

## The spatial structure of the 1st, 2nd and 3rd «dwellings» of Sungir (An example of primary lithic knapping).

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Sungir is probably the only upper Palaeolithic settlement, whose area of excavation exceeds 4500 square meters. The materials obtained during the work on Sungir, allow to put the issues on the organization of the living space of the site, including on the conditions of accumulation of the cultural layer. One of the most difficult issues here is the duration of accumulation of the cultural layer, directly associated with the time of existence of the settlement as a set of person visits this place.

Excavations uncovered Sungir settlement is an oval along the slope of the spot balances cultural dimensions of approximately 130 x 50 m, oriented North-East in the direction of arrow cape between the valley of the Klyazma river and the ravine, through which flows a stream Sungir (fig. 1).

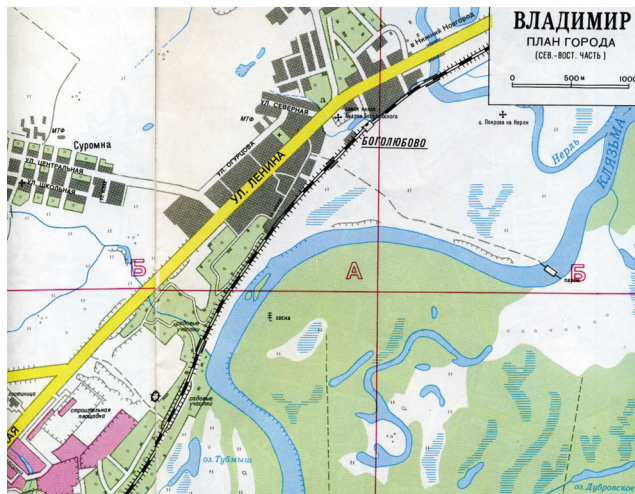


Figure 1: The Sungir settlement on the Vladimir city plan

The early radiocarbon dates of Sungir are located in the interval from 27.700 BP to 24.430 BP. In the laboratory of radiocarbon Dating (GIN) was made a large series of dates on animal bones from the excavations 1957-1977, that determined the lower chronological level of Sungir before the time of the order 29-28 thousands years ago (Sulerzhitsky L.D., 2000. Paleosoils and modern soils...).

According to the data of Bader (Bader O.N., 1978. Sungir...), the cultural layer of Sungir lies in heavily disturbed by solifluction and permafrost deformations of the buried second from the top soil of Pleistocene age, covered with three-meter layer of deluvial loess-like loam. The finds were distributed throughout the thickness of the mineral soil and in the most saturated parts began to meet again at the bottom of the loam, with the level about 20 cm above the soil surface. During the excavations observations were made about the existence of ancient dry hollow width of 5-6 m and a depth of 20-25 cm,

stretched on the spit of the Cape across the toward the mouth of the brook of Sungir (Fig. 2). Northwest hollows, on its left side was located the bulk of the cultural remains, the burials, and the overwhelming majority of fireplace pits (Fig. 2).

In the excavations 1957-1977 of the Sungir was used the technique of fixation of finds on meter squares and fixed horizons of 5-20 cm. In the excavation II 1st horizon had a thickness of 17 cm, 2nd - 20 cm, 3rd - 10 cm and 4th - to the rest of the depth. In excavation III 4 upper horizon had a capacity of 20 cm, the 5th is divided into 2 subhorizons - A and B are 10 cm each, 6th - to the rest of the depth.

According to the data of 1978 in the area of excavation №1 the finds lies mainly in upper and middle parts of cultural layer. The maximum of the finds were in the 1st and 2nd horizons, in the excavation III - in the 3rd and 4th horizons. Large animal bones were deposited mainly in the lower half of the layer. The difference in the depth of finds was due to the different nature and strength of solifluction in the upper and lower slope parts of the site. In the North-Eastern part of dry hollow less strong frosty cryoturbation has led to the fact that the location of cultural remains on the area of the excavation III closer to their initial position. In 1986 excavations of Sungir were renewed, and since 1992 the Sungir constant complex expedition of Institute of archeology of the Russian Academy of Sciences (N. O. Bader and L. A. Mikhailova) has been restored. When working on a new excavation II-a, which was defeated at the North-Western wall of the pavilion (Fig. 2,3), was applied sloping (oblique) Stripping contingent horizons with a capacity of 20 cm, with individual fixing of each find in three-dimensional space and the abandonment of the stratigraphic cuts every two meters (Pozdnepaleoliticheskoye poseleniye Sungir..., 1998).

In excavation II the Bryansk soil was divided in two litological horizons - the upper (light) and the lower (dark), which were arbitrarily defined as the top and bottom of the soil, both destroyed by solifluction (Fig. 4). The study of these horizons, held Lavrushin, Spiridonova, Gugalinskaya and Alifanov, led to the conclusion about the different conditions of their formation. The lower dark Bryansk soil with a high content of humus according to the palynological research existed in the zone of spruce forests with admixture of pine and birch, and considerable areas of bogs and grass-forb meadows, the upper light Bryansk soil - in zone of pine forests mixed with birch and willow are also meadows and boggy areas (Pozdnepaleoliticheskoye poseleniye Sungir..., 1998).

Research of 1986-1989 of Mikhailova allowed to allocate in each of the separate soil horizons horizon of the

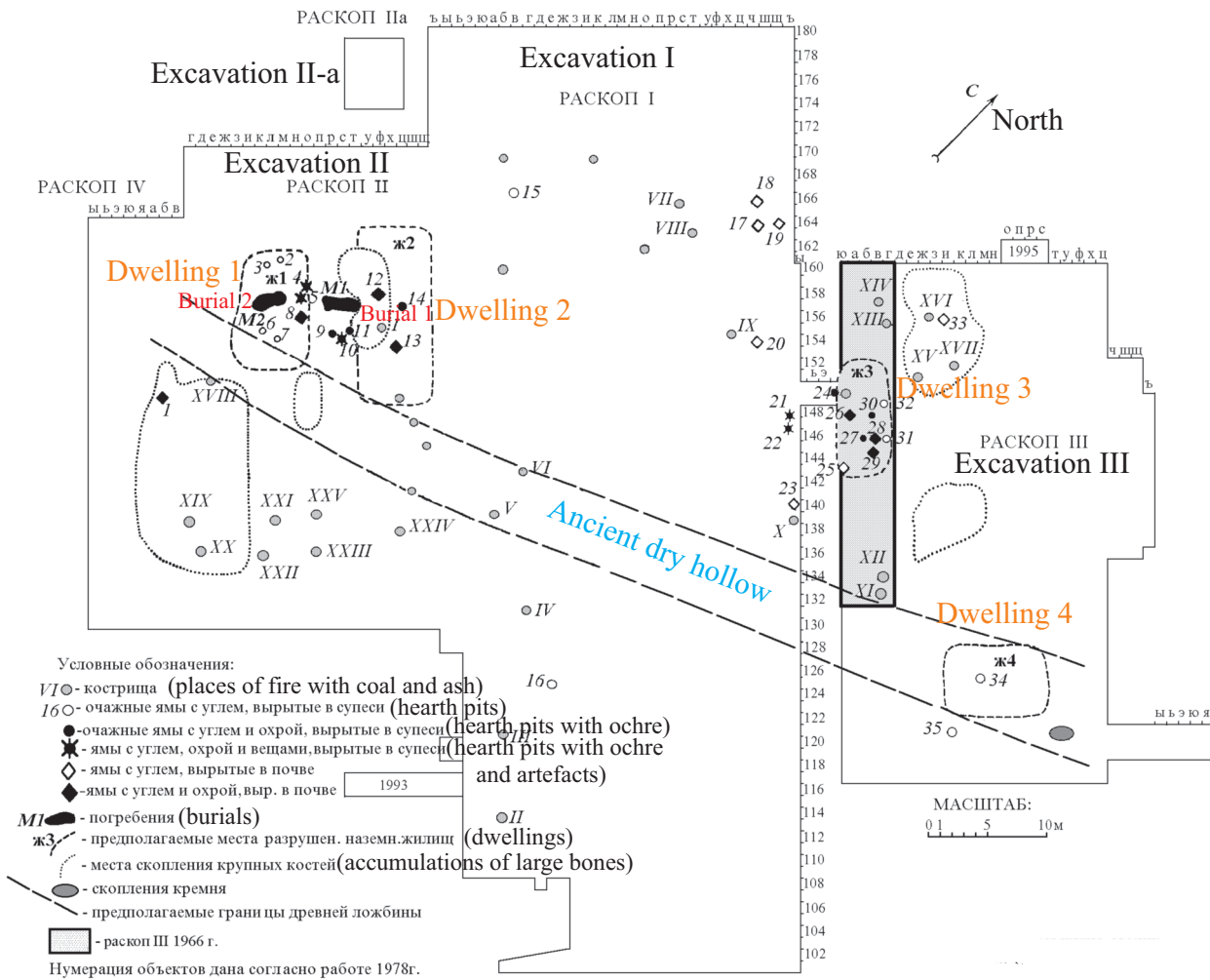


Figure 2: The Sungir settlement. Plan of excavated area in 1956-1995 (by Bader O.N., 1998).

cultural layer. Light soil consistent with the upper horizon with isolated findings, but a dark soil - the lower, the rich cultural remains, and tending to the upper half of the soil. The works of 1993 of N. Bader on the southern periphery of the site (Fig. 2), have documented a well-preserved dark horizon of a buried soil with thickness not exceeding 0.5 m, with cultural discoveries, tending to the surface or upper part. The excavation II in 1993 from the light soil remained only small lenses. As a result of excavations of 1995 of N. Bader, in the Northern part of excavation area III, it was found that solifluction disturbed buried soil with cultural remains with capacity from 0,6-0,8 m was divided, as in excavation II-a, two horizon - light and dark, between less than a clear line of transition. Small cultural finds of the excavation III 1995 met in both horizons and concentrated at two levels - at the top of horizon 1 and the bottom of the horizon 3 parts of the thickness of the cultural layer (Pozdnepaleoliticheskoye poseleniye Sungir..., 1998). Data of palynological analysis carried out on samples from the excavation III, showed the almost complete absence down here in the dark soil making the assumption that mapping material remains in the excavation III with the upper (not lower) horizons of the cultural layer than in the excavation II.

In the field season of 2000, from the newly opened North-West wall of excavation area II-a (Fig. 3,4) from

different stratigraphic horizons of the soil and the cultural layer, for the first time in the history of study of Sungir settlements 4 samples of soil material for radiocarbon Dating were selected (Sulerzhitsky, 2000). For the sample of light upper horizon of the soil was obtained – 24800 ± 2100 (GIN-10922), from the top of a dark (lower) soil horizon – 25800 ± 800 (GIN-10921), for the sample from the bottom of the dark (lower) horizon of the soil – 25800 ± 800 (GIN-10920), from lenses of black humus at the base of the dark soil – 26500 ± 1600 (GIN-10919)

Radiocarbon Dating of samples from different soil horizons, from our point of view, may indicate a relative chronological difference between the time of formation of the "light" and "dark" horizons of a buried Bryanc soil, which, as we noted above, also may be confirmed by data of palynological analysis of these horizons. As a result of field work in 2001 was found that the area was situated in 12 metres to the South-West from location of Sungir burials 1 and 2 (Fig. 3), the stratigraphic position of the horizon of cultural remains was confined to the upper part of the buried dark layer of soil is disturbed on this plot of slope processes (Seleznyov A.B., 2008. Stoyanka Sungir...).

The excavations of 2004 resulted in interesting and important observations on the stratigraphy cultureflash

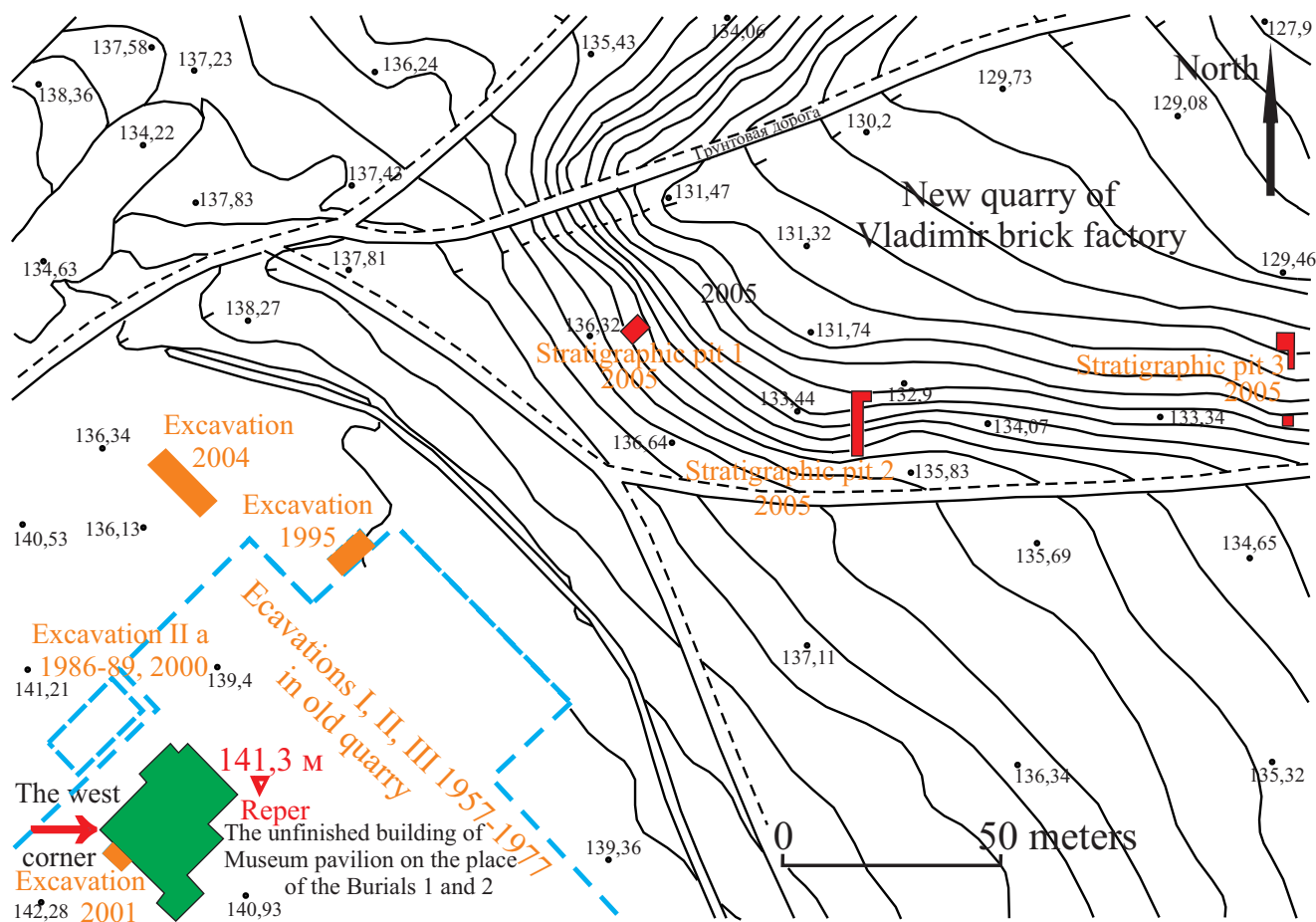


Figure 3: The Sungir settlement. The situational plan of location of excavations and stratigraphic pits of 1986-1989, 2000, 2001, 2004 and 2005. The horizontals drawn through 0.5 meters.

sediments of the North-Western periphery of the Sungir settlement (Fig. 3), according to which the vast majority of finds was found in a horizon associated the upper light horizon of the Bryansk soil marked glandular ortsangabe (Fig. 5). The study of stratigraphy on the Northern periphery of the site in 2005, the area of stratigraphic pits 1, 2, 3 (Fig. 3) showed, in General, the stratigraphic similarity of these plots with the main area of the settlement (Bader N.O., Seleznyov A.B., 2005. Polevie raboti...).

In pit 3 (in 300 m to the north from dig III) in the loam below the Bryansk soil layer directly above the Mikulino soil was found a stone artifact from siliceous raw similar to silicified limestone, is widely used in the knapping on the Sungir (Seleznyov A.B., 2008. Stoyanka Sungir...).

Typologically, it with visible negatives of previous removals on the back could be used as a tool (Fig. 6). Here in the Mikulino soil was found a fragment of the epiphysis of the tubular bone of the animal. Today is the first such find of fauna in the more old deposits than the cultural layer of the Sungir settlement (Fig. 6).

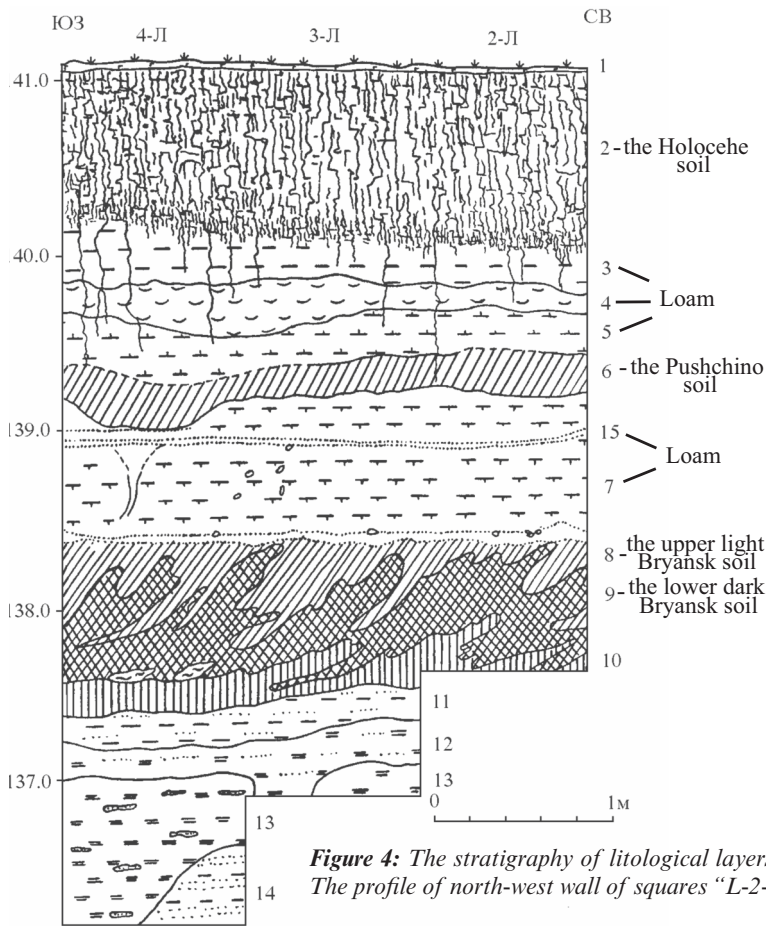
### The spatial analysis of primary knapping of the 1st, 2nd and 3rd «dwellings» of Sungir

Area of dwellings 1st and 2nd flint complex products of primary cracking at the level of the 1st horizon focus

on 3 areas where met the ruined remains of camp-fires (Fig. 7). On the squares adjacent to the Burial 1 at 1-year horizon, a fixed area diluted concentration of split rock (Fig. 8). At the level of the 2nd split horizon stone is distributed of not flint knapped rocks on the area of dwelling 2 at the level of 2-year horizon shows a tendency to their attraction to the Central and North-Western parts of the dwelling 2. A square distribution of items of all groups of a primary knapping on the area of dwelling 2 shows that the maximum concentration falls on the Central and South-Eastern parts of the dwelling.

The distribution of objects the primary knapping of stone in the area of dwelling 2 gives some data on the stratigraphic level at which there were various activities associated with splitting stone. This level applies to 2nd horizon and can be matched with the top layer of dark soil (Fig. 8). Splitting on the area of dwelling 2 was held at sites in the immediate vicinity of the fireplace pits and fireplaces. **It is important to note that the area of burials practically do not overlap intensive cultural layer saturated flint waste production** (fig. 7,8).

On the area of dwelling 1, the half products of cracking stone, as in the case of dwelling 2, on the 2nd horizon (fig. 8). But unlike dwelling 2, more than one-third of the subjects from the dwelling 1 refers to the 3rd and 4th horizons that can be mapped to data on the ma-



**Figure 4:** The stratigraphy of litological layers of Sungir of excavation II-a. The profile of north-west wall of squares "L-2-4".



**Figure 5:** The north-west stratigraphic cut of excavation of 2004. The view from the west.

majority of fireplaces and pits to the top of the 3rd horizon (fig. 9). The distribution of objects splitting of stone in the area of the 1st dwelling, on level 1 of the horizon, shows their concentration to the West of burial 2, on an area of about 10 m<sup>2</sup> (Fig. 7). At the level of the 2nd horizon, which can be associated with the top layer of dark soil, this concentration takes the form of localized clusters in the North-West of dwelling 1 to the North-West of burial 2 (Fig. 9). On the area of the burial, at the level of the upper two horizons met rare finds of split rock (Fig. 9). With the level of the lower half of the 3rd and the 4-year

horizons, the concentration of split stone is offset on the South-Eastern part of the dwelling 1 (Fig. 9).

Such uneven distribution of chipped stone on the horizons in different parts of dwelling 1, in my opinion, can talk about their different stratigraphic positions and, accordingly, non-simultaneous use of these local sites. Earlier the education level of the cultural layer of the settlement, we think, presents the dwelling 1, where in the primary processing of not flint knapped rocks were widely used slate.

We can assume that the allocated levels of maximum concentration of the primary objects of the splitting on the area of dwellings 1 and 2 could in some degree to correspond to two lithologic horizons of the soil layer. In the South-Western, upper slope of the accumulation of cultural remains (Bader, 1978) could be used 2nd phase of the dwelling 1 and the adjoining

South-East area of fireplace pits N°. 9-11, where in the primary processing not flint rocks were widely used slate. The area of dwelling 2, in our opinion, had a higher stratigraphic position and could refer to the final stage of existence Sungir settlement.

As mentioned above, the first finds in the excavation III (Fig. 9), on the area of dwelling 3, were recorded at the base of a light loam, which is mapped to the us with the horizon 1.

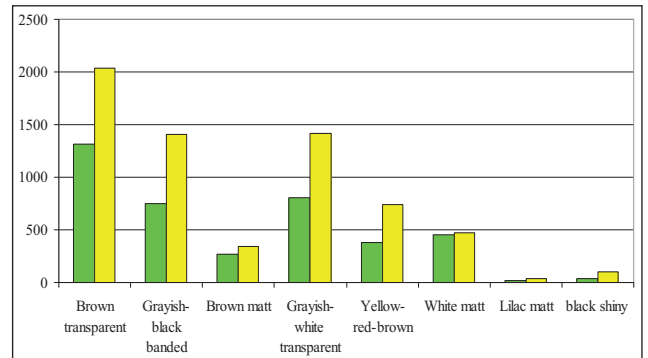
In addition, on the area of dwelling 3 have been recorded pits fireplace, flat with the surface of the buried soils, the fixation in several cases of camp-fires and emissions from the fireplace pits to the horizon 1. Also, on the site of dwelling 3, O. N. Bader was not observed stratigraphic non-simultaneity of fireplace pits and fireplaces. Here the layer formed a uniform structure, except for the release plist-ash mass from the fireplace pit N°. 31 that overlaps the fireplace pit N°. 30 (fig. 9).

Analysis of field plans of dwelling 3 shows that the vast majority of stone artifacts of the initial array knapping on the area of dwelling 3 and the adjoining areas with fire pits encountered in the 1st and 2nd horizons and is the spatial unity of concentration of cultural remains. It allows, from our point of view, to the assumption of a single genetically complex nature of cultural remains on the area of dwelling 3, which could be related to one (the latest?) the level of accumulation of the cultural layer. One may assume that the concentration level of the subjects of primary cracking at the site of dwelling 3 could correspond to the upper (light) horizon of the soil and belong to the final stage of existence of Sungir settlement.

The concentration of materials of primary knapping stone raw materials around in-depth and surface lesions on the area of dwelling 3 overall, in our view, could indicate the operations for splitting different types of stone in warm season or time of year, when it was not necessary to go beyond the enclosed space. 3 the dwelling itself, we believe, was no housing as such and was a residential site of open type where in addition to the primary cracking could be conducted and other economic activities.

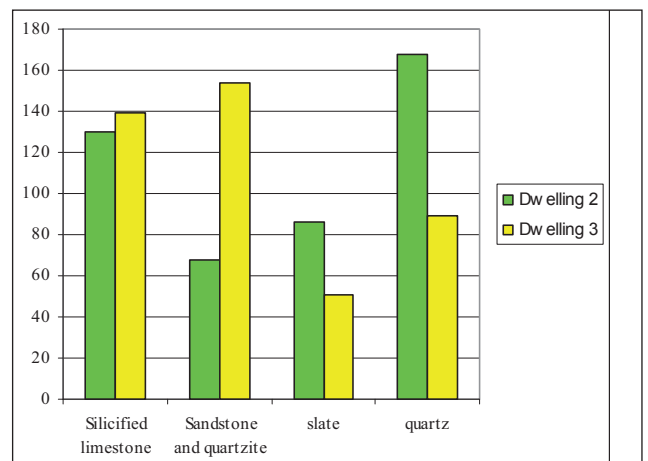
Comparative analysis of total number of products in the array splitting the primary varieties of flint used in sectors 1, 2 and 3 dwellings shows some difference in the use of different varieties of flint (within 1-4%). It can be noted that on the area of dwellings 1 and 2 more often than other varieties cracked plastic of the best quality and grades of flint brown transparent flint and grayish-white transparent flint. In the area of the home 3 more than anyone else participated in the process of splitting also brown transparent flint. 2nd place in the cleavage on the area of dwelling 3 was, in contrast to dwellings 1

and 2, lower quality grayish-black, banded flint, which took 3rd place in the flint collection from the dwellings 1 and 2. From our point of view these discrepancies may indicate the use of a Sungir settlers for knapping and making tools of various sources of moraine flint.



Comparing dwellings 1, 2 and 3 for distribution in their area of different varieties of flint in the 1st horizon, you can see that on the area of dwellings 1 and 2 is dominated by the highest quality varieties of flint. On the area of dwelling 3 is more or less plastic and coarser varieties. In our view, such a pattern may indicate various possibilities in the extraction of raw flint and its subsequent cleavage at the sites of these pits. One may assume that the area of dwelling 3 during primary cleavage can largely be used a lower-quality varieties of flint once in moraine outputs the highest quality varieties began to dry up.

Also about possible non-simultaneity of dwelling 3 dwelling 1 may indicate greater participation in the process of splitting not flint rocks: sandstone and quartzite. We think these facts, coupled with a weak saturation of the cultural layer of the primary waste splitting on the monument, where the whole cycle of operations for the splitting, can confirm the seasonal nature of individual visits Sungir settlements, reflected in the brevity of the stages of accumulation of the cultural layer. In General, the higher the concentration of primary products of cleavage of the stone raw materials around the centers of large areas of dwellings 1, 2 and 3, which, from our point of view, more correctly should be called the housing and economic platforms of open type, according to our opinion, that the strong economic activity, including transactions on the primary knapping stone, was conducted in Sungir settlement in warmer season.



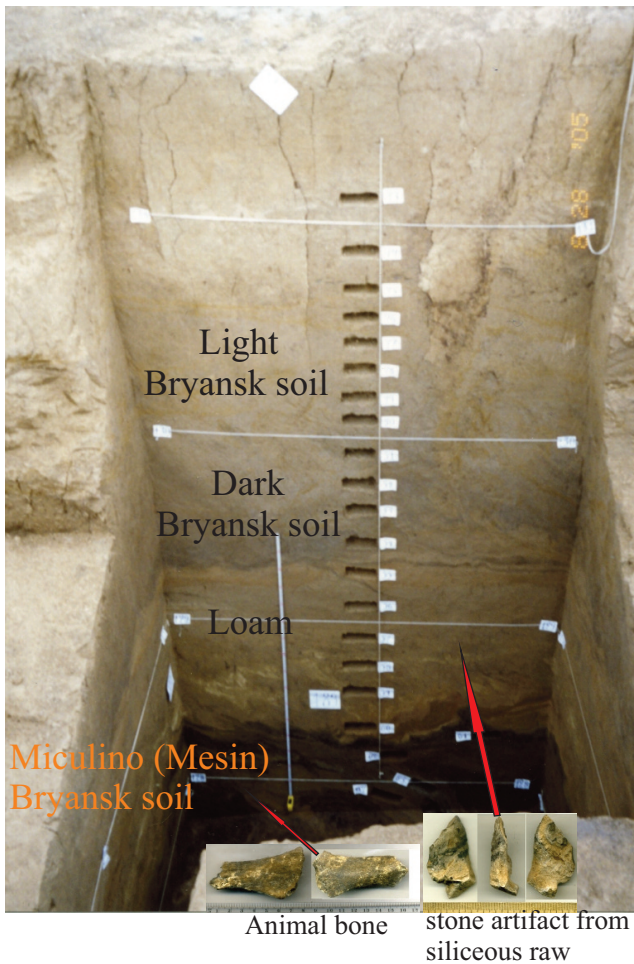


Figure 6: Sungir-2005. The south cut of stratigraphic pit № 3. The view from the north.

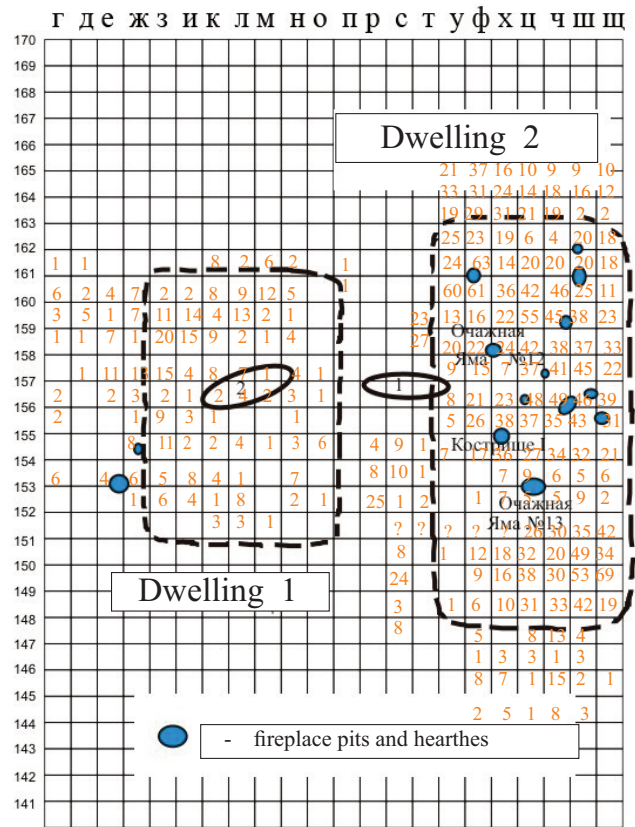


Figure 7: Distribution of products of primary knapping on the area of «dwellings» 1 and 2. Horison 1.

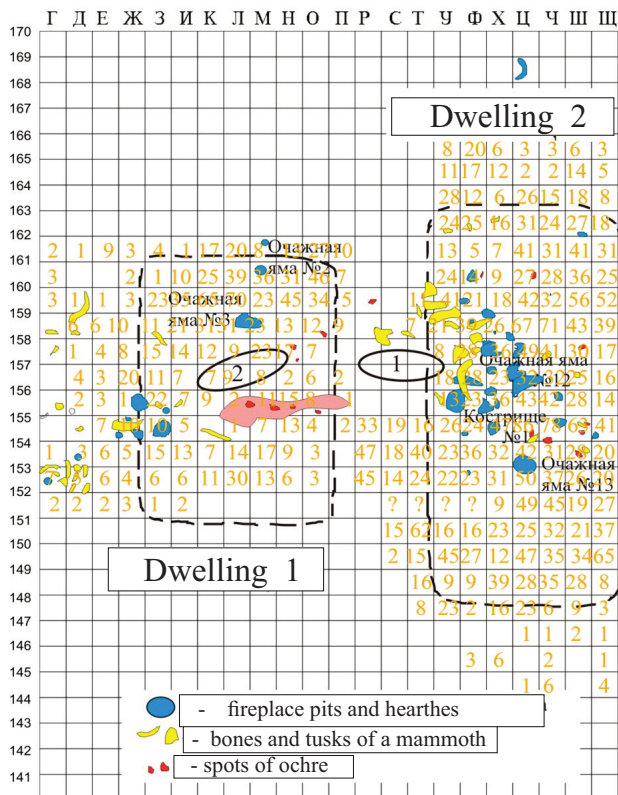


Figure 8: Distribution of products of primary knapping on the area of «dwellings» 1 and 2. Horison 2.

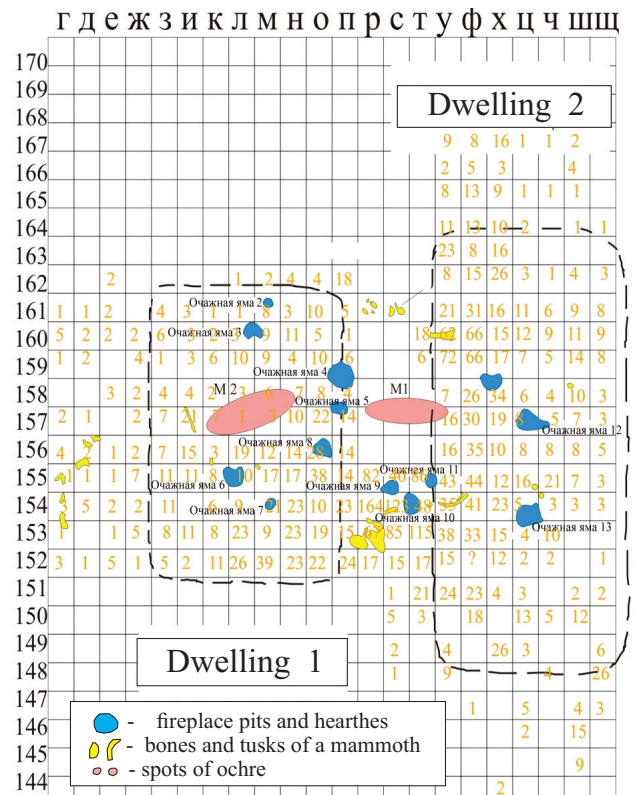


Figure 9: Distribution of products of primary knapping on the area of «dwellings» 1 and 2. Horisons 3,4.

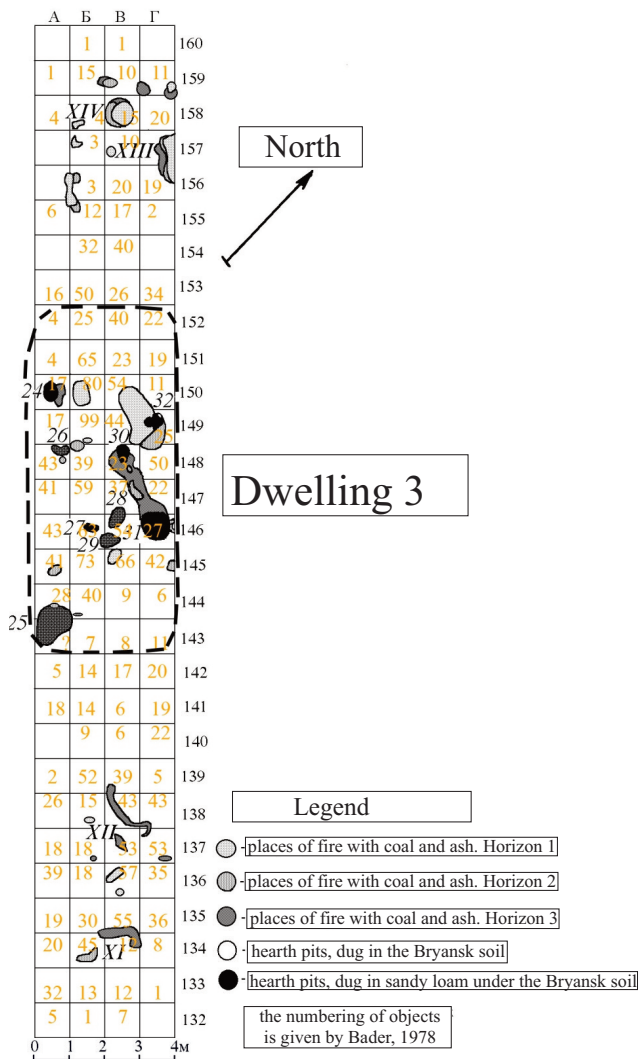


Figure 10: Distribution of products of primary knapping on the area of «dwelling» 3. Horizon 1.

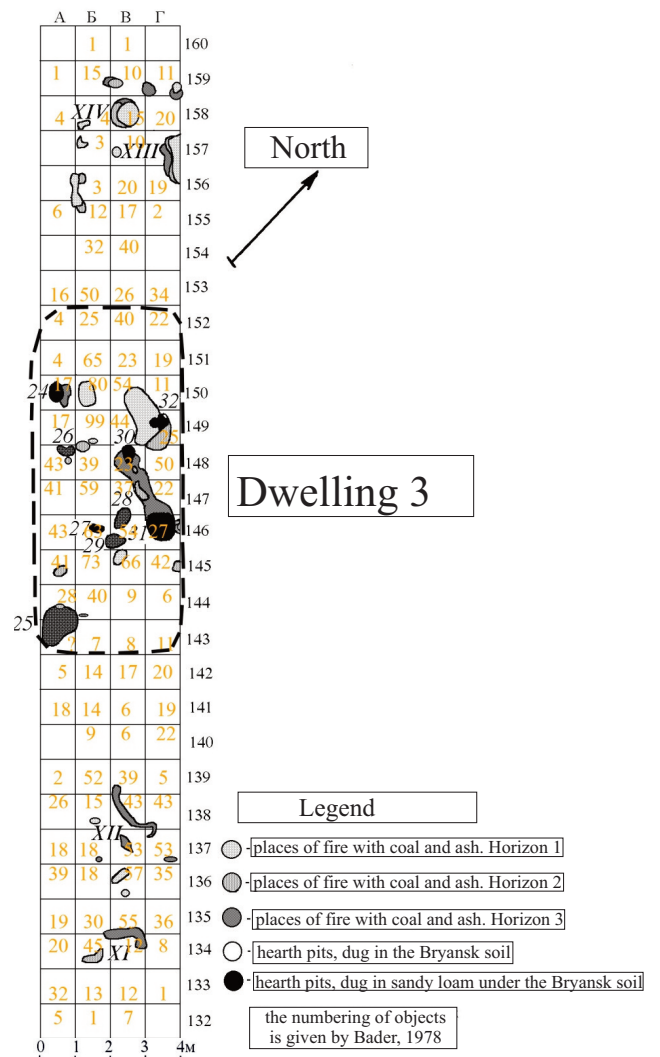
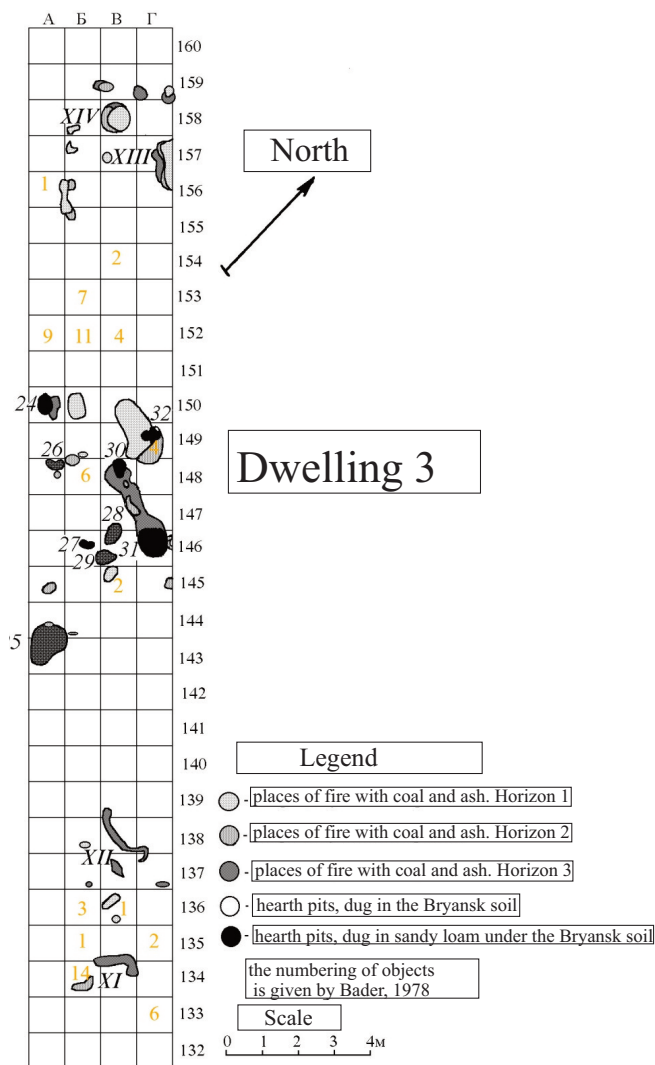


Figure 11: Distribution of products of primary knapping on the area of «dwelling» 3. Horizon 2



**Figure 12:** Distribution of products of primary knapping on the area of «dwelling» 3. Horizon 3.

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