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THE SETTLEMENT OF MOUNTAINOUS REGIONS: A VIEW FROM THE CAUCASUS

ABSTRACT: This article discusses the record of hominid occupation of Georgia during the Pleistocene. It concludes that Georgia was initially colonized by the early Pleistocene and that it was continuously occupied from the middle Pleistocene onward. This continuous occupation was made possible by both altitudinal zonation, which offered human colonists a great variety of resources, and the fact that this region was less affected by Pleistocene climatic fluctuations than other parts of Eurasia.

KEY WORDS: Georgia – Colonization – Paleolithic – Paleoenvironment – Hominid occupation

THE GEOGRAPHIC SETTING

Georgia lies between the Major Caucasus ridge in the north, the Minor Caucasus ridge in the south, the Black Sea in the west, and the Kura-Araks Plain in the east (*Figure 1*). Physiographically, the country is divided into western Georgia with warm and humid Mediterranean climate and eastern Georgia, where the climate is more continental. The western and central Caucasus lie at the northern periphery of the subtropical climatic zone. Georgia's complex topography of river valleys, plateaus, foothills, and mountains is mirrored in the strict altitudinal zonation of its biotic resources, and the country contains all climatic zones from coastal to mountainous ones reaching the altitude of 5,201 m above sea level (asl).

THE RECORD OF HOMINID OCCUPATION

Data on hand suggest that this region was originally colonized by the anthropoids. A primate tooth found in Upper Sarmatian (Upper Pliocene) deposits in eastern Georgia is assigned to a new species of higher primates named *Udabnopithecus garedziensis* Bur. et. Gab.

(Burchak-Abramovich, Gabashvili 1945). Favourable environments with abundant vegetation and faunal resources, water sources, a variety of lithic raw materials, and numerous natural shelters were apparently also attractive to hominids who occupied Georgia during the entire Paleolithic and left behind about 400 known archaeological sites (*Figure 1*).

Given the geographical location of the Caucasus, we can assume that this region served as the dispersal corridor for hominids leaving Africa through the Levantine corridor and entering Eurasia.

A. From the Late Pliocene through the Middle Pleistocene

The site of Dmanisi (1,000 m asl), located 80 km south of Tbilisi, contains the earliest evidence for hominid occupation and dates to the Upper Pliocene. The site has yielded primitive cobble tools and hominid remains, including a mandible exhibiting features of African *Homo erectus* (Gabunia 1992, Gabunia, Vekua 1995). The Dmanisi cultural layers lie directly on a basalt lava bed which has K/Ar dates of 1.8 ± 0.1 , 1.9 ± 0.2 , 1.95 ± 0.22 , and 2.04 ± 1.37 million years ago (Schmincke, van de Bogard 1995). Both the lava bed and the cultural layers exhibit normal

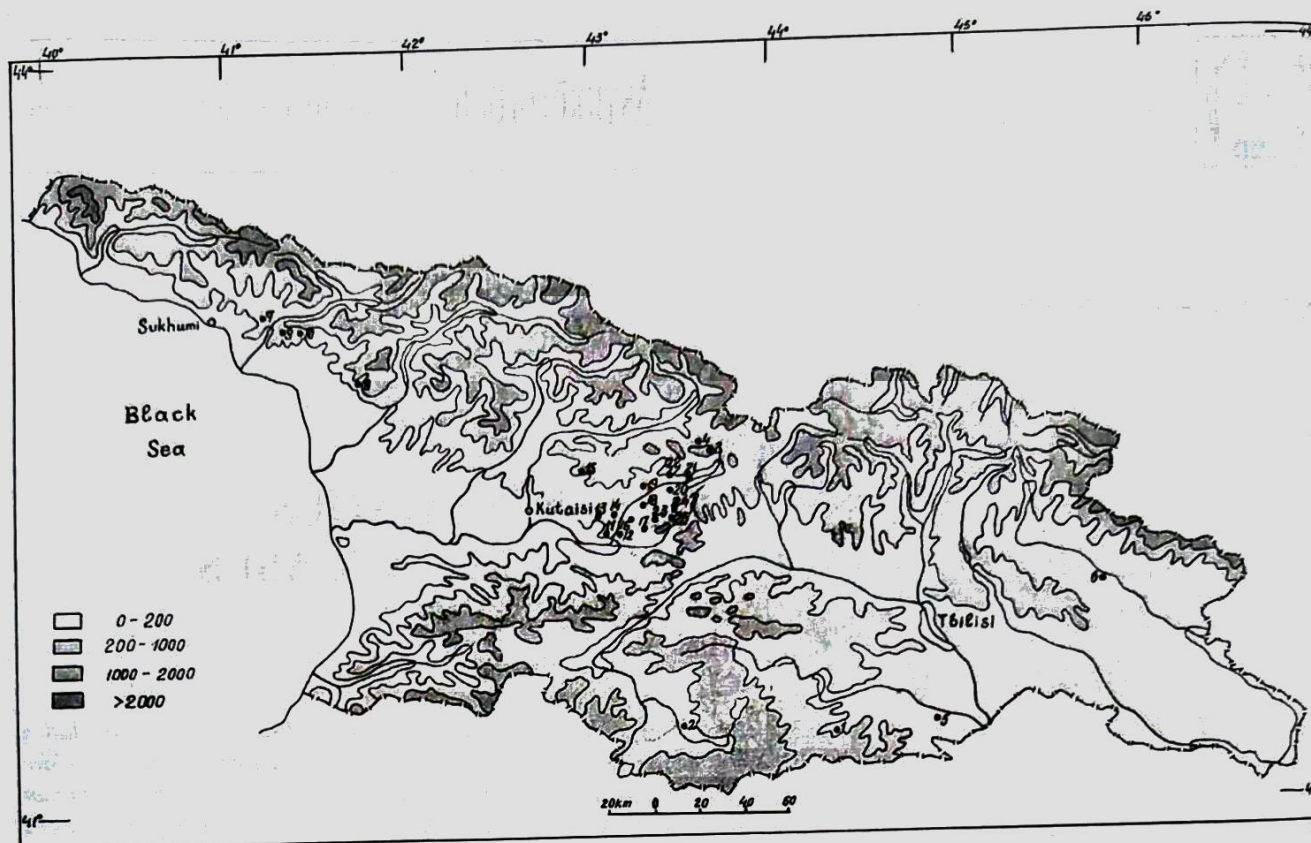


FIGURE 1. Distribution of Paleolithic sites in Georgia: 1 – Dmanisi, 2 – Akhalkalaki, 3 – Tsona, 4 – Kudaro, 5 – Tsopi, 6 – Ziari, 7 – Apiancha, 8 – Okumi, 9 – Kvachara, 10 – Svanta Savane, 11 – Sagvardjile, 12 – Devis Khvreli, 13 – Ortvala, 14 – Sakajia, 15 – Tsutskhvati, 16 – Mgvimevi, 17 – Ortvala-Klde, 18 – Djirutchula, 19 – Khergulis-Klde, 20 – Samertskhle-Klde, 21 – Gvardjilas-Klde, 22 – Dzudzuana, 23 – Sareki, 24 – Togon-Klde, 25 – Chakhati.

polarity (Sologashvili *et al.* 1995). Faunal remains recovered here include *Archidiskodon meridionalis*, *Struthio dmanisensis* Kowalskia sp., *Mimomys* cf. *reidi*, *Homoterium crenatidens*, *Megantereon megantereon*, *Cervus perieri*, and *Equus* cf. *stenonis* (Vekua 1995, Muskhelishvili 1995). Thus, biostratigraphic and polarity data correlate the Dmanisi deposits with the Olduvai palaeomagnetic event.

The remains of woodland (deer, wild boar, forest mouse) and open landscape taxa (antelope, horse, ostrich, hamster) indicate that Dmanisian hominids lived in a savannah environment. Pollen spectra from the site, which are dominated by *Chenopodiaceae*, *Ephedra*, *Artemisia* and *Tilia*, point to the existence of open and woodland plant communities as well (Klopotovskaya *et al.* 1989). The large number of *Borraginaceae* and some Celtic *glabrata* seeds recovered also point to the mix of savannah and sparse forest habitats (Lemee 1967, Gulisashvili 1980).

The Dmanisi remains are found at the margins of a relict lake or pond and show that hominids occupied a marginal hollow formed by a mud flow (Djaparidze *et al.* 1989). The mosaic environment and the proximity to water here were factors which attracted hominids to this location. It remains unclear how they obtained the animal species

found at the site – whether by hunting or scavenging. Some antlers recovered indicate breakage by hominids. At the same time, we have also recovered crania of several sabertooth felids, which were probably not hominid prey.

The site has also yielded remains of hackberry and *Ephedra*, both of which may have been eaten by hominids (Grosgeim 1946). Hackberry remains has also been reported at Zhoukoudian (Dohnal 1961), at Lazaret, Terra Amata, and Tautavel (Bahn 1984).

The site of Akhalkalaki, located about 50 km from Dmanisi, is found at the elevation of 1,600 m asl. To date, only a small part of the site has been excavated. The recovered cobble tools and numerous skeletal remains of *Archidiskodon meridionalis*, *Dicerorhinus etruscus*, *Equus hipparionoides*, *E. sussenbornensis*, and *Mammuthus trogontheri* all point to a Lower Pleistocene age for the site. Organic remains recovered indicate a savannah environment (Gabunia *et al.* 1994).

The Central Caucasus contain other stratified sites including the caves of Kudaro and Tsona, lying at elevations of 1,580 m asl and 2,150 m asl respectively. The lowest cultural layers at both sites primarily contain bifaces dating to the middle Acheulean. Pollen data and faunal remains suggest that these Lower Paleolithic layers

accumulated under warm and humid climatic conditions (Zelikson, Gubonina 1985, Vekua *et al.* 1987).

Kudaro contained Lower and Middle Paleolithic as well as Mesolithic cultural levels. Lithic assemblages from the lowest layers consisted of choppers, chopping tools, bifaces, scrapers, and notched tools dated to the middle Acheulean (Liubin 1989).

While both the lithic artifacts and the faunal remains from Kudaro are similar to those from Tsona, with warm-loving taxa predominating, faunal remains display more diversity at Kudaro. For example, the Acheulean levels contained the remains of macaques.

The richness of archaeological remains at Kudaro suggests a long-term Acheulean occupation while those of Tsona suggest a more ephemeral presence, perhaps a temporary hunting camp. While geological research here is still in progress, Liubin (1989) dates the lowest cultural levels to the Mindel glaciation and the overlaying Acheulean level to the Mindel-Riss interglacial (or possibly the Riss-Würm interglacial).

The extant stratigraphic record of Lower Paleolithic sites in Georgia shows a long chronological gap between Dmanisi, on the one hand, and Tsona and Kudaro, on the other. This gap may reflect the taphonomic reality of poorer preservation of materials in mountainous terrains. At the same time, it also probably reflects the fact that mountainous regions remain much less explored by archaeologists.

In addition to these cave sites, the majority of the Lower and Middle Paleolithic cultural materials recovered in Georgia to date come from surface collections over vast areas ranging in elevation from 200 m (Kolkhida lowlands) to 2,000 m asl. Open-air sites with undisturbed cultural levels are very rare. One of these, Ziari in eastern Georgia, was found at the elevation of 900 m asl. Bugianishvili (1991) has assigned its lithic assemblage to the Middle Acheulean. Another stratified open air Middle Paleolithic site, Tsopi, located in eastern Georgia, lies at the elevation of 820 m asl. Tushabramishvili (1984) classified its lithic industry as belonging to the Charentian facies of the Mousterian – unique in the Caucasus. The faunal assemblage recovered here suggests the dominance of open landscapes (Grigolia, Vekua 1963). Neither of these sites, however, has been dated biostratigraphically and the lack of radiometric dates for the deposits makes it difficult to correlate the layers with the available stratigraphic schemes.

While there are other Middle Paleolithic sites in western Georgia and adjacent regions, to date Upper Paleolithic sites are only known from the western part of the country. Based on currently available data, all known western Georgian Middle and Upper Paleolithic cultural levels from stratified sites probably date to the Last Glaciation.

B. The Late Pleistocene

1. The environmental setting

During the Last Glaciation (Würm, Valdai, Visla)

humans occupied two environmental zones in Europe: the periglacial one and a more moderate one (Velichko 1988, 1989). The Caucasus, together with the Iberian Peninsula, the Apennines, and a part of the Balkans, were included in the latter zone. Compared to climatic changes further north, the Caucasus experienced only minor climatic fluctuations throughout the Last Glaciation.

Due to the diversity of the landscapes and proximity to the Black Sea, environments of the western Caucasus featured local specificities. While the entire temperate zone witnessed radical environmental changes during the first half of the last glaciation, western Caucasus did not undergo extreme fluctuations and climate remained rather cool and humid. Climatic changes did bring about the redistribution of the vegetation zones but did not affect their structure. During the middle Valdai warming the environment became similar to the present-day one. The growth of glaciers resulted in temperature inversions which caused the occasional spread of birch and boreal vegetation to lower altitudes.

A gradual lowering of the altitudinal zones began in the second half of the glaciation. The zones reached their lowest points during the Last Glacial Maximum (20,000–18,000 B.P.). The increased aridity of the climate led to the degradation of forest landscapes, but did not totally eliminate the warm-loving species which survived in refugia and spread widely right after the maximum.

2. The archaeological record

Most Late Pleistocene archaeological sites are located in Western Georgian foothills at the elevations between 200 and 800 m asl. Human presence in the Georgian highlands during the first half of the Last Glaciation is in evidence in the Middle Paleolithic levels at the Kudaro and Tsona caves. Available faunal remains recovered at the sites point to the hunting of red deer and ibex. Liubin (1980) has argued that abundant salmon remains recovered here also point to fishing, but the presence of bears in the assemblages make this interpretation problematic. To date, no undisturbed Upper Paleolithic cultural levels have been found in this zone.

Five of the fifteen Tsutskhva caves in Shabata-Gele Gorge (250–350 m asl) contained undisturbed Middle Paleolithic cultural levels (Bronzovaia, Dvoinoj Grot, Bizonovaya, Medvezh'ia, and Verkhniaia). The lower levels contain assemblages dominated by bison and ibex, while remains of the cave bears dominate assemblages from the upper levels (Vekua 1978). Hominid remains are represented by an upper left molar of a 8 year-old Neanderthal recovered from the Bronzovaya Cave (Gabunia *et al.* 1978).

The Sakjia and Ortvala caves, located near the Tsutskhva area, contain cultural remains dated to the middle and late Middle Paleolithic. Cave bears dominate the recovered faunal remains (Nioradze 1992). Hominid remains consist of a Neanderthal maxilla found at Sakjia (Gabunia *et al.* 1978).

The presence of ten caves with cultural remains on the Upper Imeret' Plateau suggest that the Kvirili Gorge was intensively occupied during the Middle Paleolithic as well. One of the most important sites here is the Djruchula Cave found at the elevation of 600 m asl. This cave contained two cultural layers dating to the middle and late Middle Paleolithic. The two layers were separated by a sterile deposit which measured 1m in thickness. Hominid remains recovered include a first molar belonging to a mature Neanderthal (Gabunia *et al.* 1961). Faunal remains from the lower level mostly consist of cave bear bones while those from the upper level are dominated by ibex, deer, and bison bones.

Ortvala-Klde, a multilayer site found at the elevation of 560 m asl, contains archaeological remains dating to the late Middle Paleolithic. It is the only Middle Paleolithic site in the area containing few cave bear remains, with a faunal assemblage dominated by ibex and bison. The cave has also yielded a Neanderthal tooth (Lordkipanidze 1992). When the cave was first occupied, it was situated at the upper boundary of the spruce and fir forests. The presence of frost-shattered gravels in the deposits, as well as the bones of ibex and snow vole, argue for a rather cold and humid climate. The sterile layer separating the culture-bearing deposits probably dates to the first cold maximum of the last glaciation (cold and humid phase). The subsequent climatic warming saw the accumulation of silty clays and the spread of the oak and hornbeam forests. The presence of the birch suggests that environmental conditions were unstable at this time. At this point in time, Ortvala-Klde was located relatively close to a subalpine meadow inhabited by ibex. This episode of human occupation of the site may thus be dated to a Middle Würm interstadial. The subsequent climatic cooling saw the accumulation of coarse deposits at the site and the relocation of the vegetation zones to somewhat lower altitudes. Beech forests, which today form the upper forest belt in Western Georgia, were dominant. This time span corresponds to the beginning of the second half of the last glaciation.

The multilayered Apiancha Cave is found 30 km east of Sukhumi, located on the eastern coast of the Black Sea. The Middle Paleolithic levels from the cave, found at the elevation of 150 m asl, date to the late Middle Paleolithic. Faunal remains recovered here are dominated by cave bears (Tsereteli *et al.* 1982).

Upper Paleolithic sites have been found only in the Georgian foothills. About 20 stratified cave sites are known from the eastern Black Sea region and from the Kvirili-Rioni Basin. Upper Paleolithic remains from the Black Sea region come from Apiancha, Kvachara (700 m asl), Okumi (300 m asl), and Svanta Savane (400 m asl). Faunal remains have been quantified only from Okumi where they are dominated by bison (Berdzenishvili, Khubutia 1974).

The Imeretia region also contains a number of sites including Sagvardjile (220 m asl), Devis Khvreli (340 m asl), and the Upper Paleolithic levels at Sakjia and Ortvala.

Sagvardjile archaeological remains date to the Early Upper Paleolithic while its faunal assemblage contains remains of horses (Gabunia 1959).

The Upper Imeretia Plateau likewise contains a number of sites. The faunal remains at Mgvimevi (620 m asl) are dominated by bison, ibex, and horse (Gromova 1948, Vereschagin 1959). Fauna from Gvardjilas-Klde (600 m asl) mostly consists of ibex and bison. This faunal assemblage also contains many remains of alpine and subalpine birds. Bison dominate the assemblage from Samertskhle-Klde, located 600 m asl (Nioradze 1975).

The cultural layers at Dzudzuana (500 m asl) date to the second half of the Last Glaciation. At the time of occupation, the site was located within a mixed coniferous-deciduous forest. Later, these forests were replaced by more open pine-spruce forests combined with open areas occupied by *Chenopodiaceae*, *Gramineae*, and *Astereae*. Floral remains from the upper portion of the cave's stratigraphic profile (level 4 and above) show the expansion of deciduous forests. The structure of the recovered faunal remains is in good accord with the evidence from floral data. Horse remains dominate in the lower levels occupied when the landscape was sparsely forested. These environmental reconstructions, supported also by lithological studies, suggest that the cave's lower levels accumulated during colder and more arid climatic conditions. Extremely cold conditions documented in level 6 appear to date this level to the Last Glacial Maximum. Other Upper Paleolithic cave sites in this area include Khergulis-Klde (545 m asl), Sareki Rockshelter (450 m asl), Togon-Klde (500 m asl), and Chakhati (500 m asl).

In western Georgia, no Upper Paleolithic sites are known from the coastal lowlands. Since this area was submerging at the rate of 6 mm/yr (Adamia *et al.* 1990), it is likely that the Upper Paleolithic remains there today lie deeply underground.

Finally, the absence of known Upper Paleolithic sites in Eastern Georgia reflects insufficient archaeological surveying rather than any paleoenvironmental factors. The open landscapes which dominated the area during this period were probably favourable for human occupation and call for future research.

SUBSISTENCE PRACTICES

During the last glaciation many regions of Georgia contained stable resources such as water, lithic raw materials, and natural shelters. Paleobotanical studies indicate that warm-loving floral species survived in western Georgia even during the Last Glacial Maximum and produced a number of resources which could be gathered. Today, eight kinds of nuts, about 60 kinds of edible berries and fruits, approximately 70 kinds of edible roots, and up to 160 kinds of other edible vegetable resources are known in Georgia. Various subtropical plants may also have

TABLE I. Faunal remains from the Paleolithic sites in Georgia (after Liubin 1980, Lordkipanidze 1992, Nioradze 1992, Vekua 1991, Vereschagin 1959, Vereschagin, Baryshnikov 1980).

Site and level	1	2	3	4	5	6	7	8	9	10	11	12	13
MIDDLE PALEOLITHIC													
Ortvala-Klde													
3	-	1	-	-	-	-	-	1	-	1	-	-	26/7
4	6/2	-	-	-	-	-	-	1	-	16/4	1	-	110/21
5	10/4	-	-	1	-	-	4/2	4/2	4/1	50/11	-	-	296/37
6	12/4	-	-	-	-	-	1	8/2	3/1	82/17	1	-	747/49
7	15/5	-	-	-	-	-	-	2/1	-	81/14	-	-	583/62
9	5/2	-	1	-	-	-	-	3/1	-	23/7	-	-	284/18
10	-	-	-	-	-	-	1	-	-	4/2	-	-	14/6
Sakjia													
3A	259/17	1	3/1	1	-	-	6/2	64/8	2/1	74/11	-	-	40/6
3B	237/21	-	4/2	-	-	-	8/3	27/4	1	22/6	-	-	30/4
3C	188/18	-	1	1	-	-	3/1	20/4	1	18/5	-	-	21/5
3D	134/11	-	-	1	-	-	-	3/1	-	-	-	-	6/2
3E	21/7	-	-	-	-	-	-	-	-	-	-	-	-
3F	22/6	-	-	-	-	-	-	-	-	-	-	-	-
Ortvala													
3	140/7	-	3/1	-	-	-	1	7/2	-	3/1	-	-	4/2
3A	1112	-	5/2	2/1	-	-	2/1	38/5	2/1	16/4	-	-	14/4
3B	185	1	1	3/1	-	-	2/1	33/6	-	5/2	-	-	11/2
3C	223	-	2/1	1	-	-	2/1	21/4	-	15/3	-	-	7/3
3D	257	1	18/8	2/1	-	-	2/1	18/3	-	15/4	-	-	7/1
Djrchula													
I	1623	11	17	12	-	-	9	239	22	117	-	-	301
II	3987	-	13	4	-	-	7	128	17	72	-	-	98
UPPER PALEOLITHIC													
Ortvala													
	21/2	-	2/1	2/1	-	-	-	-	-	3/1	-	-	4/1
Sakjia													
	18/3	4/2	14/2	5/2	4/2	48/2	83/4	193/5	3/1	432/11	-	2/1	113/12
Samertskhle-Klde													
	2/1	-	-	1	-	3/1	-	2/1	-	159/5	-	-	1/1
Mgvimevi													
	111	-	3/2	-	1/1	21/3	-	-	-	57/4	-	-	37/4
Devis Khvreli													
	23/7	-	1	-	-	-	30/10	17/4	2/1	6/3	-	2/1	16/5
Gvardjilas-Klde													
	3/1	11/3	4/2	-	-	-	5/3	35/8	15/9	192/25	-	21/3	209/20
Okumi													
	359/16	5/2	21/3	16/2	4/1	-	9/2	55/3	9/2	20/3	-	-	333/24
Ortvala-Klde													
	-	1	-	-	-	-	-	2/2	-	4/2	-	-	40/10
Dzudzuana													
	4/1	2/2	-	-	-	164/14	5/3	1	-	397/14	-	21/3	-

Legend:

Species: 1 - *Ursus spel.*, 2 - *Ursus arc.*, 3 - *Canis lupus*, 4 - *Vulpes vulpes*, 5 - *Felis*, 6 - *Equus caballus*, 7 - *Sus scrofa*, 8 - *Cervus elaphus*, 9 - *Capreolus carpeolus*, 10 - *Bison priscus*, 11 - *Bos sp.*, 12 - *Rupicapra rupicapra*, 13 - *Capra caucasica*.

x/y: x - minimal number of bones

y - minimal number of individuals

constituted a significant part of human diet during the Pleistocene. The use of these resources, however, is very poorly documented in Georgia, as elsewhere.

Animal protein was a crucial subsistence resource for Pleistocene groups who occupied the Caucasus. Table 1 shows that remains of cave bears dominate the Middle Paleolithic assemblages recovered from the cave sites. Extant views that this taxon was the main prey and became extinct as a result of human predation (Burchak-Abramovich 1980, Vekua 1991), however, are in need of revising. Numerous bones of *Ursus speleaus* could have originated from natural deaths of the animals, especially during winter hibernation. The predominance of old individuals at Kudaro seem to support such an interpretation (Vereschagin, Baryshnikov 1980).

The dominance of one species – ibex – at Ortvala-Klde mirrors those recorded at a number of European Middle Paleolithic sites. The French examples include *Hortus* rich in ibex remains (de Lumley 1972), Combe Grenal where either reindeer, red deer, or horse remains prevail in the different levels (Chase 1990), and Mousterian levels at Mauran (Girard, David 1982) dominated by bison bones. Red deer and horse remains predominate at the German sites of Heidenschmiede and Kogelsteinklufte (Bosinski 1967). Numerous ibex remains were found in the Middle Paleolithic levels at Repolust in Austria (Mottle 1960). In Russia, 80% of animal bones found at Il'skaia in the Kuban' Basin belonged to bison (Gromova 1948). The Mousterian levels at Starosel'e contained numerous remains of the steppe asses (Vereschagin 1971). Finally, ibex remains dominate at Teshik-Tash (Okladnikov 1966). All these sites appear to be associated with seasonal hunting of a specific animal species. The issue of whether this represent specialized hunting, especially prior to the Upper Paleolithic, or just reflect the taking of what was available, remains open.

Upper Paleolithic sites from south-western Europe, especially Cantabria and the French Pyrenees, are also rich in ibex remains. Some of these sites (e.g. Rascaño, Bolinkoba, Erralla, and Ermitia) are located at the elevations of 240–350 m asl and are interpreted as specialized seasonal hunting stations (Straus 1977, 1987). Within this context, Ortvala-Klde appears to have been occupied from late fall to early spring to hunt ibex when they reached the lower altitudinal boundary of their range.

In western Georgia horses were rarely exploited during the first part of the last glaciation. They became a more important subsistence resource with the spread of the open landscapes during the Upper Paleolithic.

Extant models for Upper Paleolithic adaptations to mountain environments in Spain argue that human groups followed herds of seasonally migrating red deer, occupying coastal lowlands in winter months and moving to the mountains in summer months (Straus 1977, 1986, Bahn 1984). More complex models have been offered for Greece (Baily, Gamble 1990). The complexity of the latter is probably more applicable to Georgia where the

archaeological remains indicate neither a high degree of mobility nor extensive sedentism.

SUMMARY

We can summarize the data on hand on human occupation of Georgia by underscoring that:

1. Hominids first colonized this region possibly as early as the late Pliocene.
2. Abundant archaeological remains indicate continuous occupation from the Middle Pleistocene onward.
3. Pleistocene climatic changes were less dramatic here than in more northerly regions of Eurasia. This resulted in greater temporal continuity of familiar landscapes with known resources through time.
4. Human adaptations in Georgia throughout the Pleistocene were organized around altitudinal zonality which characterized this region in the past and continues to do so today.

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