CHAPTER 6

Prehistory and history of the DSP landscape

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When initiating the project, its delimitation was determined as the area roughly between Černomorskoe to the W and Masliny to the E. The southern border of the study area was the edge of the Plateau, which constitutes the spine of the peninsula. Thus, the overall study zone is roughly a trapeze measuring 5 (NS to the W) x 25 (EW to the S) x 15 (NS to the E) x 30 km (along the coast). Because the project was cancelled prior to its completion, some parts of this zone were not investigated at all. This holds true for the area between Černomorskoe and Panskoe and for the Plateau itself. In addition, in 2008 due to the wish of our Ukrainian partners, the study zone was further restricted to a 12 km wide N-S transect located roughly between Mežvodnoe and Vodopojnoe, but covering all environmental zones of the region.

6.1 FROM SITE CLASSIFICATION TO SITE INTERPRETATION | P. ATTEMA, T. DE HAAS, W. DE NEEF & C. WILLIAMSON

6.1.1 Introduction

In order to discuss the long term settlement organization in the DSP landscape, we present in this paragraph a classification of the sites mapped in the transect, based on their descriptions in the catalogue. This site classification will then be the basis of the period-by-period maps that, in combination with the landscape classification, will serve a functional interpretation of settlement organization in the wider area of study. Archaeological sites are defined in the DSP as *all artefact scatters and structural features that are indicative of past human activity at circumscribed locations in the landscape, provided these remains are detected 'in situ'* (Chapter 2.5). Fig. 6.1 shows that archaeological sites have been attested in all land types. In the following we will try to establish whether there are any correlations between site classes (and related human activities in the landscape) and land types as discussed in Chapter 3. To this end we will first present the site classification to subsequently show in the period-by-period maps how site types may correspond with land types. The resulting interpretation of settlement organization in the DSP survey area will then be evaluated in light of the regional settlement pattern in Sections 6.2.1 and 6.2.3.

The *first* step in devising the classification presented here entailed the characterization of the archaeological data and their attribution into defined classes. The substantial environmental differences and related post-depositional histories between the higher and lower areas in the landscape are determining factors in the appearance of archaeological sites and the ways in which they may be investigated. Because of this we decided to distinguish two classifications: one for the cultivated area featuring the landscape types Lowland Ridge/Coastal Cliff, Coastal Lakes, Pediment and one for the higher parts in the landscape featuring the landscape types Hillsides and Plateaus/Uplands.

6.1.2 The cultivated area

Most sites in the cultivated area (Lowland Ridge/Coastal Cliff, Coastal Lakes, Pediment) appeared as (multiple) surface scatters of artefacts in the ploughed terrain, although isolated artefacts did occur. A minority of sites was (also) visible as an elevated feature in the landscape (for instance kurgan, cadastre or ash heap). Although magnetometer surveys at Panskoe I gave evidence for new structures, we have no information as of yet on possible subsurface archaeology revealing plans of (stone) structures at other sites in the cultivated area. In the first column in the first table of Appendix 1, all

sites found are listed with a short description based on the catalogue entries in the second column. In the third column the attribution to one of the following classes is given:

- Part of a large complex settlement (scatters related to Panskoe I)
- Large settlement (> 1 ha, multiple scatter)
- Small settlement (ca. 0.5 ha, single or multiple scatter)
- Non-settlement (< 0.1 ha, single scatter)
- Funerary area (ploughed out and/or intact kurgans)
- Land divison
- Isolated find

The map (Fig. 6.2) shows the distribution of the various classes over the landscape.

6.1.3 The slopes

Most settlement sites in the higher parts (Hillsides and Plateaus/Uplands) are noticed by their stone features or by marked differences in the vegetation, while kurgans appear as clear elevations. Artefact scatters are rare and generally only appeared in the occasional ploughed areas. Many sites were subjected to magnetometer surveys yielding images of the plans of the stone structures and, when wider geomagnetic prospection was conducted, the extent of the settlements to which they belong. Therefore more settlement classes could be discerned compared to the cultivated area. In the first column of the first table of Appendix 1 all sites are listed with in the second column a short description based on the catalogue entries. In the third column the attribution to one of the following classes is given:

- Large complex settlement (multiple stone structures, pits, pens, > 2 ha)
- Small complex settlement (multiple stone structures, pits, pens, < 1 ha)
- Large simple settlement (multiple simple stone structures > 2 ha)
- Small simple settlement (multiple simple stone structures < 1 ha)
- Isolated double pen
- Isolated stone structure
- Funerary area (groups of kurgans)
- Quarry
- Dam
- Crop marks
- Natural phenomenon

The map (Fig. 6.3) shows the distribution of the various classes over the landscape.

6.1.4 General observations

From the list of site classes compiled for the cultivated areas and the higher parts of the landscape we observe the following:

– Animal pens have only been discovered on the Hillsides, both isolated and in combination with settlements. In the cultivated area no pastoral structures were identified.
– Settlements on the Hillsides all feature stone foundations, but indications for the use of stone as a building material were very rare in the cultivated area. Sites here consist of pottery scatters only (excepting the Hellenistic coastal farmhouses). Although this might be due to the lack of geomagnetic observations in the ploughed area, the significant absence of stone construction materials in the pottery scatters would indicate that less durable materials were used here.
– Settlements on the Hillsides are often associated with so-called household pits that were presumably used for storing foodstuffs. No such pits have been identified in the cultivated area. This is likely due to the lack of geomagnetic observations in the ploughed area. Against this argument would plead the general absence of surface discolorations associated with the small pottery scatters and the fact that in the rare instances that geomagnetics were carried out on pottery scatters, no subsurface archeology was found, and finally that augerings with the exception of two sites did

not reveal the presence of clear cultural layers. This would indicate that the cultural layers associated with the pottery scatters have been homogenized by ploughing.
– Possible land divisions were only observed in the cultivated area (cadastre) and were visible as elevations in the landscape (earth banks). Although on the Hillsides several 'lines' in the landscape were observed on the geomagnetic maps (Fig. 4.152-153, 4.201, 4.235, 4.249), these cross-cut older features and most probably are of recent date.
– Kurgans appear both in the high- and cultivated parts of the landscape.
– Field conditions allowed to record off-site pottery only for ploughed fields. In the cultivated areas, where survey was carried out exclusively in ploughed fields, off-site pottery was consistently present in the fields and as such can be used as an indicator of past land use (manuring, discard). In the higher parts the recording of single sherds or very low densities of sherds are not necessarily indicative of off-site, but did in some cases signify sites hidden below the vegetation revealed by geomagnetic survey.

6.1.5 Period-by-period maps

The *second* step consisted of the compilation of period-by-period maps indicating the distribution of site classes over the landscape types. Because the sites that appeared during survey were predominantly Bronze Age, Late Classical-Early Hellenistic and some Early Modern, the discussion here is focused on these periods; no sites from the Medieval period were identified, although sherds from this period were collected in off-site contexts. We will start out with describing the map depicting the Bronze Age sites.

6.1.5.1 Bronze Age sites in the DSP transect (Fig. 6.4)
The Lowland Ridge has:

- Large settlements. They were classified as 'simple' because we do not know anything about their internal structure due to the absence of good geomagnetic data. The sites measure 1.2 (DSP08-F03-02 (Skalistoe 2)) and 1.9 ha (DSP08-F06-01). These sites are associated with variations in elevation and soil composition.
- Funerary areas (kurgans). These however do not show a clear spatial relationship with the settlements.

The Hillsides have:

- Two large complex settlements. They were classified as 'complex' because they consist of various types of stone structures, at times associated with pits and pens. We have to be cautious however as the dating of the agglomerations is based on a few observations only. Not all structures within an agglomeration need therefore be of Bronze Age date, although the consistency of the structures makes this likely.
- Small complex settlements. Three clusters on one hill, the others are 'isolated'. Such small settlements were not identified on the Lowland Ridge.
- Isolated double pens, probably corresponding to settlements not yet found in the survey.
- No clear funerary areas; the kurgans so far are thought to be all Late Hellenistic-Early Classical and the stone circles appeared to be natural phenomena, not megalithic tombs.

6.1.5.1.1 Functional interpretation
While the larger sites on the Lowland Ridge are, due to the availability of arable soils and proximity of the Lake Džarylgač, most plausibly interpreted as the permanent habitations of communities involved in mixed farming, hunting and fishing, the settlement remains on the Hillsides rather point to pastoral activities. Whether the settlements and animal pens on the Hillsides were used on a semi-permanent basis by seasonally returning groups of pastoralists *or* were settled all-year-round by pastoralists/farmers *or* were the facilities of people living on the coastal ridge, we are unable to say. The many pits at some of the sites – if we accept their interpretation as storage pits – may point to permanent settlement or at least to prolonged stays. However, ethnographic parallels should instruct us as to whether pastoralists seasonally returning to the same spot would have built such extensive durable stone structures and facilities as were mapped in the geophysical survey (see Chapter 5.1.4). Unlike the off-site material from the Late Classical-Early Hellenistic period, the off-site material from the Bronze Age could not be related to sites; therefore this should be interpreted as belonging to sites that have either not been located or have already disappeared altogether.

6.1.5.1.2 Chronological interpretation
Permanent settlement on the Lowland Ridge started in the Middle Bronze Age and continued into the Late Bronz Age. It is unclear when in the Bronze Age the construction of the pastoralist settlements began.

6.1.5.2 Late Classical/Early Hellenistic sites in the DSP transect (Fig. 6.5)
The Lowland Ridge/Pediment has:

- Three large settlements (possibly hamlets or farms as they consist of more than one pottery scatter), one small settlement and two non-settlements (possibly storage facilities?).
- A large complex settlement (Panskoe I).
- Possibly one more large settlement.
- A number of small settlements.
- Funerary areas.

The Hillsides have:

- Large complex settlements (pens, numerous stone house structures, household pits).
- Large simple settlements (e.g. agglomerate of >10 simple structures).
- Small complex settlements (e,g, three structures and pits) and small simple settlements (isolated farmhouses).
- Funerary areas.

Plateaus/Uplands[76] have:

- Funerary areas.

6.1.5.2.1 Functional interpretation
The largest pottery scatters are found on the Lowland Ridge. They are best interpreted as hamlets consisting of a number of rural dwellings made of non-durable materials (wooden construction, mudbrick, wattle and daub, straw). They lack any signs of stone architecture. The Pediment is characterized by small pottery scatters, again without any sign of durable building materials. These small scatters may represent single huts or sheds. Sites near the Coastal Lakes may have been fishing stations or involved in salt extraction, sites inland may be associated with arable farming. The consistent pattern of off-site materials around sites would be expected if we accept the manuring hypothesis, which could correspond with the presence of animal pens or simply household waste (e.g. Wilkinson 1982; 1989; Bintliff and Snodgrass 1988; Bintliff 1992). Larger single scatters on the Pediment may just as well represent small farmsteads. Settlements may hypothetically be related to groups of kurgans (Fig. 4.270). Most sites on the survey on the lowland however seem to represent rather poor dwellings.

The Hillsides are characterized above all by small villages and hamlets, although isolated farms also occur. Here almost all the evidence is based on stone structures and not on sherd scatters. As on the Lowland Ridge and Pediment, also on the Hillsides most sites seem to represent rather basic dwellings. There is however a limited number of more complex house plans with an internal articulation. These sites may be comparable to the non-fortified farmsteads along the coast that are known from the topographic survey (see Section 6.2.2) Kurgans occur on separate hills and are clearly separated from the rural settlements and also here it is possible to model which funerary areas would have belonged to which settlements. On account of the presence of animal pens in the larger simple settlements, it is likely that they were primarily inhabited by pastoralists. On the other hand, farming likely took place as well, as is indicated by the complex architectural structure on DSP07-H18-01.

6.1.5.2.2 Chronological interpretation
The majority of the sites date within the relatively short time span between mid-4th century BC and ca. 270 BC.

[76] However, survey has been very limited here.

6.1.5.2.3 LC/EH in sum

Taken together the site data for the Late Classical-Early Hellenistic period point to a complex rural site typology with, speaking in hierarchical terms, Panskoe I as a complex fortified settlement at the top. Other rural site types are fortified and non-fortified farmsteads along the coast (as recorded in the topographic survey), hamlets inland on the Lowland Ridge, isolated small farmsteads and sheds on the Pediment, villages, hamlets and farmsteads on the Hillsides. The overall economy in the cultivated areas is likely to have been geared towards agricultural production and fishing/salt extraction, while on the Hillsides pastoralist activities will have been a more prominent feature in the economy. This settlement organization developed quickly, making a marked impact on the landscape, but was also quickly abandoned.

6.1.5.3 Early Modern sites in the DSP transect (Fig. 6.6)

The Lowland Ridge/Pediment has:

- Three small settlements.
- One non-settlement (dump?).

The Hillsides have:

- Three small simple settlements.
- Two isolated stone structures.
- One dam.

6.1.5.3.1 Functional interpretation

The sites in the cultivated areas are all characterized by small scatters with few indications of stone architecture. It is difficult to tell whether these scatters belonged to villages or isolated structures. Some may correspond to larger nearby settlements known to have been in the area based on the cartography.

Although these sites may be small settlements, they could also be temporary or seasonal structures; the single non-settlement site is located close to a road and may have been a waste dump.

On the Hillsides, the isolated stone structures may have served as facilities related to the villages in the vicinity. The simple settlements may also be related to these villages. One site may have been a settlement of several small houses (DSP07-H04-02) but this is difficult to interpret due to the heavy vegetation. Dams in the ravines are relatively common, and the one found during the survey may have been related to the small settlement close by.

Off-site material from the Early Modern period was found in nearly every field surveyed. In field DSP08-F04 this may be related to the Early Modern settlement at Kipčak, The heavier concentration near DSP08-F05-01 indicates Early Modern activity near this Late Classical-Early Hellenistic site.

6.1.5.3.2 Chronological interpretation

The material from this period is relatively poorly known, relying primarily on the presence of glazed pottery, and is thus difficult to date with any precision. Therefore, it is not possible yet to interpret possible chronological relationships or developments in the Early Modern period for the area studied in the DSP.

6.2 THE SETTLED LANDSCAPE | P. GULDAGER BILDE & K. WINTHER-JACOBSEN

In this section we will place the observations on the settled landscape within the transect as found in the systematic survey (Section 6.1) in the wider perspective of the DSP study area.

In the cultivated zone, prehistoric sites are associated with relatively high density discrete clusters of artefacts sometimes associated with soil changes and elevations. In the past, some of these coastal sites have been excavated. On the slopes, the sites are associated with relatively low density discrete and diffused clusters of artefacts associated with soil changes. Structural remains associated with a few artefacts and distinctive vegetation indicate spatially well-defined soil changes.

6.2.1 Prehistoric period (Fig. 6.7)

Based on the methodology and the post-depositional history of the individual sites, six different categories of sites can be distinguished: 1) Structural remains of settlements visible on the surface associated with a few artefacts and distinctive vegetation to indicate spatially well-defined soil changes and relatively low density discrete and diffused clusters of artefacts such as DSP07-H06-01, DSP07-H08-01, DSP07-H14-01, possibly DSP07-H01-01 and DSP07-H02-01, whereas it is difficult to form an opinion about DSP07-H07-1-2, DSP07-H09-01 and DSP08-H13-01 due to sampling methods. 2) High density discrete clusters of artefacts sometimes associated with soil changes and elevations interpreted as settlements such as DSP08-F03-02 and DSP08-F06-01. 3) Structural remains of settlements associated with a Bronze Age element but dominated by finds from later periods such as DSP08-H12-01 and DSP07-H18-01. 4) Kurgans associated with Bronze Age finds such as DSP08-F04-4 (Feature 3). 5) Isolated artefacts possibly associated with burials such as DSP07-F04-01 (axe) and DSP07-F05-02 (stele). 6) Previously identified Prehistoric sites within the survey area such as Baj Kijat 1-2, Burun Eli 1, Jarylgač Severnoe, and Skalistoe 2, where excavations have been carried out. 7) Sites, where Prehistoric material has previously been recorded by means of *razvedki*-type of survey, e.g. the Vodopojnoe 1-5 sites. The overall topographical distribution suggests that settlements are located in all the ecological zones of the DPS landscape even if the coastal zone is only represented by one settlement, namely Baj Kijat 1. The settlements in the cultivated zone on the N side of the Džarylgač Lake such as DSP08-F06-01, Skalistoe 2, Burun Eli 1 and Severnoe 1 are all substantial sites. Assemblage studies of the DSP sites suggests that DSP08-F06-01 may have been associated with lithics production – at least when compared with Skalistoe 2. The chronology is very coarse. Both DSP sites have Middle and Late Bronze Age elements, and all the sites may have been occupied intermittently; nevertheless, the spatial distribution is approximately equidistant. The area on the N side of the Džarylgač Lake is broken by a roughly E-W running ridge surface if generally very smooth and there is no current conclusive evidence to suggest that the localities were sheltered from the dominating winds, except Skalistoe 2, which is located in a shallow depression.

Notably, we have not been able to locate any Bronze Age settlements on the Pediment of the S side of the Džarylgač Lake. One secure Bronze Age kurgan (DSP08-F04-4 Feature 3) and one possible burial of the same general period (DSP07-F04-01) have been identified in the same zone. Moreover, the two possible Bronze Age burials identified on the N side of the lake (DSP07-F07-01 (Feature 3) and DSP07-F05-02) are also not located anywhere near contemporary settlements, and the location of kurgans during this period may be determined by other criteria.

A number of settlements have been identified on the slopes all belonging to the first category of settlements mentioned above. Even if structural remains have been identified at all the sites, the Bronze Age component in the form of ceramics is not always firm. All the sites were reoccupied during the Late Classical-Early Hellenistic period, and the precise association between the architecture and the Bronze Age ceramics is tentative. The location of the settlements on the slopes appears to be guided by dominating winds as the majority is sheltered by higher hills on the NW side. Furthermore, generally the settlements are all located towards the tip of a promontory near a ravine which provided the easiest access to fresh water in the form of wells as well as dams. Of course, the ravines also provided shelter for the animals.

The same topographical features are found in the Vodopojnoe Ravine where at least four Bronze Age settlements have been identified (Vodopojnoe 2-5). Apart from these topographical amenities, Vodopojnoe 2-3 are also located at geostrategic points namely at the major crossings of the ravine tying these sites into the system of long distance routes (see Chapter 6.6).

In order to compare approximate population density, we will assume that the settlements were contemporary and continuously occupied. Even compared to the excavated sites on the slopes, the finds densities N of the lake are disproportionally higher. Also the settlements on the N side of the Džarylgač Lake are located at ca. 4-5 km apart; whereas on the slopes and around the Vodopojnoe Ravine, the settlements are located much closer between 0.7 and 2 km apart. The topographical variety of the DSP area provides the basis for a mixed agropastoral economy. The absence of settlements on the Pediment S of the lake suggests that this zone was reserved for a different purpose. Held up against the relatively closer settlement pattern on the slopes, it is possible that the people settled there cultivated the Pediment S of the lake while grazing their flocks on the slopes. Of course, if the settlements were occupied intermittently, there is a whole range of possibilities.

6.2.2 Greco-Roman period (Fig. 6.8)

Based on the methodology and the post-depositional history of the individual sites, the following different categories of sites can be distinguished: 1) Structural remains of settlements visible on the surface associated with a few artefacts and distinctive vegetation to indicate spatially well-defined soil changes and relatively low density, discrete and diffused clusters of artefacts such as DSP07-H01-01, DSP07-H06-01, DSP07-H07-01, DSP07-H10-01/H18-01, DSP08-H11-02, DSP08-H12-01, and possibly DSP07-H02-01, DSP07-H08-01, and DSP07-H14-01, whereas it is difficult to form an opinion about DSP08-H13-01 due to sampling methods. 2) High density discrete clusters of artefacts sometimes associated with soil changes and elevations interpreted as settlements such as DSP07-F08-01, Skalistoe 2, DSP08-F04-03, and DSP08-F04-07. 3) Relatively low density, discrete clusters of artefacts sometimes associated with soil changes and elevations interpreted as settlements such as DSP07-F02-01, DSP07-F02-02, DSP07-F02-03, DSP07-F02-04, DSP07-F06-02-03, DSP08-F02-01, DSP08-F04-01-02, DSP08-F04-06, DSP08-F05-01, DSP08-F06-03 and DSP08-H20-01. 4) Individual sherds associated with subsurface structures such as DSP08-H17-01 and DSP08-H23-01-02. 5) Kurgans associated with Greco-Roman finds such as DSP07-F01-02, DSP07-F03-01, DSP07-F07-01, and probably DSP08-F01-01, DSP08-H17-02, DSP07-H19-03-04, DSP08-H24-01, DSP08-H26-01-02. 6) Previously identified Greco-Roman site within the survey area such as Černomorskoe and associated farms, Panskoe I-V, Groty 1, Skalistoe 1, 3-4, Baj Kiat 1 and 3, Burun Eli 1-5, Jarylgač, Jarylgač Vostočnoe, Masliny 1-2, Mežvodnoe, Severnoe 2 and possibly Vodopojnoe 2.

The overall topographical distribution suggests that settlements are located in all the ecological zones of the DPS landscape. However, unlike the Bronze Age, a large number of the previously known sites are located on the coast. Furthermore, a large number of previously known sites are located around the Kelšeich and Sasyk Ravines, whereas the Bronze Age sites were located on the Vodopojnoe Ravine. At least one of the sites in the Vodopojnoe Ravine has a Hellenistic element, but the area was not thoroughly investigated, so it is difficult to form an opinion as to the settlement pattern in this ravine after the prehistoric periods and before the Early Modern times.

Only kurgans are attested on the Coastal Ridge N of the Džarylgač Lake, but there appear to be two groups of settlements in this zone: two sites of the third category (DSP08-F02-01, Skalistoe 2) located 600-700 m from the present coast and close to several coastal sites (Skalistoe 1, 5 and 8). Skalistoe 2 is located in the same area as the Bronze Age site Skalistoe 2. A small cluster of sites appear to be located along the old road between the modern settlements at Mežvodnoe and Vodopojnoe (DSP07-F08-01, DSP08-F05-01, DSP08-F06-03, DSP07-F06-01-03). Unlike the Bronze Age, the cultivated zone on the S side of the Džarylgač Lake is spatially, densely occupied (DSP06-F04-01, DSP07-F02-01-04, DSP08-F04-01-03 and DSP08-F04-06-07). A long chain of kurgans of unknown date range is located in the same area, at least one of which dates back to the Bronze Age. A Late Archaic amphora rim was collected near the southern-most of these (DSP07-F02-05). DSP07-H11-01 is located at the foot of the Hillsides where there is a string of 19th century villages. 850 m to the NE is a small chain of contemporary kurgans (DSP07-F03-01). Immediately NW of this group is a large kurgan reused as a cemetery by the nearby village of Snežnoe (Fig. 6.9). According to the traditional typology a kurgan of this size would be dated to the Bronze Age.

Several of the sites on the slopes are new (DSP07-H04-01, DSP07-H10-01, DSP08-H11-02, DSP08-H20-01, DSP08-H23-02, DSP08-H24-03 and probably DSP08-H12-01). However, the location of a small majority of Hellenistic settlements sites on the slopes coincides with Bronze Age settlements (DSP07-H01-01, DSP07-H02-02, DSP07-H06-01, DSP07-H07-01, DSP07-H08-01, DSP08-H13-01, DSP08-H14-01). The slopes are characterised by the numerous kurgan chains running roughly N-S, the most impressive of which is the chain on Hill 19 consisting of at least 31 kurgans (see Appendix 1). The kurgans have been looted one time or other. In some cases, a few Hellenistic sherds and flint tools have been collected around the kurgans probably left by looters. Apart from the officially excavated ones (DSP07-H19-01 Kurgans 1-3 and 10), the kurgans are almost impossible to date. The excavation of a strong anomaly near Kurgan 3 produced an amphora toe of the mid-4th century BC. Generally, the kurgans and settlements are located on different hills, and there appears to be no direct spatial relationship between the two.

In order to compare approximate population density, we will assume that the settlements were contemporary and continuously occupied. The combination of densities, assemblage composition and geographical size implies the existence of a settlement hierarchy. One group is defined by the presence of tile and tablewares combined with high density level: DSP07-F08-01, DSP08-F04-03 and DSP08-H11-01. To this group should be added the Černomorskoe settlement, Panskoe I and II, and possibly Groty 1 and Masliny 1. Tiles are in general rare on the Tarkhankut Peninsula even at Panskoe I and significantly, single tile fragments have been collected from all these sites. Apart from Panskoe I (and II), tablewares are rare at the sites identified by survey, but tablewares also always occur at the sites where tiles have been col-

lected. Otherwise assemblage compositions distributions are diverse, possibly due to the relatively small size of the surface assemblages. The spatial distribution of these settlements is dispersed at a distance no closer than 3 km. The combined elements characterising this group of sites suggests that they are multiple settlements as has been proven the case by excavation at Černomorskoe, Panskoe I and Masliny 1.

Another group is defined by the absence of tile, almost absence of tablewares and relatively lower overall densities (DSP08-F02-01, Skalistoe 2, DSP08-F06-03, DSP08-F05-01, DSP07-F06-01-03, DSP07-F02-01-04, DSP08-F04-01-02, and DSP08-F04-06-07) and possibly Groty 2. In the group probably belong slope sites DSP07-H04-01, DSP08-23-02, DSP08-H24-03, DSP07-H01-01, DSP07-H02-02, DSP07-H07-01, DSP07-H06-01, DSP07-H08-01, DSP08-H20-01, DSP08-H14-01. Due to different post-depositional processes surface densities are very low on the slopes making direct comparative analysis with sites in the cultivated zone impossible. On the other hand, the number of structures recorded at some of these sites is substantial, but since they occupy sites also inhabited during the Bronze Age it is impossible to date the individual structures for certain based on surface observations alone. The proportion of handmade wares and flint tools appears not to be correlated to the hierarchical structure.

Structural elements define two additional groups: DSP08-H11-02 is a unique site consisting of pit houses, and although stone structures appear to be visible on the surface these could not be definitely identified on the geomagnetic map. DSP07-H10-01/18-01 and DSP08-H12-01 both have multiple stone structures visible on the surface and subsurface, but tiles have not been collected distinguishing these sites from the group mentioned above. Of course, finds densities are very low since the sites have not been ploughed.

Another consistent pattern which appears to divide the settlements into two groups is the occurrence of large clusters of pits located at sometimes a short distance away from the structures (DSP07-H01-01, DSP07-H07-01, DSP07-H10-01/H18-01, DSP08-H11-02, DSP08-H12-01). Of course these features have only been identified at sites where geomagnetic survey were carried out, and they appear to be absent at a number of hills where extensive areas have been surveyed (DSP07-H02, DSP07-H08, DSP08-H13-H14). The area investigated on Hill 6 is too small to postulate absence. On DSP07-H01-01 the cluster of pits was located in the southern part and the excavated pit revealed only Hellenistic material. The remaining sites where clusters of pits have been recorded are all predominantly Hellenistic. The fact that clusters of pits were not recorded on Hill 8 and 14 – the major Bronze Age settlements on the slopes – would suggest that this is not a phenomenon associated with this period.

The chronology is only as precise as the locally available ceramic typologies. Consequently, the period between 400 and 270 BC is well attested due to the publication of Panskoe I. A few finds appear to precede this period (Chapter 5.3.3.6). The earliest finds are two Late Archaic amphora rim fragments collected near DSP07-F02-06 and at Skalistoe 2. At the latter site a 5th century BC amphora sherd was also collected. Additionally, a small cluster of 5th and early 4th century pottery was collected along the present S bank of Lake Džarylgač at and around DSP07-F04, DSP07-F02-01-02, and DSP08-F04-01-03. These finds suggest that the sites mentioned are earlier or at the latest contemporary with the foundation of Panskoe I. The bulk of Greco-Roman material collected dates to the mid/late 4th to early 3rd century. No more than 12 Greco-Roman finds post-date 270 BC. Eight of these sherds were collected at the larger settlements where also tiles were collected as well as higher proportions of tablewares (Panskoe I-II and DSP07-F01-02, DSP07-F08-01, DSP08-F04-03 and Groty 1). This Late Hellenistic phase is documented at Černomorskoe and Masliny 1 and of course at Panskoe I. Two Late Hellenistic sherds were collected at the multi-period (Bronze Age and Late Classical – Early Hellenistic) settlement DSP08-F03-02, where a Late Archaic sherd was also found. The last two Late Hellenistic sherds were collected at Skalistoe 10 and in DSP08-F06.

6.2.3 Medieval and Early Modern period (Fig. 6.10)

The Early Modern settlement history can be studied from surface finds, existing and abandoned sites as well as a series of historical maps. There are only two towns of some size, both located close to but sheltered from the sea: Černomorskoe and Mežvodnoe. Apart from two/three coastal/near coastal farms in that area and presumably replaced by Skalistoe by 1955 (e.g. DSP08-F03-02), there are no Medieval to Early Modern sites between the major settlements at Mežvodnoe and Vodopojnoe on the N side of the Džarylgač Lake. The fishing station currently located next to the ancient site Skalistoe 5 is an even more recent addition to the landscape.

Until 1944, the DSP study zone was relatively densely settled with foremost Tatar villages. These are located, where there is the easiest access to fresh water: at the lower slopes in the ravines and at the foot of the slopes of the ridge of the Džangul' Uval, where the water-bearing horizon of the Sarmatian clays is closest to the surface (Smekalova 2007, 83-85).

Thus they are situated as three strings of pearls running roughly E-W. The northernmost consists of (from W to E): Burun Eli, Tubaka, Baj Kijat (present village Vladimirovka), Sakaja, Časilmaj/Čigiltaj (present village Dalekoe), Tanabaj, and Kirgiz Kazak. The middle one is to be found in the N branch of the Vodopojnoe Ravine E of Kirleut/Vodopojnoe (again from W to E): Kubaran, Kurman Adži, Tok Džol', Otus (present village Zorjanoe), Dauldžar' (present village Groznoe), Kul' Džakin, Baim, Tatarian Čongurči and Russian Čongurči (present village Zadornoe). In the middle branch of the ravine are located the villages: Buzak and Džamal' (present village Kirovskoe) with Gadži Gazan in a southern side branch. In the inner part of the S branch of the ravine we find Ak-Baš. The southern string of settlements consists of: (from W to E) Evan(?),[77] Aldermen, Aldermenskaja Skala, unnamed village ruin, Saja, (Koš) Ateš (Kostrovka), Snežnoe, Karlav (Čaikino), Musali (Zajcevo), Džajlav, Kipčak Učkuju/Majorovo, Kurama Kostel' (Malyševka), Kostel', Kurama, Kabla Kurama, and Syrt Kurama. None of these sites were surveyed systematically and intensively. Apart from the eastern part of Kurama Kostel', which was grab sampled, the remaining Early Modern sites are either currently occupied or left as grassy ruins with very low visibility (Fig. 6.11). A discrete cluster of finds (DSP07-F04-02) must probably be associated with Džajlav. This assemblage is particularly interesting because it is the only one of the Early Modern sites where no glazed wares were collected, and according to the maps this site was a ruin already in 1837.

Not all settlements were occupied at the same time (Table 6.1). In addition, today there are by far fewer settlements than was the case in the 19th and even in the first third of the 20th century. We can follow the villages' demographic development through the maps of the 19th century (Chapter 6.2.3), and from a head count in 1806. From the half-verst map of the 1890s we are also informed of the ethnic composition of the individual towns and villages. The earliest more detailed and reliable map is Major General Semjon Mukhin's *Vojennaja topografičeskaja karta poluostrova Kryma* in 10 sheets. It is a topographical map made for military purposes in the scale of 1:168 000. The survey was done in 1816 and the map was printed the following year (published in English, French and Italian editions; see also Jankowski 2006, 11-12). The second map is by Betev made in 1837 (see Chapter 2.2.1). Very valuable are the handwritten emendations made to the map from a second survey made in 1865. Demidoff's map compiled in 1837 (published in 1853) is included as a supplement. Very important is also the half-verst map of the late 1890s. Last to be mentioned is the pre-WWII map of 1931 revised in 1941, which presents the situation at the eve of the Tatar deportation.

According to the half-verst map, in the late 19th century the two larger towns were inhabited by Russians alone. Of the first string, Tatars were the only inhabitants with the exception of Baj Kijat and Kirgiz Kazak, which had a mixed settlement of Tatars and Russians; in the 1931 map Tanabaj is mentioned as *nemeckij* (German). Of the villages in the Vodopojnoe Ravine, only in the two settlements at either end of the N branch lived Russians. In Kirleut/Vodopojnoe the Russians lived side by side with the Tatars, whereas at the end of the ravine a small Russian village was built with the same name as the nearby Tatar village Čongurči; Russians were also the exclusive inhabitants of the village of Gadži Gazan in an isolated side branch off the middle branch of the ravine. Finally, in the southern string the village of Kostel', which was in ruin already in 1837, was Tatarian and the very small settlement of Musali was Russian. The other villages we have information about consisted of a mix of Russian and Tatar inhabitants.

[77] Only mentioned in the map of Demidoff 1853, but an area of ca. 100 x 100 m with a different colour can be seen on the map of Google Earth, which may mark this location.

Name in 19th century	Recent name	1790	1817 Mukhin	1837a Demidoff	1837b Betev	1865 Betev rev.	1890s	1931	1941	1955 1:25,000	1:100,000	Number of households					Ethnicity of inhabitants[1]
												1806[2]	1817	1837	1865	1890s	
Coastal zone																	
Šeichlar[3]	Černomorskoe				X	X	X	X	X					26	82	104	Russian
[N] Šeichlar	Černomorskoe				X	cem.								14			
Ak Mečet[4]	Černomorskoe	X	X	X	X	X	X	X		X	X						
Takil'[5]	Černomorskoe				X									6			
Cultivated zone N of Džarylgač Lake/Vodopojnoe Ravine																	
Kula Šeich			X	X	X	X	ruin			X	OTF			10	1		
Kula Šeich *chutor*							X										
[Skalistoe] *chutor*	Skalistoe						X	X	X								
Atajčik[6]			X	X			ruin										
Bornel/Burun Eli[7]			X	X	X	X	X			FS	FS		8	4	12	20	Tatarian
Tuaka/Tubaka	Rovnoe		X	X	X	X	X			X	Ur.			11	6	23	Tatarian
Kutaj			X														
(Köp or Baj) Kijat[8]	Vladimirovka		X	X	X	X	X			X	X		30	24	11	46	Tatarian and Russian
Baj Kijat *chutor*							X										
Sakab/Sakaja	Morozova		X	ruin	ruin	ruin		X	X								
Čagaltaj/ Čagiltaj/ Čigiltaj/ Čegoltaj[9]	Dalekoe		X	X	X	X	X			X	X			7	11	30	Tatarian
Tananbaj[10]	Najdenovo			X	X	X	X				Ur.			25	17	44	Tatarian[11]
Kirgiz (Kazak)	Kazaube			X			X									34	Tatarian and Russian
Džarylgač Lake/Vodopojnoe Ravine																	
Erilgač/Jarylgač /Džarylgač[12]	Mežvodnoe		X	X	X	X	X			X	X			8	50	48	Russian
Kirleut[13]	Vodopojnoe		X	X	X	X	X			X	X		45	43	33	83	Tatarian and Russian
Kubaran			X		ruin					ruin							
Kurman Adži/ Romašino	Uročišče Romašino		X	X	X	X	X	X	X	X	Ur.	8[14]	11	10	30	50	Tatarian
Tok Džol'[15]	Kolodežnoe		X	X	X	X	X	X	X	ruin	OTF			14		23	Tatarian
Otuz[16]	Staroseľe / Zorjanoe		X	X	X	X	X	X	X	X	X		34	16	10	32	Tatarian
Dauldžar[17]	Groznoe				X	X	X	X	X	X	OTF			26	27	36	Tatarian
Kul' Džakin'	Ochotniki						X	X	X							32	Tatarian
Baim[18]	Tichaja						X	X	X							31	Tatarian
Čongurči[19]Tat.	Jaroslavka						X	X	X							34	Tatarian
Čongurči Russ.	Zadornoe						X	X	X							31	Russian

Name in 19th century	Recent name	1790	1817 Mukhin	1837a Demidoff	1837b Berev	1865 Berev rev.	1890s	1931	1941	1955 1:25,000	1:100,000	Number of households					Ethnicity of inhabitants[1]
												1806[2]	1817	1837	1865	1890s	
Assan/(G)adži Gazan			X	X	ruin	ruin		X	X			2[20]	2			11	Tatarian (1806); Russian (1890s)
(Kastel) Bozak/ Buzak/Buzav[21]	Dedovo		X	X	ruin	ruin		X	X								
Džamal' (Adži)[22]	Nizovka/ Kirovskoe		X	X	X	X	X	X	X	X	X	37[23]	44	42	25	40	Tatarian
	Novo Uljanovka							X	X	X	X						
Ak Baš[24]	Vjačeslavka		X		X	ruin	X	X	X	X	Ur.	3[25]	3	1	1	19	Tatarian
Sasyk Lake/Ravine																	
Kolbaše					ruin	ruin				OTF							
Cultivated zone S of Džarylgač Lake/Vodopojnoe Ravine																	
Evan				X													
Aldermen			X	X	X	X	ruin							8			
Aldermenskaja Skala	Uročišče Aldermenskaja Skala				X	X	X	X	X	Ur.	Ur.			8			
Unnamed village ruin B (1890s)							ruin										
Saja[26]			X	X	ruin	ruin	ruin	ruin	ruin	X							
(Koš) Ateš	Kostrovka		X	X	ruin	ruin	ruin	X	X	X							
	Snežnoe							X	X	X	X						
Karlav	Čaikino		X	X	X	X	X	X	X	X				19	10	22	Tatarian and Russian
Musala/Musali	Zajcevo		X	X	X	X	X	X	X	X	X			4		4	Russian
Džajlav[27]			X		ruin	ruin	ruin										
Uč Kuju Kipčak /Kipčak Učkuju[28]	Majorovo/ Uročišče Majorov		X	X	X	X	X	X	X	ruin	Ur.	15[29]		22	10	40	Tatarian and Russian
Karama/ Kurama Kostel' (Kastel')[30]	Malyševka		X		X	X	X			X	OTF			26	15	40	Tatarian and Russian
Kostel' (Kastel')					ruin	ruin	ruin					10[31]					Tatarian
Kurama							ruin	ruin	ruin								
Kabla Kurama					ruin	ruin	ruin	ruin	ruin								
Syrt Kurama[32]					ruin	ruin	ruin				MTF						

Table 6.1
Overview over Early Modern and modern settlement history. Ur. = *Uročišče* (small, wild wood); OTF (cattle farm), PTF (chicken farm); FS = fishing station

1 Korosteleva & Obcinnikova 2002, appendix 4 and half-verst map of 1890s.
2 Korosteleva & Obcinnikova 2002, appendix 4.
3 Meaning 'of the sheiks'.
4 Meaning 'white mosque' (Jankowski 2006, 183-184).

[5] Meaning 'deserted steppe'.
[6] Ata = father; land owned or inhabited by this person (Jankowski 2006, 226-227).
[7] Meaning 'Cape of El(i)', the name of a people (Jankowski 2006, 347).
[8] Baj means a wealthy man; Kijat is a Mongolian and Turkish ethnonym (Jankowski 2006, 367).
[9] Čigil is the ethnic name of nomadic tribe (Jankowski 2006, 404-405).
[10] Tana + baj meaning rich owner of a cow (Jankowski 2006, 1025).
[11] In 1931 map mentioned as nemeckij (German).
[12] Jaryl means split or broken in two; gač is suffix: a lake split in two (Jankowski 2006, 514).
[13] Kirleut is the name of Mongol tribe (Jankowski 2006, 604-606).
[14] 26 males, 19 females.
[15] Tok = filled; džol' = road, so filled road (Jankowski 2006, 1077-1078).
[16] Male name, anthroponym (Jankowski 2006, 768-769).
[17] Davul = storm or hurricane; džar = ravine (Jankowski 2006, 436-437). The Russian name is a direct translation.
[18] Baim = Baj, a rich or wealthy man (Jankowski 2006, 258).
[19] Čongurči = Čongurov, family name (Jankowski 2006, 258).
[20] 4 males, 5 females.
[21] Ethnonym, boz = calf (Jankowski 2006, 333-334).
[22] Džamal' = beauty, Adži = Hadji, person who has been on pilgrimage to Mecca (Jankowski 2006, 496-497).
[23] 150 males, 145 females.
[24] Ak Baš = white head (Jankowski 2006, 173-174).
[25] 16 males, 9 females
[26] Pen for sheep or cattle (translation: Jankowski 2006, 949).
[27] Summer residence or summer pasture (translation: Jankowski 2006, 495).
[28] Uč = three, kuju = wells (Jankowski 2006, 1125-1126.
[29] 72 males, 62 females.
[30] Kastel'/Kostel' = castle, stronghold (relations to kurgans: Jankowski 2006, 606).
[31] 40 males, 28 females.
[32] Syrt = northeastern (Jankowski 2006, 53).

In almost all cases can we observe an increased number of households from the first half of the 19th century to the end of the same century. The head count of 1806 (Korosteleva & Obcinnikova 2002, appendix 4) gives not only the number of farms, but also the number of individuals and their gender. In this count, 50 farms are numbered as well as the 308 males and 268 females living in them, in total 576 persons (with an average number of 11.5 persons per farm).

The best preserved Early Modern site on the slopes is the settlement on the ridge top (DSP08-H07-03). It consists of at least three rectangular stone structures surrounded by small ash hills, household pits, a cluster of fire places as well as a dam. The settlement was probably associated with the exploitation of the cultivated area on the top of the ridge. Due to the few finds, the settlement cannot be securely dated, but the diagnostic Medieval to Modern sherds collected on the slopes appear to belong in the 18th-20th century. Several "Modern" single settlements were also identified on the slopes which were not indicated on any of the maps. The identity and date was suggested by vegetation and architectural remains, e.g. DSP08-H15-01, DSP08-H22-03, DSP08-H21-01 and DSP08-H27-01, but due to very poor visibility no artefacts were collected. All of these sites are located on the edge of the Plateau/Uplands or at the bottom of the Hillsides suggesting they were associated with the cultivation of the land in these areas as well as the resources of the Hillsides.

6.3 The productive landscape | P. Guldager Bilde, P. Attema & K. Winther-Jacobsen

The DSP study zone is an area with many different ecological niches, which allowed the region's inhabitants to have a mixed, sustainable economy. However, the geology and hydrology makes it best suited for pastoralism and mixed agro-pastoralism. Periods of intensive cultivation are mainly the result of external forces occupying the region, be that the Greeks of the Late Classical and Hellenistic periods, the Russian Empire and later the Soviet Union. Characteristic of these are that decisions on cultivation are made according to standards developed for different ecological regions. Because the Tarchankut is an area of marginal lands intensive cultivation was bound to fail. In the Hellenistic period after the initial success in a period of climatic optimum, a severe crisis pushed the area off the edge wherefore after only half a century of intensive cultivation this was completely abandoned. The same was the case after the collapse of the Soviet Union in 1991. Last-mentioned can easily be read in the landscape in the form of ruined collective farms, which today serve as mining ground for building materials. In the beginning of the new millennium economy in the region is again

mainly agro-pastoral supplemented with some fishing in addition to the touristic facilities of the coastal towns, foremost Černomorskoe.

6.3.1 Agriculture

As discussed in Chapter 7.3.1 below, large parts of the Chersonesean chora was divided into regular plots (Fig. 6.12). This was also the case with the Tarchankut Peninsula. In this section we shall briefly discuss the possible cadastral system of the region NE of the Kelšeich Ravine, which corresponds to the wider study area of the DSP.

During the preliminary survey in May 2006, several plot division walls preserved as straight earthen banks were measured in the western part of the Tarchankut Peninsula (Figs. 6.13-14). The location of the walls prove beyond doubt that the orthogonal system of tracks, unrelated to the Early Modern settlement structure, which can be seen on the half-verst map of the 19th century on the western tip of the Tarchankut Peninsula, follows the ancient cadastre as also suspected by Ščeglov, Smekalova and Smekalov. Closer to the Karadža Settlement, the division wall taking its departure near the settlement itself can be followed as a dry stone wall over a considerable stretch (Fig. 6.15).

The presence of a cadastral system around the Černomorskoe Settlement has long been assumed. In his 1967 article on the rural surroundings of this settlement, Ščeglov proposed the identification of a land division system in the immediate surroundings of the town with Vetrenaja Bay being furthest away (Ščeglov 1978, 87 fig. 43; Chtcheglov 1992, 118-120; 2002, pl. 4.2; Fig. 4.22). According to Ščeglov, the divided land was located within a ca. 2 km radius from the town, and he was of the opinion that to the NE, the divided land did not continue on the E side of the small ravine having its mouth where the Vetrenaja Bay farm is located (Fig. 4.22). On the contrary, he identified a low earthen rampart, which he believed protected the farmland. Thus, he recognized four contiguous blocks of land stretching from Vetrenaja Bay towards SW as well as small part of a block close to the site of the supposed Florya Pension farm house (a corner of the division wall was found under the market square (Ščeglov 1967, fig. 5, ca. 250 m from the pension) and some minor patches NE of the settlement (Ščeglov 1967, fig. 2.4-7 and 3 respectively). Today, the Florya site is completely built over and plot divisions can no longer be verified. However, the space images available from Google Earth makes it possible to identify blocks of land division on the entire promontory W of Ščeglov's blocks 6 and 7 (Fig. 6.16). He identified ca. 60 plots each measuring 210 x 420 m (Chtcheglov 1992, 118) or 362 x 200 m (Ščeglov 1967, 243). The plots were marked by a low wall of field stones. In some cases, we can even study the further sub-division of the plots into strips of 10, 20 or 30 m width. There are several kurgans close to the Vetrenaja Bay farm. These can be earlier than the Hellenistic period; however, we cannot exclude that they belonged to the landed aristocracy.

The orthogonal system of tracks, again unrelated to the contemporary settlement structure, which we find NE of the Kelšeich Ravine on the half-verst map of the late 19th century, can be similarly assumed to mirror the ancient cadastral system, as we saw concerning the western part of the Tarchankut Peninsula. The tracks indicate that the today small promontory stretching W of the Sasyk Ravine was also part of the divided land (Fig. 6.17). It should be noted that the three parallel roads visible in the map of Google Earth (Road XIIIa-c; see below Section 6.6) are of the 20th century. Though only the southeasternmost one of them (XIIIc) is retained today, the fields still follow their orientation. 20th century agriculture on the promontory most likely has obscured all remains of the ancient cadastral system. Panskoe III (and IV?) is a farm located in the divided land similar to the farm of Vetrenaja Bay. Also on this promontory a fair number of kurgans is located.

It is likely that the land S of the Sasyk and Vodopojnoe Ravines and N of the last-mentioned was also divided into regular plots. Ščeglov hints at the existence of cadaster S of Panskoe and on the Mežvodnoe Peninsula (Chtcheglov 1992, fig. p. 251; 2002, pl. 4.3.A), but this is not otherwise described. Faint lines can be observed on the Mežvodnoe Peninsula in the air photos of 1978, but nothing shows up on Google Earth. The lines S of Panskoe mentioned by Ščeglov are even more difficult to identify, and they cannot be distinguished from Google Earth either. Yet again, if we trace the cadastral system in the tracks of the half-verst map, we find that it followed the orientation of the coastline of the Sasyk Ravine and hence of the E-W Road XII, which Ščeglov considered as ancient (1987, fig. 2.I; see below Section 6.6). Thus, the reconstructed cadastral system NE of the Kelšeich Ravine follows one and the same orientation. However, since this is also the orientation of the modern fields, modern landuse may obscure traces of the ancient one.

In Field DSP07-08 were found remains of what may perhaps be interpreted as internal plot divisions. Over an area of ca. 47 ha, a grid of soil banks was visible on the surface (Fig. 6.18). However, the overall orientation of this grid does not coincide with the one of the supposed overall system of the region mentioned above. It is therefore likely that we deal with traces of more recent agriculture.

It should be noted that the orientation of the plot demarcation grid of the agricultural territory W and NE of the Kelšeich Ravine respectively followed two slightly different orientations (Fig. 6.12). Surely, this is due to the fact that the gridding respected the major landscape features of the two different regions, but it may also support the theory that there seemingly were two central places in the Tarchankut Peninsula: the Karadža and the Černomorskoe Settlements respectively.

Smekalova & Smekalov mention that on aerial photos of 1977 traces of rectangular plots can be seen near Masliny (Smekalova & Smekalov 2006, 239). However, the only kind of 'parcelling' we can see in this area, are the irregular 'parcels' devoid of burials, which were created by the nomadic migratory routes (Sections 6.5 and 6.6). In all likelihood, they may have served for grazing animals rather than for farming. The tracks of the half-verst map does moreover not give reason to assume the presence of cadastral systems this far north.

6.3.2 Fish

A large number of sites were located by the shore of lakes and the sea, and it is therefore likely that fish constituted a significant part of the ancient inhabitants' daily diet. However, no fish bones are recorded from sites in the area, so this must remain a hypothesis.

6.3.3 Salt

Salt was one of the major raw materials of the Crimea and tens of thousands of tons were produced annually in the 19th century (Holderness 1923, 89; Lyall 1825, 230). In the DSP area salt was harvested from salt vats in the shallow Sasyk and Džarylgač Lakes, as can be gleaned from the half-verst map of the 1890s (Fig. 6.17). Whether salt was also collected here in antiquity is a matter of speculation, but it is likely.

6.3.4 Quarries

Exposed bedrock with preserved cut marks is evidence for limestone quarrying on Hills 19, 22 and 24. Extensive quarrying in the S part of Hill 19 (DSP08-H19-01) may be associated with the village of Snežnoe 1.5 km to the SW. Although specific relations are impossible to demonstrate, the remaining quarries appear to be associated with sites: approximately midway between a line of kurgans (DSP08-H19-03) and DSP08-H12-01, 78 m NW of DSP08-H22-03 and 85 m E of DSP08-H24-03. 30 m NW of DSP08-H11-02 Feature 1 is a patch of exposed bedrock (Feature 15) which may be a quarry, but there were no obvious tool marks. Evidence for recent lime stone quarrying were observed in several locations as well as evidence for loess quarrying (see Chapter 3.3).

6.4 The sacral landscape | P. Guldager Bilde

During the DSP survey, the only find that can be related to religious activities of the inhabitants of the region was a terracotta egg (**Cat. 778**) found in 2008 in Field 2 and apparently not associated with a site. It may have come from a ploughed-out grave, which was not otherwise observed. A similar terracotta egg was found in Panskoe I U6 room 13 (Rogov 2002, 274 M 22, pls. 149, 175). However, many local limestone reliefs found in the Chersonesean chora with depiction of Herakles bear witness to his status as the mythological Doric founder of the colony.[78] In addition can be mentioned a club found in the Vetrenaja Bay farmhouse (Ščeglov 1967, fig. 16). Similar finds have come to light closer to Chersonesos: two Herakles' clubs in terracotta were unearthed in an outside niche in the central tower of farmhouse

[78] *Mežvodnoe* farmhouse: Vysotskaja 1968 [reclining]; *Panskoe I* U6, room 14: Panskoye I 2002, pl. 143.G1 [standing with club]; *Kulčuk*: found in 2008 [reclining], S.B. Lancov, personal communication; *Kerkinitis*: Kutajsov 2004, 90, fig. 88.1 [reclining]; *Mojnak Lake* farmhouse: Kutajsov 2004, 90, fig. 88.2 [reclining]; *Lake Saki* (farmhouse?): Kutajsov 2004, fig. 90.1 [seated]; *Čaika*: flanking tower room R: Kutajsov 2004, fig. 90.4 [standing with club], farmhouse 3 room 10: Popova & Kovalenko 1996, fig. 3-4 [standing with club], *Čaika*, farmhouse: Karasev 1966 [reclining].

151 in the Herakleian Peninsula (Carter et al. 2000, 727) and in a farmhouse at the Evpatorija lighthouse too (Kolesnikov 1984, 81 [not seen]).

On the Tarchankut Peninsula only one sanctuary has ever been found, which attests to public worship. This is located at the cliffs of Džangul' NE of the Karadža Settlement (unpublished; Ščeglov 2002a, pl. 4.1.17; Fig. 1.1.17). A small group of finds, which were located *ex situ*, were excavated by the Tarchankut Expedition in 1983 with a few sherds picked up in 1984. The finds are presently for the larger part kept in the storerooms of the Institute of the History of Material Culture (Russian Academy of Sciences), St. Petersburg. They consist of handmade and wheelmade pottery (amphorai account for almost 50%), glass, and sea shells. The finds have a ca. 500 years dating horizon from the 4th century BC to at least the 1st century AD. Of great importance are the numerous graffiti, which show that the sanctuary was devoted to a goddess by the name of Targa, and one is a joint dedication to Targa and Achilleus, the main god of Roman Olbia. Though the graffiti are incised in Greek language, the goddess is not of the Greek pantheon. In all likelihood she is a goddess of the Hellenized 'barbarian' population of the region. However, the sanctuary must also have attracted the Greek settlers, so it is likely that it was a common arena for the local inhabitants notwithstanding their ethnic background.

6.5 THE FUNERARY LANDSCAPE | P. ATTEMA & T. SMEKALOVA

6.5.1 Kurgans in Western Crimea: an introduction | T. Smekalova

Thousands of kurgans are scattered throughout the steppe of the Northern Black Sea littoral. They break the visual monotony of the steppe and provide a sense of monumentality to the landscape. Even though they belong to different periods and vary in dimension, relative position, and the number of burials inside, there are certain regularities in their arrangement within the landscape possibly determined by various historical conditions.

The word *kurgan* is of Turkish origin. Originally kurgan meant a hill, burial hill, fortress, settlement or town. Owing to Russian scholarship it has been established in scientific literature as a technical term for a barrow mound. From Russian it was introduced into other Western languages, e.g. German.

The earliest kurgans occurred in the Northern Black Sea area during the Middle and Late Chalcolithic period, when societal change from hunting and gathering to animal husbandry and agriculture took place. During this period the earliest social and economical differentiation became visible. In all likelihood, it was pastoralism that gave the impulse to the culture of constructing barrows. The only way to make the ancestral graves noticeable in the steppe landscape was to heap a mound above the burial. Later kurgans probably imitated those of the past. Given that the migrations of the population took place over vast territories, kurgans, which originally were exclusively burial monuments, immediately became noticeable signs in a space otherwise devoid of any reference points.

Kurgans were built mostly of turf blocks. To construct the largest Scythian kurgans, it was necessary to remove the soil layer from a fairly large area. Thus, the famous Čertomlyk kurgan was erected from turf blocks measuring 15 × 25 × 20 cm; according to various calculations, the area of turf removed for its construction was 35 to 75 ha (Murzin & Rolle 1989, 93; Alekseev, Murzin & Rolle 1991, 171; Klamm, Viebrok & Meyer 1991, 306). Kurgans of the Chalcolithic and Bronze Age periods, as well as some Scythian barrows, e.g. the Melitopol' Kurgan, were occasionally built of excavated soil, clay rolls or primitive mud bricks (Terenožkin 1955, 30; Mozolevskij & Polin 2005, 249).

Constructing a kurgan demanded considerable collective efforts. Therefore the emergence of the earliest kurgans must have corresponded to a stage in the development of society, when fairly large groups of kinsmen had been established in order to enable the organization of such works. The construction of kurgans may have constituted a bonding link, which united the entire group. These collectives appeared due to the necessity of labour division after the transition from food gathering to food production. During the same period, surplus production first emerged, which enabled the collective to spend its efforts on non-productive goals. Using the primitive digging tools of the Mesolithic and Chalcolithic epoch, a collective body of 20-25 members was in 1-2 days able to build a fairly small barrow of soil 0.5-1 m high, 8-20 m in diameter, with a volume of 45-50 m^3 (Belov & Ljasko 1991, 29; Semenov & Korobkova 1983, 84-88). A minor Scythian barrow, 1.5-2 m high, 18 m in diameter and with a volume of the mound between 60 and 115 m^3 could have been constructed in 1-1.5 weeks time by a fairly small team also (Mozolevskij & Polin 2005, 253). When kurgans up to 3-4 m high with stone or wooden structures were built, undoubtedly much greater labour investment had to be spent and correspondingly larger working teams had to be attracted. But even this scale of work cannot be compared with that of the construction of the huge Scythian kurgans of the 4th century BC for which, according to

some calculations, 1,000-1,500 persons were working simultaneously for a week or two (Mozolevskij & Polin 2005, 252-253).

The surface of a newly built kurgan "revived" immediately after its completion recovering from the wounds and scars afflicted by the cutting of the turf blocks. Soon it would become part of the general soil development processes. This fact made the kurgans inseparably linked with the natural landscape providing simultaneously their long term preservation and stability. Only man himself was able to disturb a kurgan otherwise proof against any natural effects such as earthquakes, showers, animal or plant activities.

Kurgans are mostly situated so as to be best viewed from all (or at least more) sides, i.e. at margins of watersheds, on dominating hills or in other prominent places. This makes them into landscape markers that function as reference points organizing the wide space of the steppe. The resulting patterns of reference points may have served various purposes.

It is normally assumed that kurgans arranged as long chains in the steppe marked ancient roads or traditional routes of seasonal migrations of nomadic tribes (e.g. Boltrik & Fialko 1987; Boltrik 1990). Inter-visibility must have been consciously aimed at so that from any kurgan the next one could be viewed. Under steppe conditions lacking any other reference points, the kurgans were a kind of "road mark" ensuring movement during migration. During long-distance movement of nomads with their herds it was of vital importance to follow certain routes with localities of good grazing and watering. The chains of kurgans must have marked those routes, the deviation from which could have been dangerous for an entire tribe. One of the longest and straightest kurgan chains can be traced from the sea coast of the Džarylgač Bay towards the Dnieper at Kakhovka. The appearance of that route hardly seems to have been accounted for due to the peculiarities of the relief, because the route in places passes absolutely flat terrain devoid of any elevation. According to V.S. Ol'khovskij the kurgans, which compose this "highway", belonged to the Jagorlyk-Kalančak tribe (to the S) and the Podneprovskaja tribe (to the N), two groups kindred to each other (Ol'chovskij 1991, 135). Presumably, this kurgan chain indicates the seasonal N-S migrations of the Scythians from the Dnieper region. The route is exceptionally convenient because it crosses no water or other obstacles on its way and passes through rich grazing and watering territories. It is not without reason that in a map of the late 19th century numerous stockyards and wells are marked there. We cannot rule out that one of the salt routes used both in antiquity and in Polovtsy and Kiev Russian times went along this route (Boltrik 1990, 39). Chains and clusters of kurgans may also have marked particular territories and their boundaries.

Despite the fact that for two centuries kurgans have invariably attracted the interests of scholars, no overall work concerning their spatial and chronological distribution has ever been made. The accelerated destruction due to agricultural activities and looting undermines the scientific base represented by these archaeological monuments – the commonest in the region under consideration. Therefore, scholars lacking this scientific base miss the possibility of arriving at the correct historical conclusions concerning the life of the people who once were living here. Identification of kurgans using detailed historical maps, investigation by remote sensing methods in addition to field survey are able to provide us with a real picture of the present-day state of these archaeological monuments. In addition, a comparison of topographic maps and the archive evidence on the kurgans will allow us to consider their preservation for at least the last 120 years and to assess the anthropogenic factor influencing their state and number.

The present general introduction is part of an overall study by T. Smekalova of territorial and chronological patterns in the arrangement of kurgans within the landscape of the Northern Black Sea littoral entitled 'Communicating power, a study of kurgan burials'.[79] This study is based on the study of cartographic evidence, geophysical methods and archaeological survey. Today, primarily results of remote earth sounding are widely used for investigating large areas: space photographs of high resolution and maps of scanning the earth's surface. In addition, historical aerial photos preserved in the aerophotoarchives of the Institute of Archaeology in Moscow as well as at other scientific institutions and production companies are now easily available. In addition, it is now possible to study detailed topographic maps, both old and new ones of high resolution, preserved in archives because now most of these materials have been declassified. The importance of examination of large-scale maps was already understood by B.N. Mozolevskij, who fulfilled the meticulous work of identifying areas of distribution of large kurgans in maps. He has revealed barrows from 8 to 15 m high in the area from the Moločnaja River to the E up to the Southern Bug River to the W and based on these studies has developed a concept of the ethnical geography and political structure of Scythia in the 4th century BC (Mozolevskij & Polin 2007, 46; Terenožkin & Mozolevskij 1988, 179-222).

[79] http:www.pontos.dk/research/ra_6/research/ra_6/ra-6b-communicating-power-a-study-of-kurgan-burials-1

In this study, a number of detailed historical maps are employed. In 1836-1838, the Corps of Military Topographers under the direction of F.P. Schubert and D.D. Oberg triangulated the Crimea. Their work resulted in a map based on the topographic survey of Colonel Betev (Fig. 2.2). His map of 1837 clearly shows the relief, the main and minor roads and the numerous contemporary villages. Furthermore, it also showed water sources and wells as well as a fairly large number of kurgans. The proportions of the peninsula practically coincide with those of the modern maps. In 1865 a reconnaissance was conducted on the basis of the maps of 1837 within the frame of large-scale works of 1845-1870, when entire Poland and 22 provinces of central and southern Russia, including the province of Taurica, were surveyed in the scale of one verst (1 verst corresponds to 1.067 km). The map of 1865 shows a greater number of roads, settlements, kurgans and wells. The basis of the three-verst map issued in 1865 was also based on Betev's survey (Fig. 2.2).

Since the early 1870s, surveys almost completely ceased in the internal provinces of Russia and were continued only in the border regions, including the Crimea, but now conducted in half-verst scale (1:21,000; Fig. 2.3). In the half-verst military topographic map of the Crimea issued in the late 19th-early 20th century, an enormous amount of kurgans is marked with height specifications for the largest mounds. Such serious attention was paid to kurgans because they were viewed as strategic military points. In addition, water sources and wells were drawn in detail and roads and paths, including the abandoned ones, are shown. The relief of the landscape was rendered with contour lines at an interval of 2 sažens (c. 4.3 m). Crimea's proportions correspond exactly to the present ones, so objects identified in this map may easily be transposed into new maps or compared with air and space photos.

The volume of information represented in the half-verst map is comparable with the data of another detailed map, namely that in the scale of 1:25,000, which was reconnoitred in the 1950s and revised in the 1980s on the basis of the results of air-photography (Fig. 2.5). The contour lines in that map are drawn at an interval of 5 m. In that map, kurgans are also shown but their number is considerably less than in the half-verst map. The heights of the largest kurgans are specified. More kurgans with names are depicted in the western part of the Tarkankhut Peninsula on the half-verst map, but E of Černomorskoe, no kurgans are mapped with names.

The half-verst map of the Crimea of the late 19th century has been chosen as the main source for composing a general map with distribution of kurgans. Although some mounds, particularly the smaller ones, are not shown in that map, nevertheless, the percentage of such omissions is relatively low in comparison with the number of kurgans that are presented. Moreover, it can be hoped that this percentage is uniform throughout the whole Crimea, thus allowing for a comparative analysis of the distribution of kurgans of the entire Crimea.

The scanned sheets of the half-verst map were assembled by means of MapInfo software. Kurgans were marked in a special layer with circles of different sizes depending on the dimensions of the kurgans. In the half-verst map, near mounds over 1 sažen high (1 sažen = 2.1336 m) their approximate height (in sažens) is noted. These larger barrows are marked with larger circles, while smaller kurgans are signed with small circles. Not surprisingly, the latter kurgans are much more numerous than the larger ones. It has proved possible to identify a total of 15,500 kurgans in the half-verst map of the Crimea.

The analysis based on the half-verst map defined three areas with particularly high number of kurgans. These are: the E part of the Kerch Peninsula, the Tarkhankut Peninsula and northern foothills of the Crimean Mountains. The number of kurgans in the areas exceeds many times that in the remaining central part of the Crimea.

In the Tarkhankut Peninsula alone the total number of kurgans as evidenced by cartography is at least 5,000. However, it seems as if the region of Lake Džarylgač in a certain sense is peripheral to the Tarkhankut Peninsula, because W of the Kelšeich Ravine a significantly larger concentration of kurgans has been recorded. In the Tarchankut the largest kurgans are situated mostly on the crests of watersheds and they are spaced at certain intervals equal to the limits of vision. Kurgan chains are well discernible along the crest of the Džangul' Uval rising up to 137 m S of Lake Džarylgač. They are also found on the N bank of the lake along the top of the Plateau rising 20 m above sea level. Numerous smaller kurgans form compact clusters, which are arranged on the slopes created between the small ravines running from the main ridges to the lake and to the sea. The small kurgans are especially abundant on the S shore of the Tarchankut Peninsula, on the slopes coming down towards the coastal valley, as well as in the area of the Džangul' Uval, where it slopes down towards Lake Džarylgač.

6.5.2 Kurgans in the DSP area | P. Attema

A specific aim in the DSP survey programme was to analyze the spatial relationship between burial mounds and contemporary settlement organization in the transect area. Both in the 2007 and 2008 campaign work focused on one particular

slope of the Hillsides featuring several distinct groups of kurgans, a small number of which had been previously excavated (Hill 19). Although all the kurgans on this particular slope had already been generically recorded on the half-verst map, they had not been surveyed in detail nor was their exact geographical location known. Moreover, it appeared that several kurgans still needed to be mapped (Chapter 5.2).

Although several anomalies were recorded, only one case merited a trial trench excavation. The trench did not, however, yield convincing evidence for cultic activity nor were any fossa graves detected. The geomagnetic survey generally covered the same areas as the digital elevation models, allowing us to superimpose the layers in GIS for further analysis.

6.6 The landscape of paths | P. Guldager Bilde

Because the Western Crimea has been and still is a marginal area for agriculture, in many patches, the nomadic landscape can be recognized even today. The most readily visible remains are the numerous kurgans, which were dealt with in detail in Section 6.5 above. Moreover, in many places the actual paths of nomadic migration can be distinguished in the maps of Google Earth. Since these paths are frequently lined with kurgans and/or cross hubs with clusters of kurgans, and since they rarely coincide neither with modern routes, nor with routes documented on historical maps, their antiquity can hardly be disputed (Fig. 6.19).

The Tarchankut Peninsula is one of the Crimean regions most densely occupied by kurgans (c. 5,000 according to the investigations of T.N. Smekalova).[80] Alone in the area between Bakal', Černomorskoe and the end of the Donuzlav Lake, thus the region immediately surrounding (and including) the DSP study zone, roughly 1,500 kurgans can be distinguished with the help of historical maps and Google Earth. These kurgans are the physical remains of the nomadic, the semi-nomadic and settled population of the region from at least the Bronze Age until the present day.[81]

As already discussed by Smekalova (Section 6.5.1), kurgans are not dispersed randomly in the landscape, on the contrary. Moreover, kurgans and roads are intricately linked; it is therefore necessary briefly to sketch the types of spatial arrangement of kurgans in the landscape in order to obtain an idea of the landscape of paths.

Kurgans are normally found in one of the following four types of spatial configuration:

(a) In chains on watersheds (e.g. Fig. 4.148)
(b) In clusters around settlements (e.g. Fig. 4.24)
(c) In clusters at hubs, where several routes converge (e.g. Figs. 6.23 and 6.30)
(d) In straight lines along roads

Ad (a) Kurgans are located in chains following larger or smaller ridges and crests in the landscape. In the DSP area there is a major E-W chain on the ridge N of the Džarylgač Lake as well as along the N edge of the Plateau S of the lake. In addition, there are smaller chains running downhill N-S on the ridges separating the small ravines N and S of the lake. A good example is the kurgan chain described in Section 6.5.2. Even in the ploughed zone, these kurgan chains can be seen on barely perceptible watersheds. Because the kurgan chains follow the watersheds they are rarely placed in straight lines.

The position on a ridge made the kurgans highly visible from more sides. There may have been paths along the watersheds, but these would mainly have served local movement. It is more likely that the kurgans on watersheds marked particular territories. A common feature of traditional peoples worldwide is how they conceive of nature in terms of a geographical boundary, in particular a watershed. This is described by Berkes et al (1998) based on a large ethnographic material. According to them, the watershed unit forms the basis for a people's or a group's self-understanding ('we are the people of NN River') and the watershed thus forms the easily recognizable boundary of a territory, be that of hunting, grazing, living etc. As an example, they mention how NW Pacific chiefs' territory run from "mountain top to mountain-top" (Berkes et al. 1998, 410). It is conceivable that something similar is the case in the DSP study zone.

Ad (b) It is a characteristic element of cities and settlements of the Northern Black Sea region that they featured sig-

[80] It should be noted that this considerable sum is derived from digitizing the Russian half-verst map of the 1890s; however, when compared with the number of kurgans readily visible from Google Earth, the number of kurgans is yet significantly higher.

[81] It is quite a common phenomenon that kurgans are used for contemporary cemeteries, as we can gather e.g. from a kurgan near Snežnoe (Figs. 4.59; 6.9) and one at Hub II.5.

nificant kurgan necropoleis immediately outside the inhabited area (Chapter 4.3.1.1 on the Černomorskoe Settlement, Chapter 4.3.2.1 on Panskoe I). It has habitually been taken for granted that they are evidence of barbarians living in the settlements. We will not enter this discussion here. In the half-verst map of the 1890s are marked as kurgans a number of clusters around the deserted Tatar villages of Baj Kijat, Tanabaj, Kirgiz Kazak, Dauldžar, Kul Džakin and Čongurči. They are not included in the present section, because in many cases, they are more likely sub-recent ash hills rather than kurgans. Especially in the maps of Google Earth, it is easy to observe the difference in how they appear when compared with kurgans proper: their margins are blurred and the colour deviates from the one of the kurgans.

Ad (c) Kurgan clusters, that are not located in the vicinity of settlements, normally mark hubs where several routes meet. A good example is the Superhub V.1/VI.3 (Fig. 6.30). Hubs marked by kurgans may have constituted sites of temporary camps in use during long-distance movement.

Ad (d) In many places the actual paths lined with kurgans can be distinguished on Google Earth. Visually two different types can be noted:

Type A: the path is preserved as a dark line (black, brown or deep green) surrounded by an ample very light margin at each side, which differs from the general colour of the terrain. This type of path is normally rectilinear and it runs over considerable distances. Surely, a path, which left such an imprint, and which has withstood later times' agriculture, must have been well trodden and probably used over considerable time. It could be interesting to verify such a path through excavation.

Type B: the path is preserved as a black line, more diffused in the margins and without the bordering light margins of Type A. This type of path normally runs over shorter distances and it tends to be more irregular in its orientation. Probably this type of path was of more local use with less heavy 'traffic' and perhaps also more short-lived. Good examples can be found around the immense Bakal' Settlement.

How visible these paths are on the individual sheet of the Google Earth map depends on the time of the year, the satellite picture was taken, as well as of the crops on the ground. It is necessary to employ the feature "Historical pictures" in order to catch as many features as possible.

An attentive study of the maps available on Google Earth compared with data concerning location of kurgans and roads in the Russian half-verst map of the 1890s allow us to distinguish the following overall pattern (Fig. 6.19): First of all, there is a significant difference between the areas W and E of Vodopojnoe in terms of number and orientation of roads. The area E of Vodopojnoe features a large number of roads, whereas to the W features few roads. The shift corresponds nicely to the pattern, we saw concerning the presence of farmland laid out in regular plots (Fig. 6.12). Let us first discuss the area E of Vodopojnoe, where no cadastre was detected. In this part of the Tarchankut, most of the roads run NE-SW following the overall contour of the peninsula. Two roads are long-distance roads. Road I brings the Tarchankut Peninsula in connection with the Perekop region; Road II connects the crossings of the Vodopojnoe Ravine and of the Donuzlav Lake and Ravine respectively. Roads III to VI represents medium-range traffic between the area of Bakal' and Vodopojnoe, whereas Roads VII to IX are major connecting roads running NW-SE. Road X connects Vodopojnoe with the intensely settled area between Medvedevo and Ozerovka at the coast of the Donuzlav Lake.[82] Road XI runs at the N edge of the Plateau bordering the Hillside settlements further N.

W of Vodopojnoe is the farmland, which was divided into regular plots. The main artery is Road XII running almost E-W, which most likely links the area between the Černomorskoe Settlement and the zone S of Vodopojnoe. It is likely that in antiquity, this was also a main thoroughfare, and it probably constituted the longest of the roads in the cadastre system. Road XIIIa-c are three recent parallel roads running parallel throughout the length of the small peninsula N and W of the Sasyk Ravine. Road XIV is a track leading to the settlement of Panskoe I. Road XVa-b are two short, parallel roads. Road XVI is the main route of the 19th century. It connects the area W and E of Vodopojnoe.

Between hubs, the road runs in a straight line, whereas it may slightly change orientation between hubs. This shows beyond doubt that the kurgans were used as markers of orientation in the steppe. Because so few kurgans have been excavated, we have little means to date them and accordingly to date the roads. It is therefore uncertain whether all of the mentioned routes existed at the same time. In some cases it can be seen how the road was shifted some dozen meters. Such roads were hardly contemporary. But the overall pattern is that the location of roads was rather stable. Beneath is a brief characterization of the 16 most important roads. With the exception of Roads XIII and XVI, which belong to the

[82] For the settlement in the mentioned area, see Lantsov & Uzhentzev 2007, fig. 2.

20th and 19th century respectively, it is likely that all the remainder are ancient. Nevertheless, some of them had a long life; thus, Road XI also occurs on the half-verst map of the late 19th century. The same is the case with Road XII, which even today in its westernmost part is covered by the modern asphalt road, T0107.

Road I (Figs. 6.20-21)
Straight SW-NE road between Hub I.1/III.1 and the hub leading to Bakal' (Hub I.5). The distance between the two hubs is ca. 25 km. The road continues beyond Bakal' leading towards Perekop, where it can be distinguished as a line of kurgans, the path itself not being visible. Hub I.1/III.1 is a superhub, where several major roads converge at one of the Vodopojnoe crossings (Fig. 6.21). Three further hubs are located with regular distances at the road: HI.1 to H1.2: 4.5 km; HI.2 to HI.3: 4.5 km; HI.3 to HI.4: 7.5 km; HI.4 to HI.5: 7.5 km. Between Hubs I.1 and I.5 the path itself is clearly visible over long tracts of land. Kurgans are mostly located as clusters around hubs. The multi-period settlement of Vodopojnoe 2 (Late BA; LC-EH?; Early Modern) is located near Hub I.1/III.1. Road IX crosses Road I in Hub I.2/IX.3 (Fig. 6.22). At the same hub the road has two further forks towards SW and SE. At Hub I.3, which is located at a cluster of kurgans centred on one of the very large kurgans, the road branches towards N and S. From Hub I.4 (Fig. 6.23), which is a superhub, a number of roads converge and a straight road aims at Hub III.3/VIII.3. Also this hub is centred at a kurgan cluster There are several NW-SE and SW-NE roads in the immediate vicinity.

Road II (Figs. 6.24-25)
Partly straight W-E road between Hubs II.1/X.1 and II.5 with a distance of ca. 17.5 km between the hubs. The road is located on the plateau between the two main branches of the Vodopojnoe Ravine. The distance between hubs varies. From HII.1/X.1 to HII.2: 2.7 km; HII.2 to HII.3: 1 km; HII.3 to HII.4: 3.3 km; HII.4 to HII.5: 9.6 km. Hub II.2 is marked by a kurgan cluster with at least 10 kurgans. It is crossed by a road leading to the Bronze Age settlement of Vodopojnoe 4 1.5 km to the NE and to the crossing opposite another Bronze Age settlement of Vodopojnoe 5 1.5 km to the SW. At Hub II.3 located at one of the very large kurgans, the road forks off towards NE. Hub II.4 is a superhub, where several roads converge (Fig. 6.25); most notably the Road II is here crossed by a straight road between the Tatar villages of Buzak and Dauldžar, but since it does not occur on any of the historical maps, this road must be ancient. Also this hub is marked by one of the very large kurgans. Between Hubs II.1/X.1 and II.4 the actual path can be followed over long tracts of land. Between Hubs II.4 and II.5 the route can only be traced by means of a few kurgans. Hub II.5 is a superhub located 1 km S of (Russian) Čongurči and thus in the very end of the Vodopojnoe Ravine. From this hub, which is marked by a kurgan cluster including a large kurgan used as a modern cemetery, the road branches off in different directions aiming for the main crossing of the Donuzlav Ravine as well as for the end of the same ravine. The road also branches off in a more northern direction heading for the Perekop area.

Road III (Figs. 6.26-27)
A significant route stretches for 25 km between the Vodopojnoe crossing and the mouth of the Bakal' Ravine. Either end constituted a major pole in the landscape. Road III started/ended at the same Vodopojnoe crossing as Road I (HI.1/III.1; Fig. 6.21). The other end of the road is immediately opposite the much extended multi-period settlement of Bakal' discovered in the *razvedki* by P.N. Schulz in 1948 (unpublished; Lancov 2004, fig. 1.82), which was probably one of the most important settlements in the entire region. The road crosses a number of hubs. At the first hub (HIII.2) the road is crossed by a short path linking Road I and III by the multi-period settlement of Vodopojnoe 3 (Late BA; LC-EH; Early Modern). It is also connected with a straight road ending at the E outskirts of present day Vodopojnoe. 1.3 km further NE the road is crossed by Road IX. The cross is not marked in particular, and it is therefore possible that the two roads were not contemporary. At Hub III.3 a road branches off towards SW and several cross roads cut Road III in the vicinity. At the location of the hub a well is marked on the half-verst map. In the late 19th century a sheepfold was stationed there; in all likelihood the well has greater antiquity. Hub III.4 located between Čigiltaš/Dalekoe and Tanabaj is a superhub, where a number of roads cross (Fig. 6.27). From here a straight road crosses Road I. The hub is marked by a small kurgan cluster. Hub III.5 is a cross road marked again by a small kurgan cluster. A straight road leading from Hub I.4 ends in this hub, provided the road continues the straight line. Finally at Hub III.6 a large number of roads converge. This is an area of intense traffic. The distances between the hubs vary and probably not all hubs have been recognized. From HI.1/III.1 to HIII.2: 2.3 km; HIII.2 to HIII.3: 7.5 km; HIII.3 to HIII.4: 2.5 km; HIII.4 to HIII.5: 8.1 km; HIII.5 to HIII.6: 2.6 km. The actual path can be followed over long stretches of land. In places it is lined with kurgans.

Road IV (Fig. 6.28)
This road runs N of and parallel to Road III at a distance of up to 1.2 km. It is quite irregular in its layout. It starts/ends immediately above Vodopojnoe 2, mentioned several times above. It possibly ends in Hub III.5. It is crossed by a number of minor roads leading to the sea. In Hub IV.2 the road is crossed by Road IX. Its maximum length is 21.3 km. The actual path can be followed over some stretches; it is partially lined by kurgans.

Road V (Figs. 6.29-30)
Straight road connecting Hubs V.1/VI.3 and III.6/V.2. In the central part of this road, the actual path can be identified. The road is lined by a few kurgans. The total length of this road is 15.3 km.

Road VI (Figs. 6.30-31)
Straight road between the Bronze Age settlements of Burun Eli 1 and Severnoe 1. The road continues beyond both sites. Beyond Burun Eli 1 it may have joined the line of kurgans on the watershed of the ridge N of Lake Džarylgač; beyond Severnoe 1 it continued to the coast of the sea. Its length is at least 14 km. The E end of the road may mark a (Bronze Age?) locality, which has been eroded away by the sea. Traces of the road itself are preserved. The road is lined by a discrete number of kurgans. Hubs are located with short distances. From HVI.1/IX.1 to HVI.2: 3 km; HVI.2 to HV.1/VI.3: 1.3 km; HV.1/VI.3 to the sea: 6.3 km. At Hub V.1/VI.3 is a kurgan cluster with at least 10 kurgans (Fig. 6.30). From this hub several cross roads branches out. From Hub VI.2 a road connects Road VI and III crossing Road IV. In all likelihood, Road VI can be dated to the Late Bronze Age, the date of the two settlements it connects – if not as early as the Middel Bronze Age, because a very large kurgan in the kurgan cluster of Hub V.1/VI.3 seems to overlay the road line as well as of yet a road branching out in a more southern direction.

Road VII (Fig. 6.19)
Short transversal road between Hub VII.1 and I.5/VII.2. The road probably continues across the Bakal' Ravine ending at the sea. Its total distance is 10.2 km. Hub VII.1 is a superhub, because here converge at least eight roads. Its centre is a very large kurgan and around it is a kurgan cluster of at least six more kurgans. Hub I.5/VII.2 is also a superhub where several roads converge. Also this is marked with a discrete kurgan cluster. In addition, midway between the two hubs is one further kurgan cluster.

Road VIII (Fig. 6.32)
Short, straight transversal road linking Hub III.4/VIII.1 with Hub VIII.2. The distance between the hubs is 6.8 km. At the latter the road forks and continues further 1.9 km SW towards Kul Džakin and 2.8 km towards SE. Both roads end with a kurgan. The actual path can be followed over a considerable distance.

Road IX (Fig. 6.33)
Long-distance road running in a straight line from Burun Eli 2 to at least Hub II.4/IX.4 but probably on to the Donuzlav Ravine, where it seemingly used the same crossing as is used toady. The distance is at least 13 km, but more likely ca. 30 km. The road may have been early, because at some point it was superposed by another route running E-W crossing it and seemingly obliterating the former passage 2 km E of Vodopojnoe 3. The actual path can be followed in some areas. Hub VI.1/IX.1 is marked by a couple of kurgans. In Hub IV.2/IX.2 it crosses Road IV, and in Hub I.2/IX.3 it crosses Road I, whereas it joins or crosses Road II in Hub II.4/IX.4.

Road X (Figs. 6.34-35)
Road leading from one of the Vodopojnoe crossings at Hub II.1/X.1 towards SE probably continuing in a straight line as far as the area between Medvedevo and Ozerovka at the coast of the Donuzlav Lake. At Hub X.2 the road forks in a more northern direction, which may ultimately have ended in Hub XI.1. The actual paths are visible and a discrete number of kurgans line the roads.

Road XI (Fig. 6.36)
This road is a curving road aiming at the N edge of the Plateau. It is very weak in the satelite images og Google Earth. There is one hub (Hub XI.1), which is a superhub, because here a number of roads converge. At this hub is a kurgan cluster with at least one large kurgan. Road XI defines the N edge of the Plateau. It must have been an ancient road,

because it is lined with kurgans. However, it also occurs on the late 18th century map. The Plateau is practically devoid of kurgans and further traces of roads.

Road XII (Fig. 6.37)
Straight E-W road connecting the area immediately S of the Černomorskoe Settlement with the area S of Vodopojnoe. The road is easily distinguishable in the zone S and SE of Panskoe, and it passes immediately S of the fortified site of Panskoe II, which may have controlled the road. Further W it is either underlying the modern asphalt road, T0107, or is shifted ca. 100 m to the further N, because a track close to the S shore of the Sasyk Lake is of the same orientation. The preserved stretch is at least 4 km long. It crosses a number of kurgan chains, but it does not appear to be kurgan-lined itself. This road was noted by A.N. Ščeglov, and he considered it ancient (1987, fig. 2.I). Several stretches of it are also indicated on the 1890s map (the stretch S of Lake Sasyk; stretch N of Karlav and Kipčak Učkuju). It may mark a major artery in the divided farmland of the Černomorskoe Settlement.

Road XIIIa-c (Fig. 6.17)
Three parallel, straight roads located on the small peninsula constituting the W side of the Sasyk Ravine. They are without doubt of the first half of the 20th century, because they do not occur on the half-verst map of the late 19th century but instead on the mid-20th century map in scale 1:25,000 (Fig. 2.5). Only the southernmost of the three still exists.

Road XIV (Figs. 6.38-39)
This road was noted already by the Tarchankut Expedition (Ščeglov 1978, fig. 17; Ščeglov 1987, fig. 2.I [erroneously given as a straight road]; Ščeglov 2002a, pl. 6). It is a small, local track branching off from Road XVI immediately E of the fortified site of Panskoe II. The first km runs NNE; after this point, it turns sharply to a NNW direction leading to the sea shore between the settlement to the W and its necropolis to the E. The length of this part of the road is 1.1 km, and the overall length accordingly 2.1 km. On its way, close to Panskoe V it passes immediately W of a kurgan cluster formed around a large Bronze Age kurgan as well as closer to Panskoe I it passes two isolated kurgans. If we accept Ščeglov's reconstruction of the ancient topography, we may have an explanation for the sharp bend of the road, namely that it followed the side of the ancient ravine (Ščeglov 1987, fig. 2.I).

Road XVa and b (Fig. 6.40)
Two parallel tracks running from the Hillsides NNE to the crossing of the Sasyk Ravine. The length is ca. 2.3 km. The eastern one is lined by several kurgans. Their date is difficult to ascertain, but since they do not occur on any historical or modern maps they are probably ancient.

Road XVI (Fig. 6.41)
In the 19th century, the main road of the DSP area was an inland route leading from Ak Metčet via Bakal' to the mainland. In Mukhin's map of 1817 the major villages are marked as Ak Metčet → Aldermen → Karlav → Učkuju Kipčak → Kubaran → (Baj) Kijat → Sakab → Čagaltaj → Tanabaj. The same route is given in A. de Demidoff's map from 1837 and in S.A. Mitchell's map from 1859,[83] whereas the indication of roads and tracks in Betev's map of 1837 with revision in 1835 is considerably more detailed showing also the internal connection between the villages. And they also make it clear that tracks were highly mobile, not necessarily remaining in the same place but changing with changes in settlement pattern. The modern main road (T0107) follow the line of the 19th century main road from slightly W of Vladimirovka (Baj Kijat) to Bakal'. However, this is not the case between Černomorskoe and Vladimirovka, where today the road is led via Mežvodnoe. The actual road can be faintly distinguished between Evan and Aldermen (Fig. 6.41) and between Aldermenskaja Skala and Saja/Kostrovka. It is noteworthy that the main road of the 19th century does *not* coincide with the nomadic routes and it is equally noteworthy that this road does only sparingly show up in the maps of Google Earth indicating that traffic in antiquity must have been much more 'heavy' than in the 19th century.

[83] *A Complete Map of the Crimea Showing the Military and Carriage Roads with Distances from Various Points of the Western Coast From English & Russian Surveys.* Philadelphia. Available at http://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~36464~1200831:A-Complete-Map-of-the-Crimea-Showin.

Summing up

The routes mentioned above are tangible testimonies of mobility and man's interaction with the landscape, and the preserved and reconstructed paths reveal an intricate web of movement. In all likelihood, the watershed units as defined by the kurgan chains may characterize zones of micro-mobility of a sedentary or semi-sedentary population, for example the zone in which a flock of animals could be moved during a day. The rectilinear roads on the other hand bear witness to movement over longer distances. It is normally assumed that these are nomads' routes of seasonal migration thus of macro-mobility. Their location in the landscape is very rational being foremost concerned with finding the easiest crossing at the beginning of the ravines. Incidentally, it appears that the survey area is located at the junction, where several types of mobility patterns can be observed. As we have already seen, there seems to be a relation between the area, where the cadastre can be reconstructed and the number of paths. Moreover, there is a similar change in the way the kurgans were spatially arranged, because kurgan chains, which are so common in our area and further W in the Tarchankut Peninsula, are rarely found to the E and NE of the Džarylgač Lake.

It is likely that the settlements found on the slopes are more or less permanent villages constituting the winter quarters sheltered from the winds. They may have been inhabited throughout the year by inhabitants practicing agro-pastoralism. In that case, some members of the family probably went to summer pastures perhaps in the foothills or the *jajlas* of the Crimean Mountains ca. 100 km and more to the SW. In the 19th century, they attracted shepherds with their flocks from as far away as Romania (Cordova, Rybak & Lehman 2001, 372). Thus, in a comparative perspective, the distance from the DSP study area to the Crimean Mountains is slight when discussing transhumance, because we know from ethnographical studies how flocks can be moved 500 km or more.[84]

[84] Eurasian steppe in Kazakhstan: Chang 2006, 197; Altai: Suttie & Reynolds (eds.) 2003.