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Onur Özbek

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Onur ÖZBEK\*

## KAYNARCA: A NEOLITHIC MOUND IN GELIBOLU PENINSULA

### INTRODUCTION

With its similar form to an island and its strategic position, right between two seas the Aegean and the Marmara, the Gelibolu peninsula<sup>1</sup> has been a point of attraction for the prehistoric societies since Paleolithic times (Fig. 1). Many scholars studying on the prehistory of islands have questioned the subsistence strategies of the prehistoric societies and tried to compare them with those of inland societies<sup>2</sup>. This study is an essay, which refers to the prehistorical relation between the people and the environment living in similar geographical settings. Taken as a case study, the Gelibolu peninsula was subject to analysis for the reconstruction of the prehistoric settlement patterns after the necessary authorisations were obtained from the Ministry of Culture in Turkey in 2006<sup>3</sup>.

The earlier archaeological investigations in the Gelibolu peninsula began in the late nineteenth century with an excavation carried out at the mound of Karağaçtepe (Protesilaos)<sup>4</sup> by H. Schliemann in 1882, without the necessary official permissions from the government. When the authorities warned against an illicit digging on the spot, Schliemann was hindered from carrying on

his excavations (Demangel 1926: 5, Schliemann 1984: 286-295). In the beginning of the 20<sup>th</sup> century, the peninsula was invaded by French Allied Forces. The military officers who were very much interested in archaeology yielded to curiosity and started excavations at Karağaçtepe on the peninsula between the years 1920-1923. In the 1960's, a number of sites such as Asartepe and Akbaş Şehitliği were noted on the Gelibolu Peninsula by D. French (1964: 37).

Prior to our survey, the peninsula was studied by Özdoğan from İstanbul University in 1982 (Özdoğan 1982, 1996). The field survey brought to light an important number of sites on the peninsula including Kaynarca, and the first data obtained were published in the following years<sup>5</sup>.

It is worth emphasizing the gravity of this area on the migration of cultures as here we can see the second shortest distance between Thrace and Anatolia after the Bosphorus Strait. The entire hypothesis on the history of human migration on this part of the country should be evaluated with paleogeographical features of the coastlines<sup>6</sup>. The change of the sea levels and their effects on the paleo-coastline together with the change of the salinity features of the seawater in Marmara Sea

\* ) Çanakkale Onsekiz Mart Üniversitesi, Fen ve Edebiyat Fakültesi, Arkeoloji Bölümü, Çanakkale, Türkiye.

1) Gallipoli peninsula was named Thracian Chersonesus in the Antique World. In Greek, etymologically the word means an island (*nesos*) linked to the mainland (*chersos*), i.e. a peninsula.

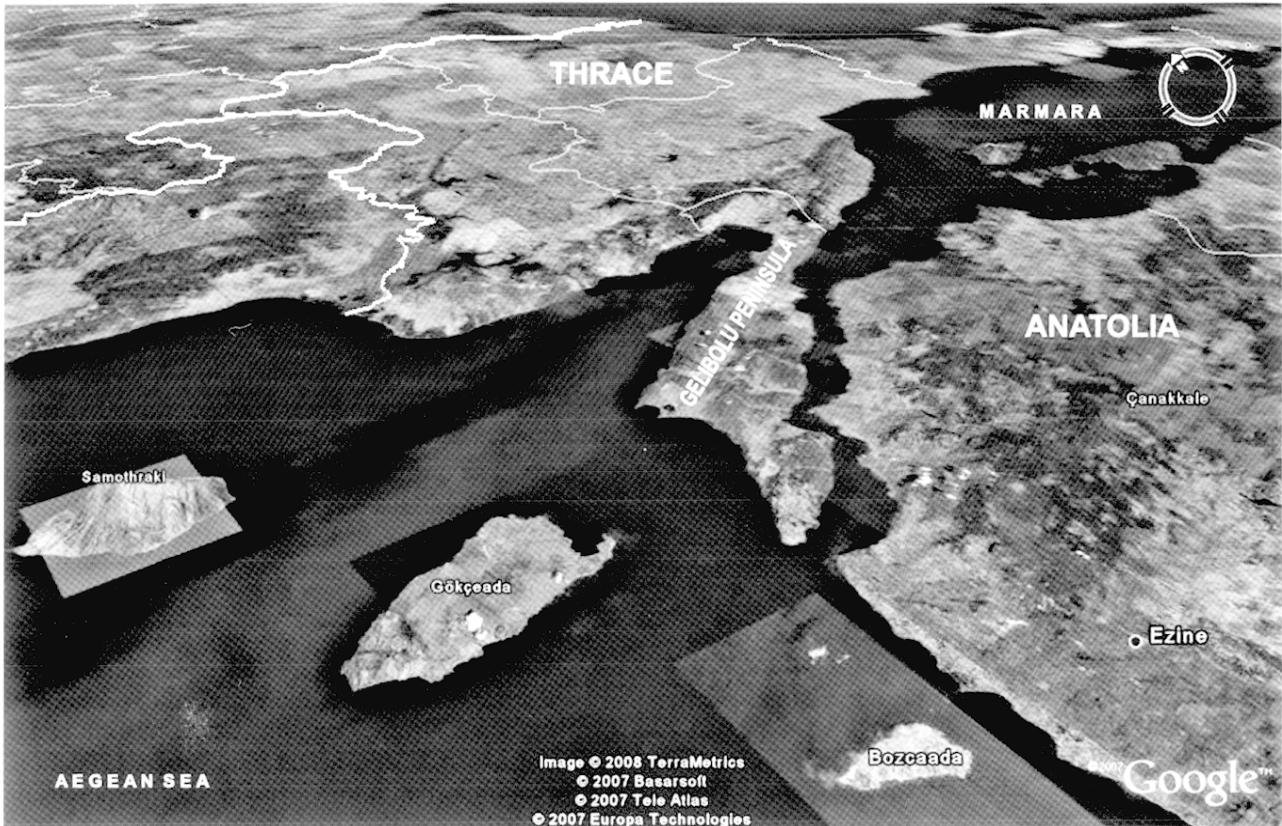
2) See Keegan and Diamond 1987 for the colonisation theories of the Neolithic islands in the Mediterranean, Cherry 1990, Patton 1996, Kohn 2002 for general discussions about island prehistory and finally in a recent significant discussion considering neolithic sea cost sites in North western Turkey, Erdoğan 2005. See also Cooney 2007: 323-328 for a general assessment on the subject and Phillips 2007: 371-384, for the role of megalithic monuments as geographical marks seen from sea.

3) We would like to express our thanks to the General Directorate of Monuments and Museums for providing us the necessary survey permissions.

4) Or Protesilaos. Various places were mentioned for the exact location of the tumulus or the mausoleum of the Thessalian war hero on the peninsula (Graves 1974: 307-308).

5) See Özdoğan 1985a and 1985b.

6) The Dardanelle Strait is nearly 62 kilometres long with an average depth of 55 metres. The shallowest part of the bottom is measured to be about 50 meters. For the evolution hypothesis for the opening of the Strait of Dardanelles see Önem 1974, Erol 1992, Demirbağ *et al.* 1998, Yaltrak *et al.* 1998a,b and for the details on the sill depth of the Straits of Dardanelles and the bathymetric contours of the seashore along the peninsula see Alpar *et al.* 1998 and Alpar and Doğan 1999.



**Fig. 1 : Situation of the Gelibolu Peninsula.**

would have affected the settlement and subsistence patterns of the human groups<sup>7</sup>. Especially, when studying the settlements near the coast, we should consider all these factors in order to construct our theories.

We should also remind the reader that the surface finds in the 1982 survey at the two localities of Değirmenlik and Ören in the south of the peninsula were attributed to Epi-paleolithic (Özdoğan 1986)<sup>8</sup>. Our present knowledge particularly of the Neolithic period here is based largely on very few surveys held in the past years. The prehistorical cultural interaction of the societies living in the peninsula with the societies living in the main land

(Thrace) and Anatolia is another study subject that should be considered in the future studies.

### GEOGRAPHICAL SETTING

Kaynarca is located seven kilometres southwest of the modern town of Gelibolu, which gives its name to the peninsula (Fig. 2). The Gelibolu peninsula is eighty-eight kilometres long from the beginning of the isthmus. The narrowest part of this isthmus is 6 kilometres and the largest part is about 20 kilometres. Approximate surface of the peninsula covers nearly a thousand square kilometres largely dominated by low lands and small valleys. The highest part of the land on the peninsula

7) Until 12000 B.P. the Marmara Sea was a lake (Göktaşan *et al.* 2007). See Hiscott *et al.* 2007 and Aksu *et al.* 2002 for further reading on the history of water exchange periods, sea level changes and its climatic effects of the Marmara Lake/Sea. Also for the archaeological evaluation of this paleogeographic incident, see Özdoğan 1985c: 39-162 and 1999: 209.

8) See Runnels and Özdoğan 2001: 70 for their general ideas about the presence of the Epi-paleolithic culture in this region and in the Turkish Thrace. We may also use the term Mesolithic in Northwest Anatolia. Although there are no systematic excavations and radiocarbon datation series regarding this period, Epi-paleolithic cultures approximately date between 12.000-10.000 BP uncalibrated in Northwest Anatolia as stated by studies made by M. Özdoğan, I. Gatsov and C. Runnels. C. Perlès also uses the term "Early Holocene hunter-gatherer culture" for Mesolithic. According to Perlès, this period spans between 9500-8000 BP uncalibrated (Perlès 2001: 20). In his various studies, N. Efstratiou states that until now, no Mesolithic or Epi-Paleolithic site or stray finds were encountered near the Turkish border in Northeast Greece (pers. comm.). See Ammerman *et al.* 1999: 211-214, Kotsakis 2005: 8-15, Efstratiou 2005: 143-153, Galanidou and Perlès 2003: 27-33, for the discussions on the topic and Middle Paleolithic finds from different surveys.



**Fig. 2 : Geographical position of Kaynarca Neolithic mound and the distance to Kalanuro.**

is 424 meters a.s.l.<sup>9</sup> north of the modern village of Tayfurköy<sup>10</sup>. The second peak with its 404 meters height near Değirmendüzü village, situated west of modern Gelibolu town is a rough terrain, which is constituted by mainly evergreen shrubs and some partial pine tree woods. Although these elevations are not very high in proportion to other neighbouring lands in Anatolia or in northern Turkish Thrace, the rise in altitude is quite prompt when considered right from the seacoast. The geological faults usually shape the peninsula where the high hills form a natural barrier before the Aegean Sea coast at the Western part. The low fertile lands reach the Marmara Sea with slight elevations to the east. The small planes namely Evreşe, Karainbeyli, Sütlüce and Ilgardere are the most flat places on the peninsula.

The western part of the peninsula, especially near the seacoast, is formed by Eocene and Oligocene flysches, which make steep inclines through sea bottom near the Ecelimanı bay (Ternek

*et al.* 1987). However, the eastern part of the peninsula is covered by Miocene and Pliocene sedimentary rocks with rather less steep geographical features. The highest elevation near the isthmus of the peninsula is the Ganos Mountain where a part of the elevation extends to the heart of this land until the small modern village of Seddulbahir<sup>11</sup>. In fact, the Korudağ Hill reaches about 725 meters high but the rest of the hilly part has an elevation of about 300 meters. The geographical features between these hills constitute low lands with small valleys like Evreşe, Karainbeyli, Sütlüce and Ilgardere where today there is mechanical agriculture. The water sources are mainly Ilgarderesi, Kavak Çayı, Uçköprüler Deresi, and Çokalçı Deresi, which join Marmara seacoast on the east. When compared with other evergreen vegetation cover around the land, this valley constitutes one of the few important places for wood resources for the present day. The modern wood resources are concentrated on three other localities in the Gallipoli peninsula.

9) a.s.l. above sea level.

10) The highest part of the geography is constituted by sedimentary rocks rather than volcanic rocks (Önem 1974: 4).

11) See İlhan 1960, 1964, Önem 1974, Sümengen *et al.* 1987, Önal 1986, for the detailed geological descriptions of the area. See Erol 2003 and 2001 for the studies related with geoarchaeology in the North end of the peninsula.

The water sources are not abundant but not rare on the peninsula. Precisely, to the north of the study area where the isthmus has the highest and the steepest geography, the fresh water sources have less flow rate, are seasonal and decline in number. Nevertheless, this is only a narrow coastline stretching for about 5 kilometres in a northeast-southwest direction. Kavak Çayı (brook) is approximately 50 kilometres long with its tributaries and is situated on the further end of the northeast of the isthmus. The longest stream in the region gently descends to the Saros gulf by passing the Çokal village. Oppositely, the stream of Ilgarderesi, to the southwest of Kaynarca, nourishes from the Eşikçi Mountain and flows towards Uveyik Mountain and Pazarlı village joining the Marmara on the south. It is noteworthy to mention the Çokalıcı Deresi, which is the nearest water source to Kaynarca prehistoric settlement.

The present climate of the peninsula resembles a climate between Turkish Thrace and Aegean region<sup>12</sup>. Geographers accept the shielding role of the Korudağ Mountain on the north hindering the rough weather effects of the Thrace region to descend down to the peninsula. The modern precipitation has high levels at the autumn rather than the springtime. The land is famous with its northerly winds that increase its force in the wintertime but during most of the year, there are strong air currents. When compared with the Thrace region the autumn is rather warmer here and the summer and spring times reflect a similar climate to the Aegean coast on the south.

Today, the locality of Kaynarca faces Marmara Sea on a slightly higher elevation than the other fields nearby (Fig. 3). The eroded hills on its east where the Kalanuro site lies, prevents it to be easily seen from the sea. Kalanuro is another prehistoric site found by Özdoğan in 1982 (Özdoğan 1986), which is situated on a promontory facing the Sea of Marmara (Fig. 2). However, the distance to the Aegean Sea at its west, is only about 13 kilometres after the village of Fındıklı. In order to reach

the Aegean coastline, one can walk by the inner valleys between low hills where today we can see pine forests.

## SITE DESCRIPTION

Kaynarca (N 40°21'59.4" E26°36'38.0) is one of the few Neolithic sites known on the peninsula<sup>13</sup>, which was found by the İstanbul University survey team. The result of the 1983 survey made by Özdoğan had already pointed the scarcity of the Neolithic settlements in the peninsula. The Kaynarca fresh water source is the nearest but not the only one in the vicinity<sup>14</sup>. The mound is presently divided into two sectors by a dirt road towards east and west. When the previous survey teams visited the site, the surface area of the mound would have been estimated as smaller may be due to less destruction effectuated by agricultural activities in the past. At present, although it has relatively a low relief feature, it stands about two meters higher than the surrounding fields especially on its northeastern sector. Our 2006 survey confirms the fact that the surface area of this mound covers a larger area than the previous estimations<sup>15</sup>. The eastern sector of the mound mostly yields the Neolithic material whilst the western sector yields materials that are more recent (Fig. 4). The western part of the mound can be estimated as 100x100 metres. Although there seems to be a difference in the archaeological material in comparison with the western and eastern part, we assume that a single habitation exists here<sup>16</sup>. However, the eastern part covers a larger area (100x150 metres).

### Surface finds

#### Pottery finds

During our surface collection in 2006, we have noted pottery finds belonging to different periods (Fig. 5). In order to better analyse the settlement we had to divide the site into two sectors: east and west. The western sector yielded less material

12) In Dewdney 1971, the climate of this region is identified as "thermo-Mediterranean".

13) According to the 1982 survey Özdoğan is sure about only two Neolithic sites on the peninsula: the first is Karağaçtepe excavated by Schielemann and Demangel previously (mentioned earlier in the Introduction) the second is Kaynarca (Özdoğan 1986: 54, 57). However, we should remind that two other sites Değirmenlik and Ören Mevkii were mentioned in Özdoğan's article as possible Epi-Paleolithic sites. Değirmenlik site was described as an area "on the inland slope of a rocky rise by the sea covering half hectare (50x100 m.) just hundred metres south of Akbaş Şehitliği". Although Değirmenlik and Akbaş sites both have been totally wiped out due to a highway and a factory construction, we can not give detail about them.

14) Apart from this fresh water spring which is still active, there are other sources.

15) We could not put aside the possibility that in 20 years by heavy erosion of the mechanical farming dispersed the cultural material further out of the original occupation surface.

16) Certainly, there needs to be soundings and an excavation to understand the exact limits of the mound. The information given here is only an assessment according to surface finds collected in the first survey season in 2006.



**Fig. 3 : Kaynarca from the north: arrow indicates the middle of the two sectors of the mound divided by the earthen road.**



**Fig. 4 : Kaynarca from the west and the main concentration of the Neolithic finds near a tree.**



**Fig. 5 : Pottery finds from Kaynarca.**

belonging to Iron Ages and more material from Roman times. Although we can find various Roman pottery, the absence of the architectural elements points that here there were no important settlements nearby (Fig. 3). The eastern sector was divided into three parts. At the northern end of the eastern sector where we are nearer to the fountain of Kaynarca (Kaynarca Çeşmesi), the prehistoric material was seen at the first 75 metres.

The Neolithic pottery found in this sector was first attributed to Fikirtepe<sup>17</sup> pottery by Özdoğan (1983, 1996). Since the vast majority of the Kaynarca Neolithic pottery is red slipped and burnished, consisting "S" profiled bowls, hole-mouth jars, flaring and straight sided bowls and dishes, the assumption of considering this settlement as a Fikirtepe influenced culture is no longer maintainable (Erdoğan 2000)<sup>18</sup>. Vertically placed tube-like and knob-like perforated tubular lugs, as well as crescentic lugs are characteristic. As we had reminded above, Özdoğan correlates the dates of Kaynarca with that of Classic phase of the Fikirtepe Culture. Lichter, for example accepts Kaynarca as a Late Neolithic settlement with West Anatolian cultural elements rather than Northwest Anatolian elements (2005: 62, Fig. 1). To sum up: Kaynarca pottery is much more similar to the Western Anatolian red slipped ware tradition than to Classic Fikirtepe. Although it is early to conclude this but it seems that, the Western Anatolian early Neolithic ware tradition might have extended into the Gelibolu Peninsula by the mid point of the 7<sup>th</sup> millennium B.C.

### ***Lithic-chipped finds***

According to the surface material collected in 2006, chipped stone industry at Kaynarca does not constitute a rich group of findings. The raw material of the lithic, chipped industry at this mound is mainly composed of chert, jasper and quartz. The collected samples of the industry seem to increase in number at the part of the mound near the Kaynarca fountain (Fig. 4). The blades, micro blades and cores are mostly of chert and jasper. Jasper or chalcedony is a fine-grained siliceous

sedimentary rock, which has been abundantly used in the prehistory for the chipped stone industry (Fig. 6-9). At times called as silicon oxide, this rock is quite near to chert or silex<sup>19</sup>. The 2006 survey yielded also some few materials of arrowheads usually fragmentary but the regular form of the proximal extremity distinguished. The notched flakes are also remarkable in Kaynarca industry (Fig. 6-7). The side scrapers are abundant while there are also frontal scrapers (Fig. 6-7).

The chipped stone industry of Kaynarca has been first mentioned by Özdoğan in his early articles about the Gelibolu Peninsula survey only with a brief description<sup>20</sup>. It has never been subject to detailed analysis in terms of typology or technology. As the site is easily reachable by the İstanbul-Çanakkale highway, it has been frequented by many people interested and the surface material was collected by amateurs<sup>21</sup>. Although Özdoğan has mentioned the presence of obsidian chipped stone industry at Kaynarca in his early articles, at not only Kaynarca but also throughout the Gelibolu Peninsula, we have not found a single obsidian raw, semi-finished or finished tool in our survey.

The limited number of finished tools we found on the surface of the mound of Kaynarca shows no distinctive debitage. However, when compared to finished tools, the waste material and cores were much more in quantity (Fig. 8). This makes us think that the flint working was carried out on the settlement. The microlithic industry, as it is quite common in this period, is mainly used in the production of sickles (Fig. 10). The silex material here is of good quality and macroscopically homogeneous with fine grain blonde or light brown colour. As the chipped stone artefacts collected from the surface are far from defining the whole industry of Kaynarca in this preliminary analysis, we can only indicate the preference and procurement of raw material. Jasper and chert show evidence of onsite tool production while we cannot be sure about the tendency in tool type production in the site. To be able to talk about a distinct source area in the peninsula, we have to wait for further surveys and analyses.

17) See Özdoğan 1999 for a concise discussion of the first evaluation of Fikirtepe excavations and its significance in comparing the other Neolithic cultures in the Marmara region. According to Özdoğan, the subsistence strategies of Fikirtepe Neolithic population depends on fishing and hunting (1998: 72).

18) Erdoğan, pers. comm.

19) It is also classified as a cryptocrystalline quartz rock.

20) "There are also a fair amount of flint and obsidian implements, with numerous micro-blades and a few geometrics". (Özdoğan 1986: 57).

21) According to the information given by locals.



**Fig. 6 : Lithic finds from Kaynarca mainly of flint, jasper, black jasper (Face A).**



**Fig. 7 : Lithic finds from Kaynarca mainly of flint, jasper, black jasper (Face B).**



**Fig. 8 : Lithic finds from Kaynarca mainly of flint, jasper.**



**Fig. 9 : Lithic finds from Kaynarca: blades, bladelets, flakes.**



### Ground stone finds

We have observed two major groups of ground stone tools. The first include few examples of sophisticated polished axes or adzes of only one rock type: metabasite<sup>22</sup> (Fig. 11). The origin of these polished tools is high quality durable metamorphic rock found probably in the form of axe rough outs obtained some distance away from the site<sup>23</sup>. The tools were usually in fragmented conditions but rare pieces were found as whole piece (Fig. 12-13). Most of them were probably broken at some stage in use. At the present stage of knowledge, we are away to talk about their fragmentation during manufacture as we need to find the other elements of the production in the "chaîne-opératoire". However, some preliminary details about their techno- morphology can be given. The common points of the three fragmentary examples are that they are not abandoned even after their possibly accidental break during usage. Most of the pieces were restored into other types of tools like pounders after it broke. The general dimensions of four of the examples are not very different (for instance four of them have 5 to 6 centimetres of width). The reutilisation of the broken pieces might be a frequent situation in Kaynarca (Fig. 13). Some of the examples are only polished on its distal extremities while the proximal extremities are left unpolished or pecked second time to increase the friction of the surface area where it enters in the handle<sup>24</sup> (Fig. 12). In only one example, one side of the tool is visibly more rounded than the other, which makes it nearer to adzes rather than axes. The tools in this group generally present an archaic form in the Neolithic considering information we obtained from the excavations like Hoca Çeşme and Aşağı Pınar.

Second group found in Kaynarca consists of whetstones, pounders, querns and hand grinders. For the production of second group of ground stone tools, usually limestone or sandstone is used.

22) We can also call this group polished cutting edge tools.

23) For a limited number of examples, petrographical analyses are done for determining the main source. The first group of the tools are fabricated from the same raw material we found in Şarköy metamorphic outcrops (Özbek 2000, 2002). There was also a close similarity with the end products we discovered in Hamaylıtarla axe workshop in the sense of morpho-technology.

24) Possibly the handles were wooden for this type of tools. There is no indication of use of deer antler handles or animal bone sheaths as an intermediary element in Turkish Thrace from the excavations as Hoca Çeşme or Aşağı Pınar. These intermediary elements are usually used for small sized adzes or chisels in the mentioned region.

25) Özdoğan finds resemblance of the Değirmenlik site with that of the other Epi-Paleolithic sites on the Black Sea littoral. This lithic material have "Gravette" type blades or bladelets with lateral retouches (1999: 210).

26) The site was demolished after a couple of years it was discovered by Özdoğan in his survey although it was protected by the state laws related with the protection of cultural heritage.

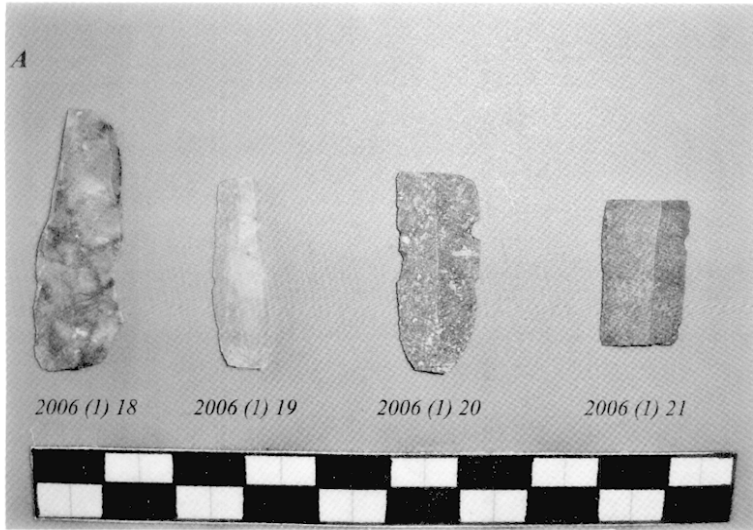
27) See Özdoğan 2005: 13-27, for the discussion on "the expansion of the neolithic way of life" towards west and the possible role of Thrace in this expansion. The recent data about the occurrence of red slipped pottery with white painted designs (Karanovo I style) in Aşağı Pınar settlement is mentioned as well in this publication (23).

### DISCUSSION AND CONCLUDING REMARKS

Unfortunately, our present state of knowledge indicates the scarcity of the Neolithic sites situated near the coastal strip of the Sea of Marmara and the Aegean Sea around the Gelibolu Peninsula. We need to continue our field surveys in the peninsula in order to have information about the numbers of the prehistoric sites. While Özdoğan is sure about the presence of Epi-Paleolithic sites or population movements on the peninsula (1999: 210), a pre-Neolithic culture on the peninsula needs to be confirmed by future researches, which merits to be studied separately. Özdoğan's assessment for the sites like Değirmenlik only 25 kilometres far from Kaynarca was Epi-Paleolithic<sup>25</sup> according to 1982 survey. Unfortunately, this important prehistoric site was entirely bulldozed during a factory construction<sup>26</sup> and now we are unable to discuss the presence of Epi-paleolithic by comparing the finds from this site.

Özdoğan, in his various studies indicated the close resemblance and contemporaneity of the pottery material of Fikirtepe with that of the Kaynarca. Situated in a very strategic position in South Thrace like Hoca Çeşme and Hamaylıtarla, Kaynarca constitutes an important place and role between the Balkans and Anatolia from the point of view of cultural interaction (Özdoğan 1986, 1996)<sup>27</sup>. However, the Early Neolithic pottery material of Fikirtepe settlement is rarely seen on the west of the Bosphorus Strait (Harmankaya 1997). Kaynarca and Hamaylıtarla share some affinities when the pottery and lithic traits considered. Especially, the data obtained from recent surveys in South Thrace indicates relations with West Anatolia rather than Northwest Anatolia (Fikirtepe). However, excavations should verify these preliminary observations.

Kaynarca Neolithic population may have consumed wild foods around the settlement. If we con-



**Fig. 10 : Lithic finds from Kaynarca: bladelets.**



**Fig. 11 : Kaynarca from the east with a polished stone axe find *in situ*.**



**Fig. 12 : Kaynarca polished stone axe: only distal extremity polished.**



**Fig. 13 : A fragmentary polished axe/adze find with the indications of restoration work on its proximal extremity; an accidental break in the median part.**

sider Hoca Çeşme for instance, we suggest that agricultural production may have played a vital role as well as exploitation of the marine sources. Recent palynological research based on marine pollen cores provided from the Sea of Marmara<sup>28</sup> supports the evidence of temperate deciduous forests around Marmara Sea by 9000 BP (Mudie *et al.* 2002: 255). The modern mesic forest started to appear by 7000 BP. Researchers like Mudie, Rochon and Aksu are against the former hypotheses put forward by Ryan *et al.* (1997: 119-126) about the sea water levels of Marmara Sea and the climate conditions around 10000 BP. According to latest data obtained from marine pollens, deforestation of the land does not seem to start earlier than 4600 BP, approximately and that before 7000 BP the regional climate was excessively wet hindering the growth of grain crops and sustaining the growth of the forest around Marmara. The palaeoclimatic records elaborately studied and analysed by this team merit great attention but we cannot agree with the idea that between 7000 - 4000 BP, “the mesic forestland would make the region unsuitable for agriculture prior to development of metal tools for land clearing” (Mudie *et al.* 2002: 256, 257). Studies in prehistoric archaeology especially in Europe clearly demonstrates that by the first occurrences of flint and polished axes, the dense forest covers could be cleared by the Neolithic village communities not only to build settlements but also to open small fields to practice the initial stages of farming (see Pétrequin 1984: 132-135). We must also remind the readers about numerous work in ethnology carried out at very humid geographies like Papua New Guinea where we see man opening land with the help of their polished stone axes for agricultural land (see Pétrequin and Pétrequin 1993).

We would like to put stress on a new information about raw material procurement in the peninsula. On the contrary to the previous observations by archaeologists on the occurrence of obsidian in finished flaked industry in Kaynarca and in

Karaağaçtepe, we discovered that the mistaken rock type was a type of jasper, black in colour (see Özdoğan 1986, 1996 and other articles). We did not find any raw or worked piece of obsidian in our survey in 2006. The preference for the lithic industry was in favour of jasper and flint in Kaynarca. Especially most of the cores we found on this site were in jasper, which indicates an onsite tool production. As sourcing studies will continue in the future years, we will be able to give more information about the locations of primary sources or quarries here. We are optimistic of enlarging our knowledge about the Gelibolu Peninsula and the Marmara region with future surveys.

### ACKNOWLEDGEMENTS

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O.Ö.

28) Until 2002, six cores from the Marmara and Black Sea. See Mudie *et al.* 2002 and Aksu *et al.* 2002 for the commencement of very important and detailed studies on pollen analysis carried out at close proximity to Gallipoli peninsula.

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