging, risky, and unpredictable voyages across the Atlantic on a regular basis; such travels remained a matter of chance.

Textile in the Pazyryk culture

As shown by our studies of Pazyryk textiles, finding hematein-dyed woolen fabric in the burial of noble nomads in the Altai Mountains was by no means a matter of chance. The textile clothes of the Pazyryk people should hardly be associated with their living conditions, harsh climate, and way of life. Cattle breeders and hunters, living in mountain valleys and taiga, are expected to wear clothes made of more durable materials: fur, leather, or felt. In the Pazyryk culture of the Altai Mountains, textiles could have served, on the one hand, as a marker of a completely different cultural environment and, on the other hand, as evidence that the local population engaged in extensive contacts.

The technological features of the woolen fabrics from the Pazyryk burial mounds indicate a high level of weaving skills. The raw materials from which the woolen fabrics were made were of different compositions, depending on the social status of a given buried person. Thus, as emphasized by Sergey I. Rudenko, the discoverer of the “royal” burial mounds, the textiles from these mounds were woven from down hair, while the Ukok textiles contained coarse overhair, awn hair (intermediate between overhair and down hair), and camel wool.

However, raw materials of the same composition, distinguished by the presence of coarse overhair and even “dead” hairs, were also identified for the well-known pile carpet from the Fifth Pazyryk Mound (Rudenko, 1953; Mikolaichuk, 1999). Most researchers rightly associate the origin of this carpet with either Iran or Central Asia. Awn hairs with down (coarse wool) were also found in the warp threads of a multicolored textile (part of a skirt) from the Second Pazyryk Mound, presumably of a Near Eastern origin (Rudenko, 1948).

Thus, the “coarser” composition of the wool in the Ukok textiles is not evidence of their local origin. Moreover, all the analyzed woolen fabrics, as well as the felts with appliques and pile carpet from the Fifth Pazyryk Mound, were dyed with the same set of dyes, regardless of the quality of the wool.

The study of the Pazyryk textiles showed that all the dyes originated from the Mediterranean region. In that region, one could have obtained all the three sources of the red dye found in the Pazyryk textiles: madder roots (*Rubia tinctorum*), carmine-bearing scale insects of the genus *Porphyrophora*, and scale insects of the species *Kermes vermilio*. The latter is the only species of the genus *Kermes*, which serves as a source of such a dyeing substance as *kermesic acid*. In the Pazyryk textiles, kermesic acid acts either as an independent dye, i.e., without carmine, or exceeds it in terms of quantity. This excludes the use of the more common *Polish scale insects* (*Porphyrophora polonica*) since the dye obtained from them contains both carmine and kermes. Scale insects of the species *K. vermilio* have a rather limited habitat, unlike those of the genus *Porphyrophora*. It is the widespread use of the former in dyeing the Pazyryk textiles that defines the territory of the Eastern Mediterranean as the region where the dyeing could have occurred.

Carmine and kermes have always been regarded as expensive dyes. Therefore, the fact that almost all the textiles from the Pazyryk mounds, regardless of the rank of the buried, were dyed using one or both of these dyes, raises the question: Was the dye from the scale insects really so rare in antiquity that only high-ranking members of society could use items dyed with it? Or does the set of dyes in the ancient textiles, which consists of carmine

and kermesic acids as well as *madder dye*, indicate that the dyeing was performed in places with accessible sources of all the three ones, and other options simply did not exist?

This assumption is also supported by the results of a study of ancient British textiles, which show that insect dyes, which were very important for the Mediterranean region in the Roman times and much earlier, had no tangible impact on Northern Europe (Wild, 1986). That is, local people always preferred to dye with what was at hand. But Pazyryk textiles, as we can see, were dyed not with local dyes available in Altai (Korolyuk, 2006).

In our opinion, the fact that all the Pazyryk textiles were dyed with a combination of carmine, kermesic acids, and madder dye could serve as an important piece of evidence that these textiles got to the Altai Mountains from a region where these dyes were popular and accessible. This region was the countries of the Eastern Mediterranean and the Armenian Highlands, where the dyeing craft originated and flourished and wherefrom, since antiquity, bright-colored clothing, fabrics, yarn, and wool had been spreading throughout the oecumene.

The Pazyryk textile culture was brought in from outside rather than had local roots. We probably underestimate the scale and scope of trade relations and specialization in certain crafts, especially in textile-making and dyeing. However, written sources tell us that long before the Pazyryks, workshops attached to palaces and temples in the ancient states of Greece, Syria, Egypt, and Mesopotamia specialized in the manufacture of various fabrics, which not only satisfied the needs of local populations but also served as necessary and profitable exports. Caravan routes maintained a connection between raw-resource centers and cultural ones. Both in ancient times and in the Middle Ages, fabrics and wool played a big role in caravan trade. Hundreds of kilograms of wool and thousands of rolls of fabric were carried over huge distances.

Fabrics and clothes became the spoils of victors during military campaigns (Dyakonov, Yankovskaya, Ardzinba, 1988). In the Pazyryk times (5th-3rd centuries BC), Phoenicia was part of the Achaemenid Empire, where international maritime trade – conducted on a scale unprecedented for that time – remained mostly in the hands of Phoenician merchants (Dandamaev, 2004). When Alexander the Great conquered the empire, precious items from Achaemenid treasuries, as well as the rich personal belonging of Persian nobles, including fabrics and carpets, clothing, and horse harnesses, were captured and scattered over vast spaces. Under favorable conditions, fabrics, as well as clothes made from them, could have survived over long periods of time, outliving their producers and owners and traveling over huge distances to start a new life in foreign cultures.

Archaeology is not meant to confirm existing scientific facts. Its discoveries often contradict established theories and prove the truly limitless capabilities possessed by people in ancient times. In all times there were brave-hearted ones who dared to undertake risky journeys by sea and land, so there is no reason to disbelieve that the New World could have been discovered by unknown Greeks or Phoenicians long before our era.

The opinion that contacts with European seafarers must have left an indelible mark on South American cultures, a footprint we now do not see, seems to make it hard for us to admit the possibility of such connections. But could a handful of people in the times before Christ have changed the life of an entire continent like they did during the conquest? “Thin threads of pre-Columbian connections” – these are what we should be looking for, and the American dye hematein, which was found in textiles from an elite Pazyryk burial in the Altai Mountains, may be one of these threads.

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Women's costume from the Second Pazyryk Mound. *Reconstruction by D. Pozdnyakova*