The forest zone of central Eurasia is a territory of continental climates (cold winters and warm summers), with dense temperate forests punctuated by grasslands and many rivers and lakes. The rich natural resources allowed early 3rd and 2nd millennium BC populations to base their economies on foraging—hunting, fishing, and gathering—while participating in economic relationships with more “advanced” economies in the regions to the south. Not until the end of the 2nd millennium BC were metal objects used in this forest zone, and iron use and local metal production did not appear until the 1st millennium BC with the beginnings of farming in the broad temperate zone.

Excavations in the central Russian part of the forest zone have been carried out from the 1950s to the present, focusing on the Oka river basin (Krisnova 1993; Fig. 1). This region borders the forest-steppe and steppe zones to the south and is crosscut by major river systems that ultimately flow south (the Volga, Don, and Dnepr systems). The river basin has a great density and diversity of archaeological sites (Fig. 2) which document land use from the Mesolithic through medieval times, making it a key region for comparing its specialized adaptation to a forest environment with those of neighboring regions. It clearly played a role in interregional interaction, and yet maintained its distinctive economy and way of life through time.

Volosovo Foraging Culture

In the second half of the 3rd millennium and the beginning of the 2nd millennium BC (2500–1800 BC), people living in the Oka and Volga drainage basins had a highly organized,
sedi- nary foraging economy (Kraynov 1987). This type of economy is described in the literature as "Late Neolithic—Eneolithic," indicating that the people used stone tools instead of metal ones, although metal was known. Numerous crafts and art objects from this culture have been documented from large-scale excavations at the sites of Volodyary, Volo sovo, Iberdus, Chernyaya Gora, Vylydchyno, Shagara II; Volo sovo's character- istic artistic style gave its name to this early forest culture.

Volosovo settlements are closely linked to water resources. Sites are almost invariably located along lake shores, near the estuaries of small rivers and streams or the isthmuses of lakes and channels, along old river beds—anywhere open water supported abundant fish and water birds (Fig. 3).

Unlike many other hunting and gathering societies, the forest Volosovo culture had large settlements that were occupied year-round and over long periods of time. The settlements were each 5000–5000 square meters in area and comprised 5 to 10 houses linked to each other by narrow passages. The houses were rectangular wooden structures, measuring 50 by 100 square meters. While the wood has not been preserved, postholes show that the houses were semi-subsurface—sunk one meter into the ground—with wood frames and superstructures. At the en- trances to the houses, large pits (0.5–0.8 m in diameter and 0.4–0.7 m deep) filled with ash and charcoal indicate an ancient heating system; the pits appear to have been filled with red-hot coals which were then covered with soil to heat the structure. We estimate that 10 to 15 family members lived in each house, and the large houses appear to have been built as components of a community structure. Linear posthole com- stributions indicate connecting passages that were most likely covered, allowing for easy movement between houses even in winter (Fig. 4).

Craft Production

Most categories of artifacts were produced in individual households, despite the corporate vil- lage organization. Evidence for the manufacture of goods is found in almost every house. Just as in the cultures to the south, the Volosovo culture used pottery for preparing and preserving foods. The pottery was all locally made—large, thick-walled vessels were coil-b built out of the local dark clay tempered with shells and chaff.

The vessels are richly decorated that in the exterior, sometimes with gouged and linear impressions, but more frequently with impressions from bone and stone stamps of various forms (Fig. 5).

Numerous flint tools with very fine retouch give us an insight into the primary production of the region: wooden objects. Unfortunately, almost no such objects were preserved. However, trace weave analysis indicates that cutting tools such as axes, polished stone adzes with straight and grooved blades, flint knives, scrapers, drills, bone adzes, and chisels (Fig. 6) were used to produce large wooden items such as boats, skis, bows, oars, and spades. Composite flint tools such as scrapers, drills, and other tools with burnishing and carving capabilities were used to make small, finely carved and turned game was mostly hunted in the fall and winter. Beaver, red deer, wild boar, fox, bear, badger, hare, otter, polecat, roe deer, and even wolf were hunted. Birds were also caught, mostly water fowl (goose, duck, swan), but also marsh birds (wood-grouse, black-grouse, partridge). Bone hunting whistles or hoots, to attract birds, were found at some sites. Numerous finds of flint and bone arrowheads suggest the bow and arrow was the main hunting weapon. These arrowheads have diverse shapes and sizes that reflect hunting specialization (Fig. 8). The larger flint arrowheads were capable of piercing a thick hide with their sharp edges. Needle-shaped bone arrowheads could burrow deep into the body of an animal. Some of these arrowheads were numerous and were used to hunt fur ani- mals and forest birds. Spears and darts were also equipped with large arrowheads.

Even with abundant resources, hunting alone could not provide a large settlement with sufficient food for year-round occupation; in the spring and summer months fishing played a significant role. People ate a diversity of common river and lake fish of the region: pike, ide (carp), bream, crucian carp, perch, roach, sheatfish, sturgeon, and sterlet. Fishing rods must have been employed, and worked stones appear to have been used as sinkers. Composite and one-piece bone fishing hooks have been found in settlements of the Oka region. Most were composed of two served bone pieces tied together to form a sharp hook. One-piece hooks were shaped like modern metal ones, some hav- ing delicate and sharp barbs carved into the hook. Some of the hooks were enormous, but most were similar to medium-sized modern hooks designed to catch small fish.

Harpooning or spearing was another com- mon method of fishing. Both small and large (up to 20 cm) spear or harpoon heads are typical for Volosovo sites. The upper parts of most of these weapons have notches or round channels, typically with two to four clearly cut stone flakes, back-shaped and sparsely placed. Worked stone flakes were fixed to a wooden rod using vegetable fibers and resin. It appears that the heads were affixed to the rod, unlike the har- poon heads that separate from the rod after hitting the target.

We find imprints of small—sized nets on some Volosovo ceramics, although the nets proper have almost never been preserved. Sink- ers for these nets have been found in some Neolithic sites; these are stones wrapped in birch bark or with holes or channels for fastening. Floats were cut out of wood or spruce bark, sometimes of birch bark. In addition, exca- vations in peaty deposits of old river beds near Volosovo sites revealed wooden pillars and pickets intertwined with tree branches which ap- parently served as fish—traps (Kraynov 1991). The appearance of long-term settlements in the forest zone of Eurasia appears to be linked with the development of freshwater and sea fish- ing to the north (Oshikina 1956). Use of water craft enabled further exploitation of rivers and lakes in the forest region, which opened the po- tential for economically important fishing and for interregional contacts from the Black Sea north to the White Sea.

Remains of boats and oars have been found at settlements of the Oka region and other forest
regions to the north (see, for example, Oshibkina 1996). Dugouts with distinctive raised prows were cut out of logs. It is mostly remains of oak boats that have been preserved, but no doubt softer trees were used too. Similar watercraft from Onega Lake and the White Sea were decorated with images of hunted marine mammals (Savateyev 1997). Northern petroglyphs depict large boats with crews of from 12 to 24 persons, but scholars disagree as to whether these drawings reflect boats used for transportation purposes, hunting and fishing, or ritual. The discovery of similar boat remains in the southern forests suggests the possible exchange of ideas, goods, and technologies by way of rivers.

Interregional interaction is clearly revealed in various shared technologies and rituals found along Eurasia's north–south axis. For example, occasional copper objects have been found in the Oka basin Volosovo sites. Most of the finds have been small fragments of artifacts, but include locally used objects such as a copper awl in a bone handle from the Shagara II settlement. The earliest copper goods came to the Oka river basin from the south through exchange. While they were valued highly, they did not replace their bone and stone counterparts; thus, the Volosovo culture maintained and in many ways intensified its local adaptations. During the late Volosovo, people began to exploit local copper sands as the raw material for metal working (Chernykh and Kuzminykh 1977); small ingots and crucibles with remains of copper drops have been found.

**FOREST IDEOLOGY**

The Volosovo culture expressed itself artistically through elaborate figures made of chipped stone, and carved and engraved bone and other materials. Most ornaments were found in the occupational layers of the sites, suggesting that they were lost while being worn or carried. Other finely made ornaments and sculpted objects are found in “hoards” or ritual burials at cemeteries; these assemblages include some of the most elaborate examples of forest art. In rare instances, ornaments have been discovered in situ in burials, indicating placement on clothing, headwear, and footgear.

Most ornaments depict realistic forms of bears, wild boars, beavers, water birds, birds of prey, and fish (Figs. 9, 10). Overall, the art of the forest Volosovo culture depicts hunted prey. This artistic emphasis, plus articulated skeletal parts of hunted animals found in ritual areas of settlements and burials, suggests the ideological as well as economic importance of the hunting and fishing way of life. In contrast, images of humans in the Oka Volosovo sites are unusual and are very generalized; they look like cookie cutouts with a distinct head and outstretched arms and legs.

In some cases large flint pieces were chipped into silhouettes of animals. Details of the figures are not clear-cut, but in most cases there is no doubt as to what animal the craftsman wanted to depict. Small, carved bone sculptures with remarkably accurate features typically depict
Fig. 6. While few wooden objects have been preserved from Volosovo sites, trace-ware analysis on these tools indicates that most of the stone and bone tools found were used to produce wooden objects. Ground stone axes, flint piercers and drills, and composite tools of stone and bone represent the diverse implements which the ancient woodworkers used.

Fig. 7. Scrapers and awls of flint and bone were used for hide preparation, while perforators made of bone and flint, bone awls, and needles made of large fish bones with finely drilled eyes were used in stitching hides and possibly textiles.

Fig. 8. Hunting was one of the major subsistence activities. Both bone and stone (shown here) points were used for hunting. Petroglyphs dating to the 3rd millennium BC from the Russian forest zone provide a background to illustrate the major quarry—elk and deer.

Fig. 9. Fliesknapping took on the characteristics of art in the small, carefully crafted figurines of animals and humans found at Volosovo sites. A beautifully carved elk head is made of bone. The central figurines are 5 cm in length.

Fig. 10. Waterfowl are depicted in realistically carved bone and stone pendants. The pierced objects probably adorned clothing. The central bird figure is 3 cm in length.

Fig. 11. Neckings were made of wild boar tusks. Pendants from burials were found adorning individuals’ necks. The bone pin with the image of an elk head is one of the masterpieces of Volosovo art.
Seven such hoards have been found at the ritual site in the settlement of Volodary alone.

Conclusions

The long duration of the Volosovo culture (2500–1800 BC) represents a specialized and remarkably stable adaptation to the forest environment contemporary with farming and herding cultures to the south. Interregional interaction is revealed in various technologies and rituals shared with cultures to the north and south. The general pattern of Eurasian identity is seen in the Volosovo forest culture: sedentary lifestyle, permanent settlements, ocher-laced burials, ritual symbols of power, and economic specialisation to local circumstances. This Eurasian identity is perhaps most clearly seen in seafaring, boatbuilding, and fishing interconnections between the White Sea in the north, and the Black Sea in the south. Within this context, the distinctive Volosovo culture of the 3rd and 2nd millennia BC demonstrates technological interconnections between the steppe, forest, and sea—though the regions maintained their distinct identities through time.

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Bibliography


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