Destined to Succeed. The Clazomenian Colonization Endeavor at Abdera in Retrospect: Evidence from the Anthropological Record

Anagnostis AGELARAKIS,
agelarakis@adelphi.edu

This paper aims to elucidate aspects of the Clazomenean endeavor to found Abdera, a new settlement in Thrace, around 655 BC[1]. Although earlier versions of this study have been both incorporated into a larger assembly of archaeological data[2] and published independently[3], no prior report is as comprehensive as this one.

Replete with human osteological remains, the primary anthropological data from the Clazomenean burial contexts in Abdera offers significant information with quantitative implications for scholarly research. These include the plausible reconstructions of facets of the demographic dynamics and paleopathological profile characteristics of the population.

Beyond the elementary retrieval of anthropological bio-cultural data[4], this reconstructive approach bases itself upon a cross-disciplinary effort, permitting further reflection upon a number of undocumented archaeological-historical issues and allowing new insights into the challenges of the Ionian Greeks in colonizing Aegean Thrace [5].

Aspects of Methodology and Project Objectives

Through an anthropological archaeology methodology and an environmental-population approach, this project represents a methodical, cross-disciplinary study of recovered anthropological remains. When conjoined with the rest of the archaeological record, such study permits clearer derivations of archaeo-anthropological understandings of the demographic profile and dynamics of the population, features of their genetic and epidemiological record, reflections on their socio-cultural and physical environments, and clues to their history and fate in the region[6].

After their recovery in both dry and cremated forms in the archaic burial ground[7] in area "K", the human remains underwent in situ inspectional and mensurational documentation. This was followed by laboratory physical/forensic anthropological and archaeometric analyses[8]. The subsequent, ongoing analysis has focused upon, but is not limited to, the biological growth, epigenetic variation, dietary patterns, palaeopathology, and ecology of disease distribution, as well as the reconstruction of aspects of both the physical and social palaeoenvironmental contexts of the Clazomeneans in Abdera[9].

1 See bibliographical reference No. 1, 2, 3, 4, 5, 6, 7, 8.

2 See bibliographical reference No. 23

3 Agelarakis, A., "On the Clazomenean Quest in Thrace During the 7th and 6th c. BC, as Revealed Through Anthropological Archaeology", 2001, *Eulimene*, 2: 161-186.

4 During the summer field season of 1983, the author was invited to participate as the Physical Anthropologist of the excavations conducted at the Archaic burial ground, at the "Sand Dunes" site (excavation area "K"), in Abdera. Under the auspices of the Greek Archaeological Service, and Archaiological Etaireia (9, 10, 11, 12, 13, 7, 14, 8, 15, 16, 17, 18, 19, 20, 21, 22) the author had both the privilege and the opportunity of working in an archaeo-anthropological project aiming to illustrate the Clazomenean condition in Abdera through in the field and laboratory analyses. The sample of anthropological materials excavated during the 1982 season from the Archaic burial ground of area "K" was studied by Dr. T. Pitsios of the Anthropological Museum in Athens and is presented accordingly in the doctoral dissertation of E. Skarlatidou (23). The 1982 anthropological sample is currently integrated by the present author in the larger human population database of the site.

5 Of critical importance for the implications of this project is an ongoing study comparing Archaic anthropological remains recovered from both sites of Clazomenai and Abdera.

6 See bibliographical references No. 24, 25, 26, 27, 28, 29, 30, 31

7 I wish to thank Argyro Agelarakis, for her assistance in the field (especially during the excavation of jar burials) and laboratory. Her floor-plan maps, and in-scale perspective technical drawings of the burial features, especially those that helped record the in situ positions of infant remains inside the jar burials were indispensable for Forensic Anthropology studies.

8 Analyses were carried out by the author since 1983 in laboratory and repository support areas which prefaced the construction of the Archaeological Museum at the historic village of Abdera (established in year 2000), and later at the Anthropology laboratories of Columbia and Adelphi Universities.

9 See bibliographical references No. 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46

Challenging dimensions to the objectives of this project transpired by continued archaeological discoveries. Firstly, archaeological excavations evidenced a vast spatial distribution of Clazomenean activities in Abdera. Secondly, Abdera's extensive systems of fortification walls, facing the endoplains and trailing the outline of a natural harbor, were dated[10]. And, thirdly, the results of analysis and relative dating methods of the artifactual assemblages recovered from the Archaic burial ground in area "K" indicated nearly 70-80 years of uninterrupted use of the burial ground, from the second half of the 7th c. into the third decade of the 6th c. BC[11]. Bolstering these archaeological understandings, two additional Archaic period Clazomenean burial ground locations in Abdera were unearthed[12]. In both of these archaeological sites the author served as the Physical Anthropologist[13] and, through personal communication with his colleagues, it could be stated that the Archaic Clazomenean components had been stratigraphically superimposed, by 6th and 5th c. BC burials. Particularly at excavation area "A"[14,] the Clazomenean burials served as the basal stratigraphic layer for the construction by the Teans of extensive, overlapping burial tumuli of the 6th c. BC.

According to this newfound archaeological record, the Clazomenean presence in Abdera was spatially extensive and elaborate. Furthermore, judging from the chronological data retrieved so far from the Archaic burial ground of area "K", the Clazomenean presence was of considerable duration, presumably overlapping with the arrival of the Teans. From such evidence, is it then possible to ask and investigate new questions about the Clazomeneans, thereby "fine-tuning" our understandings of their sustenance and fate in Abdera[15]?

Context and Preservation of Human Remains

As jar burials predominated the burial features at excavation area "K", the site's recovered human skeletal remains proved relatively protected from taphonomic impacts and, therefore, in fairly good condition. In situ chemical analyses of sediment attributes within the jars indicated neutral to alkaline pH conditions. Stratification processes internal to the jar burials indicated an axonometric allocation of three distinct, vertically superimposed layers of sediments interfaced with pockets of silt and clay deposits. The two upper layers comprised sediments accumulated by infiltration deposition. These postdated the interment processes and contained soils of 7.5 YR 4.5/3 hue and chroma of the Munsell soil chart values, coarse and very coarse sand (0.5 - 2.0 mm), granules (2.0 - 4.0 mm) and pebbles (4.0 - 60.00 mm), characteristic for their sub-angular and occasionally angular particle shape, hence lacking the physical characteristics indicative of extensive physical weathering. The third, or basal, layer contained deposits of 7.5 YR 2.5/2 silt (< 0.06 mm), 7.5 YR 8/5 (Munsell values) sand particles of very fine (0.07 mm) to very coarse sizes, and marine molluscan fragments[16] (not as remnants of human consumption) ranging in size from 2.0 mm - 25.00 mm, and manifesting exclusively rounded and sub-rounded sphericity indicia typical of extensive physical wear through exposure to the elements. This evidence identically matched the nature, attributes and characteristics of the sediment particles and ecofactual components[17] of the geological substrate of the burial ground. In agreement with the sedimentological data the geological data, precisely located the burial ground at its active, littoral setting on the Thracian shores of the northern Aegean Sea during the Archaic period in Abdera[18].

With isolated exceptions (suspected to have been imposed by soil fauna activities), most anthropological remains were recovered imbedded in sedimentologic conglomerates[19] from the contexts of the third stratigraphic layers within the jars.

---

10 See bibliographical references No. 47, 8, 48, 15, 20.

11 See bibliographical reference No. 23.

12 In the areas of excavations designated topographically as "97" and "96", excavated by Ms. K. Kallintzi, (49, 50), and in the area of excavations designated as "A" excavated by Ms. Lydia Kranioti (16), both archaeologists of the 19th Ephoreia of Prehistoric & Classical Antiquities of Thrace.

13 See bibliographical references No. 51, 52.

14 See bibliographical reference No. 16.

15 A dramatic nexus echoes the Archaic component indicative of a theater of struggles and difficulties faced by a colonization process striving to establish itself in a new territory. Such reflections are characteristically recorded by Herodotus (1: A,168) who clearly states that it was the Teans, from the neighboring city to Clazomenai in Ionia, who in 545 BC --about a century later than the Clazomenean arrival in the area of Abdera, came to the area and succeeded in rebuilding the city of Abdera, since the Clazomeneans had been repulsed from the region by the Thracians.

16 Taxonomic identifications of mollusk samples have been kindly carried out by Dr. David Reese.

17 See Appendix No. 1.

18 See bibliographical reference No. 47.

19 Based on synergistic taphonomic processes relative to: a) the anisotropic nature of the osseous components combined with the chemical microenvironment within the jars and the physical as well as chemical attributes of the encompassing sediments; b) the seasonal water table elevation fluctuations--of brackish nature; c) diachronic alluviation processes; and d) the general climatic conditions in the region.

The nature and stratification of the sediments suggested several origins of the third, or basal, layer. Firstly, it could have been deposited culturally, according to burial customs for the "preparation and softening" of a burial bed within the jars, thereby reflecting an inorganic component of cultural stratigraphy. A second hypothesis offered the sediments as representative of taphonomic depositional processes through infiltration, coeval with[20] and/or synchronous to the *terminus* of the Clazomenean horizon. Lastly, a combination of the previous explanatory hypotheses proved tenable. Regardless of its debatable origin, the basal layer did offer at least one definitive discovery: the accumulation of seashore materials as basal components of the jars' internal stratigraphy *preceded* the sequential deposition through infiltration processes by alluvial sediments of the two upper layers. Presumably, alluvial processes also were caused by human activities relative to deforestation. And, later in antiquity, erosion, intentional landscape changes, and intensive agriculture also would play at least partial roles[21] in encasing, but not deeply burring, this Archaic burial ground with alluvial sediments, a fact distinctly represented stratigraphically within the burial jars by the two upper sedimentological layers.

Given the intricate complexities of internal jar burial excavation, the in situ documentation of the anthropological remains proved a tantalizing task. But the combination of careful field work with long term laboratory conservation and curatorial processes ensured the preservation of adequate osseous and dental surfaces for in-depth bio-archaeological studie[s22].

Sediment samples from twenty jar burials were retrieved through selective and random pinching techniques, especially from the silt and clayish pockets in the third stratigraphic layer within the jars, along with several standard samples. These materials then were processed in four separate bio-geological laboratories[23] for the detection of environmental and dietary pollen. The laboratories also sought to recover additional ecofactual and intestinal macro- and microscopic residual substances, including parasitological contents[24].

Mircobotanical analyses showed an absence of pollen spectra. Only in one case were pollen grains isolated, and their severe state of degradation rendered them unidentifiable. While seasonality might have been a contributing factor to the absence and/or degradation of pollen spectra (i.e. the lack of environmental pollen during late Autumn and Winter), the more likely explanation involved certain aspects of taphonomic implications, namely the relative alkalinity and oxidation of sediment attributes (i.e. the micro-scavenging of pollen through fungal activities). Furthermore, every sample contained non-carbonized macroscopic fiber residues. This debris, often tracing the internal surfaces of the base of the jars, derived from the small arachnoidal plant root systems of germinating seeds intrusive to the jars. By no means was it either the result of ante-mortem plant consumption by the individuals involved or of burial offerings. Additionally, charcoal micro-flakes of currently undetermined origin were discovered in all samples. They might represent debris resulting from coeval burial habits and practices, such as funeral pyres for cremating adult individuals and/or for the preparation of relative burial feasts; they might reflect contamination processes from later phases of antiquity in Abdera; and/or they might signify more recent historic conditions[25]. Regardless, none of the series of 10 pertinent sediment samples prepared for parasitological studies scored positive results. This lack of parasitological evidence in the form of spores or fragmented parasite body component(s) might indicate that the young individuals were not affected by parasitic infestations, and/or that such evidence was lost due to post interment burial processes.

To evaluate dietary patterns in the Infancy I age group, sets of bone samples were selected from jar burial No. K 111 (2.5 - 3.0 years) and jar burial No. 156 (4.5 - 5.5 years). These sets then were prepared and processed for bone isotopic fractionation[26]. Similarly to a set of nine-bone isotopic trial samples also lacking their gelatin (collagen) components, these two final samples yielded only apatite values. Hence, apatite values

20 Aeolic and general weather conditions should be considered for such an exposed seashore area.

21 For seashore changes responsible for contributing in geomorphologic modifications see (47).

22 See bibliographical reference No. 30.

23 Laboratories where samples were processed: a) New York University's Biology Dept. Lab; b) Columbia University's Lamont-Doherty Geological Lab; c) Nebraska State University's Parasitological Lab; d) Adelphi University's Earth Sciences/Environmental Studies Lab.

24 See bibliographical references No. 53, 54.

25 Given the extensive and purposeful annual (mid July-Late August) firing processes aiming to clear the fields, consuming and partially recycling elements (N, K, P) from the residual stems of cereals and undergrowth, following the harvesting seasons, at the agricultural fields of the historic village of Abdera, where dry farming has been the mode and habit of farming as long as any local informant could recall referring to memories past down from earlier generations.

26 See bibliographical references No. 55, 56.

suggested either a 19% intake of C4 plants (plants that conduct photosynthesis through the C4 pathway, like millet), or a 59% intake of seafood-based dietary components. In introducing the proportionalities of marine foods to C4 plants in the diet, the author recognizes their relative difficulties in interpretation, but explanatory alternatives could not be evaluated properly in the absence of preserved gelatin components. In addition, dietary intake as reflected through apatite values does not necessarily reflect weaned conditions for the infants[27]. Therefore, the isotopic results could indicate shifted proportionality of food types due to lactation processes, therein recognized as reprocessed carbon. Bone isotopic fractionation conducted on samples representing adult individuals emulated the fractionation proportionality retrieved from infants.

Facets of Demographic Profile and Manifestations of Paleopathology

A substantial number of 203 burial contexts were excavated since 1983[28], comprising 165 jar burials[29], 19 cremation (pyre bed) features[30], 16 inhumations[31], 2 inhumation/jar burials[32], and 1 cyst burial[33]. These burial contexts yielded 231 human skeletal individuals, representing the majority of the Clazomeneans interred in the archaic burial ground of area "K" (23), and seemingly reflecting an adequate random sample of the Clazomenean population, at large, in Abdera [34].

Of the 231 interments, 199 (86%) were assessed as primary and 32 (~14%) as secondary. Such understandings were achieved by studying multiple lines of evidence. These included the stratigraphic relations and contextual conditions of relative burial features; the possibilities of taphonomic impact; and the nature, kind, and preservation of osseous structures as juxtaposed to the main interments. These particulars further indicated that 25 of the secondary interments were intrusive under most probabilities, whereas the remaining 7 were of non-intrusive nature. In the latter case, the 7 burial contexts (a mere 3.5% ratio out of 203 burial contexts) suggest the presence of family graves reflecting consanguineous relations (4 jar burials[35], 1 inhumation feature, and 1 cremation pyre) and/or affinity (1 inhumation feature No. 217) between individuals interred (Table 1).

---

27 Without necessarily drawing standards for comparison with the conditions of the Clazomeneans in Thrace, ethnographic information gathered by the author from the larger region of Abdera indicated that it was not uncommon for young individuals, within their second and even third year of life, to be fed through lactation, if not constantly then in a supplemental fashion by: a) their own mothers--some of whom were already caring for a younger offspring; and/or b) other female relatives or very close female friends, capable of lactating, in times of difficulty (i.e. strenuous conditions imposed by war).

28 See footnote No. 3.

29 Of the 165 jar burials 4 were void of human remains. Hence, 161 jar burials yielded 161 primary and 9 secondary interments 4 of which were assessed anthropologically as non intrusive, whereas the remaining 5 as of intrusive nature), all in dry form, the vast majority of which were age assessed as infants, as well as 17 individuals in cremated form (most probably of intrusive nature).

30 The 19 cremation features yielded 19 primary and 1 secondary (non intrusive) cremated interments (the vast majority of which were age assessed as adults), as well as 1 secondary individual, in dry form (most probably of intrusive nature).

31 The 16 inhumations yielded 16 primary and 2 secondary (non intrusive) interments in dry form, and 2 secondary (intrusive) cremated individuals.

32 The 2 inhumations/jar burials yielded 2 primary interments in dry form.

33 The 1 cyst burial yielded 1primary interment in dry form.

34 The anthropological sample recovered in 1982, from the Archaic burial ground in area "K" during the first excavation season, (see footnote No. 16), and additional Clazomenean burials discovered at peripheral sites, as explained above, are in the process of being incorporated in the demographic inventory of the Clazomenean horizon in Archaic Abdera, and will be presented as such in a forthcoming publication.

35 In the case of burial features "K129», and "K232», age assessments based on biological growth and maturation of bones and teeth might suggest interments of twins. Nevertheless homo-, or hetero-zygosis of twins could not be established given that most recent repeated DNA analyses could not recover nucleotide data (57).

Table, No. 1. Archaic Burial Ground, Area "K", in Abdera: Burials with Double Interments Suggested to Reveal Consanguineous Relationships, and/or (for Burial No. 217) Affinity

Burial & Individual No.	Burial Type	Age Assessment	Sex Assessment
110 Homo 1	Cremation	Young/Middle Adult	Female
110 Homo 2	Cremation	Infancy I (3-4 years+/-9 months)	Indeterminate
129 Homo 1	Jar burial	34-36 uterinal weeks	Indeterminate
129 Homo 2	--	34-36 uterinal weeks	Indeterminate
155 Homo 1	Jar burial	~/= 4-6 postnatal months	Indeterminate
155 Homo 2	--	Prenatal	Indeterminate
201 Homo 1	Jar burial	Birth-6 months	Indeterminate
201 Homo 2	--	2-3 years	Indeterminate
208 Homo 1	Inhumation	4-5.5 years	Indeterminate
208 Homo 2	--	12-18 months	Indeterminate
217 Homo 1	Inhumation	>35 years	Male
217 Homo 2	--	=/>35 years	Female
=232 Homo 1	=Jar burial	=Near Birth-6 months	=Indeterminate
232 Homo 2	--	Near Birth-6 months	Indeterminate

Facets of the demographic profile of this population are presented through eleven age group categories (Table 2) and six biological sex sub groupings (Table 2a), reflecting the complexity of this collection's preservation of human skeletal remains. Intriguingly, the highest prevalence of mortality was scored within the "Perinatal" and "Infancy I" age groups, which if lumped together account for 71% of the represented population. Of similarly considerable importance, a clustering of detailed age assessments within the "Infancy I" age group (">Birth-6 years", also see descriptions of age groups in Table 2) would reveal progressively decreasing mortality values past the apex scored at the "greater than Birth to 6 months" age subgroup (at approximately 38%), tapering off at the "greater than 6 months to 12 months" age subgroup (at approximately 9 %), and then falling to the lowest prevalence toward the terminal years of "Infancy I", namely between "4 to 6 years" (at less than 1%). Whereas the "Prenatal" and "Infancy II" (or otherwise the 6 -12 years subgroup) age groups revealed relatively low mortality values, each at 3 percent, the next higher locus on the mortality curve was scored with the "Subadults" age subgroup, totaling 6%. This tapered off among the "Middle Adults" and "Late Adults", each at 4%, before the declination phase with the lowest score observed among the "Maturus" age subgroup, at 1% representation.

With its distribution of age clusters simulating in shape a lowercase Greek letter "8", the bell curve outline of the mortality prevalence at this Archaic Clazomenean burial ground could implicate several complex demographic and paleoepidemiological arguments, especially with regards to the very young individuals of the population[36]. For example, if endurance through the "Infancy I" age group's aforementioned mortality prevalence is perceived through the eyes of the paleopathologist as demographic survivorship, then what were the causative agents and underlying factors functioning as early "checking point mechanisms" and removing such a considerable number of offspring from the Clazomenean population [over an archaeologically determined Clazomenean presence in Abdera of minimally seven to eight decades[37]]?

36 It is noted that aspects of the demographic profile of the Clazomenean population in Abdera will change, especially as this pertains to the "Adults", "Maturus", and "Senilis" age groups, as revealed by the study of the anthropological record, following the most recent discovery by Ms. K. Kallintzi (49, 50), of an additional Clazomenean burial ground, in Abdera, as explained above.

37 See bibliographical references No. 23.

Table, No. 2. Age Group Categories Used for Age Assessing the Human Skeletal Individuals Recovered from the Archaic Burial Ground, Area "K", in Abdera

Age Group Categories	Values in Uterinal Weeks	Uterinal/Postnatal Weeks	Values in Years
«Prenatal»	20 up to 32-34 weeks		
«Perinatal» or«Near Birth»		>34-36/37 uterinal weeks to 39 uterinal weeks/Birth	
«Infancy I»			>Birth to 6 years
«Infancy II»			>6 to 12 years
«Juvenilis»-«Subadults»			>12 to <18/19 years
«Young Adults»			>18/19 to 25 years
«Middle Adults»			>25 to 35 years
«Late Adults»			>35 to 45 years
«Maturus»			>45 to 55 years
«Senilis» or «Older»			>55 to 80+ years
«General Adults», a term indicating the lumping of the three «....Adults» age group categories in a new one, used circumstantially as dictated by conditions of very limited preservation, hindering more accurate age assessments			~18/19 to 45 years

Table, No. 2a. Biological Sex Subgroupings Used for Sex Assessing the Human Skeletal Individuals Recovered from the Archaic Burial Ground, Area "K", in Abdera

Biological Age Subgroupings
«Indeterminate due to preservation»: might implicate both young and old individuals in dry and cremated form
«Indeterminate due to young age»: exclusively implicates young individuals with immature skeletons
«Females»: individuals assessed forensically as females
«Females?»: an individual nearly bordering female morphological anatomy and metric indicia
«Males»: individuals forensically assessed as males
«Most probably Male»: an individual bordering the lower margin of male morpho-metric data

In pondering this, one should avoid initial generalizations referring to comparable data of 50% and higher infant mortality among populations of the pre-antibiotic era, current displaced peoples of preliterate tribal settings, and/or even inter-city areas of post-industrial nations occupied by economically depressed groups. Such explanatory scenarios and comparative measures likely will prove poor models, if not ectopic and non-specific. For the circumstances of the human condition in Archaic Abdera, especially as substantiated by the diachronic study of its anthropological record[38], covering a sequential temporal continuum from the 7th c. BC to the late 14th c. AD, only in two instances were there manifestations of significant prevalence of high infant mortality. Pointedly, these exceptions were recorded during the initial settlement of Abdera by the Clazomeneans during the 7th c. BC[39], and then again at the terminal habitation phase of ancient Abdera (Polystylon) during the end of the Late Byzantine period in the 14th c. AD. Therefore, arguments referring to aspects of the high infant mortality in Abdera should be evaluated through the specific and idiosyncratic cultural filter of the Clazomenean group(s), especially with regards to their well-deserved reputation for cultural and techno-economic achievements, including the application of complex medical and surgical

38 See bibliographical references No. 45, 58, 51, 59, 60, 61.

39 See bibliographical reference No. 46.

knowledge[40]. That acumen is exemplified through the paleopathological evidence of a masterfully executed cranial surgical trepanation on a Clazomenean female within the "Maturus" age group who survived the surgical intervention[41].

Still more complications arise regarding the evaluation of this complex data. For instance, lacking datable burial offerings[42] and precise chronological data pertaining to the exact year of deposition of each of the number of jar burials, should the paleopathologist distribute the "Perinatal" and early "Infancy I" individuals evenly over the duration of approximately seventy to eighty[43] years? Should such a distribution of interments be considered the result of the multitudinous reasons responsible for normal demographic attrition at this most sensitive biological age, or should one anticipate that the majority of these individuals were interred during the first year(s) of the Clazomenean colonization of Abdera when compounding difficulties could have been overwhelming[44] ? For example was it the lack of adequate food production systems, the lack of cultural mechanisms typically buffering physiological and even pathological stress, or a combination of these factors? Further, should the paleopathologist consider the strike of one or several epidemics removing many young individuals per instance? But if considering epidemics, why is there lack of increased mortality among the other age groups, unless of course it was the matter of childhood disease(s)? Although such questions seemingly may be argued by the available paleopathological and epidemiological data, a plethora of larger historical questions with important implications for anthropological archaeology surface. And these larger questions prove far more difficult to resolve.

Among the most fundamental questions is one of demographic composition. How veritably might one reconstruct the demographic composition of the founders of Abdera (i.e. their gender diversity and age structure cohorts, their affined and consanguineous relations, their social and economical standing)? If reliable, such an understanding might provide a watershed of historical insights. For the Clazomenean founding group of individuals left behind, in Ionia, a well organized and flourishing (save the imminent Persian threat) city with a minimum core population of several hundreds of citizens. From that fact, civic curiosity arises. Would the nature and organization of the founders present an adequate number of male individuals of age for establishing the emigrants militarily in a land renowned for the polemical aptitude and might of the local Thracians? And did the settlers carry materials and tools with them from their city of origin to help with the founding of Abdera? If so, this might represent an important spread of technology across the region. Furthermore, it could position Abdera as a microcosm of the technological capacities and organizational abilities of the colonizers realm and/or city of origin. Further investigating the notions of travel, what types of ships were used and what was the seafaring route[45] of the settlers? And when did they travel? One would suspect they voyaged just after the harvest and before the trade winds of late June to August. But what was the duration of their expedition? Issues of weather aside, what were the nature and quality of dietary resources/provisions[46] originally carried and then acquired or replenished en route? Had they tried to settle other more preferable, but less naturally fortified and/or hostile areas before reaching the land of Abdera, or was Abdera always the intended destination? During their expedition, did the explorers suffer significant and/or irreplaceable losses of materials and perishable goods? Perhaps more importantly, did they lose members of their group (i.e. a leader, a priest, a medical practitioner, a midwife, a navigator, a ceramist) en route due to attrition, piracy, polemical activities, exposure, old age, and/or disease? How many members began the journey, and how many arrived ultimately at Abdera? And what could have been

41 Whereas it is assessed that the cranial trepanation took place in Abdera, evidence for the presence of a very experienced "*Cheirourgos*" at Abdera, this also provides strong qualitative evidence, for the high level of social standing shared by female individuals in an Archaic Hellenic socio-cultural context.

42 Relative dating of diagnostic ceramic burial offerings is much more accurate in this context than what absolute radiometric dating could possibly offer. Diagnostic ceramic dating by assessing a *terminus ante/post quem* , could narrow down into smaller windows of 5 to 10 years the deposits of individual burials, within the larger time frame of the 70-80 years (23) of usage of this human activity area.

43 See bibliographical reference No. 23.

44 See bibliographical references No. 45, 58, 46.

45 A mainland peri-coastal sealing/rowing to Abdera (strongly suspected as the most plausible route), or one that combined both mainland peri-coastal and aspects of island circumnavigation in the north-eastern Aegean, setting course from Hellespont to Imbros toward Samothrace before reaching the Thracian coast of the northern Aegean between Makri and Maroneia, then reaching Abdera?

46 For example of grains, olives, salted fish, water and wine, fruits, and of other perishables--some of them dried, and of what species, if any, of live domesticates.

their fertility ratios[47]? Up to what age were females and males respectively fecund? How did Abdera's strenuous conditions (ibid. and 1: A, 168) impact reproductive behavior, dietary intake, and/or psychological and physical health? Furthermore, how active and supportive was Clazomenai in founding, administrating and sustaining the new colony city of Abdera[48]?

To approach aspects of the aforementioned questions, one can turn to physical anthropology and paleopathology. For example, through macroscopic and, in selected cases, radiographic[49] observation, a complete absence of dental crowns' linear enamel hypoplasias (LEH), permanent markers of early life stress, was noted. LEH are caused by arrested and improved constitutional growth, potentially affecting dental enameloblast cell appositional growth functions concomitantly with the formation of enamel crown components on both deciduous and permanent dentitions[50]. Similarly, x-ray images of long bones[51] showed a lack of Harris lines[52], stress lines of impaired and improved bone growth[53]. Besides reflecting good maternal health, this indicated a lack of in utero and postnatal biological early life stress markers, hence revealing an absence of organismal arrested and improved growth instances due to temporary and/or recurrent conditions of malnutrition, and/or under-nutrition, including the gamut of dietetically contingent pathologies possibly causing such changes (i.e. high fevers, prolonged diarrheas, parasitism, infection, and trauma.) The absence of LEH and Harris lines was considered significant paleoepidemiological evidence, especially among the young Clazomeneans brought to and/or born in Abdera. For had the initial morbid conditions not proved fatal, the ameliorated individuals would have, under most probabilities, developed dental enameloblastic defects and/or Harris lines. However, localized enameloblastic defects did appear in some cases, mainly affecting deciduous and sometimes permanent canine labial surfaces. This was often present bilaterally in single depressions with well defined, ovoid-shaped smooth[54] enamel boundaries, exposing at their base primary dentin tissue (in good condition) with diameters ranging from a few to several millimeters. Described by the author as "laccoid" to distinguish it from hypoplastic pitting, this kind of enameloblastic defect has been noticed with a low prevalence in the region. It appears diachronically from Archaic to Byzantine Abdera[55,] and in Thasos Island, from the earliest Proto-Historic Thracian population[56] to the Classical, Hellenistic[57], and Palaeo-Christian populations. While additional contributing causes to the expression of "laccoid" hypoplasias could be explored[58], the probability of a genetic pretext, of *founder effect*, seems characteristic for the new comers in Abdera[59], at least as signifying the symptomatic specificity of such hypoplastic defects[60].

---

47 What could have been the population fraction of individuals within their optimal fertility years (less than 1/3?), considering that a small group of emigrants (all in all much less than 500) with yet a smaller group of reproduction capable individuals could not sustain the generational future of a colony without significant gene flow processes bolstering their gene pool--and considering the dire prevalence of their infant mortality and their geopolitical isolation as pioneers in Aegean Thrace?

48 On the strength of the argument [see discussion in (20)] that the expedition to Thrace, might not have just been the result of a domestic Clazomenean wrangle.

49 X-rays were taken and processed at Columbia University's School of Dental and Oral Surgery, assisted by Dr. Sidney Horrowitz, Prof. and Dean, and Dr. Irwin Mandel, Prof. and Director of Clinical Research.

50 See bibliographical references No. 62, 63, 64, 65, 66, 67, 68, 69.

51 Cranial and infracranial x-rays were taken, processed, and evaluated at Mt. Sinai's Hospital, Department for Bone Diseases, in a joint effort with Dr. Allan Schiller, Prof. and Director of Bone Pathology, including his team of radiologists.

52 See bibliographical reference No. 70.

53 These would appear radiographically as denser, and therefore as more lucent, osseous linear demarcations—oriented transversally to the disto-proximal axes of long bones, the result of stunted and resumed growth plate activities of bone development.

54 Not due to *ante mortem* masticatory wear or taphonomic weathering.

55 See bibliographical references No. 45, 58, 51, 59, 60, 61.

56 See bibliographical reference No. 71.

57 See bibliographical reference No. 72.

58 For example the result of benign stress in the form of pressure points imposed bilaterally on the mandibular hemispheres, with emphasis on the loci of the deciduous mandibular canines, through the application of a cultural tradition of binding the body and head of new born up to their 6 postnatal months (as documented ethnographically by the author), and/or through benign stress imposed on the oral mucosa and alveolar processes loci enveloping the mandibular canines by a mouth piece given to new born individuals for assistance in lactation processes, and/or for simulating one, such as in the case of a pacifier.

59 While this is an issue under further investigation further, and without diminishing the potential of gene flow processes between the Thracian populations to these of the Cycladic and Ionian Greeks, the author documented, at least for the Clazomenean-Abdera nexus, that "laccoid" hypoplastic defects were affecting infants interred in the Archaic necropolis of Clazomenai, known as "Akpinar" site, with dates slightly earlier as well as coeval to the colonization endeavor to Abdera.

60 Causing localized circumscribable labial necrosis of enameloblasts on those most sensitive canine teeth (for the deciduous teeth from 7 prenatal months to about 3 postnatal months, and for the permanent teeth from 1 to about 5 years within the Infancy I age group).

Additional exploration of dentitions revealed a larger segment of both deciduous and developing permanent teeth with incomplete root segments revealing histological enamel discolorations of 10YR 3/6 (dark red) and 5YR 4.5/3.5 (reddish brown) on the Munsell scale. These manifestations were initially considered as of probable pathologic nature secondary to specific diseases, such as infantile hepatitis, porphyria, and/or discoloration possibly due to the dietary inclusion of certain substances, perhaps with pharmaceutical benefits. But through chemical and trace element analyses[61], the discolorations proved to be pseudo-pathological conditions of taphonomic causality. In fact, the discoloration comprised nothing more than post-depositional infiltrations of exogenous substances into the dental components of primary dentin (through the dentino-enamel junctions) and enamel (through post mortem cracks) in the form of silicates, ferrous oxides, and high fluorine concentrations (23000 ppm; F in fluoroapatite).

Especially in the young individuals, cranial and postcranial bones reflected relatively uninhibited bone growth processes. However, substantial skeletal changes due to pathologies often were evident. While the cranial bones revealed thin but intact diploic components, vault bones showed uneven and non-uniform, thin layers of subperiosteal bone apposition with distinct, sharp boundaries, mainly on internal cranial tables. Postcranial skeletal remains rarely showed similar periosteal reactions, and although differing in severity among individuals of the same age, these skeletal manifestations were considered responses to inflammatory complications, most likely due to infectious conditions.

Ectocranial porotic hyperporotic changes, of porotic to cribrotic size, appeared in a considerable number of infants lacking diploic hyperostosis. Only in rare cases were these individuals affected by hyperporotic, but non-hyperostotic reactive lesions at their orbital roofs. Their postcranial skeletal changes showed hyperporous reactions on rib surfaces, as well as on long bones. The appendicular skeletal changes were not the result of metaphyseal ends' remodeling, which would have indicated normal growth processes. Rather, those appendicular changes signified any of a number of pathogenetic causative agents particular to hemopoietic (but not pernicious) disorders, living conditions in aggregate[62] environments, and the subsequent health difficulties of these conditions. Such conditions would include viral contagious diseases spreading through aerosol form, through food and water contamination (including bacterial, and parasitic infections) of both direct and indirect contagious nature, through domesticated animals (including their by-products, i.e. milk and cheese), and/or through the natural habitat of the insect vectors thriving in the wetlands and marshlands of Abdera.

Continued paleopathological evaluations of the skeletal record of young individuals indicated the presence of well defined ectocranial areas of moderate hyperporous reactive bone loci of porotic size, especially on temporals, parietals, occipitals, and the maxillo-mandibular quadrants. Similar changes also were observed infracranially at preserved supero-dorsal surfaces of scapulae and humero-ulnar disto-proximal thirds, respective components of the shoulder and elbow joints. Caused by localized hemorrhaging, such changes should be attributed to scorbutic conditions[63] due to vitamin C deficiency[64]. Nevertheless, in some cases the cranial bones indicating scorbutic changes revealed porosity at selected endoctanial bone surfaces suggesting compounding infectious/inflammatory conditions. This occurred specifically at the lower lateral walls and the base of the crania, including the cerebral faces of the temporals, such as the petrous bone components, the sphenoids, the occipitals, and *partes basilares*. Finally, it was possible to diagnose a case of rickets caused by vitamin D deficiency.

The childhood diseases[65] (contagious infections), anemias (i.e. acquired in mature due to iron deficiency and/or parasitic infestation), scurvy (dietary intake inadequacies), and secondary infectious conditions (i.e. opportunistic due to aggregate living and/or lowered strength of immune systems) which seemingly extorted

61 Analyses conducted at Columbia University's Chemistry Department.

62 It is tantalizing to consider that prior to the construction of any defensive walls, relative safety from Thracian skirmishes could be attained temporarily by seeking refuge in the ships--and possibly in safe distance from the shore. In such cases it could be assumed advisable for mothers and infants to have sheltered behind the decks of those ships (pending on their nature and make). Such scenarios would provide for optimal conditions of disease distribution ecology in an aggregate. But even after the initial establishment of few or several shelters on land, the lack of any pre-existing (and time consuming and labor intensive tasks) substructural means for buffering contamination (i.e. of water) would still contribute toward an aggregate environment.

63 Differential diagnosis processes of palaeopathologic manifestations attributed to Scurvy had been discussed with Dr. Donald Ortner, Prof., National Museum of Natural History, Dept. of Anthropology, Smithsonian Institution (see 73).

64 See bibliographical reference No. 73.

65 Discussions on current infant epidemiology, circumstances of pathological stress, and treatments continue to be carried out for purposes of comparisons with Dr. Dimitrios Hatzis, M.D., Ph.D., Pediatrics, currently at Presbyterian Hospital of Columbia University.

a heavy toll among the young[66] also could have affected severely the net reproductive success and subsequent long-term livelihood of the Clazomenean population in Abdera during the 7th and 6th c. BC., especially if reinforcements (lack of gene flow) from Clazomenai were rare. Furthermore, both ancient references (*Herodotus*, *Plutarch*, and *Solinus, C.J.*) and relatively recent ethnohistoric information (gathered by the author since 1982 through the local elder informants from Abdera and neighboring villages) detail the peri-, and endo-coastal areas of Abdera as surrounded by slow moving, often stagnant water bodies and marshlands. Therefore, epidemiologically speaking, this topography therefore represents the optimal breeding grounds for the vector transmitting malaria disease, especially in the eras preceding modern insecticides. Adding such epidemiological factors to all the other compounding difficulties facing the Clazomenean newcomers, the settlement of Thrace must have been a daunting, if not overwhelming, experience. Is it possible that such difficult survivorship bolstered the polemical image, aptitude and capacities of the Thracian challengers (1:A, 168), especially in the ears of non-participant members[67]?

The post "Infancy II" skeletal remains represented approximately 23%t of the population sample. In evaluating these samples, ranging from the "Juvenilis" to the "Older" (or "Senilis") age groups, data relative to biological sex was retrieved where forensically pertinent. Therefore, although approximately 87% of the entire skeletal collection was of indeterminate sex, 5% of the skeletally mature and adequately preserved individuals were assessed as females, and 6% as males. Among the reasons for such low percentages of determinable sex are the very young ages and immature skeletal bodies of 75% of the collection, as well as the limited preservation of the remains of 12% of the skeletally mature individuals.

Representing the largest systematically excavated archaic burial ground in Abdera[68], this skeletal collection could be considered a representative random sample of the Clazomenean population. As such, the number of males then seems insignificant with regards to the fatalities and/or secondary casualties[69] (i.e. irrepressible hemorrhaging, infected wounds, opportunistic secondary diseases) caused by warfare and/or prolonged hostilities (severe enough to earn a description by Herodotus, see 1: A, 168) between the Thracians and the Clazomeneans[70] Furthermore, few notable traumatic manifestations were discovered skeletally, indicative of a lack of paleopathological evidence of peri-mortem, healing, or healed traumatic injuries, and/or of post-traumatic complications, caused by projectiles (i.e. slingshots, arrow heads, javelins) received from a distant trajectory or close-encounter battle. Could the lack of such manifestations indicate the efficacy of the heavy hoplitic armor and discipline of a Clazomenean phalangeal formation against the more flexible, lightly armed, Thracians? So far circumstantial evidence may support this argument.

Had the Thracians conducted a war of attrition by disallowing the Clazomeneans adequate access to peripheral land (i.e. for agriculture and lumber acquisition) and/or by opportunely or seasonally plundering and ravaging the Clazomenean crops[71,] the newcomers' dietary stress and inadequate intake would be discernable in paleopathological skeletal changes. Such evidence would indicate under- and/or malnutrition, and possibly even marasmus[72] due to recurring inadequate dietary intake. But, in this instance, that evidence would prove difficult to evaluate critically through bioarchaeology. For, superior nautically to

66 It is of importance to underline that based both on personal communications with the senior director of projects Dr. Güven Bakir , Dr. Yaşar Ersoy, and Dr. Bilge Hürmüzlü, excavators of Clazomenean sites, and subsequent study by this author of the skeletal record retrieved from the Archaic necropolis at "Akpinar" it can be reported that infants seemingly scored an disproportionately higher mortality prevalence in Abdera as compared to Clazomenai.

67 Consider an additional record to (1:Z:126), of a non specific description for the location of Abdera in (1: H,120), whereas it is clear that Herodotus visited the region as indicated by (1: ST, 47), see also (1: ST,46).

68 See bibliographical reference No. 23.

69 Even if one would assume, paradoxically, the entire cluster of males (15 individuals, or ~6% of the sample) and females (12 individuals, or 5% of the sample) to have exclusively fallen as victims of war against the Thracians (for the case of female casualties sustained before the construction and subsequently when outside the walls of fortification, during raids and/or ambushes conducted by the Thracians.

70 For according to Herodotus (1:A,168), one would be inclined to deduce that the Clazomeneans would have at best retreated (suffering dead and wounded), if not defeated (with many more casualties) from the might of the Thracians (i.e. from Thracian horsemen skirmishes, deployment of archers, sling shooters and peltasts, and/or during attempts of Clazomenean phalanx charges against the non compatible army formations of the enemy or contingents thereof--with very different mentalities, habits, and ethics of war tactics and battle engagement compared to a pitched battle). And considering the potential of the Thracian strength and superiority in population numbers, access, knowledge and use of the topography and territory, while supported by an unhindered flow of "unlimited" logistical resources, as well as allies in the effort of defeating and banishing the Clazomeneans.

71 As was the case even during the early 4th c. BC in the Thracian Chersonese region requiring for the protection of the agricultural yield of nine Greek cities, the repair of existing, and further construction of walls of fortification carried out by Derkylidas (74).

72 Especially among the young requiring greater nutritional needs at a biological age of rapid growth.

the Thracians, the Clazomeneans might have relied upon pelagic resources and trade, if not opportunistic piracy, to sustain themselves, thereby placing a seasonal harvest of their own local agricultural produce of C3 pathway photosynthesizing cereals like wheat and barley in a necessarily secondary, unreliable position. Might this then explain why the stable isotopic results of bone components revealed, albeit only from the apatite contents, the possibility of overwhelmingly high levels of seafood consumption and/or a C4 pathway photosynthesizing cereal grass like millet (more rugged and less demanding of agricolation than wheat and barley) in the samples? So far, archaeometrically retrieved evidentiary data may support this explanatory hypothesis. Parenthetically, the C4 dietary component appears again in Abdera (through a diachronic study of bone isotopic analyses) only during the chronological phases of the Late Byzantine components[73], en era of steady socio-economic decline at Polystylon.

Similar to the male individuals of this collection, the small number of females obviates demographic/epidemiological arguments about epidemics decimating the Clazomenean population, except of course for childhood diseases primarily affecting the young. And in the case of an aggravated rise of childhood disease(s), if one were to understand Clazomenean females as the primary caretakers of the very young due to labor distribution, one would expect to observe a correspondingly larger number of females, even of older females past their reproductive years, in the mortality curve chart of this archaeological population. For at higher risk of exposure to the disease(s), the females would trail the scores of the worst hit age group, namely that of "Infancy I". However, according to the anthropological sample, this was not the case at Abdera during the Clazomenean horizon.

Skeletal morphocharacteristic and morphometric studies of the Clazomeneans in Abdera revealed a differentiation of anatomic and muscular imprint loci typical of ancient Hellenic societies: the females were more gracile and the males more robust. Further skeletal record forensic anthropologic assessments revealed a much stricter differentiation of labor diversity between biological sexes, especially in comparison to the populations of the Hellenistic, Roman and Middle Byzantine components of Abdera. Notably, this lucid differentiation paralleled that of the much documented Classical period's *Abderetes*[74]. Hence, females showed the most emphasized skeletomuscular markers of habitual and occupational stress (MHOS)[75] at their forearm bones and hands, likely consequences of domestic activities and aspects of food production and preparation. In juxtaposition to females, males showed an influx of osteo- and spondylo-arthropathic manifestations immediately past the middle of their third decade of life. This was evident in emphasized traces of benign physiological stress on trajectory loci of stress along their vertebral columns and the structures of their upper and lower extremities, suggesting heavy load impact, including but being limited to labor intensive processes and activities involving food production. Furthermore, males presented skeletal acquired manifestations indicative of extensive locomotory behavior on non-precipitous substrates--conditions subject to geomorphologic terrain parameters and bone plasticity stimuli, hence placing their usual activities, during the Archaic period, away from the steep mountainous habitats of the Thracian endoplains [76].

Uniformly peculiar, however, were the significant dental crown enamel cracks and flaked off enamel loci at both maxillo-mandibular labio-incisal and occlusal surfaces. Indiscriminate of sex and common among individuals with preserved dentitions, these dental micro-traumatic manifestations[77] appeared to have been acquired shortly pre-mortem. In other words, they were superimposed atop uniformly smoothed and polished dental incisal and occlusal masticatory surfaces[78]. More importantly, according to non-circumstantial forensic dental evidence of the high quality and splendidly prepared food in Clazomenai[79], these micro-traumatic

73 Such a food-stuff appears in the human dietary intake at the end of the Middle (at a 30% prevalence) and the Late Byzantine (at 41%) periods, while both terrestrial animal protein and C3 plant (wheat/barley) dietary components drop significantly. See bibliographical reference No. 75.

74 See bibliographical reference No. 59.

75 See bibliographical references No. 76, 77, 78, 79, 80.

76 A diametrically opposite condition to what has been documented forensically among Proto-Historic Thracian populations in the region by this author (72, 71, 81, 82).

77 See bibliographical references No. 83, 84, 85.

78 The high prevalence and specificity of characteristics identifying these manifestations affecting the dentitions of both younger and older individuals, from both biological sex groups, as well as their random distribution on both incisal and occlusal mandibulo-maxillary enamel loci, strongly suggest forensically that they may not represent the result of a cultural habit(s) adopted while in Thrace, nor the use of the dentitions as a third hand for assistance in the conduct of manual processes requiring additional dexterity.

79 Based on the study of the Archaic anthropological remains of the Clazomenean necropolis recovered from the site of "Akpinar".

manifestations could substantiate a number of significant changes in the processes of preparation, quality, and perhaps even composition of the colonizers' dietary intake after their arrival in Thrace.

Unable to be re-smoothed and/or re-polished, the individuals' cracked dental surfaces reflected unavoidable traumatic impacts continuous until death. This represented not only the lesser degree of food preparation activities, but also an underlying intensification of strain on the Clazomenean population once in Thrace, thereby quantifying a lowered quality of life. Such clues also suggested a lack of certain necessities and resources, indicating at least certain substructural limitations, although not exclusively cultural-technological in nature. Whatever their specifics, the deprived/reduced resources apparently had been routinely available to the Clazomeneans before their endeavor to build and inhabit Abdera. And, as discerned through the lowered techno-economic standards affecting the quality of diet, the diminished/forfeited resources were never to be reclaimed during the lives of these Clazomeneans who were laid to rest in Thrace.

The measure of such archaeo-anthropological scenarios for the fate of the Clazomeneans in Abdera may appear merely mosaic as reflected through the narrative of their osseous tale-tell. Yet it is anticipated that continued bio-archaeological research in conjunction with the rest of the archaeological record, and by the incorporation of the additional Clazomenean population sample discovered at Abdera, as explained above, will offer a nuanced elucidation our understandings concerning this critical period in Aegean Thrace.

Furthermore, the ongoing comparative study of the Archaic skeletal collections retrieved from Clazomenai and Abdera provides singular opportunities for science.

Anthropological-Archaeology Ramifications of the Clazomenean Endeavor in Abdera

A synthesis of data afforded through the bio-archaeological analysis of the Clazomenean human population sample from Abdera provides the exceptional prospect for an interdisciplinary development of the anthropological record. Such an approach reveals evidence of the Clazomeneans' human condition and their experiences during the colonization of the Thracian frontier. Clarifying some of the dynamics of fertility, survivorship and mortality prevalence, the demographic profile's saddle clues combine with skeletal anatomy and morphology, the nature of manifestations and spectra of paleopathological distribution, as well as the archaeometric results to tell the bones' encrypted tales. When interwoven with archaeological and historical records, such unique realizations aid in advancing inquiry into the human condition during those tumultuous times. Hence, concurrent with important but arcane discoveries, a relatively comprehensive picture of the Clazomenean fate in Abdera is slowly emerging. It details a vividly dramatic story in all respects, characteristic of the vision, spirit, stamina, courage and hope of the Clazomeneans striving to establish themselves in a new territory.

Concordant with the region's mythological founder, the efforts and achievements of the Clazomeneans in Abdera appear Herculean[80]. After traveling from afar, they entered the territory of the dreadfully polemical Thracians intending to claim and settle it. Could such an ambitious endeavor have been arbitrarily initiated, merely a system of trial and error? Several anthropological-archaeology threads of evidence could possibly offer obstinate clues.

It appears that in addition to preceding nautical endeavors, for determining suitable mooring sites proximal to the coast for acquisition of materials or exchange of goods with the Thracians, the Greeks had a rich legacy of archaic cultural awareness of the idiosyncratic conditions and riches of Thrace. Hence, it is strongly suspected that the Clazomeneans' decision to moor in Abdera's natural harbor[81] seems to have been an intended endeavor.

The littoral periphery of the cove was nearly unapproachable from land at its southwest and western sides. This offered the advantageous natural safeguards of the Aegean Sea, the cove and its bay locale. Furthermore, the meandering brackish water bodies and slow moving wetlands of the Nestos river (1: Z126, 49) maneuvered as significant defense "ditches"[82]. The effectiveness of defensive potential of this topographic terrain lied not only in its allowing the Clazomeneans to insightfully focus upon securing and fortifying the less protected northern, northeastern and upper southeastern sides, but also of the stratagem of funneled potential land-

80 Just considering that they sustained themselves for a minimum of seventy to eighty years at Abdera (23).

81 See bibliographical reference No. 47.

82 Offering some natural protection by hindering Thracian attacks from those sides, but also allowing for a relatively safe harboring of and proximity to Clazomenean boats.

bearing Thracian attacks to those aforementioned selected sides. In other words, the focal point of the area must have been perceived as highly favorable for habitation due to the ease and speed[83] with which it could be secured and defended by a relatively small number of personnel[84]. Hence, the erection of the fortification walls along the area's geomorphology[85] initiated in the third quarter of the 7th c. BC (ibid.) enhanced the protection capability of the Clazomeneans offering shelter to their emergent settlement and ships. Further, the natural harbor was situated at an advantageously essential location for terrestrial communication: the hub of the Thracian pericoastal plains and the northerly endoplains, accessible by the natural pathway beside the Nestos river through the high mountainous complex of Rodope. Lastly, the cove leading this Thracian passage to the Aegean was tactically sited in overlooking the northerly seafaring activities of Thasos Island[86]. Although the aforementioned assessments are inductive in nature, the Clazomenean colonization of the Thracian coast nevertheless remains both bold and exactingly artful in appearance.

There may be no uncertainty that the Clazomeneans committed themselves in the founding of their new polis, of Abdera. They displayed dauntless confidence in their own power and organizational capacities, confronting grave difficulties and dangers, facing the bitter hostilities of the local Thracian tribes such as the Bistones and the much more significant in territorial reach and military might Paiones, staying their ground, and maintaining phenomenal entrepreneurial drive. They strove relentlessly not only to tame and harvest a promising alien environment, but also to cultivate constructive relations with their polemical neighbors. The Clazomeneans' price for this was debilitating effort and human life. For even if their polis-Estia offered reinforcements, the settlers suffered constantly while struggling to claim territory in Thrace. And although an interpretative holistic anthropological understanding mandates quantifiable data guided by a population approach, the significance of the individual pieces of evidence, from the perinatal to the old individuals, can hardly slip out of focus. Hence, each Clazomenean in the archaic burial ground of Abdera reveals a qualitative narrative of often-unfulfilled dreams of building and succeeding in Abdera. And through such evidence, the settlers' planning, courage, agony, misfortune, lamentation, hopes, strength, and commitment become apparent.

A qualitative view like this might create the nexus for the Clazomenean saga in Thrace. It embodies the struggles of a population facing significant stress, morbidity, and mortality, a population that would have had to rediscover the functions of certain cultural mechanisms and processes[87] or face perilous prospects. Furthermore, the Clazomeneans had to biologically acclimatize and adapt over generations to the harsher physical circumstances of their new locale[88], all the while considering the intricate relationships between the Abdera climate and ecotone[89], its catchment area and carrying capacity, its agrable land and food production issues, and its safety and defense. Similarly, to excel, they must have deliberated means of better organizing activities, communicating with Ionia, and trading in a new geopolitical location.

83 Considering the greater vulnerability of the group to enemy action before and during the construction of the walls.

84 This might be of great importance since it is suspected, should suspicions be based on the recovered anthropological record but without neglecting to consider the traffic of people to and from Clazomenai and Abdera, that the initial group of colonists did not involve very large numbers of people. Whereas the participation of an initial larger group would be possibly advantageous in such an endeavor, it would also require larger logistical efforts for its management and sustenance. Further, we do not know specifics of the colonization decision making, implicating for example an optimal number of people Clazomenai was able and willing to part with, without sacrificing its safety and sustainability. One would assume that the departure of a smaller number of colonists, but without jeopardizing the goals of the undertaking, would be more feasible or preferable for Clazomenai, considering the likelihood of conflict and warfare in the area of Asia Minor such as that which had transpired at Clazomenai, around 600 BC, during the Lydian attack (1: A,16). And yet, there are more questions. Was the Clazomenean dispatch a composite of a corps d'Jlite for such an endeavor, or an amalgam of younger and older and especially of the less wealthy--willing to risk some more in anticipation of good returns, or of the politically disfavored ---as might be hinted by a version of the interpretation of the historical fragments ? [for such a discussion see, (20)].

85 See bibliographical references No. 48, 20.

86 The archaeological record reflects on a lack of traded goods/ceramics between Abdera and Thasos (20), bolstering the archaeological argument that competitive affairs must have characterized their interactions viz. trade with the Thracians.

87 For example by regaining aspects of their fabric of cultural habits and traditions, which were readily available in Clazomenai, (i.e. from the esoteric necessities required for the skills of a specialist(s), to the cultural mechanisms for medically buffering and alleviating physiological stress and trauma).

88 Not only by erecting the walls and constructing a functional harbor, but by managing to deter and overcome the danger of malnutrition and the potential of starvation (the suspected result of Thracian activities), antagonism and even piracy from the sea, and by aiming to better understand and control morbidity causing circumstances, affecting their population, by exposure to this new environment.

89 For references on the excellent climatic conditions in the Clazomenean and Lydian region see (1: A,142).

Despite the rough complexities in improving life in Abdera, the Clazomeneans yielded no ground according to the archaeological and anthropological data of the archaic burial ground of area "K"[90]. With considerable walls of fortification [91], they shielded the archaic settlement of Abdera and the northwestern side of their harbor, founding an Ionian colony at a singularly strategic position in the heartland of Aegean Thrace. Furthermore, by engaging and defending their settlement from the Thracians, the Clazomeneans acquainted themselves with Thracian battle tactics[92] and improved their modes of military operations. They also likely witnessed and negotiated with a Thracian system of political etiquette[93], precious experience to the next generations of Greeks[94] destined to venture to Abdera.

Therefore, even if the results of the Clazomenean experience in Abdera were bleaker than anticipated for the posterity of a "pure" Clazomenean daughter polis in Aegean Thrace, the Clazomenean vision and strategy to build in Abdera must be viewed as ultimately victorious. Whatever the political processes, conferred understandings, and/or negotiations between Clazomenai, Teos (1: A, 142), and populace of Abdera, the fact remains that the Teans seeking refuge in Abdera from 545 BC (1: A, 168) honored the leader of the Clazomenean colonization, Timisias[95], as the non-mythological founder-hero of their new polis. This symbolically[96] exemplifies the significance of the Clazomeneans in founding Abdera, a plausible explanatory theory emerging pragmatically through integrated anthropological-archaeological data.

In retrospect, not only did the Clazomenean vision and determination create an opening in the auspicious land of Thrace, far from the tribulations of the imperialistic reach of Persia for some time, but also they also befittingly secured a perfect refuge for the entire population[97] of Teos during ominous times in Ionia (86). Applying more than two and a half millennia of hindsight, those circumstances proved positive for the long-term sustenance of Abdera, although the point of view of the mother polis of Clazomenai[98] might never be known. Yet nowhere in the ancient sources is there to be found any bitterness, posturing, and/or antagonism between the two neighboring cities of Clazomenai and Teos. In fact not only did those two cities out of the Ionian Amphictionia, in Asia Minor, share common roots, legacies, and traditions, but they also entertained overlapping experiences in war, peace, and exploration, such as their endeavors into Thrace and Egypt (1: B, 178).

---

90 See bibliographical reference No. 23.

91 With a construction consistency of 4 m thick walls made out of local stone, for details see, (20).

92 Demystifying any legends of their might and savagery.

93 Consider the negotiations that transpired in later periods and the commercial relationships with Upper Thrace, best known by its Odrysean rulers.

94 And presumably of others who would seek the lights of Clazomenean advisors in their efforts for grandeur.

95 A *primus inter pares*, or a *persona non grata* among the colonists?--for an evaluation see (20).

96 Out of respect for an existing Clazomenean population in Abdera.

97 For a discussion on the size of the Tean population seeking refuge and migrating to Abdera see (86).

98 It is Clazomenai that should be given the prime role of the Mother city, rather than Teos, considering that Teos was re-founded by the returning Teans from Abdera (4:14,644), and Pindar quoted in (20, 86). For an extensive evaluation on this matter see (86).

Bibliographical References

Abbreviations
AEMTh = To Archaiologiko ergo stè *Makedonia kai Thraki*
PAE = Praktika tes en Athenais archaiologikes etaireias

1. HERODOTUS from HALICARNASSUS (c. 484-420 BC), *History.*
2. THUCYDIDES (c. 460-455 BC), *History*, 431-404 BC.
3. DIODORUS SICULUS (c. 60-30 BC), *(World History)* Bibliotheca Historica.
4. STRABO from AMASEIA (64/3 BC-AD 21 at least), *Geography*, Book 7: North and East Europe, North Balkans.
5. GAIUS PLINIUS SECUNDUS (23/24-79 AD), *Naturalis Historia*, Books 3-6.
6. DIELS H. 1906. *Die Fragmente der Vorsokratiker*, 2nd ed., Berlin, Weidmann, 1960-61.
7. SKARLATIDOU E. 1985. "The Archaic Cemetery of Abdera", *Thracia Pontica* III, 99-108.
8. KOUKOULI-CHRYSANTHAKI Ch. 1985. "Abdera and the Thracians", *Thracia Pontica* III, 82-98.
9. LAZARIDIS D. "Anaskafi en Abdirois", *PAE* 1950, 293-302; 1952, 260-278; 1954, 160-172; 1955, 160-164; 1956, 139-140; 1966, 59-66; 1971, 63-71.
10. KOUKOULI-CHRYSANTHAKI CH., "Anaskafikes ereunes sta archaia Abdira", *PAE* 1982, 1-17; 1983A, 1-12; 1984A, 1-11; 1987, 177-185.
11. BAKIRTZIS X., "Anaskafi Polystylou Abdiron", *PAE* 1982, 18-26; 1983A, 13-19.
12. SKARLATIDOU E. 1984. "Episkopisi tis istorias ton Abdiron me basi tis filologikes piges kai ta arxaiologika dedomena", *Thrakiki Epetirida* 5, 147-161.
13. BAKIRTZIS X. and ZIKOS N. 1984. "Anaskafi Polystylou Abdiron", *PAE*, 11-17.
14. SKARLATIDOU E. 1987. "Anaskafi sto archaio nekrotafeio ton Abdiron", *AEMTh* 1, 421-425 538 (summary).
15. KOUKOULI-CHRYSANTHAKI CH. 1987. "Anaskafes sta Archaia Abdira", *AEMTh* 1, 407-410.
16. KRANIOTI L. 1987. "Tymbos apo ti BD nekropoli ton Abdiron", *AEMTh* 1, 431-435.
17. SAMIOU X. 1988. "To elliniko nekrotafeio ton Abdiron", *AEMTh* 2, 471-480.
18. SKARLATIDOU E. 1990. "Oikismoi kai egkatastaseis istorikon chronon mesa sta oria tis 'choras' ton Abdiron", Mnimi D. Lazaridi, Thessaloniki, 611-618.
19. KALLINTZI K. 1990. "Anaskafi tafikou tymbou sta Abdira" *AEMTh* 4, 561-568.
20. KOUKOULI-CHRYSANTHAKI CH. 1997. "I archaiki poli ton Abdiron. B: Archaiologikes ereunes", Praktika 2ou Diethnous Symposiou Thrakikon Spoudon: *Archaia Thraki*, II, 715-734.
21. MPONIAS Z. 1997. "Andrikos kormos apo ta Abdira", Anakoinosi sto 2o Diethnes Symposio Thrakikon Spoudon*: Archaia Thraki*, Komotini.
22. TRIANTAFYLLOS D. 1997. "Sarkofagos Klazomenikou typou apo ta Abdira", Praktika 2ou Diethnous Symposiou Thrakikon Spoudon: *Archaia Thraki*, II, 741-774.
23. SKARLATIDOU E. 2000. *Apo to Archaiko Nekrotafeio ton Abdiron: Symboli stin Ereuna ton Klazomenion sta Abdira*, Doctoral Dissertation (unpublished), Dept. of History and Archaeology, Aristotelian University, Thessaloniki.
24. HASSAN F.A. 1981. *Demographic Archaeology*, Academic Press, New York.
25. BUTZER W.K. 1984. *Archeology as human ecology: Method and theory for a contextual approach*, Cambridge University Press.
26. AGELARAKIS A. 1996. "Environments and Human Ecology: Dynamic Factors in Processual Equations of Human Adaptations as seen from Archaeological Perspectives", in Pantel G.A., Schneider A.K. and G. Loyola-Black, (eds.), *Proceedings of the IV New World Conference on Environment and Archaeology*, San Juan Puerto Rico, December 6-12, 1992. Organization of American States, USDA, Forest Service, World Archaeological Congress, 112-118.

27. BERNARD H. R. 1994. *Research Methods in Anthropology: Qualitative and Quantitative Approaches*, 2nd edition, Sage Publications, Inc., California.

28. BORDENS K.S. and B.B. ABOTT 1991. *Research Design and Methods*, 2nd edition, Mayfield Publishing Company, Toronto.

29. SHIPMAN P. 1981. *Life History of a Fossil: An Introduction to Taphonomy and Paleoecology*, Harvard University Press, Cambridge, Massachusetts.

30. AGELARAKIS A. 1996. "Egxeiridio fysikis anthropologias gia archaiologous", *Ariadni*, 8, 189-247.

31. ISCAN M.Y. and KENNEDY K.A.R. (eds.) 1989. *Reconstruction of Life from the Skeleton*, Alan R. Liss, Inc., New York.

32. DIBENNARDO R. 1986. in Reichs Kathleen J., (ed.) Forensic Osteology: *The Use and Interpretation of Common Computer Implementations of Discriminant Function Analysis*, C.C. Thomas, Springfield, Ill. 171.

33. VAN VARK G.N. and SCHAAFSMA W. 1991. in Saunders S.R. and Katzenberg M.A., (eds.), *Skeletal Biology of Past Peoples: Advances in the Quantitative Analysis of Skeletal Morphology*, Willey-Liss, New York, 225-257.

34. STEWART T.D. 1979. *Essentials of Forensic Anthropology*, C.C.Thomas, Springfield, Ill.

35. ORTNER D.J. and PUTSCHAR W.G.J. 1981. Identification of Pathological Conditions in Human Skeletal Remains, Smithsonian Contributions to *Anthropology,* No.28. Smithsonian Inst. Press, City of Washington.

36. HUSS-ASHMORE R. 1982. "Nutritional inference from paleopathology", *Advances in Archaeological Method and Theory* 5, 395-474.

37. KROGMAN W.M. and ISCAN M.Y. 1986. *The Human Skeleton in Forensic Medicine*, C.C. Thomas, Springfield, Ill.

38. ORTNER D.J. and AUFDERHEIDE A.C. 1991. Human Paleopathology: Current Synthesis and Future Options, Smithsonian Institution Press, Washington.

39. BROOKS S. and SUCHEY J.M. 1990. "Skeletal Age Determination based on the Os Pubis: A Comparison of the Ascadi-Nemeskeri and Suchey-Brooks Methods", *Human Evolution* 5, N, 3, 227-238

40. EL-NOFELY A. and ISCAN M.Y. 1989. In Iscan M.Y., (ed.), Age Markers in the Skeleton: Assessment of Age from the Dentition in Children, C.C. Thomas, Springfield, Ill, 237-254.

41. SAUNDERS S.R. 1989. In Iscan M.Y. and Kennedy K.A.R. (Eds.), *Reconstruction of Life from the Skeleton: Nonmetric Skeletal Variation*, A.R.Liss, New York, 95-108.

42. FINNEGAN M. 1978. "Non-metric variation of the Infracranial skeleton", *Journal of Anatomy* 125, 23-37.

43. BERRY C. and BERRY J. 1967. "Epigenetic variation in the human cranium", *Journal of Anatomy* 101.2, 370-390.

44. SUTHERLAND D. L. and SUCHEY J.M. 1991. "Use of the Ventral Arch in Pubic Sex Determination", *Journal of Forensic Sciences* 36, N, 2, 501-511.

45. AGELARAKIS A. 1982. "*The Archaic Burial Grounds: Physical Anthropological Investigations*", Archival Reports, Museum of Komotini, 1-45.

46. AGELARAKIS A. 1999. "Paleopathology of Archaic Infants in Abdera, Greece", (Paper presentation), *Abstracts of the 26th Annual Meeting of the Paleopathology Association*, April 27-28, Columbus, Ohio.

47. PSILOBIKOS A. and SYRIDIS G. 1997. " I archaia poli ton Abdiron. A. Geomorphologikes ereunes", Praktika 2ou Diethnous Symposiou Thrakikon Spoudon: *Archaia Thraki*, II, 707-714.

48. KOUKOULI-CHRISANTHAKI Ch. 1988. "Oi anaskafikes ereunes sta archaia Abdira", *sto Symposio, "I istoriki, archaiologiki kai laografiki ereuna gia ti Thraki"*, Thessaloniki, 46-48.

49. KALLINZI K. 1991. "Archaiologikes ergasies sta Abdira", *AEMTh* 5, 456-469.

50. KALLINZI K. 1997. "Ethima tafis sta arxaia Abdira. Tafikes praktikes kai ethimikes praxeis apo ta mesa tou 6ou os ta mesa tou 3ou ai. B.C." Praktika 2ou Diethnous Symposiou Thrakikon Spoudon: *Archaia Thraki II*, 807-839.

51. AGELARAKIS A. 1997. "Social Hierarchy in a Classical Society at Abdera as Revealed by New Archaeological Perspectives of the Human Skeletal Record", Praktika 2ou Diethnous Symposiou Thrakikon Spoudon: *Archaia Thraki II*, 849-866.

52. AGELARAKIS A. 1996. Report on Anthropological Investigations in Classical Abdera: Cremated and Dry Human Osseous Materials, *Archival Report*, Archaeological Museum of Abdera.

53. AGELARAKIS A. 1990. "Archaeological Forensics and Paleopathology", in Grosman, J., (ed.), *The Excavation, Analysis, and Reconstruction of the Transitional Period, Late Woodland Period and Colonial Occupations at the Little Wood Creek Site, Fort Edward, Washington County, New York*. Project Reference No: C36-130-5-01, New York State Historic Preservation Office, the Advisory Council on Historic Preservation-Washington D.C., Vol: IV.

54. REINHARD J.K. 1992. "Parasitology as an Interpretative tool in Archaeology", *American Antiquity* 57.2*,* 231-245.

55. KRUEGER H.W. and SULLIVAN C.H. 1984. Models for Isotope Fractionation Between Diet and Bone, *ACS Symposium Series*, No.258, Stable Isotopes in Nutrition, R. Turnland and P.E. Johnson, (eds.). American Chemical Society, Washington, DC.

56. KRUEGER H. W. 1985. Models for Carbon and Nitrogen Isotopes in Bone, Krueger Enterprises, Inc., Cambridge, Mass.

57. ROGAN K. P. and SALVO J.J. 1990. "Study of Nucleic Acids Isolated From Ancient Remains", *Year Book of Physical Anthropology* 33, 195-214.

58. AGELARAKIS A. 1984. "The Archaic Burial Grounds: Physical Anthropological Investigations", *Archival Reports*, Museum of Komotini, 1-52.

59. AGELARAKIS A. 2000. "Aspects of Demography and Palaeopathology Among the Hellenistic Abderetes in Thrace, Greece", *Eulimene* 1, 13-24.

60. AGELARAKIS A. and AGELARAKIS Ar. 1989. "The Palaeopathological Evidence, Indicators of Stress and Dietary Evaluations from two Skeletal Populations, a Middle and a Late Byzantine, from Polystylon Abdera, Greece", *Byzantinische Forschungen* 14, 9-26.

61. AGELARAKIS A. 1997. "Excavations at Polystylon (Abdera) Greece: Aspects of Mortuary Practices and Skeletal Biology", *Archaiologiko Deltio* 47, 293-308.

62. SCRIMSHAW N. 1964. "Ecological Factors in Nutritional Disease", *American Journal of Clinical Nutrition* 14, 112-122.

63. SWARDSTEDT T. 1966. *Odontological aspects of a Medieval population in the province of Jamtland\ Mid-Sweden*, Tiden-Barnangen AB, Stockholm.

64. GRAHNEN H. 1967. "Maternal diabetes and changes in the hard tissues of primary teeth, I. A clinical study", *Odont. Rev.* 18, 257-162.

65. GRAHNEN H. 1969. "Neonatal asphyxia and mineralization defects of the primary teeth", *Caries Res*. 3, 3 01-307.

66. ROSE J.C., ARMELAGOS G.J. and LALLO J., 1978, "Histological Enamel Indicators of Childhood Stress in Prehistoric Skeletal Samples", *AJPA* 49, 511-516.

67. PINDBORG J.J., 1982, "Aetiology of Developmental Enamel Effects not related to fluorosis", *Int. Dent. J.* 32.2, 123-134.

68. ROSE J.C., CONDON K.W. and GOODMAN A.H., 1984, "Diet and Dentition: Developmental Disturbances", in Mielke J. and Gilbert R., (eds.), *The analysis of Prehistoric Diets*, Academic Press, New York.

69. CATE R. A. Ten, 1994, *Oral Histology, Development, Structure, and Function*, 4th edition, Mosby, New York.

70. PARK E.A., 1964, "The imprinting of nutritional disturbances on the growing bone", *Pediatrics* 38, 815-862.

71. AGELARAKIS A., 1999, "Reflections of the Human Condition in Prehistoric Thasos: Aspects of the Anthopological and Palaeopathological Record from the Settlement of Kastri", Actes du Colloque International *Matières premières et Technologie de la Préhistoire à nos jours*, Limenaria, Thasos. Publications of the French Archaeological Institute in Greece, 447-468.

72. KOUKOULI-CHRYSANTHALI Ch., SGOUROU, M., and AGELARAKIS A., 1996, "Archaiologikes ereunes sti nekropoli tis archaias Thasou 1979-1996", *AEMTh* 10B, 770-794.

73. ORTNER J.D. and ERICKSEN M.F., 1997, "Bone Changes in the Human Skull Probably Resulting from Scurvy in Infancy and Childhood", Int. J. *Osteoarchaeology* 7, 212-220.

74. XENOPHON, *Hellenica* 3.2.10-11.

75. AGELARAKIS A. and BAKIRTZIS Ch., 1998, "Cemeteries of Polystylon-Abdera", *Proceedings of the First Symposium on Burial Customs and Practices in the Rhodopes*, Smolyan, Bulgaria, (5-6 Oct., 1995), 1, 58-68.

76. AGELARAKIS A. 1996, "The Archaeology of Human Bones: Prehistoric Copper Producing Peoples in the Khao Wong Prachan Valley, Central Thailand", Bellwood P., (ed.), The Indo-Pacific Prehistory: The Chang Mai Papers, *IPAA Bulletin*, 14, I, 133-139.

77. ZAREK J. M., 1966, "Dynamic Considerations in Load Bearing Bones with Special Reference to Osteosynthesis and Articular Cartilage", in Evans F.G., (ed.), *Studies on the Anatomy and Function of Bones and Joints*, Springer Verlag, N.Y., 40-51.

78. SOGNAES R.F. (ed.), 1963, *Mechanisms of Hard Tissue Destruction*, AAAS, Publ. 75, Wash., D.C.

79. LEVI L., 1972, *Stress and distress in response to physiological stimuli*, Pergamon Press, Oxford.

80. CURREY J., 1984, *The Mechanical Adaptations of Bones*, Princeton Univ.Press, Princeton N.J.

81. AGELARAKIS A., 2001, "Report on the Anthropological Forensic and Palaeopathological Study of a Select Sample of Human Skeletal Individuals from the Ancient Necropolis of Thasos", in Sgourou, M. "Jewellery from Thasian Graves", *Annual of the British School at Athens*, V:96, 355-364,

82. AGELARAKIS A., 2002, "Investigations of Physical Anthropology and Palaeopathology at the Ancient Necropolis of Thasos", in Sgourou, M. "Excavating Houses and Graves in Thasos", *Annual of the British School at Athens*, (forthcoming).

83. PINDBORG J.J., 1970, *Pathology of the Dental Hard Tissues*, W.B.Saunders Co., Philadelphia.

84. MOLNAR S., 1971, "Human tooth wear, tooth function, and cultural variability", *AJPA* 34, 27-42.

85. DARLING A.I., 1970, "Dental Caries", in Gorlin R.J. and Goldman H.M.,(eds), *Thoma's Oral Pathology*, The C.V.Mosby Co., St. Louis, 239-307.

86. BELIGIANNI-TERZI Chr., 1997, "Teos kai Abdira" , Praktika 2^{ou} Diethnous Symposiou Thrakikon Spoudon: *Archaia Thraki II*, 1997, 691-705.

Appendix No. 1

Burial Number	Taxonomic Identification of Shells Recovered per Burial Context
K125	1 Loripes lacteus (Linnaeus, 1758), small individual 1 Astarte cf. sulcata (Da Costa, 1778), water worn (*) 1 Arca noae (Linnaeus, 1758), (Ark shell, or Turkey wing, or Καλόγνομι, small individual, water worn 1 Cerithium vulgatum (Bruguiere, 1792) (Cerith, Horn or Needle shell, or Κεράτιον) – fragment 2 Donacilla cornea (Poli, 1795) (Wedge shell, or κοχίλιον)- valves, 1, or 2 individuals 1 Mytilus galloprovincialis Lamarc, 1819 (Mussel, or Μύδι) 1 Solitary coral head, small size
K126	3 Bittium reticulatum (Da Costa, 1778), all small sizes 1 Arca- fragments, water worn 2 Cerastroderma (Cardium) edule glaucum (Bruguiere, 1789), fragments, 2 individuals, both water worn (Cockle, or Κάρδιον, (Κυδόνιον, Μεθύστρα), fragment, adult individual 1 Spondylus gaederopus, (Linnaeus, 1758), (Spiny or Thorny oyster, or Σπόνδυλος), fragment, very worn and pitted 1 Ceritium or Murex (Truncullariopsis, Hexaplex) trunculus, or Πορφυρία (Linnaeus, 1758), fragment, water worn apex 1 Venus, could be a fossil 2 Acanthocardia (Rudicardium) tuberculata (Linnaeus, 1758) (Rough or Rednosed cockle, or Ακανθοκάρδιον, Κόλχιον), fragments, water worn 1 Cardita calyculata (Linnaeus, 1758), fragment 1 Donax sp. (Wedge shell, or Κοχίλιον) 1 Ostrea sp. (Oyster, or Οστρέα), fragment 1 Glycymeris sp. (Dog-cockle, or Μελοκίδονο) 1 Smaragdia viridis (Linnaeus, 1758), small individual
K127	1 Helicid land snail, small individual 1 Murex, body fragment water worn 2 Cerastroderma, water worn 3 Bittium, small individuals 1 Dentalium sp. (Scaphopod, Tusk or Tooth shell, or Σκαφόποδο) 1 Lionucula tenuis, small individual, fresh 1 Small gasropod 1 Donax sp., small individual 1 Glycimeris, small individual, water worn
K132	3 Loripes, 3 individuals 1 Bittium, small individual 3 Cerastroderma, small individual, water worn 1 Venus 1 Donax 1 Glycymeris, water worn 1 Dentalium 1 Gibbula sp. (Top shell, or Τροχός) 1 Chama gryphoides, (Linnaeus, 1758) (Hoof shell) 1 Grab pincer, small individual

K139	3 Helicid land snails, all small individuals 5 Bittium, all small individuals 1 Gastropod in Family Turridae, possible Cythara sp.
K150	1 Anomia ephippium (Linnaeus, 1758) (Slipper clam) 1 Cyclope neritea (Linnaeus, 1758) (Basket or Nassa shell)
K151	1 Bittium , small individual
K156	1 Loripes, small individual 1 Bittium 1 Cerastroderma, small individual 1 Vermetid 1 Crab pincer, small individual 1 Paracentrotus lividus (Lamarck) spine (Sea urchin, or Αχινός)

(*) NOTE: water worn = collected/deposited dead