

**SETTLEMENT PATTERNS OF ALTINOVA IN THE EARLY BRONZE AGE**

**A THESIS SUBMITTED TO  
THE GRADUATE SCHOOL OF SOCIAL SCIENCES  
OF  
MIDDLE EAST TECHNICAL UNIVERSITY**

**BY**

**FAHRİ DİKKAYA**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE  
IN  
SETTLEMENT ARCHAEOLOGY GRADUATE PROGRAM**

**NOVEMBER 2003**

Approval of the Graduate School of Graduate School of Social Sciences

---

Prof. Dr. Sencer Ayata  
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of  
Master of Science.

---

Prof. Dr. Numan Tuna  
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully  
adequate, in scope and quality, as a thesis for the degree of Master of Science.

---

Dr. D. Burcu Erciyas  
Supervisor

Examining Committee Members

Prof. Dr. Numan Tuna

---

Yrd. Doç. Dr. Geoffrey Summers

---

Dr. D. Burcu Erciyas

---

## **ABSTRACT**

### **THE SETTLEMENT PATTERNS OF ALTINOVA IN THE EARLY BRONZE AGE**

Dikkaya, Fahri

M.Sc., Settlement Archaeology Graduate Program

Supervisor: Dr. D. Burcu Erciyas

December 2003, 184 pages

This study aims to investigate the settlement patterns of Altinova in the Early Bronze Age and its reflection to social and cultural phenomena. Altinova, which is the most arable plain in Eastern Anatolia, is situated in the borders of Elazığ province. The region in the Early Bronze Age was the conjunction and interaction area for two main cultural complexes in the Near East, which were Syro-Mesopotamia and Transcaucasia, with a strong local character.

The effect of the foreign and local cultural interactions to the settlement patterns of Altinova in the Early Bronze Age and its reflection in the socio-economic structures have been discussed in the social perspective. In addition, the settlement distribution and its system were analyzed through the quantitative methods, that were

gravity model, rank-size analysis, and nearest neighbor analysis. The results of these quantitative analyses with the archaeological data have been discussed in the social and theoretical context.

Keywords: Settlement Pattern, Early Bronze Age, Altınova, Keban Dam, Population, Early Transcaucasian Culture, Gravity Model, Nearest Neighbor Analysis, Landscape Archaeology, Settlement Hierarchy

## ÖZ

### ,ERKEN TUNÇ ÇAĞ'DA ALTINOVA'NIN YERLEŞİM DÜZENİ

Dikkaya, Fahri

M.Sc., Yerleşim Arkeolojisi Lisansüstü Programı

Danışman: Dr. D. Burcu Erciyas

Aralık 2003, 184 sayfa

Bu çalışma Altınova'nın Erken Tunç Çağ'da yerleşim düzenini ve sosyo-kültürel bağlamda bu düzenin yansımalarını araştırmayı amaçlamaktadır. Doğu Anadolu'nun en bereketli ovası olan Altınova, Elazığ il sınırları içindedir. Bölge, Erken Tunç Çağ'da iki önemli kültürel yapının çatışma ve etkileşim alanı idi. Suriye-Mezopotamya ve Transkafkasya olarak isimlendirilen bu kültürel yapılar, güçlü yerel kültürel bir yapıyı da içerisinde barındırmaktadır.

Erken Tunç Çağ'da Altınova'nın yerleşim düzenine yabancı ve yerel kültürel unsurların etkileri ve sosyo-ekonomik yapıdaki yansımaları, sosyal bilimsel bir bakış açısı içerisinde tartışılmıştır. Ayrıca, yerleşim dağılımı ve sistemi, matematiksel yöntemler üzerinden analiz edilmiştir. Bu matematiksel yöntemlerin sonuçları, sosyal ve kuramsal bağlamda tartışılmıştır.

Anahtar Sözcükler: Yerleşim Düzeni, Erken Tunç Çağı, Altınova, Keban Barajı,  
Nüfus, Erken Transkafkasya Kültürü, Gravity Model, En Yakın Komşu Analizi,  
Yerleşim Hiyerarşisi

## ACKNOWLEDGEMENTS

This dissertation was based on the courses of Settlement Archaeology Graduate Program at Middle East Technical University. I would especially like to mention and express of my gratitude to my advisor Professor D. Burcu Arıkan Erciyas. Her generous help and guidance have greatly provided my intellectual perspective on this thesis. I would also like to thank kindly Professor Numan Tuna for his illuminating instruction in his course called Settlement Archaeology (SA 510) which I learned firstly the settlement pattern as an archaeological concept and the models in archaeology.

I would also like to thank warmly Professor Marcella Frangipane of University of Rome for her generous help and guidance to understand cultural developments and modifications in East-Central Anatolian Archaeology and for her acceptance of me to work and study in Arslantepe. In Arslantepe, I would like also to acknowledge Carlo Persiani, Anna Maria Conti and other my friends for their helps and supports during the excavation seasons. I would also like to thank Professor Antonio Sagona of Melbourne University for the years of encouragement and support in my decision to seek a career in archaeology and for his helps in Sos Hoyuk to understand Early Transcaucasian Culture. On the other hand, I will remember every time the helps and supports of Claudia Sagona and Sos Höyük excavation team which I think the most funny and helpful team in Anatolian Archaeology. I would also to thank Professor Harald Hauptmann of Heidelberg

University for the discussion of my results in this thesis. I would like also to acknowledge Professor Geoffrey Summers for his help and support in this thesis.

I must also thank the staffs of British Institute of Archaeology at Ankara, especially Yiğit and Yaprak, for the use of its library and pottery collection. I would also like to thank warmly my friends, İlham, Nadire, Burcu and Aylin for their generous help in this thesis and in my study at METU. I thank my cousin Kubilay Devrim Dikkaya for mapping in computer.

This dissertation would not be complete without acknowledging my gratitude to my mother and my father whose patience and support help me to complete this thesis.

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Date:

Signature

## TABLE OF CONTENTS

|                                                                                                   |      |
|---------------------------------------------------------------------------------------------------|------|
| ABSTRACT .....                                                                                    | iii  |
| ÖZ .....                                                                                          | iv   |
| ACKNOWLEDGEMENTS .....                                                                            | vi   |
| TABLE OF CONTENTS .....                                                                           | viii |
| CHAPTER                                                                                           |      |
| I. INTRODUCTION .....                                                                             | 1    |
| II. CHRONOLOGICAL AND CULTURAL REMARKS OF EAST –<br>CENTRAL ANATOLIA IN THE EARLY BRONZE AGE..... | 10   |
| II.1 Early Bronze Age I .....                                                                     | 11   |
| II.2 Early Bronze Age II .....                                                                    | 18   |
| II.3 Early Bronze Age III .....                                                                   | 29   |
| III. SETTLEMENT PATTERNS OF ALTINOVA IN THE EARLY<br>BRONZE AGE .....                             | 41   |
| III.1 Theoretical Context .....                                                                   | 42   |
| III.2 Ancient Landscape .....                                                                     | 49   |
| III.3 Population .....                                                                            | 53   |
| III.4 Settlement Hierarchy .....                                                                  | 58   |
| IV. CONCLUSIONS .....                                                                             | 68   |

|                                                              |     |
|--------------------------------------------------------------|-----|
| REFERENCES .....                                             | 73  |
| APPENDICES .....                                             | 90  |
| A. The Settlements in Altinova in the Early Bronze Age ..... | 90  |
| B. The Calculation of Nearest Neighbor Analysis .....        | 107 |

## LIST OF MAPS

### MAP

1. Physical Map of East-Central Anatolia (Duran 1974: 30-1)..... 111
2. Satellite Map of Elazığ Region  
([http://www.mta.gov.tr/RSC\\_WEB/images.html](http://www.mta.gov.tr/RSC_WEB/images.html))..... 112
3. Topographical Map of Elazığ Region (Akkan 1972)..... 113
4. The Keban Area (Koşay 1976: Harita 1)..... 114
5. Geological Map of Altınova (Altınlı 1963) ..... 115
6. The Settlements of Altınova in the Early Bronze Age I..... 116
7. The Settlements of Altınova in the Early Bronze Age II..... 117
8. The Settlements of Altınova in the Early Bronze Age III..... 118
9. The Catchment Areas of Settlements in the Early Bronze Age I..... 119
10. The Catchment Areas of Settlements in the Early Bronze Age II..... 120
11. The Catchment Areas of Settlements in the Early Bronze Age III ..... 121
12. Nearest Neighbor Analysis Map of Altınova, Early Bronze Age II ..... 122

## LIST OF TABLES

### TABLE

|                                                                               |     |
|-------------------------------------------------------------------------------|-----|
| 1. Chronological Table of East-Central Anatolia in the Early Bronze Age ..... | 123 |
| 2. Climatic Data in Elazığ Province .....                                     | 124 |
| 3. Population Trends of Altnova in the Early Bronze Age.....                  | 125 |
| 4. Settlement Size Graph, Early Bronze Age I .....                            | 126 |
| 5. Settlement Size Graph, Early Bronze Age II.....                            | 127 |
| 6. Settlement Size Graph, Early Bronze Age III.....                           | 128 |
| 7. Settlement List .....                                                      | 129 |
| 8. Graph of Domestic Animal Rates in Korucutepe and Tülintepe.....            | 130 |
| 9. Griffin Population Estimates.....                                          | 131 |
| 10. Nearest Neighbor Analysis Data Index .....                                | 132 |

## LIST OF FIGURES

### FIGURE

1. Red-Black Burnished Wares from Arslantepe VI B1..... 133  
(Frangipane 2000: fig. 10)
2. Architecture in Arslantepe VI B1..... 134  
(Frangipane 2000: fig. 9)
3. Findings in Norşuntepe, Early Bronze Age IA..... 135  
(a: Hauptmann 1974: fig. 80-1,  
b: Hauptmann 1982a: fig. 26-1,  
c: Hauptmann 2000: fig. 2-3 and 4)
4. The pottery of Tepecik, Early Bronze Age IA..... 136  
(Esin 1976a: fig. 72, 2-3-4)
5. Late Reserved Slip Ware in East-Central Anatolia ..... 137  
(a: Hauptmann 1982a: fig. 43-5,  
b: Hauptmann 1982a: fig. 41-3,  
c: Hauptmann 1982a: fig. 40-7,  
d: Hauptmann 1982a: fig. 43-1,  
e: Frangipane 2000: fig. 13-16,  
f: Frangipane 2000: fig. 13-19,  
g: Hauptmann 1982a: fig. 41-5)
6. Plain Simple Ware in East-Central Anatolia..... 139

(a: Frangipane 2000: fig. 13-22,  
b: Hauptmann 1982a: fig. 40-1,  
c: Hauptmann 1982a: fig. 40-2,  
d: Hauptmann 1982a: fig. 41-2,  
e: Frangipane 2000: fig. 13-9,  
f: Frangipane 2000: fig. 13-10,  
g: Hauptmann 1982a: fig. 41-1,  
h: Esin 1976a: fig. 72-4)

**7. Architecture in Arslantepe VI B2 ..... 141**  
(Frangipane 2000: fig. 12)

**8. Architecture in Norşuntepe, Early Bronze Age I..... 142**  
(a: Hauptmann 1982a: fig. 34;  
b: Hauptmann 1979a: fig. 40)

**9. Red-Black Burnished Wares in East-Central Anatolia, Early Bronze Age II... 144**  
(a: Hauptmann 1982a: fig. 44-5,  
b: Hauptmann 1982a: fig. 44-6,  
c: Hauptmann 1982a: fig. 46-1,  
d: Hauptmann 1982a: fig. 45-7,  
e: Hauptmann 1982a: fig. 45-8,  
f: Hauptmann 1982a: fig. 45- 9,  
g: Hauptmann 1982a: fig. 45-10,  
h: Hauptmann 1982a: fig. 46-2,  
i: Hauptmann 1982a: fig. 45-6)

**10. Red-Black Burnished Wares in East-Central Anatolia, Early Bronze Age II.. 145**

(Hauptmann 1982a: fig. 47)

**11. Red-Black Burnished Wares in East-Central Anatolia, Early Bronze Age II...146**

(a: Hauptmann 1982a: fig.44-9,

b: Hauptmann 1982a: fig. 49-11,

c: Hauptmann 1982a: fig. 48-1,

d: Hauptmann 1982a: fig. 48-2,

e: Hauptmann 1982a: fig.46-3,

f: Hauptmann 1982a: fig. 46-4,

g: Hauptmann 1982a: fig. 46-5,

h: Hauptmann 1982a: fig. 46-6,

i: Hauptmann 1982a: fig. 45-1,

j: Hauptmann 1982a: fig. 45-2)

**12. Painted Wares in Altınova, Early Bronze Age II ..... 148**

(Hauptmann 2000: fig. 6)

**13. Imported Wares in East-Central Anatolia, Early Bronze Age II ..... 149**

(a: Hauptmann 2000: fig. 5-10,

b: Hauptmann 1982a: fig. 46-8,

c: Hauptmann 1982a: fig. 46-9)

**14. Architecture in Arslantepe VI C2 ..... 150**

(Conti and Persiani 1993: fig. 2)

**15. Architecture in Norşuntepe, Early Bronze Age II, Level XXIV ..... 151**

(Hauptmann 1982a: fig. 33)

**16. Architecture in Norşuntepe, Early Bronze Age II, Level XXIII..... 152**

(Hauptmann 1982a: fig. 32)

|                                                                                           |            |
|-------------------------------------------------------------------------------------------|------------|
| <b>17. Architecture in Norşuntepe, Early Bronze Age II, Level XXI .....</b>               | <b>153</b> |
| (Hauptmann 1982a: fig. 31)                                                                |            |
| <b>18. Architecture in Norşuntepe, Early Bronze Age II, Level XIX .....</b>               | <b>154</b> |
| (Hauptmann 1982a: fig. 30)                                                                |            |
| <b>19. Architecture in Norşuntepe, Early Bronze Age II, Level XVIII .....</b>             | <b>155</b> |
| (Hauptmann 1982a: fig. 29)                                                                |            |
| <b>20. Architecture in Tepecik, Early Bronze Age II .....</b>                             | <b>156</b> |
| (Esin 1974: fig. 110)                                                                     |            |
| <b>21. Architecture in Korucutepe D.....</b>                                              | <b>157</b> |
| (Van Loon 1978: pl. 15)                                                                   |            |
| <b>22. Architecture in Değirmentepe Level 4 .....</b>                                     | <b>158</b> |
| (Duru 1979: pl. 68)                                                                       |            |
| <b>23. Architecture in Değirmentepe Level 3 .....</b>                                     | <b>160</b> |
| (Duru 1979: pl. 69)                                                                       |            |
| <b>24. Settlement Plan in Pulur-Sakyol, Early Bronze Age II .....</b>                     | <b>162</b> |
| (Koşay 1976: pl. 117)                                                                     |            |
| <b>25. Red-Black Burnished Wares in East-Central Anatolia, Early Bronze Age III...163</b> |            |
| (a: Hauptmann 1979: fig. 44-1,                                                            |            |
| b: Hauptmann 1982a: fig. 52-1,                                                            |            |
| c: Hauptmann 1982a: fig. 52-2)                                                            |            |
| <b>26. Red-Black Burnished Wares in East-Central Anatolia, Early Bronze Age III . 165</b> |            |
| (a: Hauptmann 1979: fig. 45-4,                                                            |            |
| b: Hauptmann 1972: fig. 75-7,                                                             |            |
| c: Hauptmann 1972: fig. 75-8,                                                             |            |

|                                                                                |            |
|--------------------------------------------------------------------------------|------------|
| d: Hauptmann 1976: fig. 52-4,                                                  |            |
| e: Hauptmann 2000: fig. 7-7,                                                   |            |
| f: Hauptmann 2000: fig. 7-9,                                                   |            |
| g: Hauptmann 2000: fig. 7-3                                                    |            |
| h: Hauptmann 2000: fig. 7-4,                                                   |            |
| i: Hauptmann 2000: fig. 7-6,                                                   |            |
| j: Hauptmann 2000: fig. 7-8,                                                   |            |
| k: Hauptmann 2000: fig. 7-10)                                                  |            |
| <b>27. Malatya-Elazığ Painted Wares .....</b>                                  | <b>167</b> |
| (a: Hauptmann 1979a: fig. 44-2,                                                |            |
| b: Hauptmann 2000: fig. 8-4,                                                   |            |
| c: Hauptmann 1979a: fig. 45-2,                                                 |            |
| d: Hauptmann 1979: fig. 45-3,                                                  |            |
| e: Hauptmann 1976a: fig. 52-1,                                                 |            |
| f: Hauptmann 1976a: fig. 52-2)                                                 |            |
| <b>28. Imported Wares in East-Central Anatolia, Early Bronze Age III .....</b> | <b>169</b> |
| (a: Hauptmann 1976a: fig. 52-8,                                                |            |
| b: Hauptmann 1976a: fig. 53-9,                                                 |            |
| c: Hauptmann 2000: fig. 7-12,                                                  |            |
| d: Hauptmann 2000: fig. 7-11,                                                  |            |
| e: Hauptmann 1976a: fig. 51-3,                                                 |            |
| f: Hauptmann 2000: fig. 7-13)                                                  |            |
| <b>29. Architecture in Arslantepe VI D1 .....</b>                              | <b>170</b> |
| (Conti and Persiani 1993: fig. 3)                                              |            |

|                                                                          |     |
|--------------------------------------------------------------------------|-----|
| <b>30.</b> Architecture in Arslantepe VI D2 .....                        | 171 |
| (Conti and Persiani 1993: fig. 4)                                        |     |
| <b>31.</b> Architecture in Norşuntepe, Horizont VIII .....               | 172 |
| (Hauptmann 2000: fig. 9)                                                 |     |
| <b>32.</b> Architecture in Norşuntepe, Horizont VII .....                | 173 |
| (Hauptmann 2000: fig. 10)                                                |     |
| <b>33.</b> Architecture in Norşuntepe, Horizont VI, Palace Complex ..... | 174 |
| (Hauptmann 2000: fig. 11)                                                |     |
| <b>34.</b> Architecture in Korucutepe E .....                            | 175 |
| (Van Loon 1978: pl. 24)                                                  |     |
| <b>35.</b> The Plan of the Hall in Korucutepe E .....                    | 176 |
| (Van Loon 1978: pl. 30)                                                  |     |
| <b>36.</b> Architecture in Korucutepe F .....                            | 177 |
| (Van Loon 1978: pl. 36)                                                  |     |
| <b>37.</b> Architecture in Tepecik, Level 3b .....                       | 178 |
| (Esin 1971: fig. 98)                                                     |     |
| <b>38.</b> Architecture in Tepecik, Level 3a .....                       | 179 |
| (Esin 1971: fig. 97)                                                     |     |
| <b>39.</b> Architecture in Tepecik, Level 2b .....                       | 180 |
| (Esin 1971: fig. 96)                                                     |     |
| <b>40.</b> Architecture in Tepecik, Level 2a .....                       | 181 |
| (Esin 1971: fig. 95)                                                     |     |
| <b>41.</b> Architecture in Değirmentepe, Level 2 .....                   | 182 |
| (Duru 1979: pl. 70)                                                      |     |

- 42.** Architecture in Değirmentepe, Level 1 ..... 183  
(Duru 1979: pl. 71)
- 43.** The plan of the “Ağa Konak” in the village of Munzuroğlu ..... 184  
(Koyunlu 1982: fig. 157)

## CHAPTER I

### INTRODUCTION

Settlement pattern, which may be defined as “the arrangement of population upon a landscape” is probably the most powerful class of data to explain sociocultural contexts of a society (Price 1978: 165). Scholars have discussed the basic methodological and conceptual features of settlement pattern over the past thirty years. In this discussion, the concepts of “settlement archeology” and “settlement pattern” were theorized as a new approach *within* archaeology since 1960’s. But, settlement studies in archaeology were conceptualized into different perspectives that were revealed within the self-epistemological constructions of two schools, the processual and post-processual.

On the other hand, before the development of the “new archaeology”, Gordon Childe had interpreted his excavation data Skara Brae in the Orkneys and the island of Rousey into the context of settlement archaeology (1931; 1942). He used ethnohistoric analogies for the interpretation of the house found at Skara Brae using nineteenth century rural houses as a basis. In these analogies, he indicated that women and children worked and slept on the separate sides of the house. Therefore, Childe, for the first time, took into consideration the social use of space and applied gender studies to archaeological data (Trigger 1994: 16). Furthermore, Childe surveyed the megalithic monuments on the island of Rousey (1942). In this survey, he considered site distribution and estimated the size of the Neolithic population in the light of the amount of the arable land on the island. According to Trigger, his

methodology in this survey was a very early use of settlement data in archaeological studies (1994: 16). Renfrew thought that these studies made Childe as “a pioneer in the field of settlement archeology” (Renfrew 1994: 127). However, Gordon Willey was the first scholar who systematically applied settlement pattern to archaeological studies. Settlement pattern earned a place in archeological literature since this early application by Willey.

The definition of settlement as a concept helps explain the conceptual framework of this study. According to Chang, archaeological settlement means “the local context wherein the community is presumed to have resided and to have gone about its daily business” (1968: 3). In this context, he described the settlement as “the physical locale or cluster of locales where members of a community lived, ensured their subsistence, and pursued their social functions in a delineable time-period” (ibid.). According to these definitions, it could be suggested that settlement pattern is determined by the social interaction depending on the environmental and economic factors.

In this study, settlement patterns of Altınova in the Early Bronze Age will be examined. Polybius calls Altınova *Kalon Pedion* meaning “fair plain” (Polybius VII. 23.1, see Hauptmann 1969/70: 22). In addition to its current name, Altınova has been called Uluova or occasionally Mollakendi Ovası (Saraçoğlu 1956: 378). In archaeological studies, Altınova has been used by scholars (Burney 1956; Keban 1968-1975; Van Loon 1978; Whallon 1979; Schmitt 1996).

Altınova, which is the most arable plain in Eastern Anatolia, is situated in the borders of Elazığ province (Map 1-2). The plain lies parallel to the Southeastern Taurus Mountains and Gölçük depression lying southwest – northeast (Erinç 1953 :111). The eastern part of the plain that constitutes the research area of this study has been under the waters of Keban Dam since 1975. Keban Dam (Map 4) was constructed in the narrow strait lying between the ends of the Northeastern Taurus Mountains of Keban town, a small one near the ancient city of Dascusa, and Munzur

and Bulutlu Mountains. Karasu and Muratsu join together and form Euphrates in this narrow strait which is 850 m. in altitude. Keban Dam covered some large plains between the high mountain chains of the Eastern and Northern Taurus; some of these plains are Kuzova or Küçükova including Ağın and Aşvan regions in the west and Uluova or Altınova in the east. Altınova is enclosed by lat. 38° 17' and 38° 43' and long. 38° 36' and 39° 07'. The superficial area of Altınova covers 370 km<sup>2</sup> and the elevation of it varies between 800 and 950 m. (*Hydro. Report* 1970: 51) (Map 5). The Reservoir area of Keban Dam in Altınova, also the study area of this thesis comprises, 136 km<sup>2</sup> and the elevation of it varies between 800 and 850 m.

Altınova plain, like other Eastern Anatolian plains, is a morphological unit with clear borders (Map 3). Peaks formed by Eocene flysch and volcanic stones with opheolithic series surround the plain on its western and northern borders while its southern border has a different structure formed by Upper Cretaceous flysch series, and consists of Çelemik, Masdar (2140 m.) and Hazarbaba (2230 m.) Mountains and Gölcük Depression (Akkan 1972: 182). Altınova is the greatest depression area in the region (Akkan 1972: 181) and is an old lake bottom with a fairly high ground water level (Van Zeist and Bakker-Heeres 1975: 233). Altınova consists of a broad sheet of alluvium. The eastern end of the plain is covered with Pleistocene alluvium which is flooded today, but the upper, western end is covered by recent alluvium (Altınlı *et al.* 1963). This alluvium is covered with a thick and very fertile soil (Saraçoğlu 1956: 379) (Map 2). In geological context, one of the important economic resources in the region is the crucial ores localized in the Taurus mountains. The main metallurgical resource of the region is copper. Fifty kilometers southeast of Altınova is the location of an extremely well-known copper mine, the Ergani Maden (Altınlı 1963: 111). Other minor deposits of copper are also reported in Hozat located in the north of Altınova and in nearby Palu (*ibid.*; Ankara 1972: 111). The other metallurgical resource of the region is gold. Gold deposits are located in Ergani Maden region, the mountains behind Harput, old Elazığ, and the mountains surrounding the Altınova

region in the south (Ryan 1960). According to Yener, gold sources were probably known and used in the ancient times (1984: 72). Silver mines in the region were documented in historical texts (Akkan 1972: 198). Silver ore in Keban mines, fifty-two kilometers west of Elazığ, at the junction of Keban stream and the Euphrates river, was extracted in great amounts in the Ottoman period (*ibid.*). According to Manchen, four to five thousand kilograms of silver were produced in Keban mines annually until 1833 (Manchen 1938 in Yener 1980: 73). Lead ore occurrences are also found in Palu located in the east of Altınova (Altınlı 1963: 112), and in Keban in the north (Akkan 1972: 198). Another metallurgical resource in the region is iron. According to Yener, the metallurgical potential in the region, that is mentioned above, was the main elements of the third millennium trade in the Near East (Yener 1983; 1984: 68; 2000: 57-64).

The landform of the study area is not divided into distinct units except the flood plain on the eastern side of Altınova. The flood plain was situated within the great sweep of Murat river. The Murat river enters the plain near Hendek Mountain and leaves the plain after İlemil swings into the large meander. Meandering greatly, it traversed approximately 10 km in the plain and the width of its bed reached 2 km in some parts of the plain (*Hydro. Report* 1970: 62). The Heringet Stream, one of the major streams in Altınova plain, travels from the southwest to the northeast. Another important hydrological element in the region is spring. There are many springs in the plain with shifting discharges depending on the seasons. The springs sprout from alluviums and rocks in the vicinity. The prominent spring areas are alluvial cones and the alluviums with permeability outside the clay areas in the central part of the plain. On the other hand, the upper layer of the clay area is, from place to place, sandy, therefore some springs can also be found in the central part of the plain (*Hydro. Report* 1970: 67). The climate of the Altınova Plain is intermediate between the upland and lowland regions; a complete continental climate prevails in the area (Table 2). Summers are warm and dry, and winters are cold and wet.

The earliest investigation in the Elazığ and Altınova Plains were conducted by early European travellers who passed through the area (Hauptmann 1969/1970: 21-30). But, the first detailed investigations of ancient sites in the region of Elazığ was made by Pietschmann in 1914. He described some ancient sites in his book called *Durch Kurdische Berge und Armenische Städte* (Hauptmann 1970: 103). To our knowledge, the first archaeological reconnaissance of the Keban Area was carried out by I. K. Kökten in 1945 (Kökten 1947). Kökten noted the presence of numerous mounds in the region although he was mainly interested in sites from Palaeolithic and Mesolithic ages. He remarked on the necessity of extensive excavations in Altınova, and especially at Norşuntepe (1947: 461). He recorded only 11 settlements in the Elazığ region (Kökten 1947: 460-1 and 466) and mistakenly described some Early Bronze Age sherds as Chalcolithic (Kökten 1947: Lev. XCIV, CII, CIV).

One of the most significant archaeological investigations in the region was held by Burney in the summer of 1956, then a scholar of the British Institute of Archaeology at Ankara. His survey work aimed at making an extensive reconnaissance of Eastern Anatolia. Burney's report in *Anatolian Studies* VII (1958), "Eastern Anatolia in the Chalcolithic and Early Bronze Age", was the second of four reports arising from that survey, and gave the first well-illustrated account of the prehistoric pottery. In this survey, Burney visited Altınova in order to understand the Chalcolithic and Early Bronze Ages in the region (Burney 1958). The data of this survey was later reassessed by Russell and was published under the title "Pre-Classical Pottery of Eastern Anatolia" in BAR International Series (Russell 1980).

In 1966, another archaeological appraisal was conducted by the Middle East Technical University's Department of Restoration and the results were published in a book called *Doomed by the Dam* (METU 1967). The aim of this survey was to locate and record antiquities which were threatened by the flooding, but the orientation of this survey was towards historical periods. The METU survey was interested particularly in standing architectural monuments. Thus, three large prehistoric

mounds in Altınova were recorded (METU 1967: 63). Prior to inundation, the region was examined extensively from 1966 to 1975 by international archaeological teams, from Germany, the Netherlands, Turkey, the United Kingdom and the United States of America, under the leadership of the Middle East Technical University. The teams participated in a salvage program combining archaeological, architectural, ethnographical, sociological and environmental research. This study is based on basically the research of these teams in the region. In “Keban Project” of the Middle East Technical University, 6 ancient settlements in Altınova were excavated by archaeologists; these are: Korucutepe excavated by M. Van Loon from Chicago University, continued which by H. Ertem from Ankara University, Norşuntepe and Körtepe by H. Hauptmann from German Archaeological Institute at İstanbul, Tepecik by U. Esin from İstanbul University, Tülintepe by U. Esin and G. Arsebük from İstanbul University and Değirmentepe by R. Duru from İstanbul University. S. Kantman from İstanbul University and R. Whallon from Michigan University surveyed the Keban Region in the scope of this project. The reports of the excavations were published in the Keban Project Books<sup>1</sup>. The results of the survey of the region were published by R. Whallon as a book in 1979 following the dam construction. This survey however, was limited to Keban Reservoir Area (Whallon 1979).

- 
- <sup>1</sup> - 1968 Summer Work. Ankara : Middle East Technical University, Keban Project Publications, Series 1, No :1. 1970.
- Keban Project 1969 Activities. Ankara : Middle East Technical Univesity, Keban Project Publications, Series 1, No : 2. 1971.
  - Keban Project 1970 Activities. Ankara : Middle East Technical Univesity, Keban Project Publications, Series 1, No : 3. 1972.
  - Keban Project 1971 Activities. Ankara : Middle East Technical Univesity, Keban Project Publications, Series 1, No : 4. 1974.
  - Keban Project 1972 Activities. Ankara : Middle East Technical Univesity, Keban Project Publications, Series 1, No : 5. 1976.
  - Keban Project 1973 Activities. Ankara : Middle East Technical Univesity, Keban Project Publications, Series 1, No : 6. 1979.
  - Keban Project 1974-1975 Activities. Ankara : Middle East Technical Univesity, Keban Project Publications, Series 1, No : 7. 1982.

Whallon was also the first scholar to analyze the settlement patterns in the Keban area from the Early Chalcolithic to the Medieval-Ottoman Periods (1979: 259-87). In 1980, A. Yener submitted her Ph.D thesis entitled “Third Millennium B.C. Interregional Exchange in Southeast Asia with Special Reference to the Keban Region of Turkey” at Columbia University. In this thesis, she did not directly analyze the settlement patterns of the Keban region in the third millennium B.C., however, she looked at settlement patterns, especially in Altınova, in order to reconstruct interregional exchange between Turkey and its resource-poor neighbours to the south in the third millennium B.C. (1984). In 1990, C. Persiani submitted his Ph.D. thesis entitled “Il Bronzo Antico II nell’area di Malatya-Elazığ. Relazioni interregionali in un’area di frontiera culturale nel III millennio a.C.” at the University of Rome “La Sapienza”. He published the summary of his thesis in English as well (Conti and Persiani 1993: 387-405). In this thesis, he investigated the settlement patterns and demography of Malatya and Elazığ regions in the third millennium B.C. (ibid.). In 1996, Alan Lupton published his book entitled “Stability and Change, Socio-political development in North Mesopotamia and South-East Anatolia 4000-2700” in BAR International Series (1996). In this book, he described the cultural aspects of Keban, Karababa, Tabqa, and North Jazira regions and later analysed the settlement patterns of these regions from Middle Chalcolithic to the end of Early Bronze Age I (ibid.). According to this data, he described the socio-political developments in the regions, and based it on an impact from southern Uruk (1996: 99- 106). However, there are some problems in his approach. For example, some Red-Black Burnished Ware and Painted Ware examples from Early Bronze Age II were dated to Early Bronze Age I by Lupton. He also did not look at Late Reserved Slip Ware and Plain Simple Ware that constituted the characteristic feature of Early Bronze Age I in Altınova. As a whole, he accepted to Whallon’s conclusions without questioning them (Lupton 1996: 73-6, 82-4).

The East-Central Anatolia was the conjunction and interaction region for three main cultural areas in the Near East, that were Syro-Mesopotamia, Transcaucasia, and Central Anatolia with the strong local characters in antiquity. This fact was very obvious in the Early Bronze Age. Therefore, the problem of this study is how the foreign and local cultural interactions affected the settlement patterns of the region in the Early Bronze Age. In addition, another problem is how settlement patterns reflected the socio-economic structures in the region. In this context, the previous investigations mentioned above will be reassessed with questioning them.

In order to understand the mechanisms of settlement distribution in Altınova, the chronological and cultural developments of East-Central Anatolia in the Early Bronze Age will first be investigated in this study. In Chapter II, the archaeological data found during the excavations in East-Central Anatolia will be examined in chronological order. In this chapter, the chronological framework of the region will be based on the threefold Early Bronze Age Tarsus sequence suggested by H. Goldman. Each subperiod of Early Bronze Age in the region will be examined in detail with the differences in pottery technology and the changes in architecture. In addition, the absolute chronologies of subperiods recognized at the excavated sites, especially at Arslantepe and Norşuntepe, will be discussed in this chapter.

In Chapter III, the settlement patterns of Altınova in the Early Bronze Age will be discussed in theoretical and methodological contexts. The theoretical context of the study will be presented in the first part of Chapter III. In this part, the theoretical and methodological modifications in the processual and post-processual schools will be analyzed. Later, the ancient landscape of Altınova in the Early Bronze Age will be presented. In the third part, a population estimate will be made. In the last part of Chapter III, the settlement systems of Altınova will be analyzed according to relevant theoretical models. These models, gravity model, nearest neighbor analysis and rank-size model, will be presented and applied to the data. In

the context of the results of these models, the social implication of settlement systems and modifications through time will be analyzed. A summary of the results in these two chapters will be presented in Chapter IV.

## CHAPTER II

### CHRONOLOGICAL AND CULTURAL REMARKS OF EAST-CENTRAL ANATOLIA IN THE EARLY BRONZE AGE

The historical reconstruction of the cultural development of Altınova in the Early Bronze Age concerns the determination of the general cultural horizons connected with the chronological framework of the region. The structural characteristics of local and foreign cultural aspects contribute to the building of a local chronological framework and the link of the neighboring areas. A detailed examination of the archaeological data in Altınova indicates a strong local character as well as cultural busy interaction between the Syrian and Transcaucasian societies.

The determination of a sequence in Altınova for the Early Bronze Age is important to understand the cultural modifications and transitions between different cultural phenomena in Altınova. As Claude Lévi-Strauss has said, “there is no history without dates” (Levi Strauss 1966: 258). The meaning of this sentence could be transformed to archaeology as “there is no archaeology without chronologies”.

During the past years many scholars have proposed chronologies for Eastern Anatolia, often related to the Near Eastern middle chronology (Mellink 1989, Spanos 1977, Kuhne 1976, Yakar 1985), and alternatively to its long chronology (Easton 1976, Mellart 1981). In this context, the Tarsus sequence has served as a reference in the Early Bronze Age for the wider Near Eastern chronology because the data from the site provided a link between Anatolia and Syria and the absolute chronologies of Mesopotamia and Egypt. As a result, the wider Near Eastern chronology borrowed the Anatolian threefold Early Bronze Age subdivision from the Tarsus sequence. The

chronological framework of Tarsus in the Early Bronze Age was subdivided into three by H. Goldman based on the differences in pottery technology, as well as the changes in architecture (1956). This tripartite division in the Anatolian/Cilician Early Bronze Age could be a result of the excavations at Eutresis in Boeotia conducted between 1924 and 1927 by Goldman (Karg 1999: 290). In the publications, this major prehistoric site in Greece, the Early Helladic Period was subdivided into three phases, Early Helladic I, II and III (Goldman 1931). According to N. Karg, Eutresis can be the birthplace of our ‘magic system of tripartition’, as was called by M. Mellink (Karg 1999: 290).

In East-Central Anatolia, the threefold subdivision of the Anatolian/Cilician Early Bronze Age is often used by the excavators working there, with one notable exception (Van Loon 1978: 12-23; Duru 1979; Conti and Persiani 1993: 362-378; Sagona 1994: 15-18; Schmidt 1996: 7; Frangipane 2000; Hauptmann 2000). In Altınova, the Norşuntepe sequence sets the chronology of the region. This chronology was based on generally the differences in pottery technology and changes in architecture, especially at Korucutepe (Van Loon 1978: 3-23). On the other hand, R. Duru who excavated at the site of Değirmentepe in Altınova, did not propose any division of the Early Bronze Age (1979: 105).

At Arslantepe, however, A. Palmieri, who formerly excavated Arslantepe, asserted that Arslantepe VI A (Late Uruk) could be considered the first period of the Early Bronze Age (EBA Ia), before the first appearance of Early Transcaucasian Culture in the Malatya-Elazığ region (1981). C. Marro, on the other hand, proposed an alternative general chronological framework for the Upper Euphrates and divided the Early Bronze Age into four sub-phases (Marro 2000).

In this work, the Anatolian threefold Early Bronze Age subdivision will be used because the scholars who worked in the region have generally used this tripartite division for the region’s Early Bronze Age.

## **II. 1. The Early Bronze Age I**

The nature of the developments in the East-Central Anatolia during the transition from the Late Chalcolithic to the Early Bronze Age I indicates an abrupt change from permanent Mesopotamian culture to semi-permanent Transcaucasian. But, the Early Bronze Age I is often subdivided into two phases because two different cultural horizons were defined on the basis of different pottery and architectural style. The first phase of Early Bronze Age I was distinguished by the Transcaucasian influx at Arslantepe, which is visible in the appearance of the wattle-and-daub buildings in VI B1 phase (Figure 2). In this level at Arslantepe, only hand-made Red-Black Burnished Pottery was found (Persiani and Conti 1993: 362; Frangipane 2000: 447-49). This pottery in this phase was characterised by jars with cylindrical necks, bottles with a groove at neck base and hemispherical bowls with black interior (Frangipane and Palmieri 1983: 541, fig. 10-13) (Figure 1). A so-called royal tomb dating from the very beginning of the third millennium was also found at Arslantepe. It was constructed substantially by stone cist and contained rich funerary gifts of metal and ceramics (Frangipane 1998). The metal objects from the tomb, shedding light on the questions of the metallurgical activities in the region, were made of copper, copper-arsenic, copper-silver, silver and gold. The pottery assemblage of the tomb consisted of Mesopotamian style wheel-made jars, some with reserved slip decoration, and hand-made Red-Black Burnished Pottery that is clearly of Transcaucasian origin (Frangipane 2001: 7). At Norşuntepe, Late Reserved Slip Ware complex that marks the second phase of Early Bronze Age I is separated from local Late Chalcolithic wares by a hiatus (Hauptmann 1972 : 113-15 ; Hauptmann 1982 : 59-61). A marble cylindrical seal produced by Cemdet Nasr-Gylyptik, a marble animal head pendant (Tierkopfhanger), a needle with conical head, as identified “Kargamiş” type, and a bronze needle with a double spiral, the origins of which is in the Caucasus, were associated with this phase at Norşuntepe by Hauptmann (2000: 421-2, fig. 2) (Figure 3). At Tepecik, however, local Late Chalcolithic Ware below Level 14 is followed by Uruk-derived pieces, identified as

‘fruitstands’, and sherds with an incised, white-filled pattern (Esin 1976a : 114-16 ; Esin 1982a : 117) (Figure 4).

The second phase of Early Bronze Age I is identified by the Late Reserved Slip Ware and Plain Simple Ware of the Syrian and Mesopotamian cultural areas (Figure 5-6). There is an abrupt transition at Arslantepe from VI B1 to VI B2. The wheel-made Late Reserved Slip Ware, Plain Simple Ware and hand-made Red-Black Burnished Ware became dominant pottery types in this period (Conti and Persiani 1993 : 379). A small footed jar with four pierced lugs on the shoulder of the type Plain Simple Ware comparable to Ninevite V shapes was also found at Arslantepe (Frangipane and Palmieri 1983: 551). In Arslantepe VI B2, the rectangular mudbrick buildings lying above VI B1 ruins were discovered (Conti and Persiani 1993 : 362) (Figure 8). To the north of these buildings, an enormous mudbrick fortification wall on a stone foundation about 6 meters wide was uncovered (Frangipane 2001: 8, fig. 22 and 23) (Figure 7). Palmieri associated Arslantepe VI A with VI B2. In this context, she explained the transition from the Late Chalcolithic Period to the Early Bronze Age I on the basis of the shift from Early Reserved Slip Ware (Arslantepe VI A in the Late Chalcolithic) to Late Reserved Slip Ware (Arslantepe VI B2 in the Early Bronze Age I) (Palmieri 1985 : 192). The Cyma recta bowls that are among the regular finds elsewhere during this period is absent, except one sherd that was found in a pit of the early VI C levels in Arslantepe (Conti and Persiani 1993: 380). Many sherds of Cyma recta bowls were found at Gelinciktepe located on a volcanic rock 2 km to the east of Arslantepe, however no architectural remains from this period were discovered at the site (Palmieri 1967). Consequently, Gelinciktepe was identified as a camp site of Arslantepe in the Early Bronze Age I.

*Schichten* XXX-XXV of Norşuntepe belong to Early Bronze Age I (Hauptmann 2000: 421), and indicate similarities with Arslantepe. Late Reserved Slip Ware, Plain Simple Ware, Red-Black Burnished Ware, Ninevite V small footed jars and Cyma recta bowls are present at Norşuntepe in the Early Bronze Age I

(Figure 5-6). Small single roomed mudbrick houses supported by wooden posts and simple wattle-and-daub houses dating to the Early Bronze Age I were reported by H. Hauptmann (Hauptmann 1982: fig. 29) (Figure 8). One of the mudbrick houses constructed with niches and white plaster walls had a wall painting of what appears to be a horned animal (Hauptmann 1974). The settlement was encircled by a three meter thick fortification wall at Level XXX, constructed of a mudbrick superstructure on stone foundations (Hauptmann 1976a; Hauptmann 1974) (Figure 8).

At Tepecik, the Early Bronze Age I is represented by the Late Reserved Slip Ware and the small footed jars of Ninevite V in spite of the absence of Cyma recta bowls (Esin 1982a; 1982d) (Figure 5-6). The architectural structures associated with Early Bronze Age I/II were uncovered on the southern terrace of the settlement. A staggered circular enclosure wall with insets at regular intervals constructed of mudbrick on stone foundations was also revealed (Esin 1974: pl. 108). At Korucutepe, there are no remains attributable to Early Bronze Age I (Van Loon 1978: 12). At Tülintepe, at the Early Bronze Age levels, mostly disturbed on the surface, a circumference wall with insets, probably belonging to a citadel (Esin and Arsebük 1974: 152, pl. 122) and a stone-lined well were discovered (Esin 1979b: 72). At Değirmentepe in Altınova, the earliest level in the Early Bronze Age, Level 4, had painted wares that are associated with Early Bronze Age II (Duru 1979), which indicates that the site was not settled in the Early Bronze Age I, although A. Yener asserted that the pottery affiliations with Early Bronze Age I at Norşuntepe provided a chronological link with Değirmentepe (Yener 1984: 93).

In the Aşvan area, at Pulur-Sakyol, Han İbrahim Şah and Taşkun Mevkii Red-Black Burnished Ware of Transcaucasian origin were commonly found in the Early Bronze Age (Koşay 1976; Ertem 1982; Sagona 1994). In Han İbrahim Şah, Cyma recta bowls are also present in Levels XIV-XI dating to the Early Bronze Age I (Ertem 1982). Late Reserved Slip Ware and Plain Simple Ware were found in

Taşkun Mevkii as well, but they never predominate the pottery assemblages of the settlement. Taşkun Mevkii Levels 1-4 yielded very few architectural remains. In Level 3 of the site, four free standing houses of mudbrick were encountered (Helms 1974: fig. 4). One of the houses was constructed from wattle-and-daub, another house had stone foundations but no remains from the superstructure (Helms 1974: 53). According to A. Sagona, the Murat Valley around Aşvan was only of marginal interest to Syrian merchants in the Third Millennium B.C. because the concentration of Plain Simple Ware originated in Syro-Mesopotamian region was characteristic in Altınova in the Early Bronze Age I, while in the Murat Valley, Early Bronze Age I ceramics were almost all Red-Black Burnished Pottery originated in Transcaucasia (1994: 16).

In the same way, the Muş Plain in the Early Bronze Age is characterised by the Kura-Araxes complex that originated in Transcaucasia. However, the local characteristics of pottery in their shape and decoration is very strong, therefore the cultural phenomenon of Muş Plain in the Early Bronze Age is not directly in connection with other cultural areas at which the Kura-Araxes or Transcaucasian cultural traits are observed (Rothmann and Kozbe 1994: 119). According to Burney, “in some isolated areas of the highlands, such as the plain of Muş, it is not the normal Early Bronze Age ware” (1958: 166).

Sos Höyük in north-eastern Anatolia was the orbit of the eastern half of Kura-Araxes complex in the Early Bronze Age (Sagona 2000; Sagona and Sagona 2000: 68). The pottery of Sos Hoyuk VB dated to Early Bronze Age I include jars with cylindrical wide necks (Sagona and Sagona 2000: fig. 14- 1 and 2) and large storage jars with geometric design (Sagona and Sagona 2000: 63; fig. 42-43). The jars with cylindrical wide necks at Sos Höyük are very similar to the jars discovered at Arslantepe VI B1. A single-roomed half a stone-based house including a fixed circular hearth was uncovered at Sos Höyük (Sagona and Sagona 2000: 63; figs. 1 and 39). This type of architecture is commonly associated with Kura-Araxes Culture.

At Hassek Höyük located in the Lower Euphrates region of Anatolia, in *Bauphasen* 4-3 (Early Bronze Age I), Late Reserved Slip Ware and Plain Simple Ware were found. Especially the small four-lugged footed jar was very common among the funerary gifts found at large the necropolis of the site (Behm-Blancke 1984: 53). The Red-Black Burnished Ware is only represented by “a dozen sherds” (Hoh 1984: 40). In *Bauphasen* 2-1 of Hassek Höyük, Cyma recta bowls associated with Reserved Slip Ware began to be used (Behm-Blancke 1984: 10-1). A shallow bowl with a small band in relief near the rim and a cup with globular body, short everted rim and ring base, sometimes with a long tubular spout which is the main shape of Plain Simple Ware occurring with Cyma recta bowls can be compared with the similar examples of Qal’at el-Mudiq in Syria (Conti and Persiani 1993: 379).

At Kurban Höyük, the transition between the Late Chalcolithic and Early Bronze Age I could be identified in the distinction between the Chaff-tempered Coarse Ware of the Late Chalcolithic and the finer and grit-tempered Plain Simple Ware of the Early Bronze Age I (Algaze 1986: 278). Although one of the determinants for Early Bronze Age I at Kurban Höyük is Late Reserved Slip Ware (Marfoe *et al.* 1986: 56-8), it disappeared with the appearance of Cyma recta bowls in this period (Algaze 1986: 57). In Carchemish, Late Reserved Slip Ware and Plain Simple Ware were found together with “champagne pottery”, high stemmed cups, in Grave KCG 13 (Woolley and Barnett 1952: 221). Like Kurban Höyük, at Carchemish Cyma recta bowls were found without Late Reserved Slip Ware (*ibid.*).

In the Amuq area, G Phase dated to the Early Bronze Age I and Late Reserved Slip Ware together with Plain Simple Ware are commonly found. Red-Black Burnished Pottery and Cyma recta bowls appear for the first time in this period in the Amuq region (Braidwood and Braidwood 1960: 352). In Amuq H characterised by Cyma recta bowls and Red-Black Burnished Pottery, architectural features such as the small rooms with dimpled hearths and domed ovens with literal ash-trough were uncovered (Braidwood and Braidwood 1960: 516-21). Dimpled

hearts are typical for Arslantepe VI B2 (Frangipane and Palmieri 1983: fig. 5; Conti and Persiani 1983: 381, note 16) and Norşuntepe XXVI (Hauptmann 1982: tav. 34). This suggests that Amuq H possibly dates to Early Bronze Age I (Braidwood and Braidwood 1960: 516-21; Conti and Persiani 1993: 381). However, some scholars, such as Kühne and Yakar, proposed its contemporaneity with Tarsus Early Bronze Age II (Kühne 1976; Yakar 1979), while Spanos with Tarsus Early Bronze Age III (Spanos 1977).

The absolute chronology of Arslantepe in Early Bronze Age I based on the radiocarbon dates indicates a time interval between 2900 and 2700 B.C. (Di Nocera 2000: 75). In the Early Bronze Age I, the time interval at Norşuntepe is between 3300 and 2926 B.C. (ibid.). Therefore, the Early Bronze Age I of Norşuntepe cannot be dated earlier than 3000 B.C., if we consider the cultural relationship with Arslantepe VIB to be valid (Di Nocera 2000: 75; Hauptmann 2000: 422). Another site which provided radiocarbon dates establishing an absolute chronology for the region is Pulus-Sakyol. The standard deviations of the Pulus dates cover a timescale of +/- 180-200 years (Crane and Griffin 1972: 193). The radiocarbon dates of Pulus indicate maximum overlapping in the interval 2920-2496 B.C. (Di Nocera 2000: 75).

To conclude, the Early Bronze Age I in East-Central Anatolia is characterised by Late Reserved Slip Ware and Plain Simple Ware. The Transcaucasian Culture and its Red-Black Burnished Pottery, especially in Arslantepe VI B1 dominates in the earliest phase of this period. This period which can be dated to between 3000 and 2700 signifies an abrupt cultural change within the subperiods of Early Bronze Age I in the region. The power system of Late Chalcolithic Period based on economic centralisation of labour and goods which was especially evident in Arslantepe collapsed at the end of this period in East-Central Anatolia. The emergence of a new dominant system connected to the Early Transcaucasian Culture, in the beginning of the third millennium, must have created a crisis in the political and economic system. As a result, in the second phase of this period, the “followers” of the old system of

the Late Chalcolithic regained dominant position in the region. Although they used Reserved Slip Ware and Plain Simple Ware similar to the Syro-Mesopotamian cultural area, the archaeological excavations in the region indicated that the monumental buildings and sealings in the Late Chalcolithic, especially in Arslantepe, were abandoned. Instead, village community without monumental architecture characterised the period. However, the conflict between these two cultural environments – the Late Uruk societies related to Syro-Mesopotamian cultural area and the Transcaucasian communities – resulted in the construction of fortifications encircling the settlements.

## **II. 2. The Early Bronze Age II**

In the Early Bronze Age II in Malatya-Elazig region Painted Ware appeared and Red-Black Burnished Ware predominated. According to Sagona, the region distanced itself from the orbit of the Syro-Mesopotamian cultural horizon and became well ensconced within the broader developments of the eastern highlands where the Early Transcaucasian or Kura-Araxes cultural complex almost entirely predominated (1994: 16).

The Early Transcaucasian Culture spreaded from the Caucasus to the East-Central Anatolia and to Levant and Iran. This culture was characterized by a specific pottery that was hand-made, elegant, varied in form, and black polished. Houses were curvilinear or round and sometimes rectangular houses in plan. They had benches, sometimes a wattle-and-daub superstructure and spectacular anthropomorphic andirons (Burney and Lang 1971: 56-7; Van Loon 1980: 272; Kushnareva 1997: 43-4). Scholars have not so far agreed upon a uniform terminology regarding this culture and its pottery. Most of the Soviet archaeologists use the term “Kura-Araxes Culture,” but there are variations even amongst the Soviet archaeologists. For example, Piotrovskii and Munchaev call it the “Eneolithic Culture of Trans-Caucasia”, while others use the “Trans-Caucasian Copper Age” (Burney and Lang 1971: 44). In Anatolia, the term “East Anatolian Early Bronze

Age” was first used by Burney (1958) and in Iran Dyson used the term the “Yanık Culture” (1968). This culture was called the “Karaz Culture” by Koşay with a referral to the Anatolian material culture (1959). In the Levant it was named the “Khirbet-Kerak Culture” by the Israeli archaeologists (Maisler et al. 1952). Burney renamed it as “Early Trans-Caucasian Culture” in his book *The Peoples of the Hills: Ancient Ararat and Caucasus* (Burney and Lang 1971). This term is now used by most of the western scholars.

The pottery of Early Trans-Caucasian culture has also been given different names in different geographies. For example, in the Soviet Transcaucasus this pottery was called “Black-on-a-rose-base Ware” by Kuftin (Kushnareva 1997: 43). In Turkey, this pottery was named “Karaz Ware” by Koşay (1959), whereas in the Amuq region Braidwoods named it “Black-Red Polished Ware”(Braidwood and Braidwood 1960: 358). In Palestine, the Israeli archaeologists termed this pottery “Khirbet-Kerak Ware” (Maisler et al. 1952: 116). It was Burney who, for the first time, considered the Transcaucasian and Anatolian pottery as one entity, and called it the “Transcaucasian-Anatolian Ceramics of the Early Bronze Age” (1958: 165). Later, in 1971, he renamed this pottery as “Early Trans-Caucasian Pottery” (Burney 1971). In East-Central Anatolia, the pottery was named as “Red-Black Burnished Ware” by the excavators of Arslantepe (Palmieri 1981; 1985, Frangipane 2001, Conti and Persiani 1993). Therefore, in this study, Red-Black Burnished Ware has been used to interpret the pottery of Early Transcaucasian Culture.

In Arslantepe, the sequence continues with VI C period characterised by handmade Red-Black Burnished Ware (Figure 9-10-11). Although the transition from VI B2 to VI C has formerly been considered as “Terminal VI B”, the recent archaeological data indicated that this transition period linked tighter with VI C than with VI B. Some VI B2 houses were rebuilt in this period. During the excavations, only Red-Black Burnished Ware comprised of the jars and potstands with incised decorations was found in this level. (Conti and Persiani 1993: 363).

Arslantepe VI C period was divided into two subperiods, VI C1 and VI C2, following the 1991 excavation season (*ibid.*). At Arslantepe VI C1, no architecture has been as yet uncovered, but the period comprised of a series of strata pierced by several pits including some graves (Palmieri 1973: 110-12; Conti and Persiani 1993: 363). This indicated that Arslantepe VI C1 was probably a semi-permanent settlement. Building levels in this period were identified only at Gelinciktepe (Palmieri 1967; 1968), perhaps suggesting that the people of Arslantepe perhaps were live in the rock shelter at Gelinciktepe in VI C1 period. Arslantepe VI C2 is characterized by the appearance of very large square mudbrick buildings constructed by sturdy stone terrace walls (Figure 14). The houses consisted many domestic facilities and were surrounded by courtyards where numerous fireplaces lie. At the same time, the new terraced outline of the mound was to be retained and improved with time (Conti and Persiani 1993: 363).

The pottery assemblages of Arslantepe in VI C included handmade Red-Black Burnished Ware, the dominant shapes of which were carinated bowls, jars with triangular lug handles on the rim and engraved potstands (Figure 9-10-11). In the late VI C2 carinated shapes decreased in number. The common form in pottery became rounded profiles. Apart from these, Arslantepe VI C is perhaps best identified by the appearance of Painted Wares, local “Gelinciktepe Painted Ware” and “Karababa Painted Ware” which was closely related to Southeastern Anatolia (Figure 12). Gelinciktepe Painted Ware commonly had reddish or brownish stripes of lines in angular patterns (Conti and Persiani 1993: 363; Marro 1993: 50).

Karababa Painted Ware was first noticed at Gelinciktepe and was interpreted as local pottery because of its similarity with the local Gelinciktepe Painted Ware (Palmieri 1967). However, the term Karababa Painted Ware was first used by A. C. Thissen (Thissen 1985) who recorded its presence at the sites surveyed during the construction of Karababa, now Atatürk, Dam in the Urfa-Adiyaman region. The

Karababa Painted Ware, slipped or unslipped, was decorated with reddish and brown ladder patterns (Conti and Persiani 1993: 363).

Metallic Ware was the other common imported ware in Arslantepe, which originated from the Urfa-Adiyaman region and Eastern Syria (ibid) (Figure 13). Simple Ware, another imported ware which is one of the dominant shapes in Amuq I (Braidwood and Braidwood 1965: 396-98), was also present in Arslantepe (Figure 17).

Gelinciktepe in the Early Bronze Age II mostly had Red-Black Burnished Ware with carinated shapes, Gelinciktepe and Karababa Painted Wares (Palmieri 1967). According to A. M. Conti, it is not possible to attribute the local engraved potstands either to Early Bronze Age I or II (Conti and Persiani 1993: 368). The Red-Black Burnished Ware, Gelinciktepe Painted Ware and Karababa Painted Ware are also present in Şemsiyetepe (Darga 1989), İmikuşağı (Conti and Persiani 1993: 376) and Pirot Höyük (Karaca 1984).

*Schichten* XXIV-XIV of Norşuntepe dating to the Early Bronze Age II is characterized by the prevalent Red-Black Burnished Ware (Hauptmann 2000) (Figure 9-10-11). However, the chronological marker of the phase at Norşuntepe is the painted pottery, although this painted pottery and the Syrian imports, especially the Metallic Ware cups, are rare. In the earlier level of this phase, a “ladder” patterned painted pottery, *Groupe A* (Marro 1997; Marro 2000), is the typical for Norşuntepe (Hauptmann 1982: fig. 50, 1-2) (Figure 12). In the later level of the phase, the “ladder” pattern was replaced by “triangles and wavy lines” called *Groupe B* and “suns and flames” called *Groupe C* (Marro 1997; Marro 2000) (Figure 12). Neither Gelinciktepe style pottery nor Karababa Painted Ware, the characteristic painted potteries at Arslantepe in this phase, were present at Norşuntepe (Conti and Persiani 1993: 376).

The handmade Red-Black Burnished Ware in this phase was decorated with rib design (*Rippendekor*), lozenges and double and bold spirals (Hauptmann 2000:

423, fig. 4-5). Nahçevan-type handle which is a characteristic feature of the Early Transcaucasian Culture and its Red-Black Burnished Ware were produced at Norşuntepe in the Early Bronze Age II. The shapes in this phase included recessed neck jars and carinated bowls, small rounded cups, engraved potstands and hemispherical bowls with triangular lug handles on the rim which is the most common kitchen ware type in the region (Hauptmann 2000, fig. 4-5) (Figure 9-10-11).

In the Early Bronze Age II in Norşuntepe an additional architectural style of round houses related with the Early Transcaucasian Culture was introduced. In Level XXIV, the settlement was occupied by numerous pits were probably used for storage (Figure 15). In L19 c/d area, a round building with 6 m. of a diameter and built of mudbricks was found in this level (Hauptmann 1979: 70-71; Hauptmann 1982: 48-49). In Level XXIII, any important architectural feature was reported except an intramural burial having a well preserved skeleton of a male in a contracted position with arms folded under the chest (ibid.). In Level XXII, a street climbing to the central plateau was found in Norşuntepe. Part of a mudbrick room which was whitewashed on the inside was found to the south of the street. In the northern part of the street a row of posts which the excavator believed to have been the limit of a pen was reported (Figure 16). In Level XXI, multi-roomed mudbrick houses with round hearths with a clover-leaf-shaped centre were found and the street from the earlier level was reused within the same plan (ibid.) (Figure 17).

The wattle-and-daub houses appeared in Level XIX of Norşuntepe (Figure 18). These varied in size and had round corners and internal posts supporting the roof. These wattle-and-daub buildings were found together with a mudbrick house constructed in the same level. The larger of the two houses published could be a metal workshop because of a number of metal processing artifacts found scattered on the benches and around the fireplaces. In the next three levels (XVIII-XVI), only wattle-and-daub buildings with clay benches and round hearths were uncovered and

mudbrick buildings disappeared in Norşuntepe (Hauptmann 1979a) (Figure 19). In Early Bronze Age II, the distinct andiron or hearth as a domestic element that is a characteristic feature for the Early Transcaucasian Culture appears firstly in Norşuntepe.

At Tepecik, Levels 4-11 belonged to the Early Bronze Age II. The pottery assemblages of Tepecik in this phase included the Painted Wares similar to the Painted Wares (Esin 1982a: 105) and Red-Black Burnished Ware (Esin 1982a: 103-5) (Figure 9-10-11-12). Imported Metallic Ware was also found, but is very rare in Tepecik in this phase (ibid.) (Figure 13). Rectangular mudbrick buildings were constructed at Tepecik. The larger walls in these buildings had stone foundations (Esin 1982a: 104) (Figure 20).

At Korucutepe, Phases C and D are associated with the Early Bronze Age II by M. N. Van Loon (1978). In Phase C, a one-room house measuring 3 x 5 m. was built entirely of mudbricks without stone foundations. The entrance in the eastern wall had a partly wooden doorsill. Outside, next to the door, was a curved wooden enclosure. Inside, benches raised 25 cm above the floor and ran along the west and north walls. There was one round hearth on the western bench and another in front of the northern bench. A horseshoe andiron was found in situ on the western hearth. Parts of other five houses built in similar techniques were also found at the site (Van Loon 1978: 13).

In Phase D at Korucutepe, several mudbrick houses with cooking installations round a courtyard were found (Figure 21). The courtyard was first identified in Stratum LXXII, was large and there was a rectangular hearth platform built of mud in its north. The platform had a post-hole at the center of its southern edge and was mounted by two steps on its western side (Van Loon 1978: 14). In Strata LXXIII-LXXIV the platform was replastered and reused, but in contrast to the previous stratum, the whole area was plastered and partly roofed. A new hearth platform with similar features was built in the southwest edge of the courtyard. Hearths, bins, and

fire pits were placed throughout the courtyard (Van Loon 1978: 15-16). To the east of the courtyard two small rectangular rooms filled with fallen bricks, charred logs, and other burned roof remains were uncovered. Room 1 was largely occupied by the two hearth platforms. Another room (Room 17) had a mud-plastered oven-like feature, that may have been domed, and a circular hearth. In the west of Room 1, there was a pebble-lined fire pit and in the courtyard between the two rooms, were an andiron and a square hearth built with an ash channel alongside it. Room 17 was probably connected to a larger room (Room 8) which was only partially excavated (Van Loon 1978: 16-17). In Stratum LXXV, the houses remained in use, but they partly eroded. The house in O 12 built on a different plan. It had only one room, bounded by two mudbrick walls running east-west (Van Loon 1978: 17). This stratum was destroyed by a fire. In Strata LXXVI-LXXVII, following a fire which left 10-15 cm of charcoal, the same house was rebuilt on a slightly different plan. The circular hearth platforms with andirons in the each stratum were built in the house (Van Loon 1978: 18).

The pottery in Korucutepe in the Early Bronze Age II was dominantly represented by the Red-Black Burnished Ware (Figure 9-10-11). The recessed neck vessels with rail rim in this ware, which constituted the 41% of the total in this period, was very popular in Korucutepe. Bowls, recessed neck jars and pots, and globular pots were the most common shapes in the Early Bronze Age II. In this period, the predominant type of decoration was relief with some incised designs. The most common relief design was the quartered lozenge sometimes with a ladder pattern along the edges. In some cases, the bottom of the lozenge was connected to a pendent crescent (Kelly-Buccellati 1978a: 70-2). Stylized bird and animals were often used together with the lozenge design (Sagona 1984: 75). Lids at Korucutepe were usually undecorated and had a bevelled edge, with a circular depression around a central handle that could have been a strap or loop handle. A number of potstands

were also found. One oval vessel, miniature vessels, and two spouts were also found in these levels (Kelly-Buccellati 1978a: 71-2).

The painted pottery at Korucutepe was grouped according to its pattern variations. Some sherds (Kelly-Buccellati 1978a: plate 128A, 4; 128B, 6; 129A, 2) could be associated with *Groupe A* of C. Marro, with “ladder” pattern. Pottery that would be identified as *Groupe B*, with “triangles and wavy lines” pattern and *Groupe C* with “suns and flames” pattern with stylized animals were also found at Korucutepe in the Early Bronze Age II (Kelly-Buccellati 1978a: 72-3; plate 121, 122, 128, 129) (Figure 12).

The Simple Ware imported from Syria, especially Amuq I, was found at Korucutepe. These were wheelmade, tempered with small grits and buff in colour. The exterior had corrugated effects (Kelly-Buccellati 1978a: 68). The Metallic Ware called “Akkadian Ware” by the excavators is also wheelmade with a fine grit temper. The colour of this ware in Korucutepe shades from gray to orange, and its exterior has also corrugated effects (*ibid.*) (Figure 13).

At Değirmentepe, four Early Bronze Age building levels were distinguished in Trench A. Level 4 and 3 could be associated with Early Bronze Age II, however the excavator of the site did not propose any division of the Early Bronze Age into phases I, II and III (Duru 1979). At Level 4, the earliest level in the Early Bronze Age at Değirmentepe, no clear evidence regarding the plans of the houses was found (Figure 22). The published building remains suggest that the houses were built on stone. Only one house had a *terre pisé* floor and a pebble paved courtyard (Duru 1979: 70-72). The architecture in Level 3 was completely different than Level 4 (Figure 23). The buildings had a wattle-and-daub superstructure in this level. In the earliest phase of this level, posts that were set close together, hearths and basalt quern fragments were found. There is no have plan that has survived. In the final phase of this level, Level 3a, a house in the familiar Early Transcaucasian plan which is trapezoidal-shaped, rounded at the corners, with a rectangular annex and a central

grooved hearth was uncovered (Duru 1979: 72). This phase that is on top of the ruins of Level 3b was destroyed by a fire (ibid.).

Red-Black Burnished Ware was the most common pottery at Değirmentepe in the Early Bronze Age II (Figure 9-10-11). In Level 4, the most common shapes of Red-Black Burnished Ware were hemispherical, deep and carinated bowls with rail, straight, bevelled or thickened rims. Jars with triangular lug handles on the rim were also found. Lids at Değirmentepe, like the examples at Korucutepe, had a bevelled edge, with a circular depression around a central handle that could have been a strap or loop handle (Duru 1979). Level 3 was characterized by the recessed neck and hemispherical bowls of the Red-Black Burnished Ware. Recessed neck bowls with everted or plain rim, and a round or concave base are more common than other shapes. These bowls were sometimes decorated with horizontal grooves on the rim. Relief decoration, especially lozenges, appear for the first time in this level at Değirmentepe.

Painted pottery with same decoration and technique as in the rest of Altınova Plain were found in the Levels 4 and 3 at Değirmentepe. *Groupes A, B and C* were also represented at Değirmentepe in the Early Bronze Age II (Duru 1979).

In the Aşvan Area, Taşkun Mevkii was abandoned at the beginning of this period, while Aşvan Kale and Taşkun Kale continued to be settled throughout the Early Bronze Age II (Sagona 1994: 16). Burnished Pottery varying in colour from black to brown, to red and buff is the most common group in the region. Several bowl shapes, especially recessed neck jars, globular pots and potstands, were found. Some of them had rail rims that is the characteristic feature for this period. In addition, some painted pottery was also found (Sagona 1994).

At Han İbrahim Şah, Levels X-VIII belong to Early Bronze Age II (Ertem 1982). Red-Black Burnished Pottery was the dominant pottery type. Flat lids are reported from this phase, but not illustrated. Interestingly, the painted pottery that is similar to pottery from other sites in the Elazığ region were found together with

Gelinciktepe and Karababa Painted Wares that were used in the Malatya region. Metallic Ware was also found in the settlement (Ertem 1970; 1972; 1974). Several sealings, some comparable to Jemdet Nasr designs were found in Level VIII. This is a very interesting phenomenon because seals which have a very important role in understanding economic activities were unfortunately not found too much at the other sites of Malatya-Elazig region in the Early Bronze Age II. The architecture at the settlement was composed of rectangular mudbrick structures on stone foundations, distinguished by their horseshoe-shaped and round hearths (Ertem 1974: plate 66).

At Pulur-Sakyol, Levels XI-VII were associated with Early Bronze Age II. In Level XI, houses were single-roomed with a bench along the back wall facing the doorway, but how they were built and with what material is unfortunately not reported. According to the published plans, the houses could have had stone foundations. In front of the bench a circular heart platform, sometimes with horseshoe-shaped andiron was found in every house. Level X had rectangular and mudbrick houses with simply beaten earthen floors. Mudbrick benches and platforms, hearths, and ground stone tools were found as part of the traditional household fittings of the Early Transcaucasian Culture. Houses 79, 80 and 83 had human faces in relief in the corners, but their plans, which is similar to the rest of the houses, make it difficult to suggest that they were some kind of shrines. This level was destroyed by a fire. In Level IX, the mudbrick houses on stone foundations were arranged around a courtyard. In Level VIII, the people of Pulur-Sakyol continued to build in the same layout. But, the houses in Level VII were constructed in a different plan. They were trapezoidal in shape and were constructed on stone foundations (Kosay 1976).

The settlement plan of Pulur-Sakyol in the Early Bronze Age II differs markedly from the other settlements in the same cultural horizon (Figure 24). Pulur houses were juxtaposed and arranged in a circle around a central courtyard. This

radial settlement plan is very similar to west Anatolian settlement plans such as Demircihöyük F-H (Sagona 1998: 19).

Red-Black Burnished Pottery is the prevalent pottery group in the Early Bronze Age II at Pulur-Sakyol. Tall necked, angular jars, pots with globular bodies with wide mouths and sinuous curves, small carinated shaped jars, bowls with concave necks are numerous in the pottery assemblages of the site. In the late phases of this period, miniature vessels which Koşay termed “cosmetic cups” were found (Koşay 1976: 127-31). According to Sagona, these vessels may have been used in the working of metal (Sagona 1984: 71). Another characteristic pottery group was the potstands which were very similar to the Arslantepe VIC potstands (Conti and Persiani 1993: 378). Jars from Pulur-Sakyol were decorated with schematic human faces in relief. The Painted Pottery commonly found in Elaziğ region was also found at Pulur-Sakyol. Another pottery group at the site was the Metallic Ware imported from Syria (Koşay 1976).

Sos Höyük (Period VC) in the Early Bronze Age II remained as the center of Early Transcaucasian Culture. The layout of the structures remained unchanged, they were built of mudbrick on stone foundation. The houses had a single-room. A circular clay hearth decorated with a double spiral design and, behind this hearth, a bench that ran along the back wall were uncovered (Sagona and Sagona 2000: 64; Hopkins 2003: 81). The same location of hearth and bench in the residence is redolant of the Pulur-Sakyol residence plans in the Early Bronze Age II. Black Burnished Pottery was the only group found at Sos Höyük in Early Bronze Age II (Sagona and Sagona 2000: 64; Hopkins 2003: 91-2).

The southern neighbouring regions of East-Central Anatolia produced and used Metallic Ware and Simple Ware in the Early Bronze Age II. Metallic Ware was especially prevalent in the East, while Simple Ware was more commonly found in the West, especially in Amuq I. Metallic Ware has also been called “Akkadian Ware”, “Grey-Black Burnished Ware”, or “Stone Ware” (Braidwood and Braidwood

1960: 370; Fielden 1977; Kuhne 1976; Mallowan 1947; Prag 1970). In Altınova, the pottery is generally referred to as “Akkadian Ware” or “Syrian imported pottery” (Hauptmann 1976a; 1976c; Kelly-Buccellati 1978a).

The Metallic Ware examples in Altınova is wheelmade, fine tempered with minerals and fired at a very high temperature. The pottery has a colour shading from gray to orange. The exterior has corrugated effect (Hauptmann 1969-70: 53-54; Kelly-Buccellati 1978a: 68; Van Loon 1978: 16; Duru 1979). The common shapes are the conical cup (Van Loon, ed.1978: pl. 117, I; Duru 1979: fig. 26, 33) and the little jar with outturned rim (Van Loon, ed. 1978: pl. 127, H).

Simple Ware that is prevalent in Amuq region, especially in Period I is wheelmade, tempered with small grits and buff in colour (Kelly-Buccellati 1978a: 68). The most common shape of Simple Ware is the “caliciform” with corrugated goblets (Braidwood and Braidwood 1960: 396-98).

Arslantepe VI C dates to between 2612 and 2461 B. C. on the basis of the maximum overlapping of 7 calibrated dates out of 7 (Di Nocera 2000: 75). At Korucutepe, 9 radiocarbon readings came from Phases C and D (Van Loon 1978: 8). The 2 dates from Phase C overlap in the interval between 2857 and 2709 B.C. (Di Nocera 2000: fig. 4b). 7 radiocarbon readings coming from Phase D overlapped a time interval between 2848 and 2503 B.C. (Di Nocera 2000: 76). Norşuntepe is another settlement where radiocarbon dates were obtained. Three out of the four dates here overlapped with the interval between 2881 and 2614 B.C. (ibid.). At Sos Höyük, two radiocarbon readings (Beta 120451 and OZD-713) relating to Period VC indicated a time interval between 2900 and 2500 (Sagona 2000: 64). These radiocarbon dating data suggested that Early Bronze Age II in East-Central Anatolia dates between 2700 and 2500 B.C.

### **II. 3. The Early Bronze Age III**

During the Early Bronze Age III, although the prevalent pottery in the region was Red-Black Burnished Ware and some scholars considered it as a product of

semi-permanent or semi-nomadic societies (Burney and Lang 1971), an abrupt change in architecture demonstrated a central character. This cultural modification in East-Central Anatolia from village to “center” form is unique for the Early Transcaucasian Culture.

The Early Bronze Age III is represented by Arslantepe VI D, also known as *Fase Recente*. It was divided into three subperiods, VI D1, D2 and D3 (Conti and Persiani 1993: 363). However, before Conti, Hauptmann was the first scholar to suggest a threefold subdivision for Early Bronze Age III in East-Central Anatolia because of the change in the painted pottery style after a period of a twofold subdivision (Hauptmann 1976a: 78, footnote 21).

The square mudbrick structures were built in the earliest level of this period (VI D1) at Arslantepe. Big horse-shoe shaped hearths as domestic elements were also uncovered (Conti and Persiani 1993: 364). Between VI D1 and D2, an architectural level composed of a group of oval semi-subterranean structures called “round houses” were found. These buildings had inward descending staircases, peripheral benches and central flat stone interpreted as a post base (Conti and Persiani 1993: 365) (Figure 29). In VI D2 period, the settlement was enlarged and new terraces were constructed. The houses in this period were rectangular in plan and were built of mudbrick walls on stone foundations. They were grouped in blocks separated by alleys and open courtyards (Conti and Persiani 1993: 364) (Figure 30). The settlement was surrounded by a stone defense wall that had a halfround tower in its southern part (Palmieri 1985: fig. 1). VI D3 can be defined as “urban” (Conti and Persiani 1993: 368), but information on this period is limited because it is still under study. In this subperiod, a stone-lined water channel among the houses, connected with a stone staircase was uncovered (ibid.).

In the Early Bronze Age III, Red-Black Burnished Pottery which is the predominant pottery group at Arslantepe following the previous period was represented by a kind of thickened rim with thin edge, called the “bullet rim” (Figure

24-25). In VI D2, the “rail rim” is also very frequent in this kind of pottery. Incised decoration that is one of the characteristic features for the Early Bronze Age III appeared in this subperiod for the first time (Conti and Persiani 1993: 364-8). Chevrons and dots were among the common motifs in the incised decoration (Sagona 1984: 81). In the late subperiod, Red-Black Burnished Pottery was transformed to a kind of pottery with totally black or brown surface (Conti and Persiani 1993: 368). The common shapes were round-bodied cups, bottle-shaped jars with a globular body, cooking pots with triangular lugs on the rim, neckless globular jars and cups, hemispherical bowls and tall ovoid-bodied jars with recessed necks (Conti and Persiani 1993: 364-8; Sagona 1984: 81). According to Sagona, most of the shapes from Arslantepe VI D seemed to represent a local amalgamation of features from both east and central Anatolia (1984: 81).

The painted pottery featured a new pattern that is pendants filled with triangles on the rim and the shoulder (Figure 26). In VI D2, the assemblage comprised of several geometric patterns bordered by thick lines on the shoulder. A line of thick commas or strokes were also used as a fringe on rim and shoulder. There are free patterns on the body which are called “potter’s mark”. In VI D3, different than in previous ones, the fringe was composed of thin strokes. Bichromy in red and black colours is more common in the late VI D3 (Conti and Persiani 1993: 364-8).

The imported pottery (Figure 27) included Metallic Ware and Simple Ware in this period at Arslantepe. Another imported pottery called “Smear Wash Ware” appeared in the settlement as well (ibid.). An early type *depas* cup corresponding to the A43 type of Troy II b-g fragment was found (Conti and Persiani 1993: 368, note 6). The same type is also present at Tarsus Early Bronze Age IIIa (Goldman 1956, fig. 356, 471); though, Conti believes it to be unfortunately from an unreliable context (Conti and Persiani 1993: 368). Two spiral burnished bottles were found at Arslantepe VI D as well (Conti and Persiani 1993: 386).

At the site of İmamoglu in Malatya region, the Early Bronze Age sequence began with a terraced rooms complex which is dated to the earliest levels of Early Bronze Age III (Uzunoğlu 1989). At İmamoğlu, Şemsiyetepe and Köşkerbaba, the houses were constructed of well plastered mudbrick walls on sturdy stone foundations and had large hearths (Darga 1982; eadem 1983; eadem 1985; Uzunoğlu 1985; Bilgi 1985). The pottery assemblages in these settlements included the same pottery groups as Arslantepe; Red-Black Burnished Pottery and local Malatya-Elazığ Painted Pottery (ibid.). İmamoğlu and Pirot Höyük demonstrated similar cultural traits, but no related levels are known from these sites (Conti and Persiani 1993: 376).

*Schichten XIII-IX* and *Horizonten VIII-VI* at Norşuntepe dated to the Early Bronze Age III (Hauptmann 2000: 424 and fig. 1). In *Schichten XIII-IX*, the site was characterised by multi-roomed mudbrick houses (Mehrraumhäuser) flanking both sides of a well-defined street (Hauptmann 1976a: 78). In *Horizonten VIII* and *VII*, a highly elaborate citadel building system with terraces, courtyards, storage units and streets appeared. An L-shaped building complex constructed of mudbrick walls on stone foundations was found in the eastern side of the uncovered area. Although the central storeroom was located outside of the complex in *Horizont VIII*, in the western side of the courtyard in front of the complex, a central storeroom which contained twenty pithoi was found in *Horizont VII*. In both levels, a room with a domed oven on a platform was uncovered in the complex (Hauptmann 1976a: 75). In *Horizont VIII*, in the western side of the excavated area, the multi-roomed mudbrick houses flanked both sides of a street, containing domestic elements like benches, horseshoe shaped hearths and ovens (Figure 31). But, in *Horizont VII*, the houses located in the southern side of the street were destroyed and a “building complex” with a courtyard was constructed (ibid.) (Figure 32). The most developed version of these units were found in *Horizont VI* (Figure 33). The remains of the monumental building complex, originally 25 x 15 meters, covered an area of 2700 m<sup>2</sup>

(Hauptmann 1976a; 1976c). This complex is called the “Pithos Gebäude” because of the at least 100 storage jars arranged in rows found within the building complex. The building complex was built on stone foundations with a mudbrick superstructure supported by wooden beams as infrastructure (ibid.). The storage building of this complex consisted of eight rooms with a four-room south wing. A rectangular storeroom consisting of three rooms stood in the northwest corner of the complex. To the south of this room, there was another storeroom and a big rectangular room. In the eastern side of the complex, in R-T/21-23, some square and rectangular rooms with domestic elements like benches, hearths and domed ovens were uncovered. Another storeroom was found in the southwest corner of the complex. The capacity of storage of this building complex, on the basis of the capacities of storage jars found in situ, was calculated at approximately two hundred tons of grain (Hauptmann 1979b: 63). This monumental building complex is defined as a “Palace” by Hauptmann (2000: 424-5). On the other hand, Aktüre suggested that this complex would not have been a palace because the buildings were constructed as independent buildings for different activities (1994: 105, note 205). At the end of the period, the complex was destroyed, the building got burnt and plundered. Simple houses were built over the ruins, where “Cappadocian Ware” which find parallels at Kültepe/Kaneš in the Assyrian Trade Colony Period was found (Hauptmann 1974: 15).

Although the architectural remains of the site demonstrated a central character, Red-Black Burnished Ware that constituted 90% of the pottery assemblage was used dominantly in this subperiod (Hauptmann 2000, fig.1). Most significant types in this pottery group are the flattened belly jars and cups with rail rim, some of which have incised decoration, step-shouldered pots, pot lids with incised decoration and bowls with introvert lips (Figure 24-25). The Malatya-Elazığ Painted Ware marks the sub-chronological division of the region in the Early Bronze Age (Figure 26). This pottery is characterized by red and black painted designs placed around the

neck and rim of the smaller ones in bands on a cream-buff ground (Kelly-Bucellati 1978a: 72). According to Sagona, there are two groups of Malatya-Elazığ Painted Ware (Sagona 1984: 68). One of these is characterized by its buff to pinkish-buff colour, well fired and tempered texture with medium-sized grits and chaff. The main shape of this group is the globular pots. Paint is invariably monochrome and matt, and ranges in colour from dark red to purple and even grey (Sagona 1984: 68). The patterns are always simple that is a row of triangles filled with oblique line (ibid). According to Sagona, this group of painted pottery is limited geographically to the Murat basin and Altınova plain (Sagona 1984: 69).

The second group of Malatya-Elazığ Painted Ware is recognized from its fine decoration (Sagona 1984: 69). This group is well fired and is tempered with small grits. It is buff to orange buff in colour. Paint is always matt, and usually black or dark tones of brown and red were preferred. The main shapes of this group are globular pots with interned-rim, small globular bowls, and narrow-necked jars (Sagona 1984: 69). A main decorative frieze is nearly always placed around the neck: the exceptions are cylindrical and conical cups which are painted all over. Broad horizontal bands separated by narrow lines left in reserve dominate the frieze. Between the bands is a geometric pattern of chevrons and triangles; lozenges, herringbone, and network design occur, but are not as popular (ibid). According to Sagona, this group is common in Malatya and Elazığ regions, but rare in the Murat basin (ibid).

In Norşuntepe, the painted pottery called *Groupe D* (Marro 2000), which has “row of triangles” pattern appeared in the early phase of Early Bronze Age III (Hauptmann 2000: 424, Abb. 6, 6-8). In *Horizont VIII* and *VII*, *Groupe D* disappeared and *Groupe E*, with triangles between bands, and *F*, with zigzag patterns between bands that are black painted replaced it (Hauptmann 2000: 424, Abb. 8, 1-6). *E* and *F* are 8% in the pottery assemblages in the Early Bronze Age III (Hauptmann 2000: Abb. 1). In the final level of the Early Bronze Age III (*Horizont*

VI), *Groupe G* that has polychrome painted bands and zigzag patterns between bands on the neck and vertical bands between neck-decore (Halsdekor) and base on the body appeared (Hauptmann 2000: 464, Abb. 8, 7-9).

Among the imported pottery (Figure 27), the most common types are the Metallic Ware and Simple Ware cups (Hauptmann 2000: 424, fig.1: 11-12). Another pottery type, imported from Southern Taurus region, is Smearred Wash Ware (Rotbandschale) which has a complete reddish slip (Hauptmann 2000: 424, fig. 13). Elongated spiral burnished bottles were rarely found at Norşuntepe VI (Hauptmann 1969/70: fig. 12: 9).

At Korucutepe E and F Phases belong to the Early Bronze Age III (Van Loon 1978: 18-23). The first stone-foundation buildings appeared in Phase E, in contrast to the only mudbrick buildings of Phases C and D (Van Loon 1978: 18). The house floor enclosed by walls of these new structures, built over the burnt remains of Phase D houses, contained a bowl-shaped hearth. This building was rebuilt twice in the following Strata and new domestic elements like, an oven, hearths and platforms, were added (Van Loon 1978: 18) (Figure 34). In Stratum LXXXI, an imposing thick-walled, large and sturdy building (6 x 9 m.) or the so-called “the hall” was constructed at Korucutepe (Van Loon 1978: 20) (Figure 35). Its whitewashed walls were 1.60 m and were built on stone foundations. The entrance of this hall in the western part of the south wall, had a clay doorsill covered with wood. Against the east wall, a 72 cm and 1.0 m wide podium was built and in front of it, a circular raised hearth with a grooved edge where three interlocking horseshoe andirons stood on top was situated (Van Loon 1978: 21, plate 26-29). Two communicating storage units in the west and south of this building containing storage jars filled with white ash were uncovered (ibid.). In Stratum LXXXVI, a corridor-like room measuring 9.5 x 2 m was built along the south wall of the hall. Another addition to the hall was a square room measuring 2.5 x 2.5 m located to the east of the hall (Van Loon 1978: 22, plate 30-32). The hall was rebuilt in Stratum LXXXIX with slightly thinner

walls, but not along the lines of its former structure. In the southeast of the rebuilt hall, a basement, dug 1.20 m deep into a courtyard, was uncovered (Van Loon 1978: 22). This basement had a four-step entrance in the eastern wall and a clay base with a central pillar supporting a wooden roof (Van Loon 1978: 22-3, plate 34). To the east of the hall a square room was also refloored and its walls were raised (Van Loon 1978: 23).

Towards the end of the Early Bronze Age, in Period F the settlement was abandoned, at a time when at Norşuntepe the monumental building complex was built (Van Loon 1978: 23). After the period of abandonment, the settlement shifted from the top of the mound to the base of it, and was represented by rather undistinguished structures (Van Loon 1978: 23, plate 36) (Figure 36). There is no stratigraphic break leading into the Middle Bronze Age at Korucutepe (Van Loon 1978: 24).

During the Early Bronze Age III, at Korucutepe Red-Black Burnished Ware continued to be the most common type (Kelly-Bucellati 1978a: 68) (Figure 24-25). In this period, the use of recessed-neck vessels declined (24% of the total), while globular pots with horizontally fluted necks without any relief ornament continued (Types D, E and M) (Kelly-Bucellati 1978a: 70, plate 112). Incurving bowl called Type R increased in number during the Early Bronze Age III (ibid.). The more heavily decorated pottery stands predominated in this period. One example of a tall stand dating to Phase E is the closest example to the tall stands from Syria at Hama, the Amuq Phase H and Garni in Armenia (Kelly-Bucellati 1978a: 72). The pot lids in this ware were often incised along the edge and had a pronounced central depression and strap handle (Sagona 1984: 76). The painted pottery is the same with Norşuntepe (Figure 27). *Groupes D, E, F and G* were found (Kelly-Bucellati 1978a: plate 121-122-128 and 129). Two examples with a highly stylized bird-shape and a horned animal design can be dated to this period (Kelly-Bucellati 1978a: 73). Metallic Ware and Simple Ware were also found (Kelly-Bucellati 1978a: 71)

(Figure 27) . Level G dated to Middle Bronze Age I by Van Loon (Van Loon 1978: 6; 1980: 3) which was a very disturbed context formed by the mixture of Early Bronze Age III and Middle Bronze Age I materials (Van Loon 1980: 3).

At Tepecik, Levels 5-1 belonged to the Early Bronze Age III. The earliest levels were distinguished by single roomed rectangular mudbrick houses lining a street. These houses were rebuilt several times with the same plan in the following levels (Esin 1974: 132, plate 108; 1972: 155) (Figure 37-38-39-40). In Level 2, the single roomed rectangular mudbrick houses continued with no changes in building plan and technique, but they were oriented differently on the mound (Esin 1972: 154). A wide, rectangular, well built mudbrick platform was uncovered in Level 2 (ibid.). This platform could have been a terrace covering almost all of the top of the mound (Sagona 1984: 78). Level 1 was extensively wiped out by pits and the Iron Age buildings. Some remnants of mudbrick walls dating to this level were found (Esin 1974: 127) (Figure 40). The large structures associated with this period, like the examples at Norşuntepe and Korucutepe were not found at Tepecik. According to Esin, this might be the result of the devastation caused by the Iron Age and Medieval structures (1974: 127).

The pottery assemblages are the same as at other sites in Altınova. However, the full repertoire of the pottery assemblage at Tepecik has been not published yet. Red-Black Burnished Ware, as is called Karaz Ware and Khirbet Kerak Ware by the excavator, were prevalent in the Early Bronze Age III (Figure 24-25). The common shapes of this pottery were recessed-neck vessel, globular pot with horizontally fluted neck and incurving bowl. In addition, small jars with tall flaring necks, the unique pedestalled bowls with an animal head and the plain pedestalled bowls also dated to this period (Esin 1972: 154-155). The painted pottery at Tepecik had the same features with the examples of other sites in Altınova (ibid.; Marro 1993: 49) (Figure 26). Metallic Ware was found at Tepecik (Esin 1972: 154-5, plate 105: 2) (Figure 27).

Level 2 and 1 at Değirmentepe belonged to the Early Bronze Age III. In Level 2, two mudbrick houses were uncovered in the middle and northern part of Trench A (Duru 1979: 75) (Figure 41). One had a single square room with plastered walls. Two raised mud platforms were set into the corners opposite each other. A circular hearth and a U-shaped oven were found in the structure. Another oven was placed outside, against the east wall (ibid.). The other building had a single room as well. It had a floor paved with pebbles and covered with burnished clay. A raised, mud platform was set in against the south wall. A basalt quern and fragments of what was probably a grinder was placed on it. A horseshoe shaped hearth was found in the building (Duru 1979: 76). In the earliest phase of Level 1, a wattle-and-daub house with a circular hearth, filled with andirons and potstands was uncovered. In the latest phase of this level, a two-roomed mudbrick house was discovered (Duru 1979: 77) (Figure 42).

Red-Black Burnished Pottery is once again predominant (Figure 24-25). In this period, the shapes of this pottery included recessed neck vessels, large jars, horizontally fluted neck vessels, bowls with a horizontal groove below the rim, jars with vertical lug handles at the rim and spouted bowls. The lids with a central depression and incised edge and the potstands with a bevelled rim and base were also found. Painted pottery in this period had same features as at other settlements in Altınova (Duru 1979) (Figure 26).

At Pülür-Sakıyol in the Aşvan area, the traces of Early Bronze Age III were found between Levels VI and I. In Level VI, houses had small rooms built of thick mudbrick walls. They were arranged in a circle around a courtyard like the previous level. But, both the size of the settlement and the number of houses decreased during this period. The wattle-and-daub houses (Houses 1-14) with plastered walls appeared in Level V. The houses were rectangular with rounded corners and were clustered together. The hearths were found in most of the houses at this level. House 1 contained a portable crescentic andiron. Levels from IV to I were destroyed by

erosion. Pottery in this level was characterised by the prevalent Red-Black Burnished Ware similar to the Keban region. Painted ware of the Early Bronze Age III was also found (Koşay 1976).

Levels VI and V corresponded to the Early Bronze Age III at Han İbrahim Şah (Ertem 1982). In Level VI, the circular buildings were constructed at Han. Houses in Level V were two-roomed and built over the sturdy stone-bases (ibid.). Red-Black Burnished Pottery and painted ware of the Early Bronze Age III were found in this period at Han İbrahim Şah.

In North-Eastern Anatolia, Period VD belonged to the Early Bronze Age III at Sos Höyük (Sagona 2000: 341). A part of a room with an ashy plastered surface and rounded corners was uncovered in Trench L16 (Sagona and Sagona 2000: 64). Wooden supports were used as the superstructure. Two burials were discovered at Sos Höyük dating to the Early Bronze Age III (Sagona 2000: 341-2). Red-Black Burnished Ware, or Kura-Araxes Pottery as labelled by the excavator, at Sos Höyük included tall jars with strongly defined divisions of rim, neck and girth. Lids have a central depression on their top surface (Sagona 2000: 344). Two vessels that were found in the burials indicate a connection with the Martkopi and early Trialeti complexes of Transcaucasia (Sagona 2000: 343).

Arslantepe VI D is subdivided into three phases and 16 radiocarbon datings from VI D2 and VI D3 were analysed by Di Nocera (2000: 76). The radiocarbon samples collected in the contexts of VI D2 gave the interval 2451-2288 B.C., while the overlapping of 5 datings out of 5 attributed to VI D3, gave the interval 2140-2041 B.C. (ibid.). There is no information about VI D1 radiocarbon datings in the article (Di Nocera 2000). According to her, Period VI D seemed to have ended before 2000 B .C. (Di Nocera 2000: 76). At Norşuntepe, the overlapping of 20 datings out of 22 attributed to the Early Bronze Age III provided an interval of 2458-2170 (Di Nocera 2000: 76, fig. 6a). At Korucutepe, the overlapping of 2 datings attributed to Phase E indicated a time interval of 2612-2465 (ibid.). But, Van Loon asserted a time interval

for the Early Bronze Age III between 2300 and 2000 B.C. (1978: 6, table 1). The radiocarbon dates indicate a time interval between 2500 and 2000 in East-Central Anatolia for the Early Bronze Age III.

In East-Central Anatolia in the Early Bronze Age III a modification in architecture from simple houses to monumental ones, especially at Norşuntepe, was observed, although Red-Black Burnished Ware was still predominant in the region. The transition from the Early Bronze Age to the Middle Bronze Age in East-Central Anatolia is not very well understood because of the lack of a good published stratigraphy. However, the presence of Central Anatolian Cappadocian Ware indicates that the region has cut off the cultural connection with Transcaucasia during this time. In the beginning of the Middle Bronze Age the cultural phenomenon seen in Altınova was a culture of Central Anatolian extraction.

### CHAPTER III

#### SETTLEMENT PATTERNS OF ALTINOVA IN THE EARLY BRONZE AGE

The relationship between people and their landscape is one of the basic determinants in creating cultural identity in a community or a society throughout the history of humanity. Landscapes are represented by the tension between material culture and social relations, on the one hand, and the realm of cognition, on the other (Crumley and Marquardt 1990: 73). In this context, culture evolves with its natural and cultural environments related with the manipulation and exploitation of the landscape. Thus, social systems may be conceptualized in terms of the physical, material and cultural landscapes where people live.

The concept of settlement is regarded as the act of peopling in nature. To settle is the human reaction, while to shelter is the animal reaction. Space is the main element in the settlement. Gregory suggested that space is made up of “hierarchically ordered arenas of social practice” (1985: 315). The settlement as an entity of spaces, in the same way, is located hierarchically in the landscape. The settlement hierarchy based on social and economic impacts is the sign of the material and ideological structures of the landscape. In this context, the settlement patterns are the critical parts of cultural ecology in understanding the modifications and transformations of the culture. According to Price, “settlement patterns may be taken as the material isomorph of the entire mode of production in its broadest sense, and one of the core features of social and political organization” (1978: 165).

The study of the settlement patterns in archaeology has developed in both theoretical and analytical contexts. However, the epistemological modifications in

archaeological thought have brought on different perceptions of settlement as a study area. According to the processualists, people, in order to realize their certain aims, exploited material culture as a passive object. On the other hand, postprocessualists considered that material culture both shaped and was shaped by social action (Hodder 1985; 1998: 83-91; Preucel 1995: 162; Thomas 2000). In this context, settlement archaeology in processualism focused on archaeological sites and settlement reconstruction, while landscape archaeology in postprocessualism focused on the entire landscape and its social, spatial, and ideational correlates (Knapp 1997: 2).

### **III. 1. Theoretical Contexts**

Settlement as a study area in the Meso-Americanist tradition of archeology was closely related to processualist approach of the 1960's. Settlement archaeology was conceptualized and systematized into the processual approach in archaeology. Processualism is based on highly formal scientific methodology and logical positivism that are conceptualized by deductive and nomological approaches. According to Flannery, the strategy of process school is to isolate each system and study it as separate variables (1967: 120). In this context, the ultimate goal of the processualism is to reach general laws and regularities that govern human behavior. Settlement archaeology as a product of processualism is the study of changing human settlement patterns, is part of the analysis of adaptive interactions between people and their external environment, both natural and cultural (Chang 1968). Trigger defined settlement archaeology as the study of social relationships through the use of archaeological data (1967: 151). For Nir, settlement pattern is

The layout of human settlements on the landscape, are the results of relationships between people who decided, on the basis of practical, political, economic, and social considerations, to

place their houses, settlements, and religious structures where they did (Fagan 1991: 387).

According to Willey who used settlement patterns for the first time in the field of archaeology, settlement pattern is “a strategic starting point for the functional interpretation of archaeological cultures” that reflect “the natural environment, the level of technology on which the builders operated, and various institutions of social interaction and control with the culture maintained” (1956:1).

Settlement pattern studies during 1960s focused on two themes; the first relied on the study of cultural ecology. According to this approach, settlement patterns resulted from the interaction between technology and the environment (Trigger 1978: 168). The second, however, assumed that settlement patterns were related to social organizations (Chang 1962). In this approach, settlement pattern data is used to make inferences about the sociopolitical and religious organizations (Trigger 1978: 168-9). Winters who worked on prehistoric settlements in the Wabash Valley in USA made a distinction between settlement pattern and settlement system. According to Winters, settlement pattern is the spatial relationships of contemporary sites in any culture; however, settlement system is the functional relationships amongst sites within the settlement pattern (1969: 110).

In the processual approach which is based on definitive studies on settlement patterns, Trigger determined three general levels and determinants that shaped each level (1967; 1968). In these articles, Trigger defined settlement pattern as a product of the simple interaction of two variables, that are environment and technology. His definition of settlement pattern shaped an ecological determinism and a cultural ecological-centric discourse. According to him, settlement pattern reflects the adaptation of a society and its technology to its environment (1968: 54). Trigger’s three levels of settlement patterns are individual building or structure, the manner in which these structures are arranged within single communities, and the manner in which these communities are distributed over the landscape (Trigger 1968). Fagan

suggested that a critical part of settlement archeology is understanding the interaction between these three levels (1991: 387). Thus, the settlement patterns are determined by the analysis of this interaction.

In the processual approach, these three levels were commented into deductive and nomological approaches, and the settlement was perceived as a passive object. The study of individual building or structure, the first level, developed into household archaeology. According to household archaeology, a building reflects the adaptation to climate and the skills of its builder and his technology. Wilk and Rathje suggested that, at the household level, social groups directly articulated economic and ecological processes (Wilk and Rathje 1982: 618). The household archaeology identified the domestic strategy conducted by production, distribution, and reproduction, which are primary needs of a society (ibid.).

Community, as the second level, is associated with a single settlement and therefore, according to Trigger, can be identified with the archaeologist's *components* (1968: 60). Community in archaeology is defined as "the tangible remains of the activities of the maximum number of people who together occupy a settlement at any one period" (Fagan 1991: 526). In settlement archaeology of the processual approach, community is concerned with "the archeology of place" which Binford used for place-orientation in archaeological research (1982). In this perspective, the organizational relationship between places that had different functions within a single cultural system shaped the past cultural systems (ibid.). In this context, the concept of place represents "an attempt to reconceptualize the interaction between human subsistence strategies and landscape environment and physiography by focusing on location in the landscapes where these elements conjoin" (Rossignol and Wandsnider 1992: 62). Almost three decades ago, Trigger suggested a solution that may depend on the definition of *whatever nuclei* exist in the pattern and on estimations of the size of a community that could be associated with *a particular mode of subsistence* (Trigger 1968).

The “region” was Trigger’s third level in the definition of settlement archaeology. Extensive survey and ‘landscape approach’ (Rossignol and Wandsnider 1992) were used in the methodological orientation of the region within the processual approach. Extensive survey assumed that all significant cultural information concerning a region may be obtained from sites or from artifact scatters around sites (Knapp 1997: 11). The landscape approach which was used by Rossignol and Wandsnider, for the first time, (1992) questioned into the problematic relationship between settlement systems and settlement patterns which was pointed out by Flannery for the first time (1976). The landscape approach focused chiefly on the formational history of landscape (Knapp 1997: 2). According to Rossignol,

Landscape approach differs substantially from landscape archaeology. Because of their explicitly historical emphasis, method and interpretation of landscape archaeologists do not incorporate ecological and geological system variables. Both British and American practitioners of landscape archaeology assert an historical and Hodderian contextual focus for the discipline (Rossignol 1992: 4-5).

Archaeological climate in the 1990s changed with an epistemological break that was called structural at first, and post-processual archaeology later. In this approach, archaeological data is transmitted into social and symbolic values. Post-processual archaeology, influenced by the structuralist ideas of Cladue Lévi-Strauss and the advances in linguistics of Noam Chomsky (Renfrew and Bahn 2000: 486), rejected an object fetishism in archaeology and the discourse that created a close relationship between materialism and idealism. Post-processual archaeology assumed an approach that was based on anti-positivism and interpretive or hermeneutic approach of critical theory developed by the Frankfurt School.

Although the levels that were determined by Trigger for settlement studies in archaeology were accepted by the post-processual archaeologists, the interpretation of archaeological data concerning the determination of these levels were different than in the processual approach. In the early 1980s, Ammerman criticized the research problems of settlement archaeology that were identified by Willey (1981). In this criticism, he pointed to the extensions of research problems that were landscape reconstruction, demographic trends, land use, and diachronic settlement patterns. The conceptual framework of Ammerman's critics was regarded with spatial patterns (ibid.). For Ammerman, each level of building, community, or region can be interpreted in terms of its own organizational principles.

In the meantime, Vogt suggested three new themes in settlement pattern research as an alternative to Trigger's level (1983). He emphasized the need for improved data collection techniques such as remote sensing or aerial photography, comparative methods such as ethnoarchaeology, and analytical and interpretive models such as disequilibrium, ecological, symbolic, or locational in settlement pattern research (ibid.). In post-processual approach, both Vogt's and Trigger's levels and ideas were accepted and continued to be used in the 1990's (Knapp 1997: 7).

Trigger's three levels were adopted in the following way: the first level, the building, is interpreted into ethnoarchaeological approach in post-processual archaeology. Ethnoarchaeology is the study of living societies as a way of better understanding and interpreting the past social organizations, bringing meaning and importance to archaeological data. Hodder conceptualized ethnoarchaeological studies with structural and symbolic contexts (1982). According to him, symbols are actively involved in social strategies and therefore archaeologists should look for the principles and concepts which shaped the social and ecological structures of the past societies, constituted by the symbols (ibid.; 1998: 24-44). In this context, ethnoarchaeology is used to estimate the population, to determine social activities,

and to interpret the material attributes of households (Kramer 1979). Ethnoarchaeology attempted to look more broadly at human behavior over space through time, and the study is carried out not at sites but throughout the landscape (Knapp 1997: 8). Thus, the ethnoarchaeological approach tries to form an analogy between past structures and present ones that were built and lived in. In the context of the building level of Trigger's determination, ethnoarchaeology provides "vital information on the nature of spatial ekistics, movement and micro-environment within buildings" (Matthews *et al.* 2000: 185). For example at Çatalhöyük, the ethnoarchaeological studies of the architecture at ancient Çatalhöyük site and modern Küçükköy village indicated an analogy in the surface textures of not only floors, but also of walls and ceilings that varied depending on the nature of intended activities within these spaces and their socio-cultural significance (Matthews *et al.* 2000: 186). The analysis of architecture in this context provides an insight into the relation between organic development and life cycles of different buildings and areas of settlement.

The second level of Trigger, which was the community, is interpreted into ethnoarchaeological and spatial analysis in post-processual archaeology. Spatial analysis in this approach is concerned with site-oriented survey (Bintliff and Snodgrass 1988), intra-site spatial analysis (Hietala 1984), the study of domestic architecture (Kent 1990) and civic landscape (Alcock 1993: 93-128), and micro-archaeological analyses of plants, bones and other remains (Stain 1987; Brewer 1992). In the other words, "the archaeology of place" of Binford in the processual approach is transformed in to "the archaeology of space" in post-processualism. Post-processualists accept an interaction between the material culture and the social structure of a community (Shanks and Tilley 1987: 79-117; Hodder 1991: 6-10, 165-166). According to them, space is one of the signs of the social phenomena in a community.

Intensive survey, spatial analysis, and landscape archeology in the post-processual approach determine the third level, the region, of Trigger (Knapp 1997: 3). Intensive survey aims at understanding the landscape shaped by continuous distribution of artifacts (Ebert 1992). In this perspective, the artifact density designates a site, and such artifact distribution indicates the modification of cultural systems and intensities of landscape use (ibid.). According to Knapp, in the view of this approach, ethnoarchaeological studies indicated that modern-day hunter-gatherer and pastoralist deposits in the landscape were a discontinuous, sporadic, and thin spread of cultural material. On the other hand, sedentary populations created off-site debris as a result of hunting, herding, farming, or other activities that exploited the environment (Knapp 1997: 11).

Landscape archaeology is one of the characteristic features in the post-processual approach. Landscape archaeology is interested in the physical, cultural and cognitive landscapes that have social and spiritual meaning as well as utilitarian (Savage 1990: 330). According to Savage, landscape archaeology acknowledges the role of a cognized, physical and cultural environment and a dynamic, active, and human-centered perspective (1990: 339). Therefore, it has a cognitive dimension (Renfrew and Bahn 2000: 398).

Landscape archaeologists use geoarchaeological and ecological 'system variables' in their research design (Barker and Lloyd 1991; Cherry *et al.* 1991; Knapp and Given 1996). According to Barker, the archaeological studies of landscape are concerned with diachronic settlement processes as with more narrowly defined settlement patterns (1991: 1). Furthermore, Crumley and Marquardt suggested that both sociohistorical and physical structures, and their interpretations help determine and define a landscape (1990: 74). In Knapp's words, "by linking the physical form, human exploitation, and social conception of the landscape, it is possible to gain a better understanding of both cultural process and social change" (1997: 13).

In this study, the methodological and theoretical distinctions between processual and post-processual approaches in archaeology will not determine the conceptual framework. Because the scientific reality in the social science is not based on certain decisions determined by ideological structures. The scholars in the social science should accept the versatile character of social reality. Therefore, the appropriate methodological and theoretical approaches in both schools will be used in this study. In this context, the using of mathematical formulas in the gravity model indicates an empirical perspective of the processual school. At the same way, definitive characteristic of the positivist processualism is the general perspective of the Chapter II. On the other hand, the population estimate and social interpretation in the outcome of the model application have a post-processual perspective.

### **III. 2. Ancient Landscape**

Reconstructing the ancient environment of Altınova is difficult because the series of sediment cores and surface studies from the region are inadequate (Beug 1967; Van Zeist 1975). Yet, the environmental studies conducted by some archaeological projects in Eastern Anatolia has provided some evidence that might be used in any attempt at reconstructing the ancient environment of Altınova. Van Zeist, Timmers and Bottema took sediment cores from a series of lakes and swamps in Southeast Turkey (Van Zeist *et al.* 1970). The samples were taken from Bozova in Urfa, the western end of Lake Hazar in Elazığ, Gölbaşı Lake in Adıyaman and a marsh near Siirt. In addition, surface samples of various vegetation types were collected. However, only the samples from Bozova and Gölbaşı yielded sediments suitable for pollen analysis. According to pollen analysis, East-Central and Southeastern Anatolia were covered by forests consisting of oak, juniper and pistachio until 1900 B.C. The pollen spectrum from the core showed a diminished quantity of tree pollen, although climatic fluctuations were not visible in any comparable cores. Therefore, they suggested that deforestation in the region was caused by human agency and not by climatic factors some time after 1900 B.C. In

the same way, the results of the palaeobotanical studies at Çayönü, about sixty kilometers southeast of Altınova, indicated that at about 7000 B.C. the region was covered with oak-pistachio forests from Southeastern Turkey to the Zagros Mountains of Western Iran (Van Zeist 1972 : 16-7). Yet other palaeobotanical data based on the huge quantity of charcoal recovered, for the ancient environment in the region came from sites around Aşvan located in the north of Altınova (Willcox 1974). According to Willcox, the Aşvan region was part of the Irano-Turanian geography as was suggested by Zohary (Zohary 1973), and consisted of deciduous steppe-forest (Willcox 1974: 120). Willcox identified maple, juniper, oak, ash, plane, poplar, tamarisk and other trees at the sites. He suggested that during the Chalcolithic and Early Bronze Age periods the trees were most probably exploited for fuel and timber and that this marks the first period of deforestation in the region. Oak seems to have substantially diminished after the first millennium B.C. (Willcox 1973 : 132-3). It is therefore suggested that some woodlands were still extant in the region in the third millennium B.C.

In Altınova, the archaeobotanical studies in Korucutepe by Van Zeist and Bakker-Heeres (1975) indicated that the natural vegetation of the Altınova plain probably consisted of forests with poplar, ash and elm as dominant species in the Early Bronze Age. According to them, these trees did not grow far from home, therefore the Altınova plain could have been a woodland. Oak as another dominant natural vegetation in the region covered the mountains surrounding the plain (Van Zeist and Bakker-Heeres 1975 : 233). But, the number of samples per period is generally much too small (Van Zeist and Bakker-Heeres 1975 : 245, table 11).

The historical texts from Mesopotamia, concerning the vegetation of East-Central Anatolia is difficult to interpret. According to Rowton, the mountainous country above Mesopotamia was viewed as a forest domain in the historical texts from Sumerian to Assyrian times (1967). Rowton suggested that the eastern Taurus Mountains and part of the northern Zagros were referred to as the wild cypress

mountains and the tree-epithet for this geography might go back to a very early phase in the Sumerian literary tradition, far back into the Early Bronze Age or perhaps even earlier (1967: 268). He noted that this region is likely to have been deforested at an early date, most probably in the third millennium (1967 :274).

The results of the seed analysis in Korucutepe and Tepecik indicated that the main crops in the region were barley (*Hordeum distichum*) and wheat (*Triticum aestivum/durum*) (Van Zeist and Bakker-Heeres 1975 : 228). *Hordeum distichum* is a two-row barley and *Triticum aestivum* (common wheat) and *Triticum durum* (hard wheat) are a free-threshing tetraploid wheats (*ibid.*). Although free-threshing wheat and two-row barley would have been the main cereal crop plants in the third millennium, emmer wheat (*Triticum dicoccum*) was represented by small numbers of seeds. In the same way, the small amount of *Triticum monococcum* encountered in a few Early Bronze Age samples from Tepecik suggest that this species had not disappeared completely by the Early Bronze Age (Van Zeist and Bakker-Heeres 1975 : 230). Lentil played a fairly important part in the diet of the inhabitants of Altinova. In addition, chick pea (*Cicer arietinum*) was cultivated as well (*ibid.*). The grape pips from Tepecik could indicate that grapes were cultivated in Altinova in the third millennium B.C. (*ibid.*).

Domestic animals make up 85% of total in the Early Bronze Age at Korucutepe (Boessneck and von den Driesch 1975 : 208) (Table 8). This percentage grew to 95% at Tülintepe in Chalcolithic and Early Bronze Ages (1972 : 173). Ovicaprids (sheep and goats) accounted for 65% of animal kept at Korucutepe in the Early Bronze Age (Boessneck and von den Driesch 1975 : 210). In Tülintepe, the greater part of the bone was from Chalcolithic and Early Bronze Ages, and these species accounted for 50% of animal kept (Boessneck and von den Driesch 1972 : 173). In the publication of animal bones from Kortepe in Altinova, the periodical distribution of animal bones were not pointed out, only the complete bones were described and measured (von den Driesch 1972). Therefore, the bones from Körtepe

is not taken into account in this study. Cattle (*Bos taurus*) accounted for 26% of the animal kept at Korucutepe in the Early Bronze Age (Boessneck and von den Driesch 1975 : 210). In Tülintepe, they accounted for 30% of the animal kept (1972 : 173). Pig (*Sus scrofa domesticus*) accounted for 7% of the animal kept, but in Tülintepe it was 15% (1975 : 211 ; 1972 : 173). The percentage of wild animal bones reveals a consistently low-level exploitation of wild resources in Eastern Anatolia (Boessneck and von den Driesch 1972 ; Howell-Meurs 2000 ; Kussinger 1999 ; Stahl 1989 ; Stein 1988). The assemblage from Korucutepe was exception because the hunting of red deer (*Cervus elaphus*) figures more prominently than is apparent elsewhere. Red deer at Korucutepe accounted for 12% of all bones in the Early Bronze Age. Hunters sought male animals by preference, because of their higher meat yield, and also for their antlers (1975 : 212).

According to the above information, the landscape of Altınova in the Early Bronze Age could be described as a flat fertile alluvial plain suitable for agriculture and animal husbandry. Mountains surrounded the plain, and had a greater abundance and proximity of woodlands characterised by oak and juniper trees. Depending on the calculation of the storage capacity at the so-called palace at Norşuntepe (200 tons of grain), it may be suggested that the greater part of the plain must have been covered with barley and wheat fields. In addition, grape could have been cultivated in the region surrounding Tepecik. The water drainage of Heringet stream must have been less rapid than today, as according to Boessneck and von den Driesch (1975: 220) the deep canyon of the Murat river was obviously of recent origin. There was probably a marshy land at the center of the plain because of the springs, hence, 15% of all bones at Tülintepe which was located nearby this land, belonged to pigs. Ovicaprids, the most numerous of the animals in the Early Bronze Age, must have needed low vegetation and shadeless mountain pastures for grazing. Mountains surrounding the plain were covered with oak-juniper forests where red deer and other wild animals lived, but were probably not thick forested because wild sheep and

goats were not found in the region (*ibid.*). Poplar, ash and elm grew within sites or surrounding them (van Zeist and Bakker-Heeres 1975: 233). The deforestation of the region must have begun in the Early Bronze Age (Willcox 1974).

### **III. 3. Population**

The reconstruction of settlement patterns partially depend on population estimates. However, population estimates for prehistoric times are usually no more than guesses. Population, meaning the number of inhabitants in an area, have recently been investigated systematically in the factors of population growth and decline which influence social institutions and human welfare (Nam 1968: 63). In this context, the population estimate for ancient times contributes to our understanding of the political and social structures in any society.

In population theories in The Social Sciences, T.R. Malthus shaped the intellectual discourse (1992). Malthus's ideas are presented in a book entitled *An Essay on the Principle of Population*, which was first published in 1798. According to Malthusian Theory, population depends on food, or other resource limitations as controls on population growth (Malthus 1992). On the other hand, for Marx, focusing on population, apart from the economic system that exploited labor, meant ignoring the real cause of human deprivation (Newman and Matzke 1984: 74). All of the writers in the nineteenth-century such as Malthus, Marx, and Spencer dealt in the greatest detail with the suggested relationship between population change and the human condition. These changes were collectively referred to as the demographic transition that can be seen taking shape in the Darwinian theory of evolution (Newman and Matzke 1984: 76).

In population studies in archaeology, scholars often use settlement size to estimate population. However, according to Portugali and Joffe, at multi-period settlements such a hoyuk or tell sites, it is very difficult to determine which parts of the settlement were inhabited or used in different time periods (Portugali 1982; Joffe

1993: 13-14). Therefore, settlement size does not necessarily correlate with population (Portugali 1982: 171; Joffe 1993: 16).

Some scholars suggested that data collected in archaeological survey can provide a correlation between settlement population size (Hassan 1978: 55; Hassan 1981; Feinman 1991). Demographer R. Naroll proposed a famous equation for population estimates in archeological studies, based on data derived from an examination of 18 modern cultures (Naroll 1962). According to him, the population of a prehistoric site is equal to one tenth of the total floor area in square meters (*ibid.*). A similar equation based on total settlement size and on the amount of floor space constructed by individuals in permanent settlement has also been suggested by Cherry, Whitelaw, and Wiessner (Cherry 1979: 42-3; Whitelaw 1983; Wiessner 1974). Cemeteries and burial grounds have also been used to estimate population. For example, Wagstaff and Cherry proposed a correlation between settlements and small-scale cemeteries for ancient population estimates in Melos (1982). However, this method proved to be less accurate since cemeteries are often used for a very long time.

Another method of estimating population is based on the carrying capacity of the environment in terms of its animal and plant resources for each season. The carrying capacity means “how many people that environment might have supported at a certain level of technology” (Renfrew and Bahn 2000: 452). Costin suggested that a relatively even distribution of production debris across a region indicates dispersed population, whereas an uneven distribution indicates nucleated population (Costin 1991: 29).

Cherry, Davis and Mantzourani proposed a different method for estimating ancient population. They used ethnohistorical information and ethnoarchaeological research as well as survey data in order to estimate population on Keos (Cherry *et al.* 1991; Sutton 1994). In this study, the scholars used documentary evidence on taxation during the Ottoman period on Keos. The relevance of the ethnohistoric

analogies in ancient population density estimates from Byzantine to Bronze Age on Keos was determined empirically (*ibid.*). When the susceptibility of modifications in archaeological, historical and ethnographical data accumulated in the study area is considered, the need for a method in which reliable historical documents and an analysis of the periodical modifications are available.

In Altınova, Griffin attempted to estimate population at the site of Korucutepe for Phase D (Van Loon 1980: 273-4). She based her calculations on the number of houses and the number of persons per house (Van Loon 1980: 273). The excavated houses at Korucutepe in Phase D were parts of 3 or 4 houses in NO 11-12 and a house in OP 17 (Van Loon 1978: 14-8). According to Griffin, the courtyard area around each house seemed to be at least 2 or 3 times as large as the area of the house itself, therefore she proposed an average of 1.5 house per 10 m square (Van Loon 1980: 273). By comparison, plan of Early Bronze Age houses at Tepecik indicated an average of 3 rooms per 10 m square (Esin 1972: pl. 116-7). According to E. Peters, modern houses in Alişam and Aşağı Ağınsı demonstrated that modern density might average 1 house per 20 m square (Peters 1972: 130). On the other hand, in Peters' studies, the area of streets, open spaces, dumps and the others called non-house-occupations made up one quarter of the entire occupation area in the modern sites (1972: pl. 139).

Griffin estimated the population of Korucutepe Phase D in three different ways (Table 9). In her first estimate, an area of 70 squares was taken into consideration (Van Loon 1980: 273). She omitted  $\frac{1}{4}$  of these 70 squares as not occupied by houses, leaving 52.5 m squares for calculations. At 1.5 houses per square and 5.2 people per house, the result was ca. 79 houses and ca. 410 people in the Early Bronze Age II.

In her second estimate, she took a larger area of 124 m squares. After reducing this by  $\frac{1}{4}$ , 93 m squares were left. Allowing 1.5 houses per square and 5.2 people per house, the result was ca. 139 houses with ca. 725 people.

In her third estimate, she took almost the whole area, 194 m squares, of the Korucutepe mound within the Middle Bronze Age city wall circuit. It was reduced by  $\frac{1}{4}$  to 145 m squares. According to this calculation, the result was ca. 218 houses with ca. 1133 people (Van Loon 1980: 273).

Van Loon suggested that Griffin's second estimate was the most likely which corresponded to Phase D (Van Loon 1980: 274). This is not least because 124 m squares came closest to Whallon's proposed occupation area for Korucutepe in the Early Bronze Age II that is 1.3 ha, equal to 130 m square (Whallon 1979: 281). According to these studies, it is suggested that the number of inhabitants was about 577 for each hectare of settlement in Altınova in the Early Bronze Age II.

The settlement density of ancient sites has been discussed for a long time. In Southern Mesopotamia, Frankfort proposed 400 people per hectare (1950: 103), while Adams and Nissen suggested 150-200 people per (1972: 123-4). The population of Uruk which occupied 250 ha in the Late Chalcolithic Period, was estimated as between 25000 and 50000 (Nissen 1993: 56). In Anatolia, Korfmann calculated the figure of 5 people per house at Demircihöyük in Western Anatolia, for its Early Bronze Age levels. He reconstructed the total number of houses as 26 and the population of Demircihöyük as about 130 people (Korfmann 1983: 216-8). Renfrew estimated 300 people for each of settlement in the Cyclades and the Aegean in the third millennium (Renfrew 1972: 251). Persiani proposed a population of 130-150 people in about 30 houses at Pülür-Sakıyol level XI-X (Conti and Persiani 1992: 404). Therefore, it is estimated ca. 5 people per house in Pülür, that was close to that of Korucutepe.

If we consider the suggestion of E.E. Griffin for the population of Korucutepe Phase D dated to Early Bronze Age II to be valid, we can estimate the population of other settlements using the same ration of people per hectare. In this study, the areas of occupation proposed by Whallon will be used in the equation. The following

numbers were reached by using Griffin's conclusion and Whallon's estimated occupation areas.

- 1.Norşuntepe: 1784 people
- 2.Korucutepe: 725 people
- 3.Tepecik: 1505 people
- 4.Tülintepe: 892 people
- 5.Değirmentepe: 1115 people
- 6.Habusu Körtepe: 948 people
- 7.Könk: 1171 people
10. Mezarlık Tepesi: 613 people
11. Yarık Tepe: 334 people
12. Kuruçayır Tepesi: 279 people
13. Körtepe (054/14): 223 people
14. Çakıltepe: 223 people
16. No name (054/19): 55 people
17. Kilise Tepe: 892 people
19. Taşköprü: 390 people
20. Şavka Tepe: 223 people
21. Körtepe (054/25): 390 people
22. Maşatlık: 167 people
23. Gülüşanbaba Tepesi: 279 people
24. Körtepe (054/28): 334 people
25. Altıntepe: 167 people
26. Boy Tepe: 111 people
27. Körtepe (055/4): 446 people
28. No name (055/6): 55 people
29. Aşağı Şeyhacı Tepesi: 446 people
- Total: 13731 people

According to Whallon, fluctuating around an average total occupation area of almost 14 ha, striking high points were found in the Early Bronze Age I-II (24.7 ha) and the Hittite (29.3 ha) periods, with a smaller but probably significant peak in the Ottoman-Recent period (19.4 ha) (1979: 278, fig. 211). In the last census taken before the flooding of the Keban Reservoir Area, the total population of the Keban Reservoir Area was 30.414 (Silier 1976: 16, tablo 1-2). The total measured and estimated area of occupation in Early Bronze Age II within Altınova is larger than the modern occupation area before the flooding. Therefore, a population of 13.731 people in Altınova in the Early Bronze Age II is a reasonable result.

The total population can be estimated as ca. 2900 people in EBA I and ca. 5200 people in EBA III, in spite of the fact that the occupation areas of some settlements in these periods were not measured by the surveyors. The graph of population trends (table 3) shows that the population increased markedly from EBA I to EBA II, and in the same way, it decreased strikingly from EBA II to EBA III.

### **III. 5. Settlement Hierarchy**

Settlement hierarchy is one of the determinants in the settlement pattern studies in archaeology. Generally, the settlement hierarchy is based on the rank order of settlement by size. Larger settlement is usually described as dominant or as the administrative center within a settlement system. Therefore, the hierarchical phenomenon in settlement pattern studies illuminates the economic and political system in societies.

The interactions of fields of influence indicate the hierarchy in the settlement system of a region. The boundary zone between settlements, where allegiance to one or the other of the two settlements is indeterminate, can be identified by using interaction models (Everson and FitzGerald 1972: 95). The discovery of the limits of the fields of influence of settlements at various levels in the hierarchy is of considerable importance in the reconstruction of the settlement patterns of any given region. The interaction model that has been borrowed from physical science is based

on the Newtonian theory of gravitation (Haggett 1966: 35). This model has been applied to the social and cultural aspects of regional studies as well. (Crumley 1979). Some scholars (Hodder and Orton 1976: 187-95; Hodder 1978; Crumley 1979) utilized the interaction model, or the gravity model, in the archaeological context. According to Crumley, the model enables a prediction of the degree of activity between sites (*ibid.*). In Anatolian Archaeology, Tobler and Wineburg applied this model to determine Late Bronze Age trading centers in Anatolia (Tobler and Wineburg 1971).

The model suggests that the movement between two settlements is proportional to the products of their populations and inversely proportional to the square of the distance separating them (Evans and FitzGerald 1972: 97; Haggett 1966: 35; Hodder and Orton 1976: 187-95; Butzer 1982: 215-6). In the settlement studies, this can be formulated as,

$$M_{ij} = P_i P_j / (d_{ij})^2$$

Where  $M_{ij}$  is the interaction between two settlements  $i$  and  $j$ , of population  $P_i$  and  $P_j$  respectively, and  $d_{ij}$  is the distance between them (*ibid.*).

W.J. Reilly of the University of Texas (Reilly 1929 in Everson and FitzGerald 1972: 98) developed this formulation as *the Law of Retail Gravitation*. According to him, this formulation can be used to find the interaction breaking point between two settlements. His formulation is

$$d_{jk} = d_{ij} / 1 + (P_i / P_j)^{1/2}$$

where  $d_{jk}$  is the distance between  $j$  site and interaction breaking point.

In the application of the gravity model in the settlement studies, the population size of sites has been taken as the mass element in Newton's Law (Evans and FitzGerald 1972: 100). Through the use of this model, the service capacity for the surrounding catchment area of two settlements with a given population size is determined. According to Evans and FitzGerald, "the gravity model for measuring the interaction between centers is an ideal medium for local field research, and can provide a suitable framework for individual research in the field" (*ibid.*).

Another model for interpreting settlement patterns is the "Rank-Size Analysis". Rank-Size Analysis is based on the continuum formed by the relationship between rank and size and found empirically in order to show some regularity (Hodder and Orton 1976: 69). According to Lupton, Rank-Size Analysis involves arranging the settlements in a regional system with order of size. The largest occupation is given the first rank, the second largest, the second rank, and so on (Lupton 1996: 8). The results are plotted to give a graphical representation, thus this graph shows a truncated logarithmic distribution of the study area.

Two major types of rank-size relationship have been identified by Berry who studied the city-size distributions in thirty-eight modern countries. According to him, thirteen of the thirty-eight countries were classed as *log-normal* or *rank-size* in distribution. Fifteen countries were classed as *primate* distributions in which one or two very large settlements dominate the distribution (Berry 1961: 575-8).

In archaeology, Rank-Size Analysis has been used by some scholars. For example, R.E.W. Adams and R.C. Jones applied this model to Classical Maya Cities (Adams and Jones 1981). In Near Eastern Archaeology, Lupton used the model in Keban, Karababa, Tabqa and North Jazira regions (Lupton 1996). However, according to Hodder and Orton, the application of this model in archaeology has some problems. In particular, "it is often difficult to define the exact size of sites, their exact contemporaneity, and to be certain that sites of different sizes have been equally preserved." (Hodder and Orton 1976: 73). For Altınova, the application of

this model in Early Bronze Age is not meaningful if we consider that Johnson did not use sites below 1.0 ha for his Rank Size Index calculations because of “lower limb” effect (Johnson 1980; 1987). At Altınova there are a number of sites below 1.0 ha. Even so this model was applied to Altınova for the Post Uruk Period, a period which also has a number of chronological problems.

According to the result of the gravity model applied to settlements in Early Bronze Age I Altınova, 5 independent settlements were identified (Maps 6-9 ; Table 4). However, the agricultural fields were not included for the whole area of Altınova. Van Zeist and Bakker-Heers suggested that the plain probably consisted of forests with poplar, ash, and elm as dominant species (1975: 233), but they did not say anything about the dating of this woodland. It could indeed have been the case for Early Bronze Age I because the wood data from Korucutepe indicate that the number of samples increased between 2600 and 2300. According to archaeobotanists, the charcoal samples originated from timber which had been used for constructional purposes, as well as from fireplaces. Therefore, the deforestation of the region must have begun in the Early Bronze Age II. As a result, the landscape of Altınova in the Early Bronze Age I must have been characterised by woodlands and agricultural fields located around the sites.

When the gravity model is applied to Early Bronze Age II sites of Altınova, 9 independent service centers are identified (Map 7 ; Table 5). 3 large settlements, above 2 ha, that are Norşuntepe, Tepecik and Könk, 5 medium settlements between 2 and 1 ha, Değirmentepe, Tülintepe, Korucutepe, Habusu Körtepe and Kilisetepe, and a small settlement, that is Aşağı Şeyhacı Tepesi can be identified as independent centers in Altınova in the Early Bronze Age II (Map 10). According to Whallon and Kantman, the region demonstrated a three-tier hierarchy in the Central Place Theory, and Norşuntepe was the central city where other settlements depended on in the Early Bronze Age (Whallon and Kantman 1969; 1970). However, Hauptmann proposed that the excavations in the region did not confirm this hierarchical

phenomenon proposed by Whallon and Kantman (Hauptmann 1979: 63). According to him, 10 big villages were located independently in the region (*ibid.*).

The gravity model applied to the region in this study supported Hauptmann's theory. Norşuntepe, Tepecik and Könk were dominant sites at a regional level during Early Bronze Age II. 5 small villages (10, 19, 20, 21 and 27) depended on Norşuntepe as a service center, while 2 small villages (25 and 26) could have been in Norşuntepe's catchment area, although these were closer to Korucutepe than Norsun. 4 small villages (12, 13, 14, and 24) depended on Könk. But, the settlements 13 and 14, could have been in the field of influence of Kövenk Hoyuk located outside of the flooding area in Altınova. Unfortunately, the archeological information on this settlement is very limited. Two small villages (11, 23) were located in the surrounding catchment area of Tepecik, but in the uninvestigated area to the north of the site, some villages could have depended upon Tepecik as their service center as well.

In medium centers, such as Değirmentepe, Tülintepe, Korucutepe, Körtepe and Kilisetepe, the field of influence was smaller than larger centers. Değirmentepe located on the northeast edge of the Reservoir Area in Altınova had two dependent small villages (16 and 28). But, the settlement number 16 could have been dependent on a different settlement located on the uninvestigated area. According to model, no small villages have been located in the catchment area of Tülintepe. Some dependent sites could have been present in the uninvestigated area located to the north of Tülintepe. One small village (22) depended on Kilisetepe as a service center. Körtepe (Habusu) did not have any dependent village. Two small villages, 25 and 26, could have been either in the catchment area of Korucutepe or Norşuntepe. According to the gravity model, only one small village had an independent catchment area in Altınova, and that was Aşağı Şeyhacı Tepesi. The site was located 6 km east of Körtepe and 5 km east of Korucutepe. This distant location must have contributed to this peculiar position as an independent small village.

In the Early Bronze Age III, both the number of the settlements and the settlement sizes declined radically in Altınova (Map 8 ; Table 5). 12 settlements were dated to the Early Bronze Age III. Nine small settlements including Norşuntepe and Korucutepe occupied an area below 1 ha. Two settlements, Tepecik and Tülintepe, were medium level in size. And, Könk occupied an area above 2 ha (Whallon 1979: 282). In this context, the survey data indicated that Könk was the dominant site at a regional level in Altınova, but the archeological excavation data indicated a different phenomenon. According to regularities and laws of settlement pattern studies in the positivist aspect, Norşuntepe, a small village in the Early Bronze Age III, according to the survey data, must have depended upon a larger settlement. However, the site was characterized by a monumental building complex called “palace” in the Early Bronze Age III. This building complex has also been called the “Pithos Gebäude” because of the 100 storage jars found arranged in rows within the complex. According to Hauptmann, the capacity of the storage in this building complex, on the basis of the capacities of storage jars found in situ, was calculated at approximately two hundred tons of grain (Hauptmann 1979: 63). Therefore, Norşuntepe in the Early Bronze Age III required a larger catchment area than its catchment area in the Early Bronze Age II. The gravity model was not suitable for an application in the Early Bronze Age III, when the model was applied to Early Bronze Age III sites of Altınova. Because the catchment area of Norşuntepe appeared smaller than the previous periods (Map 11). If the application of the gravity model for earlier phases is considered, this result presented a discrepancy for Early Bronze Age III. While the archaeological finds indicated that Norşuntepe had a leading role in the settlement system, the gravity model suggested the opposite.

Therefore, although Norşuntepe appeared as a small settlement expanding to an area of only 0.8 ha, it must have had a dominant role in economical and social structures within the region. Norşuntepe probably had a large catchment area in the Early Bronze Age III and exploited the region in a central economic context. The

mode of production was based on the exploitation of a large catchment area and the storage of surplus.

Before flooding in Altınova, central economic system depending on one family or community was the basic social structure in the region, according to the observation made by O. Silier in her sociological investigations (Silier 1976: 31). In this system, the social structure in Altınova had an historical identity and indicated a peculiarity of closed society based on the land (Silier 1976: 43). The lord (Ağa in Turkish) was the master of possession and rent of the land (Silier 1976: 33). The living area of Ağa with his family is constructed as a structure that is larger and its function is different than the peasants' houses. This structure, with a symbolic value, is the center of the system based on exploitation and storage. In this context, the "Ağa Konak" in the village of Munzuroğlu can contribute to an understanding of the historical social structure in the region (Figure 43). The construction technique of this building was different to that of other buildings in located both inside and outside the village (Koyunlu 1982). Three big storage rooms, two of them were used as stables later periods, and two large courtyards are the dominant elements on lower floor of the building (Koyunlu 1982: 274, pl. 157). The upper floor of the konak consists of the family living quarters (Koyunlu 1982: 275, pl. 157). The "Ağa Konak" was the symbol of social and economic phenomena in the village. The "Ağa" exploited the villages depending on his control and storage surplus of the peasants (Silier 1979: 31-3). "Ağa Konak" as a symbolic value was the *sine qua non* of the economic and social phenomenon in the region. In this context, the "palace" building of Norşuntepe in the Early Bronze Age III had a similar function to the "Ağa Konak" in the modern times, that is the storage of the surplus. In addition, the small occupation area of Norşuntepe provided an analogy with the Ağa system in Eastern Anatolia because the living area of Ağa could be smaller than villages depending on him. Therefore, the economic and social system of Norşuntepe in the

Early Bronze Age III could be identified as a central phenomenon within the pre-state organization.

Another analysis to test the application of the gravity model was carried out. This analysis, which is called the Nearest Neighbor Analysis and is a statistical knowledge, assigns to an unclassified sample point the classification of the nearest of a set of previously classified points in the simplest nonparametric decision procedure of the classification form (Cover and Hart 1991: 57). In the settlement studies, the most important determinant for the location of a settlement is the nearest neighbor distance (Tuna 1983: 130). According to Tuna, there is a reverse relation between the average nearest neighbor distance of the settlements in the same level and the number of the settlements (*ibid.*). In archaeology, this analysis is appropriate for most archaeological data (Hodder and Orton 1976: 38). According to this test, the basic data consist of the distance from each point to the point nearest to it (*ibid.*). However, the classification of the settlements is the main determinant of this analysis to understand the settlement distribution in the distance context. Therefore, unclassified data is not appropriate for the Nearest Neighbor Analysis.

In the application of this analysis to Early Bronze Age Altınova, first and third periods are not appropriate because of the unclassified data, while the second period of Early Bronze Age is appropriate. According to results of the analysis (Appendix 2; table 10), the settlements in the Early Bronze Age II distributed non-randomly in the plain (map 12). Therefore, it can be said that the settlement distribution had a non-random pattern in the Early Bronze Age II Altınova. These results of Nearest Neighbor Analysis support the gravity model application to Early Bronze Age II.

To conclude, the Altınova Plain had been affected by contact with Syro-Mesopotamian cultural zone during Early Bronze Age I. The low settlement density in this sub-period was replaced in the Early Bronze Age II by a series of spatially defined settlement clusters determined by nine service centers on the plain. The

cultural shift from Syro-Mesopotamian to Transcaucasian in the Altınova Plain was clearly demonstrated in the striking difference between two sub-periods in both settlement density and settlement system. Although the settlements in the Early Bronze Age I had an independent and self-sustaining economic structure, the settlement system in the Early Bronze Age II focused on service centers with dependent sites. However, even then, each service center had an independent and self-sustaining economic system similar to the previous sub-period.

In the Early Bronze Age III, the previous economic activity was transformed to centralized and dependent system with the weight on Norşuntepe. And the cultural phenomenon identified as Early Transcaucasian Culture continued more dominantly in the plain. In the new economic system, the “Ağa” at Norşuntepe stored the surplus produce of the plain and conducted trade relations as far a field as Southern Mesopotamia. Indeed, the new centralized political system in the Altınova Plain was the maladaptation of the *Early State* organization of Southern Mesopotamia. The Ağa at Norşuntepe began to store surplus in the storage complex of the first version of the palace in the first sub-period of Early Bronze Age III. But, Korucutepe with its monumental structure called “the hall” was the rival of Norşuntepe in this sub-period. In the later sub-period, the storage complex of the palace and its capacity were enlarged because of the larger catchment area as a result of the collapse of Korucutepe. At the end of this sub-period, the system collapsed and the palace was destroyed, the building got burnt and plundered. Simple houses were built over the ruins, where “Cappadocian Ware” was used (Hauptmann 1974: 15). The collapse could be associated with three reasons; immoderate storage which was not transformed in to economic value, asymmetric inter-regional trade with the Syro-Mesopotamian region (Algaze 1989; 1993), and limited geographical borders such as the narrow plains (Frangipane 2002). As a result of these negative factors, the centralised socio-political and economic system of Norşuntepe in the Early Bronze Age III collapsed dramatically.

All of these observations on the population, settlement pattern and settlement size relationship suggested that there was a modification in the system of each sub-period. However, the data coming from the previous researches in the region is inadequate to explain the reasons of these modifications. Therefore, these modifications will not be interpreted in this study. The investigations that will be made in the future, in the unroofing area of Altınova should give the adequate data to solve the problems in the archaeology of the region.

## CHAPTER IV

### CONCLUSIONS

This study attempted an understanding of the settlement patterns of Altinova in the Early Bronze Age and its reflection to social and cultural phenomena. The cultural interactions of the region with Syro-Mesopotamia and Transcaucasia identified the social and political developments that could be associated with phases of major modifications in the character of the social order as a whole.

The nature of the developments in the region during the Early Bronze Age I indicated a tension and conflict within the orders from Transcaucasian and Syro-Mesopotamian regions. The early phase of this period distinguished by the Transcaucasian influx to the East-Central Anatolia. In the archaeological context, this influx is very clear in Arslantepe VI B1 (Conti and Persiani 1993: 362; Frangipane 2000: 447-9). However, this subperiod is represented by hiatus in Norşuntepe (Hauptmann 1972: 113-5). In the second phase of this period, the region re-came in the orbit of the Syro-Mesopotamian complex. The wheel made Late Reserved Slip Ware and Plain Simple Ware in this subperiod characterized to the cultural materials in the region. Before Early Bronze Age, Early Reserved Slip Ware and Uruk-like wares were the characteristic pottery groups in the Late Chalcolithic Period in East-Central Anatolia and indicated Late Uruk impact (Palmieri 1985: 198; Abay 1997: 405-8). This phenomenon represented a vivid interaction between East-Central Anatolia and Syro-Mesopotamian regions, especially, at the colonial site of Uruk located outside of Tepecik (Esin 1974: 120-1; 1976: 105). Although the Transcaucasian influx halted this interaction in the early phase of Early Bronze Age

I, in the second phase of this period the interaction between two cultural environments was revived. But, the Transcaucasian people withdrawing to the north threatened the Altinova settlements. As a result, the settlements in this period were encircled by the fortification walls.

The tension in the region between these two cultural environments reflected to the settlement density in the region. The settlement density in Altinova in this period (only five settlements), was lower than the previous period. The population was about 2900 people in the region. In the Late Chalcolithic Period, however, 12 settlements were occupied by the people (Whallon 1979: 266). This incline in the number of settlements and population density in the Early Bronze Age I could have been the result of instability in the region, stemming from the Transcaucasian people in the north. At the end of the Early Bronze Age I, the system based on Syro-Mesopotamia was collapsed. And thus, the Transcaucasian people and their cultural complex re-came to the region from the north.

In the Early Bronze Age II dated between 2700 and 2500 B.C., the dominant culture seen in Altinova is a culture of Caucasian extraction spread from Caucasus to the East-Central Anatolia and to Levant and Iran. This culture was characterized by a specific pottery, Red-Black Burnished Ware, that is hand-made, elegant, varied in form, and black polished. Curvilinear or round and sometimes rectangular houses with benches were constructed with wattle-and-daub superstructure, and spectacular anthropomorphic andirons (Burney and Lang 1971: 56-7; Van Loon 1980: 272; Kushnareva 1997: 43-4).

Red-Black Burnished Ware and local Painted Ware characterized the material culture of the region in this period. The number of sites and their sizes increased in the Early Bronze Age II. In the same way, the population reached at 13700 people in this period. 25 settlements were occupied in the plain, 3 of which were large settlements above 2 ha., 5 were medium, and 17 were small settlements below 1 ha.

The gravity model suggested that there were 9 independent service centers in the region.

In the Early Bronze Age III dated between 2500 and 2000 BC, it continued that Red-Black Burnished Ware and local Painted Ware were used in dominant. But, there were some periodical changes on the pottery shape and design. In this period, both the number of the settlements and the settlement sizes declined radically in Altınova. At the same, the population reduced to about 5700 people. 12 settlements were dated to Early Bronze Age III in the region. 9 small settlements including Norsuntepe and Korucutepe were occupied an area below 1 ha. 2 settlements, Tepecik and Tülintepe, were in the medium level. And, Könk was occupied an area above 2 ha (Whallon 1979: 282). Although Norşuntepe was noticed as a small settlement expanding to an area of 0.8 ha, it had a dominant role to construct economical and social structures in the region. The site was characterized by a monumental building complex called “palace” in the Early Bronze Age III.

The archaeological picture mentioned above indicates that the socio-political modifications in the region were determined by the foreign interaction areas, Syro-Mesopotamia and Transcaucasia. These two areas imported to the region not only their cultural institutions and practices, but also their social values which were largely determined by the cultural integration of the social order. According to R. Williams, “in situations of dispersed powers the most common relations of cultural producers are those of the different form of patronage” (1986: 221). In this context, Syro-Mesopotamian dependence of East-Central Anatolia since 4<sup>th</sup> millennium BC was based on the economic resources of the region for the markets in Syro-Mesopotamia. Thus, Syro-Mesopotamia as a power and a cultural producer instituted the cultural and socio-political phenomena in the region. In the Early Bronze Age I, however, the system went into a crisis because of the inner problem of the system (Frangipane 2001: 8-9). The “old” Syro-Mesopotamian system of the region was in the conflict with the “new” system emerging as a result of the merging of the

Transcaucasian world with the cultures of the Anatolian Euphrates (Frangipane 2001: 8). In the end of the conflict, the region distanced itself from the control and exploitation area of Syro-Mesopotamia. As a result of the conflict and the unstable situation in the Early Bronze Age I, the settlement and population densities of Altinova were more lower than the previous and following periods.

After the conflict between two interaction areas, the region went to the orbit of the Transcaucasian cultural complex with a strong local character in the Early Bronze Age II. In this period, the socio-political and economic system was based on the service centers with dependent sites and self-sustaining economic structure. But, the main difference of this period was in the more settlement density than the other periods. However, the archaeological data from the previous researchs in the region is inadequate to explain the reasons of this main difference and this modification. Therefore, the investigations that will be made in the future, in the unroofing area of Altinova should give the adequate data to solve the problems in the archaeology of the region.

Depending on the archaeological data in the Early Bronze Age III, it is suggested that the system can be identified in the central economic context with the weight on Norşuntepe. The mechanisms of this system belonged to the exploitation of the catchment area and the storage of the surplus. In this context, the monumental building in Norşuntepe, as a symbolic value, represented the maladaptation and change that are twin aspects of the history of Norşuntepe in this sub-period. On the other hand, the system based on the institutional integration of power relationships. Power as an instituted economic structure did not nourish itself with a religious ideology in Norşuntepe. The temple areas dated to Early Bronze Age were not reported in the excavations of Keban region. But, the temple as one of the architectural elements of central socio-political power had been constructed in Arslantepe in the 4<sup>th</sup> millennium. Therefore, the relation between the religious structure and the central power was known as a social mode in East-Central Anatolia.

But, the absence of the religious buildings dated to Early Bronze Age in the region supported to suggest that the socio-political system was not based on the religious structure in this period. In this pattern of Early Bronze Age world in Altnova, dominated by economic concentrations of “new” power, the system was not instituted itself with the religious structure. The only economic concentration policy of power had the problems stemming from the gaps in the economic system of the period, which were immoderate storage which was not transformed in to economic value, asymmetric inter-regional trade with the Syro-Mesopotamia (Algaze 1989; 1993), and limited geographical borders such as narrow plain (Frangipane 2002). On the other hand, according to P. Bourdieu, the privilege of certain institutions can be related to a distinction between short-term cultural commerce, as in ordinary market operations, in items of limited symbolic value, and longer-term operations in which major symbolic value is dependent on the *authority* (Bourdieu 1977 in Williams 1986: 225). In this context, the fact that the ordinary market operations of Altnova were problematic as mentioned above, and in the same, symbolic value was constructed by individual and economic contexts as only monumental building, not including religious context, created a problematic perception about power. This perception brought on a resistance against it. As M. Foucault notes,

just as the networks of power relations ends by forming a dense web that passes through apparatuses and institutions, without being exactly localized in them, so too the swarm of points of resistance traverses social stratifications and individual unities (Foucault 1979: 96).

Thus, the power system in Altnova met with a crucial crisis in the end of this period. As a result, the system collapsed and the monumental building was destroyed, building got burnt and plundered. The game of people living in Altnova of Early Bronze Age finally ended with a new period starting a new history.

## REFERENCES

- ABAY, E.  
1997. *Die Keramik der Frühbronzezeit in Anatolien mit "Syrischen Affinitäten"*. Münster: Ugarit-Verlag.
- ADAMS, R.E.W. & R.C. JONES.  
1981. "Spatial Patterns and Regional Growth among Classical Maya Cities." *AmerAnt* 46: 301-22.
- ADAMS, R. Mc. & H. NISSEN.  
1972. *The Uruk Countryside: the Natural Setting of Urban Societies*. Chicago: Chicago University Press.
- AKKAN, E.  
1972. "Elazığ ve Keban Baraj Çevrelerinde Coğrafiya Araştırmaları." *N.N. Coğrafya Araştırmaları Dergisi* 1-2: 175-214.
- AKTÜRE, S.  
1994. *Anadolu'da Bronz Çağ Kentleri*. İstanbul: Tarih Vakfı Yurt Yayınları.
- ALTINLI, I.E.  
1963. *Erzurum. 1:500.000 Ölçekli Türkiye Jeoloji Haritası (Explanatory Text of the Geological Map of Turkey)*. Ankara: Maden Tetkik ve Arama Enstitüsü.
- ALCOCK, S.E.  
1993. *Graecia Capta: The Landscape of Roman Greece*. Cambridge: Cambridge University Press.
- ALGAZE, G.  
1986a. "The Seramic Sequence." In *The Chicago Euphrates Archaeological Project 1980-1984: An Interim Report*, edited by L. Marfoe et al. *Anatolica* 13: 54-60.  
1986b. "Kurban Höyük and the Late Chalcolithic Period in the Northwest Mesopotamian Periphery: A Preliminary Assessment." In *Gamdat Nasr: Period or Regional Style?*, edited by U. Finkbeiner and W. Rollig, 274-315. Wiesbaden.  
1989. "Uruk Expansion, Cross-cultural Exchange in Early Mesopotamian Civilization." *CurrAnthr* 30: 571-608.  
1993. *The Uruk World System, the Dynamics of Expansion of Early Mesopotamian Civilization*. Chicago: Chicago University Press.

- AMMERMAN, A.J.  
1981. "Surveys and Archaeological Research." *Annual Review of Anthropology* 10: 63-88.
- ANKARA  
1972. *Lead, Copper, and Zinc Deposits of Turkey*, no. 133. Ankara: MTAE.
- BARKER, G.  
1991. "Approaches to Archaeological Survey." In *Roman Landscapes: Archaeological Survey in the Mediterranean*, edited by G. Barker and J. Lloyd, 1-9. British School at Rome, Archaeological Monograph 2. London: British School at Rome.
- BARKER, G. & J. LLOYD, (ed.)  
1991. *Roman Landscapes: Archaeological Survey in the Mediterranean*. British School at Rome, Archaeological Monograph 2. London: British School at Rome.
- BEHM-BLANCKE, M.  
1984. "Hasek Höyük." *IstMitt* 34: 31-149.
- BERRY, B.J.L.  
1961. "City Size Distributions and Economic Development." *Economic Development and Cultural Change* 9: 573-88.
- BİLGİ, Ö.  
1985. "1984 Dönemi Malatya-Köşkerbaba Höyük Kurtarma Kazıları." In *Kazı Sonuçları Toplantısı* 7, 143-49. Ankara: TTKB.
- BINFORD, L.R.  
1982. "The Archaeology of Place." *JanthArch* 1: 5-31.
- BINTLIFF, J. & A. SNODGRASS  
1988. "Mediterranean Survey and the City." *Antiquity* 62/234: 57-71.
- BOESSNECK, J. & A. von den DRIESCH  
1975. "Tierknochenfunde vom Korucutepe bei Elazığ in Ostanatolien." In *Korucutepe I*, edited by M.N. Van Loon, 1-220. Amsterdam: North Holland.  
1976. "Die Knochenfunde vom Norsuntepe." In *Keban Project 1972 Activities*, METU Series I. No. 5, 91-100. Ankara: METU Press.
- BRAIDWOOD, R. & L. BRAIDWOOD  
1960. *Excavations in the Plain of Antioch. I. The Earliest Assemblages A-J*. Chicago: Chicago University Press.
- BREWER, D.J.  
1992. "Zooarchaeology: Method, Theory, and Goals." *Archaeological Method and Theory* 4: 195-224.

- BURNEY, C. A.  
 1958. "Eastern Anatolia in the Chalcolithic and Early Bronze Age." *AnatSt* 8: 157-209.  
 1961. "Excavations at Yanik Tepe, Azerbaijan." *Iraq* 23: 138-55.  
 1980. "Aspects of the Excavations in the Altinova, Elazig." *AnatSt* 30: 157-167.
- BURNEY, C.A. & D. M. LANG  
 1971. *The Peoples of the Hills: Ancient Ararat and Caucasus*. London and New York: Praeger.
- BUTZER, K.W.  
 1982. *Archaeology as Human Ecology*. Cambridge: Cambridge University Press.
- CHANG, K.C.  
 1962. "A Typology of Settlement and Community Patterns in Some Circumpolar Societies." *Arctic Archaeology* 1: 28-41.  
 1968. (ed.) *Settlement Archaeology*. Palo Alto CA.: National Press Books.
- CHERRY, J.F.  
 1979. "Four Problems in Cycladic Prehistory." In *Papers in Cycladic Prehistory*, edited by J.L. Davis and J.F. Cherry, 22-47. UCLA Institute of Archaeology Monograph 14. Los Angeles: University of California Press.
- CHERRY, J.F., J.L. DAVIS, & E. MANTZOURANI  
 1991. *Landscape Archaeology as Long-Term History: Northern Keos in the Cycladic Islands from Earliest Settlement to Modern Times*. Monumenta Archaeologica 16. Los Angeles: UCLA Institute of Archaeology.
- CHILDE, V.G.  
 1931. *Skara Brae: A Pictish Village in Orkney*. London: Kegan Paul.  
 1942. "The Chambered cairns of Rousay." *AntJ* 22: 139-42.
- CONTI, A.M. & C. PERSIANI  
 1993. "When Worlds Collide: Cultural Developments in Eastern Anatolia in the Early Bronze Age." In *Between the Rivers and Over the Mountains. Archaeologica Anatolica et Mesopotamica. Alba Palmieri Dedicata*. edited by M. Frangipane, H. Hauptmann, M. Liverani, P. Matthiae, and M. Mellink, 391-413. Rome: Universita di Roma "La Sapienza".
- COSTIN, C.L.  
 1991. "Craft Specialization: Issues in Defining, Documenting, and Explaining the Organization of Production." *Archaeological Method and Theory* 3: 1-56.
- COVER, T. & P. HART  
 1991. "Nearest Neighbor Pattern Classification." In *Nearest Neighbor (NN) Norms: NN Pattern Classification Techniques*, edited by B.V. Dasarathy, 57-63. Los Alamitos, Calif.: IEEE Computer Society Press ; Washington : IEEE Computer Society Press Tutorial.

ÇÖLAŞAN, U.E.

1970. *Türkiye İklim Kılavuzu*. Ankara: Ogun Kardeşler Matbaası.

CRANE, H.R. & J.B. GRIFFIN

1972. "University of Michigan Radiocarbon Dates XIV." *Radiocarbon* 14, 1: 155-94.

CRUMLEY, C.L.

1979. "Three Locational Models: An Epistemological Assessment for Anthropology and Archaeology." *Archaeological Method and Theory* 2: 143-73.

CRUMLEY, C.L. & W.H. MARQUARDT

1990. "Landscape: A Unifying Concept in Regional Analysis." In *Interpreting Space: GIS and Archaeology*, edited by K.M.S. Allen, S.W. Green, and E.B.W. Zubrow, 73-9. New York: Taylor and Francis.

DARGA, M.

1982. "Şemsiyetepe Kazıları 1981 Yılı Çalışmaları." In *Kazı Sonuçları Toplantısı* 4, 55-62. Ankara: TTKB.

1983. "Şemsiyetepe Kurtarma Kazıları 1982 Yılı Çalışmaları." In *Kazı Sonuçları Toplantısı* 5, 91-6. Ankara: TTKB.

1985. "Şemsiyetepe 1984 Yılı Kazı Çalışmaları." In *Kazı Sonuçları Toplantısı* 7, 119-28. Ankara: TTKB.

1989. "Şemsiyetepe Kazısı, 1987 Sonuçları." In *Kazı Sonuçları Toplantısı* 10, 181-85. Ankara: TTKB.

Di NOCERA, G.M.

2000. "Radiocarbon Datings from Arslantepe and Norşuntepe: The Fourth-Third Millennium Absolute Chronology in the Upper Euphrates and Transcaucasian Region." In *Chronologies des pays du Caucase et de L'Euphrate aux IVe -IIIe Millenaires*, edited by C. Marro and H. Hauptmann. 73-89. Paris: De Bocard Edition-Diffusion for Institut Français D'Etudes Anatoliennes D'Istanbul.

DURAN, F. S.

1974. *Büyük Atlas*. İstanbul: Kanaat Yayınları

DURU, R.

1979. *Keban Project Değirmentepe Excavations 1973*. METU Keban Project Publications, Series 3, No. 2. Ankara: METU Press.

DYSON, R.H.

1968. "The Archaeological Evidence of the Second Millennium B.C. on the Persian Plateau." In *Cambridge Ancient History* II, fasc. 66. Cambridge: Cambridge University Press.

EASTON, D.F.

1976. "Towards a chronology for the Anatolian Early Bronze Age." *AnatSt* 26: 145-73.

EBERT, J.I.

1992. *Distributional Archaeology*. Albuquerque: University of New Mexico Press.

ERİNÇ, S.

1953. *Doğu Anadolu Coğrafyası*. İstanbul Üniversitesi Coğrafya Enstitüsü Yayınları, No: 15. İstanbul: Edebiyat Fakültesi Basımevi.

ERTEM, H.

1970. "Hanıbrahimşah Kazısı 1970 yılı Ön Raporu." *TurkArkDerg* 19: 87-92.

1972. "Han İbrahim Şah Kazısı, 1970." In *Keban Project 1970 Activities*, METU Series I. No. 3, 69-76. Ankara: METU Press.

1974. "Han İbrahim Şah Kazısı, 1971." In *Keban Project 1971 Activities*, METU Series I. No. 4, Ankara: METU Press.

1982. *Keban Project, Han İbrahim Şah Excavations 1970-71*. METU Keban Project Publications, Series III, No. 3. Ankara: METU Press.

ESİN, U.

1970. "Tepecik Kazısı 1968 Yılı Ön Raporu." In *Keban Project 1968 Activities*, METU Series I. No. 1, 147-73. Ankara: METU Press.

1971. "Tepecik Kazısı, 1969." In *Keban Project 1969 Activities*, METU Series I. No. 2, 107-31. Ankara: METU Press.

1972. "Tepecik Kazısı, 1970." In *Keban Project 1970 Activities*, METU Series I. No. 3, 139-59. Ankara: METU Press.

1974. "Tepecik Kazısı, 1971." In *Keban Project 1971 Activities*, METU Series I. No. 4, 109-37. Ankara: METU Press.

1976a. "Tepecik Kazısı, 1972." In *Keban Project 1972 Activities*, METU Series I. No. 5, 101-19. Ankara: METU Press.

1976b. "Tülintepe Kazısı, 1972." In *Keban Project 1972 Activities*, METU Series I. No. 5, 119-75. Ankara: METU Press.

1979a. "Tepecik Kazısı, 1973." In *Keban Project 1973 Activities*, METU Series I. No. 6, 97-113. Ankara: METU Press.

1979b. "Tülintepe Kazısı, 1973." In *Keban Project 1973 Activities*, METU Series I. No. 6, 121-34.

1979c. "Tepecik ve Tülintepe Kazıları." In *VIII. Türk Tarih Kongresi*, vol. I, 65-76. Ankara: Türk Tarih Kurumu.

1982a. "Tepecik Kazısı, 1974." In *Keban Project 1974 Activities*, METU Series I. No. 7, 95-118. Ankara: METU Press.

1982b. "Tülintepe Kazısı, 1974." In *Keban Project 1974 Activities*, METU Series I. No.7, 127-36. Ankara: METU Press.

1982c. "Die Kulturellen Beziehungen zwischen Ostanatolien und Mesopotamien sowie Syrien anhand einiger Grabungs und Oberflächenfunde aus dem oberen Euphrattal im 4 Jt. v. Chr." In *Mesopotamien und seine Nachbarn*. XXV. Rencontre Assyriologique Internationale, Berlin 1978, Teil 1, 13-21, edited by H. J. Nissen and J. Renger. Berlin.

1982d. "Siedlungsordnung im ostlichen Anatolien während des 4. und 3. Jahrtausends v. Chr." In *Palast und Hütte. Symposium der Alexander von Humboldt-Stiftung Bonn-Bad Godesberg, Berlin 1979*. Mainz.

ESİN, U. & G. ARSEBÜK

1974. "Tülintepe Kazısı, 1971." In *Keban Project 1971 Activities*, METU Series I. No. 4, 137-43. Ankara: METU Press.

EVERSON, J.A. and B.P. FITZGERALD

1972. *Settlement Patterns*. London: Longman.

FAGAN, B.M.

1991. *In The Beginning, An Introduction to Archaeology*. 7<sup>th</sup> ed. New York: Harper Collins Publishers.

FEINMAN, G.M.

1991. "Demography, Surplus, and Inequality: Early Political Formations in Highland Mesoamerica." In *Chieftdoms: Power, Economy, and Ideology*, edited by T.K. Earle, 229-62. Cambridge: Cambridge University Press.

FIELDEN, K.

1977. "Tell Brak 1976: the Pottery." *Iraq* 39: 245-55.

FLANNERY, K.V.

1967. "Culture History vs. Cultural Process: A Debate in American Archaeology." *Scientific American* 217: 119-22.

1976. "Evolution of Complex Settlement Systems." In *The Mesoamerican Village*, edited by K.V. Flannery, 162-73. New York: Academic Press.

FRANGIPANE, M.

1998. "Changes in Upper Mesopotamia/Anatolian Relations at the Beginning of 3<sup>rd</sup> Millennium B.C." In *About Subartu*, edited by M. Lebeau, *Subartu* IV71: 195-218.

2000. "The Late Chalcolithic/EBI Sequence at Arslantepe. Chronological and Cultural Remarks from a Frontier Site." In *Chronologies des pays du Caucase et de L'Euphrate aux IVe -IIIe Millenaires*, edited by C. Marro and H. Hauptmann. 446- 471. Paris: De Boccard Edition-Diffusion for Institut Français D'Etudes Anatoliennes D'Istanbul.

2001. "The Transition Between Two Opposing Forms of Power at Arslantepe (Malatya) at the Beginning of the 3<sup>rd</sup> Millennium." *TUBA-AR* 4: 1-24.

2002. *Yakındoğu'da Devletin Doğuşu*. İstanbul: Arkeoloji ve Sanat Yayınları. Originally published as *La Nascita dello Stato nel Vicino Oriente*. (Rome: Gius. Laterza & Figli Spa. 1996).

FRANGIPANE, M. & A. PALMIERI

1983. "Cultural Developments at Arslantepe at the Beginning of the Third Millennium: the Settlements of Period VIB." In *Perspectives on Proto-urbanization in Eastern Anatolia: Arslantepe (Malatya). An Interim Report on 1975-1983 campaigns*, edited by M. Frangipane and A. Palmieri, *Origini* 12/2: 523-74.

FRANKFORT, H.

1950. "Town Planning in Ancient Mesopotamia." *Town Planning Review* 21: 98-115.

GOLDMAN, H.

1931. *Excavations at Eutresis in Boeotia*. Cambridge, Mass.: Cambridge University Press.

1956. *Excavations at Gözlü Kule, Tarsus*. Vol. II. Princeton: Princeton University Press.

GREGORY, D.

1985. "Areal Differentiation and Post-Modern Human Geography." In *Social Relations and Spatial Structures*, edited by D. Gregory and J. Urry, 67-96. London: Macmillan.

HAGGETT, P.

1966. *Locational Analysis in Human Geography*. 2<sup>nd</sup> ed. London: Edward Arnold Publishers.

HASSAN, F.

1978. "Demographic Archaeology." *Archaeological Method and Theory* 1: 49-103.

1981. *Demographic Archaeology*. New York: Academic Press.

HAUPTMANN, H.

1969/70. "Norsuntepe. Historische Topographie und Ergebnisse der Grabungen 1968/1969." *IstMitt* 19/20: 21-78.

1970. "Die Grabungen auf dem Norsuntepe, 1968." In *Keban Project 1968 Activities*, METU Series I. No. 1, 115-30. Ankara: METU Press.

1971. "Die Grabungen auf dem Norsuntepe, 1969." In *Keban Project 1969 Activities*, METU Series I. No. 2, 81-90. Ankara: METU Press.

1972. "Die Grabungen auf dem Norsun-Tepe, 1970." In *Keban Project 1970 Activities*, METU Series I. No. 3, 103-117. Ankara: METU Press.

1974. "Die Grabungen auf dem Norsun-Tepe, 1971." In *Keban Project 1971 Activities*, METU Series I. No. 4, 87-99. Ankara: METU Press.

1976a. "Die Grabungen auf dem Norsun-Tepe, 1972." In *Keban Project 1972 Activities*, METU Series I. No. 5, 71-90. Ankara: METU Press.

1976b. "Die Ausgrabungen auf dem Kortepe, 1972." In *Keban Project 1972 Activities*, METU Series I. No. 5, 33-4. Ankara: METU Press.

1976c. "Die Entwicklung der Frühbronzezeitlichen Siedlung auf dem Norsuntepe in Ostanatolien." *ArchKorrBl* 6: 9-20.

1979a. "Die Grabungen auf dem Norsun-Tepe, 1973." In *Keban Project 1973 Activities*, METU Series I. No. 6, 61-78. Ankara: METU Press.

1979b. "Kalkolitik Çağdan İlk Tunç Çağının Bitimine Kadar Norsuntepe'de Yerleşmenin Gelişimi." In *VIII. Türk Tarih Kongresi*, vol. I, 55-63. Ankara: Türk Tarih Kurumu.

1982. "Die Grabungen auf dem Norsuntepe, 1974." In *Keban Project 1974-1975 Activities*, METU Series I. No. 7, 41-70. Ankara: METU Press.

2000. "Zur Chronologie des 3. Jahrtausends V. Chr. am Oberien Euphrat Aufgrund der Stratigraphie des Norsuntepe." In *Chronologies des pays du Caucase et de*

*L'Euphrate aux IVe –IIIe Millenaires*, edited by C. Marro and H. Hauptmann. 419-430. Paris: De Boccard Edition-Diffusion for Institut Français D'Etudes Anatoliennes D'Istanbul.

HELMS, S.

1973. "Taskun Mevkii 1970-71." In *Asvan 1968-1972: An Interim Report*, edited by D.H. French *et al.* *AnatSt* 23: 109-20.

HIETALA, H.J.

1984. (ed.) *Intrasite Spatial Analysis in Archaeology*. Cambridge: Cambridge University Press.

HILLMAN, G.

1973. "Agricultural Productivity and Past Population Potential at Asvan." In *Asvan 1968-1972: An Interim Report*, edited by D.H. French *et al.* *AnatSt* 23: 225-240.

HODDER, I.

1978. *The Spatial Organization of Culture*. London: Duckworth.

1982. *Symbols in Action*. Cambridge: Cambridge University Press.

1985. "Post-Processual Archaeology." *Advances in Archaeological Method and Theory* 8: 1-26.

1991. *Reading the Past: Current Approaches to Interpretation in Archaeology*. 2<sup>nd</sup> ed. Cambridge: Cambridge University Press.

1998. *Theory and Practice in Archaeology*. London and New York: Routledge.

HODDER, I and C. ORTON

1976. *Spatial Analysis in Archaeology*. Cambridge: Cambridge University Press.

HOH, M.R.

1984. "Die Keramik von Hassek Hoyuk." *IstMitt* 34: 66-91.

HOPKINS, L.

1996. "The Rise of Social Complexity in East Central Anatolia in the Early Bronze Age." In *Cultural Interaction in the Ancient Near East*, edited by G. Bunnens. 17-26. *Abr-Nahrain Supplement Series* 5. Louvain: Peeters Press.

2003. *Archaeology at the North-East Anatolian Frontier, VI – An Ethnoarchaeological Study of Sos Hoyuk and Yigittasi Village*. *Ancient Near Eastern Studies Series* 11. Louvain: Peeters Press.

HOWELL-MEURS, S.

2000. "Exploitation of Upland and Lowland Environments: Early Bronze and Iron Age Sites from Eastern Turkey." *World Archaeological Bulletin* 10 (2000). <http://www.wac.uct.ac.za/bulletin/wab10/Howell.html>.

HYDRO. REPORT

1970. *Uluova and Elazig Plains Hydrogeological Investigation Report*. Republic of Turkey, Minister of Energy and Natural Resources, General Directorate of

State Hydraulic Works, Groundwater Division, 617, III, 17/1. Ankara: DSI Matbaası.

JOFFE, A.H.

1993. *Settlement and Society in the Early Bronze I &II Southern Levant: Complementarity and Contradiction in a Small-Scale Complex Society*. Monographs in Mediterranean Archaeology 4. Sheffield: Sheffield Academic Press.

JOHNSON, G.A.

1980. "Rank-Size Convexity and System Integration: A View from Archaeology." *Economic Geography* 56: 234-47.

1987. "The Changing Organization of Uruk Administration in the Susiana Plain." In *The Archaeology of Western Iran*, edited by F. Hole. 107-39. Washington D.C.: Smithsonian Institution Press.

KARACA, O.

1983. "Pırot Höyük 1981 Kazıları." In *Kazı Sonuçları Toplantısı* 4, 69-81. Ankara: TTKB.

KARG, N.

1999. "Tarsus and Anatolian Chronology in Retrospect." *Olba* II: 283-301.

KELLY-BUCCELLATI, M.

1974. "The Excavations at Korucutepe, Turkey, 1968-70: Preliminary Report, Part V: The Early Bronze Age Pottery and Its Affinities." *JNES* 33: 44-54.

1978a. "The Early Bronze Age Pottery, Descriptive and Comparative Analysis." In *Korucutepe II*, edited by M.N. Van Loon. 67-87. Amsterdam: North Holland.

1979. "The Outer Fertile Crescent Culture: Northeastern Connections of Syria and Palestine in the Third Millennium B.C." *UgaritF* 11: 413-30.

KENT, S.

1990. (ed.) *Domestic Architecture and the Use of Space*. Cambridge: Cambridge University Press.

KNAPP, A.B.

1997. *The Archaeology of Late Bronze Age Cypriot Society: The Study of Settlement, Survey and Landscape*. Occasional Paper Series No. 4. Glasgow: University of Glasgow, Department of Archaeology.

KNAPP, A.B. & M. GIVEN

1996. "A Report on the Sydney-Cyprus Survey Project (SCSP) – Third Season (1995)." In *AnnRepCypr*. Nicosia.

KÖKTEN, I.K.

1947. "1945 Yılında Türk Tarih Kurumu Adına Yapılan Tarihöncesi Araştırmaları." *Belleten* 11: 431-472.

- KORFMANN, M.  
1983. *Demircihöyük I: Architektur, Stratigraphie und Befunde*. Mainz am Rhein.
- KOŞAY, H.Z.  
1976. *Keban Project, Pulur Excavations 1968-70*, METU Keban Series III. no. 1. Ankara: METU Press.
- KOŞAY, H.Z. & K. TURFAN  
1959. "Erzurum-Karaz Kazısı Raporu." *Belleten* 23: 349-413.
- KOYUNLU, A.  
1982. "The 'Agha Konak' in the Village of Munzuroglu." In *Keban Project 1974-1975 Activities*, METU Series I. No. 7, 267-78. Ankara: METU Press.
- KRAMER, C.  
1979. (ed.) *Ethnoarchaeology: The Implications of Ethnography for Archaeology*. New York: Columbia University Press.
- KUHNE, H.  
1976. *Die Keramik vom Tell Chuera und ihre Beziehungen zu Funden aus Syrien-Palastina, der Türkei und dem Irak*, Vorderasiatische Forschungen der Max Freiherr von Oppenheim-Stiftung, I. Berlin: Gebr. Mann Verlag.
- KUSHNAREVA, K. Kh.  
1997. *The Southern Caucasus in Prehistory*. Philadelphia: University of Pennsylvania Museum. Originated published as *Drevnie Kult'ury Iuzhnogo-Kavkaza*. (Leningrad, 1970).
- KUSSINGER, S.  
1988. "Tierknochenfunde vom Lidar Hoyuk in Sudostanatolien (Grabungen 1979-86)." Ph.D. diss., Ludwig-Maximilians-Universität, München.
- LEVI-STRAUSS, C.  
1966. *The Savage Mind*. London: Weidenfeld & Nicholson.
- LUPTON, A.  
1996. *Stability and Change, Socio-political Development in North Mesopotamia and South-East Anatolia 4000 – 2700 B.C.* B.A.R. International Series 627. Oxford.
- MAISLER, B. (MAZAR), M. STEKELIS, & M. AVI Yonah  
1952. "The Excavations at Beth-Yerah (Khirbet el Kerak) 1944-6." *IEJ* 2: 165-229.
- MALLOWAN, M.E.L.  
1947. "Excavations at Brak and Chagar Bazar." *Iraq* 9: 1-259.
- MALTHUS, T.R.  
1992. *An Essay of the Principle of Population as it Affects of the Future Improvement of Society*. Cambridge: Cambridge University Press.

MARFOE, L.

1986. "The Chicago Euphrates Archaeological Project 1980-1984: An Interim Report." *Anatolica* 13: 37-148.

MARRO, C.

1993. "Introduction a la Ceramique du Haut-Euphrate au Bronze Ancien" *Anatolia Antiqua* II: 43-69.

1997. *La Culture du Haut-Euphrate au Bronze Ancien. Essai D'Interpretation a Partir de la Ceramique Peinte de Keban (Turquie)*. Varia Anatolica VIII. Paris: De Boccard Edition-Diffusion for Institut Français D'Etudes Anatoliennes D'Istanbul.

2000. "Vers Une Chronologies Comparee des pays du Caucase et de L'Euphrate aux VIe-IIIe Millenaires." In *Chronologies des pays du Caucase et de L'Euphrate aux IVe -IIIe Millenaires*, edited by C. Marro and H. Hauptmann. 473-91. Paris: De Boccard Edition-Diffusion for Institut Français D'Etudes Anatoliennes D'Istanbul.

MATTHEWS, W., C. HASTORF & B. ERGENEKON

2000. "Etnoarchaeology: Studies in Local Villages Aimed at Understanding Aspects of the Neolithic Site." In *Towards Reflexive Method in Archaeology: the Example at Catalhoyuk*, edited by I. Hodder. 177-88. McDonald Institute Monographs, BIAA No: 28. Oxford: Oxbow Books.

MELLART, J.

1981. "The Prehistoric Pottery from the Neolithic to the beginning of E.B. IV (c. 7000-2500 B.C.)." In *The River Qoueiq, Northern Syria, and Its Catchment*, edited by J. Matthers, 131-320. B.A.R. International Series 98. Oxford.

MELLINK, M.

1989. "Anatolian and Foreign Relations of Tarsus in the Early Bronze Age." In *Anatolia and the Ancient Near East. Studies in Honor of Tahsin Ozguç*, edited by Emre K., B. Hrouda, M. Mellink, and N. Ozguç, 319-31. Ankara: Turk Tarih Kurumu.

METU

1967. *Doomed by the Dam: A Survey of the Monuments Threatened by the Creation of the Keban Dam Flood Area*, METU, Faculty of Architecture, Publ. No. 9. Ankara: METU Press.

NAM, C. B.

1968. *Population and Society*. Boston: Houghton Mifflin Company.

NARROLL, R.

1962. "Floor Area and Settlement Population." *AmerAnt* 27: 587-89.

NEWMAN, J.L. & G. E. MATZKE

1984. *Population: Patterns, Dynamics, and Prospects*. New Jersey: Prentice-Hall.

PALMIERI, A

1967. "Insediamento del Brozo Antico a Gelinciktepe (Malatya)." *Origini* 1: 117-93.
1968. "Scavi a Gelinciktepe." *OA* 7: 133-47.
1973. "Scavi nell'area Sud-Occidentale di Arslantepe. Ritrovamento di una struttura templare dell'Antica Età del Bronzo." *Origini* 7: 55-228.
1981. "Excavations at Arslantepe (Malatya)." *AnatSt* 31: 101-119.
1985. "Eastern Anatolia and Early Mesopotamian Urbanization: Remarks on Changing Relations." In *Studi di Paleontologia in onore di Salvatore M. Puglisi*, edited by M. Liverani, A. Palmieri, and R. Peroni. Rome: Università di Roma "La Sapienza".

PETERS, E.

1972. "Lehmziegelhäuser in der Altinova." In *Keban Project 1970 Activities*, METU Series I. No. 3, 173-82. Ankara: METU Press.

PORTUGALI, Y.

1982. "A Field Methodology for Regional Archaeology (Jezreel Valley Survey, 1981)." *TelAviv* 9: 170-88.

PRAG, K.

1970. "The 1959 Deep Sounding at Harran in Turkey." *Levant* 1-2: 63-94.

PREUCEL, R.W.

1995. "The Postprocessual Condition." *Journal of Archaeological Research* 3: 147-75.

PRICE, B.

1978. "Secondary State Formation: An Explanatory Model." In *Origins of the State*, edited by R. Cohen and E. Service, 161-86. Philadelphia: Institute for Study of Human Issues.

RENFREW, C.

1972. *The Emergence of Civilization. The Cyclades and the Aegean in the Third Millennium B.C.* London: Methuen.
1994. "Childe and the Study of Culture Process." In *The Archaeology of V. Gordon Childe: Contemporary Perspectives*, edited by D.R. Harris, 121-33. Chicago: Chicago University Press.

RENFREW, C. & P. BAHN

2000. *Archaeology: Theory, Methods and Practice*. 3<sup>rd</sup> ed. London: Thames & Hudson.

ROSSIGNOL, J.

1992. "Concepts, Methods, and Theory Building: A Landscape Approach." In *Space, Time and Archaeological Landscapes*, edited by J. Rossignol and L. Wandsnider, 3-16. New York: Plenum Press.

ROSSIGNOL, J. & L. WANDSNIDER

1992. *Space, Time and Archaeological Landscapes*. New York: Plenum Press.
- ROTHMAN, M. S. & G. KOZBE  
1994. "Mus in the Early Bronze Age." *AnatSt* 44: 105-26.
- ROWTON, M.B.  
1967. "The Woodlands of Ancient Western Asia." *JNES* 26: 261-277.
- RUSSELL, H.F.  
1980. *Pre-Classical Pottery of Eastern Anatolia, Based on A Survey by Charles Burney of Sites along the Euphrates and around Lake Van*. B.A.R. International Series 85. Oxford.
- RYAN, C.M.  
1960. *A Guide to the Known Minerals of Turkey*. Ankara: MTAE.
- SAGONA, A.G.  
1984. *The Caucasian Region in the Early Bronze Age*. B.A.R. International Series 214. Oxford.  
1993. "Settlement and Society in Late Prehistoric Trans-Caucasus." In *Between the Rivers and Over the Mountains. Archaeologica Anatolica et Mesopotamica. Alba Palmieri Dedicata*. edited by M. Frangipane, H. Hauptmann, M. Liverani, P. Matthiae, and M. Mellink, 453-73. Rome: Universita di Roma "La Sapienza".  
1994. *Asvan Sites 3*. Ankara: The British Institute of Archaeology at Ankara.  
1998. "Social Identity and Religious Ritual in the Kura-Araxes Cultural Complex: Some Observations from Sos Hoyuk." *MeditArch* 11: 13-25.  
2000. "Sos Hoyuk and the Erzurum Region in Late Prehistory: A Provisional Chronology for Northeast Anatolia." In *Chronologies des pays du Caucase et de L'Euphrate aux IVe -IIIe Millenaires*, edited by C. Marro and H. Hauptmann. 329-73. Paris: De Boccard Edition-Diffusion for Institut Français D'Etudes Anatoliennes D'Istanbul.
- SAGONA, A.G. & C. SAGONA  
2000. "Excavations at Sos Hoyuk, 1998 to 2000: Fifth Preliminary Report." *ANES* 37: 56-127.
- SARAÇOĞLU, H.  
1956. *Doğu Anadolu*. Vol.1, *Türkiye Coğrafyası Üzerine Etüdüler*. İstanbul: Maarif Basımevi.
- SAVAGE, S.L.  
1990. "Modelling the Late Archaic Social Landscape." In *Interpreting Space: GIS and Archaeology*, edited by K.M.S. Allen, S.W. Green, and E.B.W. Zubrow, 330-55. New York: Taylor and Francis.
- SCHMIDT, K.  
1996. *Norsuntepe: Kleinfunde I. Die Lithische Industrie*. *Archaeologica Euphratica* I.

2000. *Norsuntepe: Kleinfunde II. Artefacte aus Felsgestein, Knochen und Horn, Ton, Metall und Glas.* Archaeologica Euphratica II.

SİLİER, O.

1976. *Keban Köylerinde Sosyo Ekonomik Yapı ve Yeniden Yerleşim Sorunları.* Ankara: METU Press.

SHANKS, M. & C. TILLEY

1987. *Social Theory and Archaeology.* Cambridge: Polity Press.

SPANOS, P.Z.

1977 *Untersuchungen über den bei Homer "depos amphikypellon" genannten Gefasstypus.* IstMitt-BH 6. Tübingen.

STAHL, U.

1989. "Tierknochenfunde vom Hassek Hoyuk (Südostanatolien)." Ph.D. diss., Ludwig-Maximilians-Universität, München.

STEIN, G.

1988. "Pastoral Production in Complex Societies: Mid-late Third Millennium B.C. and Medieval Faunal Remains from Gritille Hoyuk in the Karababa Basin." Ph.D. diss., University of Pennsylvania.

STEIN, J.K.

1987. "Deposits for archaeologists." *Archaeological Method and Theory* 11: 337-395.

SUTTON, S.B.

1994. "Settlement Patterns, Settlement Perceptions: Rethinking the Greek Village." In *Beyond the Site: Regional Studies in the Aegean Area*, edited by P.N. Kardulias, 313-35. Lanham, MD.: University Press of America.

THISSEN, A.C.

1985. "The Late Chalcolithic and Early Bronze Age Pottery from Hayaz Hoyuk." *Anatolica* XII: 75-130.

THOMAS, J.

2000. "Introduction: The Polarities of Post-Processual Archaeology." In *Interpretive Archaeology, A Reader*, edited by J. Thomas, 1-18. London: Leicester University Press.

TOBLER, W. & S. WINEBURG

1971. "A Cappadocian Speculation." *Nature* 231: 39-41.

TRIGGER, B.G.

1967. "Settlement Archaeology – Its Goals and Promise." *AmerAnt* 32: 149-59.

1968. "The Determinants of Settlement Patterns." In *Settlement Archaeology*, edited by K.C. Chang, 53-78. Palo Alto CA.: National Press Books.
1978. *Time and Tradition: Essays in Archaeological Interpretation*. New York: Columbia University Press.
1994. "Childe's Relevance to the 1990s." In *The Archaeology of V. Gordon Childe: Contemporary Perspectives*, edited by D.R. Harris, 9-34. Chicago: Chicago University Press.
- TUNA, N.
1983. "Batı Anadolu Kent-Devletlerinde Mekan Organizasyonu: Knidos Örneği." Ph. D. diss., Dokuz Eylül University.
- UZUNOĞLU, E.
1985. "İmamoğlu Kazıları 1984 Yılı Çalışmaları." In *Kazı Sonuçları Toplantısı 7*, 181-99. Ankara, TTKB.
1989. "Malatya İmamoğlu Höyüğü 1987 Yılı Kazı Sonuçları." In *Kazı Sonuçları Toplantısı 10*, 71-8. Ankara: TTKB.
- VAN LOON, M.N.
1978. "Architecture and Stratigraphy." In *Korucutepe II*, edited by M.N. Van Loon, 3-45. Amsterdam: North Holland.
1980. "Conclusion" In *Korucutepe III*, edited by M.N. Van Loon, 271-277.
1975. (ed.) *Korucutepe I*. Amsterdam: North Holland.
1978. (ed.) *Korucutepe II*. Amsterdam: North Holland.
1980. (ed.) *Korucutepe III*. Amsterdam: North Holland.
- VAN ZEIST, W.
1972. "Paleobotanical Results of the 1970 Season at Cayonu." *Helinium* 12(1): 3-19.
- VAN ZEIST, W., R.W. TIMMERS, & S. BOTTEMA
1970. "Studies of Modern Holocene Pollen Precipitation in Southeast Turkey." *Paleohistoria* 14: 19-39.
- VAN ZEIST, W. & J.A.H. BAKKER-HEERES
1975. "Prehistoric and Early Historic Plant Husbandry in the Altınova Plain, Southeastern Turkey." In *Korucutepe I*, edited by M.N. Van Loon, 224-257. Amsterdam: North Holland.
- VAN ZEIST, W., H. WOLDERING, & D. STIPERT
1975. "Late Quaternary Vegetation and Climate of Southwest Turkey." *Paleohistoria* 17: 53-143.
- VOGT, E.Z.
1983. "Some New Themes in Settlement Pattern Research." In *Prehistoric Settlement Patterns: Essays in Honor of Gordon R. Willey*, edited by E.Z. Vogt and R.M. Leventhal, 3-20. Albuquerque: University of New Mexico Press.
- VON DEN DRIESCH, A.
1972. "Addendum, zu den Tierknochenfunden vom Kortepe." In *Keban Project 1972 Activities*, METU Series I. No. 5, 35-9. Ankara: METU Press.

- WAGSTAFF, M.  
1973. "Physical Geography and Settlements." In *Asvan 1968-1972: An Interim Report*, edited by D.H. French *et al.* *AnatSt* 23: 197-215.
- WAGSTAFF, M. & J.F. CHEERY  
1982. "Settlement and Resources." In *An Island Polity: The Archaeology of Exploitation on Melos*, edited by C. Renfrew and M. Wagstaff, 245-63. Cambridge: Cambridge University Press.
- WILK, R.R. & W.L. RATHJE  
1982. "Household Archaeology." In *Archaeology of the Household: Building a Prehistory of Domestic Life*, edited by R.R. Wilk and W.L. Rathje. *American Behavioral Scientist* 25 (6): 617-39.
- WILLCOX, G.W.  
1974. "A History of Deforestation as Indicated by Charcoal Analysis of Four Sites in Eastern Anatolia." *AnatSt* 24: 117-133.
- WILLEY, G.R.  
1953. *Prehistoric Settlement Patterns in the Viru Valley, Peru*. Bureau of American Ethnology Series 155. Washington D.C.: Bureau of American Ethnology.  
1956. *Prehistoric Settlement Patterns in the New World*. Viking Fund Publications in Anthropology 23. Tucson: Wenner-Gren, University of Arizona Press.
- WINTERS, H.D.  
1969. *The Riverton Culture*. Illinois State Museum Monograph 1. Illinois State Museum.
- WHALLON, R.  
1979. *An Archaeological Survey of the Keban Reservoir Area of East-Central Turkey*. Memoirs of the Museum of Anthropology, University of Michigan 11. Ann Arbor.
- WHALLON, R. & S. KANTMAN  
1969. "Early Bronze Age Development in the Keban Reservoir, East-Central Turkey." *CurrAnthr* 10: 128-133.
- WOOLLEY, C. L. & R. D. BARNETT  
1952. *Carchemish. Report on the Excavations at Jerablus on Behalf of the British Museum. Part III. The excavations in the Inner Town*. London: The Trustees of the British Museum.
- YAKAR, J.  
1985. *The Later Prehistory of Anatolia. The Late Chalcolithic and Early Bronze Age*. B.A.R. International Series 268: Oxford.

2000. *Ethnoarcheology of Anatolia. Rural Socio-Economy in the Bronze and Iron Ages*. Tel Aviv: Emery and Claire Yass Publications in Archaeology of the Institute of Archaeology, Tel Aviv University.

YAKAR, J. & A. GÜRSAN-SALZMANN

1979. "Archeological Survey in the Malatya and Sivas Provinces – 1972." *TelAviv* 6(1-2): 34-52.

YENER, A.

1983. "The Production, Exchange, and Utilization of Silver and Lead Metals in Anatolia." *Anatolica* 10: 1-15.

1984. "Third Millennium B.C. Interregional Exchange in Southwest Asia with Special Reference to the Keban Region of Turkey." Ph.D. 1980, Columbia University. Ann Arbor: UMI.

2000. *The Domestication of Metals. The Rise of Complex Metal Industries in Anatolia*. Leiden: Brill.

## APPENDICES

### APPENDIX A

#### THE SETTLEMENTS OF ALTINOVA IN THE EARLY BRONZE AGE

In this chapter, the chronological information (Table 1) regarding the settlements, except the excavated sites, will be based on the previous studies by Burney, Russell, Whallon, Persiani and Lupton. The detailed information about materials found in the excavated sites has been given in Chapter II and will not be repeated here. The information about sites will be limited only to the Early Bronze Age. The dimensions of the settlements are taken from Whallon (1979).

##### **01. Norşuntepe :**

Location: 2 km southeast of Alişam

Length: ca. 500-600 m. north south

Width: ca. 400 m. east-west

Height: ca. 25 m

Occupations: Early Bronze Age I (no information, but it could be a small settlement)

Early Bronze Age II (measured occupation area 3.2 ha)

Early Bronze Age III (measured occupation area 0.8 ha)

Excavated by Hauptmann from 1968 to 1974

The site was numbered as 054/8 by Whallon and 269 by Russell.

##### **02. Korucutepe:**

Location: 1.5 km northwest of Aşağı İçme

Length: ca. 210-220 m. northwest-southeast

Width: ca. 150 m northeast-southwest

Height: ca. 15-17 m

Occupations: Early Bronze Age II (estimated occupation area 1.3 ha)

Early Bronze Age III (no information, it could be a small settlement)

Excavated by Van Loon from 1968 to 1970

Ertem from 1973 to 1975

The site was numbered as 055/1 by Whallon and 270 by Russell

### **03. Tepecik:**

Location: 1 km southwest of Tepecik village

Length: The central mound, including the north slopes and the terraces measures ca. 200 m long. The low slopes to the south of the terrace add an additional ca. 100 m

Width: The central mound measures approximately 200 m wide. The southern slopes are slightly narrower, being 160-170 m in width

Height: Total height is estimated at ca. 10 m

Occupations: Early Bronze Age I (measured occupation area 2.1 ha)

Early Bronze Age II (measured occupation area 2.7 ha)

Early Bronze Age III (measured occupation area 1.8 ha)

Excavated by Esin from 1968 to 1974

This site was numbered as 054/2 by Whallon and 276 by Russell. In addition, the site was called Makaraz Tepe as well.

### **04. Tülintepe:**

Location: Between the rail-way line and road from Elazığ to Muş, just before they cross, 17 km due east from Elazığ (Russell 1980: 134)

Length: ca. 260 m measured across the remaining basal area

Width: ca. 210 m similarly measured

Height: no information

Occupation: There is no adequate information about Early Bronze Age levels in the excavation reports (Esin and Arsebuk 1974; Esin 1975b; Esin *et al.* 1976; Esin 1982). Esin suggested that the site was occupied in Early Bronze Age I and II (Esin 1982). According to Whallon, Reserved Slip Ware dating to Early Bronze Age I was present at the site, but he did not illustrate them (Whallon 1979: 181). In his publication, five Red-Black Burnished Ware sherds (fig 16, p,r,s,t,v), two Bronze Age Plain Ware sherds (fig. 16, z, aa) and one relief decorated Red-Black Burnished Ware sherd from Tülintepe, similar to Early Bronze Age II examples were illustrated. In Russell's book, one painted sherd (Russell 1980: 107, Group R, 268.227) has "triangles and wavy lines" pattern that is typical of Early Bronze Age II. Therefore, it can be suggested that the site was occupied in Early Bronze Age II. Two painted sherds (Whallon 1979: fig.17, j; fig. 18, n) from Tulintepe are the examples of Malatya-Elazığ Painted Ware dated to Early Bronze Age III (for comparison, Hauptmann 2000, Abb. 8, 4). One painted sherd from Tülintepe, illustrated by Burney is the example of Malatya-Elazığ Painted Ware that can be identified as Groupe E of Marro. Except Whallon, Persiani listed the site in Early Bronze Age III sites as well (Conti and Persiani 1993: 395, table 7). Therefore, it is suggested that the site was occupied from Early Bronze Age I to III.

Early Bronze Age I (estimated occupation area 1.6 ha)

Early Bronze Age II (estimated occupation area 1.6 ha)

Early Bronze Age III (estimated occupation area 1.6 ha)

Excavated by Esin from 1971 to 1974

The site was numbered 054/1 by Whallon and 268 by Russell.

#### **05. Değirmentepe:**

Location: On the north of Haringet Stream, 5.5 km northeast of Tepecik Village and 3.5 km northwest of Ahur village

Length: ca. 160 m originally

Width: An original ca. 150 m

Height: ca. 7 m.

Occupation: Early Bronze Age II (measured occupation area 2.0 ha)

Early Bronze Age III (no information, but it could be a small settlement)

Excavated by Duru in 1973

The site was numbered as 054/3 by Whallon

**06. Körtepe (Habusu):**

Location: the site was cut through by the old Elazığ-Bingöl highway and the railway.

2.5 km east of Habusu district

Length: ca. 210-215 m measured north-south

Width: ca. 100 m measured at the broadest point east-west

Height: ca. 2 m

Occupation: The excavation report included very limited information about the site (Hauptmann 1976b). According to the report, a small sounding on a spot already partially dug away for road fill was made in the site. In this sounding, the only occupation levels excavated were Early Chalcolithic (ibid.). There was no information about Early Bronze Age levels in the excavation report. In the Whallon's publication, the occurrence of Reserved Slip Ware and Plain Simple Ware dating to Early Bronze Age I were reported and five Plain Simple Ware examples were illustrated (Whallon 1979: fig. 9, p,r,u,w,x). The Red-Black Burnished Ware dating to Early Bronze Age II were the most common one, and there are well over 1000 sherds of this ware (Whallon 1979: 254). Some of them were illustrated in the publication (Whallon 1979: fig. 13, a, i, jj, ll; fig. 14, x, cc, ff, nn, ii). The handful examples of Malatya-Elazığ Painted Ware dating to Early Bronze Age III was found also in the site, but they were not illustrated.

In the light of these data, it is suggested that Körtepe (Habusu) was settled in a period from Early Bronze Age I to Early Bronze Age III.

Early Bronze Age I (measured occupation area 0.9 ha)

Early Bronze Age II (measured occupation area 1.7 ha)

Early Bronze Age III (estimated occupation area 0.9 ha)

Excavated by Hauptmann in 1972

The site was numbered as 055/8-9 by Whallon. The site was called Habusu Körtepe as well (Hauptmann 1973: 25)

**07. Garö Tepe (?) :**

Location: 4.5 km northwest of Ahur village

Length: Small and unidentified

Width: Small and unidentified

Height: None

Occupation: The collected materials dating to Early Bronze Age were not illustrated in the publication of Whallon. Whallon suggested that the site was occupied in the Early Bronze Age I-II (ibid.). Neither Russell nor Persiani gave any information concerning the site and listed the site in Early Bronze Age sites (Russell 1980: 46; Persiani 1993: 395). Therefore, the site will not be taken into consideration of settlement patterns in the region.

The site was numbered as 054/4 by Whallon.

**08. Kazancı :**

Location: 1 km east of Sarpulu village

Length: 170 m measured in a northwest-southeast direction

Width: 130 m measured northeast-southwest

Height: ca. 2 m

Occupation: One or two sherds were identified as Red-Black Burnished Ware by Whallon. But, he said that this identification was dubious (Whallon 1979: 196). One painted sherd was identified as Malatya-Elazig Painted Ware dating to Early Bronze Age III (Whallon 1979: fig. 18, q). However, it is an example of a typical Painted Ware called Groupe I by Marro (Marro 2000), and dates to the Late Chalcolithic Period. The site was one of the important sites in the Chalcolithic period (Whallon

1979: 195-8; Russell 1980: 46). But, the site was not occupied in the Early Bronze Age.

The site was numbered as 054/6 by Whallon and 272 by Russell. The site called Sarpulu by Burney as well, but Burney's Sarpulu is not Whallon and Kantman's Sarpulu. It was their Kazancı (Russell 1980: 135). Whallon and Kantman's Sarpulu is Hittite and Medieval occupation (Whallon 1979: 194-5).

**09. Könk :**

Location: Immediately north of Könk

Length: 500 m very roughly estimated as the total length of the site, from the northern edge of high mound peak to the southern fringe of the modern village. The mound proper may be only some 350 m in length, extending only partially under the village area. The diameter of the northern, flat-topped peak is estimated as ca. 100 m at the base and 10 m at the flat top.

Width: 250-350 m, very roughly estimated. The lower figure is the maximum width of the mound around the high peak. The total width of the lower mound under the present –day village may be much broader.

Height: ca. 1-3 m for the lower slopes, ca. 16-18 m for the northern peak

Occupation: Whallon did not illustrate the collected materials from Könk. According to him, Early Bronze Age Plain Ware was present at the settlement, but it is not Plain Simple Ware dated to the Early Bronze Age I (Whallon 1979: 199). Russell illustrated three sherds (figs. 271.9, 271.65, 271.54) dating to Early Bronze Age II in Group J. 271.9 is a deep bowl and has similar example in Korucutepe (Kelly-Buccellati 1978, pl. 115, A), dated to Phase C by M. Kelly-Buccellati (Kelly-Buccellati 1978) and in Norşuntepe (Hauptmann 2000, Abb. 4, 4 and 6). 271.65 is a small deep bowl and its similar in Korucutepe (Kelly-Buccellati 1978, pl. 114, A) dated to Phase C (Kelly-Buccellati 1978). 271.54 could be kitchen ware and similar example is present in Norşuntepe (Hauptmann 2000, Abb. 5, 14), dated to Early Bronze Age II. A small deep bowl numbered as 271.10 in Group L has similar

example in Korucutepe Phase D (Kelly-Buccellati 1978, pl. 114, E). Other illustrated sherds by H.F. Russell, dated to Early Bronze Age II are, in Group L, 271.21 that is a bowl and 271.89 that is a medium shallow bowl and has similar examples in Korucutepe and Norşuntepe (Kelly-Buccellati 1978, pl. 116, F; Hauptmann 1971, pl. 10:7, Hauptmann 1972, pl. 72:5), 271.99 in Group M has similar example in Korucutepe (Kelly-Buccellati 1978, pl. 126, F) and 271.69 in Group N. In C. Burney's article, the sherds numbered as 192, 196, 197, 200 and 201 are small deep bowls with sharply defined junction of neck with shoulder (Burney 1958). These sherds are dated to Early Bronze Age II, because M. Kelly-Buccellati dated the similar examples in Korucutepe to Phase D. A jar numbered as 188 is dated to the same period as well. The sherds numbered as 209 and 213 by C. Burney are dated to Early Bronze Age II also. 209 are a simple bowl and its similar example is present in Korucutepe (Kelly-Buccellati 1978, pl. 116, B) and Norşuntepe (Hauptmann 1971, pl. 10:4). 213, a bowl with diminutive lug at the rim, have similar example in Korucutepe (Kelly-Buccellati 1978, pl. 116, D). One painted sherd from Könk, numbered as 262 by C. Burney regard to Groupe B of C. Marro, dated to Early Bronze Age II.

An illustrated sherd from Könk in Russell's book is dated to Early Bronze Age III. 271.12 in Group K is common in Early Bronze Age III in Korucutepe (Kelly-Buccellati 1978, pl. 112, J and pl. 113, diagram A). C. Burney illustrated five sherds in his article, numbered 181, 183, 204, 205 and 221 dated to Early Bronze Age III. 181 and 183, medium pot, have similar examples in Tepecik (Esin 1972, pl. 105: 1), Korucutepe (Kelly-Buccellati 1978, pl. 115, G) and Norşuntepe (Hauptmann 1972, pl. 74: 7). 204 and 205 have a thickened rim with thin edge called "bullet rim" that is one of the characteristic features in Early Bronze Age III. R. Whallon noted that "rail-rim" profile, another characteristic in Early Bronze Age III, was found in the site (Whallon 1979: 199). One painted sherd illustrated by H.F. Russell, numbered as 271. 101 are probably dated to Early Bronze Age III.

In the light of this data, it is suggested that K nk was settled in a period from Early Bronze Age II to Early Bronze Age III.

Early Bronze Age II (estimated occupation area 2.1 ha)

Early Bronze Age III (estimated occupation area 2.1 ha)

The site was numbered as 054/7 by Whallon and 271 by Russell.

#### **10. Mezarlık Tepe :**

Location: 1 km northeast of Yukarı Ađınsı village and 1.5 km east of Aşađı Ađınsı

Length: ca. 140 m measured in a northeast-northwest direction

Width: ca. 140 m measured, northwest-southeast

Height: ca. 2.5 m

Occupation: Bronze Age Plain Ware and Red-Black Burnished Ware were found at the settlement by Whallon and Kantman (Whallon 1979: 214). One illustrated sherd (fig. 14, v) can be dated to Early Bronze Age II. Two painted sherds that were dated to Early Bronze Age III by Whallon were found in the settlement, but they were not illustrated. According to Whallon, Mezarlık Tepesi in the Early Bronze Age III housed a very small or very brief occupation (1979: 214).

Early Bronze Age II (measured occupation area 1.1 ha)

Early Bronze Age III (no information) (very small)

The site was numbered as 054/10 by Whallon.

#### **11. Yarıık Tepe :**

Location: 1 km east of Alişam village and 2 km northeast of Haceri village, the h y k was cut through by Elazıđ-Bing l Highway

Length: 115 m measured north-south

Width: 110 m measured east-west along the highway

Height: ca. 1 m

Occupation: Whallon did not illustrate the collected material that dated to Early Bronze Age. He noted that Early Bronze Age Plain Ware and Red-Black Burnished Ware were found at the settlement.

Early Bronze Age II (estimated occupation area 0.6 ha)

The settlement was numbered as 054/11 by Whallon.

**12. Kuruçavır Tepesi :**

Location: 2.5 km east of Könk village

Length: 85 m north-south

Width: 90 m measured east-west

Height: ca. 2 m

Occupation: Early Bronze Age Plain Ware and Red-Black Burnished Ware were mentioned in the publication by Whallon (1979: 219). The dating of an illustrated Red-Black Burnished Ware (fig. 13, z) is difficult. He noted that a significant number of body sherds of Red-Black Burnished Ware were found in the settlement (Whallon 1979: 219). He suggested that the presence of Early Bronze Age I-II occupation was obvious at this small site (ibid.). But, the characteristic pottery of Early Bronze Age I, Plain Simple Ware and Reserved Slip Ware, were not found in the settlement.

Early Bronze Age II (measured occupation area 0.5 ha)

The settlement was numbered as 054/12 by Whallon.

**13. Körtepe or Çayırlar Tepesi :**

Location: 1.5 km northeast of Sarpulu

Length: 85-90 m measured north-south over both the destroyed and remaining area

Width: 50 m of remaining mound was measured east-west, the original width was probably approximately 75 m

Height: ca. 2-2.5 m

Occupation: The collected material which dated to the Early Bronze Age were not illustrated by Whallon. Early Bronze Age Plain Ware and Red-Black Burnished Ware were found at the settlement (Whallon 1979: 222). He noted that Red-Black Burnished Ware was the most common at the site (ibid.). Three Painted Ware sherds dated to Early Bronze Age III were identified (ibid.). According to Whallon, the

settlement was occupied from Early Bronze Age I to III. However, Reserved Slip Ware and Plain Simple Ware that dated to Early Bronze Age I were not found at the settlement.

Early Bronze Age II (measured occupation area 0.4 ha)

Early Bronze Age III (measured occupation area 0.4 ha)

This site was numbered as 054/14 by Whallon. The site was called Boztepe or Tilkitepe as well (Whallon 1979: 222).

#### **14. Çakıltepe :**

Location: 0.5 km northwest of Sarpulu

Length: 90 m measured in a northeast-southwest direction

Width: 70 m measured in a northwest-southeast direction

Height: ca. 2.5-3 m

Occupation: Whallon did not illustrate the collected material, which dated to Early Bronze Age, in the publication. According to him, the occupation took place in the general period of Early Bronze Age I-II. But, he noted that the Early Bronze Age was represented by Red-Black Burnished Ware and Early Bronze Age Plain Ware (1979: 225).

Early Bronze Age II (measured occupation area 0.4 ha)

The site was numbered as 054/15 by Whallon. The site was called Körtepe as well.

#### **15. Körpınar :**

Location: 1 km east of Tepecik village

Length: The area of the scatter was no larger than ca. 100x100 m

Width: cf. above

Height: 0 m

Occupation: Three body sherds, which Whallon did not publish, were questionably classified as Red-Black Burnished Ware. One illustrated sherd called Early Bronze Age Thick Ware by Whallon (fig. 17, f) is difficult to date chronologically. Therefore, the Early Bronze Age occupation in the settlement is problematic.

The settlement will not be involved in the settlement pattern study.

The site was numbered as 054/18 by Whallon.

**16. No name :**

Location: 0.2 km east of Kıraç, the settlement is out of the Reservoir Area

Length: ca. 50 m north-south

Width: ca. 30 m east-west

Height: ca. 0.5-1 m (?)

Occupation: All of the periods are weakly represented. Red-Black Burnished Ware and Early Bronze Age Plain Ware were found. According to Whallon, the settlement was occupied in the Early Bronze Age I-II (Whallon 1979: 228-9). But, the lack of Reserved Slip Ware and Plain Simple Ware indicate that the settlement was not occupied in Early Bronze Age I.

Early Bronze Age II (estimated occupation area 0.1 ha)

This site was numbered as 054/19 by Whallon.

**17. Kilise Tepe :**

Location: in Habusu district

Length: ca. 250 m east-west

Width: ca. 200 m north-south

Height: ca. 7-8 m

Occupation: The collected materials were not illustrated in the publication. According to Whallon, Early Bronze Age I-II are represented by body sherds of both Red-Black Burnished Ware and Early Bronze Age Plain Ware (1979: 230).

Early Bronze Age II (estimated occupation area 1.6 ha)

The site was numbered as 054/20 by Whallon.

**18. Kemaksı Mevkii Maşatlık :**

Location: 1 km southwest of Alişam village

Length: The mound is almost circular with a measured diameter of ca. 72 m

Width: cf. above

Height: 0.75 m

Occupation: The collected material which dated to Early Bronze Age was not published. Early Bronze Age occupation is uncertain (Whallon 1979: 230-1).

Therefore, the site will not be included in the settlement pattern study.

The site was numbered as 054/21 by Whallon.

**19. Taşköprü :**

Location: 1.5 km northwest of Alişam

Length: ca. 150 m northeast-southwest

Width: ca. 100 m northwest-southeast

Height: ca. 1.5-2 m

Occupation: Whallon identified some sherds as Red-Black Burnished Ware (1979: 233). The collected material which dated to Early Bronze Age was not published. But, Persiani indicated that this site was settled in Early Bronze Age II (Persiani 1993: 395).

Early Bronze Age II (estimated occupation area 0.7 ha)

The site was numbered as 054/23 by Whallon.

**20. Savka Tepe :**

Location: 1.5 km south of Haceri village

Length: 110 m measured north-south

Width: 100 m measured east-west

Height: ca. 1.5 m

Occupation: Early Bronze Age Plain Ware and Red-Black Burnished Ware were found, but the latter was not published. Only one sherd identified as Early Bronze Age Thick Ware by Whallon was illustrated in the publication (fig. 16, ff). Dating this sherd is difficult. According to him, the settlement was occupied from Early Bronze Age I to Early Bronze Age III (Whallon 1979: 233-5). Persiani suggested that the settlement was occupied in Early Bronze Age II-III (Persiani 1993: 395).

Early Bronze Age II (measured occupation area 0.4 ha)

Early Bronze Age III (estimated occupation area 0.6 ha)

This site was numbered as 054/24 by Whallon.

**21. Körtepe :**

Location: 0.2 km north of Şavka Tepe

Length: 125 m measured north-south

Width: 110 m measured east-west

Height: 2 m

Occupation: Early Bronze Age Plain Ware and Red-Black Burnished Ware were collected, but the examples were not published. According to Whallon, the site was occupied from Early Bronze Age I-II (Whallon 1979: 236). But, there are no examples of Reserved Slip Ware and Plain Simple Ware dated to Early Bronze Age I.

Early Bronze Age II (estimated occupation area 0.7 ha)

The site was numbered as 054/25 by Whallon.

**22. Masatlık :**

Location: in the northern border of Habusu district occupation area

Length: 76 m measured east-west

Width: 70 m measured north-south

Height: ca. 1-1.25 m

Occupation: Whallon only noted that The Early Bronze Age I-II is represented by Early Bronze Age Plain Ware and Red-Black Burnished Ware. Any collected material was not published.

Early Bronze Age II (estimated occupation area 0.3 ha)

The site was numbered as 054/26 by Whallon.

**23. Gülüşanbaba Tepesi :**

Location: 0.5 km north of Alişam village

Length: 110 m measured north-south

Width: 75 m measured east-west

Height: ca. 1.5-2 m

Occupation: The collected material which dated to Early Bronze Age was not illustrated in the publication. According to Whallon, Early Bronze Age I-II were represented by Early Bronze Age Plain Ware and Red-Black Burnished Ware in the settlement (Whallon 1979: 239).

Early Bronze Age II (estimated occupation area 0.5 ha)

The settlement was numbered as 054/27 by Whallon

**24. Körtepe :**

Location: 3 km northwest of Könk district

Length: 120 m measured north-south

Width: 100 m measured east-west

Height: ca. 2 m

Occupation: Whallon mentioned some body sherds of Early Bronze Age Plain Ware and Red-Black Burnished Ware, but they were not published. He suggested that the site was occupied in Early Bronze Age I-II (Whallon 1979: 240).

Early Bronze Age II (estimated occupation area 0.6 ha)

The site was numbered as 054/28 by Whallon.

**25. Altintepe :**

Location: 1.5 km northwest of Zertariç district, the site is out of the Reservoir Area

Length: 67 m measured north-south

Width: 60 m measured east-west

Height: ca. 2-2.5 m

Occupation: Early Bronze Age Plain Ware was found and, Whallon (fig. 16, n) illustrated only one sherd of Red-Black Burnished Ware. Red-Black Burnished Ware was overwhelmingly abundant (Whallon 1979: 245). According to him, the settlement was settled in Early Bronze Age I-II (ibid.).

Early Bronze Age II (measured occupation area 0.3 ha)

The site was numbered as 055/2 by Whallon.

**26. Boytepe :**

Location: 0.7 km northwest of Zertariç district, the site is out of Reservoir Area

Length: ca. 150 m measured southeast-northwest

Width: ca. 50 m measured southwest-northeast

Height: ca. 0.75 m for the terraces, ca. 2 m more for the mound on the southeast

Occupation: The collected material which dated to Early Bronze Age was not illustrated in the publication. In Early Bronze Age I, the settlement was occupied, but Whallon did not mention anything about the materials dating to this period (1979: 248). Early Bronze Age Plain Ware and Red-Black Burnished Ware were represented at the settlement. According to Whallon, Malatya-Elazığ Painted Ware dated to Early Bronze Age III was also found (1979: 247).

Early Bronze Age I (measured occupation area 0.1 ha)

Early Bronze Age II (measured occupation area 0.2 ha)

Early Bronze Age III (no information, but it could be very small site)

The site was numbered as 055/3 by Whallon

**27. Körtepe :**

Location: 3 km south of Habusu district

Length: 145 m measured in a northwest-southeast direction

Width: 110 m measured northeast-southwest

Height: ca. 1.5 m

Occupation: Two illustrated Red-Black Burnished Ware (fig. 12, qq; fig. 13, c) were identified in the Early Bronze Age II. One rim sherd is typical “rail rim” (fig. 12, qq) dated to Early Bronze Age II. Another illustrated example is Early Bronze Age Thick Ware (fig. 17, g). Reserved Slip Ware, Plain Simple Ware and Painted Ware were not found in the settlement.

Early Bronze Age II (estimated occupation area 0.8 ha)

The site was numbered as 055/4 by Whallon.

**28. No name :**

Location: 1 km north of Ahur village

Length & Width: the materials are found over an area of roughly 50 m east-west by 30 m north-south

Occupation: Only Red-Black Burnished Ware was found. But, no examples were illustrated.

Early Bronze Age II (measured occupation area 0.1 ha)

The site was numbered as 055/6 by Whallon

**29. Aşağı Şeyhacı Tepesi :**

Location: in Aşağı Şeyhacı village

Length: ca. 150 m north-south

Width: ca. 100-125 m east-west

Height: ca. 8-9 m

Occupation: The collected material which dated to Early Bronze Age was not illustrated in the publication. Red-Black Burnished Ware, Early Bronze Age Plain Ware and Malatya-Elazığ Painted Ware were found. According to Whallon, one Red-Black Burnished Ware with relief decoration dated to Early Bronze Age II (Whallon 1979: 258). Reserved Slip Ware and Plain Simple Ware were not found.

Early Bronze Age II (estimated occupation area 0.8 ha)

Early Bronze Age III (estimated occupation area 0.8 ha)

The site was numbered as 0.55/10 by Whallon.

## APPENDIX B

### THE CALCULATION OF NEAREST NEIGHBOR ANALYSIS

#### THE WHOLE LEVEL

N: the number of settlement

A: the area (km<sup>2</sup>)

N= 25

A= 136 km<sup>2</sup>

The Total of Nearest Neighbor Settlement Distance (TNNSD) = 41.8 km (for data see table 10)

$X^{\circ}$  or Dobs= TNNSD/N

$X^{\circ}$ : the mean of TNNSD

$X^{\circ}$ = 41.8/25

= 1.672 km

R: the leading coefficient (NNI)

$R = 2 \times \text{Dobs} \times (N/A)^{1/2}$

$R^{\circ} = 2 \times 1.672 \times (25/136)^{1/2}$

$R^{\circ} = \underline{1.431}$

For standard deviation, z must be calculated.

$$z = (\text{Dobs} - \text{Dran}) / \partial \text{Dran}$$

Dran: the level of neighbor distances

$$\text{Dran} = 1 / [2 \times (\text{N/A})^{1/2}]$$

$$\text{Dran} = 1 / [2 \times (25/136)^{1/2}]$$

$$\text{Dran} = 1.166$$

$$\partial \text{Dran} = 0.26136 / [\text{N} \times (\text{N/A})^{1/2}]$$

$$\partial \text{Dran} = 0.26136 / [25 \times (25/136)^{1/2}]$$

$$= 0.1219$$

$$z = (1.672 - 1.166) / 0.1219$$

$$= \underline{2.173}$$

$$p = 0.4850$$

## THE FIRST LEVEL

**The occupation area is above 2 ha.**

$$N1 = 3$$

$$A = 136 \text{ km}^2$$

$$\text{TNNSD} = 17 \text{ km}$$

$$X1 \text{ or Dobs1} = 17/3$$

$$= 5.6 \text{ km}$$

$$R1 = 2 \times 5.6 \times (3/136)^{1/2}$$

$$R1 = \underline{1.657}$$

$$\text{Dran1} = 1 / [2 \times (3/136)^{1/2}]$$

$$\text{Dran1} = 3.367$$

$$\partial \text{Dran1} = 0.26136 / [3 \times (3/136)^{1/2}]$$

$$= 1.016$$

$$z = (5.6 - 3.367) / 1.016$$

$$= 2.197$$

$$p = 0.4857$$

## THE SECOND LEVEL

**1 ha > the occupation area ≤ 2 ha**

$$N_2 = 5$$

$$TNNSD = 19.5$$

$$X_2 \text{ or } Dobs_2 = 19.5 / 5 = 3.9 \text{ km}$$

$$R_2 = 2 \times 3.9 \times (5/136)^{1/2}$$

$$R_2 = \underline{1.4898}$$

$$Dran_2 = 1 / [2 \times (5/136)^{1/2}]$$

$$Dran_2 = 2.610$$

$$\partial Dran_2 = 0.26136 / [5 \times (5/136)^{1/2}]$$

$$= 0.6090$$

$$z = (3.9 - 2.610) / 0.6090$$

$$= 2.116$$

$$p = 0.4826$$

### THE THIRD LEVEL

The occupation area  $\leq 1$  ha

$$N_3 = 17$$

$$T_{NNSD} = 38.2$$

$$X_3 \text{ or } Dobs_3 = 38.2 / 17$$

$$= 2.247$$

$$R_3 = 2 \times 2.247 \times (17 / 136)^{1/2}$$

$$= 1.58$$

$$D_{ran3} = 1 / [2 \times (17 / 136)^{1/2}]$$

$$D_{ran3} = 1.414$$

$$\partial D_{ran3} = 0.26136 / [17 \times (17 / 136)^{1/2}]$$

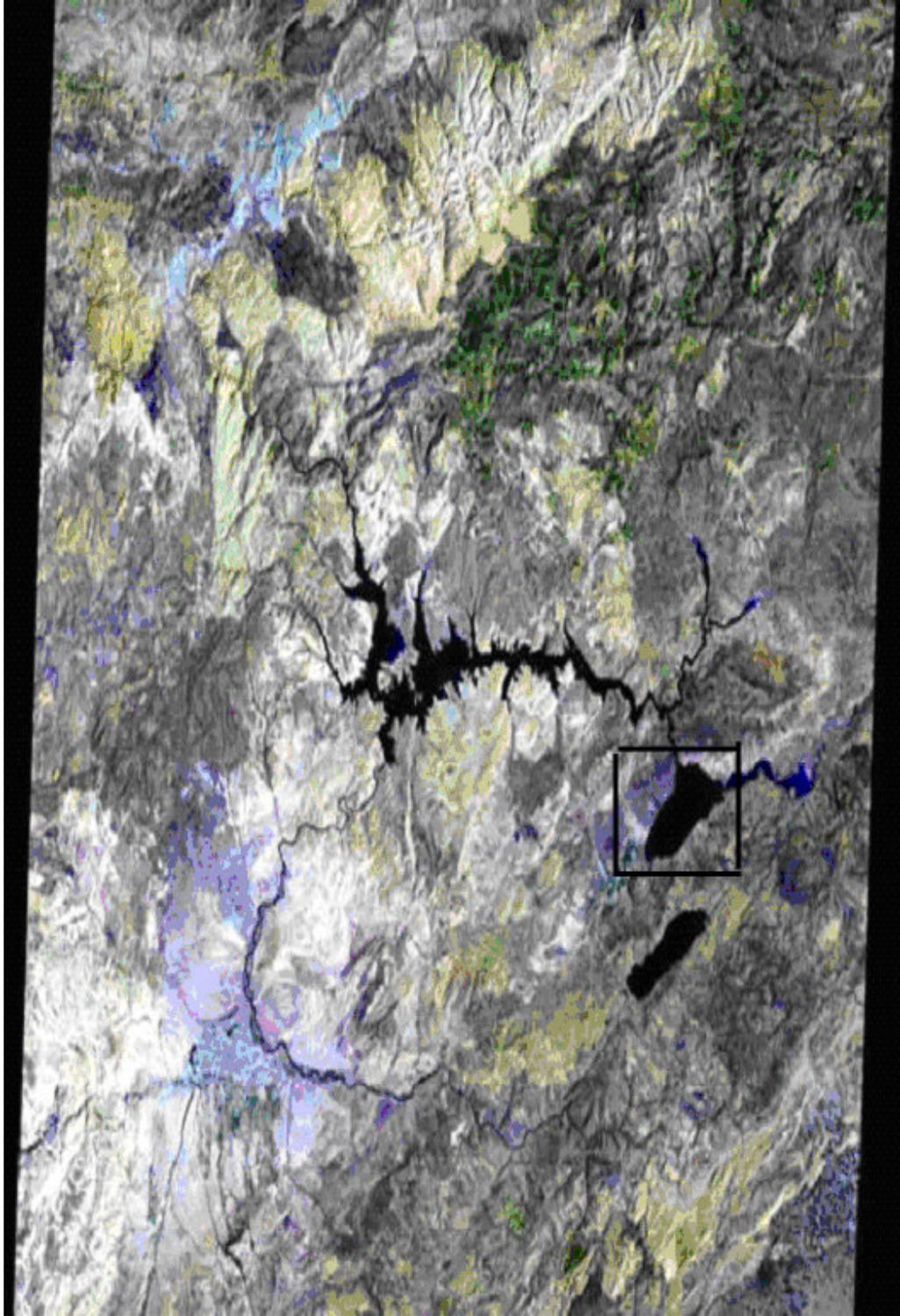
$$= 0.38$$

$$z = (2.247 - 1.414) / 0.38$$

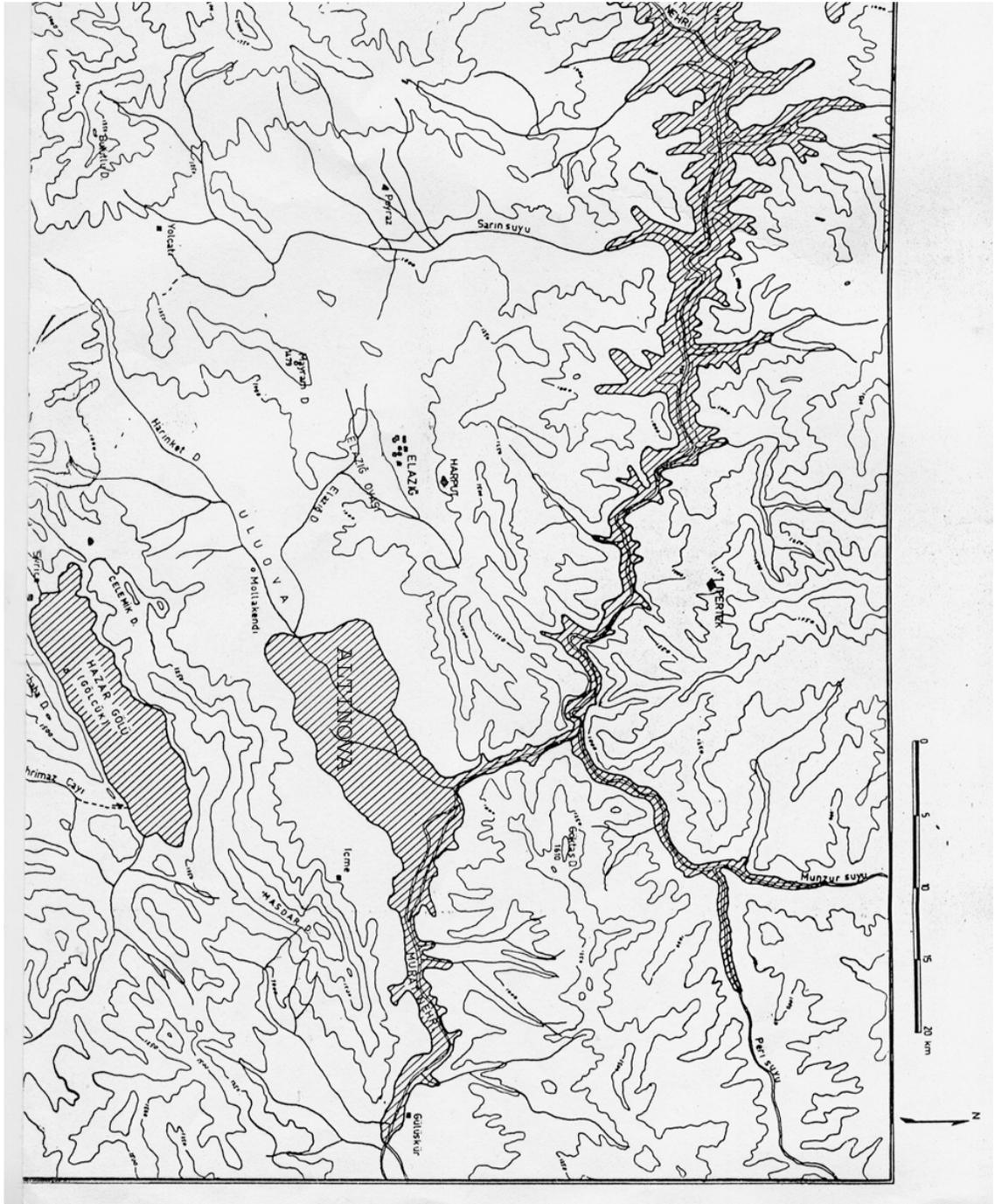
$$= 2.192$$



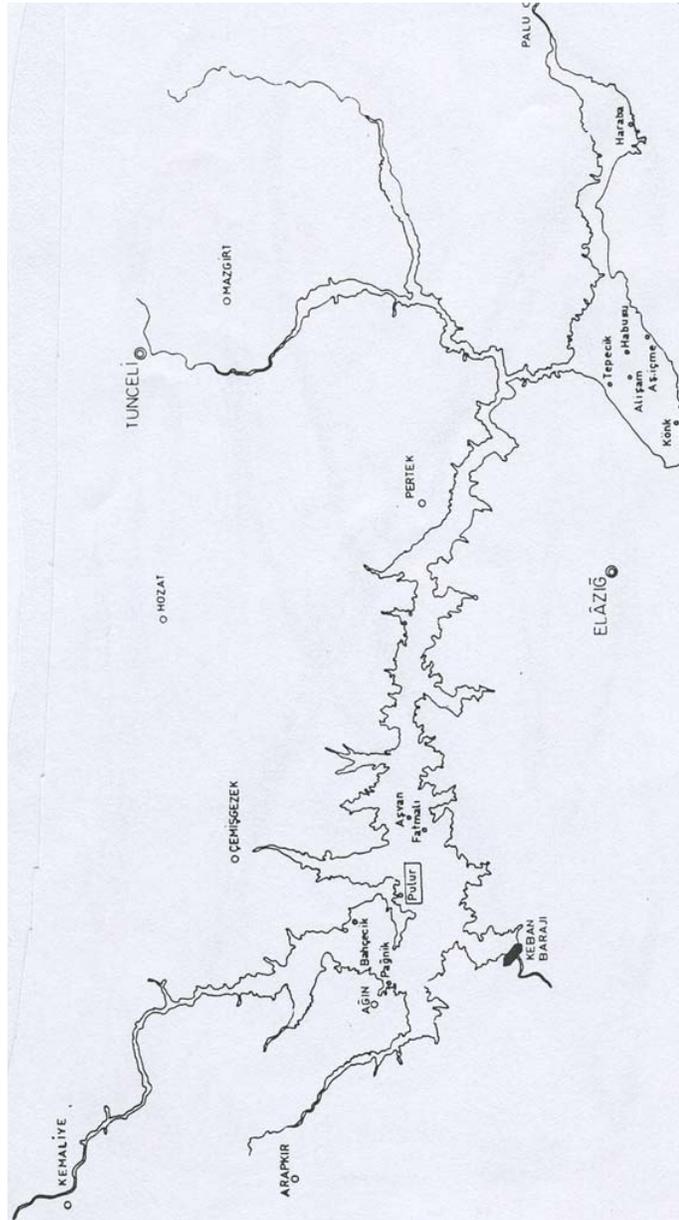
**MAP 1**  
**Physical Map of East-Central Anatolia**  
**(Duran 1974: 30-1)**



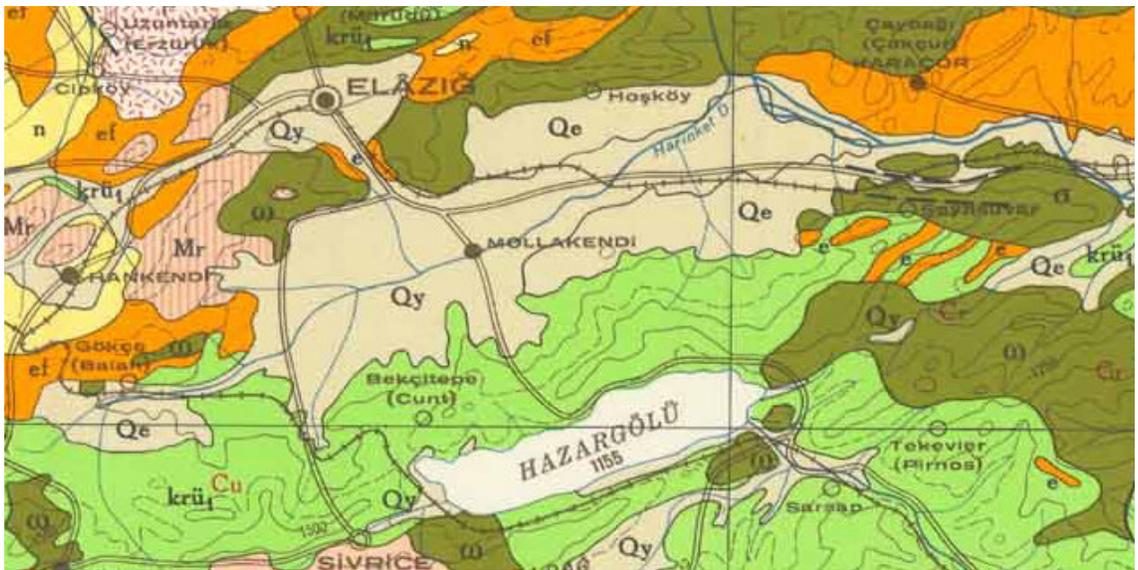
**MAP 2**  
**Satellite Image of Elazığ Region**  
**(The area in the square is Altınova)**  
**([http://www.mta.gov.tr/RSC\\_WEB/images.html](http://www.mta.gov.tr/RSC_WEB/images.html))**



**MAP 3**  
**Topographical Map of Elazığ Region**  
**(Akkan 1972)**

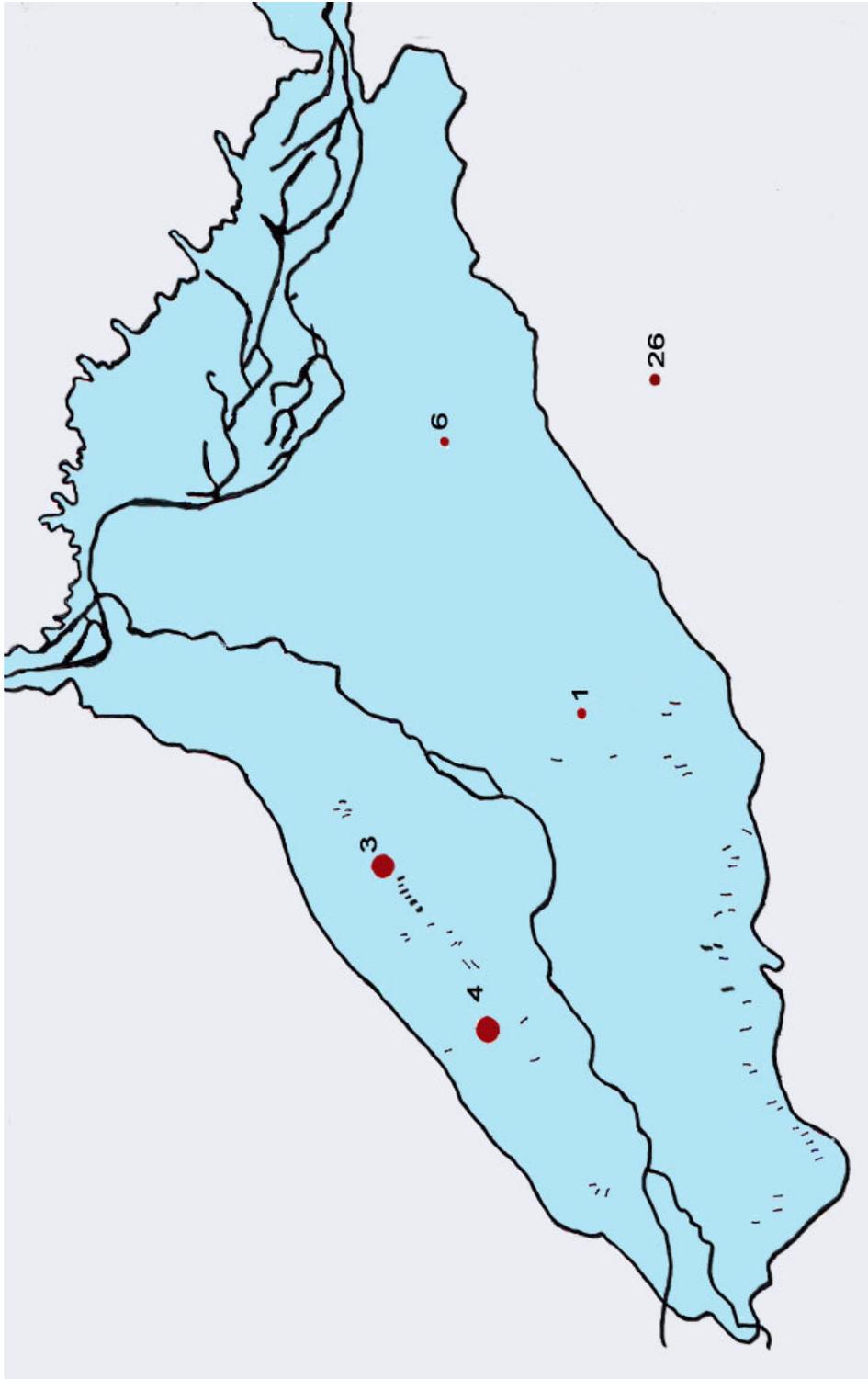


**MAP 4**  
**Keban Area**

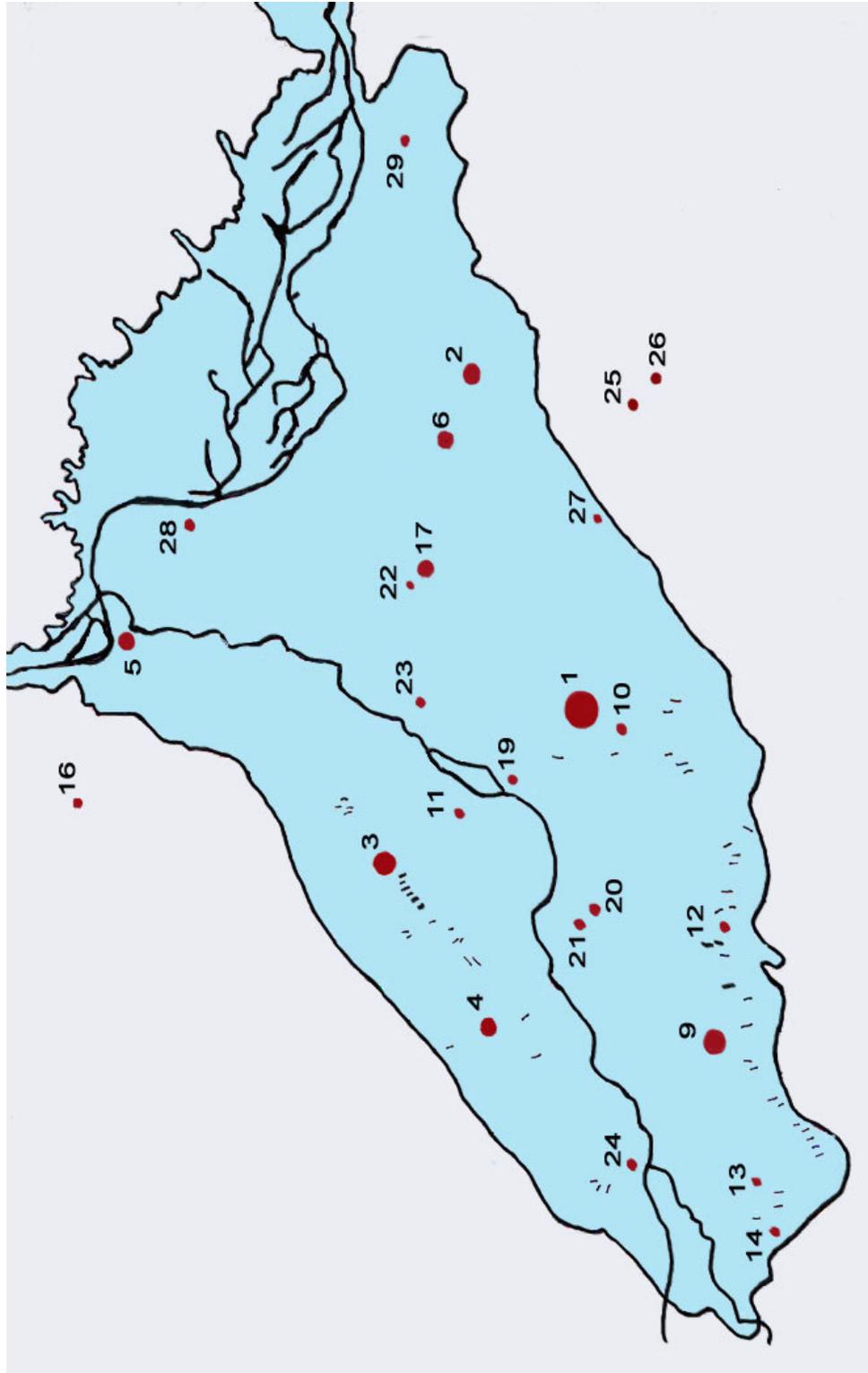


**MAP 5**

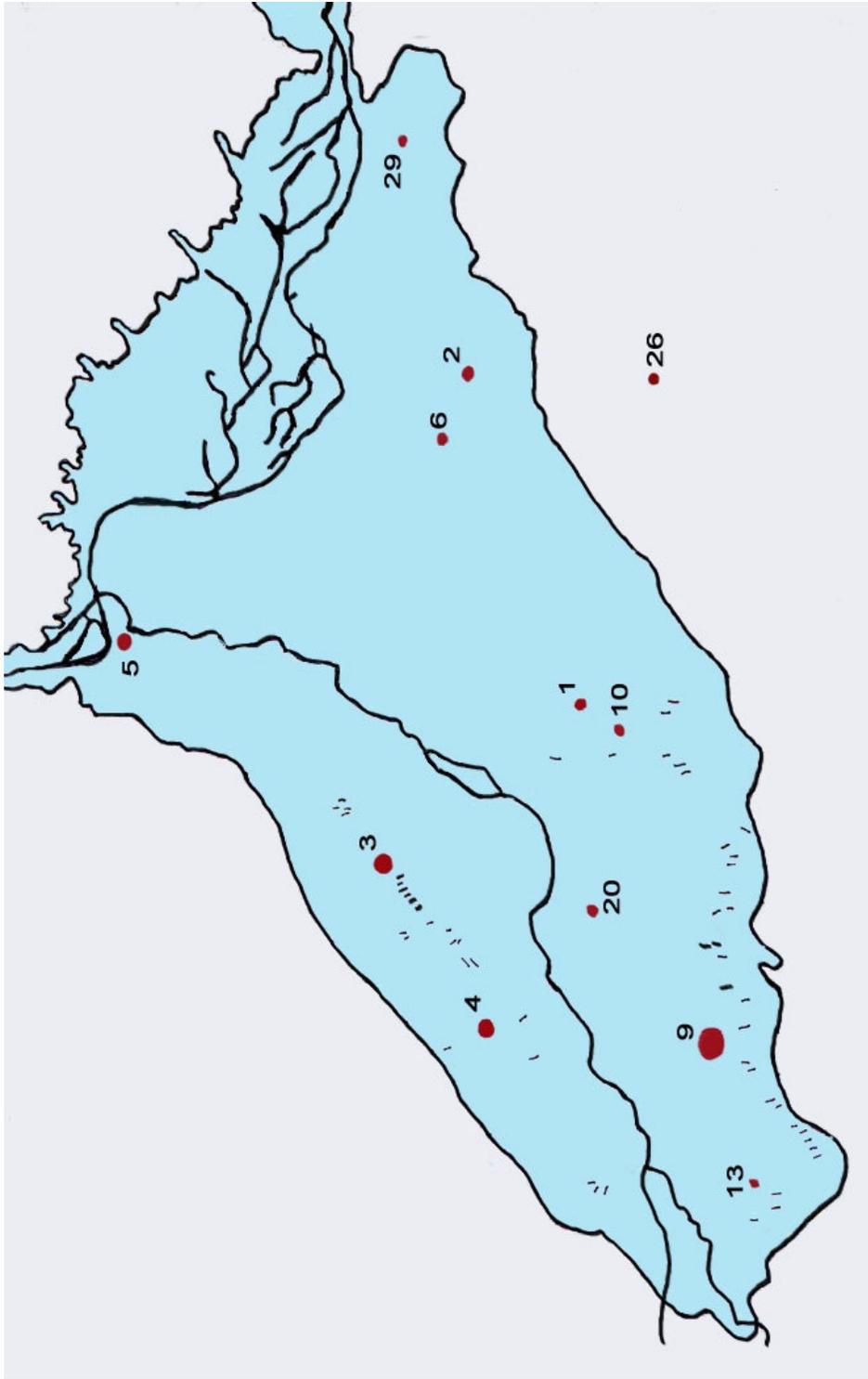
**Geological Map of Elazığ Region  
(Altınlı 1963)**



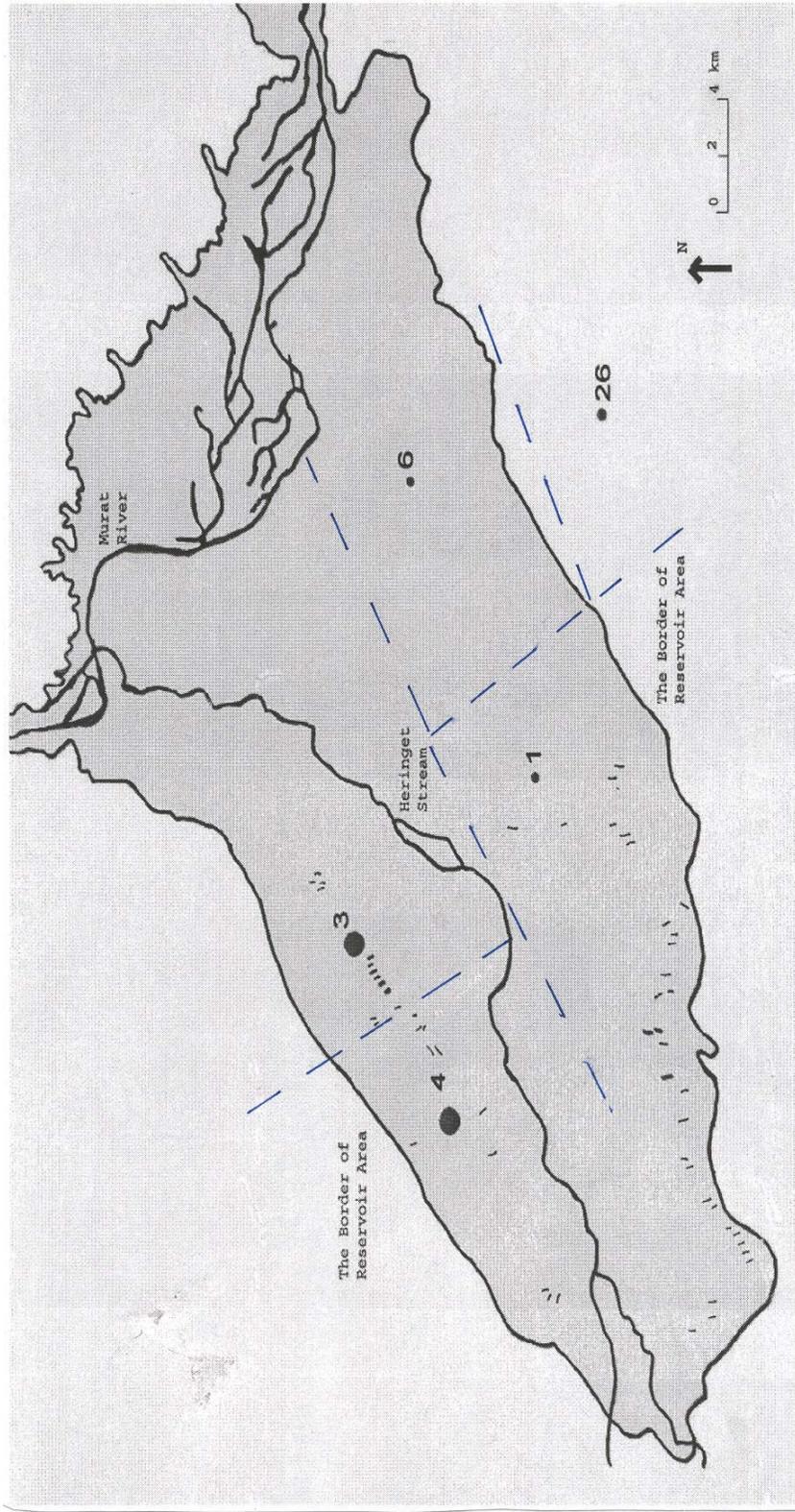
**MAP 6**  
**The Settlements of Altınova in EBA I**



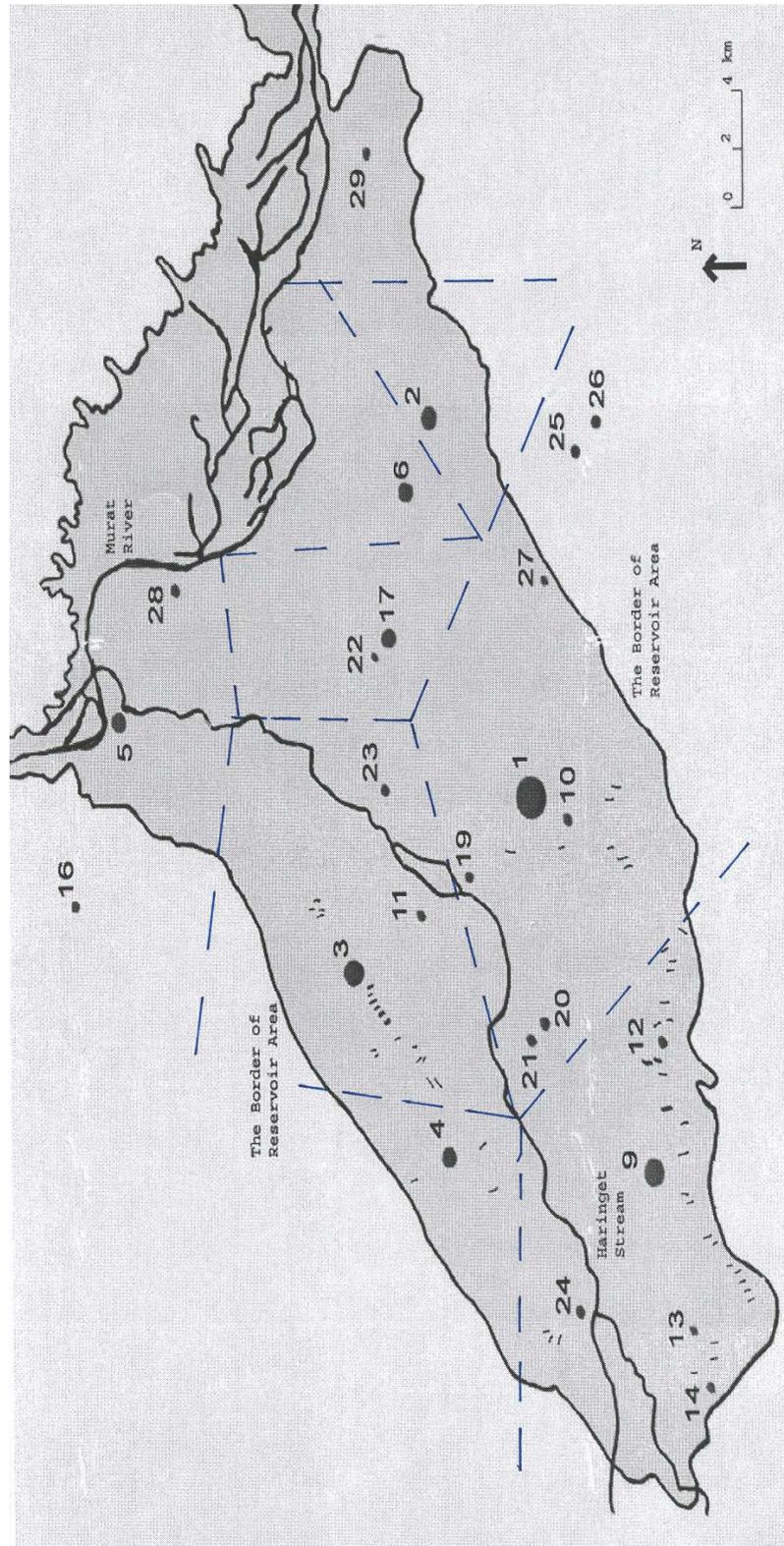
**MAP 7**  
**The Settlements of Altinova in EBA II**



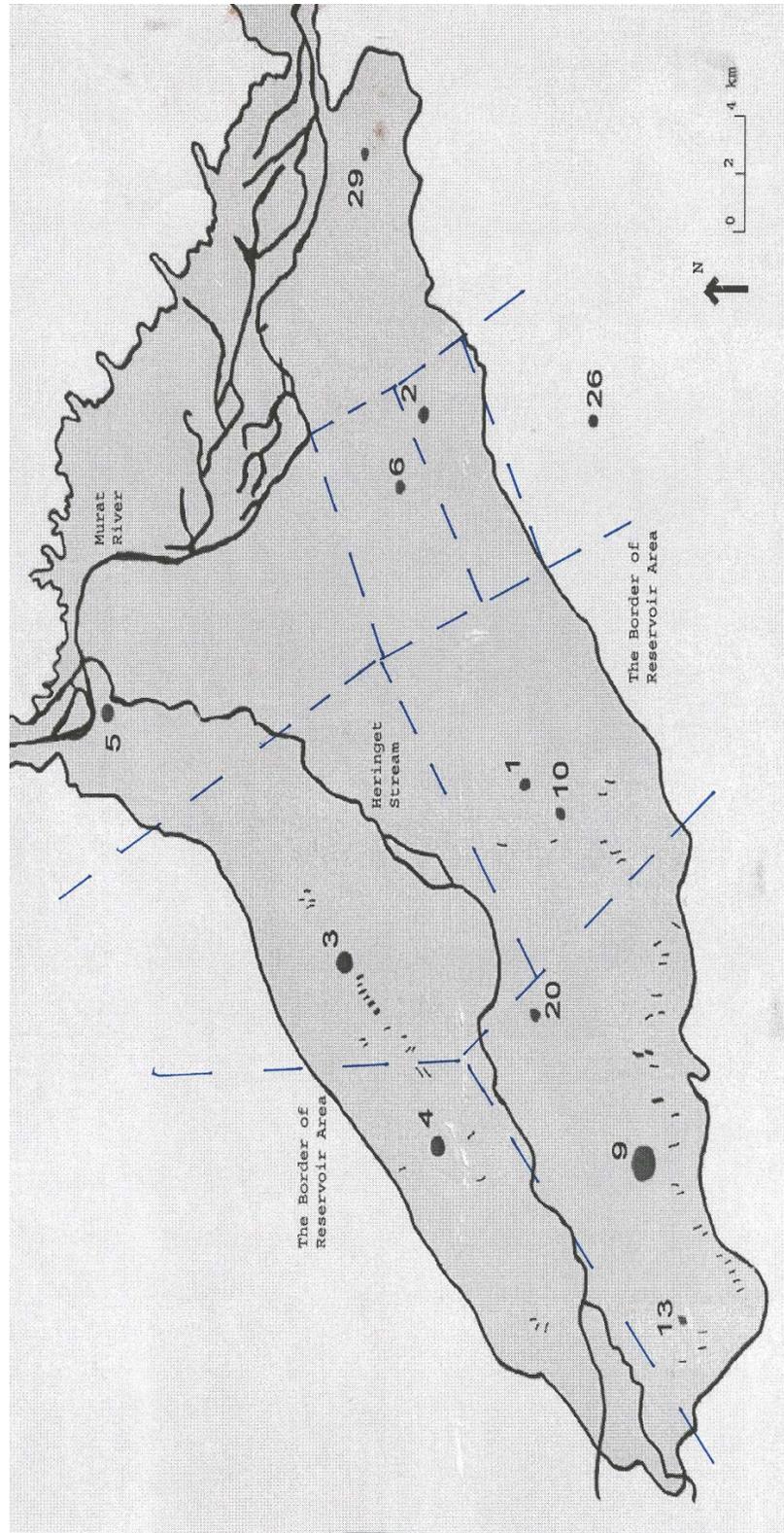
**MAP 8**  
**The Settlements of Altnova in EBA III**



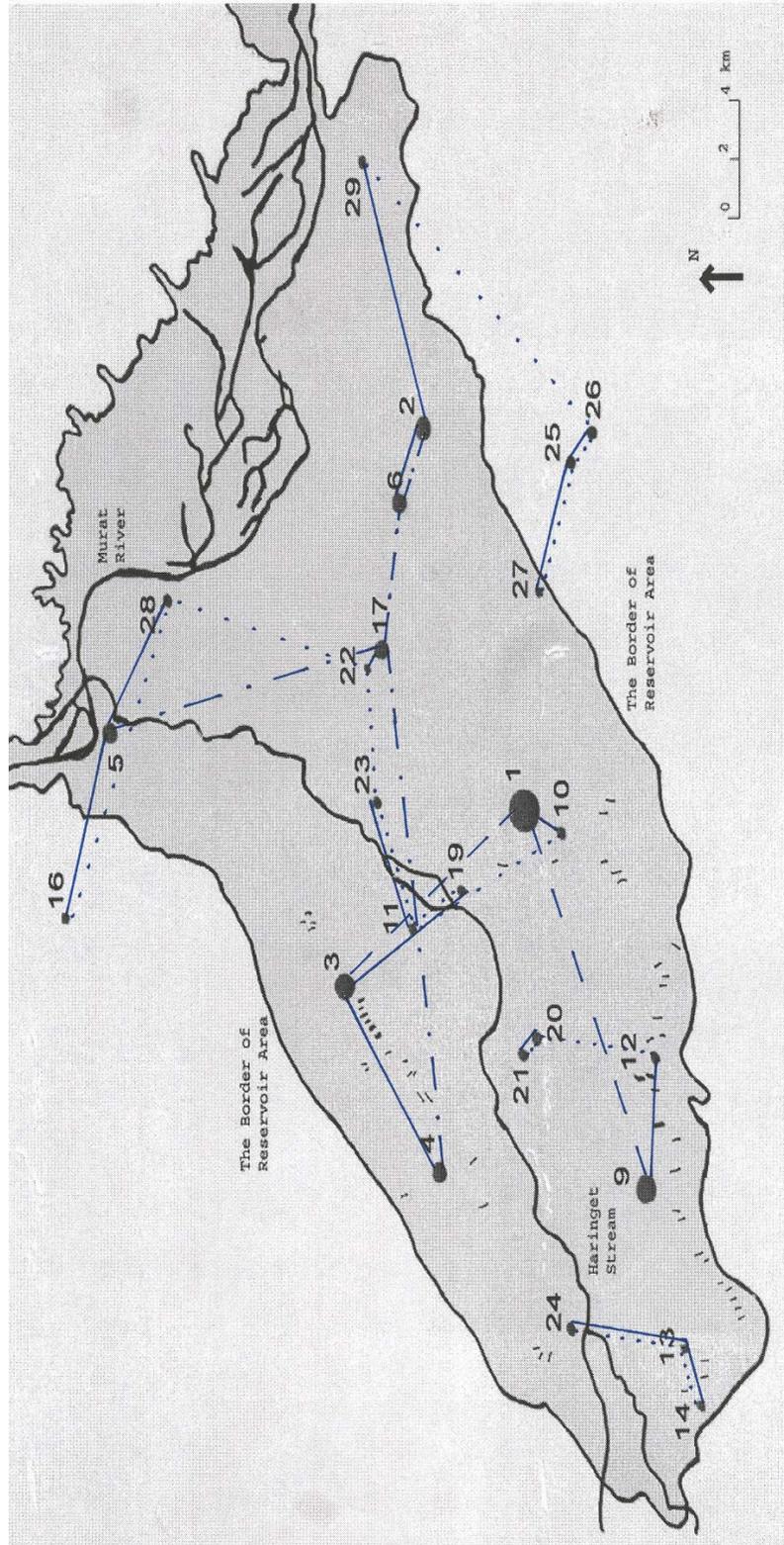
**MAP 9**  
**Catchment Area of Settlements in the EBA I**



**MAP 10**  
**Catchment Areas of Settlements in the EBA II**



**MAP 11**  
**Catchment Areas of Settlements in EBA III**



**MAP 12**  
**Nearest Neighbor Analysis Map, EBA II**

**TABLE 1 Chronological Table of East-Central Anatolia in EBA**

| DATE | PERIOD     | ARSLAN<br>TEPE | NORŞUN<br>TEPE | TEPECİK | KORUCU<br>TEPE | DEĞİRMEN<br>TEPE | AŞVAN                    |
|------|------------|----------------|----------------|---------|----------------|------------------|--------------------------|
| 3000 | EBA I      | VI B1          | HIATUS         | 14      |                |                  | TAŞKUN<br>4              |
| 2900 |            |                | 30             |         |                |                  |                          |
|      |            | VI B2          |                |         |                |                  |                          |
| 2700 |            |                | 25             | 12      |                |                  | TAŞKUN<br>1              |
|      | EBA II     | VI C1          | 24             | 11      | C              | 4                | HAN X<br>PULUR<br>XI     |
| 2500 |            | VI C2          | 14             | 5       | D              | 3                | HAN VIII<br>PULUR<br>VII |
| 2400 | EBA<br>III | VI D1          | 13             | 4       | E              | 2                | HAN VI<br>PULUR<br>VI    |
|      |            | VI D2          | 9              |         |                |                  |                          |
|      |            |                | 8              |         |                |                  |                          |
| 2000 |            | VI D3          | 6              | 1       | F              | 1                | HAN V<br>PULUR I         |

**TABLE 2 Climate of Elazığ Region**

| Month | Mean Tempt. | Mean High Tempt. | Mean Low Tempt. | Mean Preci. (mm) | Snowy Day | Snowy Gro. |
|-------|-------------|------------------|-----------------|------------------|-----------|------------|
| I     | -1,5        | 2                | -4,9            | 43,4             | 4,8       | 12,8       |
| II    | -0,1        | 3,8              | -3,7            | 47,8             | 6,8       | 9,7        |
| III   | 4,3         | 9,4              | -0,2            | 53               | 2,8       | 3,5        |
| IV    | 11,7        | 17,2             | 6,3             | 68,5             |           | 0,1        |
| V     | 17,5        | 23,3             | 11,4            | 53,4             |           |            |
| VI    | 23          | 29               | 15,7            | 13,4             |           |            |
| VII   | 27,2        | 33,6             | 19,6            | 3,5              |           |            |
| VIII  | 27,1        | 33,5             | 19,6            | 1,6              |           |            |
| IX    | 22,2        | 29               | 15,2            | 6,5              |           |            |
| X     | 11,9        | 21,1             | 9               | 35,7             |           |            |
| XI    | 6,8         | 12,5             | 3,7             | 57,1             | 0,6       | 0,4        |
| XII   | 1,1         | 4,9              | -2,1            | 45,8             | 4,2       | 4,8        |

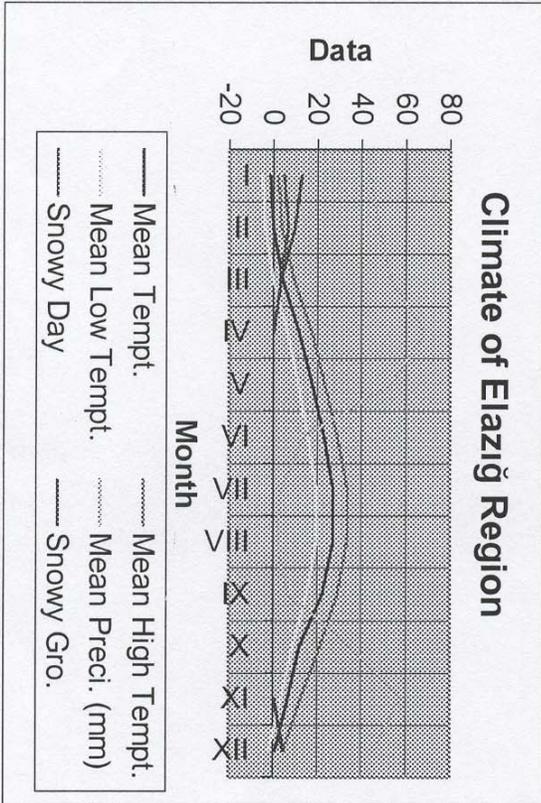


TABLE 3  
Population Trends

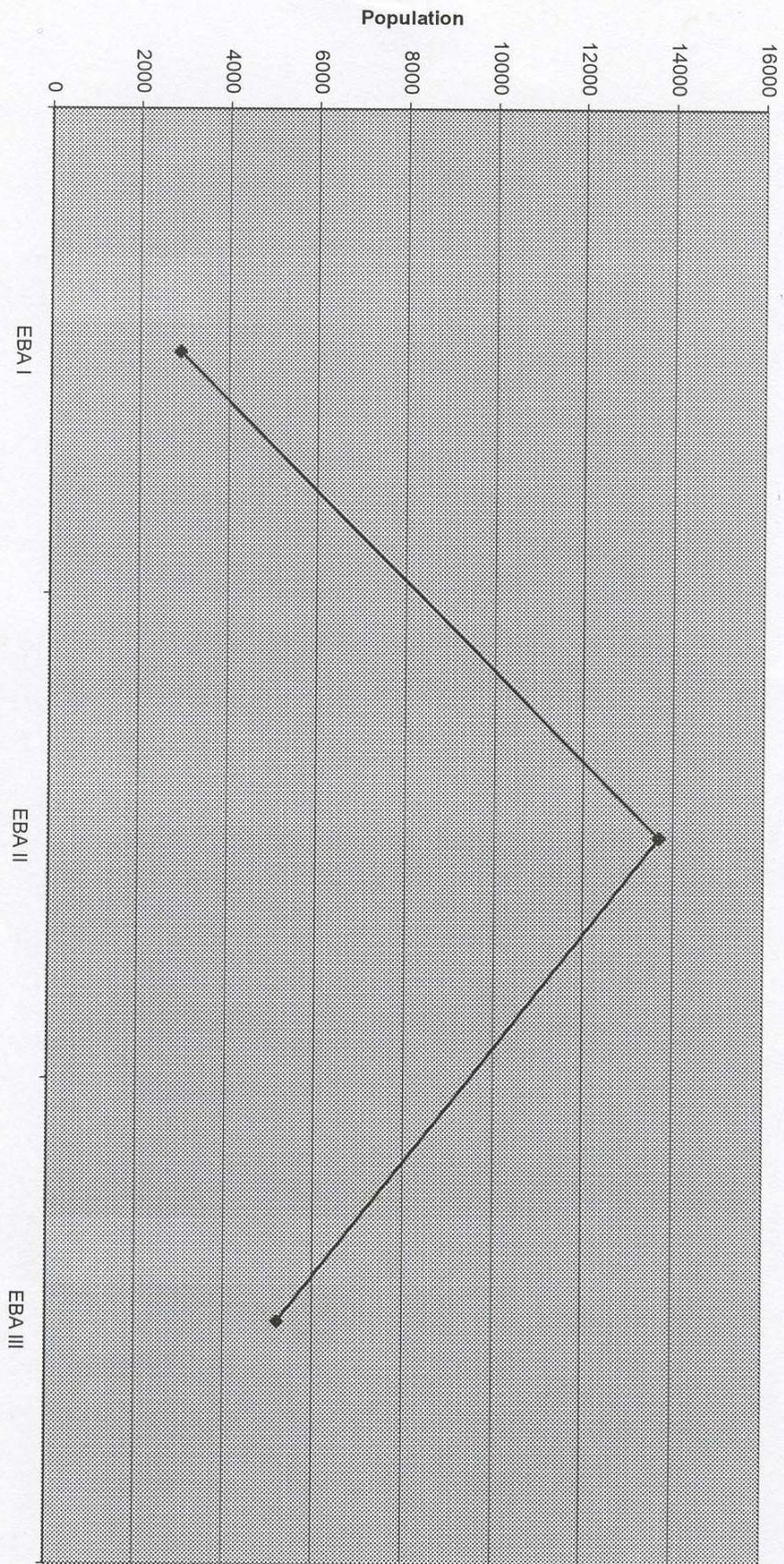
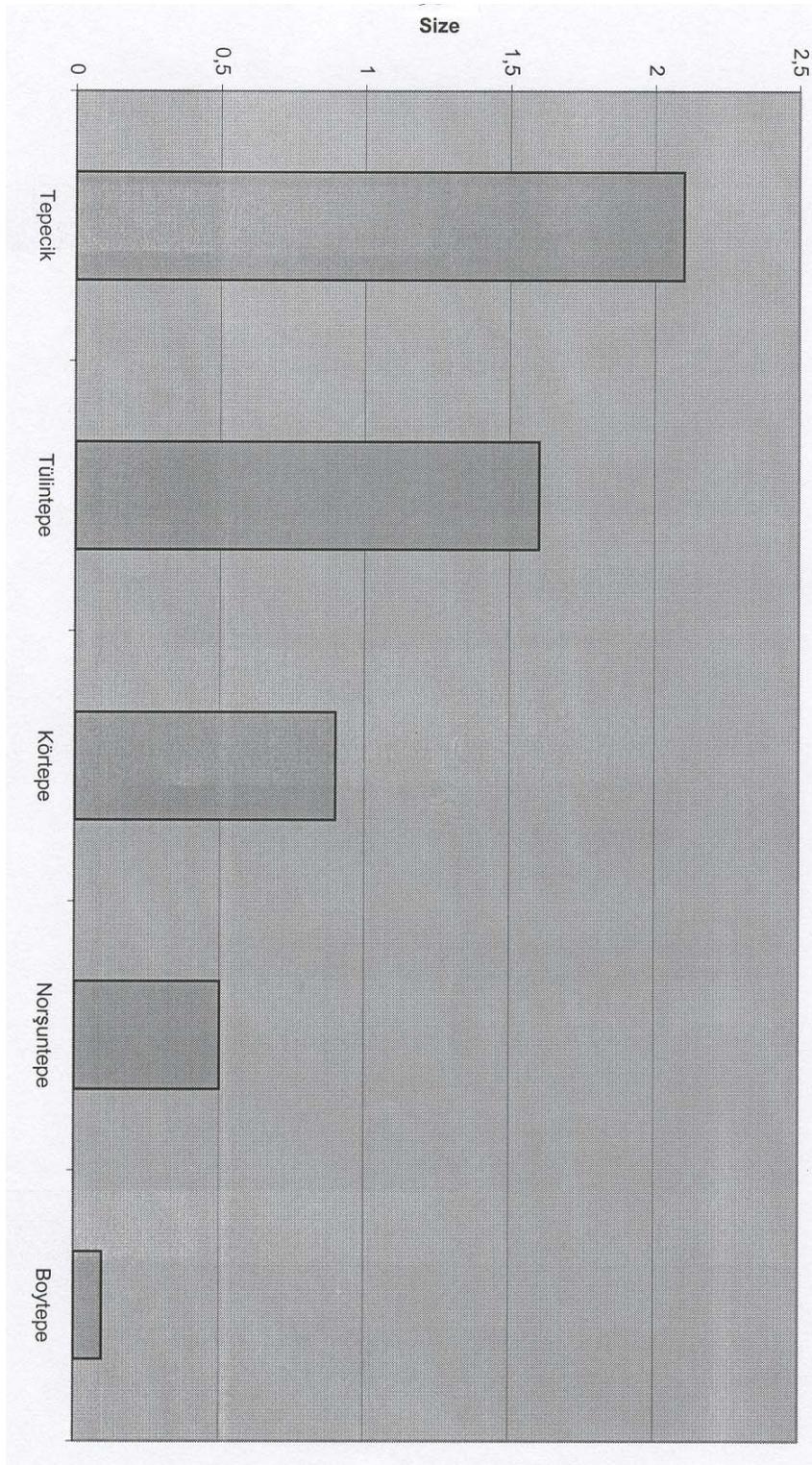


Table 4 Settlement Size Graph, EBA I



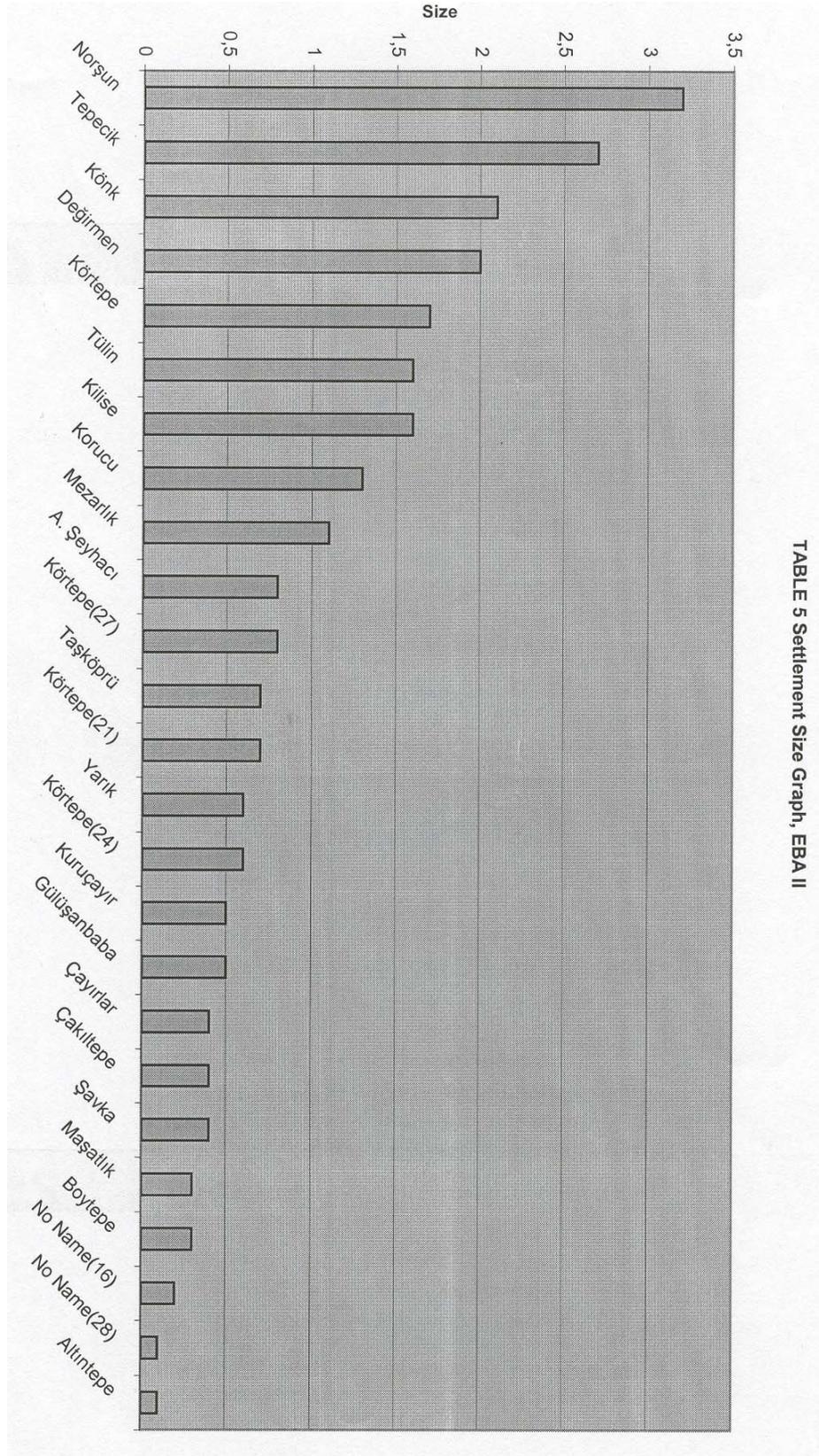


TABLE 6 Settlement Size Graph, EBA III

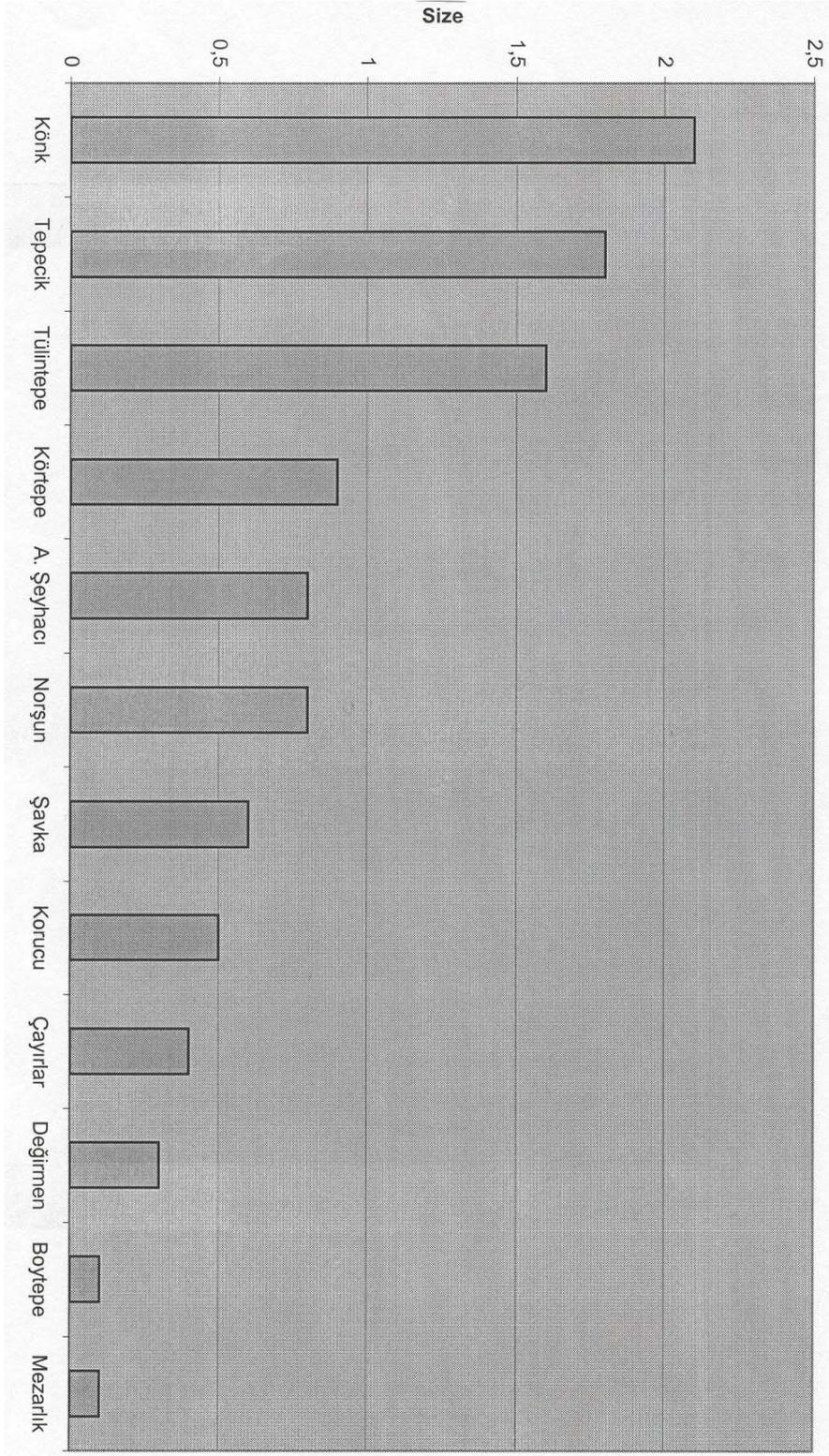
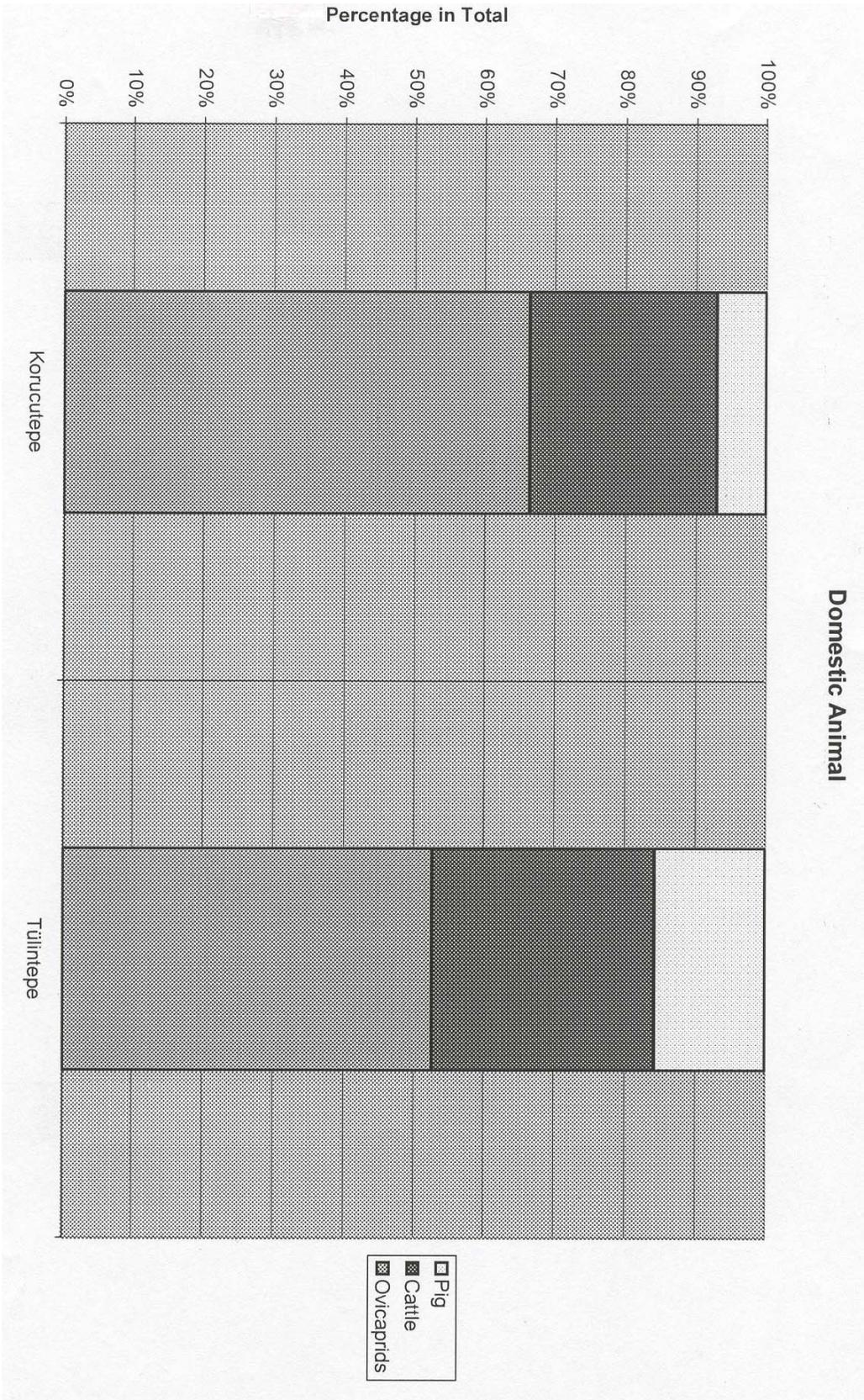
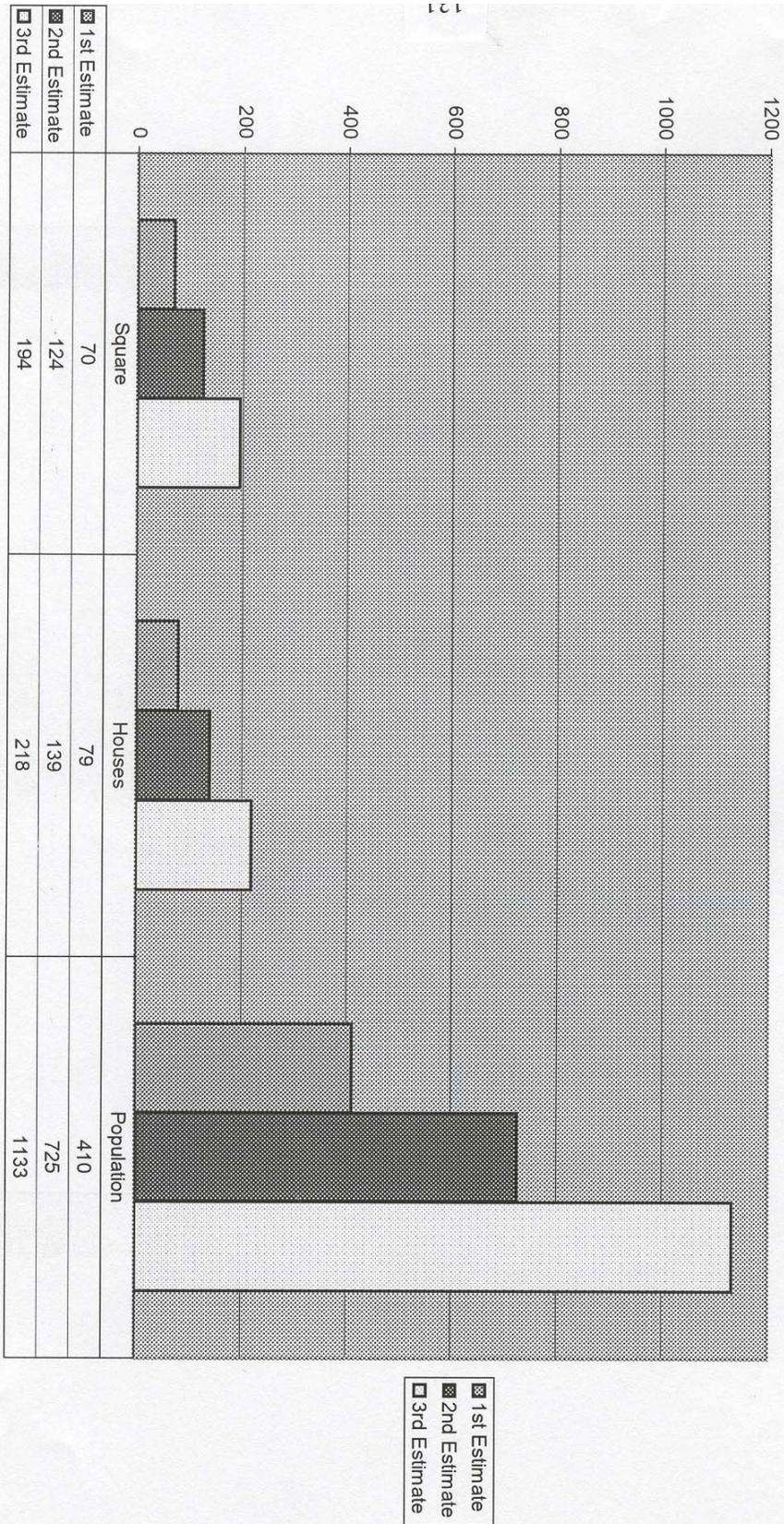


TABLE 7 Settlement List

| SITE                 | NO | PERIOD |        |         | LOCATION          | LENGTH         | WIDTH       | HEIGHT  | OCCUPATION (ha) |        |            |
|----------------------|----|--------|--------|---------|-------------------|----------------|-------------|---------|-----------------|--------|------------|
|                      |    | EBA I  | EBA II | EBA III |                   |                |             |         | EBA I           | EBA II | EBA III    |
| Norşuntepe           | 1  | X      | X      | X       | 2km SE-Alişam     | 500-600m NS    | 400m EW     | 25m     | Small           | 3,2    | 0,8        |
| Korucutepe           | 2  |        | X      | X       | 1.5km NW-Ağlıç    | 210-220m NW-SW | 150m NE-SW  | 15-17m  | N               | 1,3    | Small      |
| Tepelik              | 3  | X      | X      | X       | 1km SW-Tp         | 200m-100m      | 200m        | 10m     | 2,1             | 2,7    | 1,8        |
| Tülintepe            | 4  | X      | X      | X       | 17km E-Elaziğ     | 260m           | 210m        | N       | 1,6             | 1,6    | 1,6        |
| Değirmentepe         | 5  |        | X      | X       | 5.5km NE-Tp       | 160m           | 150m        | 7m      | N               | 2      | Small      |
| Körtepe (Habusu)     | 6  | X      | X      | X       | 2.5km E-Hıbs      | 210-215m NS    | 100m EW     | 2m      | 0,9             | 1,7    | 0,9        |
| Könk                 | 9  |        | X      | X       | N-Könk            | 500m           | 250-350m    | 16-18m  | N               | 2,1    | 2,1        |
| Mezarlık Tepe        | 10 |        | X      | X       | 1km NE-YuAğ       | 140m NE-NW     | 140m NW-SE  | 2.5m    | N               | 1,1    | very small |
| Yarık Tepe           | 11 |        | X      |         | 1km E-Alişam      | 115m NS        | 110m EW     | 1m      | N               | 0,6    | N          |
| Kuruçayır Tepesi     | 12 |        | X      |         | 2.5km E-Könk      | 85m NS         | 90m EW      | 2m      | N               | 0,5    | N          |
| Çayırar Tepesi       | 13 |        | X      | X       | 1.5km NE-Sarpulu  | 85-90m NS      | 75m         | 2-2.5m  | N               | 0,4    | 0,4        |
| Çakıltepe            | 14 |        | X      |         | 0.5km NW-Sarpulu  | 90m NE-SW      | 70m NW-SE   | 2.5-3m  | N               | 0,4    | N          |
| No name              | 16 |        | X      |         | 0.2km E-Kıraç     | 50m NS         | 30m EW      | 0.5-1m  | N               | 0,1    | N          |
| Kilise Tepe          | 17 |        | X      |         | in Habusu         | 250m EW        | 200m NS     | 7-8m    | N               | 1,6    | N          |
| Taşköprü             | 19 |        | X      |         | 1.5km NW-Alişam   | 150m NE-SW     | 100m NW-SE  | 1.5-2m  | N               | 0,7    | N          |
| Şavka Tepe           | 20 |        | X      | X       | 1.5km S-Haceri    | 110m NS        | 100m EW     | 1.5m    | N               | 0,4    | 0,6        |
| Körtepe              | 21 |        | X      |         | 0.2km N-Şavkat    | 125m NS        | 110m EW     | 2m      | N               | 0,7    | N          |
| Maşatlık             | 22 |        | X      |         | in Habusu         | 76m EW         | 70m NS      | 1-1.25m | N               | 0,3    | N          |
| Gülüşanbaba Tepesi   | 23 |        | X      |         | 0.5km N-Alişam    | 110m NS        | 75m EW      | 1.5-2m  | N               | 0,5    | N          |
| Körtepe              | 24 |        | X      |         | 3km NW-Könk       | 120m NS        | 100m EW     | 2m      | N               | 0,6    | N          |
| Altıntepe            | 25 |        | X      |         | 1.5km NW-Zertariğ | 67m NS         | 60m EW      | 2-2.5m  | N               | 0,3    | N          |
| Boytepe              | 26 | X      | X      | X       | 0.7km NW-Zertariğ | 150m SE-NW     | 50m SW-NE   | 2m      | 0,1             | 0,2    | very small |
| Körtepe              | 27 |        | X      |         | 3km S-Habusu      | 145m NW-SE     | 110m NE-SW  | 1.5m    | N               | 0,8    | N          |
| No name              | 28 |        | X      |         | 1km N-Ahur        | 50m EW         | 30m NS      | 0m      | N               | 0,1    | N          |
| Aşağı Şeyhacı Tepesi | 29 |        | X      | X       | in Aşağı Şeyhacı  | 150m NS        | 100-125m EW | 8-9m    | N               | 0,8    | 0,8        |

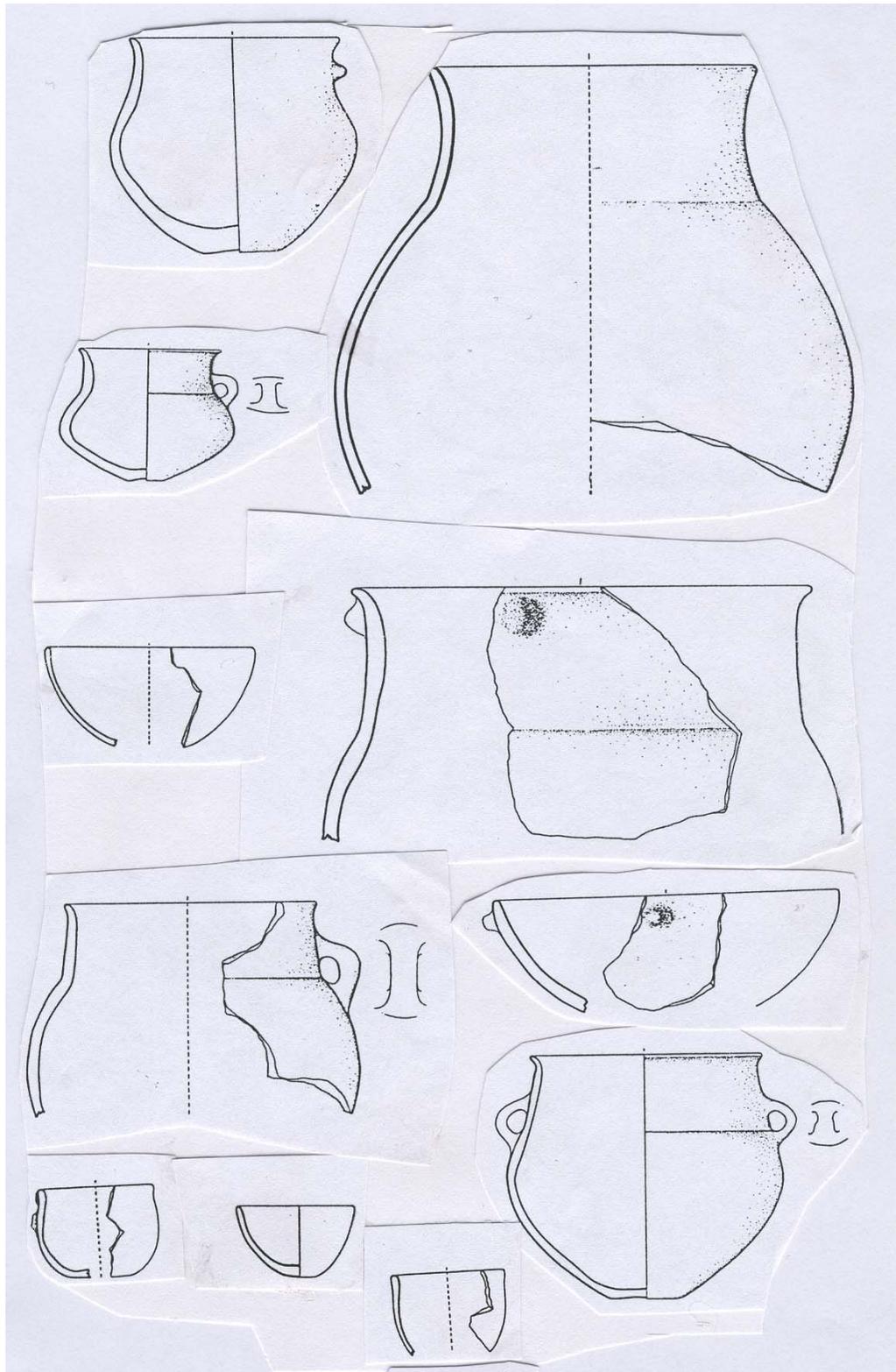


### Griffin Population Estimates

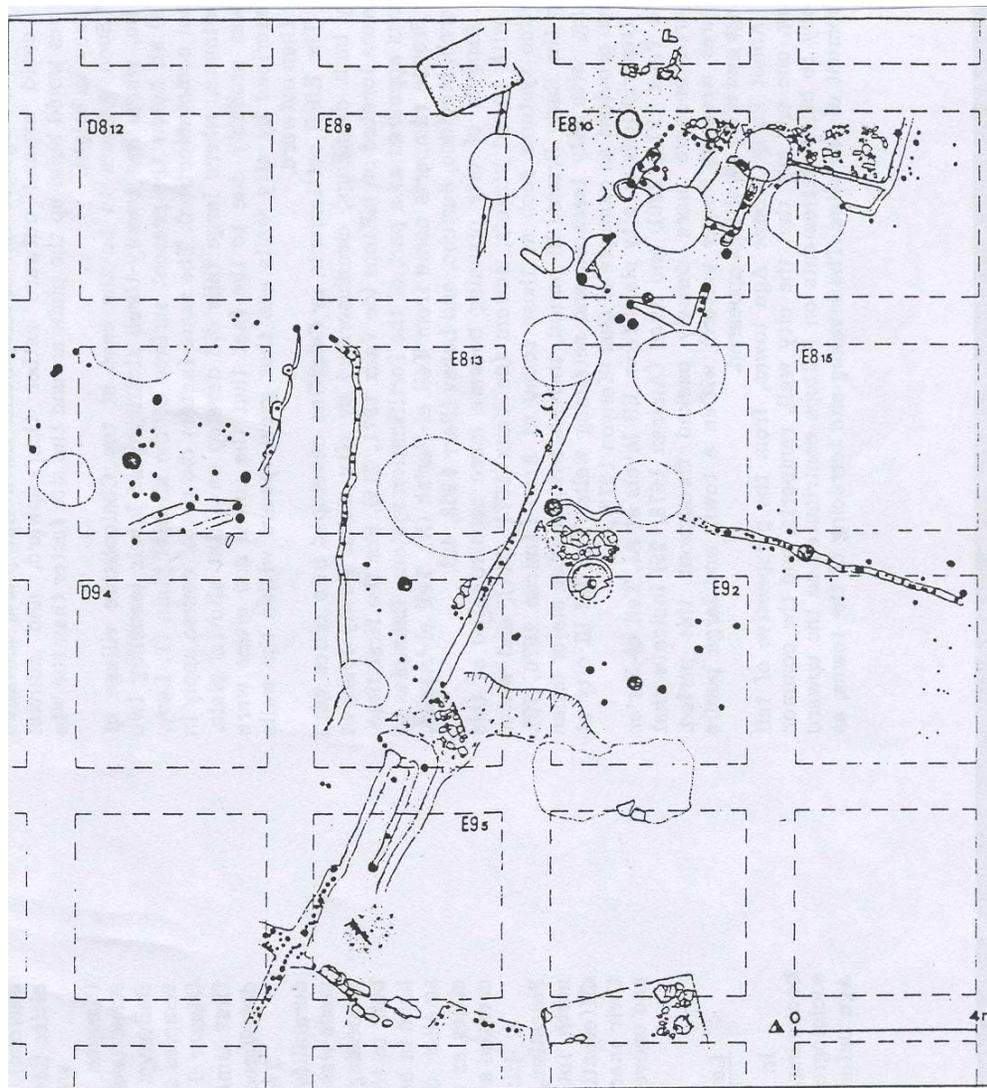


**TABLE 10****Nearest Neighbor Analysis Data Index**

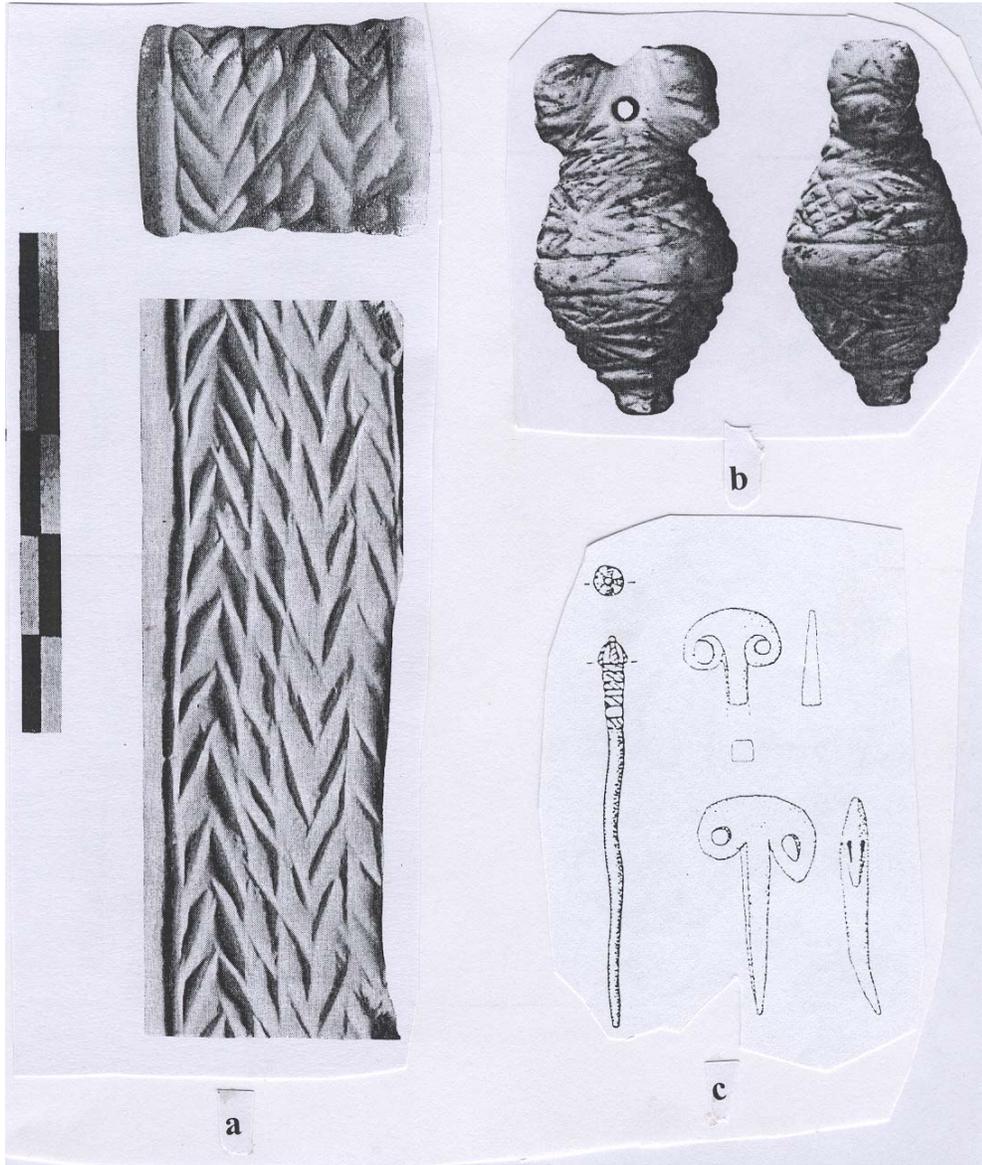
| <b>Settlement Number</b> | <b>Nearest Neighbor Distance (km)</b> | <b>Nearest Neighbor Settlement No.</b> | <b>Nearest Settlement Distance in the Same Level (km)</b> | <b>Nearest Settlement Number in the Same Level</b> |
|--------------------------|---------------------------------------|----------------------------------------|-----------------------------------------------------------|----------------------------------------------------|
| 01                       | 0.8                                   | 10                                     | 5                                                         | 03                                                 |
| 02                       | 1.4                                   | 06                                     | 1.4                                                       | 06                                                 |
| 03                       | 2                                     | 11                                     | 5                                                         | 01                                                 |
| 04                       | 3.7                                   | 03                                     | 8.5                                                       | 17                                                 |
| 05                       | 2.5                                   | 28                                     | 6                                                         | 17                                                 |
| 06                       | 1.4                                   | 02                                     | 1.4                                                       | 02                                                 |
| 09                       | 2.1                                   | 12                                     | 7                                                         | 01                                                 |
| 10                       | 0.8                                   | 01                                     | 2                                                         | 19                                                 |
| 11                       | 1.2                                   | 19                                     | 1.2                                                       | 19                                                 |
| 12                       | 2.1                                   | 09                                     | 2.9                                                       | 20                                                 |
| 13                       | 1.1                                   | 14                                     | 1.1                                                       | 14                                                 |
| 14                       | 1.1                                   | 13                                     | 1.1                                                       | 13                                                 |
| 16                       | 4                                     | 05                                     | 6.5                                                       | 28                                                 |
| 17                       | 0.3                                   | 22                                     | 2.2                                                       | 06                                                 |
| 19                       | 1.2                                   | 11                                     | 1.2                                                       | 11                                                 |
| 20                       | 0.2                                   | 21                                     | 0.2                                                       | 21                                                 |
| 21                       | 0.2                                   | 20                                     | 0.2                                                       | 20                                                 |
| 22                       | 0.3                                   | 17                                     | 2.3                                                       | 23                                                 |
| 23                       | 1.9                                   | 11                                     | 1.9                                                       | 11                                                 |
| 24                       | 2.2                                   | 13                                     | 2.2                                                       | 13                                                 |
| 25                       | 0.9                                   | 26                                     | 0.9                                                       | 26                                                 |
| 26                       | 0.9                                   | 25                                     | 0.9                                                       | 25                                                 |
| 27                       | 2                                     | 25                                     | 2                                                         | 25                                                 |
| 28                       | 2.5                                   | 05                                     | 4.8                                                       | 22                                                 |
| 29                       | 5                                     | 02                                     | 6.8                                                       | 25                                                 |



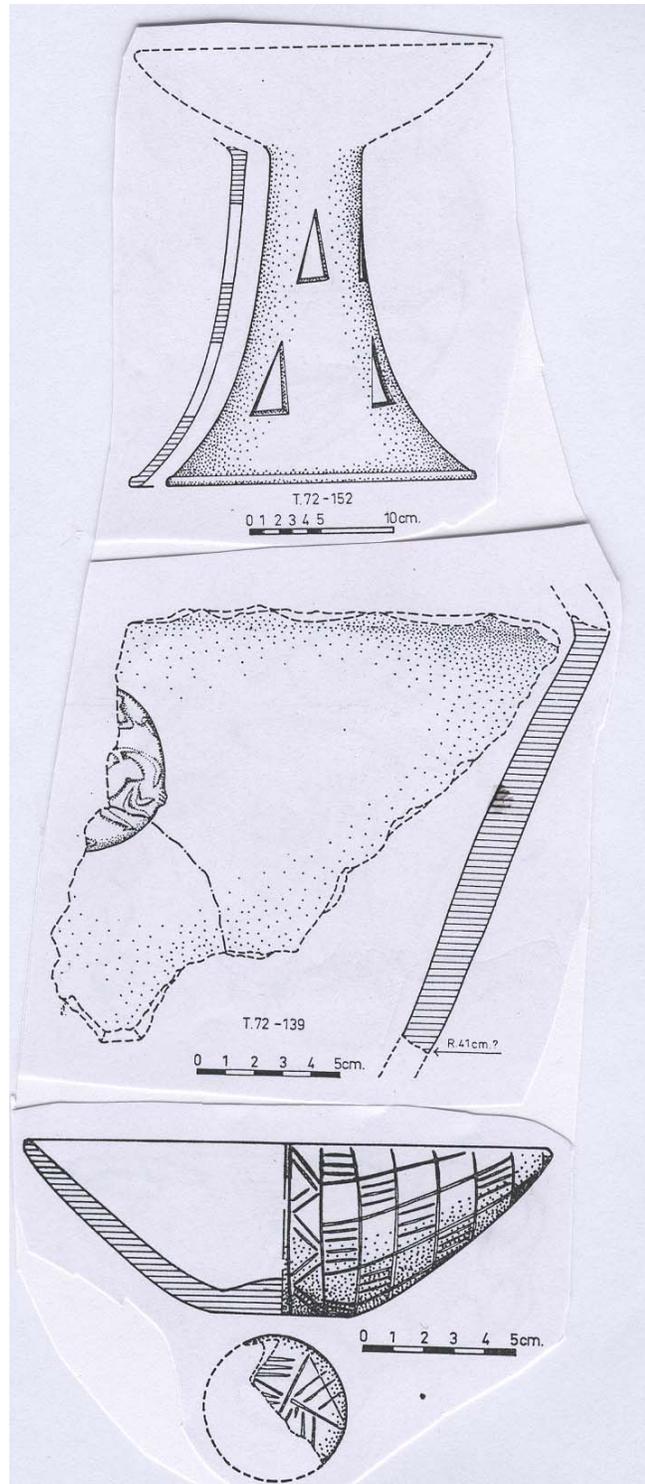
**FIGURE 1**  
**Red-Black Burnished Wares from Arslantepe VI B1**



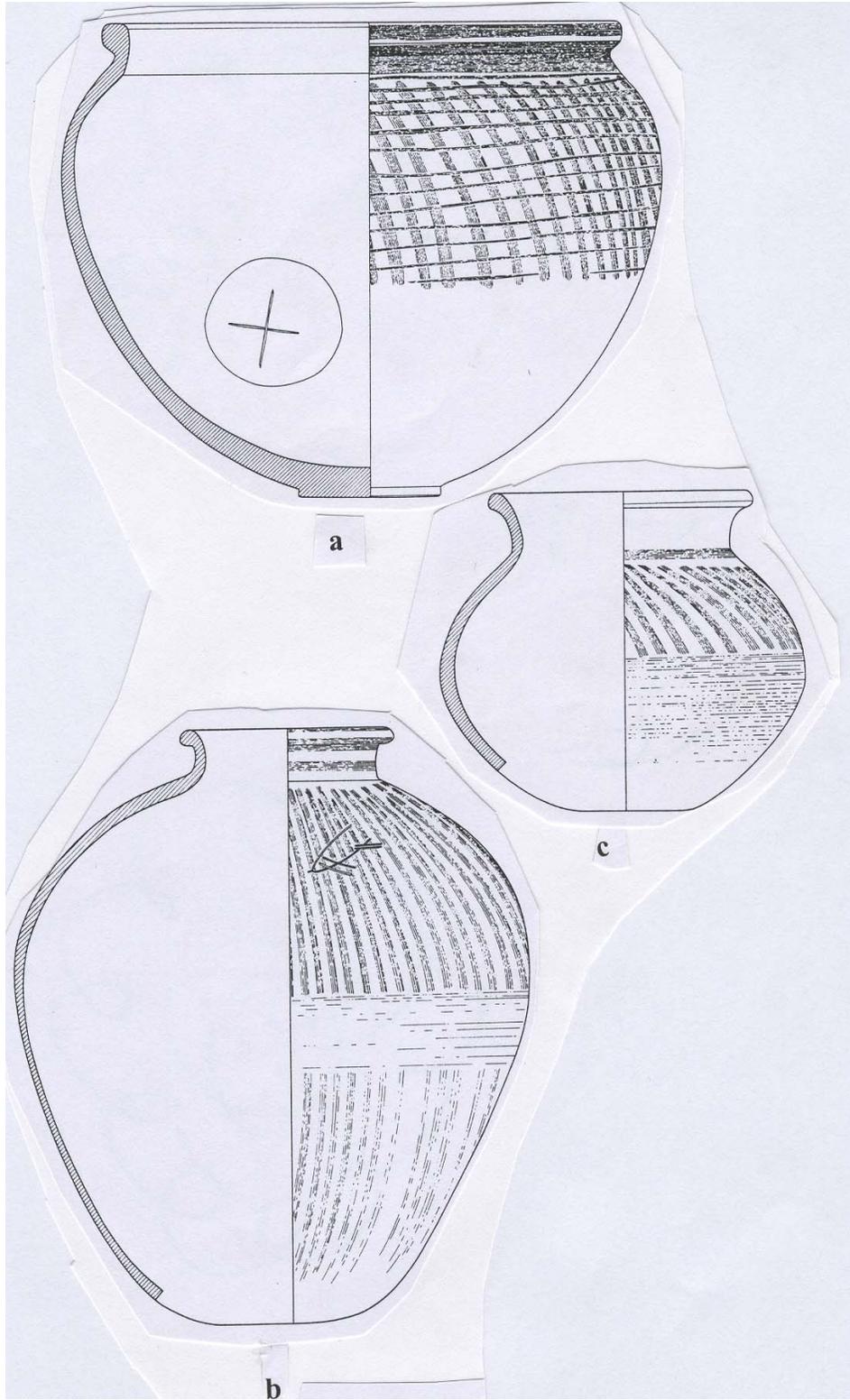
**FIGURE 2**  
**Architecture in Arslantepe VI B1**



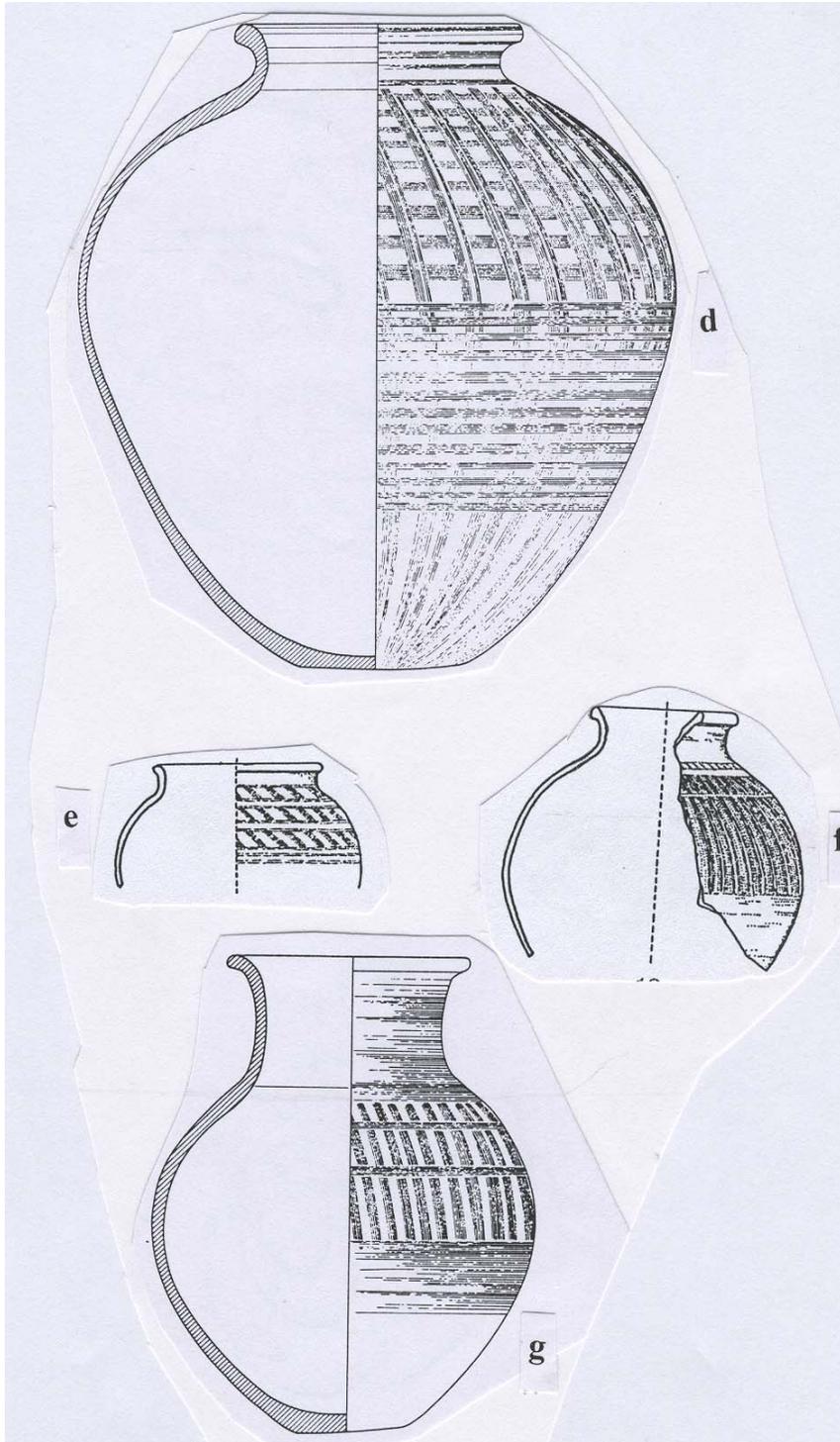
**FIGURE 3**  
**Findings in Norşuntepe, EBA IA**



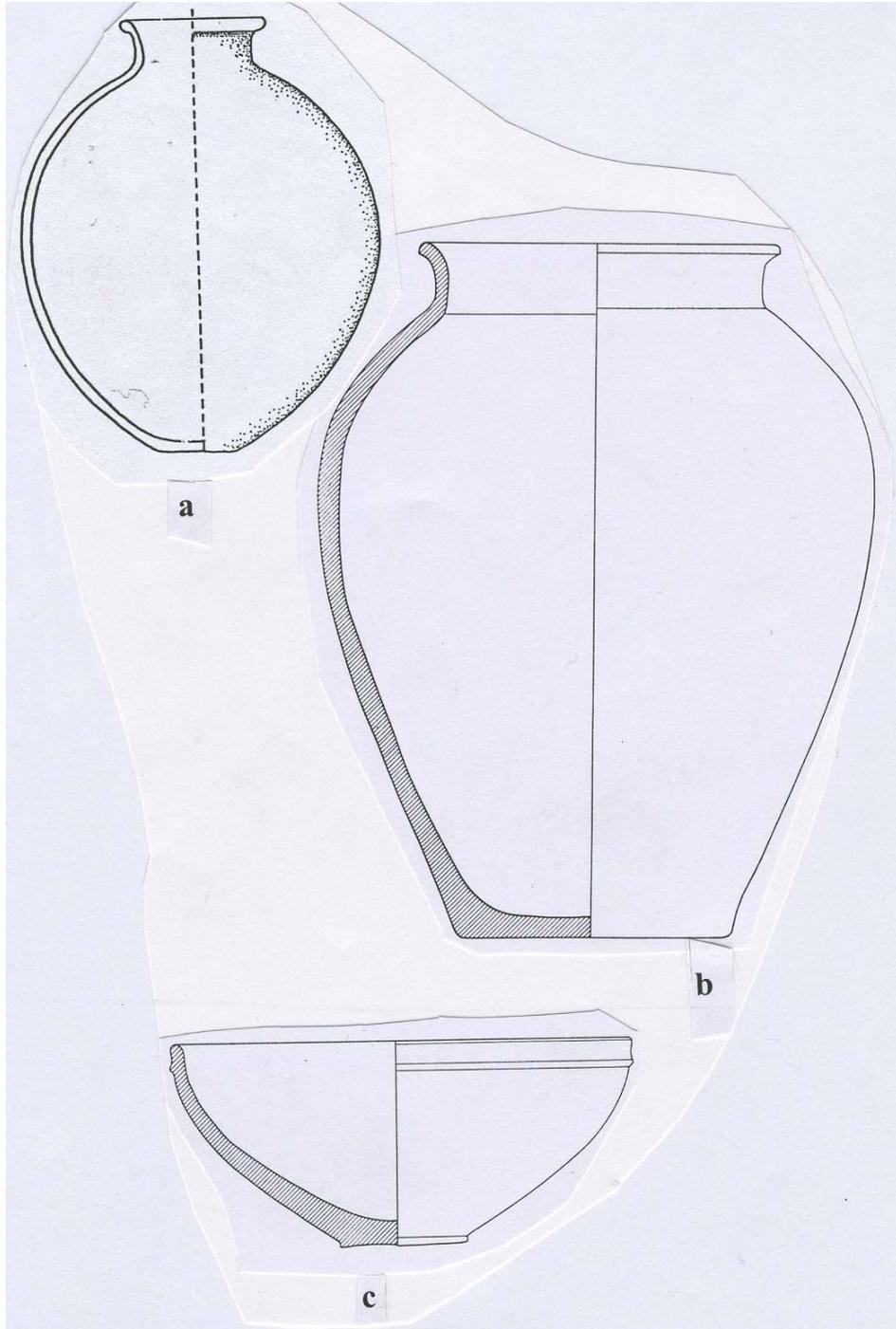
**FIGURE 4**  
**The pottery of Tepecik, EBA IA**



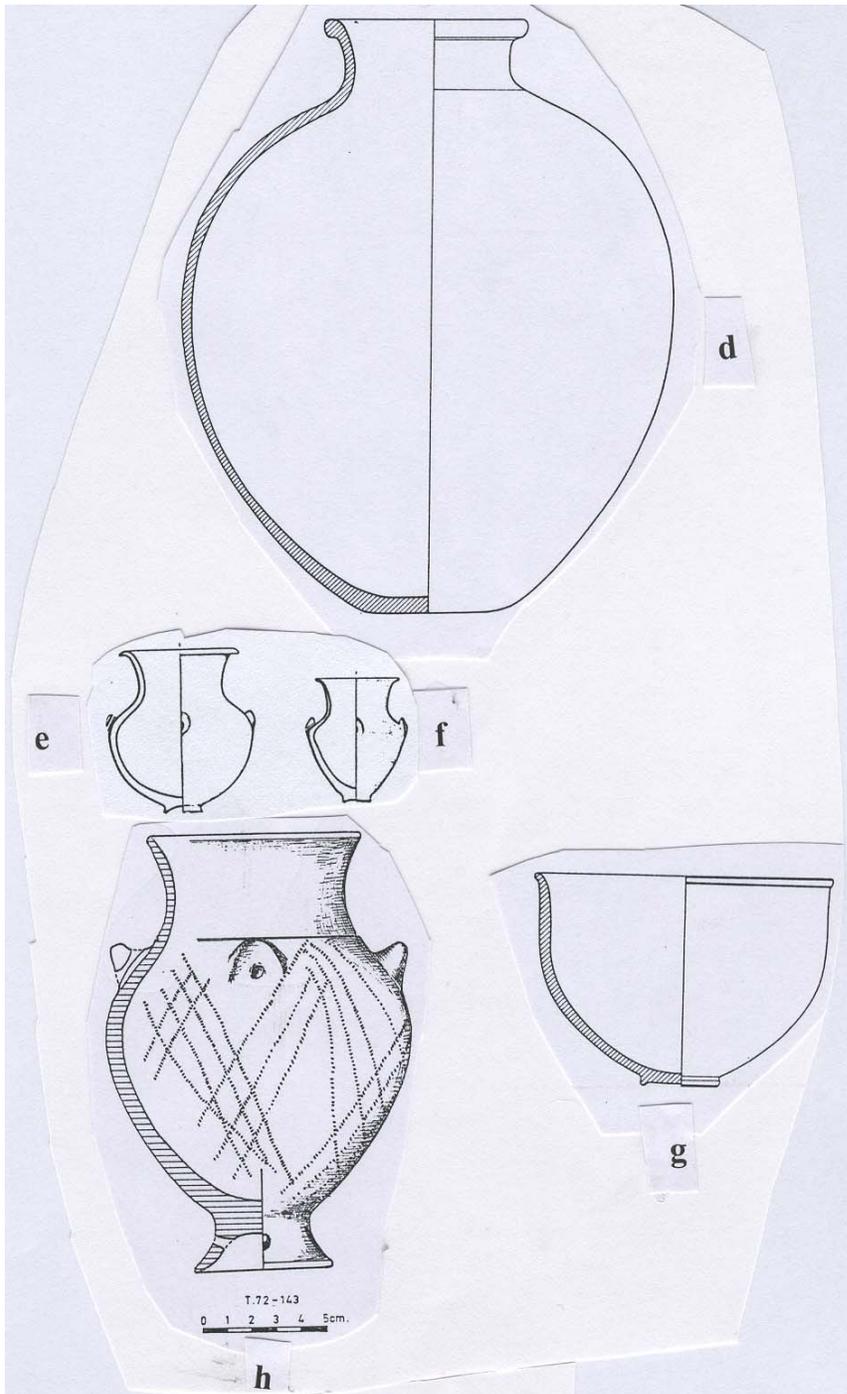
**FIGURE 5**  
**Late Reserved Slip Ware in East-Central Anatolia**



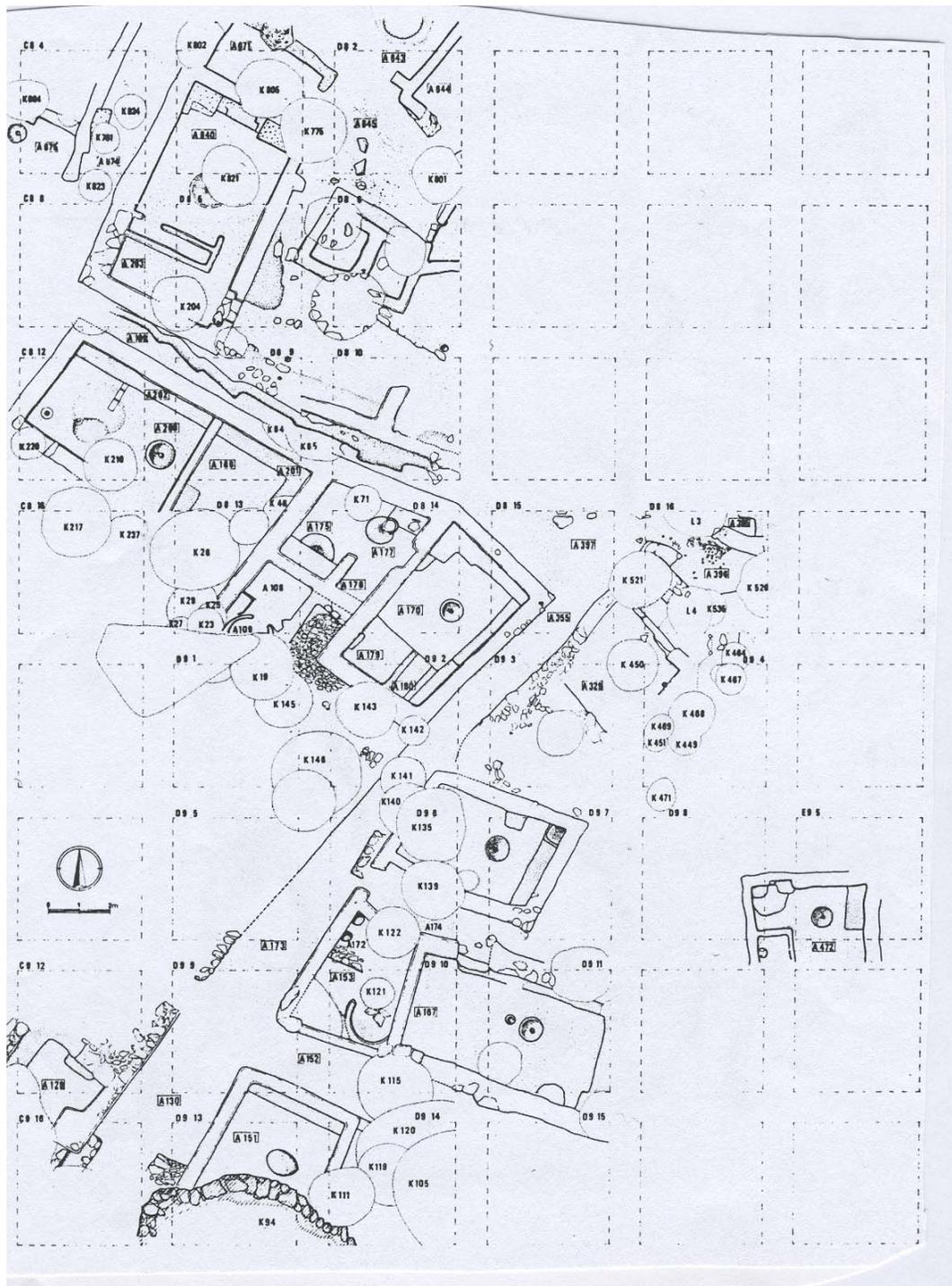
**FIGURE 5 (cont.)**



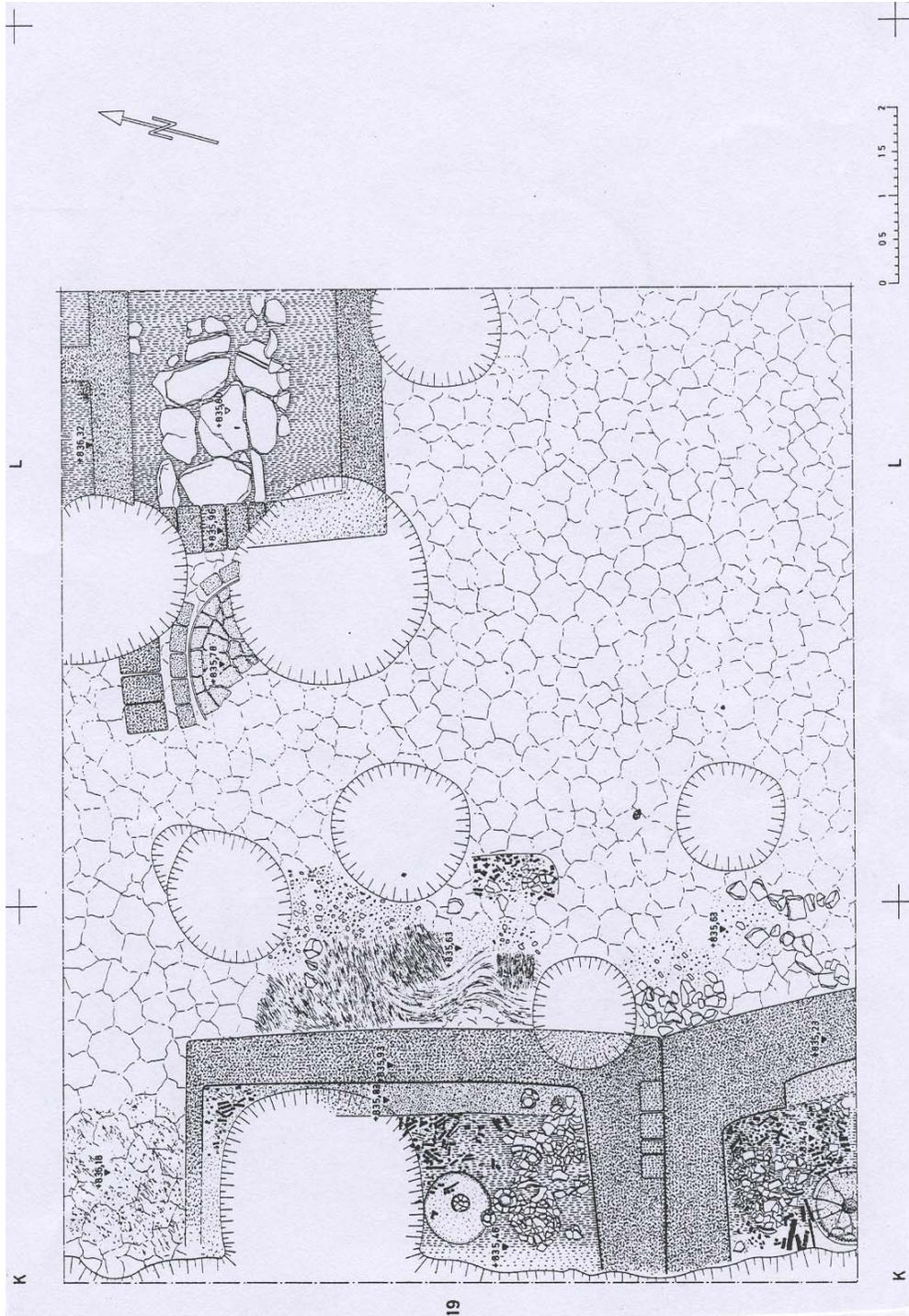
**FIGURE 6**  
**Plain Simple Ware in East-Central Anatolia**



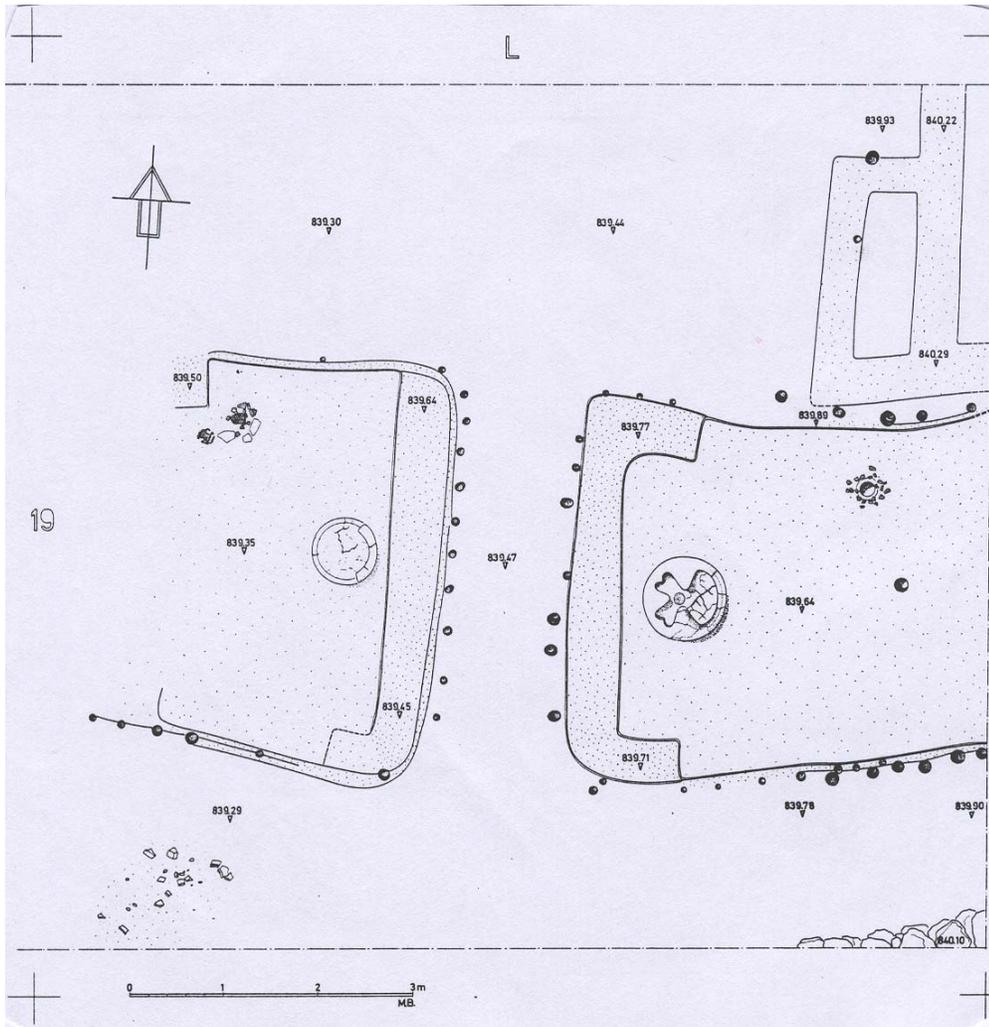
**FIGURE 6 (cont.)**



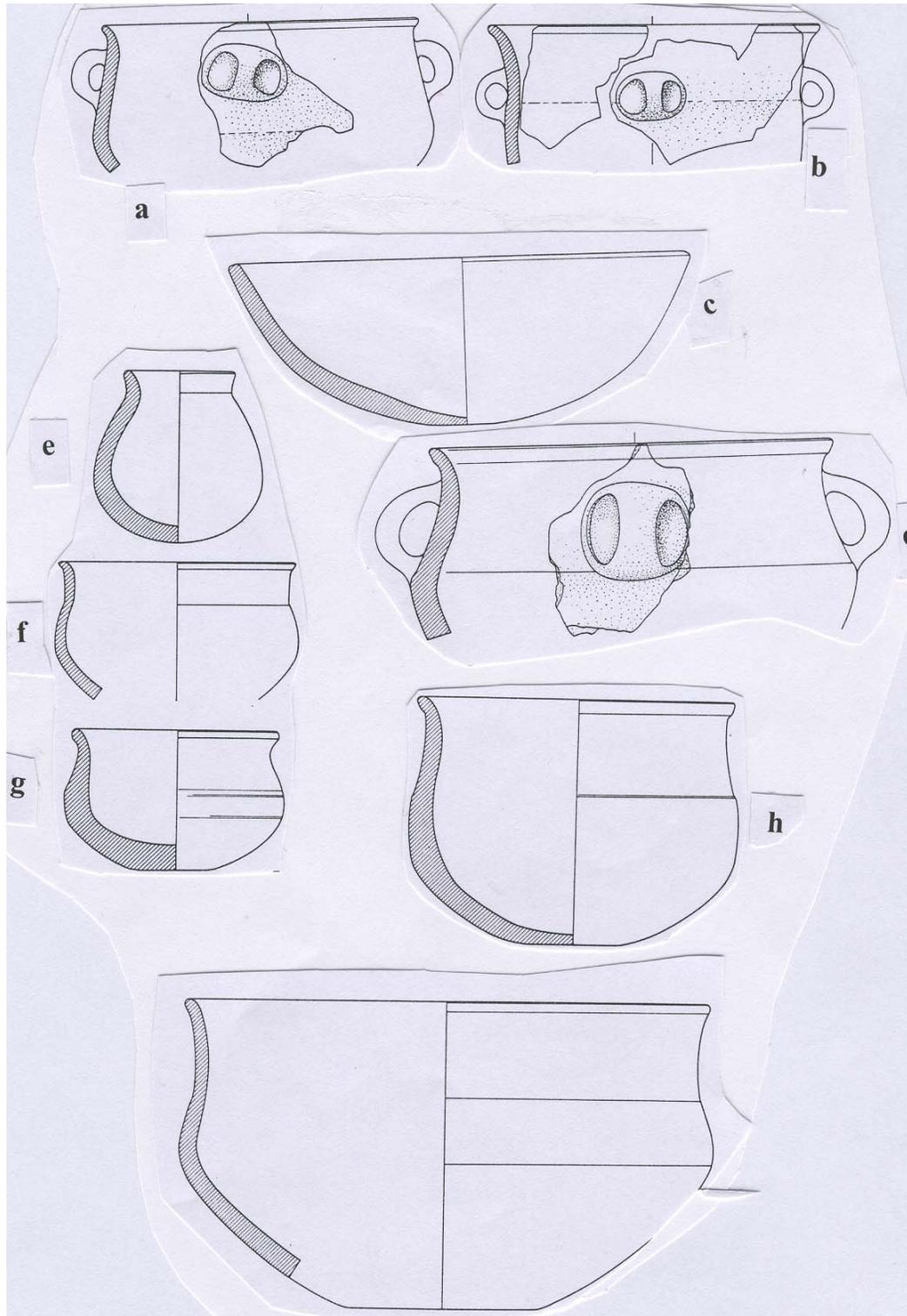
**FIGURE 7**  
**Architecture in Arslantepe VI B2**



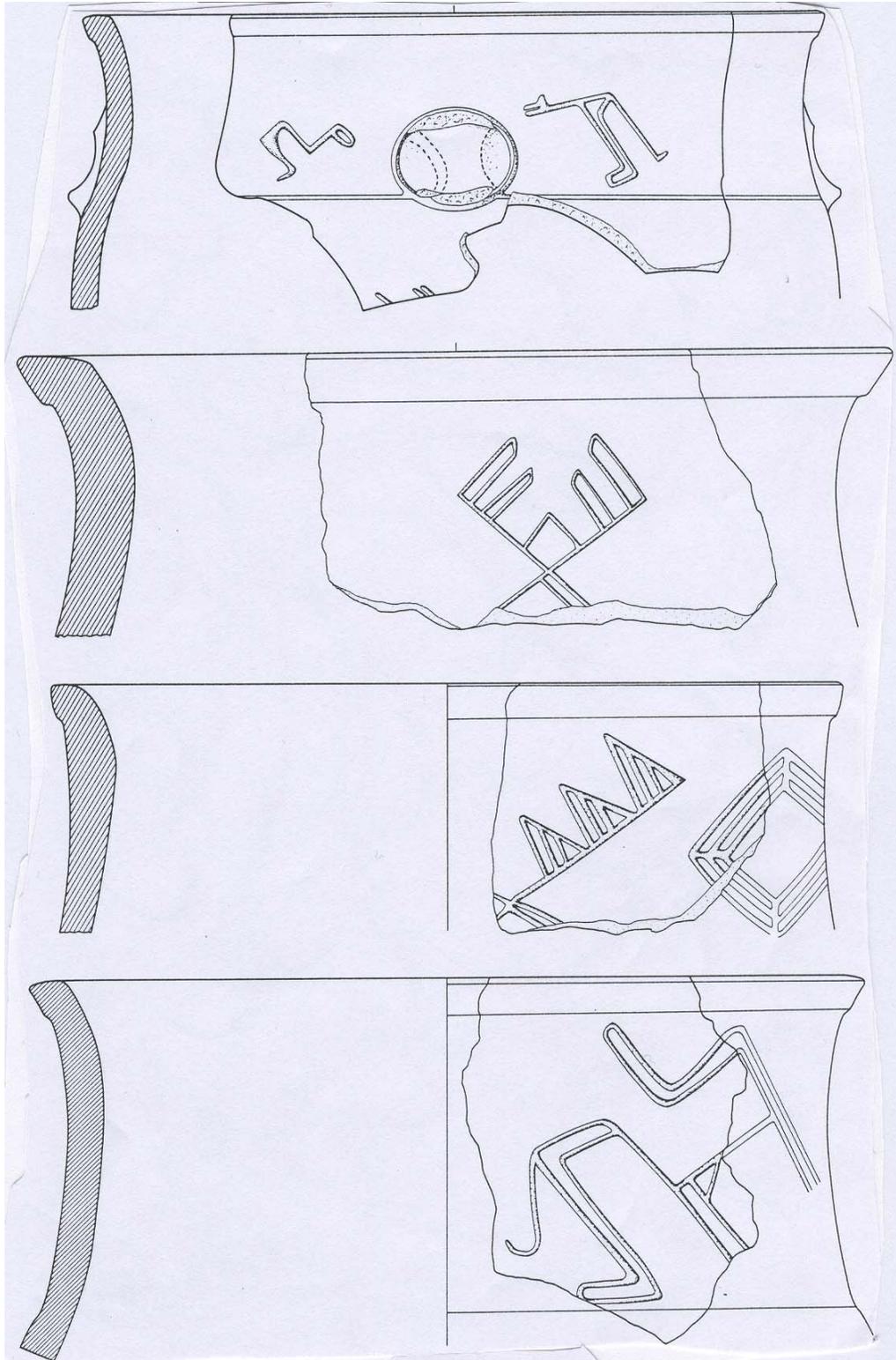
**FIGURE 8**  
**Architecture in Norşuntepe, EBA I**



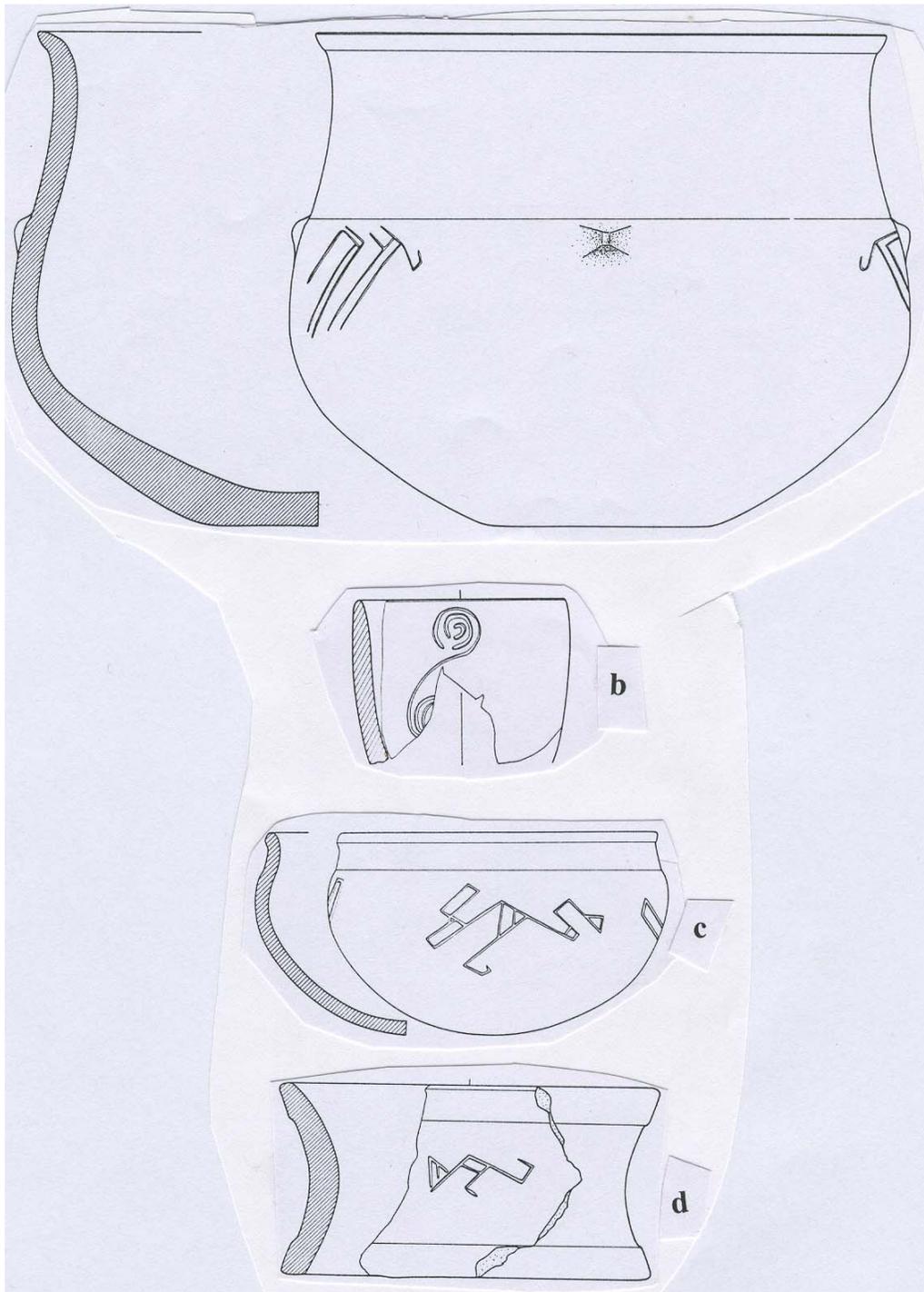
**FIGURE 8 (cont.)**



**FIGURE 9**  
**Red-Black Burnished Wares in East-Central Anatolia, EBA II**

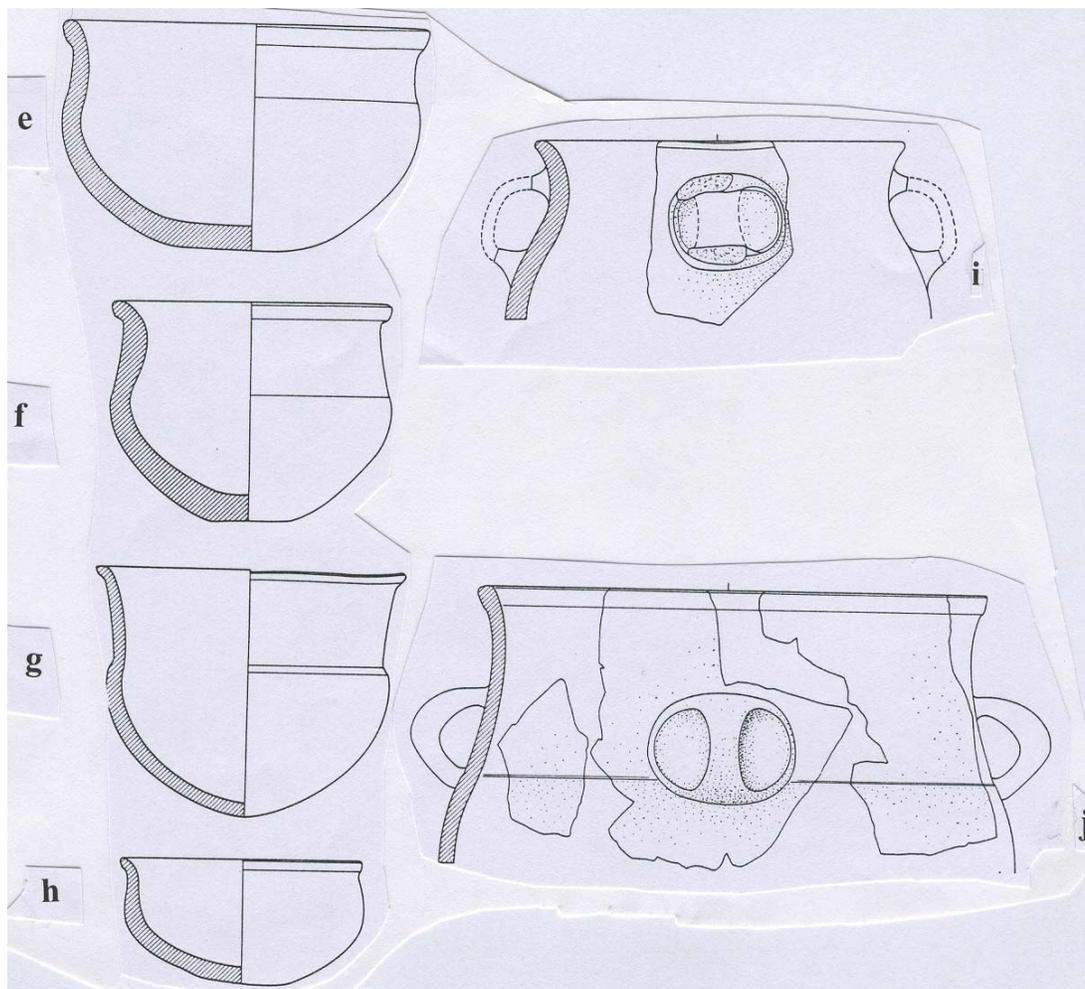


**FIGURE 10**  
**Red-Black Burnished Wares in East-Central Anatolia, EBA II**

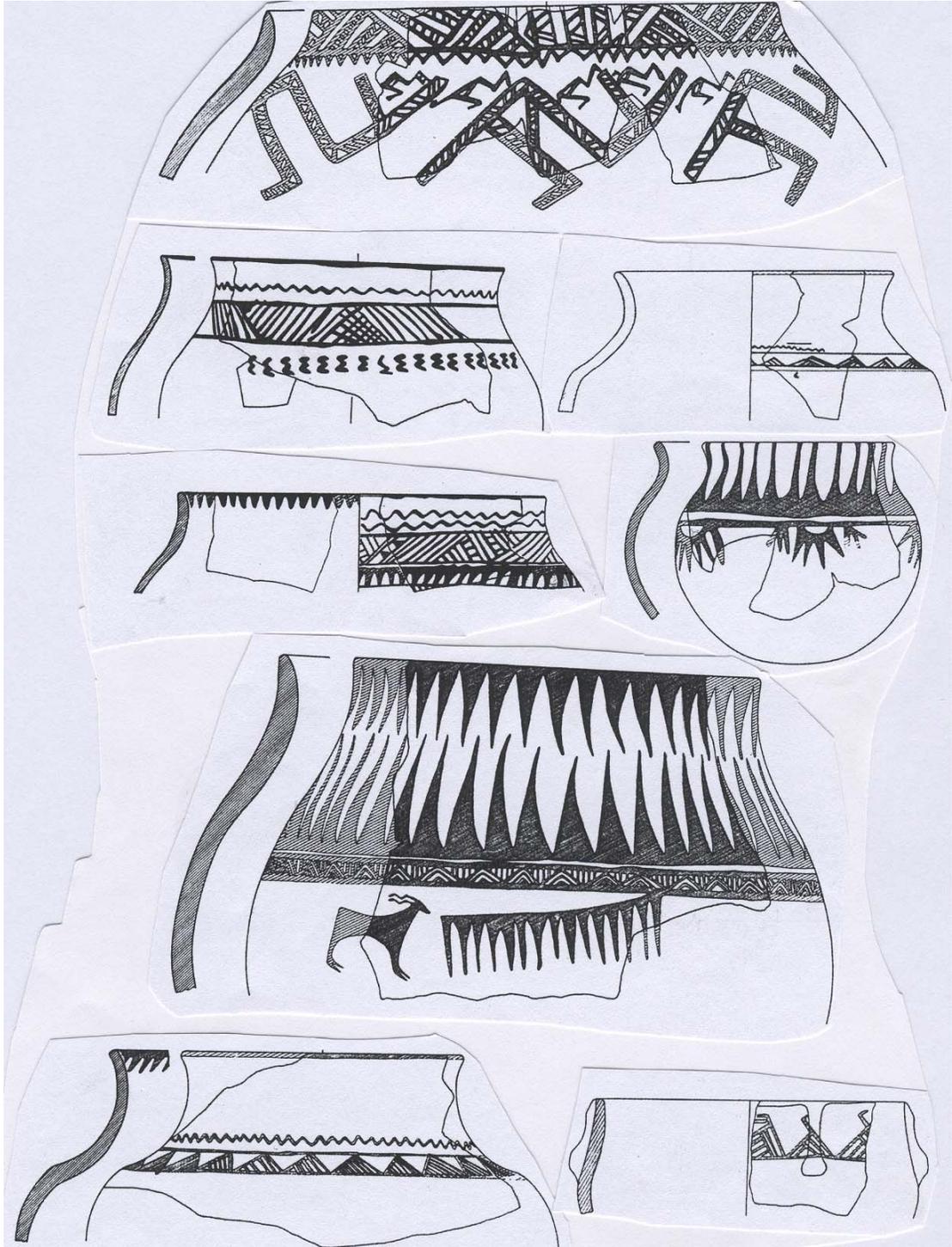


**FIGURE 11**

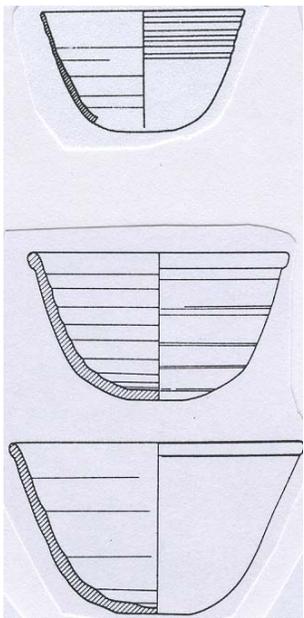
**Red-Black Burnished Wares in East-Central Anatolia, EBA II**



**FIGURE 11 (cont.)**

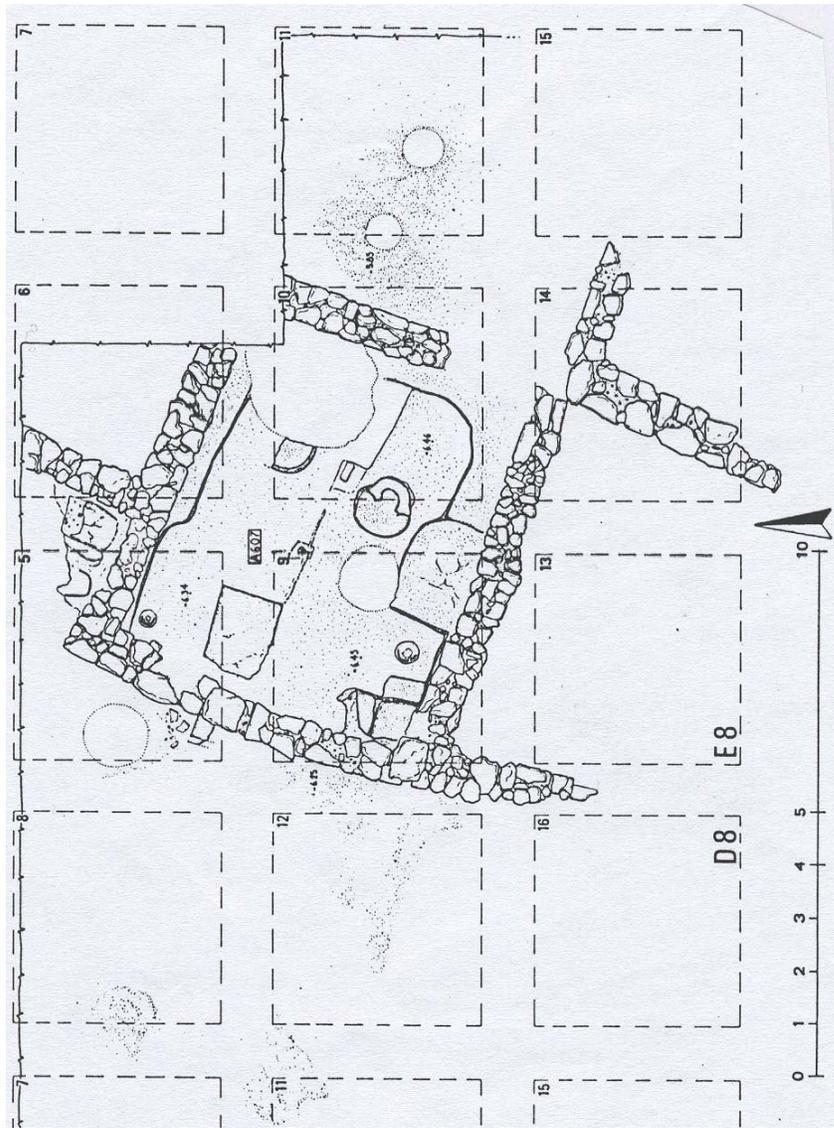


**FIGURE 12**  
**Painted Wares in Altınova, EBA II**



**FIGURE 13**

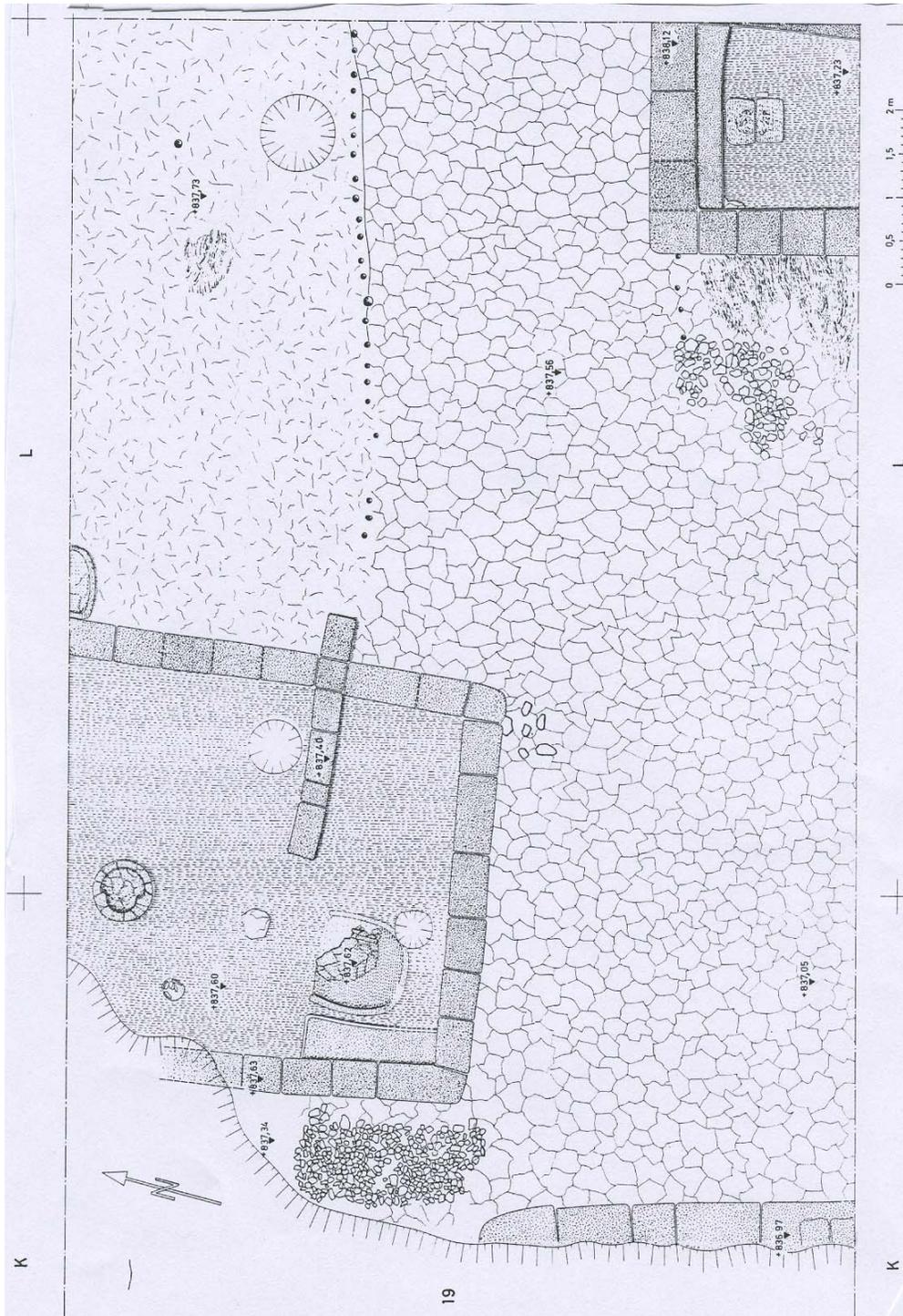
**Imported Wares in East-Central Anatolia, EBA II**



**FIGURE 14**

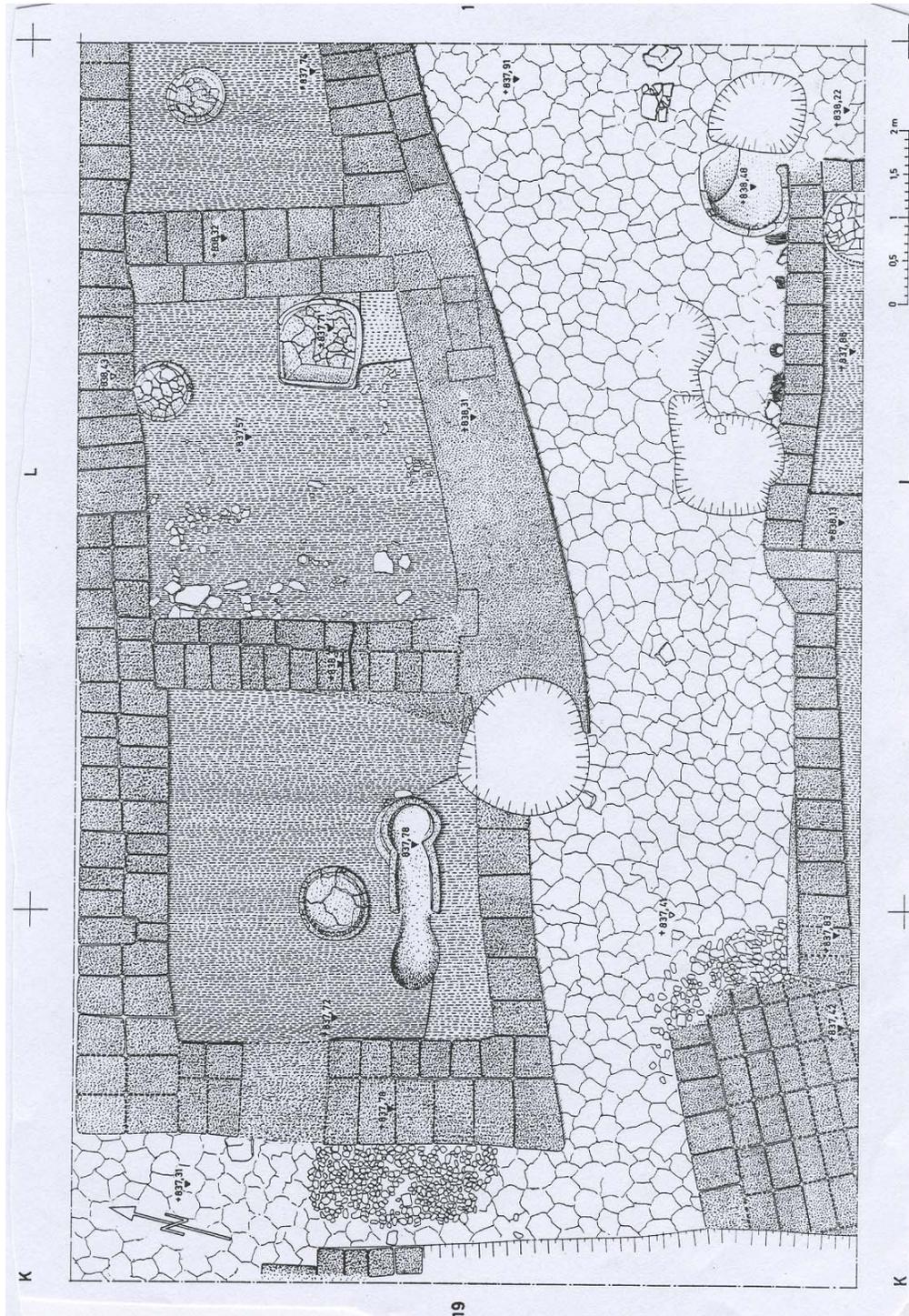
**Architecture in Arslantepe VI C2**





**FIGURE 16**

**Architecture in Norşuntepe, EBA II, Level XXIII**



**FIGURE 17**

**Architecture in Norşuntepe, EBA II, Level XXI**

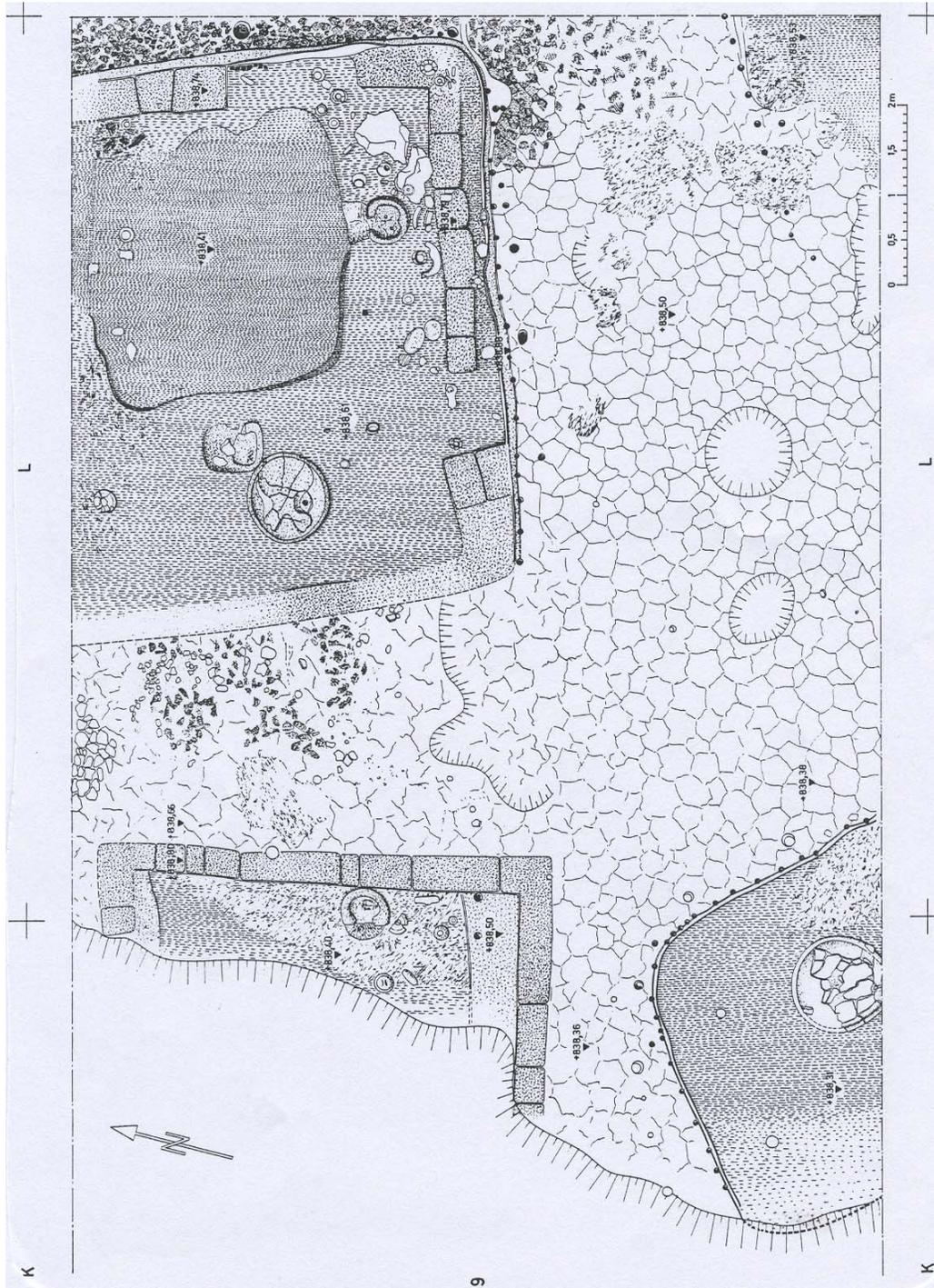
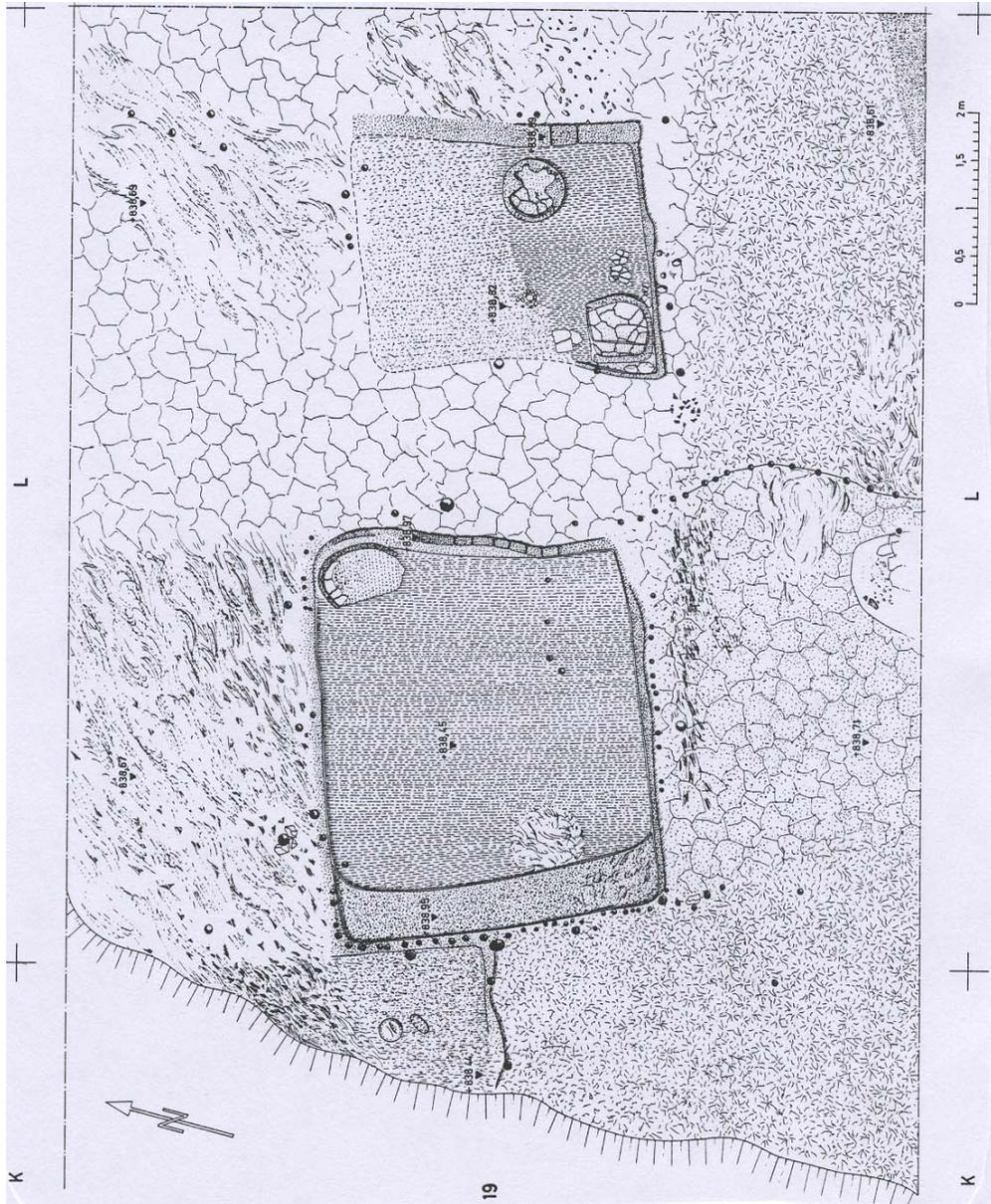


FIGURE 18

Architecture in Norşuntepe, EBA II, Level XIX



**FIGURE 19**

**Architecture in Norşuntepe, EBA II, Level XVIII**

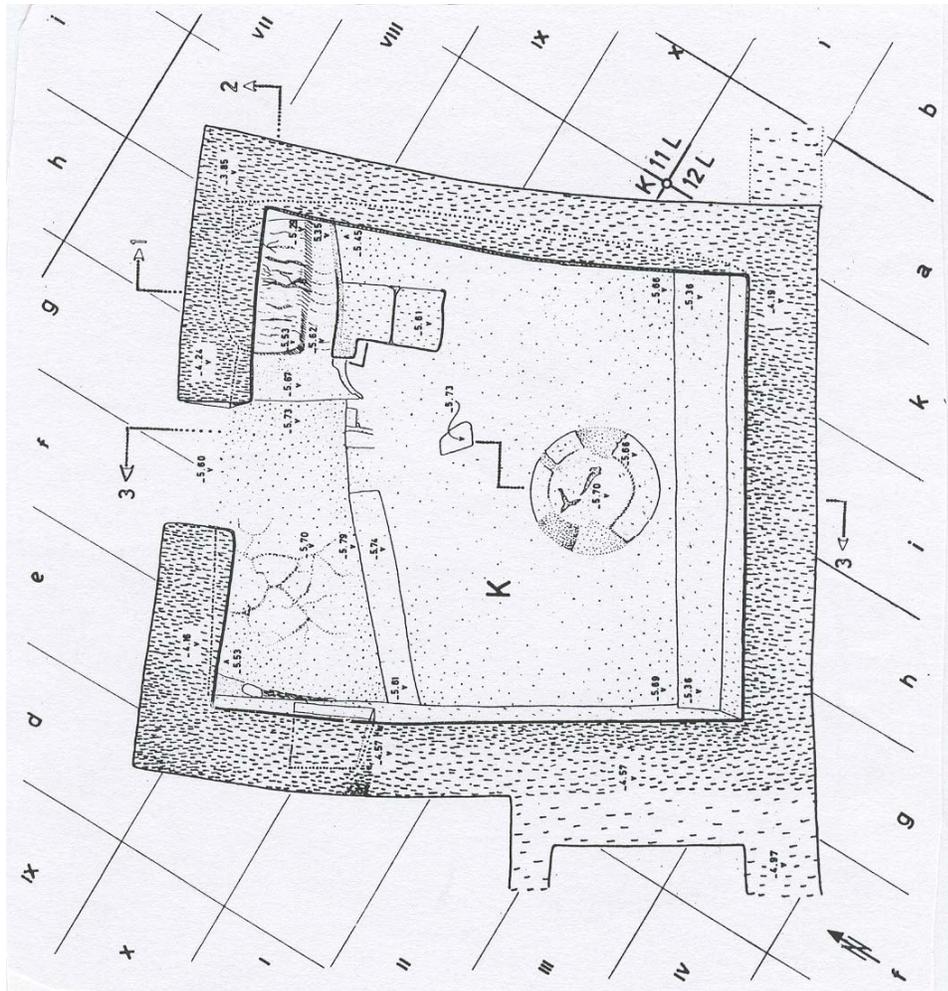


FIGURE 20

Architecture in Tepecik, EBA II

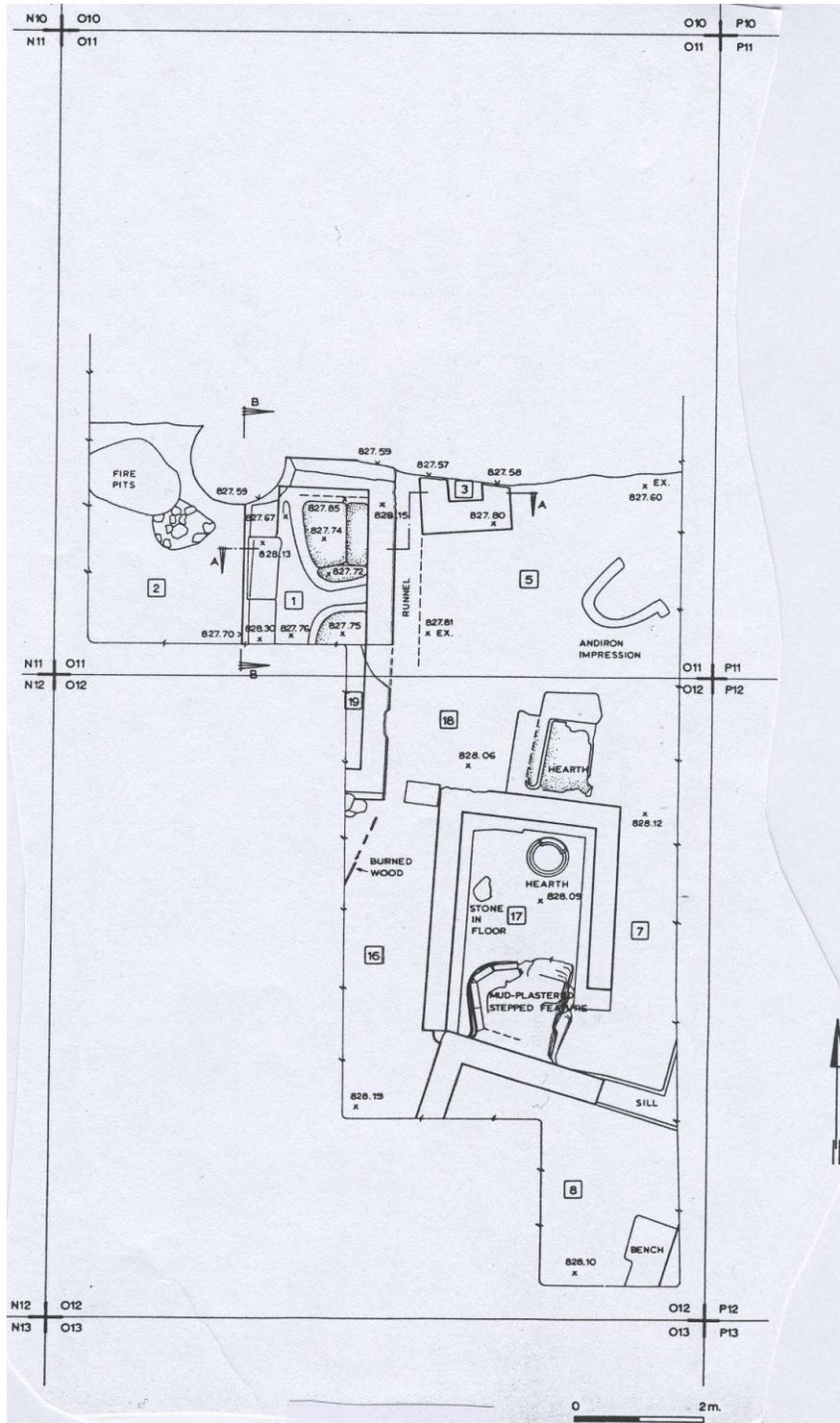


FIGURE 21

Architecture in Korucutepe D

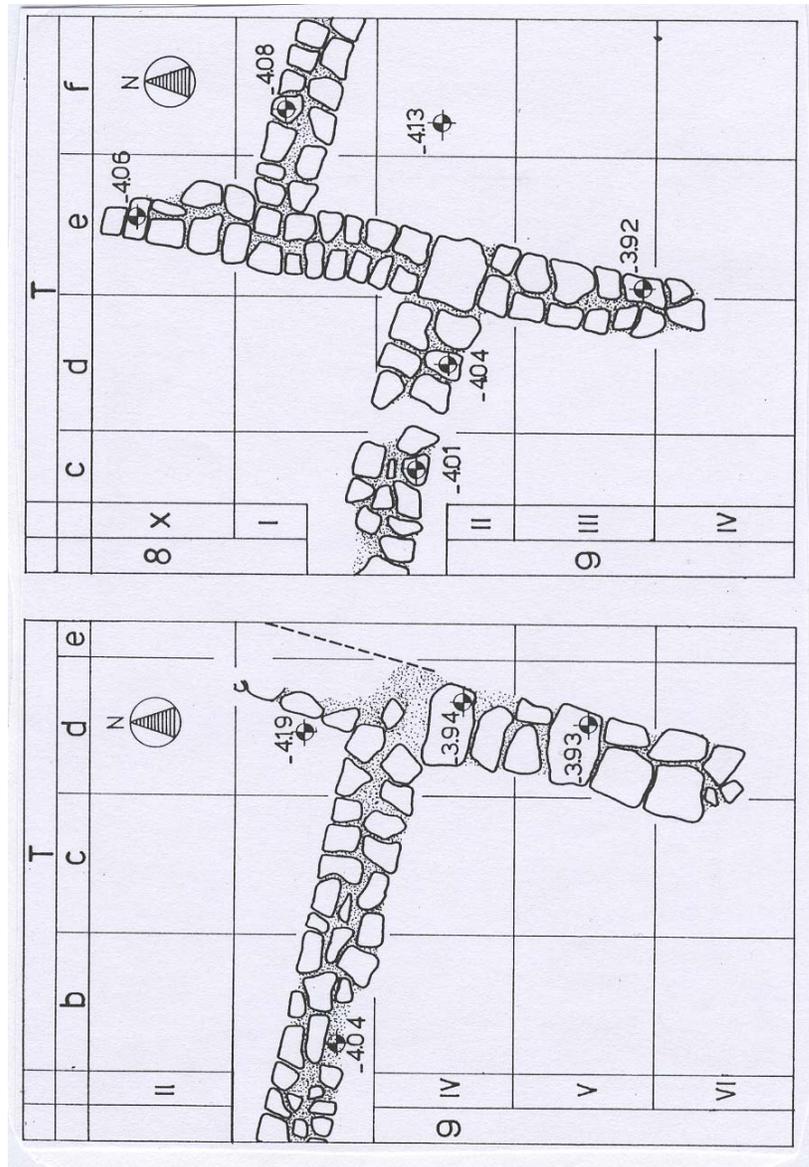


FIGURE 22

Architecture in Değirmentepe, Level 4

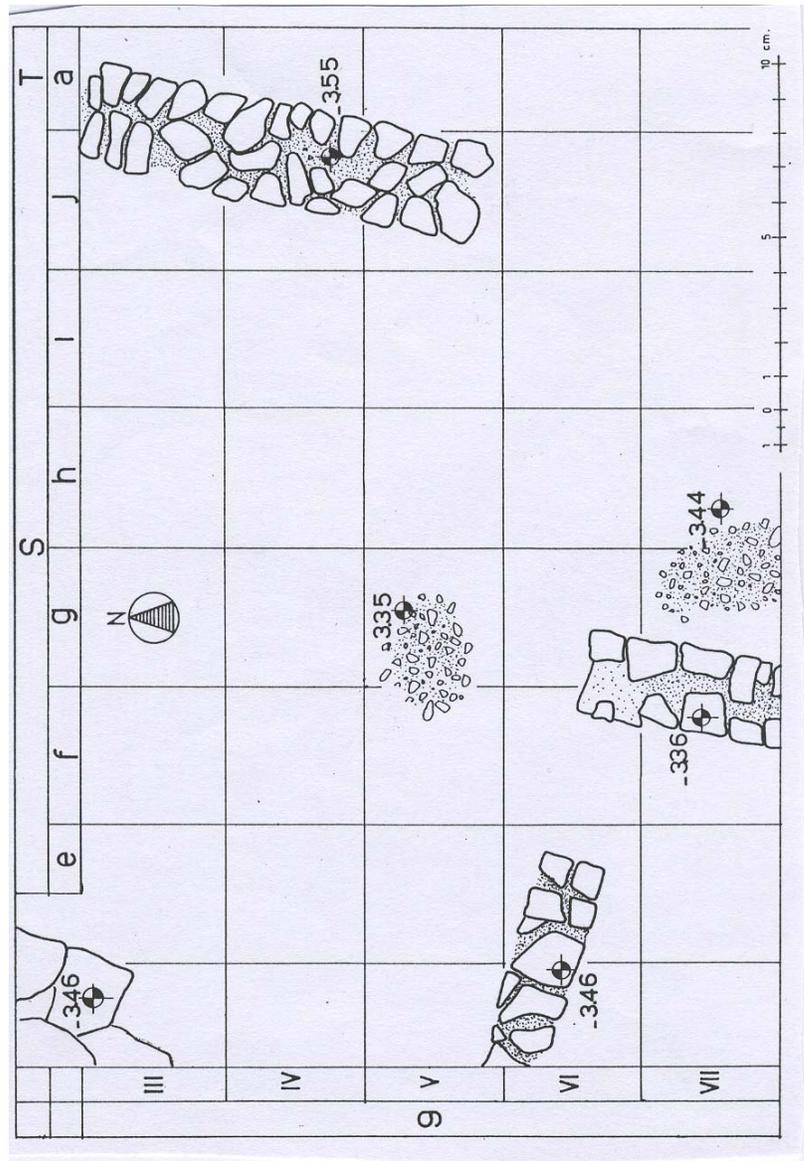
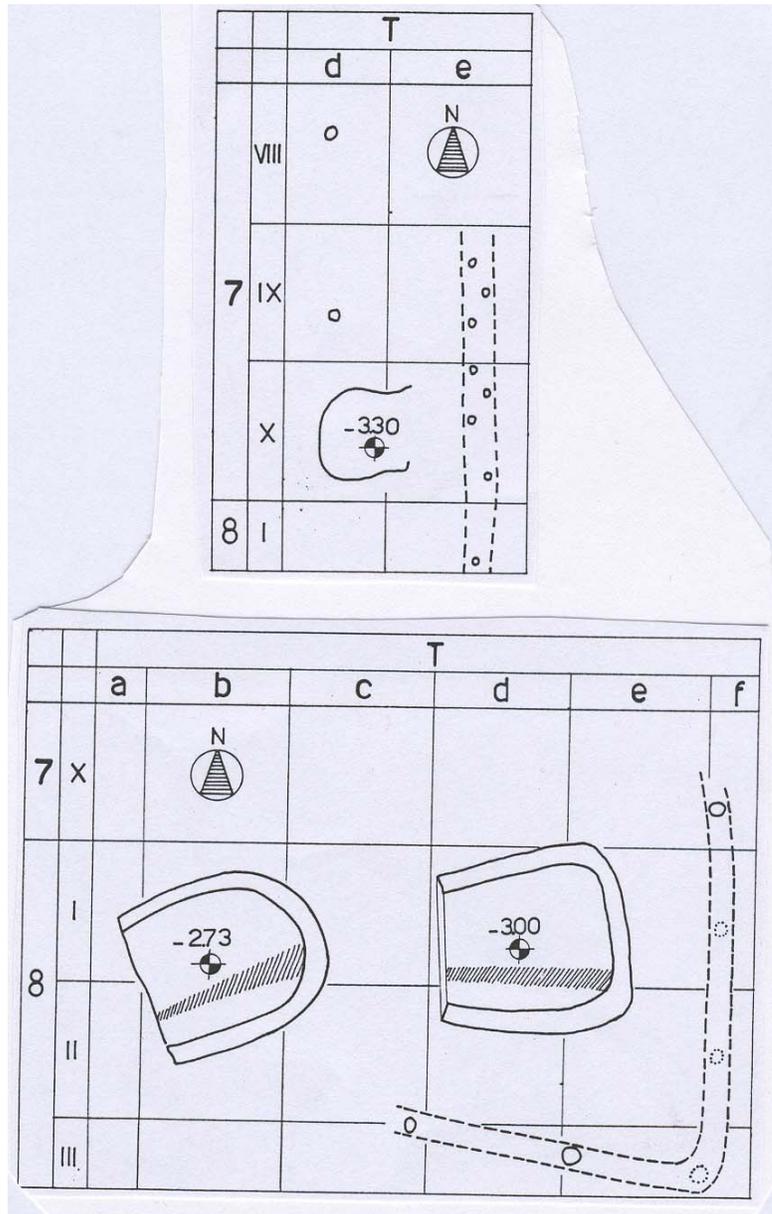


FIGURE 22 (cont.)



**FIGURE 23**

**Architecture in Degirmentepe, Level 3**

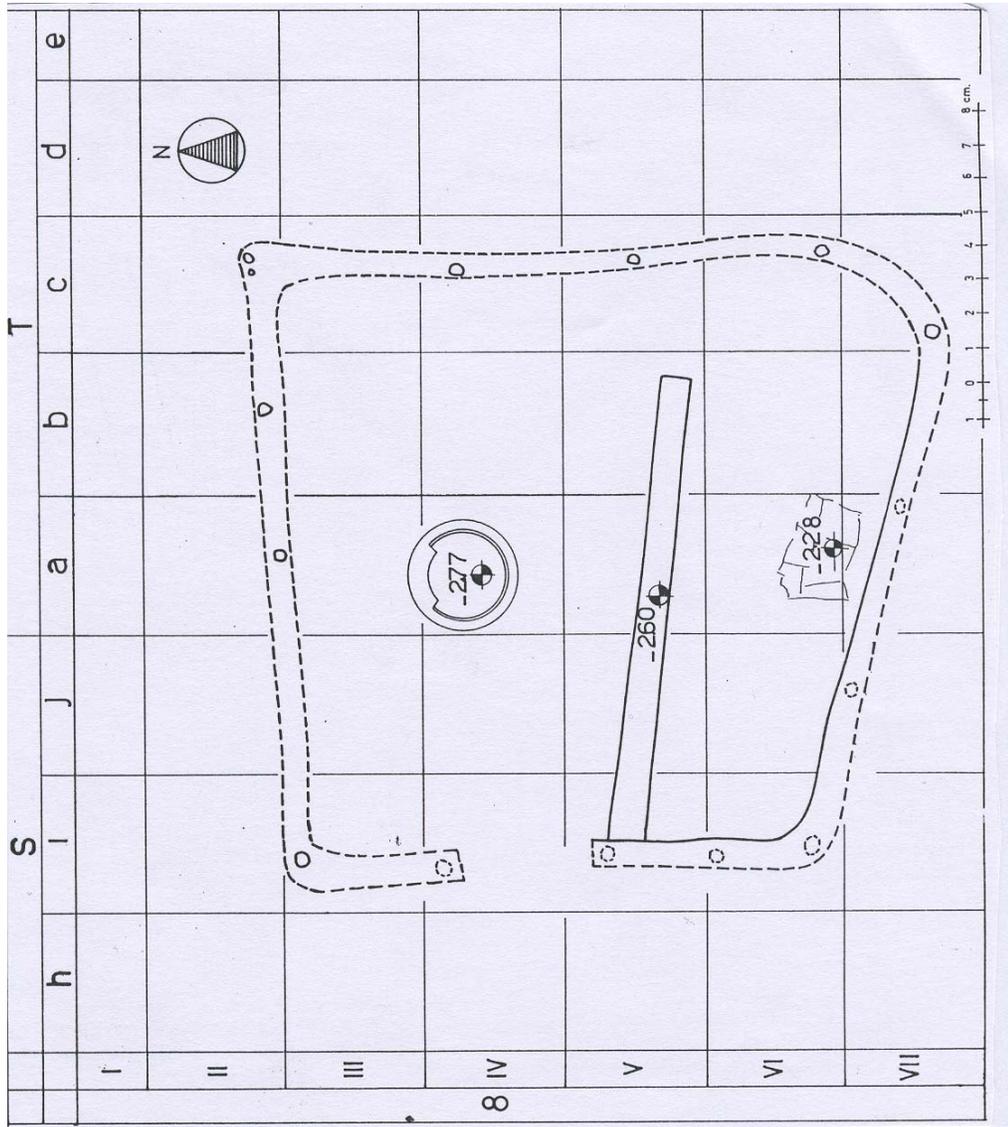
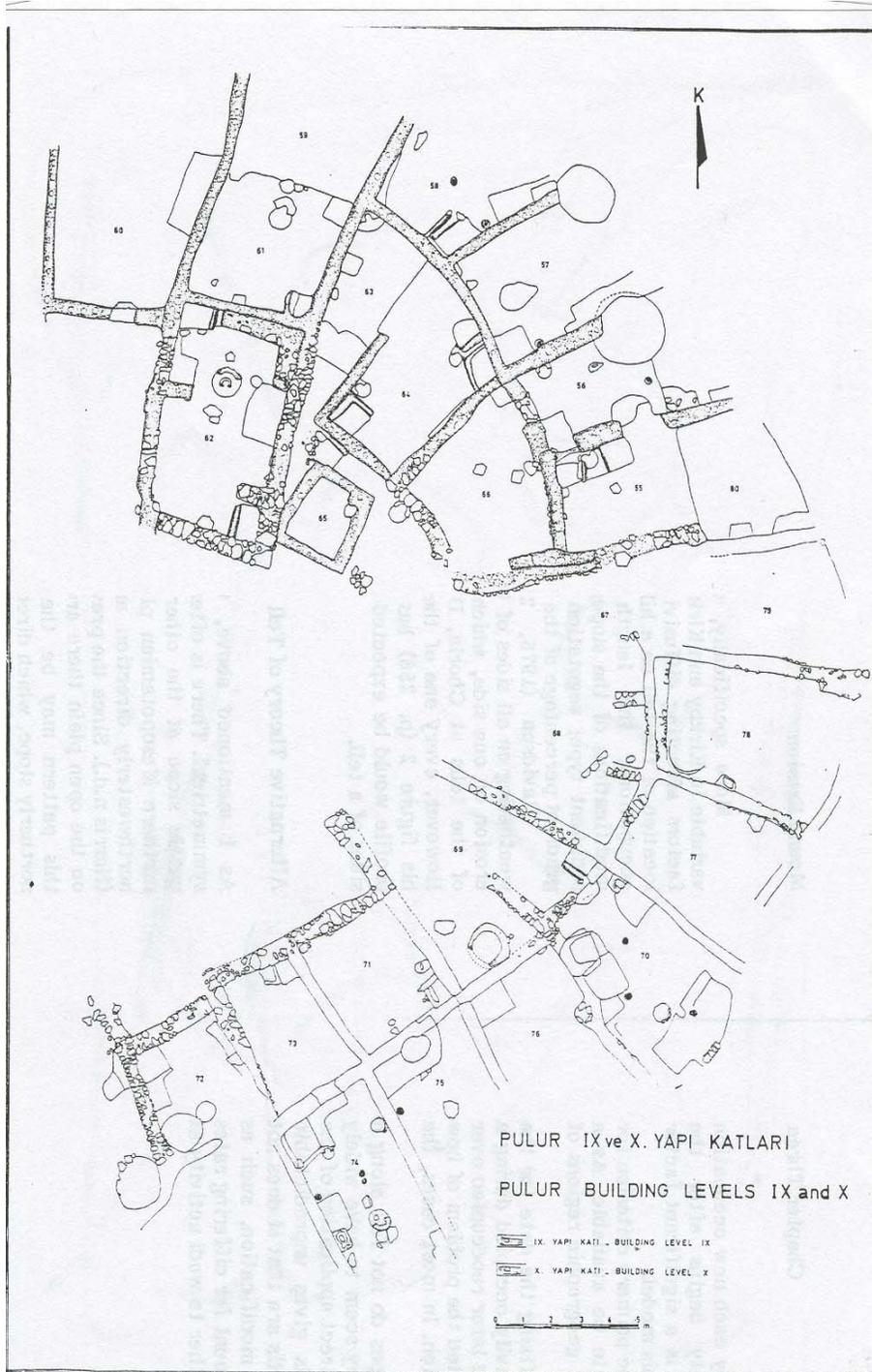
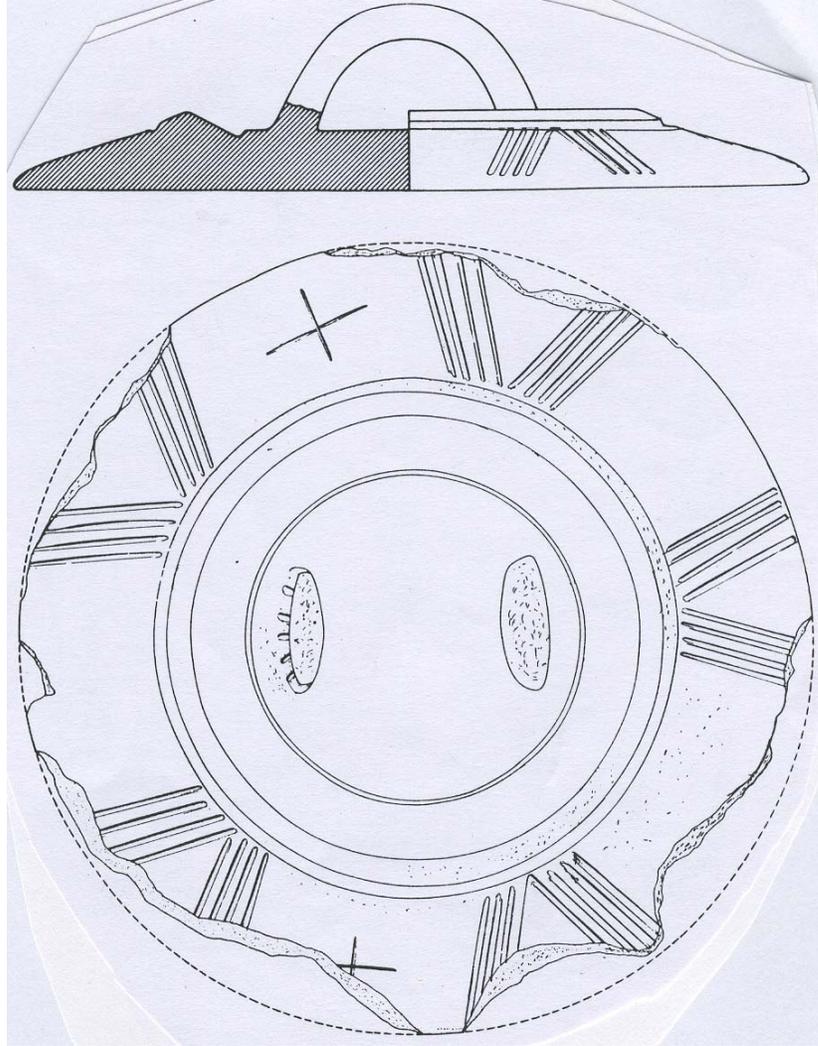


FIGURE 23 (cont.)



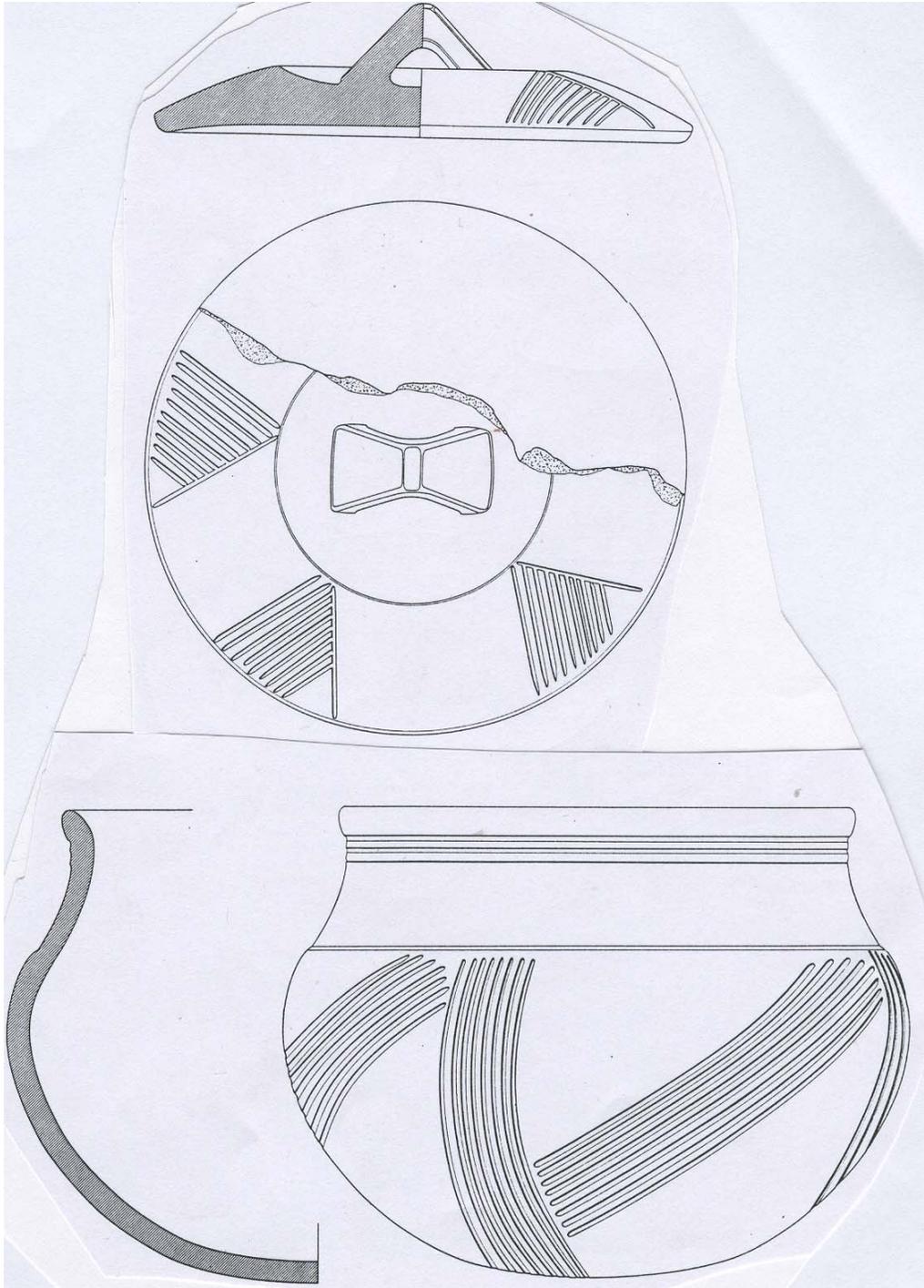
**FIGURE 24**

**Settlement Plan in Pulus-Sakyol, EBA II**

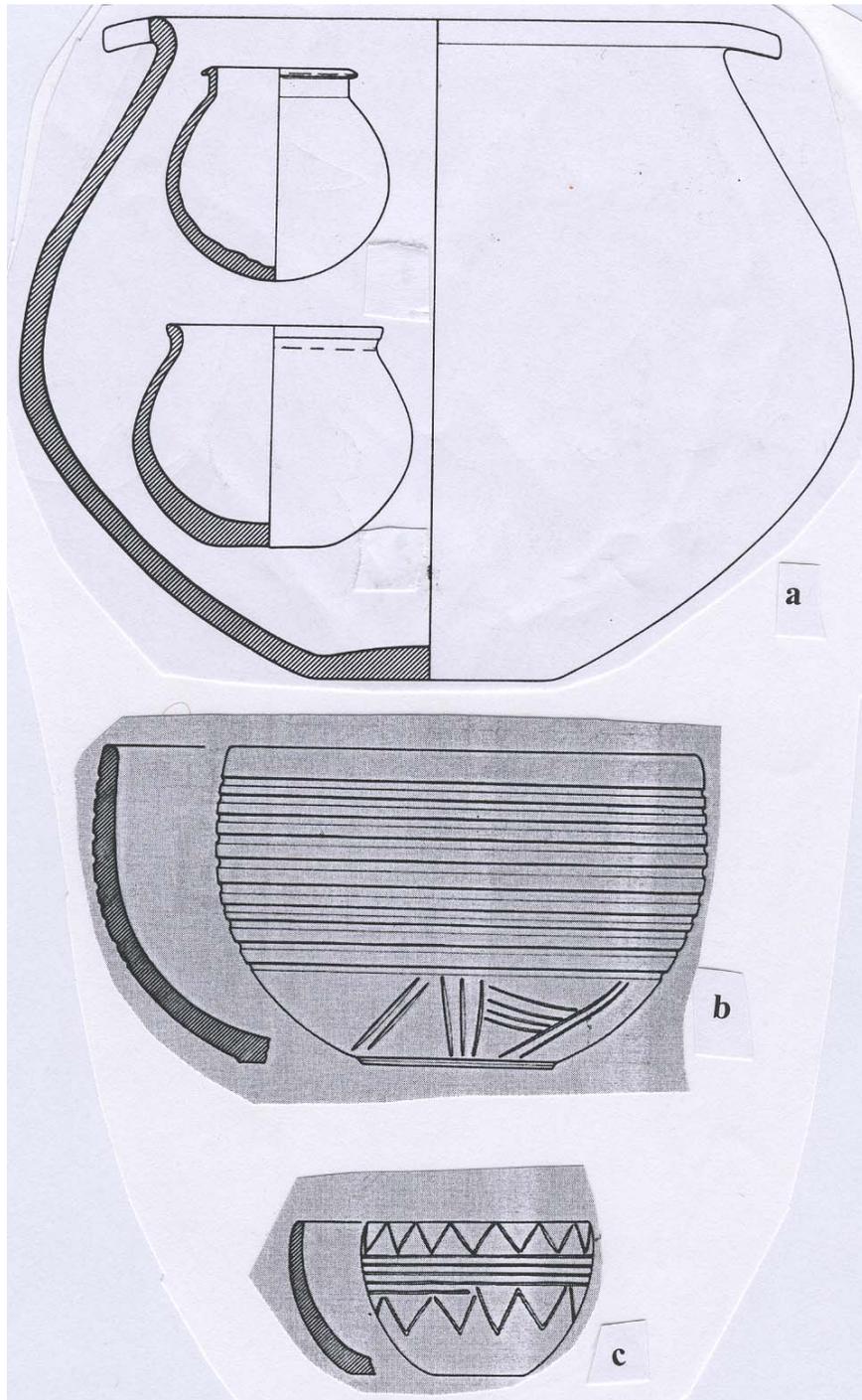


**FIGURE 25**

**Red-Black Burnished Wares in East-Central Anatolia, EBA III**

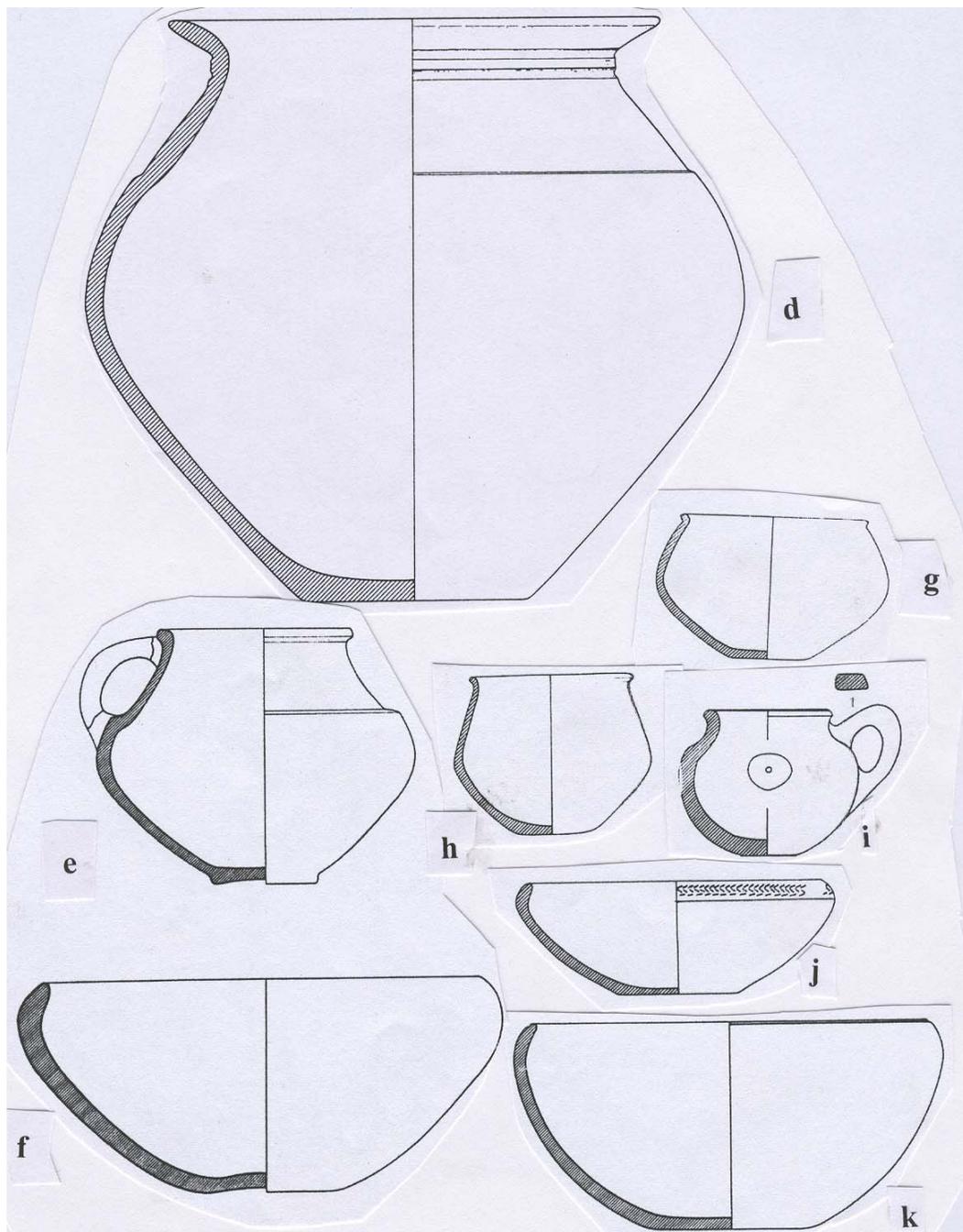


**FIGURE 25 (cont.)**

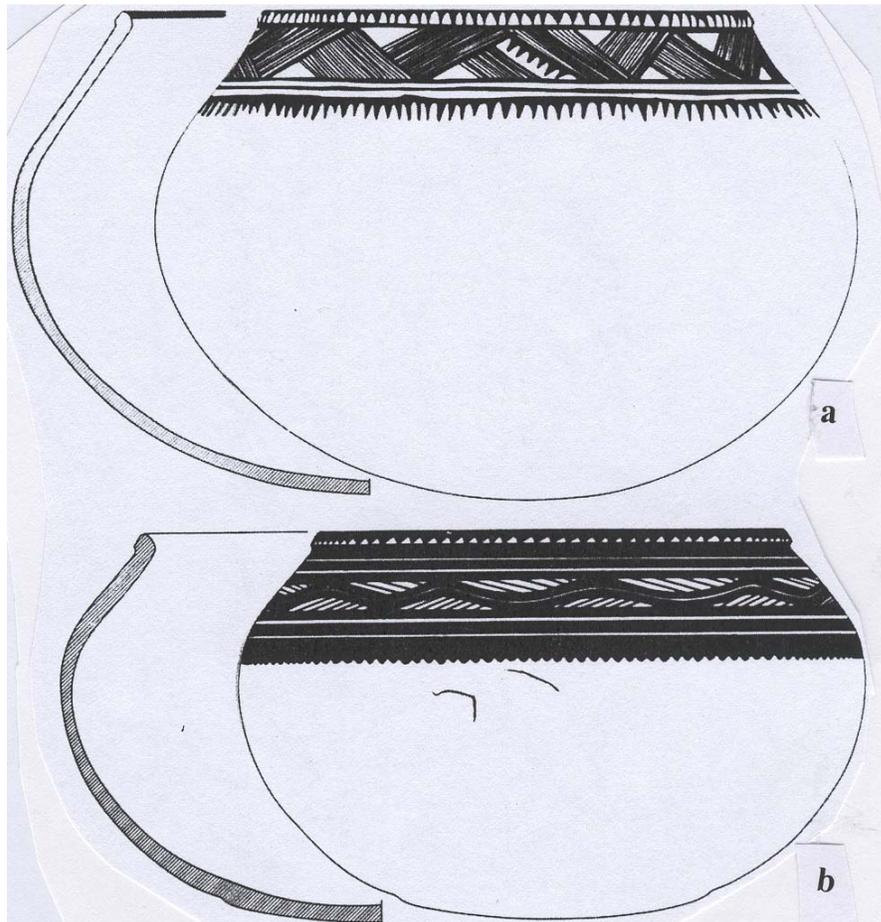


**FIGURE 26**

**Red-Black Burnished Wares in East-Central Anatolia, EBA III**

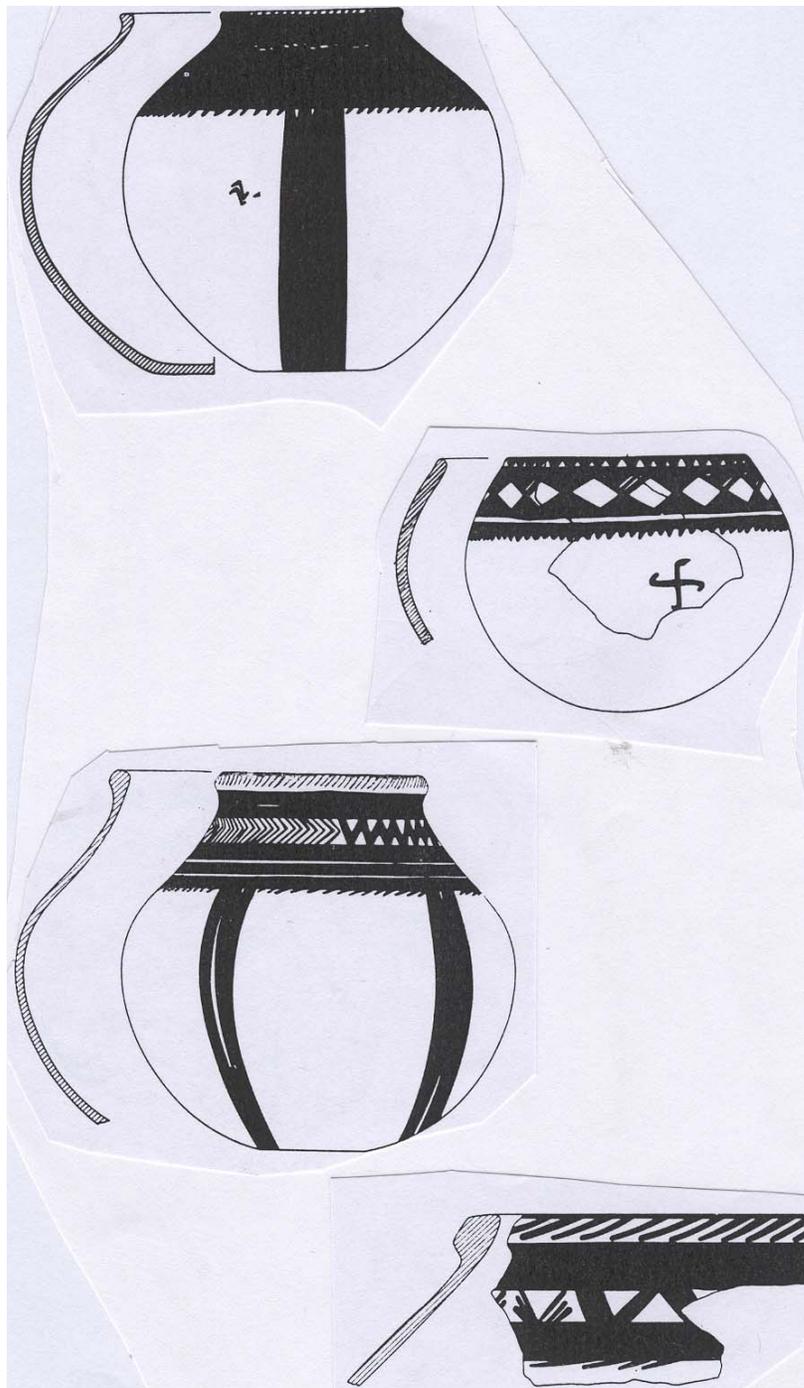


**FIGURE 26 (cont.)**

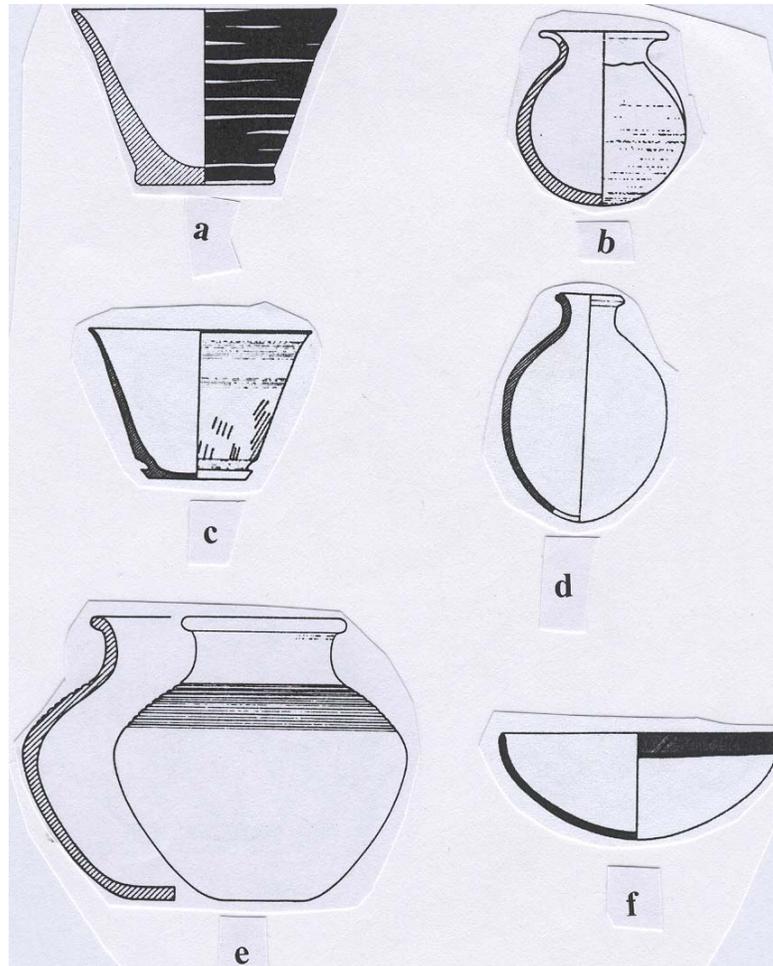


**FIGURE 27**

**Malatya-Elazığ Painted Wares**

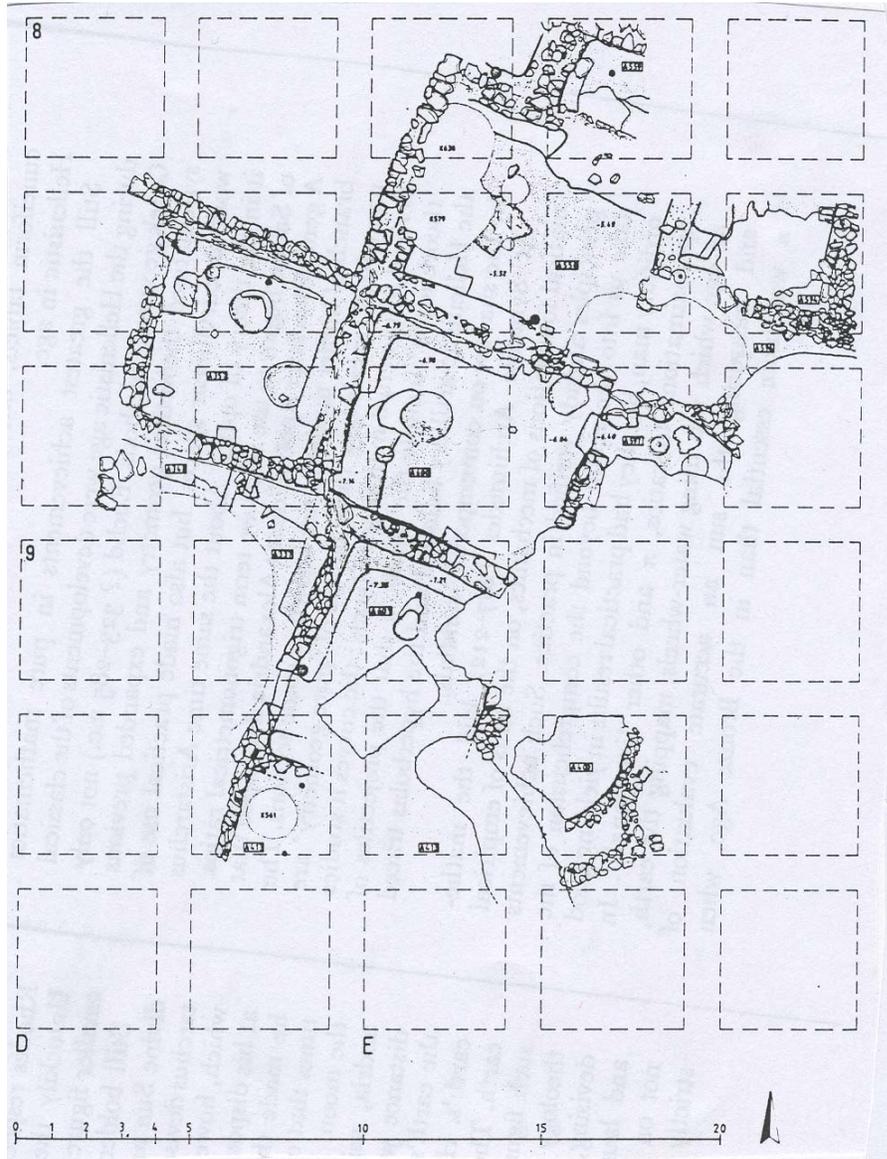


**FIGURE 27 (cont.)**



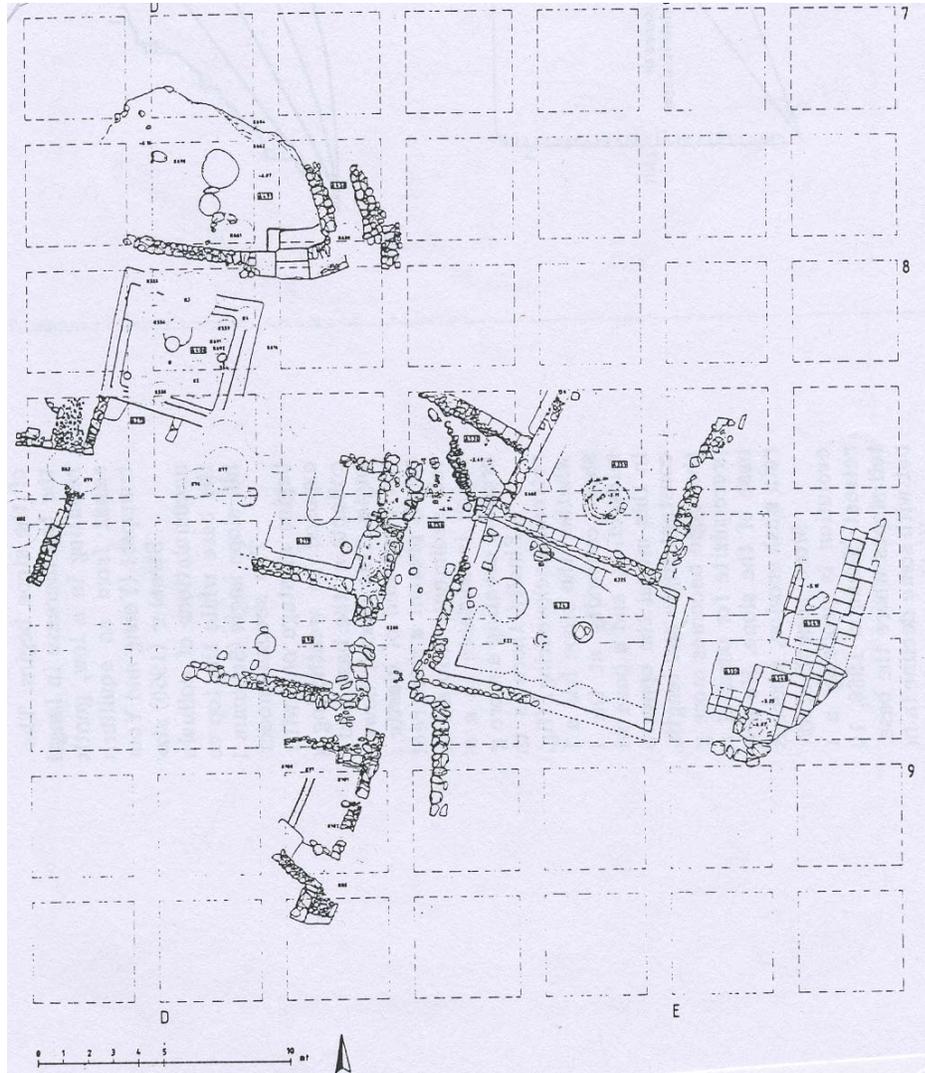
**FIGURE 28**

**Imported Wares in East-Central Anatolia, EBA III**



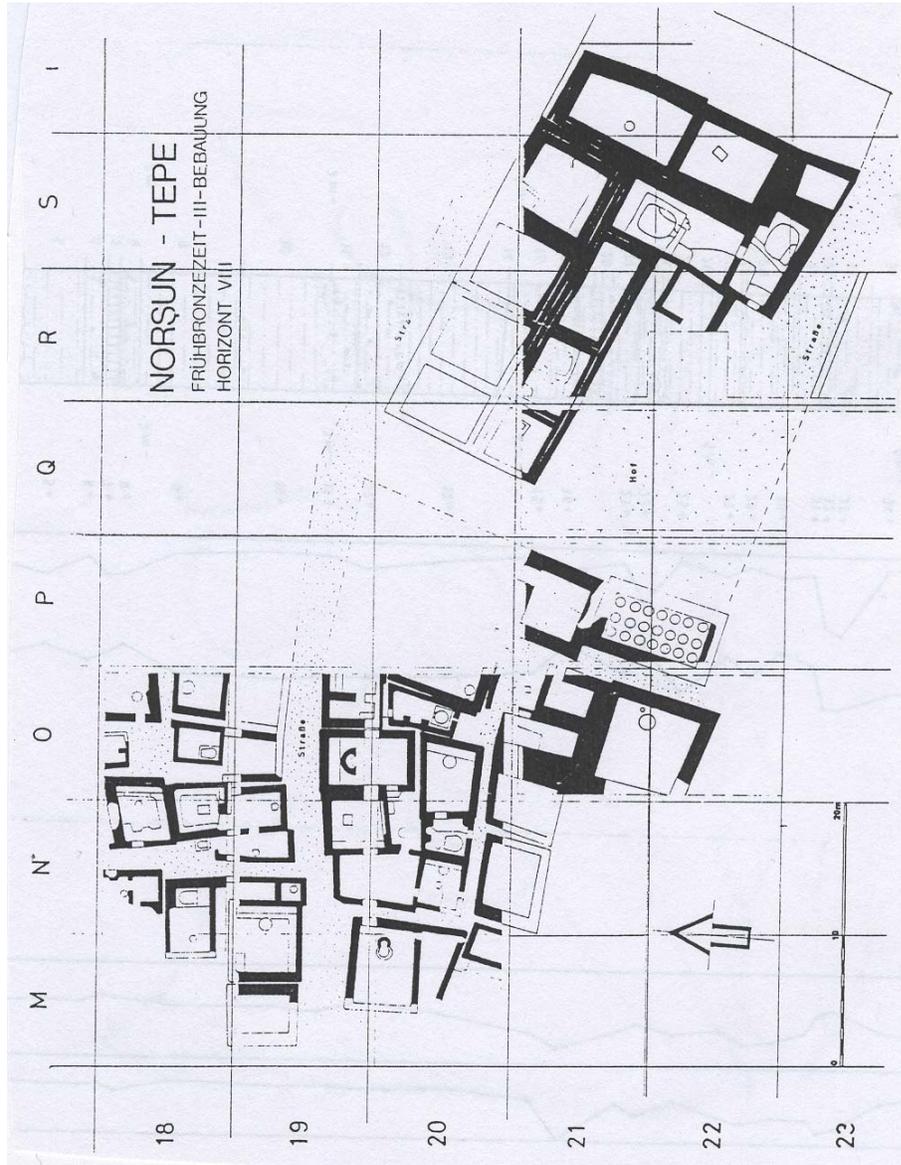
**FIGURE 29**

**Architecture in Arslantepe VI D1**



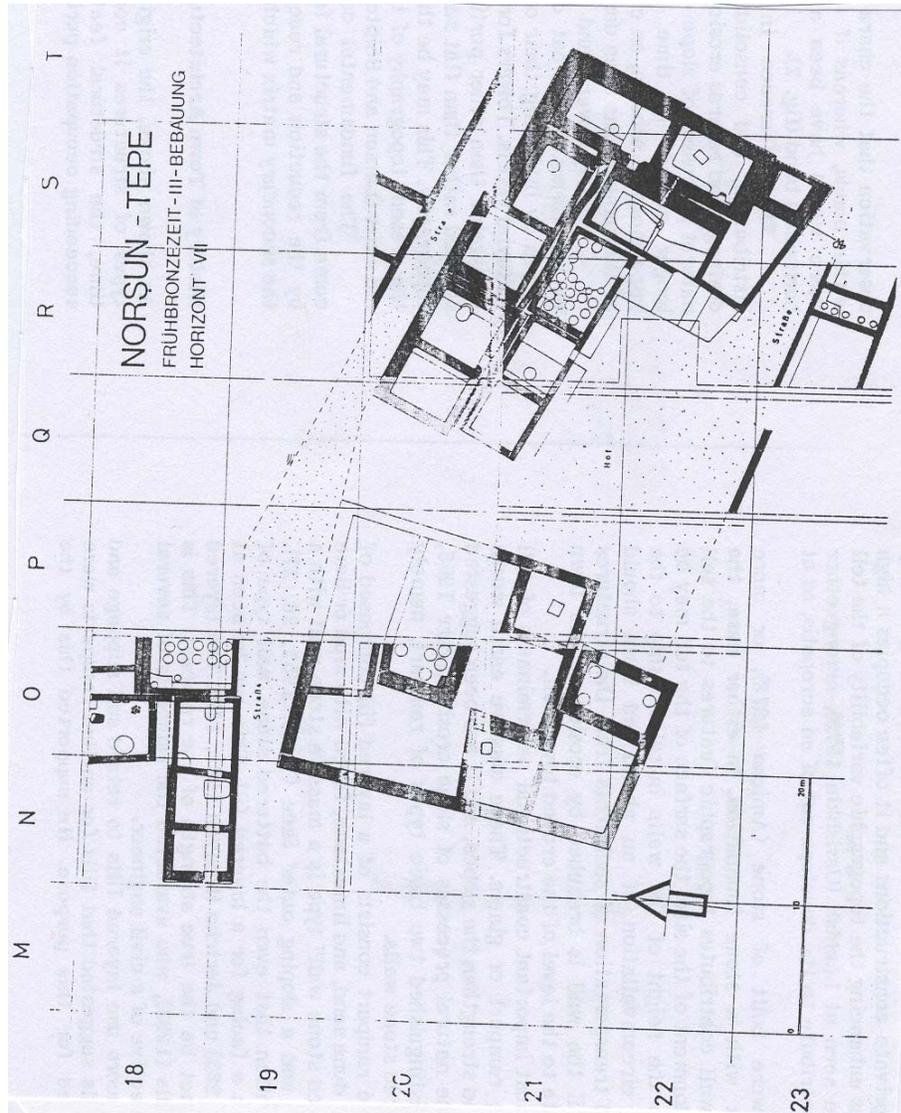
**FIGURE 30**

**Architecture in Arslantepe VI D2**



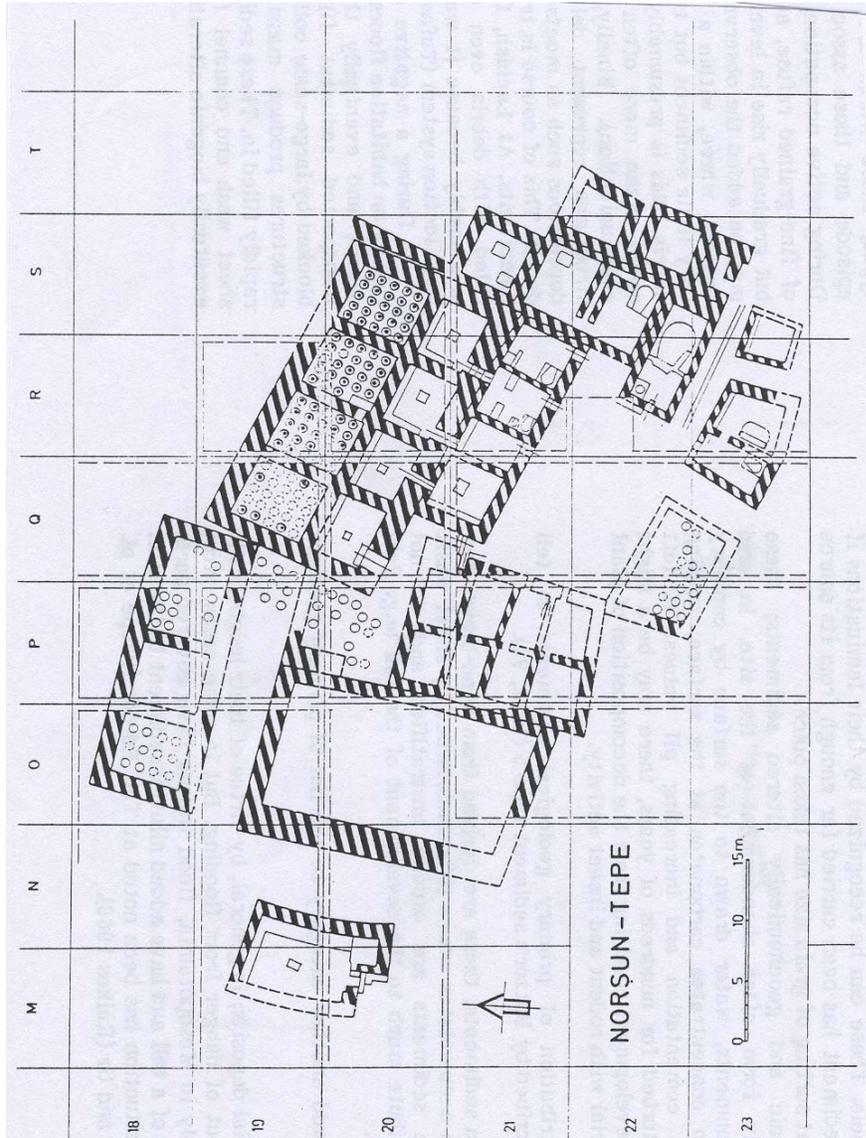
**FIGURE 31**

**Architecture in Norşuntepe, Horizont VIII**



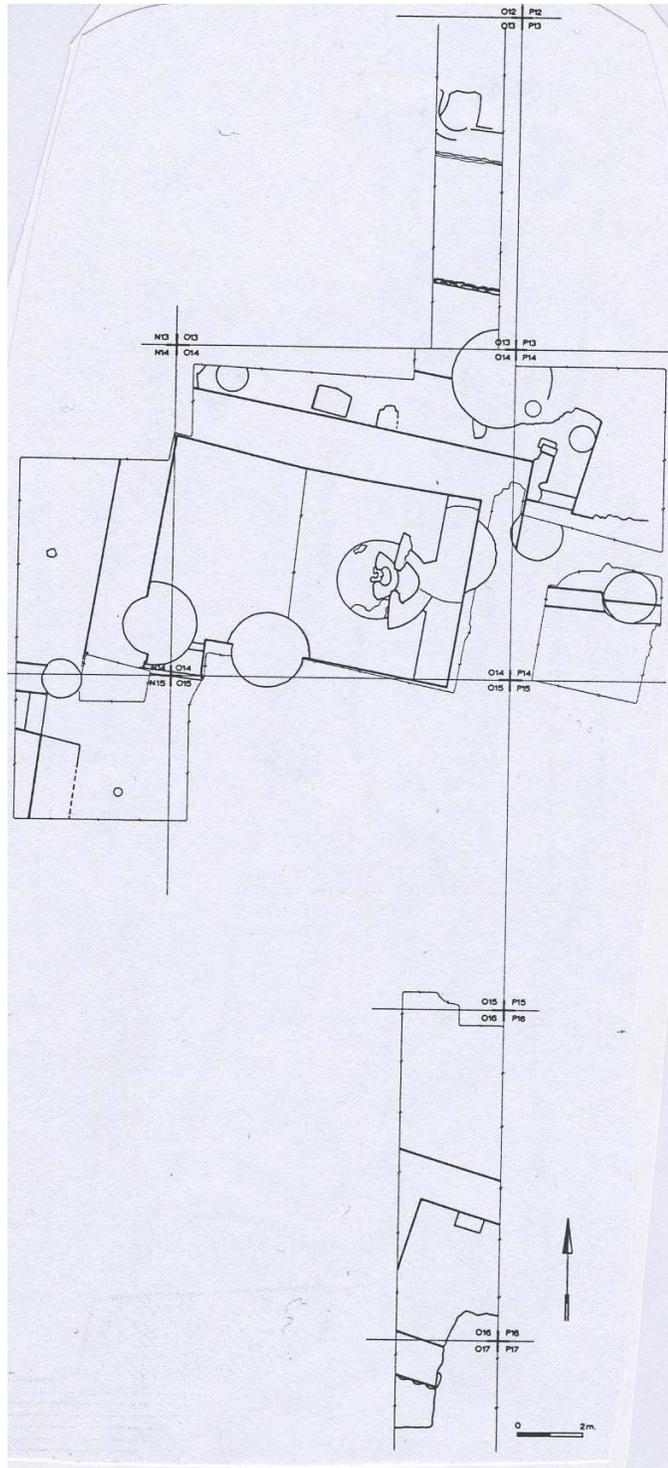
**FIGURE 32**

**Architecture in Norşuntepe, Horizont VII**



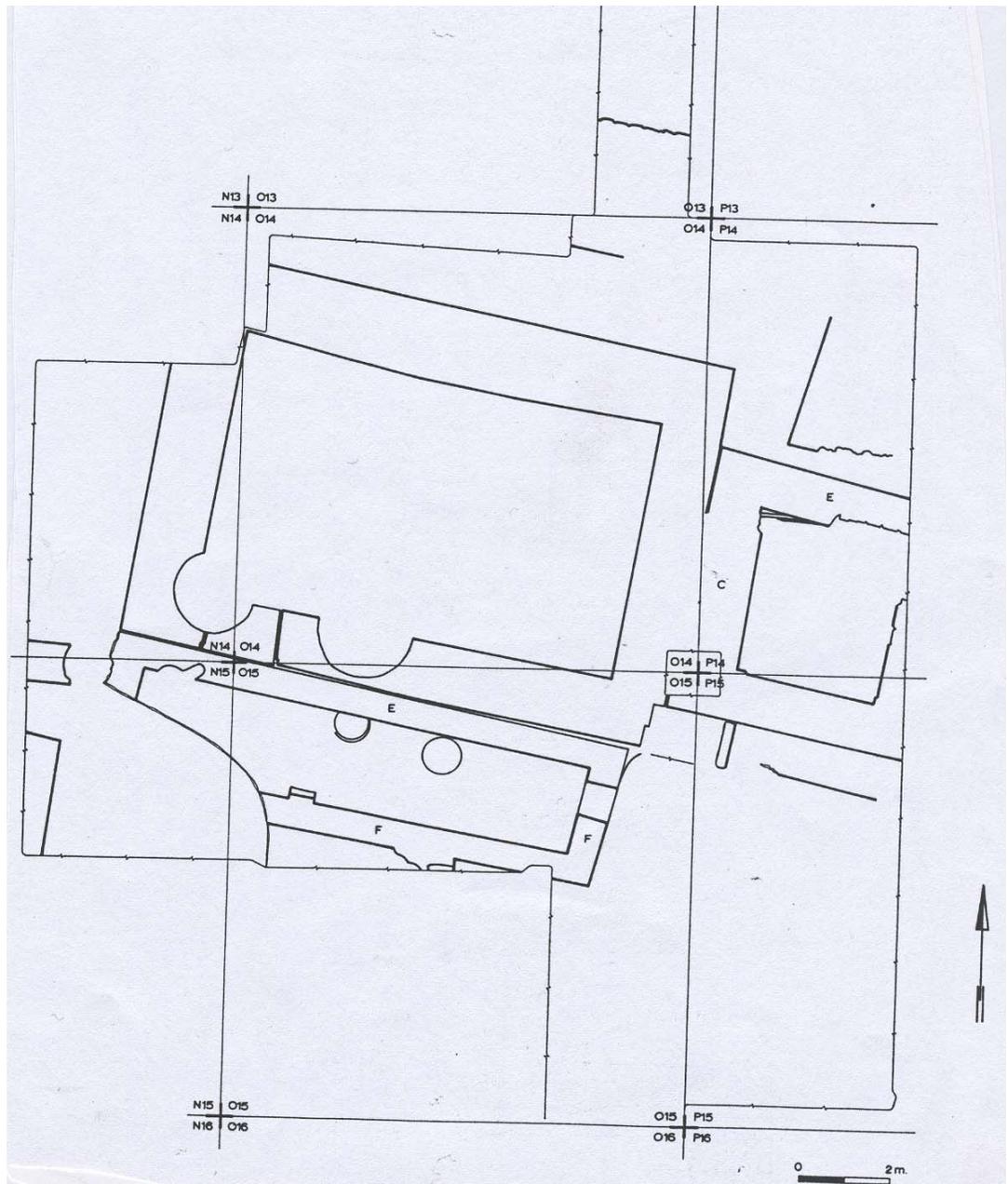
**FIGURE 33**

**Architecture in Norşuntepe, Horizont VI, Palace Complex**



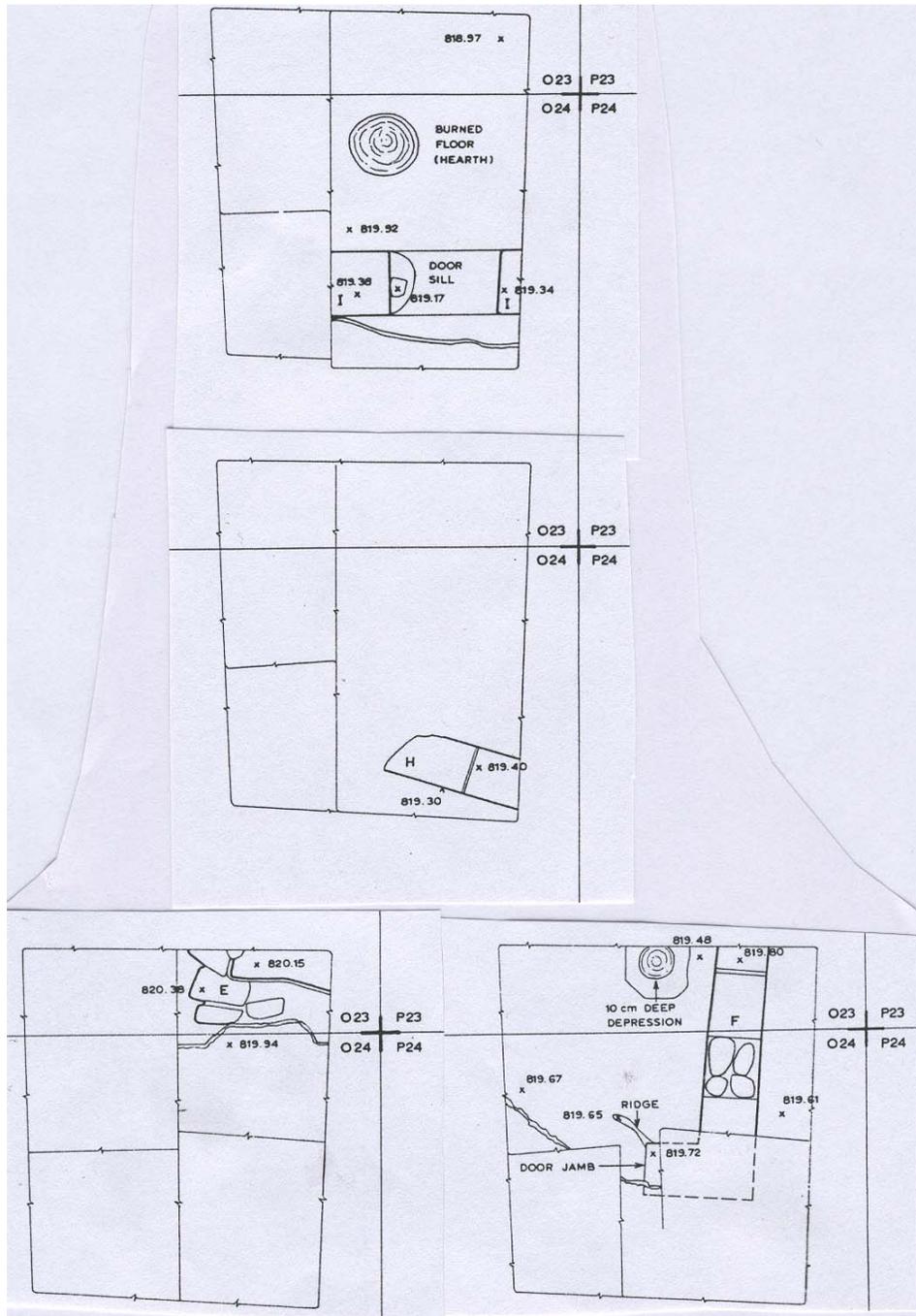
**FIGURE 34**

**Architecture in Korucutepe E**



**FIGURE 35**

**The Plan of the Hall in Korucutepe E**



**FIGURE 36**

**Architecture in Korucutepe F**

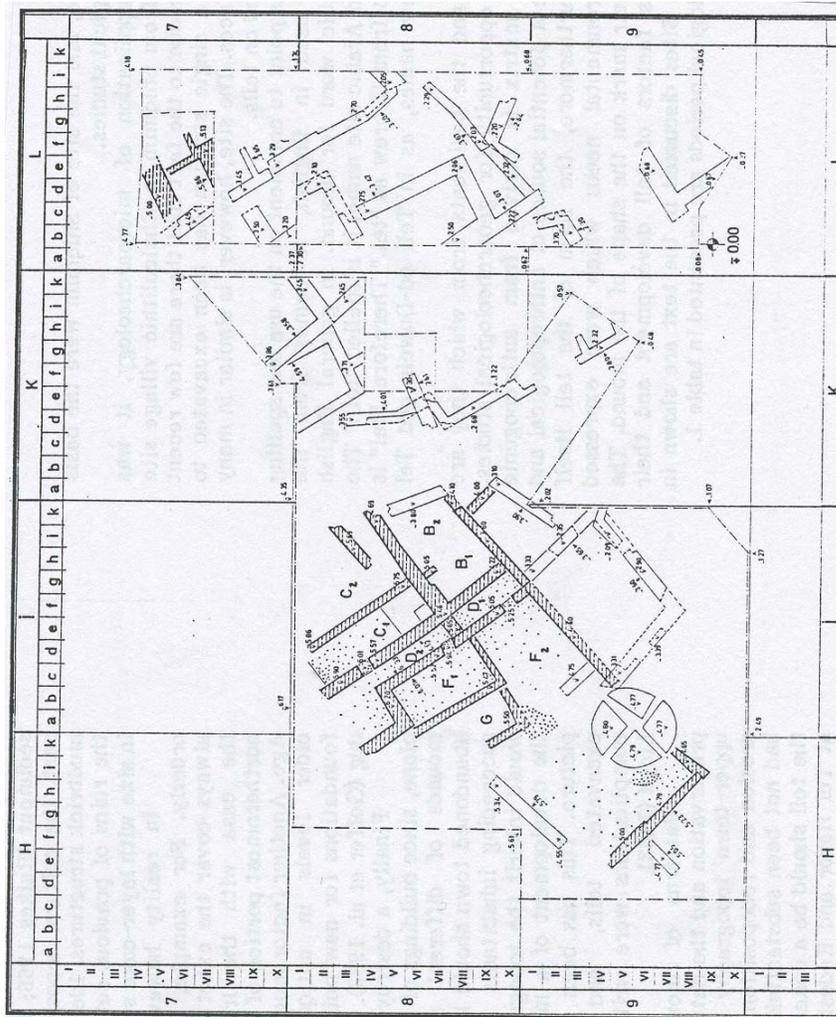
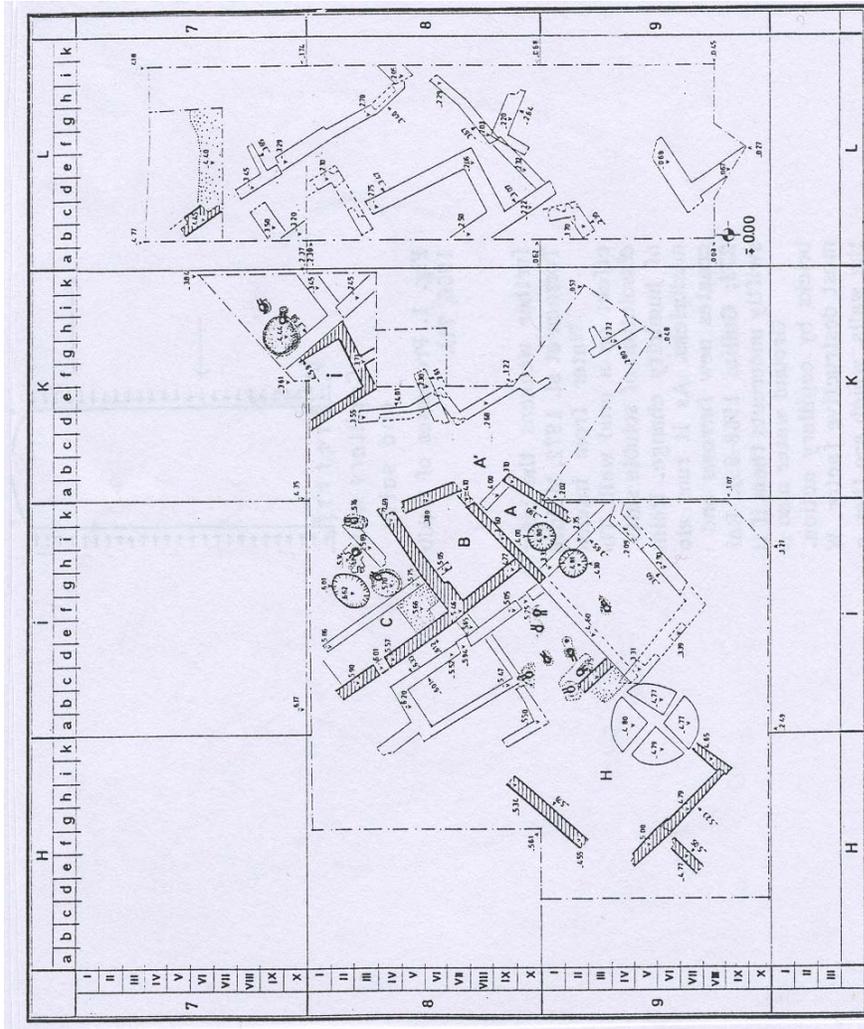


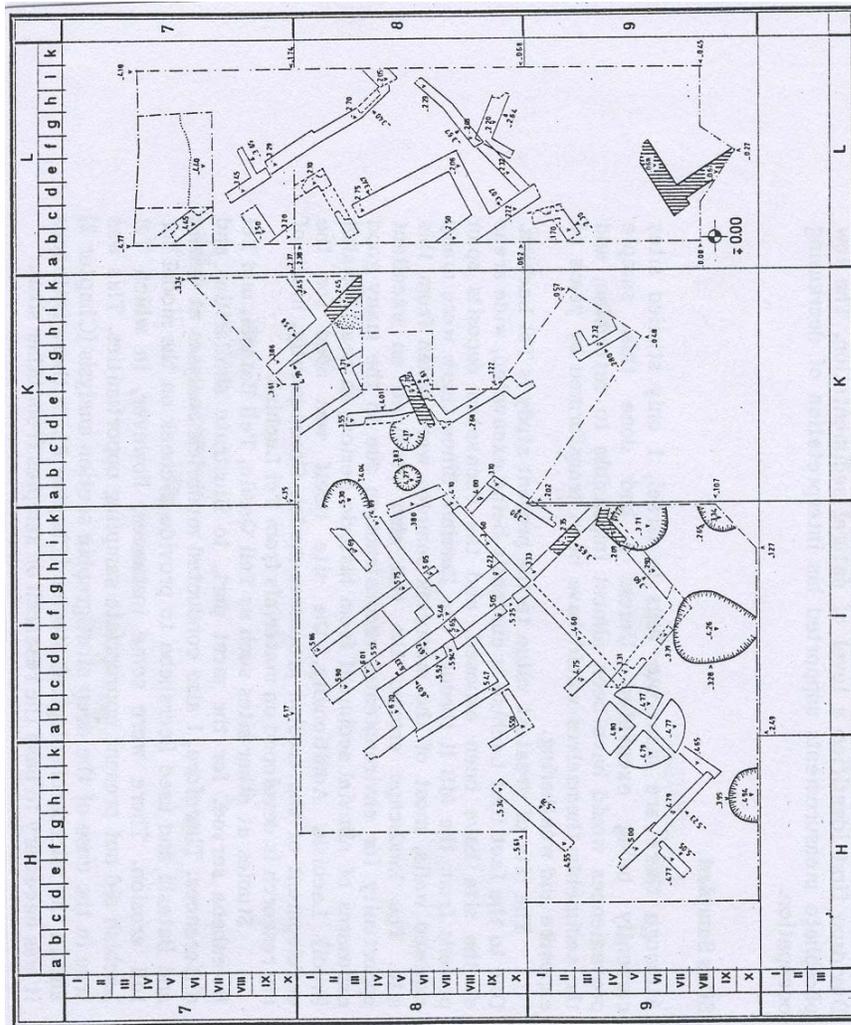
FIGURE 37

Architecture in Tepecik, Level 3b



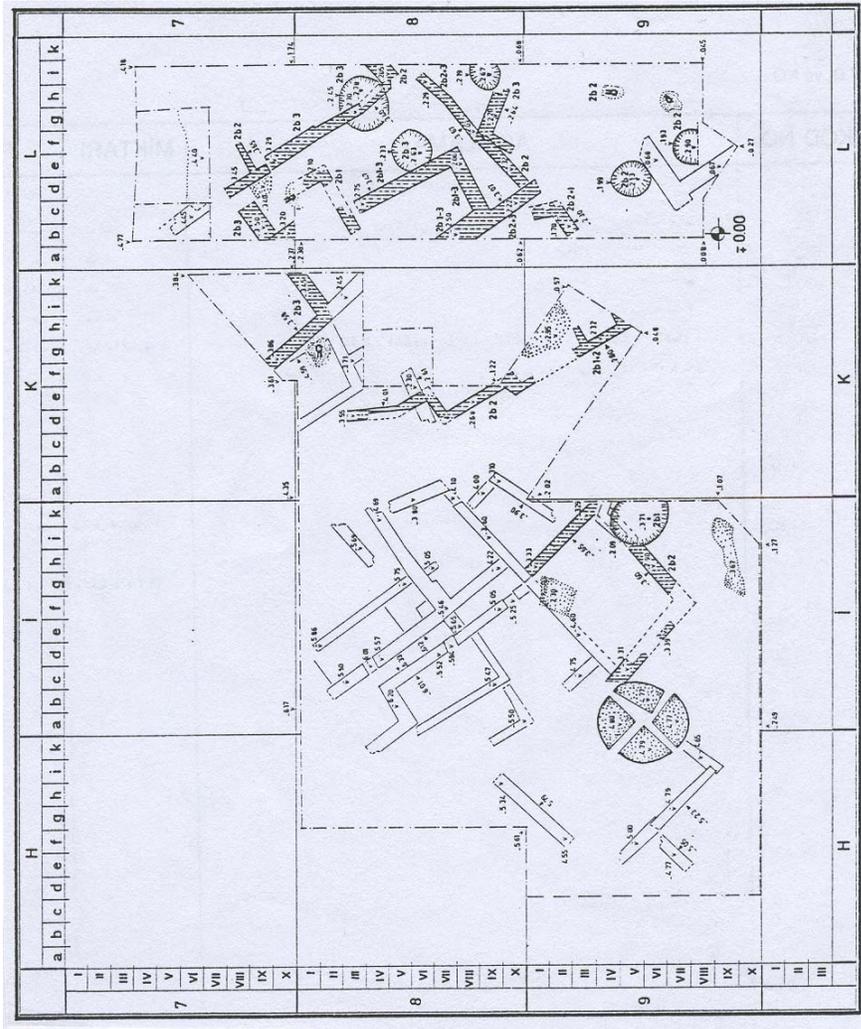
**FIGURE 38**

**Architecture in Tepecik, Level 3a**



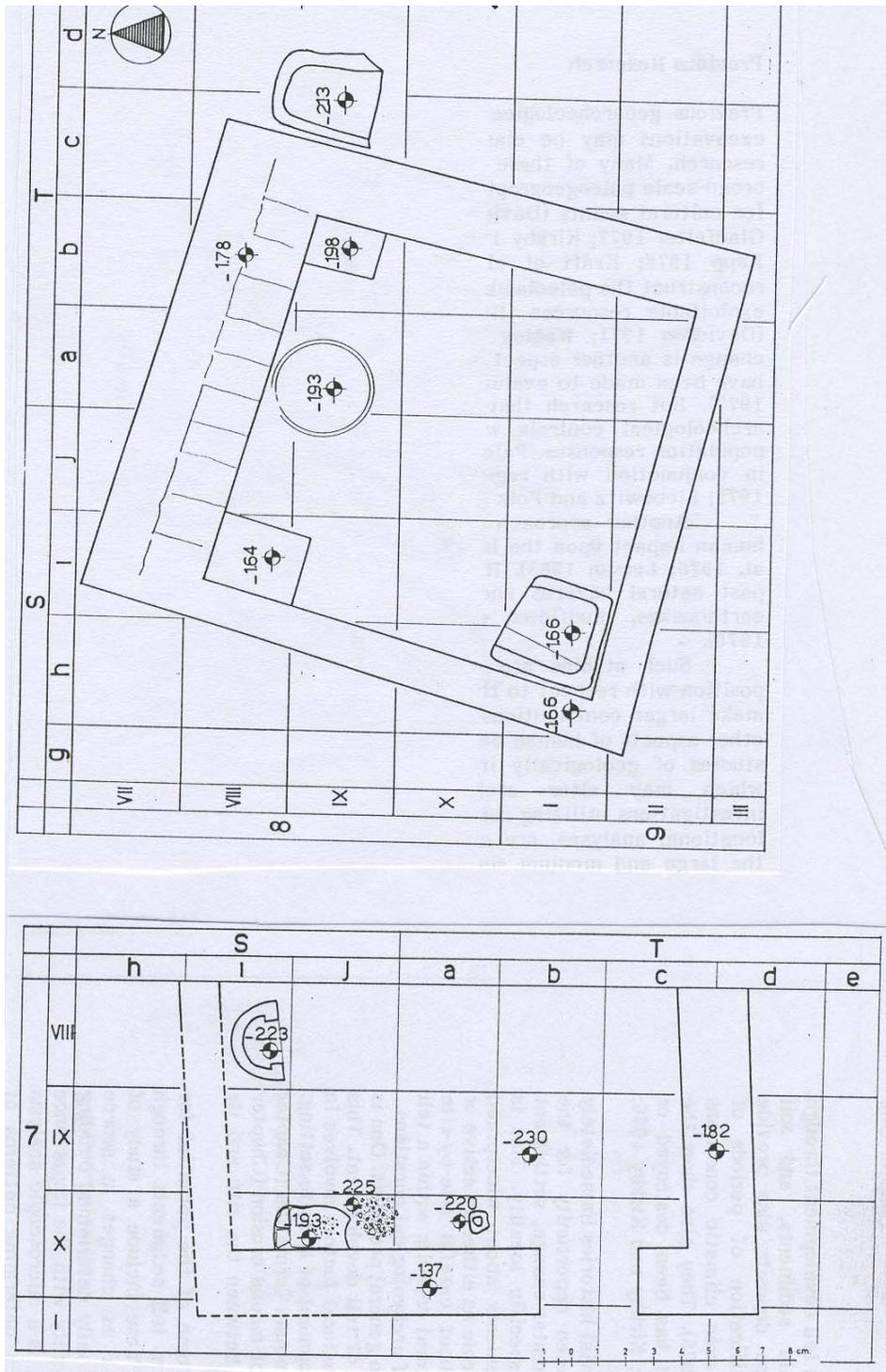
**FIGURE 39**

**Architecture in Tepecik, Level 2b**



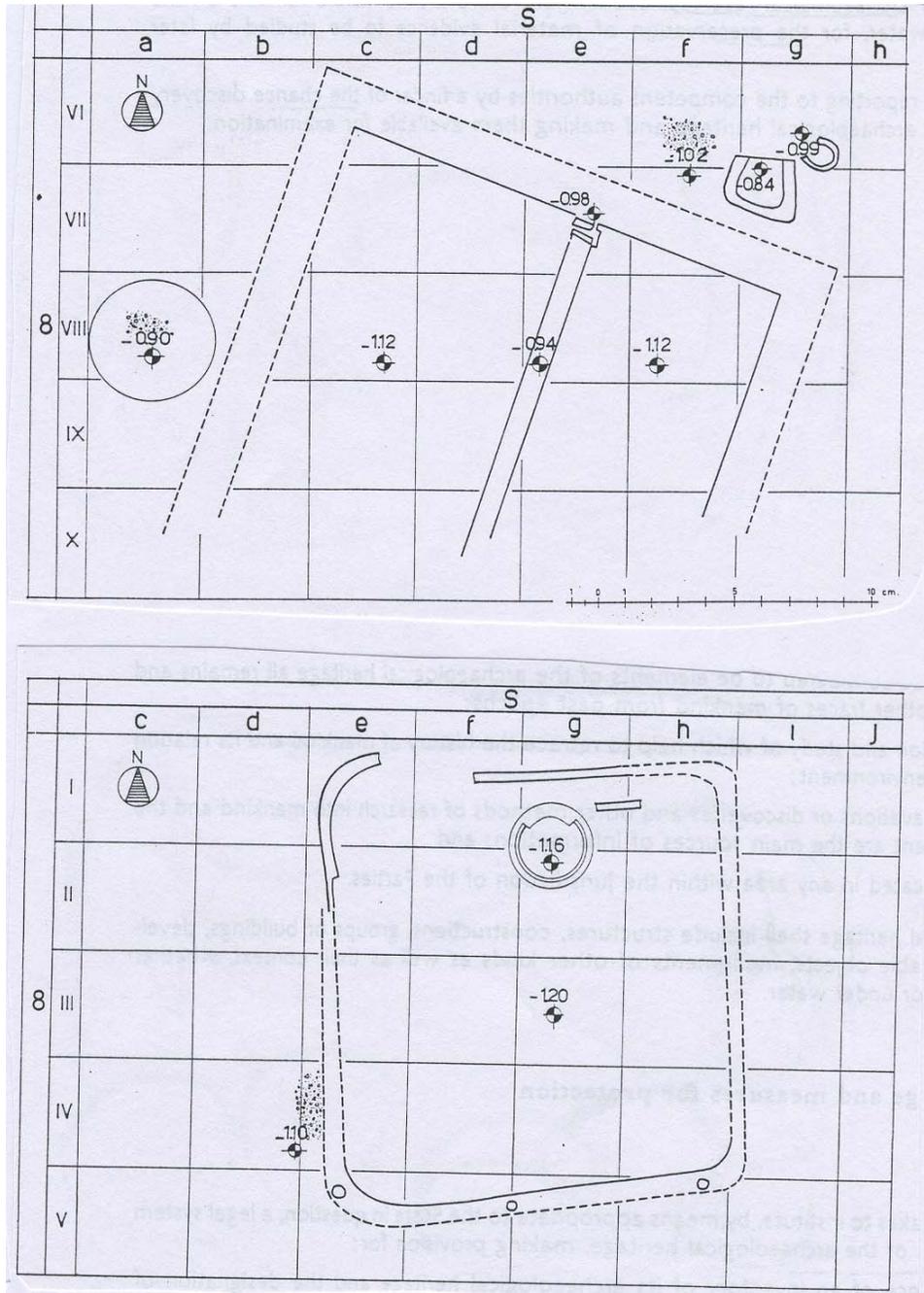
**FIGURE 40**

**Architecture in Tepeck, Level 2a**



**FIGURE 41**

**Architecture in Değirmentepe, Level 2**



**FIGURE 42**

**Architecture in Değirmentepe, Level 1**

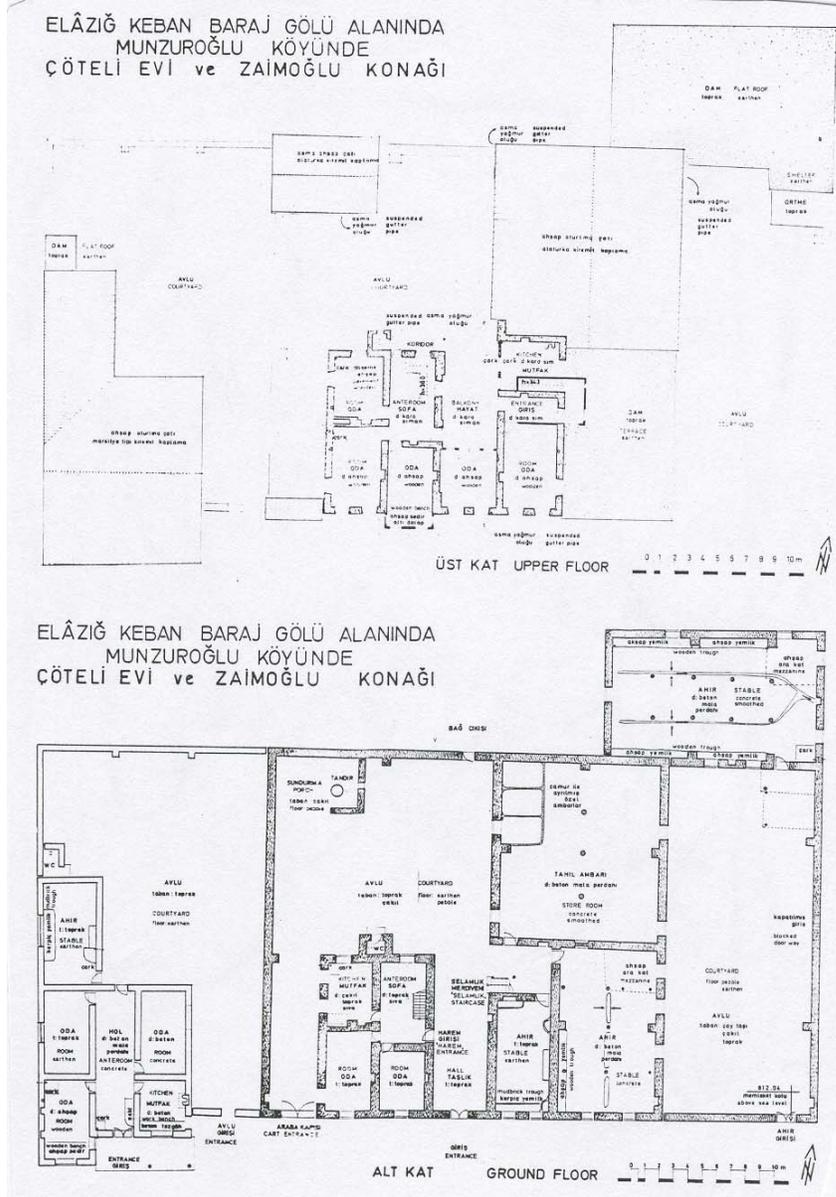


FIGURE 43

The plan of the “Ağa Konak” in the village of Munzuroğlu