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THE ANALYSIS OF EASTERN ANATOLIA ENVIRONMENT DURING BRONZE AGE WITH FOCUS ON ARCHAEOLOGICAL DATA

Keywords: Environment, Bronze Age, Eastern Anatolia, Interdisciplinary Science

Açar sözlər: Ətraf mühit, Tunc dövrü, Şərqi Anadolu, fənlərarası elm

Ключевые слова: Окружающая среда, бронзовый век, Восточная Анатолия, Междисциплинарная наука

Abstract

The biological and climatic congruence is one of the primary conditions for arising, growth, and development of animal species. Appropriate temperature, height, and the needed flora and other factors are considered as the backgrounds of life for human and animal groups for which it can be concluded by partial studies that if the studied region possesses the features needed for acceleration and encouragement of different, animal, human, and plant communities for their survival.

Comparison of plant and animal traces found in regions in Eastern Anatolia at Bronze Age which had geographic and cultural proximity with Azerbaijan region in Iran has been led to remarkable data about negative ecological effects during recent decades. Due to dry climate and climatic changes, at least quantity and varieties of plants have been reduced in current Azerbaijan region. Such consequences have even reached to borders of neighbors as well, but the greatest difference in drying of Uremia Lake at Azerbaijan and vice versa are continued with ecological life of Van Lake at Eastern Anatolia. It is clear that climatic change has been followed by noticeable effects on rainfall, evaporation and transpiration, surface runoffs, and thus hydrologic events so it is the matter of fact that the human manipulations have been assumed as the foremost natural disorders in consuming fossil fuels and urbanism. Inter alia, what it has been deemed as important for the authors is to find Archaeobotany, Zooarchaeology, Palynology, Pedology, and analysis of surface findings about types of plants and animals on potteries and making of various tools in forms of animals to climate of Eastern Anatolia out of Turkey history at this age through analyzing the given findings to some extent. Thus, it has been tried to deal with ecological conditions in this region at Bronze Age through analysis of Archaeological data and sedimentologic studies and paleopalynology in adjacent environment.

1. Introduction

Various theories have been proposed regarding effect of environment on Archaeological communities out of which the first and foremost one is the Oasis Theory (or Propinquity Theory) that has been posited by Gordon Childe who introduced climatic change as a key to formation of communities (Niknami, 2000: 15). Ecology is one of the other theories which have been presented in this field based on this theory; some limited regions have been created after Pleistocene Epoch where they enjoyed suitable biological conditions for survival (Wight, 1971: 21). It can be promoted about impact of environment on life of human to the level that according to Archaeologists, climatic changes, drought, and then economic and social crises have been mentioned as one of the main reasons for collapse of civilizations such as annihilation of Eastern Mediterranean civilizations (Kaniewski et al., 2010: 207), politi-

cal and economic and social depressions of governments in Assyria and Babylonia during 11-12 BC (Neumann and Parpola, 1987; Cullen et al., 2000) and Maya civilization (Haug et al, 2003; Butzer, 2012).

Among the related theories, theory of cultural ecosystem is most prevalent and according to this theory, human is deemed as an integrated part of environment and at the same time environment has been also mixed with culture. At this element, culture and environment have constantly impacted on and from each other. Cultural ecologists have proposed an approach separated from ecological determinists and probabilists. According to attitude of Stewart, cultures and environments are some part of a collective life network each of each can be defined in terms of other one. The environment plays active and bilateral role in human's life not determinant and passive one.

Among them, the first report of achieving of plant residues in Turkey was concerned with efforts made by a German botanist called L. Wittmack on grain seeds extracted from Troy sponsored by Schliemann, but this innovation was not repeated in other sites up to 1950s where a Danish scientist started his scientific studies at Middle East (Nesbitt, 1995: 68). In line with his botanical studies in Beyce Sultan, Chatal Hoyuk, and Hacilar with James Melart and in Amuq plain along with Braıdwood in Turkey, Hans Helbaek worked. At the end of 1960s, Willem Van Zeist from Netherlands and Gordon Hillman from UK started their works in Turkey, but absence of skilled persons for collection of extensive vegetative data was the greatest problem at this decade. However, today this field is considered as one of the scientific disciplines in Turkish Universities. In addition, basic works and tests have been conducted in animal range to identify animals at Eastern Turkey. From the very beginning, plants have played essential role in life of inhabitants at Middle East including consumption as food, fuel, tools for house construction, pharmacology, and many other applications. Overall, most of botanical Archaeological studies have been carried out on domestication of primary plants during Neolithic period in the Middle East and these studies have become less important at subsequent periods. Among them, Turkey has been one of the vanguards in technique of floatation and sifting of soil to achieve bones and botanical data and etc.

2. Geographical scope of the study area

Turkey is situated at Northern hemisphere among 36-42° of equator and 26-45° of Eastern meridian. In classification of areas of Turkey, the Eastern region of Turkey, which is well-known as Anatolia, considered as roof of Turkey with height of 2000-2200 meters above sea level and as the highest point in Turkey (Fig. 1). Iğdır is the lowest point at this region with height of 850m. The mean height of plains is 1500m at this region. Following to elongation of mountains, plains are oriented in eastern- western direction. Erzurum- Kars plain is assumed as the largest one in Turkey that is located in this region (Ateş, 2013: 130). The relatively wide plains locating at Eastern Anatolia along with flowing abundant rivers have dubbed potential for agriculture. This situation and verdant piedmonts along with multiple forage supplies have provided suitable site for nutrition of inhabitants, animals, and plants.

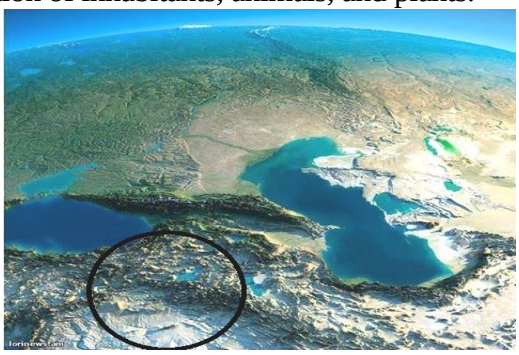

Fig 1: Eastern Anatolia (Google Earth)

3. Environment of region ahead of Bronze Age

The conducted study for identifying habitats (Fig. 2) introduces the Southeast of Anatolia in terms of communication, soil, water supplies, ground and underground supplies as suitable site for settlement in long times ago. We are exposed to growth of Archaeological regions (Karadoğan ve Kobze, 2013).

Animal bones belonging to deer and bear are prior in Göbekli Tepe (relating to Neolithic period without pottery at North East of Şanlıurfa). The other animals also lived there such as deer, boar, alpine ibex, and zebra (Schmidt, 2010: 242). Similarly, the embossed designs of animals such as boar, fox, snake, spider, heron, and scorpion have been inscribed on stone columns (Ibid).

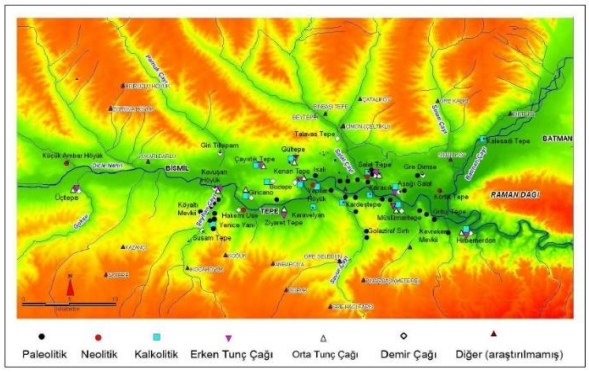

Fig 2: The distribution of settlements in the Tigris basin (Karadoğan ve Kobze, 2013: 547)

Also in Hacnebi locating in Şanliurfa, several plants species have been recorded at Uruk period (Stein et al. 1996). Fatmalı Kalecik Höyük Tepe is situated 32 km distant from Northwest of Elazığ province. This region was explored by Robert Walloon and Henry Wright in project for rescue of Keban Dam in 1968. The bones of sheep, goat, cow, and dog have been found at Early and Late Chalcolithic periods and also bones of boar, fox, badger, and wild rat were found in Late Chalcolithic period (Van Zeist, 1998). Generally, with respect to the conducted studies in various regions of Hallan çemi Tepesi, Körtik Tepe, Gritille, Hasankeyf Höyük, Grrikhacyan, Boztepe, and Domuztepe the prehistoric Bronze Age these regions indicate suitable environment at this area in Turkey that provided appropriate opportunity for settlement of civilizations. In a recent investigation done by Wilkinson in valleys locating at south of Turkey and northwest of Syria, he has also proposed that in this region the impact of human population has been increased on this outlook at Upper Euphrates River during 4000-5000 years ago and drying of atmosphere has restricted growth in trees and such atmospheric fluctuations have been definitely increased (Dönmez, 2006: 13).

4. Environment of region at Bronze Age based on Archaeological data

The human manipulations in consuming fossil fuels and urbanisms have been assumed as the paramount factor for natural disorders. Comparison of plant and animal traces found in regions of Bronze Age at East of Anatolia, which had geographical and cultural proximity with Azerbaijan region in Iran, has been led to remarkable data about negative ecological effects during recent decades. Due to dry climate and climatic changes, quantity and variation of plants have been reduced at least after current Azerbaijan. What is tangible at Bronze Age is professional and artistic commonalities of Azerbaijan inhabitants and people at East Anatolia under subfield of Kura-Aras Culture with the same art and architecture that even makes this idea possible for political alliance in wide geography at East of Caspian Sea through center of Turkey. These characteristics cause us to put these regions in identical cultural geography. The settlement of human populations has been decreased in plateau regions in Eastern Anatolia at the end of Early Bronze Age and they were settled at high mountains while nomads dealt with animal husbandry here as well. Due to abundant water supplies and meadows and suitable grazing lands, this part of Anatolia was selected as the best and most susceptible sites where the chiefs (heads of tribes) at these areas guarantied their security by building castles at heights and the rulers by laying foundations with fenced walls for the cities.

During Late Bronze Age in Gordion, it has been focused on presence of plane, cypress, and pine in construction of buildings about which it has been discussed about reduction of this trend by Miller in an independent research. Miller[1] explained consuming it as fuel as the reason for this issue (Miller, 1999). Some trac-

[1] - Naomi F. Miller

es have been discovered for existing grains, goat, sheep, boar, and cow in Kurban Höyük relating to third and second millennia BC. He assumes ecological situation of this area as a region covered with oak trees (Miller, 1997: 129). Similarly, Miller mentions that during Early Bronze Age, grape was cultivated in Şanlıurfa at Kurban Höyük. Tilbeşar is located at beach of Sajur as one of the branches of Euphrates River in Gaziantep. The animal traces from Bronze Age are as follows: dog, mouse, rat, fox, boar, wild camel, small deer, cow and deer (Berthon and Mashkour, 2008: 30). The foxtail or Italian millet seed has been reported in burnt building in Tille Höyük from Adyaman province on a road toward Diyarbakir along with Euphrates River- at New Bronze Age and Iron Age. This seed has been found in Haftavan VI settlement as well (Nesbitt and Summers, 1988: 85).

Two sites of Mezraa Huyuk and Gre Virke are located in Shanlıurfa at Southeast of Turkey where their plant traces have been studied by Mrs. Emel Oybak Donmez (Dönmez, 2006: 11) and they belong to Early and Middle Bronze Age periods and Middle Ages so that we will deal with prehistoric data here. These two areas are situated at Eastern bank of Euphrates River and in Karkemish area. This area was more noticed during building of Karkemish Dam and construction of this dam became a factor for Archaeological studies and excavations at frontier point among Turkey and Syria. The first systematic survey was done by Guillermo Algaze in 1989 and later with more details Mezraa Hüyük by direction of Tuba Okse and Macit Tekinalp and also in Gre Virke by sponsorship of Okse where this area was excavated in 2000. The excavations done by Okse in Gre Virke signify presence of several buildings and a unique group of tombs, kitchens, and chambers for gifts which have been left at the end of third millennium and then were used several centuries later at 11-13th AD centuries. According to Miller's statements, landscape or plant outlook without the existing tree at upper basin of Euphrates River is a product composed of natural forces such as climate, vegetative geography, and agricultural and cultural practices of humans. She claims that constant changes in human habitants have altered vegetation over millennia. The plant residues in these two sites have been studied through cooperation of British Archaeological Institute with Department of Biology in Hacettepe University. The samples of olive found in Mezraa and Gre Virke and north Syria characterize presence of this fruit as a part of diet of people in this region and use of it as a commercial commodity. During studies in Mezraa Huyuk at Old Bronze Age I (3000-2800-BC), grain seeds, bread wheat and cereals including Potentilla cinquefoil, Filipendula ulmaria meadowsweet, Chenopodium (goosefoot), Trifolium clover, Lens culinaris lentil, Cicer arietinum chickpea, Vitis vinifera grape (seed), Centaurea cyanus, Bromus brome grass, Lolium rye grass, Polygonum knotweed, Aegilops (spikelet base), Asteraceae daisy family, Fabaceae legumes, Hordeum barley (grain) were found in this region. Moreover, studies done by Albayrak on Mezraa Hüyük at Early Bronze Age confirm presence of animals such as sheep and goat. Also regarding Early Bronze Age III (2600- 3200BC), plant data were achieved for grains, lentil, pea, and grape (Dönmez, 2006). Barley, bread wheat, Astragalus milk-vetch, Adonis pheasants-eye, Rumex dock, Galium bedstraw, Lens culinaris lentil, Vitis vinifera grape (seed), Polygonum knotweed, Fabaceae legumes were extracted in Gre Virke Tepe during Early Bronze Age (Ibid). More likely, the existing grasses were consumed by domesticated animals or they have been brought into this site via dungs and/ or using of them as fuel. The presence of sheep, goat, boar, and cow has been discovered and proved in sites of Zeytinlibahche Höyük and Yarım Hoyuk. These animals constitute some part of livestock system and preparation of meat. Akkemik that has also studied primarily the charcoal of course in this site showed that the inhabitants have used woods of cypress, apple, or pear trees. A great quantity of charcoal has been investigated in Fıstıklı Höyük

at the given region i.e. Karkemish (Ibid, 33).

Arslantepe is situated in Malatya plain at North of Taurus Ranges in Eastern Anatolia. Today, this plain has become globally famous because of fine- quality apricots. This site has been excavated by Italian University of La Sapienza under director of Mrs. Prof. Marcella Frangipane in 1961. With over 30m of sedimentary layers, Arslantepe is situated 15km distant from West of Euphrates and cultural sequence is visible there from fifth millennium BC (Later Chalcolithic Period) through new Hittite period (712BC) (Frangipane: 2012). The fate of this palace comes to the end by great firing done by factors which have been so far unknown. Traces and signs of life of animal may be recognized for animals at this region since long millennia ago where a chariot dragged by two cows are drawn on a wall with ochre and black color locating in hall of temple A belonged to the end of new Chalcolithic period (Sadori et al., 2004: 238). Alder, cypress, juniper, poplar, elm tree, and fraxinus as a species of ash tree; hawthorn or Quercus is a type of oak tree deciduous at winter and also type of cane, reed and oboe a monocotyledon species which well-known as Arunos are some trees used in Palace B in Arslantepe (Ibid, 238). It is inferred that wood of these trees has been utilized for construction and strength of roof (Fig. 3). Sadori et al. have assumed quantity of cypress trees was less than others among aforesaid trees. Perhaps due to small size, oak tree has been less used in construction of palace and temple on the given site. Alder tree usually grows in watery regions with humid soil such as bank of rivers, littoral areas and also at the margins of forests. This tree of evergreen species grows up to height of 1000m and it has soft wood in which color becomes red and then pale pink after cutting. Pine is one of conifers with permanent leaves. It is called small pine as well. This tree is called *'Sanobar'* in Arabic and 'Cham' in Turkish. It has conic fruit with needle leaves in 9 genera and 165 species. Juniper is also a resistant plant grows in mountainous regions with 60 species and it is evergreen and tall and is called '*Ardıch'* in Turkish.

The noticeable point of this site is the lack of signs of oak tree from botanical perspective while verified samples of this tree have been reported at lower heights in Kurban and Hacınebi at South of Malatya in Late Chalcolithic Age (Miller 1994:170). Oak tree which grows on level higher than 1200m and it continues growth with at least 400mm rainfall per year. In environmental reconstruction during Late Chalcolithic Age and Early Bronze Age, Altınova plain and relatively at Northeast of Arslantepe conducted by Van Zeist and Baker- Heers this area is composed of poplar, elm, and ash trees and surrounding mountains were encompassed by oak, wild pistachio, maple, and juniper. Most of these trees were used because of lack of access to them in consuming for structures of palace and temple. In a study Sadori et al. (Sadori et al. 2006: 210-215) have conducted on Arslantepe site in Old Bronze Age the plant residues were analyzed in the burned room where in addition to the already aforesaid trees, there were some species including knotweed, green bean, pea, (*H. hexasticum*) barley, and coarse-grained wheat.

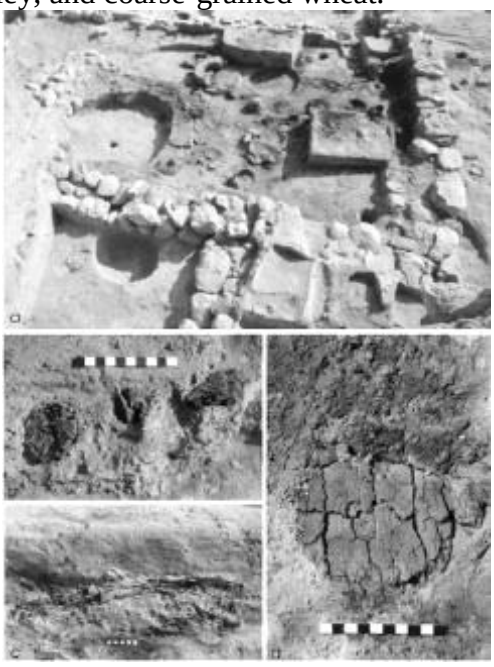

Fig 3: Room A607 in Arslantepe and close-up view of woods debris on the floor (Sadori et al., 2006: 208)

Likewise, some pitchers and jugs were

found in long room A502 relating to Period VID3 on a platform in which the bones of animal remained including stalk bones of bear, jaw of rabbit, and horns of goats.

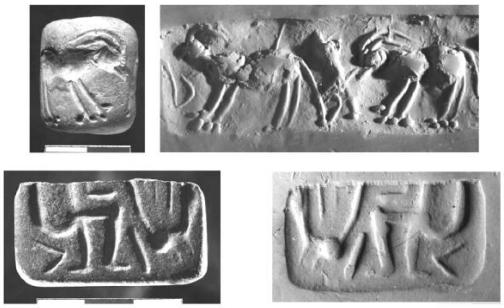

Fig 4: Animal motifs on stone stamps in Arslantepe VIB (Frangipane: 2012: 250)

One of the other important elements that is present in clarification of physiography of Eastern Turkey and record of plant and animal thematic role on seals and on the surface of potteries. Animal designs mainly similar to goats are inscribed and used on pieces of potteries and seals found at Chalcolithic period (Palumbi, 2010) (Fig. 4). Also animal designs have been utilized on stone and copper layer VIB or the same as Early Bronze Age I (Frangipane, 2012).

Yuğunhasan site is situated on 1930m higher than sea level in Aras basin and 42km distant from Kars-Sarıkamısh. Images of aquatic creatures are visible on surface of potteries as they can be seen mainly on poly chrome potteries at second millennium (Belli and Ceylan, 2002: 121). Hirbemerdon Tepe on Upper Tigris, is located among Bismil-Batman plain and 100 km distant from southeast of Diyarbakır. Papaver somniferum, Trigonella .sp, Verbascum sp., Carex Sp, Poaceae, Adonis and domestic animals such as dog, horse, mule, pig, cow, goat, sheep, and wild animals like boar, deer, wild sheep (*Ovis*), turtle, fish, and shell have been discovered in this region at Middle Bronze Age (Laneri, 2008). Some figurines, on which animal design has been reflected as well, were discovered in the artifacts from this site (Fig. 5).

Fig 5: Animal figurine in Middle Bronze Age in Hirbemerdon Tepe (Laneri, 2008)

Altınova plain is placed at east of Anatolia with unique potential for agriculture and in the border of Elazığ province. Murat River with 722km length along with Karasu originates from Aladagh Mountains and joints to Karasu River that originates from Erzurum Range and they are poured into Euphrates River at 850m higher than sea level. These two rivers are originally considered as main feeders for Euphrates River. Keban Dam, which is the connection point between two above-said rivers before pouring into Euphrates River, feeds northern and Eastern plains at piedmont of Taurus Ranges.

Altınova is one of these plains. The height of this plain varies from 800m to 950m on a hole at North direction. The major and important mines include copper, gold, silver, and iron in this region. Some sites were excavated in project of Keban Dam comprising Korucutepe and Tülintepe. The analyses conducted on animal findings in both of Korucutepe and Tülintepe sites based on perfect bones not scattered and broken ones have determined that the tame animals constituted 85% of meat consumed by Korucutepe at Early Bronze Age. This rate is increased to 95% in Tülintepe. Meat of sheep and goat included 65% and 50% of consumption in Korucutepe and Tülintepe respectively. Cow has allocated 26% of findings in Korucutepe and 30% of them in Tülintepe. Pork included 7% and 15% of feeding from animals in Korucutepe and Tulintepe regions respectively. Meat of deer constituted 12% of hunting products in Korucutepe because of further quantity of meat and use of horns

than female animal at Old Bronze Age (Dikkaya, Tülintepe, 2003). During Bronze Age animals living in Korucutepe included horse, mule, cow, sheep, goat, pig, dog, and of wild animals, deer, sheep, goat, boar, wolf, fox, bear, otter, cat, lynx, rabbit, castor, squirrel, rat, and hedgehog (Bosseneck, 1974: 109). Analysis of seeds in Korucutepe and Tülintepe sites has shown that two-row barley, wheat (two-row wheat and coarse-grain wheat) were the main grains at third millennium BC. Lentil has played important role in life cycle for inhabitants in Korucutepe. Similarly, pea and grape were cultivated in the latter site as well. With respect to above evidences, one can describe environment of Altınova region at Bronze Age. This plain is encompassed with flat and productive alluvial lands suitable for farming and animal husbandry surrounded by mounts and it embodies image of that age by massive amounts of forest trees especially oak trees and junipers. Given that grape seed was found in Korucutepe so that it can be said there was canal and drainage system at that period. Mountains and their surrounding piedmonts were grazing land for inhabitant people of that period to provide forage for the animals. The wild animals could also survive in these habitats.

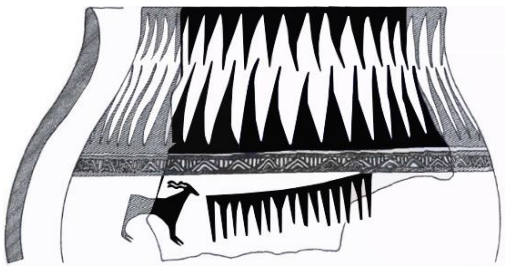

Fig 6: Pottery with Ibex painted in Korucutepe in Early Bronze Age II

With respect to the studies, settlements have been more increased at Early Bronze Age II and one of the reasons for increase of settlements is directly related to coordination of climate of this area. Moreover, with respect to suitable environment of this region and life of various animals, images of animals have been also used in designs of potteries (Fig. 6). Bones of animals such as boar, goat, sheep, horse, mule, ass, deer, and zebra have been found in excavations of Mrs. Tuba Okse in Salattepe in Bismil town in Diyarbakır belonged to Middle Bronze Age that indicated forest environment in this region (Baykara and Satar, 2012: 46). Several efforts have been made in study on life environment of Eastern Turkey in ancient time one of them is sampling from Bozova pollen sediments in Shanlıurfa and Gölbaşı Lake in Adıyaman province. According to these efforts, southeast of Turkey was surrounded by wild pistachio, oak, and juniper trees by 1900BC (Van Zeist et al. 1970). They consider the reason for reduction of pollens from plants and forests after this date not due to climatic factors but because of human manipulations and activities. So, the data relating to Chayonu site 60 km distant from Southeast of Altinova and Zagros Ranges in west of Iran emphasize in this fact that these regions were covered by oak- wild pistachio trees in 7000BC (Van Zeist, 1972). The other study on Paleobotany of amounts of charcoal in Aşvan region at the north of Altınova has revealed that Ashvan region was a part of Iran- Turan geography with steppe-forest and deciduous trees including maple, juniper, oak, ash, elm, pine, and poplar trees and tamarisk. Exploitation from these trees during Chalcolithic and Bronze Ages to use them as fuel and wooden beam in constructions are considered as one of first examples of deforestation (Willcox, 1974: 132). It has been characterized by study of Van Zeist et al. (Van Zeist et al. 1975) on data from Korucutepe that vegetative life in Altınova plain includes forest trees such as maple, ash, and elm trees in Early Bronze Age. This study and analysis done by them has described nature of this region as suitable for and long with trees. In addition to cultivation of plants and animal farming, one can observe presence of existing different animals at living scene of humans during prehistory of Bronze Age as decorative figurines. It can be probably said that the figurines are some of the first conceptual arts of human after settle-

ment in villages that have been continued with more details, accuracy, and variation among human communities several ages after them.

Buyuktepe, which also is called Ikiztepe in Northeast of Anatolia, is located at North of Chiftetash village in Bayburt and 1500m higher than sea level (Sagona, 1991: 145). The region where this site is located has continental climate with dry summers and most of rainfalls toot place in spring and autumn. The mean rate of precipitations of this region is 300-400mm per year. Howel-Muers that who analyzed animal data from Buyuktepe and Sos Hoyuk confirmed Traces of horse, mule, cow, goat, sheep, boar, and dog were found in Early Bronze Age and also horse, mule, pig, dog, chicken and wild species of buffalo, deer, badger, ferret and birds like wild dock, eagle, and partridge were found in Iron Age (Howell-Meurs, 2001). Discovery of great quantity of animal with variations indicates suitable climate of northeast of Anatolia at Iron Age. Imamoğlu is situated in the Basin of Euphrates River and among Malatya and Alaziq. The plant data were extracted from excavations in Edibe Uzunoğlu site by Istanbul Museum. The experiments have verified samples of Galium, Chelidonium, Ajuga (bugle), Lens culinaris lentil, Fabaceae legumes, Hordeum barley (grain) and a few unknown cases of seeds (Oybak Dönmez and Demirci, 1997: 174). In her studies in Sarıveli Hoyuk locating 100km distant from southeast of Erzurum, Mrs. Aynur Ozfırat had discovered pieces of potteries on which animal images are seen. Some birds are seen above the head of an ibex in a marvelous view that induces comfort of environment to onlooker. Two deer and a bird are seen in another design of pottery. Unique pottery vessels were found with several images of animals and birds in this detailed investigation.

Other major settlements that have a lot of sign of environmental data is Sos Hoyuk that is an archaeological site located in the modern village of Yigittashı in Erzurum Province, Pasinler Valley in northeast Turkey. University of Melbourne's Northeastern Anatolia project, led by Antonio and Claudia Sagona, excavated the mound of Sos Hoyuk from 1994 to 2000. In particular, the project aimed to study material from the Late Chalcolithic, Middle Bronze and Iron Ages. Middle Bronze Age have some data to reconstruct the vegetation history of the Pasinler Valley and relate this to environmental change across ecological changes in the Pasinler Valley during that period. According to Catherine Longford and others (Longford and et all, 2009) Bronze Age steppe savannah was probably an open oak-dominated woodland with maple, elm, almond, and shrubby Rosaceae, and juniper as is still present in some parts of Anatolia. Ecological sample are Triticum aestivum, Triticum sp. (wheat), Hordeum vulgare L. (hulled barley), Galium L. sp., Asperula L. sp., Polygonum L. sp., Fabaceae, Caryophylaceae and zooarchaeological data are existence sheep/goat faecal pellets and woods pinus, Betula sp., Ulmus sp., Acer sp (Ibid: 125-6).

5. Conclusion

Eastern Anatolia is one of the lands that possessed natural platform needed for entertainment of human communities. Mountains and heights, plains with fertile lands, flowing rivers, and adequate forests are some of the needed elements in this region so it is natural for this center to be a place for gathering of human groups from the past. The local, regional, and ethnic life of inhabitants in this region and the adjacent lands is continuous and dynamic by the definite time and it has not only no vacant period, but also few geographical points can be found throughout the studied region that lacks ancient gathering and civilization. Today, one can relatively find climate, for a fauna of regions during ancient periods by analysis on the findings relating to sciences of botanical Archaeology, Zooarchaeology, palynology, pedology, and also analysis on surface findings of plant and animal varieties on potteries and making various types of tools with shapes of animals. Analysis of Zooarchaeological sites gives

many clues for identifying of ancient environments. Botanical and zoological Archaeological data resulting from Archaeological sites are also assumed as primary evidences used for perceiving this subject that how people were adapted to environmental variations and how much humans caused change in environment by their own.

Based on botanical and Zooarchaeological evidences, there is no doubt that given region has played essential role in economy of inhabitants with the presence of existing various plants and animals, animal husbandry and agriculture since long millennia ago and it determines types of climatic samples in this region. The results of interdisciplinary studies of sciences in this site show consistency of data in other adjacent regions and such consistency and congruence may reveal the similar nature and environment of that region at human history in addition to cultural similarities in data. Among them, the samples of olive found in Mezraa and Gre Virke and in northern Syria determine presence of this fruit as a part of diet in this region and use of it as commercial commodity. The residues of coriander in Syria from Ed-Der Tepe have been studied by Van Zeist and Vynckier (Van Zeist and Vynckier, 1984). As we know, trees such as alder and poplar need a lot of water but all of species of these trees are found in the same environment. Finally, one can refer to humidity of this region in Anatolia at this period of history where the inhabitants of settlements might consider some canals from Euphrates Rivers for regular irrigation of various species of trees and plants.

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ARXEOLOJI MƏLUMATLAR ƏSASINDA DƏMİR DÖVRÜNDƏ ŞƏRQİ ANADOLUNUN ƏTRAF MÜHİTİNİN ANALİZİ

XÜLASƏ

Bioloji mühit və iqlim uyğunluğu heyvan növlərinin yaranması, böyüməsi və inkişafı üçün əsas şərtlərdən biridir. Müvafiq temperatur, hündürlük, bitki örtüyü və digər faktorlar insan və heyvan qruplarının həyatı üçün əsas zəmin hesab edilir.

İranın Azərbaycan regionu ilə coğrafi və mədəni yaxınlıq təşkil edən Şərqi Anadoluda tunc dövründə bitki və heyvan qalıqlarının müqayisəsi son onilliklər ərzində nəzərəçarpacaq dərəcədə mənfi ekoloji təsiri göstərir. Quru iqlim və iqlim dəyişikliklərinə görə müasir Azərbaycan ərazisində bitki növləri və keyfiyyəti azalmışdır. Belə nəticələr həmçinin qonşu ərazilərdə də əldə olunmuşdur, lakin ən böyük fərq Azərbaycandakı Urmiya gölünün qurumasıdır, bunun əksinə olaraq Şərqi Anadoluda Van gölündə ekoloji həyat davam edir. Aydındır ki, iqlim dəyişiklikləri yağıntı, buxarlama, yerüstü sular, bir sözlə hidroloji hadisələrdə nəzərəçarpan təsir ilə müşayiət olunur. Belə ki, bu faktdır ki, insanın üzvi maddələrin istehlakı və urbanizasiya təbiət qanunlarının pozulmasının əsası hesab edilir. Bununla yanaşı müəlliflər üçün vacib fəaliyyətlərdən biri də Arxeobotanik, Zooarxeoloji, Palinoloji, Pedaloji məlumatların tapılması və saxsı məmulatları əsasında bitki və heyvan tipləri ilə əlaqədar yerüstü tapıntıların analizi və müəyyən dərəcədə tapıntıların analizi vasitəsilə bu dövürdə Türkiyənin Şərqi Anadolu bölgəsinə xas heyvan formalı müxtəlif alətlərin düzəldilməsidir. Belə ki, qonşu ərazidə arxeoloji məlumatların, sedimentoloji biliklər və paleopalinoloji məlumatların analizi nəticəsində Tunc dövründə bu regionda ekoloji şəraitlə məşğul olmağa cəhd edilmişdir.